

**SECTION 07 7200
ROOF ACCESSORIES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Snow guards.
- B. Brackets for rooftop accessory mounted items including braces at boiler stacks and fire place flue.

1.02 RELATED REQUIREMENTS

- A. Section 07 4113 - Metal Roof Panels.
- B. Section 07 6200 - Sheet Metal Flashing and Trim: Roof accessory items fabricated from sheet metal.

1.03 REFERENCE STANDARDS

- A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2020.
- B. FM (AG) - FM Approval Guide current edition.
- C. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation 2018.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used.
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - 4. Maintenance requirements.
- C. Shop Drawings: Submit detailed layout developed for this project. Show dimensioned location and number for each type of roof accessory.
 - 1. Snow Guards: Submit design calculations for loadings and spacings based on manufacturer testing.
 - 2. Submit shop drawings sealed and signed by a Professional Engineer experienced in design of this type of work and licensed in the State of Alaska.
- D. Warranty Documentation:
 - 1. Submit manufacturer warranty.
 - 2. Ensure that forms have been completed in Owner's name and registered with manufacturer.
 - 3. Submit documentation that roof accessories accessories are acceptable to roofing manufacturer, and do not limit the roofing warranty.

1.05 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.

1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 CLAMPS AND MOUNTING BRACKETS

- A. Unit Snow Guards: Individual projecting metal shapes, attached to standing seams of roof panel, and non-penetrating attachment to roof deck.
 - 1. Projecting Metal Shapes: Aluminum, triangular spike design.
 - 2. Finish: Mill.
 - 3. Placement: As indicated on drawings.
 - 4. Manufacturers:
 - a. Rocky Mountain Snow Guards, Inc; S5! Blizzard II Fence Style Snow Guards and Brackets: www.rockymountainsnowguards.com/#sle.

- B. Fence Type Snow Guard: Continuous double stacked tubular snow guard, set in brackets attached to standing seams.
 - 1. Basis of Design: Rocky Mountain Snow Guards, Inc; S5! Blizzard II Fence Style Snow Guards and Brackets: www.rockymountainsnowguards.com/#sle.
 - 2. Materials: All components to be aluminum with stainless steel hardware.
- C. Brackets:
 - 1. Other General non-penetrating attachments to roof: Basis of Design:
 - 2. Pipe or Square Tube: Aluminum, mill finish.
 - 3. Solid Rod: Aluminum, mill finish.
 - 4. Supplemental Plates and Clips: Attached to horizontal component; match finish of pipe, tube, rod, or channel.
 - 5. Clamps for Standing Seam Roof: Aluminum clamps attached to standing seams of roof panels; for attachment of braces supporting vent stacks.
 - a. Seam Profile: Selected by Architect from manufacturer's standard range; match profile of metal roof.
 - 6. Manufacturers:
 - a. Metal Roof Innovations, Ltd. S-5! Attachment Solutions: www.s-5.com/#sle.
 - b. Products: S-5-V and S-5-U Clamps

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 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, in manner that maintains roofing weather integrity.

3.04 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

**SECTION 07 8400
FIRESTOPPING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Firestopping systems.
- B. Firestopping of all joints and penetrations in fire resistance rated and smoke resistant assemblies, whether indicated on drawings or not, and other openings indicated.
- C. Electrical Outlet Protection Accessories for Fire and acoustic walls.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.

2.02 FIRESTOPPING SYSTEMS

- A. Firestopping: Any material meeting requirements.
- B. Accessories for Electrical Boxes at Fire, Smoke, or Acoustic Rated walls.
 - 1. Basis of Design Product: Rockwool Putty Pads <https://www.rockwool.co.uk/product-overview/fire-stopping-products/intumescent-putty-pads-en-gb/?selectedCat=literature%20downloads>

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify openings are ready to receive the work of this section.

3.02 INSTALLATION

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

END OF SECTION

**SECTION 07 9200
JOINT SEALANTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sealants and joint backing.
- B. Joint backings and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 07 2500 - Weather Barriers: Sealants required in conjunction with air barriers and vapor retarders.
- B. Section 07 4113 - Metal Roofing
- C. Section 07 8400 - Firestopping: Firestopping sealants.
- D. Section 08 7100 - Door Hardware: Setting exterior door thresholds in sealant.
- E. Section 08 8000 - Glazing: Glazing sealants and accessories.
- F. Section 09 2116 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.
- G. Section 09 3000 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.
- H. Section 32 1373 - Concrete Paving Joint Sealants

1.03 REFERENCE STANDARDS

- A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer 2015.
- B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.
- C. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016.
- D. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants 2018.
- E. ASTM C1311 - Standard Specification for Solvent Release Sealants 2014.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
 - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
 - 2. List of backing materials approved for use with the specific product.
 - 3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
 - 4. Substrates the product should not be used on.
 - 5. Substrates for which use of primer is required.
 - 6. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
- C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including the following:
 - 1. Physical and chemical characteristics, including movement capability, VOC content, hardness, cure time, color availability.
 - 2. Performance criteria.
 - 3. Installation instructions and limitations.
 - 4. Substrate preparation and limitations.
- D. Samples for Verification: Where sealant will be exposed to view, obtain directions from Architect and submit at least two physical samples for verification of color of each required sealant.
- E. Field Quality Control Plan: Submit at least two weeks prior to start of installation.

- F. Field Quality Control Log: Submit filled out log for each length or instance of sealant installed, within 10 days after completion of work; include bagged test samples and photographic records with products and location descriptions.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.
- B. Applicator Qualifications: Employ only skilled workers who are thoroughly trained and experienced in the application of the sealant product furnished and who are completely familiar with the Drawings and this Specification.
- C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.
- D. Field Quality Control Plan:
1. Visual inspection of entire length of sealant joints.
 2. Non-destructive field adhesion testing of sealant joints, except interior acrylic latex sealants.
 - a. For each different sealant and substrate combination, allow for one test every 12 inches in the first 10 linear feet of joint and one test every 24 inches thereafter.
 - b. If any failures occur in the first 10 linear feet, continue testing at 12 inch intervals
 3. Field Quality Control Log Form: Show same data fields as on Preinstallation Field Adhesion Test Log, with known information filled out and lines for multiple tests per sealant/substrate combinations; include visual inspection and specified field testing; allow for possibility that more tests than minimum specified may be necessary.
- E. Field Adhesion Test Procedures:
1. Allow sealants to fully cure as recommended by manufacturer before testing.
 2. Have a copy of the test method document available during tests.
 3. Record the type of failure that occurred, other information required by test method, and the information required on the Field Quality Control Log.
 4. If any combination of sealant type and substrate does not show evidence of minimum adhesion or shows cohesion failure before minimum adhesion, report results to Architect.

1.06 WARRANTY

- A. See Section 01 7800 - 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 that fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Non-Sag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.
1. Sika Corporation: www.usa-sika.com/#sle.
- B. Elastomeric butyl sealant tape
- C. Self-Leveling Sealants: Pourable or self-leveling sealant that has sufficient flow to form a smooth, level surface when applied in a horizontal joint.
1. W.R. Meadows, Inc: www.wrmeadows.com/#sle.

2.02 SEALANTS

- A. Type Exterior - Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus [] percent, minimum.
 2. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
 3. Manufacturers:
 - a. Dow Chemical Company; DOWSIL 791 Silicone Weatherproofing Sealant: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.

- B. Sealant types for any product or system shall be as recommended or required by the manufacturer unless noted otherwise.
- C. Interior Standard Sealant: Single Component Silicone Sealant: ASTM C920, Grade NS, Uses A and O; not expected to withstand continuous water immersion or traffic.
 - 1. Movement Capability: Plus and minus 50 percent, minimum.
 - 2. Hardness: 15, Shore A, when tested in accordance with ASTM C661.
 - 3. Color: Match adjacent finished surfaces.
 - 4. Ultimate tensile strength: (at maximum elongation)100 psi (0.07 kgf/mm²).
 - 5. Peel strength: 25 lbs/inch (4.5 kg/cm).
 - 6. Tear strength: (die B) 25 lb./inch (4.5kg/cm).
 - 7. Ozone resistance: Excellent.
 - 8. Weathering exposure: No change in hardness or color after 4500 hours.
 - 9. Recovery: 100% recovery from 50% compression or extension.
- D. Exterior Standard Sealant: single component Polyurethane Sealant: ASTM C920, Grade NS, Uses A and O; not expected to withstand continuous water immersion or traffic.
 - 1. Movement Capability: Plus and minus 25 percent, minimum.
 - 2. Hardness: 25, Shore A, when tested in accordance with ASTM C661.
 - 3. Color: Match adjacent finished surfaces.
 - a. Provide clear sealant at windows.
 - 4. Ultimate Tensile Strength (ASTM D412): 300 psi
 - 5. Service Temperature Range: Minus 40 to 180 degrees F.
- E. Interior Sealant at Vandal-prone Areas (areas withing reach of the general public): Type S - Tamper-Resistant Polyurethane Sealant: ASTM C920, Grade NS, Uses A and O; not expected to withstand continuous water immersion or traffic. At door frames, drinking fountains and other locations where removal of sealant by "picking" is expected, substitute the standard sealant with a pick resistant sealant exhibiting the following characteristics:
 - 1. Movement Capability: Plus and minus 12-1/2 percent, minimum.
 - 2. Hardness Range: 50 to 60, Shore A, when tested in accordance with ASTM C661.
 - 3. Color: Match adjacent finished surfaces.
 - 4. Ultimate tensile strength (ASTM D412): 600 psi.
 - 5. Peel strength (ASTM C794): 31-43 psi
 - 6. Stain and Color (ASTM C510): Pass
 - 7. 100% Modulus (ASTM D412): 160 psi
 - 8. Tear strength (ASTM D1004): 100 psi
- F. Exterior Metal Roof Sealant: Non-Curing Butyl Sealant, Solvent-based, single component, non-sag, non-skinning, non-hardening, non-bleeding; non-vapor-permeable; intended for fully concealed applications; Preformed type where details refer to "BUTYL TAPE".
 - 1. Must satisfy all requirements of metal roofing manufacturer.

2.03 ACCESSORIES

- A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
- B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.
- C. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.
- D. Primers: Type recommended by sealant manufacturer to suit application; non-staining.
- E. Bond Breaker: Pressure-sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.01 GENERAL

- A. Sealant shall be applied to all open construction joints to form moisture tight joints except where specifically indicated otherwise.

3.02 EXAMINATION

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials and release tapes are compatible with sealants.
- C. Verify that backer rods are of the correct size.
- D. Carefully examine the substrate and observe conditions under which the work is to be performed. Do not proceed with the work or allow it to proceed until unsatisfactory conditions have been corrected. Commencement of work by the installer constitutes acceptance of the substrate.

3.03 PREPARATION

- A. Remove loose materials and foreign matter, including laitance, dirt, moisture and any other materials that could impair adhesion of sealant.
- B. Preparation of joints: Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.
- E. Precaution: Do not proceed with preparation of joints or installation of materials until final finish coatings have been applied to adjacent surfaces.

3.04 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer.
- D. Install bond breaker backing tape where backer rod cannot be used.
- E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- F. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
- G. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.
- H. Install backing materials in accordance with Manufacturer's instructions
- I. Installation of Sealant: Apply sealant in accordance with Manufacturer's printed instructions for the specific conditions including manufacturer range of installation using a handgun with nozzle of proper size. Fill joints and voids solid. Superficial pointing and skin beading will not be accepted. Tool joints with equipment designed especially for that purpose, leaving surfaces uniform, smooth, and free of sags, gaps, bulges, air pockets, and other inconsistencies. Remove excess material immediately. Leave adjacent surfaces clean. Cure sealed joint for a period of not less than 48 hours.
- J. Precompressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch below adjoining surface.
- K. Compression Gaskets: Avoid joints except at ends, corners, and intersections; seal all joints with adhesive; install with face 1/8 to 1/4 inch below adjoining surface.

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3.05 CLEANING

- A. Clean adjacent soiled surfaces.

3.06 PROTECTION

- A. Protect sealants until cured.

3.07 FIELD QUALITY CONTROL

- A. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.
- B. Non-Destructive Adhesion Testing: If there are any failures in first 100 linear feet, notify Architect immediately.
- C. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

END OF SECTION

**SECTION 08 1213
HOLLOW METAL FRAMES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Non-fire-rated hollow metal frames for non-hollow metal doors.
- B. Fire-rated hollow metal frames for non-hollow metal doors and insulated hollow metal doors.
- C. Interior glazed borrowed lite frames.

1.02 RELATED REQUIREMENTS

- A. Section 08 7100 - Door Hardware: Hardware, silencers, and weatherstripping.
- B. Section 08 8000 - Glazing: Glazed borrowed lites.

1.03 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
- B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors 2011.
- C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100) 2017.
- D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames 2011.
- E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2018.
- F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable 2018.
- G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.
- H. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames 2016.
- I. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.
- J. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames 2002.
- K. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames 2011.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Hollow Metal Frames with Integral Casings:
 - 1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com/#sle.
 - 2. Curries, an Assa Abloy Group company: CM Series Frames:www.assaabloydss.com/#sle.
 - 3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

- A. Refer to Door and Frame Schedule on the drawings for frame sizes, fire ratings, sound ratings, finishing, and other variations, if any.
- B. Door Frame Type:
 - 1. Exterior Doors: Use frames with integral casings. (Not currently used)
 - 2. Interior Doors: Use frames with integral casings.
- C. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
- D. Accessibility: Comply with ICC A117.1 and ADA Standards.

- E. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior frame that is also indicated as being sound-rated must comply with the requirements specified for exterior frames and for sound-rated frames; where two requirements conflict, comply with the most stringent.
- F. Hardware Preparations, Selections and Locations: Comply with BHMA A156.115, NAAMM HMMA 830, NAAMM HMMA 831 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

2.03 HOLLOW METAL DOOR FRAMES WITH INTEGRAL CASINGS

- A. Frame Finish: Factory galvanized and shop finished..
- B. Door Frames: Full profile/continuously welded type.
 - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 3 - Extra Heavy-duty.
 - b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
 - 2. Weatherstripping: Include at all smoke protected doors and as indicated for sound or other purposes. Refer to Section 08 7100 for additional information.

2.04 FINISHES

- A. Primer: Hot dipped Galvanized.

2.05 ACCESSORIES

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

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 INSTALLATION

- A. Install frames in accordance with manufacturer's instructions and related requirements of specified frame standards or custom guidelines indicated.
- B. Coordinate frame anchor placement with wall construction.
- C. Comply with glazing installation requirements of Section 08 8000.
- D. Install door hardware as specified in Section 08 7100.
- E. Coordinate installation of electrical connections to electrical hardware items.
- F. Touch up damaged factory finishes.

3.03 TOLERANCES

- A. Maximum Diagonal Distortion: 1/16 inch measured with straight edges, crossed corner to corner.

END OF SECTION

**SECTION 08 1416
FLUSH WOOD DOORS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Flush wood doors; flush and flush glazed configuration; acoustical.

1.02 RELATED REQUIREMENTS

- A. Section 08 1213 - Hollow Metal Frames.
- B. Section 08 4313 - Aluminum-Framed Storefronts
- C. Section 08 7100 - Door Hardware.
- D. Section 08 8000 - Glazing.

1.03 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials Current Edition.
- B. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass 2018.
- C. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).
- D. AWI (QCP) - Quality Certification Program Current Edition.
- E. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition 2014, with Errata (2016).
- F. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 4.0 2021.
- G. FM (AG) - FM Approval Guide current edition.
- H. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives 2016.
- I. UL (DIR) - Online Certifications Directory Current Edition.
- J. WDMA I.S. 1A - Interior Architectural Wood Flush Doors 2013.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
 - 1. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
 - 2. Include certification program label.
- D. Samples: Submit two samples of door veneer, 4" by 4" inch in size illustrating wood grain, stain color, and sheen.
- E. Certificate: Submit labels and certificates required by quality assurance and quality control programs.
- F. Manufacturer's Installation Instructions: Indicate standard and special installation instructions.
- G. Manufacturer's Qualification Statement.
- H. Installer's Qualification Statement.
- I. Specimen warranty.
- J. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE

- A. Maintain one copy of the specified door quality standard on site for review during installation and finishing.

- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.
 - 1. Company with at least one project within the past 5 years with value of woodwork within 20 percent of cost of woodwork for this project.
- C. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience in Alaska.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Accept doors on site in manufacturer's packaging. Inspect for damage.
- 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 and maintain in protected area until time of installation.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Interior Doors: Provide manufacturer's warranty for the life of the installation.
- C. 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:
 - 1. Graham Wood Doors; Premium: www.grahamdoors.com/#sle.
 - 2. Masonite Architectural Aspiro Factory Fished Wood Doors.architectural.masonite.com

2.02 DOORS AND PANELS

- A. Doors: Refer to drawings for locations and additional requirements.
 - 1. Quality Standard: Premium Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
 - 2. Wood Veneer Faced Doors: 5-ply 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 as selected by Architect..

2.03 DOOR AND PANEL CORES

- A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), 5 plies and faces as indicated.
- B. Sound-Rated Doors: Equivalent to type, with particleboard core (PC) construction as required to achieve STC rating; plies and faces as indicated above.

2.04 DOOR FACINGS

- A. 5 ply Veneer Facing for Transparent Finish: Plain Sliced WhiteMaple veneer grade AA, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.
 - 1. "Running Match" each pair of doors and doors in close proximity to each other.

2.05 DOOR CONSTRUCTION

- A. Fabricate doors in accordance with door quality standard specified.
- B. Where supplementary protective edge trim is required, install trim after veneer facing has been applied full-width.
- C. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
- D. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

- E. Cut and configure door edge to receive recessed weatherstripping or acoustical seal devices.
- F. Provide edge clearances in accordance with the quality standard specified.

2.06 FACTORY FINISHING - WOOD VENEER DOORS

- A. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:

2.07 ACCESSORIES

- A. Glazed Openings:
 - 1. Heat-Strengthened and Fully Tempered Glass: ASTM C1048. See Section 08 8000
- B. Glazing: As specified in Section 08 8000.
- C. Glazing Stops: Wood, of same species as door facing, butted corners; prepared for countersink style tamper proof screws.
 - 1. Metal Glazing stops or trim not allowed.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
 - 1. Install smoke and draft control doors in accordance with NFPA 105 requirements.
- 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.

3.03 TOLERANCES

- A. Comply with specified quality standard for fit and clearance tolerances.
- B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.

END OF SECTION

**SECTION 08 1613
FIBERGLASS DOORS AND FRAMES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fiberglass doors.
- B. Fiberglass door frames.

1.02 RELATED REQUIREMENTS

- A. Section 08 7100 - Door Hardware.

1.03 REFERENCE STANDARDS

- A. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position 2018.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- C. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference 2014.
- D. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference 2000 (Reapproved 2016).

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Molded Fiberglass Doors:
 - 1. ChemPruf Door Company, Ltd: www.chem-pruf.com/#sle.

2.02 DOOR AND FRAME ASSEMBLIES

- A. Door and Frame Assemblies: Factory-fabricated, prepared and machined for hardware.
 - 1. Screw-Holding Capacity: Tested to 890 lbs, minimum.
 - 2. Surface Burning Characteristics: Flame spread index (FSI) of 0 to 25, Class A, and smoke developed index (SDI) of 450 or less, when tested in accordance with ASTM E84.
 - 3. Flammability: Self-extinguishing when tested in accordance with ASTM D635.
 - 4. Clearance Between Door and Frame: 1/8 inch, maximum.

2.03 COMPONENTS

- A. Doors: Fiberglass construction with reinforced core.
 - 1. Thickness: 1-3/4 inch, nominal.
 - 2. Core Material: Manufacturer's standard core material for application indicated.
 - 3. Construction:
 - 4. Face Sheet Texture: Smooth.
 - 5. Subframe and Reinforcements: Fiberglass pultrusions or polymer foam; no metal or wood.
 - 6. Waterproof Integrity: Provide factory fabricated edges, cut-outs, and hardware preparations of fiberglass reinforced plastic (FRP); provide cut-outs with joints sealed independently of glazing, louver inserts, or trim.
 - 7. Hardware Preparations: Factory reinforce, machine, and prepare for door hardware including field installed items; provide solid blocking for each item; field cutting, drilling or tapping is not permitted; obtain manufacturer's hardware templates for preparation as necessary.

2.04 PERFORMANCE REQUIREMENTS

- A. Provide door assemblies that have been designed and fabricated in compliance with specified performance requirements.
- B. Water Leakage: No uncontrolled leakage on interior face when tested in accordance with ASTM E331 at differential pressure of 12.11 psf.

- C. Structural Performance: Withstand positive and negative wind loads equal to 1.5 times design wind loads specified by local code as indicated on structural drawings without damage or permanent set, when tested in accordance with ASTM E330/E330M, using 10 second duration of maximum load.

2.05 FINISHES

- A. Gel Coating: Ultraviolet (UV) stabilized polyester finish.
 - 1. Thickness: Minimum 25 mils wet thickness, plus/minus 3 mils.
 - 2. Color: As selected by Architect.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.

3.02 PREPARATION

- A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- B. Clean and prepare substrate in accordance with manufacturer's directions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions; do not penetrate frames with anchors.
- B. Install door hardware as specified in Section 08 7100.
- C. Set units plumb, level, and true-to-line, without warping or racking doors, and with specified clearances; anchor in place.
- D. Set thresholds in continuous bed of sealant.
- E. Separate aluminum and other metal surfaces from sources of corrosion of electrolytic action at points of contact with other materials.

3.04 ADJUSTING

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

3.05 CLEANING

- A. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance.

3.06 PROTECTION

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

END OF SECTION

SECTION 08 3100
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wall access door and frame units.
- B. Ceiling access door and frame units.

1.02 RELATED REQUIREMENTS

- A. Section 09 9123 - Interior Painting
- B. Section 09 2116 - Gypsum Board Assemblies

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.
- C. Shop Drawings: Indicate exact position of each access door and/or panel unit.
- D. Manufacturer's Installation Instructions: Indicate installation requirements.

PART 2 PRODUCTS

2.01 WALL UNITS:

- A. Construction: Steel; Factory fabricated door and frame; Fully assembled with corner joints welded and ground flush; Square and without rack or warp.
- B. Location: As indicated on drawings.
- C. Size: As indicated on drawings.
- D. Finish: Stainless steel.
- E. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
- F. Door Style: Single thickness with rolled or turned in edges.
- G. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
- H. Basis of Design: Babcock-Davis - BNT.

2.02 CEILING UNITS:

- A. Construction: factory fabricated and fully assembled; recessed frame and door with metal edge bead for frameless, flush installation with gypsum board inlay; 1/16" max. reveal around door; Square and without rack or warp.
- B. Location: As indicated on drawings.
- C. Size: As indicated on drawings.
- D. Finish: Gypsum Board finished to match surrounding ceiling.
- E. Door/Panel: Concealed hinge and safety cable; Concealed touch latch.
- F. Door Style: Gypsum board inlay flush with surrounding ceiling.
- G. Basis of Design: Bauco Access Panel Solutions Inc. - Bauco Plus II.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that rough openings are correctly sized and located.
- B. Verify that work area is dry, clean, and free of foreign matter.

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.

END OF SECTION

SECTION 08 4313
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Aluminum-framed storefront, with vision glass.
- B. Aluminum doors.
- C. Aluminum windows
- D. Door hardware.

1.02 RELATED REQUIREMENTS

- A. Section 07 2500 - Weather Barriers.
- B. Section 07 9200 - Joint Sealants: Sealing joints between frames and adjacent construction.
- C. Section 08 7100 - Door Hardware: Hardware items other than specified in this section.
- D. Section 08 8000 - 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 2014 (2015 Errata).
- C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures Most Recent Edition Cited by Referring Code or Reference Standard.
- D. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.
- E. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2020.
- 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 E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference 2000 (Reapproved 2016).

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with installation of other components that comprise the exterior enclosure.
- B. Preinstallation Meeting: Conduct a preinstallation meeting two weeks before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, internal drainage details .
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, electrical wiring accomodation and field welding required.
- D. Fabrication Sample:
 - 1. Doors: Corner sample consisting of a door stile and rail, of full-size components and showing details of the following:
 - a. Joinery, including welds.
 - b. Glazing.
 - 2. Windows: Sample showing radius'd aluminum window and component required
- E. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.

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- F. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
- G. Report of field testing for water leakage.
- H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.
- C. Source Limitations: Obtain aluminum-framed storefront system through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum-framed storefront system and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements." Do not modify size and dimensional requirements.
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- E. Air Infiltration Testing:
 - 1. Doors: In the closed and locked position, the test specimen shall be tested in accordance with ASTM E 283 at a pressure differential of 1.57 psf (75 Pa) for single doors and pairs of doors. A single 3'0" x 7'0" (915 mm x 2134 mm) entrance door and frame shall not exceed 1.0 cfm/ft². A pair of 6'0" x 7'0" (1830 mm x 2134 mm) entrance doors and frame shall not exceed 1.0 cfm/ft².
 - 2. Windows: The test specimen shall be tested in accordance with ASTM E283 at a minimum window size of 60" x 99". The air infiltration rate shall not exceed 0.10 cfm/ft(2) at a static pressure differential of 6.24 psf (300 Pa)
- F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".

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. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
- D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.
- E. Provide Lifetime warranty on doors included within this section.

PART 2 PRODUCTS

2.01 BASIS OF DESIGN -- ALUMINUM ENTRANCE DOORS

- A. Manufacturer: Kawneer
- B. Model: Heavy Wall 500

- C. Style: Medium Stile with 10" bottom rail.
- D. Location: Main Entrance and Vestibule (Doors 101A and 101B)

2.02 MANUFACTURERS BASIS OF DESIGN EXTERIOR STOREFRONT

- A. Basis of Design Exterior Storefront (unless noted otherwise): Kawneer North America. Trifab 451UT.
- B. Basis of Design Exterior Storefront @ W8n: Kawneer North America. 8225TL Thermal Window - Fixed
 - 1. 2-1/4" frame depth with 0.125" wall thickness
- C. Aluminum-Framed Storefront Alternate Suppliers:
 - 1. EFCO Corporation: www.efcocorp.com/#sle.
 - 2. Tubelite, Inc; Wassau: www.tubeliteinc.com/#sle.
 - 3. Substitutions: See Section 01 6000 - Product Requirements.

2.03 EXTERIOR STOREFRONT PERFORMANCE:

- A. Water Resistance: The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a minimum static air pressure differential of 10 psf (500 Pa) as defined in AAMA 501. CSA A440 B5 Rating.
- B. Uniform Load: A static air design load of 30 psf (1437 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur. CSA A440 C2 Rating
- C. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than:.33
- D. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than:74frame and 70glass
- E. Window System Performance: Provide aluminum windows of performance indicated that comply with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS)
 - 1. Performance Class and Grade: AW-PG100-FW

2.04 INTERIOR STOREFRONT

- A. Interior Storefront
 - 1. Basis of Design: Kawneer Trifab 450 storefront system
 - a. Non-thermal
 - b. 2" sightline
 - c. Aluminum Finish: Clear Anodized.
 - d. Doors within interior Storefront.
 - 1) Basis of Design: Kawneer 350 Medium Stile Entrance Doors.
- B. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.

2.05 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Fasteners: Stainless steel 316.
- C. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

2.06 FINISHES

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

2.07 HARDWARE

- A. For each door, include all specified items for each door unless noted otherwise..
- B. Other Door Hardware: As specified in Section 08 7100.

- C. Door Bottoms: Per manufacturer's recommendation for best performance.
- D. Sill Sweep Strips: Resilient seal type, of neoprene; provide on all doors.
- E. Threshold: Thermally broken, set in sealant, see details.
- F. Weatherstripping: Neoprene blade or bulb type in addition to perimeter brush seals.
- G. Dust proof strikes: per exit device manufacturer.
- H. Meeting Stiles or Keyed removable mullion as necessary at pairs of doors. Coordinate with Architect for locations.
- I. Automatic Door Operator and Actuators: As indicated in Specification 08 7100 Door Hardware and on drawings.
 - 1. Confirm and coordinate locations of 2 push button actuators.
 - 2. Coordinate for operation of one leaf of each main entry and vestibule double doors.

2.08 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.
- C. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint or neoprene washers.
- D. Arrange fasteners and attachments to conceal from view.
- E. Reinforce framing members for imposed loads.
 - 1. Coordinate locations with wood door hardware locations.
- F. 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.

3.02 INSTALLATION

- A. Install wall system in accordance with manufacturer's instructions.
- B. Field Measurements: Verify actual dimensions of aluminum-framed entrance door openings by field measurements before fabrication and indicate field measurements on Shop Drawings.
- C. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- D. Provide alignment attachments and shims to permanently fasten system to building structure.
- E. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- F. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- G. Install glass and infill panels in accordance with Section 08 8000, using glazing method required to achieve performance criteria.
- H. 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 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

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3.04 ADJUSTING

- A. Adjust operating hardware 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. Take care to remove dirt from corners. Wipe surfaces clean.

3.06 PROTECTION

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

END OF SECTION

**SECTION 08 5413
FIBERGLASS WINDOWS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Factory fabricated fiberglass windows with fixed and operating sash at all punched opening within addition exterior walls and the two windows in the existing multipurpose room.
- B. Glazed by factory; including infill panels.
- C. Operating hardware.
- D. Insect screens.

1.02 RELATED REQUIREMENTS

- A. Section 08 8000 - Glazing.
- B. Section 084413 Glazed Exterior Curtain walls

1.03 REFERENCE STANDARDS

- A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights 2017.
- B. AAMA 502 - Voluntary Specification for Field Testing of Newly Installed Fenestration Products 2012.
- C. ASTM E783 - Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors 2002 (Reapproved 2018).
- D. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference 2015.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related work, installation requirements, and details of installation with surrounding field conditions including flashings, sills and trims..
- C. Submit two samples of operating hardware.
- D. Manufacturer's Certificate: Certify that products of this section meet or exceed specified requirements.
- E. Test Reports: Prior to submitting shop drawings or starting fabrication, submit test report(s) by independent testing agency showing compliance with performance requirements in excess of those prescribed by specified grade.
- F. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.
- G. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than 8 years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least 5 years of documented experience and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect finished surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond when exposed to sunlight or weather.
- B. Jig, brace, and box the window frame assemblies for transport to minimize flexing of members or joints.

1.07 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F.

- B. Maintain this minimum temperature during and after installation of sealants.

1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide manufacturers standard express limited warranty on fiberglass frame components for a period of 20 years for workmanship and materials.
- C. Provide manufacturers standard express limited warranty on integral hardware for a period of 10 years for workmanship and materials.
- D. Provide manufacturers standard express warranty for the insulated glass units to cover premature hermetic seal failure (condensation between the lites at normal service temperatures in Unalaska) appearing within a period of 10 years from the date of substantial completion.
- E. Provide data for maintenance and cleaning in accordance with instructions under General Conditions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fiberglass Windows:
 - 1. Cascadia Windows and Doors – Langley, BC, Canada.

2.02 WINDOW UNITS

- A. Fiberglass Windows: Hollow, tubular, multi-layer fiber reinforced material; factory fabricated; with vision glass, related flashings, anchorage and attachment devices.
 - 1. Movement: Accommodate movement between window and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
 - 2. 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.
 - 3. Thermal Movement: Design to accommodate thermal movement caused by -20 degrees F to 100 degrees F temperature change without buckling stress on glass, joint seal failure, damaging loads on structural elements, damaging loads on fasteners, reduction in performance or other detrimental effects.

2.03 PERFORMANCE REQUIREMENTS

- A. Design Pressure (DP): See structural for design pressure for cladding and componenets and use for design of mullions, reinforcing, and onther spanning members.
- B. Air Tightness:
 - 1. Air infiltration rate at a static air pressure differential of 1.6 psf when tested in accordance with AAMA/WDMA/CSA 101/I.S.2/A440-11 and ASTM E283.
 - a. Fixed Windows: 0.00 cfm/ft² (0.00 L/s.m²).
 - b. Operable windows and swing doors: A3 rating or better.
- C. Water Penetration Resistance:
 - 1. Laboratory Testing
 - a. There shall be no water infiltration at a static air pressure differential as follows when tested in accordance with AAMA 101 and ASTM E331.
 - b. Water penetration resistance test pressure for all vent types, including: Fixed windows, casement, awning, tilt & turn, hopper, inswing doors, and outswing doors: 15 psf (720 Pa).
 - 2. Field Testing:
 - a. Windows shall have no water infiltration at a cyclic static air pressure difference at 12 psf (575 Pa) when tested in accordance with AAMA 101 and ASTM E1105.
- D. Structural Requirements:
 - 1. Performance Grade (PG) and Class of all windows and doors shall be:
 - 2. For fixed windows, CW-95 or higher
 - 3. For operable window (inswing or outswing), CW-45 or higher
 - 4. Design glass according to AAMA/WDMA/CSA 101/I.S.2/A440-11

5. Design fiberglass according to AAMA/WDMA/CSA 101/I.S.2/A440-11.
 6. Design glazing and spanning window frame members, including any required reinforcing, in accordance with AAMA/WDMA/CSA 101/I.S.2/A440-11. There shall be no deflection in excess of L/175 of the span of any framing member.
 7. Allow for deflection of building structure. Ensure no structural loads are imposed on window assemblies. In lieu of other specific requirements the minimum requirements are as specified by the structural engineer.
- E. Thermal Requirements
1. The Thermal Transmittance U-Value shall be certified in accordance with the National Fenestration Rating Council (NFRC).
 2. Overall U-values, utilizing triple glazed IG units, incorporating two LowE coatings:
 - a. Fixed windows = 0.15 (Imperial)
 - b. Tilt & Turn windows = 0.15 (Imperial)
 - c. Hopper windows = 0.16 (Imperial)
 - d. Casement = 0.16 (Imperial)
 - e. Awning = 0.17 (Imperial)
 3. Energy Star: Windows must be ENERGY STAR® certified. Window manufacturer must provide required documentation and labeling.

2.04 COMPONENTS

- A. All frame and sash profiles are made from Pultruded Fiberglass.
1. Pultrusions shall be manufactured with clamp-action equipment. No surface texture from rollers is permitted.
 2. Glass content average for pultruded profiles: 55% or more.

2.05 GLASS AND GLAZING MATERIALS

- A. Fasteners shall be 300 series stainless steel, 400 series stainless steel, or Leland Industries DT2000 coated of sufficient size and quantity to perform their intended function.
1. Fastener corrosion resistance shall be: 2000 hours minimum, when tested in accordance with ASTM B117.
 2. Glazing tape: black, closed cell copolymer, polyethylene foam coated with an aggressive acrylic adhesive. All upward facing exterior horizontal joints to have an additional cap bead of neutral cure silicone.
- B. Internal sealants for frame joints and continuous heel beads: 1199 DOW Corning sealant, or equal or better neutral cure silicone sealant.
- C. Insulated Glazing Units: Insulated glazing unit certified by IGMA. Glass thickness shall be in accordance with applicable Building Codes, but not less than 4mm. All insulated glass units shall be argon filled and utilize soft coat metallic low-E coating(s). Edge construction to consist of a primary seal of polyisobutylene; a tubular low conductivity stainless steel spacer-bar with sealed corners, filled with desiccant; and a secondary seal of neutral cure silicone. Performance requirements indicated in this section are for center-of-glass.
- D. Glass and Glazing Materials: As specified in Section 08 8000.

2.06 HARDWARE

- A. All hardware to be supplied by a single manufacturer:
- B. Basis of Design manufacturer: Roto Frank of America.
1. Casement and Awning windows: RotoSil nano corrosion resistant finish, rotary hardware with folding handle.
 2. Tilt & Turn and Hopper windows: RotoSil nano corrosion resistant finish, multi-point locking hardware.

2.07 FINISH

- A. Factory glaze window units.
- B. Hydro Tuff two-component waterborne polyurethane, meeting the requirements of AAMA-625.
- C. Interior Frame Finish: Architect to choose from manufacturer's standard color range.

2.08 FABRICATION

- A. Fabricate framing, mullions and sash members with fusion welded corners and joints, in a rigid jig. Supplement frame sections with internal reinforcement where required for structural rigidity.
- B. Form sills and stools in one piece. Slope sills for wash.
- C. Form snap-in glass stops, closure molds, weather stops, and flashings for tight fit into window frame section.
- D. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- E. Arrange fasteners to be concealed from view.
- F. Permit internal drainage weep holes and channels to migrate moisture to exterior. Provide internal drainage of glazing spaces to exterior through weep holes.
- G. Assemble insect screen frame, miter and reinforced frame corners. Fit mesh taut into frame and secure. Fit frame with four spring loaded steel pin retainers.
 - 1. Ensure window operation is possible without removal of screen or need for opening in screen.
- H. Double weatherstrip operable units.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this Section.

3.02 INSTALLATION

- A. Install windows in accordance with manufacturer's instructions.
- B. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.
- C. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.
- D. Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- E. Install operating hardware.

3.03 TOLERANCES

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

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for independent field testing and inspection requirements, and requirements for monitoring quality of specified product installations.
- B. Provide field testing of installed fiberglass windows by independent laboratory in accordance with AAMA 502 and AAMA/WDMA/CSA 101/I.S.2/A440 during construction process and before installation of interior finishes.
 - 1. Field test for water penetration in accordance with ASTM E1105 using Procedure B - cyclic static air pressure difference; test pressure shall not be less than 1.9 psf.
 - 2. Field test for air leakage in accordance with ASTM E783 with uniform static air pressure difference of 6.27 psf.
- C. Repair or replace fenestration components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 ADJUSTING

- A. Adjust hardware for smooth operation and secure weathertight closure.

3.06 CLEANING

- A. Remove protective material from pre-finished surfaces.
- B. Windows shall be isolated and protected from concrete, mortar, plaster and other Building materials during and after installation until acceptance by the General Contractor. Thereafter, it shall be the responsibility of the General Contractor to maintain protection and provide final cleaning.
- C. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.
- D. Remove excess glazing sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY:

- A. Section Includes: Finish Hardware for door openings, except as otherwise specified herein.
 - 1. Door hardware for steel (hollow metal) doors.
 - 2. Door hardware for aluminum doors.
 - 3. Door hardware for wood doors.
 - 4. Door hardware for other doors indicated.
 - 5. Keyed cylinders as indicated.

- B. Related Sections:
 - 1. Division 6: Rough Carpentry.
 - 2. Division 8: Aluminum Doors and Frames
 - 3. Division 8: Hollow Metal Doors and Frames.
 - 4. Division 8: Wood Doors.
 - 5. Division 26 Electrical
 - 6. Division 28: Electronic Security

- C. References: Comply with applicable requirements of the following standards. Where these standards conflict with other specific requirements, the most restrictive shall govern.
 - 1. Builders Hardware Manufacturing Association (BHMA)
 - 2. NFPA 101 Life Safety Code
 - 3. NFPA 80 -Fire Doors and Windows
 - 4. ANSI-A156.xx- Various Performance Standards for Finish Hardware
 - 5. UL10C – Positive Pressure Fire Test of Door Assemblies
 - 6. ANSI-A117.1 – Accessible and Usable Buildings and Facilities
 - 7. DHI /ANSI A115.IG – Installation Guide for Doors and Hardware
 - 8. ICC – International Building Code

- D. Intent of Hardware Groups
 - 1. Should items of hardware not definitely specified be required for completion of the Work, furnish such items of type and quality comparable to adjacent hardware and appropriate for service required.
 - 2. Where items of hardware aren't definitely or correctly specified, are required for completion of the Work, a written statement of such omission, error, or other discrepancy to be submitted to Architect, prior to date specified for receipt of bids for clarification by addendum; or, furnish such items in the type and quality established by this specification, and appropriate to the service intended.

- E. Allowances
 - 1. Refer to Division 1 for allowance amount and procedures.

- F. Alternates
 - 1. Refer to Division 1 for Alternates and procedures.

1.2 SUBSTITUTIONS:

- A. Comply with Division 1.

1.3 SUBMITTALS:

- A. Comply with Division 1.
- B. Special Submittal Requirements: Combine submittals of this Section with Sections listed below to ensure the "design intent" of the system/assembly is understood and can be reviewed together.
- C. Product Data: Manufacturer's specifications and technical data including the following:
 - 1. Detailed specification of construction and fabrication.
 - 2. Manufacturer's installation instructions.
 - 3. Wiring diagrams for each electric product specified. Coordinate voltage with electrical before submitting.
 - 4. Submit 6 copies of catalog cuts with hardware schedule.
 - 5. Provide 9001-Quality Management and 14001-Environmental Management for products listed in Materials Section 2.2
- D. Shop Drawings - Hardware Schedule: Submit 6 complete reproducible copy of detailed hardware schedule in a vertical format.
 - 1. List groups and suffixes in proper sequence.
 - 2. Completely describe door and list architectural door number.
 - 3. Manufacturer, product name, and catalog number.
 - 4. Function, type, and style.
 - 5. Size and finish of each item.
 - 6. Mounting heights.
 - 7. Explanation of abbreviations and symbols used within schedule.
 - 8. Detailed wiring diagrams, specially developed for each opening, indicating all electric hardware, security equipment and access control equipment, and door and frame rough-ins required for specific opening.
- E. Templates: Submit templates and "reviewed Hardware Schedule" to door and frame supplier and others as applicable to enable proper and accurate sizing and locations of cutouts and reinforcing.
 - 1. Templates, wiring diagrams and "reviewed Hardware Schedule" of electrical terms to electrical for coordination and verification of voltages and locations.
- F. Samples: (If requested by the Architect)
 - 1. 1 sample of Lever and Rose/Escutcheon design, (pair).
 - 2. 3 samples of metal finishes
- G. Contract Closeout Submittals: Comply with Division 1 including specific requirements indicated.
 - 1. Operating and maintenance manuals: Submit 3 sets containing the following.
 - a. Complete information in care, maintenance, and adjustment, and data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Name, address, and phone number of local representative for each manufacturer.

d. Parts list for each product.

2. Copy of final hardware schedule, edited to reflect, "As installed".
3. Copy of final keying schedule
4. As installed "Wiring Diagrams" for each piece of hardware connected to power, both low voltage and 110 volts.
5. One set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

1.4 QUALITY ASSURANCE

A. Comply with Division 1.

1. Statement of qualification for distributor and installers.
2. Statement of compliance with regulatory requirements and single source responsibility.
3. Distributor's Qualifications: Firm with 3 years experience in the distribution of commercial hardware.
 - a. Distributor to employ full time Architectural Hardware Consultants (AHC) for the purpose of scheduling and coordinating hardware and establishing keying schedule.
 - b. Hardware Schedule shall be prepared and signed by an AHC.
4. Installer's Qualifications: Firm with 3 years experienced in installation of similar hardware to that required for this Project, including specific requirements indicated.
5. Regulatory Label Requirements: Provide testing agency label or stamp on hardware for labeled openings.
 - a. Provide UL listed hardware for labeled and 20 minute openings in conformance with requirements for class of opening scheduled.
 - b. Underwriters Laboratories requirements have precedence over this specification where conflict exists.
6. Single Source Responsibility: Except where specified in hardware schedule, furnish products of only one manufacturer for each type of hardware.

B. Review Project for extent of finish hardware required to complete the Work. Where there is a conflict between these Specifications and the existing hardware, notify the Architect in writing and furnish hardware in compliance with the Specification unless otherwise directed in writing by the Architect.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping: Comply with Division 1.

1. Deliver products in original unopened packaging with legible manufacturer's identification.
2. Package hardware to prevent damage during transit and storage.
3. Mark hardware to correspond with "reviewed hardware schedule".
4. Deliver hardware to door and frame manufacturer upon request.

B. Storage and Protection: Comply with manufacturer's recommendations.

1.6 PROJECT CONDITIONS:

A. Coordinate hardware with other work. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as necessary for the proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents.

- B. Review Shop Drawings for doors and entrances to confirm that adequate provisions will be made for the proper installation of hardware.

1.7 WARRANTY:

- A. Refer to Conditions of the Contract
- B. Manufacturer's Warranty:
 - 1. Closers: Ten years
 - 2. Exit Devices: Five Years
 - 3. Locksets & Cylinders: Lifetime
 - 4. All other Hardware: Two years.

1.8 OWNER'S INSTRUCTION:

- A. Instruct Owner's personnel in operation and maintenance of hardware units.

1.9 MAINTENANCE:

- A. Extra Service Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Division 1 Closeout Submittals Section.
 - 1. Special Tools: Provide special wrenches and tools applicable to each different or special hardware component.
 - 2. Maintenance Tools: Provide maintenance tools and accessories supplied by hardware component manufacturer.
 - 3. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra service materials.
- B. Maintenance Service: Submit for Owner's consideration maintenance service agreement for electronic products installed.

1.10 MATERIALS:

- A. Hinges: Shall be Five Knuckle Ball bearing hinges
 - 1. Template screw hole locations
 - 2. Bearings are to be fully hardened.
 - 3. Bearing shell is to be consistent shape with barrel.
 - 4. Minimum of 2 permanently lubricated non-detachable bearings on standard weight hinge and 4 permanently lubricated bearing on heavy weight hinges.
 - 5. Equip with easily seated, non-rising pins.
 - 6. Non Removable Pin screws shall be slotted stainless steel screws.
 - 7. Hinges shall be full polished, front, back and barrel.
 - 8. Hinge pin is to be fully plated.
 - 9. Bearing assembly is to be installed after plating.
 - 10. Sufficient size to allow 180-degree swing of door
 - 11. Furnish five knuckles with flush ball bearings
 - 12. Provide hinge type as listed in schedule.
 - 13. Furnish 3 hinges per leaf to 7 foot 6 inch height. Add one for each additional 30 inches in height or fraction thereof.
 - 14. Tested and approved by BHMA for all applicable ANSI Standards for type, size, function and finish

15. UL10C listed for Fire rated doors.

B. Geared Continuous Hinges:

1. Tested and approved by BHMA for ANSI A156.26-1996 Grade 1
2. Anti-spinning through fastener
3. UL10C listed for 3 hour Fire rating
4. Non-handed
5. Lifetime warranty
6. Provide Fire Pins for 3-hour fire ratings
7. Sufficient size to permit door to swing 180 degrees

C. Mortise Type Locks and Latches:

1. Tested and approved by BHMA for ANSI A156.13, Series 1000, Operational Grade 1, Extra-Heavy Duty, Security Grade 2 and be UL10C.
2. Furnish UL or recognized independent laboratory certified mechanical operational testing to 4 million cycles minimum.
3. Provide 9001-Quality Management and 14001-Environmental Management.
4. Fit ANSI A115.1 door preparation
5. Functions and design as indicated in the hardware groups
6. Solid, one-piece, 3/4-inch (19mm) throw, anti-friction latchbolt made of self-lubricating stainless steel
7. Deadbolt functions shall have 1 inch (25mm) throw bolt made of hardened stainless steel
8. Latchbolt and Deadbolt are to extend into the case a minimum of 3/8 inch (9.5mm) when fully extended
9. Auxiliary deadlatch to be made of one piece stainless steel, permanently lubricated
10. Provide sufficient curved strike lip to protect door trim
11. Lever handles must be of forged or cast brass, bronze or stainless steel construction and conform to ANSI A117.1. Levers that contain a hollow cavity are not acceptable
12. Lock shall have self-aligning, thru-bolted trim
13. Levers to operate a roller bearing spindle hub mechanism
14. Mortise cylinders of lock shall have a concealed internal setscrew for securing the cylinder to the lockset. The internal setscrew will be accessible only by removing the core, with the control key, from the cylinder body.
15. Spindle to be designed to prevent forced entry from attacking of lever
16. Provide locksets with 7-pin removable and interchangeable core cylinders
17. Each lever to have independent spring mechanism controlling it
18. Core face must be the same finish as the lockset.

D. Exit Devices:

1. Exit devices to meet or exceed BHMA for ANSI 156.3, Grade 1.
2. Exit devices to be tested and certified by UL or by a recognized independent laboratory for mechanical operational testing to 10 million cycles minimum with inspection confirming Grade 1 Loaded Forces have been maintained.
3. Exit devices chassis to be investment cast steel, zinc dichromate.
4. Exit devices to have stainless steel deadlocking 3/4" through latch bolt.
5. Exit devices to be equipped with sound dampening on touchbar.
6. Non-fire rated exit devices to have cylinder dogging.
7. Non-fire rated exit devices to have 1/4" minimum turn hex key dogging.
8. Touchpad to be "T" style constructed of architectural metal with matching metal end caps.
9. Touchbar assembly on wide style exit devices to have a 1/4" clearance to allow for vision frames.
10. All exposed exit device components to be of architectural metals and "true" architectural finishes.
11. Provide strikes as required by application.
12. Fire exit hardware to conform to UL10C and UBC 7-2. UL tested for Accident Hazard.
13. The strike is to be black powder coated finish.

14. Exit devices to have field reversible handing.
 15. Provide heavy duty vandal resistant lever trim with heavy duty investment cast stainless steel components and extra strength shock absorbing overload springs. Lever shall not require resetting. Lever design to match locksets and latchsets.
 16. Provide 9001-Quality Management and 14001-Environmental Management.
 17. Vertical Latch Assemblies to have gravity operation, no springs.
- E. Door Closers shall:
1. Tested and approved by BHMA for ANSI 156.4, Grade 1
 2. UL10C certified
 3. Provide 9001-Quality Management and 14001-Environmental Management.
 4. Closer shall have extra-duty arms and knuckles
 5. Conform to ANSI 117.1
 6. Maximum 2 7/16 inch case projection with non-ferrous cover
 7. Separate adjusting valves for closing and latching speed, and backcheck
 8. Provide adapter plates, shim spacers and blade stop spacers as required by frame and door conditions
 9. Full rack and pinion type closer with 1½" minimum bore
 10. Mount closers on non-public side of door, unless otherwise noted in specification
 11. Closers shall be non-handed, non-sized and multi-sized.
- F. Low Energy Operators shall:
1. Conform to ANSI/BHMA A156.19 as a low energy power opening device.
 2. Be listed under UL228, UL325, UL10B, UL10C, UBC 7.2 and FCC listed.
 3. Shall be non-handed.
 4. Be rated for door panels weighing up to 350 lbs (160 kg).
 5. The manual door closer within the Low Energy Operator shall be adjusted to meet Americans with Disabilities Act (ADA) 5 lbs opening force [Push-Side applications only]
 6. Operator shall be isolated from mounting plate with rubber mounts to mitigate the transmission of forces between the door and the operator.
 7. Shall have a position encoder to communicate with microprocessor.
 8. Incorporate a resettable powered operation counter that tracks both powered and non-powered cycling of the Operator.
 9. Incorporate the following adjustable settings:
 - i. Hold Open Timer, to 28 seconds
 - ii. Open Speed
 - iii. Backcheck Speed
 - iv. Vestibule Sequence Timer
 10. Include DIP switch controls for:
 - i. On board diagnostics
 - ii. Power close
 - iii. Push and Go operation
 - iv. Time delay logic for electrified hardware components
 11. Include terminals for auxiliary controls including:
 - i. Activation devices; provide two discrete inputs
 - ii. Vestibule sequencing
 12. Control switches including:
 - i. Day/Night open (illuminated)
 - ii. Power On-Off
 13. Includes adhesive Low Energy Operator mounting templates.
 14. R-14 Aluminum Allow Materials
 15. For non-powered operation, the unit shall function as a standard door closer with adjustable spring force size 1 thru 6.

- G. Door Stops: Provide a dome floor or wall stop for every opening as listed in the hardware sets.
 - 1. Wall stop and floor stop shall be wrought bronze, brass or stainless steel.
 - 2. Provide fastener suitable for wall construction.
 - 3. Coordinate reinforcement of walls where wall stop is specified.
 - 4. Provide dome stops where wall stops are not practical. Provide spacers or carpet riser for floor conditions encountered
- H. Over Head Stops: Provide a Surface mounted or concealed overhead when a floor or wall stop cannot be used or when listed in the hardware set.
 - 1. Concealed overhead stops shall be heavy duty bronze or stainless steel.
 - 2. Surface overhead stops shall be heavy duty bronze or stainless steel.
- I. Push Plates: Provide with four beveled edges ANSI J301, .050 thickness, size as indicated in hardware set. Furnish oval-head countersunk screws to match finish.
- J. Pulls with plates: Provide with four beveled edges ANSI J301, .050 thickness Plate s with ANSI J401 Pull as listed in hardware set. Provide proper fasteners for door construction.
- K. Push Pull Bars: Provide ANSI J504, .1" Dia. Pull and push bar model and series as listed in hardware set. Provide proper fasteners for door construction.
- L. Kickplates: Provide with four beveled edges ANSI J102, 10 inches high by width less 2 inches on single doors and 1 inch on pairs of doors. Furnish oval-head countersunk screws to match finish.
- M. Mop plates: Provide with four beveled edges ANSI J103, 4 inches high by width less 1 inch on single doors and 1 inch on pairs of doors. Furnish oval-head countersunk screws to match finish.
- N. Door Bolts: Flush bolts for wood or metal doors.
 - 1. Provide a set of Automatic bolts, Certified ANSI/BHMA 156.3 Type 25 for hollow metal label doors.
 - 2. Provide a set of Automatic bolts, Certified ANSI/BHMA 156.3 Type 27 at wood label doors.
 - 3. Manual flush bolts, Certified ANSI/BHMA 156.16 at openings where allowed local authority.
 - 4. Provide Dust Proof Strike, Certified ANSI/BHMA 156.16 at doors with flush bolts without thresholds.
- O. Coordinator and Brackets: Provide a surface mounted coordinator when automatic bolts are used in the hardware set.
 - 1. Coordinator, Certified ANSI/BHMA A1156.3 Type 21A for full width of the opening.
 - 2. Provide mounting brackets for soffit applied hardware.
 - 3. Provide hardware preparation (cutouts) for latches as necessary.
- P. Power Transfer: Power transfer device shall be a steel housing and flexible tube. Secure and inconspicuous channel is to bring power from the frame to the door.
 - 1. Precision EPT-5
 - 2. Tube shall accept up to 5/16" wire bundle and accommodate a door swing of 120 Deg.
 - 3. Wires as required by others
- Q. Seals: All seals shall be finished to match adjacent frame color. Seals shall be furnished as listed in schedule. Material shall be UL listed for labeled openings.

- R. Weatherstripping: Provide at head and jambs only those units where resilient or flexible seal strip is easily replaceable. Where bar-type weatherstrip is used with parallel arm mounted closers install weatherstrip first.
 - 1. Weatherstrip shall be resilient seal of (Neoprene, Polyurethane, Vinyl, Pile, Nylon Brush, Silicone)
 - 2. UL10C Positive Pressure rated seal set when required.
- S. Door Bottoms/Sweeps: Surface mounted or concealed door bottom where listed in the hardware sets.
 - 1. Door seal shall be resilient seal of (Neoprene, Polyurethane, Nylon Brush, Silicone)
 - 2. UL10C Positive Pressure rated seal set when required.
- T. Thresholds: Thresholds shall be aluminum beveled type with maximum height of 1/2" for conformance with ADA requirements. Furnish as specified and per details. Provide fasteners and screws suitable for floor conditions.
- U. Silencers: Furnish silencers on all interior frames, 3 for single doors, 2 for pairs. Omit where any type of seals occur.

1.11 FINISH:

- A. Designations used in Schedule of Finish Hardware - 3.05, and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 including coordination with traditional U.S. finishes shown by certain manufacturers for their products
- B. Powder coat door closers to match other hardware, unless otherwise noted.
- C. Aluminum items shall be finished to match predominant adjacent material. Seals to coordinate with frame color.

1.12 KEYS AND KEYING:

- A. Provide keyed brass construction cores and keys during the construction period. Construction control and operating keys and core shall not be part of the Owner's permanent keying system or furnished in the same keyway (or key section) as the Owner's permanent keying system. Permanent cores and keys (prepared according to the accepted keying schedule) will be furnished to the Owner.
- B. Cylinders, removable and interchangeable core system: Best CORMAX™ Patented 7-pin.
- C. Permanent keys and cores: Stamped with the applicable key mark for identification. These visual key control marks or codes will not include the actual key cuts. Permanent keys will also be stamped "Do Not Duplicate."
- D. Transmit Grand Masterkeys, Masterkeys and other Security keys to Owner by Registered Mail, return receipt requested.
- E. Furnish keys in the following quantities:
 - 1. 1 each Grand Masterkeys
 - 2. 4 each Masterkeys
 - 3. 2 each Change keys each keyed core
 - 4. 15 each Construction masterkeys
 - 5. 1 each Control keys

- F. The Owner, or the Owner's agent, will install permanent cores and return the construction cores to the Hardware Supplier. Construction cores and keys remain the property of the Hardware Supplier.
- G. Keying Schedule: Arrange for a keying meeting, and programming meeting with Architect Owner and hardware supplier, and other involved parties to ensure locksets and locking hardware, are functionally correct and keying and programming complies with project requirements. Furnish 3 typed copies of keying and programming schedule to Architect.

PART 2 - EXECUTION

2.1 EXAMINATION

- A. Verification of conditions: Examine doors, frames, related items and conditions under which Work is to be performed and identify conditions detrimental to proper and or timely completion.
 - 1. Do not proceed until unsatisfactory conditions have been corrected.

2.2 HARDWARE LOCATIONS:

- A. Mount hardware units at heights indicated in the following publications except as specifically indicated or required to comply with the governing regulations.
 - 1. Recommended Locations for Builder's Hardware for Standard Steel Doors and Frames, by the Door and Hardware Institute (DHI).
 - 2. Recommended locations for Architectural Hardware for flush wood doors (DHI).
 - 3. WDMA Industry Standard I.S.-1A-04, Industry Standard for Architectural wood flush doors.

2.3 INSTALLATION:

- A. Install each hardware item per manufacturer's instructions and recommendations. Do not install surface mounted items until finishes have been completed on the substrate. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- B. Conform to local governing agency security ordinance.
- C. Install Conforming to ICC/ANSI A117.1 Accessible and Usable Building and Facilities.
 - 1. Adjust door closer sweep periods so that from the open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the landing side of the door.
- D. Installed hardware using the manufacturers fasteners provided. Drill and tap all screw holes located in metallic materials. Do not use "Riv-Nuts" or similar products.

2.4 FIELD QUALITY CONTROL AND FINAL ADJUSTMENT

- A. Contractor/Installers, Field Services: After installation is complete, contractor shall inspect the completed door openings on site to verify installation of hardware is complete and properly adjusted, in accordance with both the Contract Documents and final shop drawings.
 - 1. Check and adjust closers to ensure proper operation.
 - 2. Check latchset, lockset, and exit devices are properly installed and adjusted to ensure proper operation.

- a. Verify levers are free from binding.
 - b. Ensure latchbolts and dead bolts are engaged into strike and hardware is functioning.
3. Report findings, in writing, to architect indicating that all hardware is installed and functioning properly. Include recommendations outlining corrective actions for improperly functioning hardware if required.

2.5 SCHEDULE OF FINISH HARDWARE:

Option List

<u>Code</u>	<u>Description</u>
CD	CYLINDER DOGGING
ALK	ALARM, BATTERY OPERATED
CSK	COUNTER SINKING OF KICK and MOP PLATES
LBR	LESS BOTTOM ROD
MLR	MOTORIZED LATCH RETRACTION
VIN	Visual Indicator
EPT Prep	EPT Prep (full mortise)
B4E-HEAVY-KP	BEVELED 4 EDGES - KICK PLATES
1/4-20 SSMS/EA	STAINLESS MACHINE SCREWS/EXPANSION ANC.

Finish List

<u>Code</u>	<u>Description</u>
AL	Aluminum
626	Satin Chromium Plated
630	Satin Stainless Steel
689	Aluminum Painted
GREY	Grey
US26D	Chromium Plated, Dull
US32D	Stainless Steel, Dull

Manufacturer List

<u>Code</u>	<u>Name</u>
BE	Best Access Systems
BEST	BEST
DM	Dorma Door Controls
NA	National Guard
PE	Pemko
PR	Precision
SD	Stanley Door Closers
ST	Stanley
TR	Trimco

Hardware Sets

SET #01

Doors: 101A

1 Continuous Hinge	661HD UL 83"	AL	ST
1 Continuous Hinge	661HD UL 83" EPT Prep	AL	ST
2 Keypad/Prox Reader	HID-5355	626	BEST
2 Exit Device	MLR E2803 X V4908A CD LBR	630	PR
2 Mortise Cylinder	1E-74 PATD	626	BE
1 Rim Cylinder	12E-72 PATD	626	BE
2 Set of Operators	Stanley Magic Swing Full Energy	689	ST
1 Power Transfer	EPT-5		PR
1 Power Supply	RPSMLR2		PR
1 Wireless Access Controller	WQX-WAC-C-B		BE
2 Jamb Actuator	CL2055	630	SD
1 Threshold	As per details	AL	NA

NOTE: Operation: During Business hours doors are dogged open, after hours card reader will momentary unlock door also free egress. Weatherstripping, door bottom and meeting stiles by door supplier.

SET #02

Doors: 101B

1 Continuous Hinge	661HD UL 83"	AL	ST
1 Continuous Hinge	661HD UL 83" EPT Prep	AL	ST
2 Keypad/Prox Reader	HID-5355	626	BEST
1 Exit Device	E2814 X V4908A CD LBR	630	PR
1 Exit Device	MLR E2814 X V4908A CD LBR	630	PR
1 Set of Operators	ED 900PR CMP J8	689	DM
1 Wall Bumper	1270CX	626	TR
1 Power Transfer	EPT-5		PR
1 Power Supply	RPSMLR2		PR
1 Radio Control Transmitter	CL4490		SD
1 Radio Control Receiver	CL4485		SD
1 Jamb Actuator	CL2055	630	SD

NOTE: Gasketing by Door supplier

SET #03

Doors: 102

3 Hinges	FBB179 4 1/2 X 4 1/2 NRP	US26D	ST
1 Lockset	45H-7R15H PATD	630	BE
1 Closer	TS9315 SPT	689	DM
2 Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
1 Smoke Seal	S88 D (HEAD AND JAMBS)		PE

SET #04

Doors: 131A

3 Hinges	FBB168 4 1/2 X 4 1/2 NRP	US26D	ST
1 Lockset	45H-7R15H PATD	630	BE
1 Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
1 Wall Bumper	1270CX	626	TR
3 Door Silencers	1229A	GREY	TR

SET #05

Doors: 127

2 Continuous Hinge	661HD UL 83"	AL	ST
1 Exit Device	2601 CD LBR	630	PR
1 Exit Device	2603 CD LBR	630	PR
2 Mortise Cylinder	1E-74 PATD	626	BE
1 Rim Cylinder	12E-72 PATD	626	BE
2 Door Pull	1191-5	630	TR
2 Closer	TS9315 SPT	689	DM
2 Overhead Stop	910 Series	626	DM

NOTE: Meeting Stiles by Door supplier

SET #06

Doors: 131, 133

2 Continuous Hinge	661HD UL 83"	AL	ST
2 Push/Pull Set	1747 Size	630	TR
2 Closer	TS9315 STH	689	DM
1 Gasketing	S773 BL Head and Jambs		PE

NOTE: Meeting stiles by door supplier

SET #07

Doors: 131B, 140C

3 Hinges	FBB191 4 1/2 X 4 1/2 NRP	US32D	ST
1 Exit Device	2103 X 4903A ALK	630	PR
1 Rim Cylinder	12E-72 PATD	626	BE
1 Closer	TS9315 SPT	689	DM
1 Wall or Floor Stop	1201 or 1205	626	TR
1 Gasketing	S773 BL Head and Jambs		PE
1 Door Bottom	315 CN		PE
1 Threshold	As per details	AL	NA

SET #08

Doors: 135

3 Hinges	FBB179 4 1/2 X 4 1/2 NRP	US26D	ST
1 Privacy Set	45H-0LT15H VIN	630	BE
1 Closer	TS9315 SPT	689	DM
1 Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
1 Wall Bumper	1270CX	626	TR
1 Gasketing	S773 BL Head and Jambs		PE

SET #09

Doors: 136

3 Hinges	FBB179 4 1/2 X 4 1/2 NRP	US26D	ST
1 Privacy Set	45H-0LT15H VIN	630	BE
1 Closer	TS9315 SPT	689	DM
1 Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
1 Wall Bumper	1270CX	626	TR
1 Gasketing	S773 BL Head and Jambs		PE

SET #10

Doors: 140

1 Continuous Hinge	661HD UL 83"	AL	ST
1 Continuous Hinge	661HD UL 83" EPT Prep	AL	ST
1 Keypad/Prox Reader	HID-5355	626	BEST
1 Exit Device	MLR 2603 CD LBR	630	PR
1 Exit Device	2601 CD LBR	630	PR
2 Mortise Cylinder	1E-74 PATD	626	BE
1 Rim Cylinder	12E-72 PATD	626	BE
2 Door Pull	1191-5	630	TR
2 Closer	TS9315 SPT	689	DM
1 Power Transfer	EPT-5		PR
1 Power Supply	RPSMLR2		PR

NOTE: Operation: Presenting proper card at cardreader will unlock door, dogging the exit device down with the cylinder will leave door in unlocked position always free egress

SET #11

Doors: 140A

6 Hinges	FBB179 4 1/2 X 4 1/2 NRP	US26D	ST
1 Flush Bolt	3999SE	626	TR
1 Lockset	45H-7R15H PATD	630	BE
1 Overhead Stop	700 Series	626	DM
1 Wall Bumper	1270CX	626	TR
1 Gasketing	S773 BL Head and Jambs		PE
1 Astragal	300 CP 84"		PE

SET #12

Doors: 140B

6 Hinges	FBB179 4 1/2 X 4 1/2 NRP	US26D	ST
1 Flush Bolt	3999SE	626	TR
1 Lockset	45H-7R15H PATD	630	BE
1 Overhead Stop	700 Series	626	DM
1 Gasketing	S773 BL Head and Jambs		PE
1 Astragal	300 CP 84"		PE

SET #13

Doors: E103, E104, E108A, E108B, E109, E111, E113, E114B, E115B, E120

NOTE: All hardware existing

SET #14

Doors: E105, E106

1 Closer	TS9315 STH	689	DM
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NOTE: Balance of hardware existing

SET #15

Doors: E110

1 Keypad/Prox Reader	HID-5355	626	BEST
1 Exit Device	2103 X 4903A	630	PR
1 Rim Cylinder	12E-72 PATD	626	BE
1 Electric Strike	BES-0563		BE
1 Closer	TS9315 SPT	689	DM

NOTE: Verity existing lock type, balance existing.

SET #16

Doors: E124

3 Hinges	FBB179 4 1/2 X 4 1/2 NRP	US26D	ST
1 Lockset	45H-7R15H PATD	630	BE
1 Overhead Stop	910 Series	626	DM
1 Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
1 Gasketing	S773 BL Head and Jambs		PE

NOTE: Balance of hardware existing

SET #04.1

Doors: 122, 132

1 Continuous Hinge	661HD UL 83"	AL	ST
1 Lockset	45H-7R15H PATD	630	BE
1 Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
1 Wall Bumper	1270CX	626	TR
1 Gasketing	S773 BL Head and Jambs		PE
1 Auto Door Bottom	411 ANBL		PE

SET #04.2

Doors: 107A

4 Hinges	FBB168 4 1/2 X 4 1/2 NRP	US26D	ST
1 Lockset	45H-7R15H PATD	630	BE
1 Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
1 Wall Bumper	1270CX	626	TR
3 Door Silencers	1229A	GREY	TR

SET #16.1

Doors: E114A

3 Hinges	FBB179 4 1/2 X 4 1/2 NRP	US26D	ST
1 Lockset	45H-7R15H PATD	630	BE
1 Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
1 Wall Bumper	1270CX	626	TR
1 Gasketing	S773 BL Head and Jambs		PE

SECTION 08 8000
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Insulating glass units.
- B. Glazing units.
- C. Interior glass panels installed withing walls for artwork display ' Museum glass'
- D. Plastic films.
- E. Glazing compounds and accessories.
- F. Mirrors

1.02 RELATED REQUIREMENTS

- A. Section 06 200 Architectual Woodwork
- B. Section 07 2500 - Weather Barriers.
- C. Section 07 9200 - Joint Sealants: Sealants for other than glazing purposes.
- D. Section 08 4313 - Aluminum-Framed Storefronts: Glazing furnished as part of storefront assembly.
- E. Section 08 5413 - Fiberglass Windows: Glazing furnished by window manufacturer.
- F. Section 10 2800 - Toilet, Bath, and Laundry Accessories:

1.03 SUBMITTALS

- A. Product Data on Insulating Glass Unit and Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
- B. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.
- C. Samples: Submit one samples 12 by 12 inch in sizeof glass units and glazing films on glass units.
- D. Samples: Submit one sample 12 by 12 inch in size of glazing films.
- E. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- F. Shop Drawings: Indicate location of each film using designated nomenclature as defined in the glazing film schedule. Indicate surface the glazing film is to be installed on.

1.04 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA (GM), GANA (SM), and IGMA TM-3000 for glazing installation methods.
- B. All glazing must meet the requirements of this section as well as those of the the basis of design product requirements llisted in other referenced sections.
- C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- D. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.05 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.
- C. Laminated Glass: Provide a five (5) year manufacturer warranty to include coverage for delamination, including replacement of failed units.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

- A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
 - 1. Design Pressure: Calculated in accordance with ASCE 7.
 - 2. Seismic Loads: Design and size glazing components to withstand seismic loads and sway displacement in accordance with the requirements of ASCE 7
 - 3. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
 - 4. Glass thicknesses listed are minimum.
- B. Vapor Retarder and Air Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier.
- C. Thermal and Optical Performance: Provide glass products with performance properties as indicated in basis of design product literature.

2.02 GLASS MATERIALS

- A. 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. Fully Tempered Safety Glass: Complies with ANSI Z97.1 and 16 CFR 1201 criteria.
 - 3. Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.
 - 4. Low-E Coating: Basis of Design, PPG Solarban 67.
- B. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
 - 1. Laminated Safety Glass: Complies with ANSI Z97.1 and 16 CFR 1201 test requirements for Category II.
- C. Safety Glass:
 - 1. Provide safety glass at locations required by the International Building Code and as follows:
 - a. Glazing in doors.
 - b. Glazing adjacent to doors.
 - c. Glazing that occurs within 18 inches of the floor.
 - d. Glazing that is within 36 inches horizontally of a walkway and less than 60 inches above the walking surface.
 - e. Glazing adjacent to stairs or ramps that is within less than 60 inches above the plane of the adjacent walking surface.
 - f. Glazing that is less than 36 inches above a stair landing and within 60 inches horizontally of the bottom tread.
 - 2. Safety glass must be tempered at locations in and adjacent to doors, or within 18 inches of the adjacent walking surface. All other locations may be tempered or laminated safety glass.
- D. Archival Safety Glass: Protective glass at art installed into wall recesses also noted as 'Museum' glass.
 - 1. Basis of Design: TruVue Ultra Vue Laminated Glass Glass.
 - 2. Alternate: TruVue Optium Museum Acrylic
 - 3. Thickness: 1/4"
 - 4. Fully Tempered or Laminated Safety Glazing

2.03 INSULATING GLASS UNITS

- A. Glass and Glazing
 - 1. Triple glazed sealed vision glass units meeting thermal and condensation resistance performance requirements.
 - 2. Sealed insulated glass shall be tested and certified in accord with ASTM E2190.
 - 3. Glazing method shall be in general accordance with the GANA Glazing Manual for specified glass type, or as approved by the glass fabricator.

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- B. Glazing Materials
1. Setting Blocks/Edge Blocking: Provide in sizes and locations recommended by GANA Glazing Manual.
 2. Provide two rows of continuous non-outgassing polyolefin convection baffle material in all glazing pocket perimeter cavities.
 3. Back-bedding tapes, expanded cellular glazing tapes, toe beads, heel beads and cap beads shall meet the requirements of applicable specifications cited in AAMA 800.
 4. Glazing gaskets shall be non-shrinking, weather-resistant, and compatible with all materials in contact.
 5. Structural silicone sealant where used shall meet the requirements of ASTM C1184.
 6. Spacer tape in continuous contact with structural silicone shall be tested for compatibility and approved by the sealant manufacturer for the intended application.
 7. Gaskets in continuous contact with structural silicone shall be extruded silicone or compatible material.

2.04 GLAZING UNITS

- A. Interior Vision Glazing:
1. Applications: Interior glazing unless otherwise indicated.
 2. Glass Type: Annealed float glass, tempered where safety glazing is required by code.
 3. Tint: Clear.
 4. Thickness: 3/8 inch, nominal, except as otherwise indicated..
 5. Coordinate openings in tempered glazing with casework and display case hardware.

2.05 PLASTIC FILMS

- A. Locations:
1. FM-1 At Gathering Room Ventilation windows.Type W9N
 - a. Basis of Design: 3M Fasara Chamonix or other semi-opaque pattern to be selected by Architect from manufacturers full range.
 2. FM-2 At Interior Glazing within 50 inches of the floor,
 - a. Provide custom cutouts of shape silhouette or other graphics provided by architect at proximately two feet on center. Graphics to be approximately 3" x 3". See Finish Legend for examples. (4) different shapes will be provided by Architect.
 - b. Material:
 - 1) Option 1: Same as FM-1
 - 2) Option 2: 3M Clearview printable transparent film cutout into circles with shapes printed in color selected by Architect.
- B. Install Film per manufacturer recommendation and on interior side of window.

2.06 MIRRORS

- A. 1/4" tempered polished plate glass
- B. 15 yr warranty agaist silver spoilage
- C. Compy with ASTMC11503-1
- D. Smooth edges

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that the minimum required face and edge clearances are being provided.
- C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.
- D. Verify that sealing between joints of glass framing members has been completed effectively.

- E. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

- A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.
- B. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.
- C. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.
- D. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, etc.

3.04 INSTALLATION - PRESSURE GLAZED SYSTEMS

- A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- D. Install pressure plates without displacing glazing gasket; exert pressure for full continuous contact.
- E. Install cover plate.

3.05 INSTALLATION - PLASTIC FILM

- A. Install plastic film with adhesive, applied in accordance with film manufacturer's instructions.
- B. No less than two skilled persons shall attempt installation of plastic films.
- C. Place without air bubbles, creases or visible distortion.
- D. Install film tight to perimeter of glass and carefully trim film with razor sharp knife. Provide 1/16 inch to 1/8 inch gap at perimeter of glazed panel unless otherwise required. Do not score the glass.
- E. Locate plastic film on the lowest traffic side of the glazing. Indicate on shop drawings for review.

3.06 CLEANING

- A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- B. Remove non-permanent labels immediately after glazing installation is complete.
- C. Clean glass and adjacent surfaces after sealants are fully cured.
- D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.07 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.
- B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION

SECTION 09 0561
COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This section applies to floors receiving the following types of floor coverings:
 - 1. Resilient tile and sheet.
 - 2. Thin-set ceramic tile and stone tile.
- B. Removal of existing floor coverings.
- C. Preparation of new and existing concrete floor slabs for installation of floor coverings.
- D. Patching compound.
- E. Note existing restroom floors are uneven and in need of leveling compound sloping to the existing drain prior to new floor installation.
- F. Provide ADA compliant tapered topping to provide flush transition from one flooring type to adjacent flooring type. Slope of floor surface located in the ADA accessible maneuvering clearance at doors to remain below 1:48.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Moisture emission reducing curing and sealing compound for slabs to receive adhered flooring, to prevent moisture content-related flooring failures; to remain in place, not to be removed.

1.03 REFERENCE STANDARDS

- A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens) 2016a.
- B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete 1999 (Reapproved 2014).
- C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring 2019.
- D. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride 2016a.
- E. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes 2017.
- F. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings 2011.

1.04 SUBMITTALS

- A. Visual Observation Report: For existing floor coverings to be removed.
- B. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
 - 1. Moisture and alkalinity (pH) limits and test methods.
 - 2. Manufacturer's required bond/compatibility test procedure.
- C. Adhesive Bond and Compatibility Test Report.

1.05 QUALITY ASSURANCE

- A. Contractor may perform adhesive and bond test with Contractor's own personnel or hire a testing agency.
- B. Moisture and alkalinity (pH) testing are to be paid for by the Contractor.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, handle, and protect products in accordance with manufacturer's instructions and recommendations.
- B. Deliver materials in manufacturer's packaging; include installation instructions.
- C. Keep materials from freezing.

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1.07 FIELD CONDITIONS

- A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.
- B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Patching Compound / Self-Drying, Trowelable Concrete Underlayment: product, suitable for conditions, and compatible with adhesive and floor covering. Provide a product with the following characteristics:
 - 1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
 - 2. Compressive Strength: 4200 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
 - 3. Products:
 - a. ARDEX SD-P®; Manufactured by ARDEX Engineered Cements: 400 Ardex Park Drive, Aliquippa, PA, 15001, USA 724-203-5000, www.ardexamericas.com.
 - 1) ARDEX SD-P®; Manufactured by ARDEX Engineered Cements: 400 Ardex Park Drive, Aliquippa, PA, 15001, USA 724-203-5000, www.ardexamericas.com.
 - (a) Primer
 - (1) Other non-porous substrates, such as burnished concrete, epoxy coating systems, terrazzo, ceramic, quarry and porcelain tiles, concrete treated with silicate curing compounds: ARDEX P 82™ Ultra Prime
 - (2) Porous concrete: ARDEX P 51™ Primer (not required)
 - b. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

- A. Perform following operations in the order indicated:
 - 1. Preliminary cleaning.
 - 2. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
 - 3. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
 - 4. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
 - 5. Specified remediation, if required.
 - 6. Patching, smoothing, and leveling, as required.
 - 7. Other preparation specified.
 - 8. Adhesive bond and compatibility test.
 - 9. Protection.
- B. Remediations:
 - 1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
 - 2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.

3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.02 REMOVAL OF EXISTING FLOOR COVERINGS

- A. Comply with local, State, and federal regulations and recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings, as applicable to floor covering being removed.
- B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.03 PRELIMINARY CLEANING

- A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.
- B. Do not use solvents or other chemicals for cleaning.

3.04 MOISTURE VAPOR EMISSION TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.
- C. Test in accordance with ASTM F1869 and as follows.
- D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.
- E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.
- F. Report: Report the information required by the test method.

3.05 INTERNAL RELATIVE HUMIDITY TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.
- C. Test in accordance with ASTM F2170 Procedure A and as follows.
- D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.
- E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.
- F. Report: Report the information required by the test method.

3.06 ALKALINITY TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. The following procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.
- C. Use a wide range alkalinity (pH) test paper, its associated chart, and distilled or deionized water.

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- D. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch in diameter. Allow the puddle to set for approximately 60 seconds, then dip the alkalinity (pH) test paper into the water, remove it, and compare immediately to chart to determine alkalinity (pH) reading.
- E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.07 PREPARATION

- A. See individual floor covering section(s) for additional requirements.
- B. Comply with requirements and recommendations of floor covering manufacturer.
- C. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.
- D. Do not fill expansion joints, isolation joints, or other moving joints.

3.08 ADHESIVE BOND AND COMPATIBILITY TESTING

- A. Comply with requirements and recommendations of floor covering manufacturer.

3.09 PROTECTION

- A. Cover prepared floors with building paper or other durable covering.

END OF SECTION

**SECTION 09 2116
GYPSUM BOARD ASSEMBLIES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Performance criteria for gypsum board assemblies.
- B. Acoustic insulation.
- C. Acoustic sealant
- D. Gypsum sheathing.
- E. Tile Backer Board.
- F. Cementitious backing board.
- G. Gypsum wallboard.
- H. Joint treatment and accessories.
- I. Reglet reveals, J-molding, end closures and other gypsum board finish accessories.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.
- B. Section 07 2100 - THERMAL INSULATION: Acoustic insulation.
- C. Section 07 8400 - Firestopping: Top-of-wall assemblies at fire rated walls.
- D. Section 07 9005 - Joint Sealers: Acoustic sealant.
- E. Section 09 2216 - Non-Structural Metal Framing.
- F. Section 09 90 00 - Painting: Finish

1.03 REFERENCE STANDARDS

- A. ANSI A108/A118/A136.1 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium). 2017.
- B. ANSI A108/A118/A136.1 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium). 2017.
- C. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board 2017.
- D. ASTM C630 Standard Specification for Water-Resistant Gypsum Backing Board.
- E. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board 2020.
- 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 2020.
- G. ASTM C1278/C1278M - Standard Specification for Fiber-Reinforced Gypsum Panel 2017.
- H. ASTM C1280 - Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing 2018.
- I. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units 2021.
- J. ASTM C1396/C1396M - Standard Specification for Gypsum Board 2017.
- K. ASTM C1629/C1629M - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels 2019.
- L. ASTM C1658/C1658M - Standard Specification for Glass Mat Gypsum Panels 2019, with Editorial Revision (2020).
- M. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber 2016.
- N. ASTM E119-12 - Standard Test Methods for Fire Tests of Building Construction and Materials.
- O. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.

- P. GA-216 - Application and Finishing of Gypsum Panel Products 2018.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.
- C. Provide shop drawings indicating locations of expansion joints.
- D. Provide schedule listing locations of Moldings and Reveals.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing gypsum board application and finishing, with minimum 5 years of documented experience.
- B. Copies of Documents at Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C840 and GA-216.

2.02 BOARD MATERIALS

- A. Gypsum Wallboard (GWB): Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 - 1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
 - 2. Glass mat faced gypsum panels as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
 - 3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - a. Mold-resistant board is required at all locations.
 - 4. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
- B. Moisture Resistant Gypsum Board: Fiberglass-Mat Faced Gypsum Board
 - 1. Thickness: 5/8"
 - 2. Edges: Tapered
 - 3. Surfacing: Coated fiberglass mat on face, back, and long edges.
 - 4. Humidified Deflection (ASTM C473, ASTM C1658): Not more than 1/8 inch.
 - 5. Hardness, Core, Edges, and Ends (ASTM C473, ASTM C1396): Not less than 15
 - 6. Water Absorption (ASTM C630, ASTM C1396, ASTM C1658): Less than 5 percent of weight.
 - 7. Mold Resistance (ASTM D3273): 10, in a test as manufactured.
 - 8. Microbial Resistance (ASTM D6329, EPA 12-week protocol): Will not support microbial growth.
 - 9. Locations: All exposed gypsum board in bathrooms and lockers.
 - 10. Products:
 - a. Manufacturer: Georgia Pacific, Product: 5/8" DensArmour Plus
- C. Backing Board For Wet Areas:
 - 1. Application: Surfaces behind tile and in wet areas including toilet rooms, housekeeping, and janitor rooms..
 - 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>ANSI A108/A118/A136.1 or ASTM C1325.
 - a. Thickness: 1/2 inch.
 - b. Products:

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- 1) Custom Building Products; Wonderboard.
- 2) National Gypsum Company; PermaBase Brand Cement Board.
- 3) USG Corporation; Durock Brand Cement Board.

2.03 ACCESSORIES

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Acoustic Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board.
 1. Commercially formulated single component synthetic
 2. The product is to be specifically manufactured for sound rated partition and ceiling systems.
 3. Provide Tremco Acoustical Sealant or approved equal product.
- C. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
 1. Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
 2. Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
 3. Ready-mixed vinyl-based joint compound.
 4. Chemical hardening type compound.
- D. High Build Drywall Surfer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.
- E. Screws for Attachment to Steel Members Less Than 0.03 inch In Thickness, to Wood Members, and to Gypsum Board: ASTM C1002; self-piercing tapping type; cadmium-plated for exterior locations.
- F. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.
- G. Moldings and Reveals
 1. Finish General: Anodized aluminum to be verified with Architect.
 2. Expansion Bead:
 - a. Manufacturer: Trim-Tex
 - b. Product: 093V Expansion Bead
 - c. Locations: At 30' intervals, locations to be approved by Architect.
 3. C-Reveal:
 - a. Manufacturer: Fry Reglet
 - b. Product: DRMF-626-50
 4. J-Trim:
 - a. Manufacturer: Fry Reglet
 - b. Product: JAM-875
 5. L-Trim:
 - a. Manufacturer: Fry Reglet
 - b. Product: DRML-100
 6. Z-Reveal:
 - a. Manufacturer: Fry Reglet
 - b. Product: DRMZ-50-50
 7. Corner Trim:
 - a. Manufacturer: Fry Reglet
 - b. Product: DMCT-1250
 - c. Finish: Painted to match adjacent wall
 - d. Locations: All outside corners unless otherwise indicated on drawings.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 ACOUSTIC ACCESSORIES INSTALLATION

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.

3.03 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. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
 - 1. Exception: Tapered edges to receive joint treatment at right angles to framing.
- C. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
- D. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11> ANSI A108/A118/A136.1 and manufacturer's instructions.
- E. Installation on Metal Framing: Use screws for attachment of all gypsum board except face layer of non-rated double-layer assemblies, which may be installed by means of adhesive lamination.
- F. Installation on Wood Framing: For rated assemblies, comply with requirements of listing authority. For non-rated assemblies, install as follows:
 - 1. Single-Layer Applications: Screw attachment.
- G. Moisture Protection: Treat cut edges and holes in moisture resistant gypsum board and exterior gypsum soffit board with sealant.

3.04 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
 - 1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

3.05 JOINT TREATMENT

- A. Fiberglass Mat Faced Gypsum Board : Use fiberglass joint tape, bedded and finished with chemical hardening type joint compound.
- B. Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.
- C. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
 - 1. Level 5: At Lobby 103, Gathering 140, Teen 133, and on both sides of fire place not covered by bookshelves at areas 119 and 120
 - 2. Level 4: All other areas not indicated otherwise to include light orange peel texture to match existing wall finish.
 - 3. Level 3: Inside mechanical room, electrical room, mechanical loft, janitor, com closet, and housekeeping room.
 - 4. Level 2: Areas above finished ceilings and soffit spaces, whether or not accessible in the completed construction.
- D. 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.
- E. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.06 TOLERANCES

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

END OF SECTION

SECTION 09 2216
NON-STRUCTURAL METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal partition, ceiling, and soffit framing.
- B. Framing accessories.

1.02 RELATED REQUIREMENTS

- A. Section 05 40 00 - Cold-Formed Metal Framing
- B. Section 06 1000 - Rough Carpentry: Wall sheathing.
- C. Section 06 41 00 - Architectural Wood Casework: Fasteners
- D. Section 07 4113 Metal Roofing - Z Metal Furring between roof sheathing layers
- E. Section 09 2116 - Gypsum Board Assemblies: Execution requirements for anchors for attaching work of this section.

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 2020.
- C. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members 2018.
- D. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products 2020.
- E. 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 2020.
- F. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic") 2002 (Ed. 2004).

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 - 1. Indicate prefabricated work, component details, stud layout, framed openings, anchorage to structure, acoustic details, type and location of fasteners, accessories, and items of other related work.
 - 2. Describe method for securing studs to tracks, and for blocking and reinforcement of framing connections.
- C. Product Data: Provide data describing framing member materials and finish, product criteria, load charts, and limitations.
- D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
- E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

PART 2 PRODUCTS

2.01 FRAMING MATERIALS

- A. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
 - 1. Studs: C shaped with flat or formed webs with knurled faces.
 - 2. Runners: U shaped, sized to match studs.
 - 3. Ceiling Channels: C shaped.
 - 4. Furring: Hat-shaped sections, minimum depth of 7/8 inch.
- B. Loadbearing Studs: As specified in Section 05 4000.

- C. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
- D. 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.
 - 1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
 - 2. Material: ASTM A653/A653M steel sheet, SS Grade 50, with G60/Z180 hot dipped galvanized coating.
- E. Tracks and Runners: Same material and thickness as studs, bent leg retainer notched to receive studs with provision for crimp locking to stud.
- F. Furring and Bracing Members: Of same material as studs; thickness to suit purpose; complying with applicable requirements of ASTM C754.
- G. Fasteners: ASTM C1002 self-piercing tapping screws.
- H. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic.

2.02 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
- B. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates. See below for fastener schedule for specific areas and applications.

2.03 FABRICATION

- A. Fabricate assemblies of framed sections to sizes and profiles required.
- B. Fit, reinforce, and brace framing members to suit design requirements.
- C. Fit and assemble in largest practical sections for delivery to site, ready for installation.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that rough-in utilities are in proper location.

3.02 INSTALLATION OF STUD FRAMING

- A. Comply with requirements of ASTM C754 and manufacturer's instructions.
 - 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Extend partition framing to structure where indicated and to ceiling in other locations.
- C. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
- D. 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.
- E. Align and secure top and bottom runners at 24 inches on center.
- F. At partitions indicated with an acoustic rating:
 - 1. Place one bead of acoustic sealant between runners and substrate, studs and adjacent construction.
 - 2. Place one bead of acoustic sealant between studs and adjacent vertical surfaces.
- G. Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.
- H. Align stud web openings horizontally.
- I. Secure studs to tracks using crimping method. Do not weld.

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- J. Fabricate corners using a minimum of three studs.
- K. Double stud at wall openings, door and window jambs, not more than 2 inches from each side of openings.
- L. Coordinate installation of bucks, anchors, and blocking with electrical, mechanical, and other work to be placed within or behind stud framing.
- M. Blocking: Use steel channels secured to studs. Provide blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, hardware, and opening frames.

3.03 CEILING AND SOFFIT FRAMING

- A. Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.
- B. Install furring independent of walls, columns, and above-ceiling work.
- C. Securely anchor hangers to structural members or embed in structural slab. Space hangers as required to limit deflection to criteria indicated. Use rigid hangers at exterior soffits.
- D. Space main carrying channels at maximum 72 inch on center, and not more than 6 inches from wall surfaces. Lap splice securely.
- E. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.
- F. Place furring channels perpendicular to carrying channels, not more than 2 inches from perimeter walls, and rigidly secure. Lap splices securely.
- G. Laterally brace entire suspension system.

3.04 TOLERANCES

- A. Maximum Variation From True Position: 1/8 inch in 10 feet.
- B. Maximum Variation From Plumb: 1/8 inch in 10 feet.

END OF SECTION

SECTION 09 3000
TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Tile for wall applications at restroom walls.
- B. Moisture resistant backer board for tile substrate per tile manufacturer's recommendations and section .09 2116
- C. Ceramic accessories.
- D. Ceramic trim.
- E. Non-ceramic trim.

1.02 RELATED REQUIREMENTS

- A. Section 07 9200 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.
- B. Section 09 2116 - Gypsum Board Assemblies: Tile backer board.
- C. Section 09 0561 - Common Work Results for Flooring Preparation

1.03 REFERENCE STANDARDS

- A. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium) 2019.
- B. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar 2017.
- C. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar 2017.
- D. ANSI A108.1c - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex-Portland Cement 1999 (Reaffirmed 2016).
- E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive 2009 (Revised).
- F. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar 1999 (Reaffirmed 2010).
- G. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy 1999 (Reaffirmed 2010).
- H. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout 1999 (Reaffirmed 2010).
- I. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout 1999 (Reaffirmed 2010).
- J. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework 2017.
- K. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units 2018.
- L. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone 2005 (Reaffirmed 2016).
- M. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive 2013 (Revised).
- N. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation 2014.

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- O. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring 2019.
- P. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride 2016a.
- Q. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation 2019.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- C. Shop Drawings: Indicate tile layout, accessories, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, and setting details.
- D. Samples: Mount tile and apply grout on two plywood panels, minimum 18 by 18 inches in size illustrating pattern, color variations, and grout joint size variations.
- E. Installer's Qualification Statement:
 - 1. Submit documentation of 5 years minimum experience with projects of similar scope within the previous two years. Each installer shall have this level of experience.
- F. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Tile: 1 percent of each size, color, and surface finish combination but no less than 2 full tiles.

1.05 QUALITY ASSURANCE

- A. Maintain one copy of ANSI A108/A118/A136 and TCNA (HB) on site.
- B. Installer Qualifications:
 - 1. Company specializing in performing tile installation, with minimum of 10 years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 TILE

- A. Wall Tile:CT-2A
 - 1. Manufacturer:
 - a. Pental Surfaces:
 - b. Contact; Ron Davis, 206-678-3200
 - c. See Finish Legend for Product info.
 - 2. Wall Tile:CT-2B
 - a. Manufacturer:
 - b. Pental Surfaces:
 - c. Contact; Ron Davis, 206-678-3200
 - d. See Finish Legend for Product info.

2.02 TRIM AND ACCESSORIES

- A. Non-Ceramic Trim: Brushed stainless steel, style and dimensions to suit application, for setting using tile mortar or adhesive.
 - 1. Trims will include but are not limited to the following applications:
 - a. Open edges of wall tile.
 - b. Wall corners, outside and inside.
 - c. Transition between floor finishes of different heights.

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- d. Thresholds at door openings.
- e. Floor to wall joints.
- f. Borders and other trim as indicated on drawings.
- 2. Manufacturers:
 - a. Schluter-Systems: Paula Tridle, 425-393-5645, ptridle@schluter.com, www.schluter.com/#sle.

2.03 SETTING MATERIALS

- A. Epoxy Adhesive and Mortar Bond Coat: ANSI A118.3.
 - 1. Products:
 - a. LATICRETE International, Inc; LATICRETE LATAPOXY 300 Adhesive: www.laticrete.com/#sle.

2.04 GROUTS

- A. Epoxy Grout: 100% solids chemical resistant and water-cleanable epoxy grout.
 - 1. Applications: at all tile locations unless noted otherwise..
 - 2. Color(s): As selected by Architect from manufacturer's full line.

2.05 ACCESSORY MATERIALS

- A. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.
 - 1. Type: Peel-and-stick sheet.
 - 2. Thickness: 20 mils, maximum.
 - 3. Crack Resistance: No failure at 1/8 inch gap, minimum.
- B. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.
 - 1. Applications: Between tile and plumbing fixtures and at control joints.
 - 2. Color(s): To match grout color as approved by Architect from manufacturer's full line.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
- C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.
- D. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within the following limits:
 - 1. Moisture Emission Rate: Not greater than 3 lb per 1000 sq ft per 24 hours, test in accordance with ASTM F1869.
 - 2. Alkalinity (pH): Verify pH range of 5 to 9, test in accordance with ASTM F710.

3.02 PREPARATION

- A. Protect surrounding work from damage.
- B. Existing foundation walls within area of floor tile may require additional preparation that may include concrete grinding.
- C. Vacuum clean surfaces and damp clean.
- D. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
- E. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.
- F. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.03 INSTALLATION - GENERAL

- A. Install tile and thresholds and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.13, manufacturer's instructions, and TCNA (HB) recommendations.
- B. Lay tile to pattern indicated.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- E. Form internal angles square and external angles bullnosed.
- F. Install non-ceramic trim in accordance with manufacturer's instructions.
- G. Install thresholds where indicated.
- H. Sound tile after setting. Replace hollow sounding units.
- I. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- J. Grout tile joints unless otherwise indicated. [] .
- K. 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.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

- A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, with epoxy grout, unless otherwise indicated.

3.05 INSTALLATION - WALL TILE

- A. Over gypsum wallboard on wood or metal studs install in accordance with TCNA (HB) Method W243, thin-set with dry-set or latex-Portland cement bond coat, unless otherwise indicated.

3.06 CLEANING

- A. Clean tile and grout surfaces.

3.07 PROTECTION

- A. Do not permit traffic over finished floor surface for 7 days after installation or as recommended by grout manufacturer, whichever is greater.
- B. Protect completed areas of work from damage by other trades until substantial completion.
- C. Replace areas of damaged tile or stained grout prior to substantial completion.

END OF SECTION

SECTION 09 5100
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Suspended metal grid ceiling system.
- B. Acoustical units.

1.02 RELATED REQUIREMENTS

- A. Section 05 3100 - Steel Decking: Placement of special anchors or inserts for suspension system.
- B. Section 21 1300 - Fire-Suppression Sprinkler Systems: Sprinkler heads in ceiling system.
- C. Section 26 5100 - Interior Lighting: Light fixtures in ceiling system.

1.03 REFERENCE STANDARDS

- A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method 2017.
- B. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings 2017.
- C. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels 2013.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- E. 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 2020.
- F. ASTM E1264 - Standard Classification for Acoustical Ceiling Products 2019.
- G. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests 2016.
- H. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth 2019.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Do not install acoustical units until after interior wet work is dry.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other ceiling finishes, and mechanical and electrical items installed in the ceiling.
- C. Product Data: Provide data on suspension system components and acoustical units.
- D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Extra Acoustical Units: Quantity equal to 5 percent of total installed.

1.06 QUALITY ASSURANCE

- A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.07 FIELD CONDITIONS

- A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acoustic Tiles/Panels:
 - 1. Armstrong World Industries, Inc; ULTIMA TEGULAR: www.armstrong.com/#sle. 2x2 grid.

2.02 ACOUSTICAL UNITS

- A. Acoustical Units - General: ASTM E1264, Class A.
- B. See finish legend.

2.03 SUSPENSION SYSTEM(S)

- A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.
- B. Exposed Steel Suspension System: Formed steel, commercial quality cold rolled; heavy-duty.
 - 1. Profile: Tee; 15/16 inch wide face.
 - 2. Basis of Design: Armstrong Prelude XL

2.04 ACCESSORIES

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
- B. Perimeter Moldings: Same material and finish as grid.
 - 1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.
 - 2. Provide additional profiles at transitions and edges per drawing details.
- C. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.
- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- C. Locate system on room axis according to reflected plan.
- D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
- E. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- I. Do not eccentrically load system or induce rotation of runners.
- J. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.

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1. Use longest practical lengths.
2. Overlap and rivet corners.

3.03 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Fit border trim neatly against abutting surfaces.
- D. Install units after above-ceiling work is complete.
- E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- F. Cutting Acoustical Units:
 1. Make field cut edges of same profile as factory edges.
 2. Double cut and field paint exposed reveal edges.
- G. Where obstructions or penetrations over 1" occur, provide preformed closures to match perimeter molding.

3.04 TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

SECTION 09 5426
SUSPENDED WOOD CEILINGS - ACOUSTIC CEILING PRODUCTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal grid suspension system.
- B. Wood grille tegular lay in panels.
- C. Wire hangers, fasteners, main runners, wall angle moldings and accessories.

1.02 REFERENCE STANDARDS

- A. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
- B. ASTM E 1264 Classification for Acoustical Ceiling Products
- C. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings 2017.
- D. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels 2013.
- E. 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 2020.
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Sequence work to ensure ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed.
- B. Do not install ceiling until after interior wet work is dry.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other ceiling finishes, mechanical and electrical items installed in the ceiling, and details at lighting, sprinklers, exposed edges, and wall terminations.
- C. Product Data: Provide data on suspension system components and ceiling panels.
- D. Samples: Submit {CH#235514} full size samples illustrating material and finish of ceiling panels.
 - 1. Submit one sample of a field cut and finished panel straight edge.
 - 2. Submit one mockup sample of a round light fixture centered in a panel.
- E. Test Reports: Submit substantiating engineering data, test results of previous tests by independent laboratory which purport to meet performance criteria, and other supportive data.
- F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.

1.05 QUALITY ASSURANCE

- A. Designer Qualifications for Seismic Design: Under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at the State of Alaska.
- B. Single-Source Responsibility: Provide ceiling panel units and grid components by a single manufacturer.
- C. Non-Conformance: All products not conforming to the requirements of this specification and or the manufacturer's published values are to be disposed. The Contractor performing the work will replace with approved product at their expense.
- D. Fire Performance Characteristics: Identify ceiling components with appropriate markings of applicable testing and inspecting organization.

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1. Surface Burning Characteristics: As follows, tested by HPVA (Hardwood Plywood and Veneer Association) under the test standard ASTM E-84 tunnel test and complying with ASTM E 1264 for Class C products.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Suspended Wood Ceilings:
 1. Armstrong.
 - a. Woodworks Total Acoustics Square Grille tegular with Bioacoustic infill
 2. Alternates:
 - a. Geometrik.
 - b. Rullon
 - c. ASI
 - d. Linea
 3. Substitutions: See Section 01 6000-Product Requirements.
 4. Alternates and substitutions must provide similar aesthetic, acoustic performance and accessibility to above ceiling components such as light fixtures, hvac components and sprinkler systems without visual interruption to finished look of the system

2.02 SUSPENDED CEILING SYSTEM

- A. Main beams and cross tees, base metal and end detail, fabricated from commercial quality hot dipped galvanized steel complying with ASTM A 653. Main beams and cross tees are double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping prefinished galvanized steel in baked polyester paint. Main beams and cross tees shall have rotary stitching.
 1. Structural Classification: ASTM C 635 Heavy Duty
 2. Color: Tech Black (to be confirmed with Architect)
 3. Type: Prelude XL 15/16 360 painted with 4' cross tee route holes at 12" oc
- B. Lay-In Panels: Pre-assembled tegular wood grille panels, species per Finish Legend..
 1. Size: 24 by 24 inches, nominal with 12 vertical slats per panel.
 2. Overall Thickness: 2 inches.
- C. Trim and Corner Medallions: Solid wood construction, species to match suspension system.
- D. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
- E. Acoustic Backing: BioAcoustic Infill Panel (Black - Matte)
 1. Noted as scrim in some details.
- F. Performance Requirements:
 1. Design to resist seismic load by using practices specified in ASTM E580.
 2. Surface Burning Characteristics: Maximum flame spread index of 200 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
 3. Acoustic Performance: NRC .75 provided by acoustic backing infill panel

2.03 FABRICATION

- A. Shop fabricate components.
- B. Prepare components for mechanical and electrical openings as required and as shown on shop drawings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION

- A. Install wall trim and corner medallions in accordance with manufacturer's installation instructions.

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- B. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.
- C. Locate system on room axis according to reflected ceiling plan and approved shop drawings.
- D. Verify lights and other ceiling mounted items are located as indicated on approved shop drawings.
- E. Provide detail edge profiles at openings and adjacent materials as shown in details and approved shop drawings.
- F. Support ceiling grid using clips and hanger wires spaced at maximum 48 inches on center.
- G. Cutting Panels and Grid Components: Using a sharp, small blade saw and straight edge, mark the finish side and cut as required. Miter cut corners.
- H. Install border and edge panels, then full panels working across the room.
- I. Field finish all cut edges to match factory edges.

3.03 PROTECTION AND CLEANING

- A. Protect finished work from subsequent damage until substantial completion.
- B. Clean all components including slats to be free of dust and debris prior to substantial completion.
- C. Replace areas of the work that are damaged by other trades.

END OF SECTION

**SECTION 09 6500
RESILIENT FLOORING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Resilient Linoleum sheet flooring.
- B. Resilient base.
- C. Installation accessories.

1.02 RELATED REQUIREMENTS

- A. Section 09 0561 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, removal of existing floor coverings, cleaning, and preparation.
- B. Section 26 0539 - Underfloor Raceways for Electrical Systems: Electrical floor cover plates for installation of resilient flooring.

1.03 REFERENCE STANDARDS

- A. ASTM D6329 - Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers 1998 (Reapproved 2015).
- B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source 2019a, with Editorial Revision (2020).
- C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring 2019.
- D. ASTM F1861 - Standard Specification for Resilient Wall Base 2021.
- E. ASTM F2034 - Standard Specification for Sheet Linoleum Floor Covering 2018.
- F. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings 2011.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Shop Drawings: Indicate floor patterns and all seam locations for each area.
 - 1. Do not provide seams intersecting plumbing fixtures or accessories.
- D. Verification Samples: Submit two samples, [] by [] inch in size illustrating color and pattern for each resilient flooring product specified.
- E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Flooring Material: 5% of each type and color.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing specified flooring with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
- B. Store all materials off of the floor in an acclimatized, weather-tight space.
- C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
- D. Protect roll materials from damage by storing on end.
- E. Do not double stack pallets.

1.07 FIELD CONDITIONS

- A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.01 SHEET FLOORING

- A. Linoleum Sheet Flooring - Type LIN-1: Homogeneous wear layer bonded to backing, with color and pattern through wear layer thickness.
 - 1. Manufacturers:
 - a. Johnsonite, a Tarkett Company; Peggy Gonzalez, 907-562-7751, peggyg@tasupply.com: www.johnsonite.com/#sle.
 - 2. Minimum Requirements: Comply with ASTM F2034, Type corresponding to type specified.
 - 3. Backing: Jute fabric.
 - 4. Seams: Heat welded.
 - 5. Pattern: As indicated on Finish Legend.
 - 6. Color: As indicated on Finish Legend.
- B. Welding Rod: Solid bead in material compatible with flooring, produced by flooring manufacturer for heat welding seams, and in color matching field color.

2.02 RESILIENT BASE

- A. Resilient Base B-3: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove.
 - 1. Note that restroom flooring has an integral cove base (B-4) and would not require resilient base
 - 2. Manufacturers:
 - a. Johnsonite, a Tarkett Company www.johnsonite.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.03 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
- B. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH.
 - 1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

3.02 PREPARATION

- A. Remove existing resilient flooring and flooring adhesives; follow the recommendations of RFCI (RWP).
- B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- C. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
- D. Prohibit traffic until filler is fully cured.

3.03 INSTALLATION - GENERAL

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install in accordance with manufacturer's written instructions.

3.04 INSTALLATION - SHEET FLOORING

- A. Lay flooring with joints and seams parallel to longer room dimensions, to produce minimum number of seams. Lay out seams to avoid widths less than 1/3 of roll width; match patterns at seams.
- B. Seal seams by heat welding where indicated.

3.05 INSTALLATION - RESILIENT BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Install base on solid backing. Bond tightly to wall and floor surfaces.

END OF SECTION

SECTION 09 6813
TILE CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Carpet tile, fully adhered.
- B. Removal of existing carpet tile.
- C. Walk off carpet for entry.

1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 09 0561 - Common Work Results for Flooring Preparation:
- C. Section 26 0539 - Underfloor Raceways for Electrical Systems: Electrical and telephone floor cover plate with recess for carpet.

1.03 REFERENCE STANDARDS

- A. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials 2016 (Reapproved 2021).
- B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source 2019a, with Editorial Revision (2020).
- C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring 2019.
- D. CRI 104 - Standard for Installation of Commercial Carpet 2015.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- C. Shop Drawings: Indicate layout of joints, details on transitions to other materials and floor mounted items.
- D. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Carpet Tiles: Quantity equal to 3 percent of total installed of each color and pattern installed.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum ten years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience and approved by carpet tile manufacturer.

1.06 FIELD CONDITIONS

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Tile Carpeting:
 - 1. Milliken & Company: www.milliken.com/#sle.
 - 2. Shaw Technique and Vanish.
 - 3. Mohawk Amplitude and Wavelength
 - 4. Waterhog walk off carpet

2.02 MATERIALS

- A. See Finish Legend for Products and colors
- B. Tile Carpeting manufactured in one color dye lot.

2.03 ACCESSORIES

- A. Sub-Floor Filler: White premix latex; type recommended by flooring material manufacturer.
- B. Edge Strips: Anodized aluminum Schluter-Schiene or as selected by architect.
- C. Carpet Tile Adhesive: Recommended by carpet tile manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
- B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to sub-floor surfaces.
- C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and pH.
 - 1. Test in accordance with Section 09 0561.
 - 2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.

3.02 PREPARATION

- A. Remove existing carpet tile.
- B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

3.03 INSTALLATION

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install carpet tile in accordance with manufacturer's instructions.
- C. Blend carpet from different cartons to ensure minimal variation in color match.
- D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- E. Lay carpet tile in square pattern, with pile direction parallel to next unit, set parallel to building lines.
- F. Trim carpet tile neatly at walls and around interruptions.
- G. Complete installation of edge strips, concealing exposed edges.

3.04 CLEANING

- A. Remove excess adhesive without damage, from floor, base, and wall surfaces.
- B. Clean and vacuum carpet surfaces.
- C. Protect installed work until substantial completion. Replace any damaged tiles.

END OF SECTION

**SECTION 09 7200
WALL COVERINGS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wall panel coverings and accessories.

1.02 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- B. ASTM F793/F793M - Standard Classification of Wall Coverings by Use Characteristics 2015.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on wall covering and adhesive.
- C. Shop Drawings: Indicate wall elevations with seaming layout, locations of accessories, provide corner details and trim details..
- D. Samples: Submit two samples of wall covering, 4 by 4 inch in size illustrating color, finish, and texture.
- E. Manufacturer's Installation Instructions: Indicate special procedures.
- F. Maintenance Data: Submit data on cleaning, touch-up, and repair of covered surfaces.
- G. Manufacturer's Qualification Statement.
- H. Installer's Qualification Statement.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.05 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the adhesive or wall covering product manufacturer.
- B. Maintain these conditions 24 hours before, during, and after installation of adhesive and wall covering.

PART 2 PRODUCTS

2.01 WALL COVERINGS

- A. General Requirements:
 - 1. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.
- B. Wall Coverings
 - 1. WC-1 : Basis of Design: Inpro; G2 Bioblend Sheet: www.inprocorp.com/#sle.
 - 2. WC-2A : Basis of Design: Inpro; Forbo Bulletin Board
 - 3. WC-2B: Basis of Design: Forbo Bulletin Board
 - 4. WC-5:Stainless Steel Panel - See Div 05 for specifications and standards.
- C. See finish schedule for color and pattern
- D. Adhesive: Type recommended by wall covering manufacturer to suit application to substrate.
- E. Substrate Filler: As recommended by adhesive and wall covering manufacturers; compatible with substrate.
- F. Substrate Primer and Sealer: Alkyd enamel type.

PART 3 EXECUTION

3.01 INSTALLERS

- A. No less than two workers should attempt installation of products in this section.

3.02 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work, and comply with requirements of wall covering manufacturer.
- B. Measure moisture content of surfaces using an electronic moisture meter. Do not apply wall coverings if moisture content of substrate exceeds level recommended by wall covering manufacturer.
- C. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet nor vary at a rate greater than 1/16 inch/ft.

3.03 PREPARATION

- A. Fill cracks in substrate and smooth irregularities with filler; sand smooth.
- B. Wash impervious surfaces with tetra-sodium phosphate, rinse and neutralize; wipe dry.
- C. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
- D. Apply one coat of primer sealer to substrate surfaces. Allow to dry. Lightly sand smooth.
- E. Vacuum clean surfaces free of loose particles.

3.04 INSTALLATION

- A. Apply adhesive and wall covering in accordance with manufacturer's instructions.
- B. Apply wall covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface.
- C. Do not seam within 12 inches of internal corners or within 6 inches²⁴ of external corners.
- D. Install wall covering before installation of bases and items attached to or spaced slightly from wall surface.
- E. Remove excess adhesive while wet from seam before proceeding to next wall covering sheet. Wipe clean with dry cloth.

3.05 CLEANING

- A. Clean wall coverings of excess adhesive, dust, dirt, and other contaminants.
- B. Reinstall wall plates and accessories removed prior to work of this section.

3.06 PROTECTION

- A. Do not permit construction activities to damage finished wall covering areas.
- B. Replace any damaged areas prior to substantial completion.

END OF SECTION

**SECTION 09 9113
EXTERIOR PAINTING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Shop applied Primers and Paints for exterior siding and soffits.
- C. Field application of paints.
- D. Materials for backpriming woodwork.
- E. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
- F. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
 - 5. Floors, unless specifically indicated.
 - 6. Glass.

1.02 RELATED REQUIREMENTS

- A. Section 09 9123 - Interior Painting.
- B. Section 09 9600 - High-Performance Coatings for Exposed Metals.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 - 2. MPI product number (e.g. MPI #47).
 - 3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
 - 4. Manufacturer's installation instructions, recommended primers, and accessories.
- C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.
 - 2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens definitely not required.
- D. Samples: Submit two painted samples, illustrating selected colors and textures for each color and system selected with specified coats cascaded. Submit on product intended, 4x4 inch in size.
- E. Manufacturer's Instructions: Indicate special surface preparation procedures.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum three years experience and approved by manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.
 - 1. Store in climate controlled facility at all times.
 - 2. If paint is suspected to have been exposed to freezing temperatures, discard and provide new product.

1.06 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply exterior paint and finishes during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- D. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide paints and finishes from the same manufacturer to the greatest extent possible.
 - 1. In the event that a single manufacturer cannot provide specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
 - 2. Substitution of other products by the same manufacturer and as recommended by the manufacturer is preferred over substitution of products by a different manufacturer.
- B. Paints:
 - 1. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
- C. Primer Sealers: Same manufacturer as top coats.

2.02 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready mixed, unless required to be a field-catalyzed paint.
 - 1. Where MPI paint numbers are specified, provide products listed in Master Painters Institute Approved Product List, current edition available at www.paintinfo.com, for specified MPI categories, except as otherwise indicated.
 - 2. Provide paints and finishes 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.
 - 3. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
 - 4. Supply each paint material in quantity required to complete entire project's work from a single production run.
 - 5. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
- B. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
- C. Colors: As indicated in Color Schedule.
 - 1. Selection to be made by Architect after award of contract.

2.03 PAINT SYSTEMS - EXTERIOR

- A. Wood Siding, Soffits and screen wall elements and any other exterior wood elements not indicated otherwise: Opaque, Latex, 2 Coat:
 - 1. One coat of latex primer sealer. Exterior Latex Wood Primer B42W8041 shop primed all 4 sides each board.
 - 2. One coat A-100 Exterior Latex A82 Series shop applied all 4 sides.
 - 3. One coat A-100 Exterior Latex A82 Field applied top coat.
 - 4. Colors: See Finish Legend

2.04 PRIMERS

- A. Primers: Provide the primer as recommended by manufacturer of top coats unless indicated otherwise.

2.05 ACCESSORY MATERIALS

- A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
- B. Patching Material: Compatible as recommended by paint manufacturer use filler.

PART 3 EXECUTION

3.01 SHOP APPLIED AND FIELD APPLIED FINISHES

- A. Wood siding and Soffits.
 - 1. Two coats shop primer all four sides.
 - 2. One coat topcoat all four sides.
 - 3. Second topcoat to be field applied after installation.
- B. Steel
 - 1. See Section 09 9600-High-Performance Coatings for Exposed Metals.

3.02 FIELD WORK EXAMINATION

- A. Do not begin application of paints and finishes until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- E. Test shop-applied primer for compatibility with subsequent cover materials.
- F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.
 - 2. Concrete Floors and Traffic Surfaces: 8 percent.

3.03 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- F. Concrete:
- G. Concrete Floors and Traffic Surfaces: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.
- H. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior caulking compound after prime coat has been applied. Back prime concealed surfaces before installation.

3.04 APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

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- B. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.
- C. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- E. Apply each coat to uniform appearance.
- F. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply additional coats until complete hide is achieved.
- G. Sand wood and metal surfaces lightly between coats to achieve required finish.
- H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- I. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- J. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.05 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection.
- B. Owner will provide field inspection.
- C. Inspect and test questionable coated areas.

3.06 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.07 PROTECTION

- A. Protect finishes until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

**SECTION 09 9123
INTERIOR PAINTING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Materials for backpriming woodwork.
- D. Scope: Finish interior surfaces exposed to view, unless fully factory-finished or otherwise indicated .
 - 1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
 - 2. Prime surfaces to receive wall coverings.
- E. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
 - 5. Stainless steel, anodized aluminum, bronze, terne coated stainless steel, and lead items.
 - 6. Floors, unless specifically indicated.
 - 7. Ceramic and other tiles.
 - 8. Brick, architectural concrete, cast stone, integrally colored plaster and stucco.
 - 9. Glass.

1.02 RELATED REQUIREMENTS

- A. Section 05 5000 - Metal Fabrications: Shop-primed items.
- B. Section 08 1213 - Hollow Metal Frames
- C. Section 09 2113 - Gypsum Board
- D. Section 09 9600 - High-Performance Coatings for Exposed Metals.

1.03 REFERENCE STANDARDS

- A. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications 2016.
- B. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials 2020.
- C. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association Current Edition.
- D. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual Current Edition.
- E. SSPC-SP 1 - Solvent Cleaning 2015, with Editorial Revision (2016).
- F. SSPC-SP 2 - Hand Tool Cleaning 2018.
- G. SSPC-SP 6 - Commercial Blast Cleaning 2007.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 - 2. MPI product number (e.g. MPI #47).
 - 3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

- C. Samples: Submit two paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.
 - 2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens definitely not required.
- D. Manufacturer's Instructions: Indicate special surface preparation procedures.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Paint and Finish Materials: 1 gallon of each color; from the same product run, store where directed.
 - 3. Label each container with color in addition to the manufacturer's label.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 3 years experience and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.
 - 1. If products are exposed to temperatures outside the above range during transit or storage, discard and provide new materials.

1.07 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide paints and finishes from the same manufacturer to the greatest extent possible.
 - 1. In the event that a single manufacturer cannot provide specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
- B. Paints:
 - 1. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
- C. Primer Sealers: Same manufacturer as top coats.
- D. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready mixed, unless intended to be a field-catalyzed paint.
 - 1. Provide paints and finishes 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 paint material in quantity required to complete entire project's work from a single production run.
 - 3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

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- B. Flammability: Comply with applicable code for surface burning characteristics.
- C. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
 - 1. Standard coating terms defined in ASTM D 16 apply to this Section.
 - a. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
 - b. Eggshell refers to low sheen finish with a gloss range between 5 and 20 when measured at a 60-degree meter.
 - c. Satin refers to low sheen finish with a gloss range between 15 and 35 when measured at a 60-degree meter.
 - d. Semigloss refers to medium sheen finish with a gloss range between 30 and 65 when measured at a 60 degree meter.
 - e. Full gloss refers to high sheen finish with a gloss range more than 65 when measured at a 60 degree meter.
- D. Colors: To be selected from manufacturer's full range of available colors.
 - 1. Selection to be made by Architect after award of contract.
 - 2. Allow for minimum of three colors for each system, unless otherwise indicated, without additional cost to Owner.
 - 3. Extend colors to surface edges; colors may change at any edge as directed by Architect.
 - 4. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under unless indicated otherwise.

2.03 PAINT SYSTEMS - INTERIOR

- A. Interior Surfaces to be Painted, Unless Otherwise Indicated:
 - 1. Two top coats and one coat primer.
- B. Interior Gypsum Board Unless noted Otherwise
 - 1. Two top coats and one coat primer.
 - 2. Products:
 - a. Sherwin-Williams ProMar 200 Zero VOC Interior Latex, Semi-Gloss.
- C. Toilet Rooms and Childrens Room
 - 1. Products : Sherwin Williams Microbicidal Interior Latex
- D. Trim: For painted surfaces subject to frequent contact by occupants, including wood and Metal Door Frames and trim:
 - 1. Two top coats and one coat procryluniversal primer. (unless other primer is recommended by manufacturer)
 - 2. Top Coats: Pro Industrial Pre Catylized Water Based Epoxy
- E. Dry Fall: Metals; exposed structure and overhead-mounted services in existing main library area, including shop primed steel deck, structural steel, metal fabrications, galvanized ducts, galvanized conduit, galvanized piping, and other exposed elements as indicated..
 - 1. Top Coat: Water Based Dry Fall.
 - a. Products:
 - 1) Sherwin-Williams Pro Industrial Waterborne Acrylic Dryfall.
 - 2) Alternate: Sherwin Williams Pro Industrial Multisurface Acrylic

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin application of paints and finishes until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- D. Test shop-applied primer for compatibility with subsequent cover materials.

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- E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Gypsum Wallboard: 12 percent.
 - 2. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.
- F. Galvanized Surfaces:
- G. Ferrous Metal:
 - 1. Solvent clean according to SSPC-SP 1.
 - 2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
 - 3. Remove rust, loose mill scale, and other foreign substances using using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.
- H. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

3.03 APPLICATION

- A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- D. Sand wood and metal surfaces lightly between coats to achieve required finish.
- E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- F. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection.
- B. Provide Owner and Architect opportunity to review painting quality prior to reinstalling wall or ceiling mounted items that have been removed or before removing masking of those items left in place.

END OF SECTION

SECTION 09 9300
STAINING AND TRANSPARENT FINISHING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of stains and transparent finishes.

1.02 RELATED REQUIREMENTS

- A. Section 06 2000 Finish Carpentry

1.03 REFERENCE STANDARDS

- A. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual Current Edition.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Transparent Finishes:
 - 1. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
- B. Stains:

2.02 STAINS AND TRANSPARENT FINISHES - GENERAL

- A. Finishes:
 - 1. Provide finishes 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. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
 - 3. Supply each finish material in quantity required to complete entire project's work from a single production run.
 - 4. Do not reduce, thin, or dilute finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

2.03 EXTERIOR STAIN AND TRANSPARENT FINISH SYSTEMS

- A. Finish on Wood: ONLY if indicated
 - 1. Stain: Exterior Solid Stain for Wood, Water Based; MPI #16.
 - a. Products:
 - 1) Sherwin-Williams WoodScapes Acrylic Solid Color Stain. (MPI #16)

2.04 INTERIOR STAIN AND TRANSPARENT FINISH SYSTEMS

- A. Finish on Wood: Typical unless noted otherwise
 - 1. Sealer: As recommended by top coat manufacturer.
 - 2. Top Coat(s): Urethane Clearcoat
 - a. Products:
 - 1) Minwax Helmsman Spar Urethane
 - 3. Top Coat Sheen:
 - a. Satin: MPI gloss level 4; use this sheen at all locations.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

3.03 APPLICATION

- A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- D. Reinstall items removed prior to finishing.
- E. Shop apply all stains and vanrnishes to greatest extent possible.
- F. Back prime all surfaces.
- G. Apply final topcoat in field.

3.04 PROTECTION

- A. Protect finishes until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 09 9600
HIGH-PERFORMANCE COATINGS FOR EXPOSED METALS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. High performance coatings for exterior metal and wood.
- B. Primers
- C. Surface preparation.

1.02 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide complete list of all products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 - 2. MPI product number (e.g. MPI #47).
 - 3. Cross-reference to specified coating system(s) product is to be used in; include description of each system.
 - 4. Manufacturer's installation instructions.
- C. Samples: Submit two samples 8 by 8 inch in size illustrating colors available for selection.
- D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- E. Maintenance Data: Include cleaning procedures and repair and patching techniques.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Extra Coating Materials: 1 gallon of each type and color.
 - 2. Label each container with manufacturer's name, product number, color number, and room names and numbers where used.

1.03 QUALITY ASSURANCE

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of coating, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Coating Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.05 FIELD CONDITIONS

- A. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- B. All exterior metal should be shop applied to greatest extent possible. Field touch up only.
- C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the coating product manufacturer.
- D. Do not install materials when temperature is below 55 degrees F or above 90 degrees F.
- E. Maintain this temperature range, 24 hours before, during, and 72 hours after installation of coating.
- F. Restrict traffic from area where coating is being applied or is curing.

1.06 WARRANTY

- A. See Section 01 7800 - 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 bond to substrate for new surfaces and bonding to existing finish for recoated surfaces.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Only materials (primers, coatings, etc.) listed in the latest edition of the MPI Approved Product List (APL) are acceptable for use on this project.
- B. Provide high performance coating products from the same manufacturer to the greatest extent possible.
 - 1. In the event that a single manufacturer cannot provide specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
- C. High-Performance Coatings:
 - 1. Sherwin-Williams Company; [_____]: www.protective.sherwin-williams.com/industries/#sle.
 - 2. Substitutions: Section 01 6000 - Product Requirements.

2.02 TOP COAT MATERIALS

- A. Coatings - General: Provide complete multi-coat systems formulated and recommended by manufacturer for the applications indicated, in the thicknesses indicated; number of coats specified does not include primer or filler coat.
 - 1. Color: As indicated and approved by Architect through sample submittal.
- B. Exterior Metal - Topcoats: Color to match AEP Span Cool ZACTique II or other custom color identified by Architect unless noted otherwise.
- C. Exposed Structural Steel and miscellaneous exterior steel - New:
 - 1. Primer/Prep for Galvanized Steel: Wash primer, clean and etch and SW Procryl Universal Primer.
 - 2. Topcoats: High performance acrylic modified polyurethane. SW Acrolon Ultra
- D. Exposed Structural Steel- Existing to be repainted:
 - 1. Primer/Prep: Hand tool clean per SSPC-SP2
 - 2. Topcoats: Basis of Design: SW Acrolon Ultra
- E. Metal Trims and Misc Steel not pre-finished:
 - 1. Primer/Prep: Basis of Design: SW Procryl Universal Primer
 - 2. Topcoats: Water Base Alkyd Urethane-.Basis of Design: SW Acrolon Ultra
- F. Prefinished Metal Trims and Fascias- existing to be repainted:
 - 1. Primer/Prep: SSPC SP-2
 - 2. Topcoats: Basis of Design: SW Bond Plex
- G. Shellac: Pure, white type.

2.03 ACCESSORY MATERIALS

- A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of coated surfaces.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Do not begin application of coatings until substrates have been properly prepared.
- C. Verify that substrate surfaces are ready to receive work as instructed by the coating manufacturer. Obtain and follow manufacturer's instructions for examination and testing of substrates.
- D. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- E. Test shop-applied primer for compatibility with subsequent cover materials.
- F. Proceed with coating application only after unacceptable conditions have been corrected.
 - 1. Commencing coating application constitutes Contractor's acceptance of substrates and conditions.

3.02 PREPARATION

- A. Clean surfaces of loose foreign matter.
- B. Remove substances that would bleed through finished coatings.
- C. Remove finish hardware, fixture covers, and accessories and store.
- D. Existing Painted and Sealed Surfaces:
 - 1. Remove loose, flaking, and peeling paint. Feather edge and sand smooth edges of chipped paint.
 - 2. Clean with mixture of trisodium phosphate and water to remove surface grease and foreign matter.
- E. Galvanized Surfaces:
 - 1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
 - 2. Prepare surface according to SSPC-SP 2.
- F. Ferrous Metal:
 - 1. Solvent clean according to SSPC-SP 1.
 - 2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
 - 3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning", and protect from corrosion until coated.
- G. Protect adjacent surfaces and materials not receiving coating from spatter and overspray; mask if necessary to provide adequate protection. Repair damage.

3.03 PRIMING

- A. Apply primer to all surfaces, unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.

3.04 COATING APPLICATION

- A. Apply coatings in accordance with manufacturer's written instructions, to thicknesses specified and recommendations in "MPI Architectural Painting and Specification Manual".
- B. Apply in uniform thickness coats, without runs, drips, pinholes, brush marks, or variations in color, texture, or finish. Finish edges, crevices, corners, and other changes in dimension with full coating thickness.

3.05 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection.
- B. Provide field inspection log verifying 10% or more of general areas for dry film thickness as specified by manufacturer for proper coating.
- C. Touch up and restore surfaces damaged by testing.
- D. If test results show that dry film thickness of applied coating does not comply with coating manufacturer's written recommendations, and specified thickness, apply additional coats as needed to provide dry film thickness that complies with coating manufacturer's written recommendations, and specified thickness.

3.06 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.
- B. Clean surfaces immediately of overspray, splatter, and excess material.
- C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

3.07 PROTECTION

- A. Protect finished work from damage.

END OF SECTION

SECTION 10 1400
SIGNAGE AND DISPLAY SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Room and door signs.
- B. Interior directional and informational signs.
- C. Interior Signage holders for printed materials provided by owner.
- D. Library Collection Orientation Signage
- E. Emergency evacuation maps.
- F. Building identification signs.
- G. Dedication Plaque.
- H. Exterior Monument Directional Signage at entry and exit of parking area.
- I. System for Display of Temporary Artworks in Teen Area

1.02 RELATED REQUIREMENTS

- A. Section 26 5100 - Interior Lighting: Exit signs required by code.
- B. Div 26 - Elec Power to Exterior Illuminated Letters

1.03 REFERENCE STANDARDS

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines current edition.
- B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
- C. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Package signs as required to prevent damage before installation.
- B. Package room and door signs in sequential order of installation, labeled by floor or building.
- C. Store tape adhesive at normal room temperature.

1.05 FIELD CONDITIONS

- A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.01 SIGNAGE APPLICATIONS

- A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1 [____], unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
- B. Room and Door Signs:
 - 1. Sign Type: Flat signs with engraved or raised panel media as specified.
 - 2. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
 - 3. Character Height: 1 inch.
 - 4. Provide signs on both sides of door at main entry vestibule doors.
 - 5. Sign Height: 2 inches, unless otherwise indicated.
 - 6. Office Doors: Identify with room numbers to be determined later, not the numbers indicated on drawings; in addition, provide "window" section for replaceable occupant name.
 - 7. Conference and Meeting Rooms: Identify with room numbers to be determined later, not the numbers indicated on drawings; in addition, provide "window" section with sliding "In Use/Vacant" indicator.
 - 8. Service Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings.

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9. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", "FAMILY" or "STAFF" room numbers to be determined later, and braille.
- C. Interior Directional and Informational Signs:
- D. Emergency Evacuation Maps:
 1. Map content to be provided by Owner.
- E. Building Identification Signs:
 1. Use individual illuminated metal letters.
- F. Plaques

2.02 INTERIOR DOOR AND ROOM SIGNS

- A. Signage media without frame with raised letters and pictograms.
 1. Edges: Square.
 2. Corners: Radiused.
 3. Size: 8x8 inches typical. (some may be smaller)
 4. Wall Mounting of One-Sided Signs: Adhesive foam tape or set in silicone sealant as substrate requires for proper adhesion.
 5. Basis of Design: Inpro Phoenix with Kensington Maple face and dove grey backplate.
 6. Quantity: 50 Signs
 7. Locations: Generally at interior doors, exits, occupancy limits, fire extinguishers, and storage areas.
 - a. Signage Schedule to be provided by Architect during submittal process.

2.03 ART DISPLAY SYSTEM

- A. Basis of Design: gallerysystem.com product: Original Gallery System
- B. Components:
 1. Stainless Steel Cabeling (as recommended by manufacturer for location)
 2. Slider hangers (12)
 3. Push Button Hooks (12)
 4. 20.5 lin feet of annodized track
 5. End Caps annodized

2.04 DIMENSIONAL LETTERS

- A. Building Identification Signage Metal Letters:
 1. Metal: Cast Aluminum
 2. Metal Thickness: 1/2" inch minimum.
 3. Profile: 1" deep minimum
 4. Letter Height: 10 inches.
 5. Text and Typeface: As indicated on exterior elevations: Optima font UNO
 6. Verify all heights and fonts with Architect prior to submittal
 7. Finish: Brushed, satin clear annodized
 8. Product: American Sign Letters..
 9. Mounting: Blind Stud Standoffs.
 - a. Coordiante with siding and insulation layers for fastener lenghts

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide additonal blocking and substrates as needed for complete installation.
- C. Install neatly, with horizontal edges level.
- D. Protect from damage until Substantial Completion; repair or replace damaged items.

END OF SECTION

SECTION 10 2113.17
PHENOLIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Phenolic toilet compartments.
- B. Urinal screens.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Blocking and supports.
- B. Section 10 2800 - 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. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth 2019.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on panel construction, hardware, and accessories.
- C. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
- D. Samples: Submit two samples of partition panels, 4x4 inch in size illustrating panel finish, color, and sheen.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Phenolic Toilet Compartments:
 - 1. Basis of Design: Scranton Products .www.scrantonproducts.com
 - 2. Substitutions: Section 01 6000 - Product Requirements.

2.02 PHENOLIC TOILET COMPARTMENTS

- A. Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solid phenolic core panels with integral melamine finish, floor-mounted headrail-braced.
- B. Basis of Design Product: Hiny Hiders
- C. Color: To be selected by Architect from manufacturers full range if not listed in finish legend.

2.03 ACCESSORIES

- A. Pilaster Shoes: Formed ASTM A666 Type 304 stainless steel with No. 4 finish, 3 inch high, concealing floor fastenings.
- B. Head Rails: Hollow anodized aluminum, 1 inch by 1-1/2 inch size, with anti-grip profile and cast socket wall brackets.
- C. Attachments, Screws, and Bolts: Stainless steel , tamper proof type.
- D. Hardware: Polished stainless steel:
 - 1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
 - 2. Door Latch: Slide type with exterior emergency access feature.
 - 3. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
 - 4. Coat hook with rubber bumper; one per compartment, mounted on door.
 - 5. Provide door pull for outswinging doors.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify correct spacing of and between plumbing fixtures.
- C. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

- A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.
- B. Maintain 3/8 inch to 1/2 inch space between wall and panels and between wall and end pilasters.
- C. Attach panel brackets securely to walls using anchor devices.
- D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.
- E. 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.

3.04 ADJUSTING

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
- B. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.

END OF SECTION

SECTION 10 2600
WALL AND DOOR PROTECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Corner guards.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Blocking for wall and corner guard anchors.
- B. Section 08 7100 - Door Hardware: Standard protection plates and trim.
- C. Section 09 2116 - Gypsum Board Assemblies: Placement of supports in stud wall construction.
- D. Section 09 2216 - Non-Structural Metal Framing: Placement of supports in stud wall construction.
- E. Section 09 7200 - Wall Coverings: Terminating wall covering at wall and door protection.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Manufacturer's Instructions: Indicate special procedures, perimeter conditions requiring special attention, and [_____].
- C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project:
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Stock Materials: One package(s) of minimum 96 inches long unit of each kind of covers for corner guards and chair rails.
- D. Maintenance Data: For each type of product . Include information regarding recommended and potentially detrimental cleaning materials and methods.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver wall and door protection items in original, undamaged protective packaging. Label items to designate installation locations.
- B. Protect work from moisture damage.
- C. Protect work from UV light damage.
- D. Do not deliver products to project site until areas for storage and installation are fully enclosed, and interior temperature and humidity are in compliance with manufacturer's recommendations for each type of item.
- E. Store products in either horizontal or vertical position, in compliance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Corner Guards:
 - 1. Construction Specialties, Inc; Acrovyn VA Series w/ Tape, 1 1/2" Wings: www.csgroup.com/#sle.
 - 2. Inpro; Tape on, 1 1/2" Wings: www.inprocorp.com/#sle.

2.02 PRODUCT TYPES

- A. Corner Guards - Surface Mounted:
 - 1. Material: PVC Free
 - 2. Performance: Resist lateral impact force of 100 lbs at any point without damage or permanent set to corner guard or substrate.
 - 3. Width of Wings: 1 1/2 inches.
 - 4. Corner: Square.
 - 5. Colors: See finish legend.
 - 6. Length: One piece per finish legend
 - 7. Fully adhere via self adhesive tape backing and additional sealant if necessary for full adhesion.
 - 8. Locations: All

2.03 FABRICATION

- A. Fabricate components with tight joints, corners and seams.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.
- B. Verify that field measurements are as indicated on drawings.
- C. Verify that substrate surfaces for adhered items are clean and smooth.
 - 1. Test painted or wall covering surfaces for adhesion in inconspicuous area, as recommended by manufacturer. Follow adhesive manufacturer's recommendations for remedial measures at locations and/or application conditions where adhesion test's results are unsatisfactory.
- D. Start of installation constitutes acceptance of project conditions.

3.02 INSTALLATION

- A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to supporting construction.
- B. Position corner guard from top of base to finish face of ceiling.

3.03 TOLERANCES

- A. Maximum Variation From Required Height: 1/4 inch.

3.04 CLEANING

- A. Clean wall and door protection items of excess adhesive, dust, dirt, and other contaminants.

END OF SECTION

SECTION 10 2700
LIBRARY SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Book Truck for exterior book drop (Book Cart)
- B. Passport Photo Screen LA-1

1.02 RELATED REQUIREMENTS

- A. Section 05 50 00 - Metal Fabrications: Bookdrop chute
- B. Section 06 10 00 - Rough Carpentry: Blocking and supports.
- C. Section 08 4313 Aluminum-Framed Storefronts
- D. Section 09 22 16 - Non-Structural Metal Framing: Blocking and supports.

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; 2010.
- B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.

1.04 SUBMITTALS

- A. See Section 01 33 00 - Submittal Procedures, for submittal procedures.
- B. Shop Drawings: Indicate fastening methods to substrate and coordination with installations surrounding items for dimensional coordination.
- C. Product Data: Provide data on products, hardware, and accessories.
- D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Book Return Cart
 - 1. Basis of Design: American book returns M810 Book Truck
 - a. Features gentle drop no-tip floor, covered by durable canvas liner and rubber pad.
 - b. Truck is 20" x 22" x 32" tall (casters included in dimensions) and made of galvannealed paint grip steel, reinforced at each corner, edge and base.
 - c. Baked on powder coat finish.
 - d. Hoop handle and (4) 3" smooth rolling, floor safe, non-marking polyurethane tread casters (front two swivel).
- B. Passport Photo Screen.
 - 1. Basis of Design: CFS Products Wall mounted Photo ID backdrop WC-33
 - a. Includes mounting brackets for wall or ceiling attachment
 - b. Built-in fabric lock secures screen in lowered position
 - c. Matte White seamless fabric.
 - d. White screen area: 30-11/16" W x 52" H
 - e. Housing dimensions (retracted): 36-3/16" W x 4-3/4" H
 - f. Overall dimensions (fully extended): 36-3/16" W x 55" H
 - 2. Substitutions: Section 01 60 00 - Product Requirements.

2.02 COMPONENTS

- A. Toilet Compartments: Stainless steel, floor-mounted headrail-braced.
- B. Doors, Panels, and Pilasters: Sheet steel faces, pressure bonded to sound deadening core, formed and closed edges; corners made with corner clips or mitered, welded, and ground smooth.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that field measurements are as indicated.
- C. Verify correct location of built-in book drop chute, framing, anchorage, and bracing.

3.02 ADJUSTING

- A. Adjust components for consistency of line or plane.

END OF SECTION

SECTION 10 2800
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Commercial toilet accessories.
- B. Diaper changing stations.
- C. Utility room accessories.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000: Rough Carpentry
- B. Section 08 8000 - Glazing - Mirrors
- C. Section 09 3000 - Tiling:
- D. Section 10 2113.17 - Phenolic Toilet Compartments

1.03 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
- B. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service 2015a (Reapproved 2019).
- C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2015.
- D. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium 2017.
- E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- F. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use 2004, with Editorial Revision (2016).
- G. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Commercial Toilet and Bath Accessories:
 - 1. Bobrick : washroominc.com
- B. Diaper Changing Stations:
 - 1. Koala Kare Products; []: www.koalabear.com/#sle.
- C. Other manufacturers as listed in basis of design products.

2.02 MATERIALS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
 - 1. Grind welded joints smooth.
 - 2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.
- B. Stainless Steel Sheet: ASTM A666, Type 304.
- C. Fasteners, Screws, and Bolts: Stainless Steel; tamper-proof; security type.

2.03 FINISHES

- A. Stainless Steel: Satin finish, unless otherwise noted.

2.04 COMMERCIAL TOILET ACCESSORIES

- A. Basis of Design Products. (Verify all quantities prior to submittal)
1. (4) Soap Dispenser: Bobrick B-858, polished chrome (confirm same brand and style as faucet specified by mechanical)
 2. (2) Paper Towel Dispensers/Waste Receptacle: Bobrick B-3944
 3. (1) Paper Towel Dispenser (Gathering): Bobrick B-262 (locking) or B-2620 (knob latch)
 4. (2) Toilet Tissue Dispensers, Recessed: Bobrick B-3888
 5. (3) Toilet Tissue Dispensers, Surface Mounted: Bobrick B-2888
 6. (1) Partition Mounted Seat Cover Dispenser, Sanitary Napkin Disposal, and Toilet Tissue Dispenser: Bobrick B-357
 7. (5) Seat Cover Dispensers: Bobrick B-221
 8. (2) Sanitary Napkin Disposal, Surface mounted: Bobrick B-270
 9. (1) Sanitary Napkin Disposal, Recessed: Bobrick B-354
 10. (4) 18" Grab Bars, 1 1/2" Dia. Straight/Satin: Bobrick B-6806x18"
 11. (4) 36" Grab Bars, 1 1/2" Dia. Straight/Satin: Bobrick B-6806x36"
 12. (4) 42" Grab Bars, 1 1/2" Dia. Straight/Satin: Bobrick B-6806x42"
 13. (3) Baby Changing Station, Vertical, Surface Mounted: KB111-SSWM, satin stainless steel
 14. (3) Liner Dispenser for Baby Changing Station , Recessed: Koala Kare KB134-SSLD, satin stainless steel
 15. (1) Child Protection Seat: KB102, gray
 16. (4) SharpSafety Non-Locking Bracket, For 5qt In-Room Containers: Cardinal Health, Item #: 298519
 17. (4) Wallsafe Sharps Container, 5qt, Red: Bemis Manufacturing Company, Item #: 133-150-030EA
 18. (2) Partition Door Bumpers, Surface Mounted: Bobrick B-687
 19. (4) Utility Hook: Bobrick B-6707, satin stainless steel
 20. (6) Lav Shield: Trubro LavShield Impact Resistant PVC

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.
- C. For electrically-operated accessories, verify that electrical power connections are ready and in the correct locations.
- D. Verify that field measurements are as indicated on drawings.

3.02 PREPARATION

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

- A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.

3.04 PROTECTION

- A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION

**SECTION 10 3100
MANUFACTURED FIREPLACES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Manufactured direct vent propane fireplace.
- B. UL rated concentric flue system.

1.02 RELATED REQUIREMENTS

- A. Section 06 100 Rough Carpentry
- B. Section 06 200 Finish Carpentry
- C. Section 07 4113 Metal Roofing
- D. Section 07 4113 Metal Flashing
- E. 09 2216 Non Structural metal framing
- F. Section 23 1126: Gas piping to fire box.
- G. Section 26 0583 - Wiring Connections.
- H. Div 23: Stovepipe and other accessories.
- I. Div 26: Power to disconnect.

1.03 REFERENCE STANDARDS

- A. UL (DIR) - Online Certifications Directory Current Edition.
- B. UL 127 - Standard for Factory-Built Fireplaces Current Edition, Including All Revisions.

1.04 SYSTEM DESCRIPTION

- A. Built-in, frameless see-through fireplace with double glass cool touch safety screens

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide fire box cabinet dimensions, clearances required from adjacent dissimilar construction, applicable regulatory agency approvals, electrical characteristics of fan.
- C. Shop Drawings: Indicate fire box rough opening dimensions, rough opening sizes for chimney flue, clearances to combustibles, venting inlets and outlets with required clearances, finish attachments and other details necessary regarding surrounding conditions for adequate preparation prior to installation..
- D. Manufacturer's Certificate: Certify that fireplace components meet or exceed UL (DIR) requirements.
- E. Manufacturer's Instructions: Indicate installation procedures with specific instructions and diagrams on clearances to combustibles and other installed elements. Show component installation sequence, clearances and tolerances from adjacent construction, and [_____].

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Manufactured Fireplaces:
 - 1. Flare Fireplace ST-60H with 24" high glass. WWW.flarefireplaces.com

2.02 COMPONENTS

- A. Fire Box: Formed insulated steel cabinet, rectangular shaped interior, double ceramic glass faces, configured to include chimney outlet and cleanout, front air inlet and integral air outlet.
 - 1. Combustion Air Source: Ducted air with screened grilles and ducts.
 - 2. Vent: Double pipe flue vent UL rated and of sufficient length to meet roof outlet.
 - 3. Fire media: Provide Ceramic logs AND Embers AND black ceramic pebbles in sufficient quantities that one or the other may be used.
 - 4. Adjustable telescopic legs and mounting brackets.
 - 5. Gas Valve: Mertix GV60 Combination Gas Valve or as required by manufacturer.

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6. Ignition: Honeywell electronic Ignition or as required by manufacturer.
 - a. Include Battery backup
7. Electrical Controls: Verify with product manufacturer.
 - a. Dedicated Breaker.
 - b. Timer switch to be located per Architect.
8. Provide LED lighting within firebox per manufacturer option.
9. Burners: Tripple row stainless steel burners.
10. BTU Rating: 41,000.

2.03 FACTORY FINISHING

- A. Exposed to View Surfaces: Selected by Architect from Manufacturer's full range of standard and premium options. Include stainless steel or galvanized primer finish for all exposed metals.

2.04 ACCESSORIES

- A. Firestop Spacer: Non-combustible device designed to fit between chimney riser and penetrated floor or roof construction framing.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

- A. Verify that prepared openings are ready to receive work and opening dimensions are as indicated on drawings.
- B. Verify that proper power supply and fuel source are available.

3.02 INSTALLATION

- A. Install unit assembly and flue in accordance with manufacturer's instructions to maintain UL rating of complete assembly.

3.03 TOLERANCES

- A. Maximum Variation of Chimney From Plumb: 1/2 inch.

END OF SECTION

**SECTION 10 4400
FIRE PROTECTION SPECIALTIES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fire extinguishers.
- B. Fire extinguisher cabinets, recessed and semi recessed.

1.02 RELATED REQUIREMENTS

- A. Section 09 2116 - Gypsum Board Assemblies
- B. Section 09 9123 - Interior Painting

1.03 REFERENCE STANDARDS

- A. UL (FPED) - Fire Protection Equipment Directory; Underwriters Laboratories Inc.; current edition.
- B. FM (AG) - FM Approval Guide current edition.
- C. NFPA 10 - Standard for Portable Fire Extinguishers 2017, with Errata (2018).
- D. UL (DIR) - Online Certifications Directory Current Edition.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate cabinet physical dimensions, rough-in measurements for recessed cabinets, wall bracket mounted measurements, and location.
- C. Product Data: Provide extinguisher operational features, color and finish, anchorage details, and cabinet physical dimensions.
- D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

1.05 WARRANTY

- A. Provide a ten year warranty for fire extinguishers dated from the date of Substantial Completions.

1.06 FIELD CONDITIONS

- A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.01 FIRE EXTINGUISHERS

- A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
 - 1. Provide extinguishers labeled by UL for the purpose specified and indicated.
- B. Dry Chemical Type Fire Extinguishers: Aluminum tank, with pressure gage.
 - 1. Class: A:B:C.
 - 2. Size: 10 pound.
 - 3. Finish: Baked polyester powder coat, color as selected.
 - 4. Location: As indicated in the drawings.
 - 5. Provide extinguishers labeled by UL (DIR) or FM (AG) for purpose specified and as indicated.

2.02 FIRE EXTINGUISHER CABINETS

- A. Basis of Design:
 - 1. Manufacturer: Larsen's Manufacturing Co.; (800)527-7367; www.larsensmfg.com
 - a. Model: SS 2409 6 inch ID Architectural Series
 - 2. Verify cabinet can accommodate required extinguisher size without projecting face bubble or other protrusion.

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3. Fire rating: none
4. Door and Trim Material: Aluminum
5. Trim: 5/16 Flat Fully Recessed
6. Door: Vertical Duo
7. Door Glazing: Clear Acrylic - Flat
8. Door Lettering: Engraved
9. Finish: #4 Stainless Steel
10. Locations: Typical FEC unless noted otherwise.
11. Provide ADA compliant model with ADA compliant handle. Mount to meet ADA mounting height requirements.

2.03 SURFACE MOUNTED FIRE EXTINGUISHER BRACKET

- A. Basis of Design:
 1. Manufacturer: Larsen's Manufacturing Co.; (800)527-7367; www.larsensmfg.com.
 2. Size: As required to accommodate required extinguisher
 3. Material: formed steel, chrome plated.
 4. Locations: Boiler Room, Mechanical Platform

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 cabinets plumb and level in wall openings.
- C. Secure rigidly in place.
- D. Place extinguishers and accessories in cabinets.

END OF SECTION

**SECTION 10 5613
METAL STORAGE SHELVING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cantilever Metal Library shelving: new and salvaged for reuse with new end panels and tops.
- B. See drawings for quantities
- C. Shelving accessories.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

- A. ANSI MH28.1 - American National Standard for the Design, Testing, Utilization and Application of Industrial Grade Steel Shelving - Specifications; 1997.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Rated uniform shelf loads.
 - 2. Details of shelving assemblies, including reinforcement and attachments to floor or wall.
 - 3. Accessories.
- C. Test Reports: Provide independent agency test reports documenting compliance with specified structural requirements.
- D. Shop Drawings: Indicate location, type, and layout of shelving, including lengths, heights, and aisle layout, and relationship to adjacent construction.
 - 1. Indicate methods of achieving specified anchoring requirements.
- E. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and finishes.
- F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

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.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum 3 years of documented experience and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Inspect for dents, scratches, or other damage. Replace damaged units.
- B. Store in manufacturer's unopened packaging until ready for installation.
- C. Store under cover and elevated above grade.

PART 2 PRODUCTS

2.01 SHELVING - GENERAL

- A. Shelving: Provide products tested to comply with ANSI MH28.1 for design criteria, lateral stability, shelf connections, and shelf capacity.
- B. Seismic Design: Design for Seismic category D (Zone 4)
- C. Anchors: Provide anchoring hardware to secure each shelving unit to floor and wall.
 - 1. Provide hardware of type recommended by manufacturer for substrate.
 - 2. Coordinate with existing floor system.

2.02 CANTILEVERED SHELVING

- A. Cantilevered Shelving: Freestanding formed steel post frame with slots for cantilevered shelving brackets, sufficiently rigid not to require sway bracing, shelving brackets, shelving surfaces, and accessories as specified.
 - 1. Unit Width: Varies- see drawings for dims center to center of posts.

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- a. 36" width if not noted otherwise in drawing elevations or plans
2. Unit Height: See drawings for quantities and locations.
 - a. Typical Adult stacks 90" (7 shelves) for both free standing and new perimeter shelving.
 - b. Typical Children's Area free standing and other areas as indicated 42" (3 shelves)
 - c. Children's Area Single Units: 42" (3 shelves)
3. Shelf Capacity: Rated uniform load of 50 psf, minimum, tested in accordance with ANSI MH28.1.
4. Adjustability of Shelving: At intervals of 1 inches on center, minimum.
5. Shelf Depth: 10 inches, minimum. See drawings for book shelving layout.
6. Finish: [_____].
7. Accessories
 - a. Steel Canopy Top (typical all units new and reused)
 - 1) Note all shelving under 66" will get new wood tops also.
 - 2) Note all perimeter shelving, regardless of height will get new wood tops.
 - b. Triangular Reinforcing Gusset 16 gauge steel (1 per Unit)
 - c. Sliding reference shelves (12 shelves)
 - d. Storage Shelf (8 shelves)
 - e. Hinged Periodical Shelf with storage access below (12 shelves)
 - f. Sloped display base (typical all units)
 - g. Paperback zig-zag shelf (12 shelves)
 - h. Single tier sloped media shelf (12 shelves)
 - i. Universal media shelf (12 shelves)
 - j. Pull out browsing box (12 shelves)
 - k. Media hanging bag rack. (4 shelves)
 - l. Backs and ends on all shelves typical
- B. Frame: Formed steel members comprising posts, horizontal spreaders at top and bottom, and base brackets resisting overturning; frame configuration providing full face height and width available for adjustable shelves.
 1. Sheet Metal Thickness: 16 gage, minimum.
 2. Base Brackets Height from Floor: 9 inches, maximum.
 3. Connecting Hardware: Manufacturer's standard.
 4. Provide manufacturer's standard adjustable leveling devices.
- C. Shelf Brackets: Combination shelf support and bookend, formed steel; full depth of shelves and minimum 6 inches height above shelf surface; rounded outer edges and corners for safety.
 1. Thickness: 16 gage, minimum.
 2. Connection to Posts: Two hooks at top, safety lug at bottom.
- D. Shelves: Formed steel, finished on all surfaces.
 1. Thickness: 18 gage, minimum.
 2. Bottom Shelf Edge Profile: 1 inch with integral kickplate.
 3. Upper Shelves Edge Profile: Extending 3/4 inch, maximum, below top surface of shelf.
 4. Shelf Connections: Tab interlock with brackets ; positive bolt connection between shelf and bracket.
- E. End panels:
 1. Locations: All endpanels at library shelving stacks (non-perimeter) unless noted otherwise. See Architectural Woodwork Specification for Details of end panel types.
- F. Securement: Ensure seismic and overturning forces are accounted for in the installation of all free standing units. Provision for anchorage to concrete may be required.

2.03 ACCESSORIES

- A. Kick Plates: Formed sheet metal; enclose open space between bottom shelf and floor on all front sides and open ends; finished to match.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate is level and that clearances are as specified.
- B. Verify that walls are suitable for shelving attachment.
- 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 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Anchor and reinforce as specified, and as recommended by manufacturer with approved shop drawings.
- C. Install shelving with shelf surfaces level and vertical supports plumb; adjust feet and bases as required.

3.03 CLEANING

- A. Clean shelving and surrounding area after installation.

3.04 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

**SECTION 11 5213
PROJECTION SCREENS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Front projection screen assemblies.
- B. Projector Mounting Brackets.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Wood blocking in walls and ceilings.
- B. Section 09 2116 - Gypsum Board Assemblies: Suspended gypsum board ceilings for recessed screens, and openings in gypsum board partitions for fixed and rear projection screens.
- C. Section 09 5100 - Acoustical Ceilings: Suspended panel ceilings for recessed screens.
- D. Section 26 0583 - Wiring Connections: Electrical supply, conduit, and wiring for electric motor operated projection screens.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's catalog cuts and descriptive information on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - 4. Wiring diagrams for motor operators and actuators, and controls and switches.
- C. Shop Drawings: For custom installations, indicate dimensions, verified field measurements, mounting details, and interface with adjacent construction.
- D. Samples: For screen fabrics, submit two 4 by in size.
- E. Operation and Maintenance Data: Provide manufacturer's operation and maintenance instructions.
- F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Experienced in manufacturing products specified in this section.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver projection screens to project site in manufacturer's original unopened packaging. Inspect for damage and size before accepting delivery.
- B. Store in a protected, clean, dry area with temperature maintained above 50 degrees F. Stack according to manufacturer's recommendations.
- C. Acclimate screens to building temperatures for 24 hours prior to installation, or in accordance with manufacturer's recommendations.

1.06 FIELD CONDITIONS

- A. Maintain interior of building between 60 degrees F and 75 degrees F during and after installation of projection screens.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide [] year manufacturer warranty for projection screen assembly.

PART 2 PRODUCTS

2.01 BASIS OF DESIGN MANUFACTURER

- A. Da-Lite Screen Company: www.da-lite.com/#sle.

2.02 FRONT PROJECTION SCREENS

- A. Model:
 - 1. Da-Lite Screen Company, Model Tensioned Contour Electrol: www.da-lite.com/#sle.
- B. Front Projection Screens: Factory assembled unless otherwise indicated.
 - 1. Dimensions: 100" x 160" or As indicated on drawings.
 - 2. Material: Da-Lite: DaMat.
- C. Extra Drops: Black; 30 inches.
- D. Provide mounting hardware, brackets, supports, fasteners, and other mounting accessories required for a complete installation, in accordance with manufacturer's recommendations for specified substrates and mountings.

2.03 ELECTRICAL COMPONENTS

- A. Electrical Components: Listed and classified by UL as suitable for the purpose specified and indicated.
- B. Motors: Direct drive, 110 V, 60 Hz.
 - 1. Screen Motor: Mounted inside roller; three wire with ground; quick reverse type; equipped with thermal overload cut-off.
 - a. Electrical Characteristics: Not more than 2.4 amps.
 - b. Motor mounted on sound absorber.
- C. Controls: 3 position control switch with plate and adjustable limits.
 - 1. Security: Provide key operated switch; provide 2 keys for each station.

2.04 PROJECTOR MOUNTS

- A. Basis of Design: Chief 8RPA Projector Mount. chiefmfg.com
- B. Include: Projector mount, CMS Extension Column, CMS suspended ceiling kit
- C. Finish color to be selected by Architect.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate is finished and ready to accept screen installation.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that openings for recessed screens are correctly sized.
- D. Verify type and location of electrical connections.
- E. Do not install projection screens until climate control systems are in place and interior painting and other finishes are completed.

3.02 INSTALLATION

- A. Locations: RF Room 120, Gathering Space Room 151.
- B. Install in accordance with manufacturer's instructions, using manufacturer's recommended hardware for relevant substrates.
- C. Do not field cut screens.
- D. Install screens in mountings as specified and as indicated on drawings.
- E. Install plumb and level.
- F. Install electrically operated screens ready for connection to power and control systems by others.
- G. Adjust projection screens and related hardware in accordance with manufacturer's instructions for proper placement and operation.
- H. Test electrical screens for proper working condition. Adjust as needed.

3.03 PROTECTION

- A. Protect installed products until completion of project.

B. Touch up, repair, or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 12 2400
ROLLER SHADES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Manual roller shades and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Concealed wood blocking for attachment of shade brackets and accessories.
- B. Section 08 4113 Aluminum Framed Storefronts

1.03 REFERENCE STANDARDS

- A. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi 2015 (Reapproved 2021)e1.
- B. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films 2019.
- D. UL (GGG) - GREENGUARD Gold Certified Products Current Edition.
- E. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems Current Edition, Including All Revisions.
- F. WCMA A100.1 - Safety of Window Covering Products 2018.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate with accessories such as cord keepers, screens and adjacent roller shades.
- B. Preinstallation Meeting: Convene two prior to commencing work related to products of this section; require attendance of all affected installers.
- C. Sequencing:
 - 1. Do not fabricate shades until field dimensions for each opening have been taken with finished conditions in place. "Hold to" dimensions are not acceptable.
 - 2. Do not install shades until final surface finishes and painting are complete.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product to be used including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.
- C. Shop Drawings: Include:
 - 1. Elevations of each shade.
 - 2. Keyed details for head and jamb mounting conditions.
 - 3. Details of mounting location, fasteners and finished installation including cord keepers.
 - 4. Plan layout of shades including dimensions of fabric to jamb when shade is down.
- D. Source Quality Control Submittals: Provide test reports indicating compliance with specified fabric properties.
- E. Selection Samples: Include fabric samples as requested by Architect..
- F. Verification Samples: Minimum size 6 inches square, representing actual materials, color and pattern per finish legend.
- G. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- H. Project Record Documents: Record actual locations of control system components and show interconnecting wiring.

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- I. Operation and Maintenance Data: List of all components with part numbers, and operation and maintenance instructions; include copy of shop drawings.
- J. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of this type with minimum ten years of documented experience with shading systems of similar size, type, and complexity; must have written proof of manufacturer's authorized representative.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.
- B. Handle and store shades in accordance with manufacturer's recommendations.

1.08 FIELD CONDITIONS

- A. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.09 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide manufacturer's standard, non-depreciating warranty, for interior shading only, covering the following:
 - 1. Shade Hardware: 10 years unless otherwise indicated.
 - 2. Shade Fabric: 10 years unless otherwise indicated.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: MechoShade Systems LLC; www.mechoshade.com/#sle.

2.02 ROLLER SHADES

- A. General:
 - 1. Provide shade system components that are capable of being removed or adjusted without removing mounted shade brackets or cassette support channel.
 - 2. Provide shade system that operates smoothly when shades are raised or lowered.
- B. Roller Shades Type WS-1 - Basis of Design: MechoShade Systems LLC; Mecho/5X System; www.mechoshade.com/#sle.
 - 1. Description: Single roller, manually operated fabric window shades.
 - a. Drop Position: Regular roll.
 - b. Mounting: See details
 - c. Size: As indicated on drawings.
 - d. Fabric: As indicated on finish legend.
 - 2. Brackets and Mounting Hardware: As recommended by manufacturer and approved by architect for mounting indicated and to accommodate shade fabric roll-up size and weight.
 - 3. Roller Tubes:
 - a. Material: Extruded aluminum.
 - b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
 - c. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge. Shade band to be removable and replaceable without removing roller tube from brackets or inserting spline from the side of the roller tube.
 - d. Roller tubes to be capable of being removed and reinstalled without affecting roller shade limit adjustments.
 - 4. Hembars: Designed to maintain bottom of shade straight and flat.

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- a. Style: Full wrap fabric covered bottom bar, flat profile with heat sealed closed ends.
5. Clutch Operator: Integrated with bracket/brake assembly.
 - a. Provide a permanently lubricated brake assembly mounted on a oil-impregnated hub with wrapped spring clutch.
 - b. Brake must withstand minimum pull force of 50 pounds in the stopped position.
 - c. Mount clutch/brake assembly on the support brackets, fully independent of the roller tube components.
6. Drive Chain: Continuous loop stainless steel beaded ball chain, 95 pound minimum breaking strength. Provide upper and lower limit stops.
 - a. Allows for ease of operation when obstruction do not allow for direct drive chain access.
 - b. Offset chain drive shall not cause an increase of friction or pull force when operated up to a 26 degree angle from vertical.
 - c. Chain Keeper (Retainer): Chain tensioning device complying with WCMA A100.1.
7. Accessories:
 - a. Fascia: Removable extruded aluminum fascia, size as required to conceal shade mounting, attachable to brackets without exposed fasteners.
 - 1) Fascia to be capable of installation across two or more shade bands in one piece.
 - 2) Provide front fascia to accommodate regular roll shades.
 - 3) Provide front and rear double fascia to provide finished appearance where shade overlaps window glazing.
 - 4) Color and Finish: AS SELECTED BY ARCHITECT BY MANUFACTURERS FULL LINE.
 - 5) Configuration: Captured and continuous, as indicated on drawings.

2.03 SHADE FABRIC

- A. Fabric - Type as indicated on Finish Legend: Non-flammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation.
 1. Material Certificates and Product Disclosures:
 - a. Low-Emitting Material Certification: Greenguard Gold certified and listed in UL (GGG).
 2. Performance Requirements:
 - a. Flammability: Pass NFPA 701 large or small scale test.
 - b. Fungal Resistance: No growth when tested according to ASTM G21.
 3. Products:
 - a. MechoShade Systems www.mechoshade.com/#sle.
 - b. Acoustiveil.

2.04 ROLLER SHADE FABRICATION

- A. Field measure finished openings prior to ordering or fabrication.
- B. Dimensional Tolerances: Fabricate shades to fit openings within specified tolerances.
 1. Vertical Dimensions: Fill openings from head to sill with 1/2 inch space between bottom bar and window sill.
- C. At openings requiring continuous multiple shade units with separate rollers, locate roller joints at window mullion centers; butt rollers end-to-end.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine finished openings for deficiencies that may preclude satisfactory installation.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Start of installation shall be considered acceptance of substrates.

3.02 PREPARATION

- A. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.
- B. Coordinate with window installation and placement of concealed blocking to support shades.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.
- B. Replace shades that exceed specified dimensional tolerances at no extra cost to Owner.
- C. Adjust level, projection, and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

3.04 CLEANING

- A. Clean soiled shades and exposed components as recommended by manufacturer.
- B. Replace shades that cannot be cleaned to "like new" condition.

3.05 PROTECTION

- A. Protect installed products from subsequent construction operations.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 20 0000
MECHANICAL GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Supplemental requirements in addition to Division 1 - General Requirements applicable to all Divisions 20, 21, 22, 23, 25 - Mechanical specification sections.

- B. Related Sections:
 - 1. 20 0000 - Mechanical General Requirements
 - 2. 20 0513 - Common Motor Requirements
 - 3. 20 0529 - Mechanical Hangers and Supports
 - 4. 20 0553 - Mechanical Identification
 - 5. 20 0556 - Interior Trench Excavation and Backfill
 - 6. 20 0700 - Mechanical Insulation
 - 7. 20 4100 - Mechanical Demolition
 - 8. 21 1000 - Water Based Fire Suppression Systems
 - 9. 22 1100 - Domestic Water Piping and Specialties
 - 10. 22 1300 - Sanitary Waste and Vent Piping and Specialties
 - 11. 22 4000 - Plumbing Fixtures
 - 12. 23 0593 - Testing, Adjusting and Balancing
 - 13. 23 1113 - Fuel Oil Piping and Specialties
 - 14. 23 1123 - Fuel Gas Piping and Specialties
 - 15. 23 2113 - Hydronic Piping and Specialties
 - 16. 23 2123 - Hydronic Pumps
 - 17. 23 3100 - Ducts and Accessories
 - 18. 23 3400 - HVAC Fans
 - 19. 23 3600 - Air Terminal Units
 - 20. 23 3700 - Air Outlets and Inlets
 - 21. 23 5223 - Cast Iron Boilers and Accessories
 - 22. 23 8200 - Terminal Heating and Cooling Units
 - 23. 23 8318 - Snow Melting Equipment
 - 24. 25 3000 - Building Automation System Field Devices
 - 25. 25 4000 - Variable Speed Drives (ABB ACH580)
 - 26. 25 5000 - Building Automation System
 - 27. 25 9000 - Sequence of Operations

1.2 REFERENCES

A. Codes and Standards:

1. Perform work in accordance with the legally enacted editions of applicable international, state and local codes with locally accepted amendments to include:
 - a. 2012 International Building Code (IBC).
 - b. 2012 International Mechanical Code (IMC).
 - c. 2012 International Fuel Gas Code (IFGC).
 - d. 2015 Uniform Plumbing Code (UPC).
 - e. 2012 International Fire Code (IFC).
 - f. 2011 NFPA 31 – Standard for Installation of Oil-Burning Equipment
 - g. 2017 NFPA 70, National Electric Code (NEC).
 - h. Standard for Accessible and Usable Buildings and Facilities (ANSI A117.1-2009).
2. Standards: Reference to the following standards infers that installation, equipment and material shall be within the limits for which it was designed, tested and approved, in conformance with the current publications and standards of the following organizations:
 - a. American Gas Association - AGA.
 - b. American National Standards Institute - ANSI.
 - c. American Society of Heating Refrigerating and Air Conditioning Engineers - ASHRAE.
 - d. American Society of Mechanical Engineers - ASME.
 - e. American Society for Testing and Materials - ASTM.
 - f. National Electrical Manufacturers' Association - NEMA.
 - g. National Fire Protection Association - NFPA.
 - h. Sheet Metal and Air Conditioning Contractors National Association, Inc. - SMACNA.

B. Definitions:

1. "Accessible" means arranged so that an appropriately dressed man 6'-2" tall, weighing 250 pounds, may approach the area in question with the tools and products necessary for the work intended; and may then position himself to properly perform the task to be accomplished, without disassembly or damage to the surrounding installation.
2. "Authority Having Jurisdiction" is the individual official, board, department, or agency established and authorized by the political subdivision created by law to administer and enforce the provisions of the Code as adopted or amended.
3. "As Specified" denotes a product, system, or installation that:
 - a. Includes salient characteristics identified in the Drawings and Specifications.
 - b. Meets the requirements of the "Basis of Design".
 - c. Is produced by a manufacturer listed as acceptable on the Drawings or in the Specifications.
4. "Basis of Design" refers to products around which the design was prepared. Some or all of the particular characteristics of Basis of Design products may be critical to the fit or

performance of the completed installation. Such characteristics are often subtle. Where substitutions are made to products that are the Basis of Design, the Contractor is alerted that nominally acceptable substitutions may produce undesirable side effects such as products that no longer fit the space due to increased product dimensions. The Contractor is responsible for resolving impacts of substitutions. Approval of a substitution request does not relieve the Contractor of complying with the design intent and applicable Codes. Reference to a specific manufacturer's product (even as "Basis of Design") does not necessarily establish acceptability of that product without regard to compliance with other provisions of these specifications.

5. "Contracting Agency" is the Owner as defined in the General Conditions of the Contract.
6. "Demolish" means to permanently remove a component, equipment, or system and its appurtenances with no intent for reuse and to properly disposal of it.
7. "Furnish" means to purchase material as shown and specified, and cart the material to an approved location at the site or elsewhere, as noted or agreed, to be installed by supporting crafts.
8. "Install" means to set in place and connect, ready for use and in complete and properly operating finished condition, material that has been furnished.
9. "Product" is a generic term that includes materials, equipment, fixtures and any physical item used on the project.
10. "Provide" means furnish products, labor, subcontracts, and appurtenances required and install to a complete and properly operating, finished condition.
11. "Remove" means to remove a component, equipment, or system and its appurtenances and either store it for re-installation/reuse, or turn it over to the Contracting Agency.
12. "Rough-in and Connect" means provide an appropriate system connection such as water services with stops, continuous wastes with traps, shutoff valves, and piping connections, testing, etc., for proper operation, ready for furnished products to be installed. Equipment furnished is received, uncrated, assembled and set in place by supporting crafts unless prior arrangements are made to hire the rough-in installer for this work.
13. "Serviceable" means arranged so that the component or product in question may be properly removed and replaced without disassembly, destruction or damage to the surrounding installation. "Serviceable" components shall be "accessible".
14. "Shop Drawings" are dimensioned working construction drawings drawn to scale to show an entire area of work in sufficient detail to demonstrate service and maintenance clearances and coordination of all trades.
15. "Substitution" is a product, system or installation that is not by a listed manufacturer or does not conform to all salient characteristics identified in the Project Manual, but that the Contractor warrants meets specific requirements listed in the Project Manual.
16. "System Drawing" is a diagrammatic engineered drawing that shows the interconnection and relationship between products to demonstrate how the products interact to accomplish the function intended. Examples of system drawings include plumbing diagrams, control and instrumentation diagrams, and wiring diagrams. Some drawings, such as dimensioned and complete Fire Suppression Drawings may be both System Drawings and Shop Drawings.

1.3 SYSTEM DESCRIPTION

A. Performance Requirements:

1. Provide labor, products and services required for the complete installation, checkout, and startup of mechanical systems shown and specified. Coordinate related work, including the work of other crafts, to provide each system complete and in proper operating order.
2. Cooperate with others involved in the project; with due regard to their work, to promote rapid completion of the entire project.
3. Become thoroughly familiar with the local conditions under which the work is to be performed. Schedule work with regard to seasons, weather, climatic conditions, and other local conditions that may affect the progress and quality of the work.
4. Coordinate and perform demolition in support of the project whether or not such requirements are described on the Drawings. Restore systems that are to remain but that are affected in any way by demolition work. Conduct a site visit prior to bid to determine Scope.
5. In general, the mechanical, electrical and building automation systems are interrelated. Coordinate the interface and operation of systems so that interrelated systems operate in proper synchronization and balance.
6. Provide labor, materials, and equipment to facilitate the commissioning process of systems and equipment within this scope of work. Perform tests and verification procedures required for the commissioning process as requested by the Contracting Agency.

1.4 PREINSTALLATION MEETINGS

- A. Meet with and coordinate Divisions 20, 21, 22, 23, 25 work with the interrelated work of other trades including Architectural, Civil, Structural, and Electrical to identify and resolve potential conflicts.

1.5 SUBMITTALS

- A. Refer to Division 1 for general submittal requirements for the items listed below, supplemented with the additional requirements listed. In addition, prepare Divisions 20, 21, 22, 23, 25 submittals in accordance with the following.
- B. General:
1. The Contracting Agency's obligation to review submittals and to return them in a timely manner is conditioned upon the prior review and approval of the submittals by the Contractor as required by the Construction Contract.
 2. Submittal review is for general design and arrangement only and does not relieve the Contractor from any of the requirements of the Project Manual.
 - a. Submittals will not be checked for quantity, dimension, fit, or for proper technical design of manufactured equipment.
 - b. Provision of a complete and satisfactory working installation is the responsibility of the Contractor.
 3. Furnish suppliers with the applicable portions of the Project Manual and review and verify that the suppliers' submittals clearly represent products which comply with the Project Manual.
 4. Master Submittal Log]

- a. Create and maintain a master submittal log for items submitted in Divisions 20, 21, 22, 23, 25, including test results, certifications, record drawings, etc.
 - b. Submit master submittal log, independent of other submittals, as the first submittal for review and approval by the Contracting Agency.
 - c. Update submittal log with each submittal action.
 - d. Share an electronic copy with Contracting Agency and Engineer at two week intervals, or as requested by the Contracting Agency.
- C. Coordination:
1. Prior to a submittal's submission for approval, hold a meeting of all construction trades to review shop drawings and submittals. Each trade shall cross-check shop drawings and submittals for conflicts, clearances, physical space allocation and routing, discrepancies, dimensional errors, omissions, contradictions, departures from the Contract requirements, correct electrical/mechanical services and connections, and provisions for commissioning.
 2. Review, revise, correct, and appropriately annotate submittals prior to submission for approval.
 3. Keep a current copy of approved submittals and the submittal log at the job site.
- D. Electronic Submittals:
1. Provide electronic submittals in PDF format. Maximum file size to be coordinated with Contracting Agency.
 2. Follow the organization and formatting required for submittals.
 3. Provide electronic bookmarks within the PDF document for Sections and each product.
 4. If individual PDF files are provided for a product or shop drawing sheet(s), organize files into folders and name files and folders to correspond with applicable specification sections or drawing titles.
 5. Create PDF documents without security, to be searchable, and to allow copy and paste. For scanned documents, run the optical character recognition (OCR) function to ensure the document is searchable and can be copied and pasted.
 6. Reduce PDF file size by removing data and file creation elements not needed for final file presentation.
- E. Product Data:
1. General:
 - a. This section describes in detail the preparation of mechanical product submittals. Submittals not provided as described shall be rejected without review. This procedure is designed to accelerate and improve the accuracy of the technical review process, as well as, simplify the preparation of the Installation, Operation, and Maintenance Manuals (IO&Ms).
 - b. At a minimum, product data for each specification section shall be submitted in one complete package. Providing one submittal for multiple specification sections is preferred. Long lead item submittal is recommended.
 2. Submittal Organization:

- a. Organize product submittal information in the same order as the products are specified. Provide electronic bookmarks for each Divisions 20, 21, 22, 23, 25 specification section.
 - b. Within each section, organize product information in the same order as products are specified in Part 2 of each applicable specification section. Provide electronic bookmarks within each section for each separate product article.
 - c. Provide product submittal information for each product specified in 8-1/2" x 11" format. Fold-out 11" x 17" format is also acceptable.
 - d. If a particular specified product is being omitted from the product submittal or will not be used for the project, provide a single sheet within the article tab identifying the product and annotated with a brief reason why the product is not being submitted, for example: "NOT USED," "NO SUBMITTAL REQUIRED," "TO BE SUBMITTED BY (PROVIDE DATE)," etc. This will inform the reviewer that the product was not overlooked.
 - e. Partial submittals from individual subcontractors may be provided which cover a particular sub-contractor's scope of work. In this case, arrange partial submittals by system classification such as: PLUMBING, HEATING, FIRE SUPPRESSION, VENTILATION, BUILDING AUTOMATION SYSTEM, etc. Within each system classification, arrange product submittals by specification section, as described, such that each specification section can easily be reorganized into a master set of Divisions 20, 21, 22, 23, 25 product submittals organized by specification section. This will greatly simplify the preparation of IO&M manuals as described below.
 - f. Provide a table of contents on the cover page that lists the Part 2 products for that section in the same order as the applicable specification section.
 - g. Provide for each product submittal volume, the following information:
 - 1). The Contracting Agency Name.
 - 2). Project Name.
 - 3). Contractor Name.
 - 4). Subcontractor Name preparing the submittal.
 - 5). Date that the submittal or resubmittal was initiated.
 - 6). "Mechanical Product Submittals" or "Plumbing Product Submittals" etc. as appropriate.
3. Product Information:
- a. Indicate manufacturer's name and address, and local supplier's name, address, phone number.
 - b. Indicate each product as "Basis of Design", "Specified Equal" or "Proposed Substitution."
 - c. Identify catalog designation and/or model number.
 - d. Provide manufacturer's product literature. Neatly annotate to indicate specified salient features, appurtenances and performance criteria for each product specified to demonstrate compliance with the Project Manual to include scheduled information, drawing information and specified information.
 - e. Indicate product deviations from the Project Manual and mark out non-applicable items on generic "cut-sheets."

- f. Include manufacturer provided dimensioned equipment drawings with rough-in mechanical and electrical connections.
 - g. Include operation characteristics, performance curves and rated capacities.
 - h. Include motor characteristics and wiring diagrams.
 - i. Include weight of equipment. Including accessories.
 - j. Provide basic manufacturer's installation instructions.
4. Product Substitutions:
- a. Clearly indicate on the individual product submittal information each proposed substitution, deviation or change from the product as described in the Project Manual.
 - b. Submittal approval does not include substitutions, deviations or changes from the requirements of the Project Manual unless they are specifically itemized and approved. The term "No Exceptions Taken" will not apply to substitutions, deviations or changes not clearly identified.
 - c. Provision of a satisfactory working installation of equal quality to the system as described in the Project Manual shall be the responsibility of the Contractor.
 - d. Correct unapproved deviations from the Project Manual discovered in the field as directed by and at no additional cost to the Contracting Agency.
 - e. Cost of any design modifications as a result of proposed product substitutions shall be borne by the Contractor.
- F. System Drawings:
- 1. Submit System Drawings for dynamic elements/systems of the project which are performance specified to include but not limited to: Fire Suppression Systems, Building Automation Systems and stand-alone packaged equipment.
 - 2. Prepare system drawings on full sized sheets of the same size as the original construction drawings.
 - 3. Include with each system a sequence of operation narrative which describes each mode of system operation in sufficient detail to demonstrate compliance with the Project Manual to the satisfaction of the Contracting Agency.
- G. Shop Drawings:
- 1. General:
 - a. The Project Manual documents are not intended for nor are they suitable for use as shop drawings. Project Manual documents shall not be utilized for the actual fabrication or installation of products or equipment.
 - b. The Drawings are partly diagrammatic and do not show all offsets in piping or ducts, and may not show in minute detail all features of the installation; however, provide systems complete and in proper operating order.
 - c. Locations of products are approximate unless dimensioned.
 - d. Divisions 20, 21, 22, 23, 25 products and systems shall not be installed without shop drawings approved by the Contracting Agency.

- e. Rework, changes or additional engineering support required as a result of the installation of products and systems prior to the approval of applicable shop drawings by the Contracting Agency shall be provided at the Contractor's expense.
 - f. Drawing symbols used for basic materials, equipment and methods are commonly used by the industry. Special items are identified by a supplementary list of graphical illustrations, or identified on the drawings or specifications.
2. Preparation:
- a. Review each Divisions 20, 21, 22, 23, 25 specification section and identify the shop drawing requirements.
 - b. Combine the shop drawing requirements first by system (i.e. ventilation system, heating system, plumbing system, etc.) and then by area (i.e. fan room, boiler room, etc.).
 - c. Prepare shop drawings on full sized sheets of the same size as the original construction drawings.
 - d. Arrange shop drawings to scale, showing dimensions where accuracy of location is necessary for coordination or communication purposes.
 - e. Incorporate the actual dimensions and configurations of the products and systems approved through the product submittal process into the shop drawings.
 - f. Provide dimensioned maintenance clearance areas around each product as recommended by the manufacturer.
 - g. Coordinate Divisions 20, 21, 22, 23, 25 work with the interrelated work of other trades including Architectural, Civil, Structural, and Electrical.
 - h. Identify and provide recommendations to resolve major conflicts which may impact the design of the systems as shown. Such conflicts will be resolved during the shop drawing review process.
 - i. Identify locations where field coordination between various trades is necessary to avoid conflicts.
 - j. Indicate elevation of piping, ductwork and equipment above or below finished floor at various locations and in sufficient detail to demonstrate clearance from structural elements and the work of other trades.
 - k. Coordinate placement of openings and holes through structure, walls, floors, ceilings, and roof with Structural and Architectural.
3. Submittal:
- a. Submit dimensioned shop drawings as specified to demonstrate proper planning and sequencing of the applicable trades for the installation and arrangement of Divisions 20, 21, 22, 23, 25 with respect to other interrelated work.
 - b. Partial shop drawings submittals (i.e. heating system only) will be rejected without review, as the interrelationship with other related work and overall system fit cannot be evaluated.
 - 1). Underslab shop drawings may be submitted separately for review to accommodate the construction schedule.
 - c. It is assumed that shop drawings submitted for review have been thoroughly prepared and coordinated and that the products and systems can and shall be

installed as shown. Conflicts which are not clearly identified and annotated on the submitted shop drawings are assumed not to exist.

- d. Installation conflicts arising from the failure to properly coordinate the work of related trades shall be provided at the Contractor's expense.

H. Certificates:

1. Review the submittal requirements for Certificates for each Divisions 20, 21, 22, 23, 25 specification section.
2. Submit copies of certificates as specified. This information may be included within the Installation, Operations and Maintenance (IO&M) Manuals as determined by the Contracting Agency.

I. Test and Evaluation Reports:

1. Review the submittal requirements for Test and Evaluation Reports for each Divisions 20, 21, 22, 23, 25 specification section.
2. Submit copies of reports as specified. Also include these reports within the Installation, Operations and Maintenance (IO&M) Manuals as determined by the Contracting Agency.

J. Installation, Operations and Maintenance (IO&M) Manuals:

1. Review the submittal requirements for IO&M manuals for each Divisions 20, 21, 22, 23, 25 specification section.
2. Begin the preparation of the mechanical IO&M manuals with a complete and fully approved set of mechanical product data submittals organized, annotated and with the product information as indicated within the "Product Data" submittals article above and in each Divisions 20, 21, 22, 23, 25 section.
3. Next, augment each individual product submittal with the written installation, operations and maintenance information for each approved product. This type of information is not applicable (or available) for bulk commodity or simplistic products such as copper pipe, basic pipe hangers or equipment tags, etc.
4. Annotate the installation, operations and maintenance information to indicate applicable information for the specific equipment model(s) installed.
5. Maintenance information shall include:
 - a. Preventive maintenance requirements for each product, including the recommended frequency of performing each preventive maintenance task.
 - b. Instructions for troubleshooting, minor repair and adjustments required for preventive maintenance routines, limited to repairs and adjustments that may be performed without special tools or test equipment and that require no extensive special training or skills.
 - c. Information of a maintenance nature covering warranty items, etc., that have not been discussed in the manufacturers' literature.
 - d. Information on the spare and replacement parts for each product and system. Properly identify each part by part number and manufacturer.
 - e. Recommended spare parts list.
6. Organize the IO&M manual information by specification section (not by sub-contractor) with a tabbed divider separating each section. Provide the typed section number on each tab.

7. Within each section, organize the product information in the same order as the products are specified in Part 2 of each applicable section. Provide sub-tabs within each section for each product. Provide the typed product article number on each tab.
8. Provide the IOM manuals in electronic PDF format.
9. Once the electronic IOM is approved, bind the information in identical 3 inch wide; hard-backed, loose-leaf, 3 ring binders with clear front and spine insert pockets. Divide information into multiple volumes so that the pages in each binder rest naturally on one side of rings.
10. Provide a master table of contents at the front of each volume which lists the Divisions 20, 21, 22, 23, 25 specification sections and indicates which sections are located within each volume.
11. Provide a table of contents within each section which lists the Part 2 products for that section in the same order as the applicable specification section.
12. Provide identical cover and spine inserts for each IO&M manual volume, to include the following typed information:
 - a. The Contracting Agency Name.
 - b. Project Name.
 - c. "Mechanical Installation, Operations and Maintenance Manual".
 - d. "Volume 1 of X, Volume 2 of X," etc.
13. Submit copies of Operation and Maintenance Manuals in electronic format (Adobe PDF).

1.6 CLOSEOUT SUBMITTALS

1. Review the manufacturer's warranty requirements for each Divisions 20, 21, 22, 23, 25 specification section.
 2. Submit required warranty documentation to the applicable Manufacturer's Representative to validate standard manufacturer's warranty for each required product. Obtain written confirmation of receipt from each applicable Manufacturer's Representative.
 3. Provide Contracting Agency one copy of submitted warranty documentation and written confirmation of receipt for each applicable Manufacturer's Representative. This information may be included within the Operations and Maintenance (IO&M) Manuals as determined by the Contracting Agency.
 4. Provide statement of Contractor's warranty of workmanship, labor, and materials, as described under Article 1.12 Warranty below.
- B. Record Documentation:
1. General: As the Work progresses, neatly annotate a designated and otherwise unused set of Divisions 20, 21, 22, 23, 25 Contract Drawings to show the actual locations and routing of Divisions 20, 21, 22, 23, 25 Work and the terminal connection points to related Work. As a minimum, include the following:
 - a. Annotate record drawings to incorporate each applicable addendum.
 - b. Annotate record drawings as directed by each applicable Request for Information (RFI) and accepted Change Order Proposal.
 - c. Modify record drawings to show actual equipment sizes and locations and pipe and duct routing. Revise pipe and duct sizes as appropriate.

- d. Provide dimensioned locations for permanently concealed piping and ductwork (i.e. piping cast in concrete or buried underground/underslab).
 - e. Show the actual locations of system isolation valves, especially valves which are concealed above ceilings and behind access panels.
2. Preparation:
- a. Neatly annotate record drawings to provide clear interpretation to support electronic drafting by a third party.
 - b. Tape electronic sketches from addendums and/or RFIs directly to the record drawings as overlays.
 - c. Annotate the record drawings in colored pencil using the same symbols and abbreviations as indicated in the Divisions 20, 21, 22, 23, 25 legends and schedules of the Contract Drawings.
 - 1). Red to add information.
 - 2). Green to delete information.
 - 3). Blue to provide additional clarifying information which is not to be drafted.
 - d. After submittal to the Contracting Agency, provide additional clarification, information or rework as necessary to support the accurate interpretation and electronic drafting of the record drawings.
3. Submittals:
- a. Provide dimensioned underslab record drawings to the Contracting Agency prior to placing the slab. For slabs placed in multiple sections, provide record drawings for the applicable slab sections to the Contracting Agency prior to each pour.
 - b. Provide complete record drawings for concealed areas (i.e. above lay-in and hard ceilings and inside walls) to the Contracting Agency prior to concealment.
 - c. Provide the remaining portion of the record drawings for exposed areas to the Contracting Agency prior to the final completion of the project.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Spare Parts:
1. Furnish spare parts for systems and equipment as listed in applicable sections of Divisions 20, 21, 22, 23, 25.
 2. Clearly label each part with name, manufacturer's part number, system and/or equipment where used and location.
 3. Deliver parts to location and person designated by the Contracting Agency, in durable storage boxes.
 4. Group cartons containing smaller items by system or application and deliver in an appropriate number of storage boxes.
- B. Tools: Provide three sets of special tools and testing and monitoring equipment as listed in applicable sections of Divisions 20, 21, 22, 23, 25.

1.8 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturers: Companies specializing in manufacturing the Products specified in the Divisions 20, 21, 22, 23, 25 sections with documented experience.
2. Fabricators: Companies specializing in fabricating the Products specified in the Divisions 20, 21, 22, 23, 25 sections with documented experience.
3. Installers: Perform the Work using qualified workmen that are experienced and usually employed in the trade.
4. Testing Agencies: Products requiring electrical connection shall be listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and as indicated.

B. Product Testing and Certification:

1. Nationally Recognized Testing Laboratory (NRTL) Labeling: Electrical equipment and conductors shall be "Approved," "Certified," "Identified," or "Listed" and "Labeled" to establish that the electrical equipment is safe, free of electrical shock and fire hazard, and suitable for the purpose for which it is intended to be used. The manufacturer shall have the specific authorization of one of the Occupational Safety and Health Administration (OSHA) approved Nationally Recognized Testing Laboratories (NRTLs) in accordance with the applicable national standards to label the equipment as suitable.
2. Where the words Listed, UL Listed, UL Labeled, Underwriters Laboratories, Inc., UL, or variations of this terminology, appear under this Division of the Specifications or the associated drawings, it is understood that a comparable testing agency as defined by NRTL above is acceptable.
3. Such testing and certification is generally applicable to products within the following categories:
 - a. Life safety and fire suppression.
 - b. Fuel burning equipment, except certain classes of power or industrial equipment for which other recognized certification applies as well.
 - c. Factory fabricated and wired electrical control panels and packaged equipment with factory installed electrical controls or panels.
 - d. Components for life safety systems, fuel systems and medical gas systems.
4. The listing under Paragraph '3' above is provided for illustration of requirements and is not exclusive. Provide products that have been tested and listed for the intended application when such products are available unless the Contracting Agency has provided written exemption on an itemized basis.
5. Provide electrical products listed and labeled by UL, FM, ETL or other approved NRTL. If listing and labeling is not available, stamp the submittal for these products by an Alaska Registered Professional Engineer approved by the Authority Having Jurisdiction, at no additional cost.
6. Where interpretation is required, the Contracting Agency will provide direction and will be the sole judge in cases of compliance with this subsection.

1.9 DELIVERY, STORAGE AND HANDLING

A. Delivery and Acceptance Requirements:

1. Verify products are new and delivered in original factory packaging/crating and are free from damage and corrosion.
2. Replace products delivered to job site that does not comply with above requirements at no expense to Owner.
3. Remove damaged, or otherwise unacceptable, products from the project site when directed by the Contracting Agency.

B. Storage and Handling Requirements:

1. Store products in covered storage area protected from the elements, outside the general construction area until installed.
2. Store products in original factory packaging until actual installation.
3. Handle items carefully to avoid breaking, chipping, denting, scratching, or other damage.
4. Replace damaged items with same item in new condition.

1.10 WARRANTY

A. See Division 1 for general warranty requirements.

- ### **B. Warranty workmanship, labor, and materials for a period of one year from the date of final acceptance, without limitation, except where longer warranty periods are specified in a specific Section under this Division, or in the General Conditions of the Contract. Promptly coordinate and perform Warranty work at the Contractor's sole expense.**

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 PREPARATION

A. Protection of In-Place Conditions:

1. Cover and protect open ends and individual components of the ventilation and piping systems during construction when dust, dirt, debris, overspray, or other potential construction contaminants could enter the air distribution system or elements (ducts, fans, VAV boxes, silencers, etc.).
2. Provide temporary construction filters over return airshaft openings and at air handling unit return air dampers.

B. Demolition/Removal:

1. Examination:
 - a. Drawings involving existing conditions are based on building record drawings and limited field observation.
 - b. Conduct a site inspection prior to submission of Bid to become thoroughly familiar with the Scope of Work.

- c. Report discrepancies to the Contracting Agency before disturbing existing installation.
 - d. Verify field measurements, locations, sizes, and routing arrangements and site conditions.
 - e. Commencement of demolition implies Contractor accepts existing conditions.
2. Preparation:
- a. Coordinate with the Contracting Agency in advance before scheduling disruption of services.
 - b. Provide temporary mechanical systems to maintain existing systems in service during construction. Submit plan for providing temporary services for approval.
 - c. Cover and protect open ends and individual components of the ventilation and piping systems during construction when dust, dirt, debris, overspray, or other potential construction contaminants could enter the air distribution system or elements (ducts, fans, VAV boxes, silencers, etc.).
 - d. Provide temporary construction filters over return air openings and at air handling unit return air dampers.
 - e. When work must be performed on operating equipment or systems, use personnel experienced in the operation of the specific equipment affected.
 - f. Submit work plan and schedule for approval prior to beginning work.
 - g. Notify the Contracting Agency and the Fire Department Agencies at least 24 hours before partially or completely disabling Fire Suppression, Alarm, or Notification Systems.
3. Execution:
- a. Remove, relocate, and extend existing installations to accommodate new construction as shown and as required for phasing or final systems operations.
 - b. Disconnect and remove abandoned fixtures, terminal units and other products. Remove abandoned controls and associated wiring to source of signal and supply.
 - c. Remove abandoned piping and ductwork back to source of supply or other point as shown, and cap tight to accept normal system test pressures.
 - d. Remove exposed abandoned or indicated for demolition controls, equipment, pipes and ducts, including abandoned items above ceiling finishes. Cut concealed pipes and ducts flush with walls and floors. Remove brackets, stems, hangers and other accessories. Fill and repair surfaces to match surrounding finish work.
 - e. Repair damaged surfaces, insulation, ceiling tiles, and fireproofing. Plug, patch, repair holes, and surfaces. Repair assemblies to match existing fire, temperature, and/or smoke ratings. Refinish surface to match surrounding finish work.
 - f. Seal room penetrations to maintain pressure relationships to adjacent spaces.
 - g. Maintain access to existing mechanical and electrical installations that remain active. Modify installation or provide access panels as appropriate; coordinate with the Contracting Agency.
 - h. Turn salvaged items over to the Contracting Agency as noted on the Drawings. Dispose of items that the Contracting Agency does not desire to retain at a legal disposal site.

3.2 INSTALLATION

A. Special Techniques:

1. Provide temporary heating to maintain the building at 65 degrees F.

B. Interface with Other Work:

1. Electrical Work:

- a. Coordinate with Division 26 [16].
- b. See also specification section 20 0513 - Common Motor Requirements.
- c. Suggested Coordination Schedule: The Contractor is responsible to provide heating, ventilating, and plumbing equipment motors and controls, including fire suppression controls. Unless otherwise indicated on the Drawings, it is recommended that motors and controls be furnished, set in place, and wired in accordance with the following schedule. "CC" applies to either a Control subcontractor working as a sub to the General Contractor or to the Divisions 20, 21, 22, 23, 25 Mechanical subcontractor. Coordinate work between subcontractors.

MC - Divisions 20, 21, 22, 23, 25-Mechanical CC - Divisions 20, 21, 22, 23, 25-Controls EC - Divisions 26, 27 and 28-Electrical	Furnished By	Set in Place By	Power By	Control By
Equipment Motors	MC	MC	EC	CC
*Magnetic motor starters:				
Automatic controlled, w/ or w/o HOA switches	EC	EC	EC	CC
Automatic controlled, w/ or w/o HOA switches, and that are furnished as part of factory wired equipment	MC	MC	EC	MC
*Manual Motor Starters:				
Manually controlled	EC	EC	EC	EC
Manually controlled, and that are furnished as part of factory wired equipment	MC	MC	EC	MC
Combination disconnect and motor starter	EC	EC	EC	CC
Motor Control Centers	EC	EC	EC	CC
Variable Speed Drives	MC	EC	EC	CC
Push-button stations, pilot lights, contactors, multi-speed switches	EC	EC	EC	EC
Disconnect switches, thermal overload switches, manual operating switches	EC	EC	EC	--
Multi-speed switches furnished as part of factory wired equipment	MC	MC	EC	MC
Temperature control relays, transformers, electric thermostats, time clocks, etc., that are not part of factory furnished equipment	CC	CC	CC	CC

MC - Divisions 20, 21, 22, 23, 25-Mechanical CC - Divisions 20, 21, 22, 23, 25-Controls EC - Divisions 26, 27 and 28-Electrical	Furnished By	Set in Place By	Power By	Control By
Remote bulb thermostats, motor valves, controls, which are an integral part of factory furnished mechanical equipment.	MC	MC	EC	MC
Fire sprinkler suppression controls	MC	MC	EC	MC
Duct smoke detectors, including relays for fan shutdown	MC	MC	EC	EC
Fire/Smoke Dampers	MC	MC	EC	EC
Control Systems	CC	CC	CC	CC
Damper & Valve Actuators (120 v)	CC	CC	EC	CC
Damper & Valve Actuators (24 v)	CC	CC	CC	CC
Master Building Power quality monitors (loss/reversal)	EC	EC	EC	CC
Boiler and water heater controls, boiler burner control panels, internally wired	MC	MC	EC	MC
Electric Generator(s)				
Genset(s)	EC	EC	EC	EC
Fuel Lines	MC	MC	--	--
Day Tank (if separately furnished)	MC	MC	EC	MC
Silencer	EC	MC		

* Provide starters in accordance with the Electrical Division of these Specifications. Note that a thermal overload relay in each phase is required for each starter (packaged equipment included).

3.3 REPAIR/RESTORATION

- A. Touch-up, repair or replace product components broken during installation or startup with new replacement parts supplied by the product manufacturer.
- B. Substitute replacement parts from other manufacturers are not acceptable.
- C. Clean and repair existing identification tags/labels, hangers, supports, insulation, materials, instrumentation, and equipment that remain or are to be reused or are affected by this work. Materials and equipment which require major repair may be replaced at the Contractor's option.
- D. Plug, patch and repair surfaces, adjacent construction, and finishes damaged during demolition and new work. Restore to original condition or better including fire, smoke or temperature ratings or listings. Retexture surfaces to match surrounding surfaces. Repaint affected surfaces, with extent of paint to include adjacent surfaces to next wall or other clean break to avoid mismatched finish. Replace cracked or damaged ceiling tiles. Repair fire proofing, assembly fire ratings, and construction resistant to the passage of smoke.

3.4 SITE QUALITY CONTROL

A. Site Tests and Inspections:

1. The Contracting Agency may inspect and approve sample installation of systems and equipment prior to general installation of units.
2. Schedule, obtain, and pay for fees and/or services required by the local Authorities Having Jurisdiction and by these specifications, to test the mechanical systems.
3. Notify the Contracting Agency a minimum of 24 hours in advance of tests. Certify in writing that specified tests have been made in accordance with the specifications.
4. Immediately correct deficiencies that are discovered during the tests and repeat tests until system is approved. Do not cover or conceal piping, equipment or other portions of the mechanical installations until satisfactory tests are made and approved.
5. Under the direction of the Contractor and in the presence of the Contracting Agency, place the entire mechanical installation and/or any portion thereof in operation to demonstrate satisfactory operation.
6. Arrange for the Contracting Agency to witness tests. The Contracting Agency may waive witnessing any specific test at its discretion.

B. Non-Conforming Work:

1. Expediently remove and provide new for work not conforming to the Project Manual upon discovery; including warranty and discovery periods.
2. Warranty period shall start over for replaced equipment and installation from the date of accepted by the Contracting Agency.

C. Manufacturer Services:

1. Authorized manufacturer's representative shall be on-site for testing, start-up, functional check-out, and commissioning of equipment and systems.
2. Procurement, installation, start-up, and warranty services to be provided by manufacturer's authorized representative and service company.
3. Equipment, devices, hardware, and software to be approved for application, and of current production. Original manufacturer's parts, hardware, software, and support to be available for ten years after installation.

3.5 CLEANING

- #### **A.**
- Upon completion of installation and prior to initial operation, remove debris, and clean and wipe down equipment, piping, ductwork and floor to eliminate dust and dirt.

3.6 CLOSEOUT ACTIVITIES

- #### **A. Demonstration:**
- Provide demonstration, conducted by authorized factory start-up personnel, to the Contracting Agencies authorized personnel as listed in each individual specification section.
- #### **B. Training:**
- In addition to training specified in each individual specification section, provide 8 additional hours of operational instruction conducted by qualified personnel, covering any of the mechanical systems and installation requested by the Contracting Agency to its authorized maintenance personnel.

END OF SECTION 20 0000

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SECTION 20 0513
COMMON MOTOR REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: This section describes general requirements, products and methods of execution relating to electric motors in general and shall apply to motors furnished as integral parts of equipment specified in this and other Divisions.
- B. Related Sections:
 - 1. 20 0000 - Mechanical General Requirements
 - 2. 23 2123 - Hydronic Pumps
 - 3. 23 3400 - HVAC Fans
 - 4. 23 3600 - Air Terminal Units
 - 5. 23 8200 - Terminal Heating and Cooling Units

1.2 REFERENCES

- A. Codes and Standards: National Electrical Manufacturers Association, NEMA, Standards Publication Motors and Generators, MG-1.

1.3 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide product performance characteristics as specified or scheduled on drawings.

1.4 PREINSTALLATION MEETINGS

- A. Coordinate installation of electrical motors with trades responsible for portions of this and any other related sections of the Project Manual prior to installation of any components.

1.5 SUBMITTALS

- A. See Section 20 0000 - Mechanical General Requirements for general submittal requirements for the items listed below, supplemented with the additional requirements listed.
- B. Product Data:
 - 1. Provide a tabular listing of motors including the following information: Tag (from drawings), location, function, actual nameplate FLA, fuse size used, overload relay used, and overload setting.
 - 2. Make copy of list available during Substantial Completion observation by the Contracting Agency. Include list in Operations and Maintenance Manuals.

1.6 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturers: Company specializing in manufacturing the Products specified in this section with minimum 3 years' experience.
- B. Certifications: Motors shall conform to governing NEMA Standards and ASA Form C-50 for rotating machinery.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Delivery and Acceptance Requirements:
1. Verify motors are new and delivered in original product/factory packaging/crating and are free from damage and corrosion.
 2. Replace products delivered to job site that does not comply with above requirements at no expense to Owner.
- B. Storage and Handling Requirements:
1. Store products in covered storage area, protected from the elements, outside the general construction area until installed.
 2. Handle items carefully to avoid breaking, chipping, denting, scratching, or other damage.
 3. Replace damaged items with same item in new condition.

1.8 WARRANTY

- A. Manufacturer Warranty: See Section 20 0000 - Mechanical General Requirements, for general mechanical warranty requirements.

PART 2 - PRODUCTS

2.1 SUPPLY VOLTAGE

- A. Supply voltage shall be determined from the electrical plans where nominal utility voltage will be indicated.
- B. Motor voltage shall be stamped on the nameplate and relate to the nominal voltage as follows:

THREE PHASE MOTORS	
Nominal Volts	Motor Ratings
208 volts	200V, 208V, or 208/220V
240 volts	220V or 208/220V
480 volts	460V
SINGLE PHASE MOTORS	
Nominal Volts	Motor Ratings
120 volts	115V or 115/230V
240 volts	230V or 115/230V
208 volts	200V or 208V

Note: Provide nameplate indicating that voltage for a motor operating at 208 VAC is suitable.

- C. Voltage variation: Motors shall be designed to operate within the parameters of these requirements at rated load and with a voltage variation from the name plate voltage of plus or minus ten percent.

- D. Motors shall operate successfully at rated load and at rated voltage with a maximum frequency variation of five percent above or below rated frequency.
- E. Motors shall operate successfully at rated load with a combined maximum variation in the voltage and frequency of five percent above or below rated voltage and rated frequency.
- F. Motors that operate with Variable Speed Drive (VSD) controllers shall be suitable for the application.
 - 1. Motors operated using PWM type VSDs: Conform to NEMA MG 1 Part 31 requirements.
 - 2. Motors operated using six-step type VSDs: Conform to NEMA MG 1 Part 30 or Part 31 requirements.

2.2 LOCKED ROTOR CURRENT

- A. No motor above 15 HP shall have a locked rotor current in excess of NEMA code letter "G". Smaller motors may have a higher locked rotor rating, but in no case exceeding the recommended NEMA rating as related to motor size.

2.3 MOTOR INSULATION

- A. Unless otherwise specified, motor insulation shall be NEMA Class "B" (or better). Based on 40 degrees C. maximum ambient, and 90 degrees C. maximum rise, total maximum operating temperature shall not exceed 130 degrees C.

2.4 MOTOR LOADING

- A. No motors shall be subjected to loads exceeding the motor nameplate rating, under any normal operating condition.

2.5 MOTOR RATING

- A. Motors are sized in conformity with the manufacturer's published information and shall not be interpreted as the final requirement. Check each motor for adequacy in relation to the specific application.
- B. Motors indicated as being connected to variable speed drives (VSD) shall be rated for VSD service.

2.6 HIGH EFFICIENCY AC MOTORS

- A. Furnished high efficiency electric motors for equipment that:
 - 1. Require a three horsepower or larger drive motor.
 - 2. Have duty cycles classified as continuous.
- B. Efficiency of the motors shall be determined by NEMA Standard MG 1 - 12.536 and shall have efficiencies equal to or better than:

Motor Size	Nominal Efficiency
Through 3 HP	89 percent
Over 3 HP through 10 HP	91 percent
Over 10 HP through 30 HP	93 percent
Over 30 HP through 60 HP	94 percent
Over 60 HP through 100 HP	95 percent

Motor Size	Nominal Efficiency
Over 100 HP	95 percent

2.7 MOTOR HOUSING FEATURES

- A. Open drip-proof, totally enclosed fan cooled (TEFC), or explosion-proof, as appropriate for the use intended and the environment where installed, or as noted. Provide totally enclosed fan cooled motors for equipment below grade, located outdoors, or operating in damp or dust-laden locations. Provide a continuous moisture drain that is screened against insect entry for totally enclosed motors.
- B. Oversized external conduit boxes at least one size larger than NEMA standard.

2.8 SHAFT GROUNDING RINGS

- A. Motors operated on variable frequency drives shall be equipped with a maintenance-free, conductive microfiber shaft grounding ring (SGR) to meet NEMA MG-1, 3.4.4.4.3 requirements, with a minimum of two rows of circumferential microfibers to discharge damaging shaft voltages away from the bearings to ground. SGR's Service Life: Designed to last for service life of motor. Provide AEGIS SGR Conductive MicroFiber Shaft Grounding Ring, or approved equal.
- B. Application Note: Motors up to 100 HP shall be provided with one shaft grounding ring installed on either the drive end or non-drive end. Motors over 100 HP shall be provided with an insulated bearing on the non-drive end and a shaft grounding ring on the drive end of the motor with the exception of line contact bearings in the drive end of the machine. In this case the line contact bearing shall be electrically insulated and the AEGIS Bearing Protection Ring installed on the opposite drive end of the motor. Grounding rings shall be provided and installed by the motor manufacturer or contractor and shall be installed in accordance with the shaft grounding ring manufacturer's recommendations.

2.9 HIGH FREQUENCY BONDING

- A. Motors operated on variable speed drives shall be bonded from the motor foot to system ground with a high frequency ground strap made of flat braided, tinned copper with terminations to accommodate motor foot and system ground connection. Provide AEGIS HF Ground Straps, or equal.
- B. Application Note: High frequency grounding straps shall be used to ensure the proper grounding of inverter driven induction motor frames.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protection of In-Place Conditions: Cover motors to protect them from construction dirt and debris.

3.2 INSTALLATION

- A. Special Techniques:
 - 1. Installation of motors shall be as required by the driven equipment. Make sure motor design and characteristics are suitable for the application.
 - 2. Electrical connections for motors shall conform to NEC Articles 430 and 440 as applicable, and to any state and local code having jurisdiction.

3. Unless furnished as part of a complete package including disconnects and control, and/or motor fuse protection, protect motors by Bussmann Fusetron Dual-Element Time Delay fuses, or approved equal.
4. Megger motor windings prior to starting. Include log of megger readings in the Operations and Maintenance manuals.
5. Verify correct rotation of motors.
6. Comply with Article 460 of the National Electrical Code for installation of power factor correction capacitors.
7. Motor sizes shown on the Drawings are estimates based upon the mechanical design. Where motors actually furnished are of a different size than those shown, motor circuit components (starters, disconnects, overcurrent devices, and conductors) shall be revised to suit the motors actually furnished, without increase in the Contract amount. Similarly, motor overcurrent device sizes shown on the Drawings or specified are based upon estimated motor code letters, overcurrent device manufacturers' recommendations, and full-load currents from the NEC Tables. Where the motors actually furnished require different sizing, the sizes of the overcurrent devices shall be adjusted to conform to the NEC, without increase in the Contract amount.

3.3 SHAFT GROUNDING RINGS (MOTORS WITH VARIABLE FREQUENCY DRIVES)

- A. Shaft grounding rings (SGR) shall be factory installed inside the motors by the manufacturer wherever possible. SGRs may be field installed by installing contractor subject to Engineer's approval. Provide AEGIS SGR Colloidal Silver Shaft Coating, or approved equal, on shafts prior to rings installation, per SGR manufacturer's recommendations, after first cleaning shafts.
- B. Install and test SGRs in accordance with manufacturer's recommendations. Install the SGR so that the aluminum frame maintains an even clearance around the shaft. Conductive microfibers shall be in full circumferential contact with conductive metal surface of the shaft. Do not use thread lock to secure the mounting screws as it may compromise the conductive path to ground. If thread lock is required, use a small amount of EP2400 AEGIS Conductive Epoxy, or approved equal, to secure the screws in place.
- C. Shafts shall be clean and free of any coatings, paint, or other nonconductive material (clean to bare metal). Depending upon the condition of the shaft, it may require using emery cloth or Scotch-Brite. If the shaft is visibly clean, a non-petroleum based solvent may be used to remove any residue. Check the conductivity of the shaft using an ohm meter. Ohms test: Place the positive and negative meter leads on the shaft at a place where the microfibers will contact the shaft. Each motor will have a different reading but in general one should have a maximum reading of less than 2 ohms. If the reading is higher, clean the shaft again and retest.
- D. After motors with SGRs are fully installed in the field (in equipment, assemblies, or individually), for both factory installed SGRs and field installed SGRs, test for a conductive path to ground using an Ohm meter. Place one probe on metal frame of SGR and one probe on motor frame. Motor must be grounded to common earth ground with variable frequency drive according to applicable standards. Verify that SGR installations and test readings comply with SGR manufacturer's requirements.

3.4 HIGH FREQUENCY BONDING (MOTORS WITH VARIABLE FREQUENCY DRIVES)

- A. Motors operated on variable frequency drives shall be bonded from the motor foot to system ground with a high frequency ground strap made of flat braided, tinned copper with terminations to accommodate motor foot and system ground connection. Provide AEGIS HF Ground Straps, or approved equal. After motors with SGRs are fully installed in the field (in equipment, assemblies, or individually), for both factory installed SGRs and field installed SGRs, test for a conductive path to ground using an Ohm meter.

3.5 REPAIR/RESTORATION

- A. Repair any components broken during installation or startup with replacement parts supplied by the product manufacturer.
- B. Substitute replacement parts from other manufacturers are not acceptable.

END OF SECTION 20 0513

SECTION 20 0529
MECHANICAL HANGERS AND SUPPORTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. General hanger and support requirements for building service piping and mechanical equipment not required to be vibration and/or seismically controlled.
2. Performance based seismic restraint requirements for non-structural mechanical systems and components.
3. Penetrations, sleeves and seals.

B. Related Sections:

1. 20 0000 - Mechanical General Requirements
2. 22 1100 - Domestic Water Piping and Specialties
3. 22 1300 - Sanitary Waste and Vent Piping and Specialties
4. 22 4000 - Plumbing Fixtures
5. 23 1123 - Fuel Gas Piping and Specialties
6. 23 2113 - Hydronic Piping and Specialties
7. 23 2123 - Hydronic Pumps
8. 23 3100 - Ducts and Accessories
9. 23 3400 - HVAC Fans
10. 23 3600 - Air Terminal Units
11. 23 5223 - Cast Iron Boilers and Accessories
12. 23 8200 - Terminal Heating and Cooling Units

1.2 REFERENCES

A. Codes and Standards:

1. International Building Code (IBC).
2. International Mechanical Code (IMC).
3. Uniform Plumbing Code (UPC).
4. MSS SP58-2009 - Pipe Hangers and Supports – Materials, Design, Manufacture, Selection, Application, and Installation.
5. SMACNA HVAC Duct Construction Standards - Metal and Flexible (current edition).
6. ASCE 7–10 Minimum Design Loads for Buildings and Other Structures.

B. Abbreviations, Acronyms and Definitions:

1. Refer to Division 01 for general abbreviations, acronyms, and definitions.
2. Refer to Section 20 0000 - Mechanical General Requirements for general mechanical related definitions.
3. Refer to Mechanical Drawings legend sheet for general mechanical related abbreviations.

1.3 DESCRIPTION

- A. This section applies to Divisions 20, 22, 23, and 25 mechanical equipment and systems:
1. Support fire suppression system piping and equipment in accordance with the provisions of Section 21 13 10 - Fire Protection Systems.
 2. Support plumbing piping in accordance with this section and Uniform Plumbing Code requirements as applicable; whichever is more restrictive. In case of conflicts, follow UPC guidance.
 3. Support ductwork in accordance with Section 23 31 00 - Ducts and Accessories and the seismic requirements of this section.
 4. Provide seismic support for mechanical equipment and systems in accordance with this section and ASCE 7–10 Minimum Design Loads for Buildings and Other Structures – Chapter 13.
- B. Design Requirements:
1. Equipment and piping system support:
 - a. Select and apply pipe hangers and supports per MSS SP58 using stock or production parts whenever possible.
 - b. Design support spacing such that free span of piping does not exceed Code or MSS SP58 criteria (whichever is most restrictive).
 - c. Calculate required supporting force at each hanger location to confirm hanger type and hanger rod diameter selection.
 - d. Provide hangers such that equipment connection points do not carry connected piping load.
 2. Seismic restraint systems:
 - a. Provide certified seismic control anchoring and support system products and certified application design and installation supervision services from a single pre-approved product manufacturer. The applications design may also be provided by an approved Alaska licensed professional structural engineer (PE).
 - b. It is the design intent to anchor, brace and support the facilities mechanical equipment, system piping to the buildings structure such the that the systems will remain in place and operational following a design seismic or high wind event.
 3. Building Design Criteria:
 - a. Wind design data: See Structural Drawing.
 - b. Seismic design data: See Structural Drawing.
 - c. Component Importance Factors, I_p
 - 1). Fuel gas or fuel oil system: $I_p = 1.5$
 - 2). Piping Importance Factor: $I_p = 1.0$
 - 3). All other components: $I_p = 1.0$
- C. Performance Requirements:
1. Provide hangers and supports that allow for the free expansion and contraction of system piping without transferring tensile and compressive stresses to adjacent supports or connected equipment. Coordinate hanger and support anchor locations and embedment depth requirements with structural.

2. Systems shown as semi-diagrammatic. Provide additional expansion loops, pipe anchors and pipe guide assemblies as required to support installed systems.
 3. Special Performance Requirements for Open Ceiling Spaces:
 - a. Coordinate the support of piping, ductwork, lighting and electrical cabling in open ceiling spaces (utilizing the shop drawing review process) to provide a uniform and symmetrical appearance.
 - b. In general, utilize trapeze hanger style support systems with hangers equally spaced based on the limiting component being supported. Provide hanger rods vertical and straight. Trim hanger rod ends to provide a "finished" appearance.
- D. Additional Seismic/Wind Load Performance Requirements:
1. Design seismic and/or wind load restraint devices for non-structural mechanical and electrical equipment and building systems including pad-mounted equipment located within and exterior to the building as required by the Authority Having Jurisdiction.
 2. Submit seismic calculations for review and approval, which confirm the seismic support design for equipment and building systems requiring seismic restraint.
 3. Equipment with factory mounted internal vibration and seismic restraint devices shall meet the vibration and seismic control requirements of this section.

1.4 PRE-INSTALLATION MEETINGS

- A. Coordinate installation of equipment and associated piping or ductwork with trades responsible for portions of this and any other related sections of the Project Manual prior to installation of any components.

1.5 SUBMITTALS

- A. See Section 20 0000 - Mechanical General Requirements for general submittal requirements for the items listed below, supplemented with the additional requirements listed.
- B. Product Data:
1. Provide manufacturers catalog data, including load capacity, embedment depth.
 2. Manufacturer's Installation Instructions: Indicate special procedures and assembly of components.
- C. Seismic/Wind Load Calculations
1. Submit sealed structural engineering calculations, drawings, and details to support the product restraint selection and installation configuration for each seismic / wind load restraint application.
 2. Coordination and approval of non-structural element attachment techniques and design loads with the project's structural design Engineer of Record.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance (IO&M) Manuals:
1. Refer to Section 20 0000 - Mechanical General Requirements, for IO&M Manual formatting requirements and number of copies required.
 2. Include the following:
 - a. Copies of approved submittal information.

- b. Manufacturer's installation, operating and maintenance/repair instructions, parts listings, and spare parts list for each product. Clearly annotate the manual to indicate applicable information for the specific equipment model(s) installed.

B. Warranty Documentation: Provide standard manufacturer's warranty and submit documentation in accordance with Section 20 0000.

C. Record Documentation:

- 1. Indicate installed locations of hangers, supports and expansion control assemblies on record drawings on associated piping record drawings.
- 2. Provide Operating and Maintenance Data (installation and adjustment instructions) for non-commodity products.

1.7 QUALITY ASSURANCE

A. Qualifications:

- 1. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum 3 years documented experience.
- 2. Installers: Minimum 3 years' experience.
- 3. Testing Agencies: Provide piping and support systems designed and manufactured per MSS SP58.
- 4. Licensed Professionals: Provide piping and support systems designed per MSS SP58.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Acceptance at Site:

- 1. Verify products are delivered in original factory packaging and are free from damage and corrosion.
- 2. Replace equipment delivered to job site that does not comply with above requirements at no expense to the Owner.

B. Storage and Protection:

- 1. Store products in covered storage area, protected from the elements, outside the general construction area until installed.
- 2. Handle items to avoid damage.
- 3. Replace damaged items with same item in new condition.

1.9 WARRANTY

A. Manufacturer Warranty:

- 1. See Section 20 0000 - Mechanical General Requirements, for general mechanical warranty requirements.
- 2. Provide 1 year manufacturer's warranty.
- 3. Submit necessary documentation to the Manufacturer's Representative to validate manufacturer's warranty.
- 4. Provide to the Contracting Agency 1 copy of warranty documentation and confirmation receipt from the Manufacturer's Representative.

PART 2 - PRODUCTS

2.1 PIPE HANGERS AND SUPPORTS

A. General:

1. Piping and support systems shall be malleable iron, steel or copper.
2. Ferrous hangers and supports installed outdoors or in unheated spaces shall be hot dipped galvanized.
3. Select and apply pipe hangers and supports per MSS SP69.
 - a. Use stock or production parts whenever possible.
 - b. Calculate weight balance to determine the required supporting force at each hanger location and to eliminate pipe weight load at each equipment connection.
4. Fabricate and install pipe hangers and supports per MSS SP89 recommended practices.
5. Hangers shall be designed to securely lock using a mechanical fastener. Hangers and supports using gravity type locking are not acceptable. For example, adjustable swivel ring Type 6 is not allowed.
6. Pre-engineered support systems such as Unistrut, Super-Strut, B-Line and K-Line may be used in accordance with manufacturers load limits.
7. Manufacturers: Grinnell, M-CO Michigan Hanger Company, Kin Line.

B. Plumbing Piping:

1. Conform to the Uniform Plumbing Code requirements.
2. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Adjustable swivel ring; split ring.
3. Hangers for DWV and Cold Pipe Sizes two inch and over: Carbon steel, adjustable, clevis.
4. Hangers for Hot Pipe sizes two to four inch: Carbon steel, adjustable, clevis.
5. Hangers for Hot Pipe Sizes six inches and over: Adjustable steel yoke, cast iron roll, double hanger.
6. Multiple or Trapeze Hangers under six inches: Steel channels with welded spacers and hanger rods.
7. Multiple or Trapeze Hangers for Hot Pipe Sizes six inches and over: Steel channels with welded spacers and hanger rods, cast iron roll.
8. Wall Supports: Welded steel bracket and wrought steel clamp.
9. Wall Support for Hot Pipe Sizes six inches and over: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron roll.
10. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and steel support.
11. Floor Support for Hot Pipe Sizes up to four inches: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and steel support.
12. Floor Support for Hot Pipe Sizes six inches and over: Adjustable cast iron roll and stand, steel screws, and steel support.
13. Vertical Support: Steel riser clamp.

14. Provide copper plated hangers and supports for copper piping. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

C. Hydronic Piping:

1. Conform to ASME B31.9 and the International Mechanical Code.
2. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Adjustable swivel ring; split ring.
3. Hangers for Cold Pipe Sizes two inches and over: Carbon steel, adjustable, clevis.
4. Hangers for Hot Pipe sizes two to four inch: Carbon steel, adjustable, clevis.
5. Hangers for Hot Pipe sizes six inches and over: Adjustable steel yoke, cast iron roll, double hanger.
6. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
7. Multiple or Trapeze Hangers for Hot Pipe Sizes six inches and over: Steel channels with welded spacers and hanger rods, cast iron roll.
8. Wall Support: Welded steel bracket and wrought steel clamp.
9. Wall Support for Hot Pipe Sizes six inches and over: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron roll.
10. Vertical Support: Steel riser clamp.
11. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and steel support.
12. Floor Support for Hot Pipe Sizes up to four inches: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and steel support.
13. Floor Support for Hot Pipe Sizes six inches and over: Adjustable cast iron roll and stand, steel screws, and steel support.
14. Provide copper plated hangers and supports for copper piping. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

2.2 ACCESSORIES

- A. Hanger Rods: Mild steel, threaded both ends, threaded one end, or continuous threaded.
- B. Escutcheons: Nickel or chrome plate with screws or springs for holding plate in position.
- C. Pipe Protection Saddles: Shop fabricates, or purchase specially manufactured saddles specifically designed for the intended use. Provide saddles where roller type support is used, or where the pipe hanger is installed outside the insulation for protection of insulating jacket.
- D. Outdoor applications: Metal components shall be galvanized.

2.3 INSERTS

- A. Provide inserts to match the load bearing capacity of hangers scheduled in Part 3.
- B. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over four inches.
- C. Concrete deck inserts: Galvanized rod, steel plate, similar to Kin-Line figure 293.
- D. Screw insert for concrete: Malleable iron similar to Grinnell figure 152.

2.4 PRE-ENGINEERED SUPPORT SYSTEMS

- A. Manufacturers:
 - 1. Unistrut.
 - 2. Super-Strut.
 - 3. B-Line.
 - 4. K-Line.
 - 5. Erico.
- B. Materials:
 - 1. Cold worked steel.
 - 2. Type 304 stainless steel: Use for PVC, liquid-tight flex, or plastic-coated conduit installed to wood construction in outdoor, damp, corrosive or marine environments.
- C. Finish:
 - 1. Heated indoor areas: Pre-galvanized zinc coating.
 - 2. Outdoor areas: Hot dipped galvanized finish. In addition, coat hot dipped galvanized finish channel field cuts with zinc rich paint provide by the support system manufacturer.
 - 3. Painted areas: Paintable galvanizing or phosphatized and primed.
 - 4. Surface metal raceways: U.L. Listed epoxy coating.
- D. Channel:
 - 1. Standard Size: 1-5/8 inch x 1-5/8 inch. Gauge thickness as required for attached load.
 - 2. Standard Hole Pattern: Slotted. Provide solid channel in exposed public areas.
- E. Nuts and Hardware:
 - 1. Channel nuts: Hardened steel (ASTM-A675 and ASTM A36).
 - 2. Bolts, screws and nuts: Hardened steel (ASTM-A307, ASTM A563 and SAE J429).
 - 3. Finish: Electroplated zinc.
- F. Fittings: Plate steel (ASTM A635). Epoxy or electroplated zinc coating.
- G. Mechanical Accessories: Provide accessories from the support system manufacturer designed for the specific equipment to be supported to include but not limited to:
 - 1. Splice and gusset plates.
 - 2. Corner angles.
 - 3. Specialized support brackets.
 - 4. Beam clamps with restraints.
 - 5. Column supports.
 - 6. Strut pipe clamps.
 - 7. Straps.

8. Brackets.

2.5 SEISMIC RESTRAINT SYSTEMS

- A. Approved Manufacturers
 - 1. Amber Booth
 - 2. Vibro-Acoustics.
 - 3. International Seismic Application Technology (ISAT).
 - 4. Mason Industries
 - 5. Approved equal.
- B. Provide structurally engineered equipment and building system seismic restraints in accordance with approved product manufacturers written installation instructions and seismic restraint manufacturer's product application and design recommendations.

2.6 SLEEVES, ACOUSTICAL SEALS AND FIRE-STOPPING

- A. See Part 3 - PENETRATIONS.
- B. Sleeves for pipes through fire rated and fire resistive floors and walls, and fire proofing: UL listed prefabricated fire rated sleeves and seals.

2.7 FRAMED OPENINGS

- A. Provide structural steel members for framed openings conforming to ASTM A36 / A36M.
- B. Closure Collars:
 - 1. For round and rectangular ducts with a minimum dimension less than 16 inches, fabricate collars from 20-gauge galvanized steel.
 - 2. For round and rectangular ducts with a minimum dimension of 16 inches or greater, fabricate collars from 18-gauge galvanized steel.

PART 3 - EXECUTION

3.1 INSTALLERS

- A. Installer: Perform work by experienced personnel previously engaged in construction and under the supervision of a qualified installation supervisor.

3.2 PREPARATION

- A. Prior to installation, prepare detailed shop drawings of the planned installation of hanger and support products specified by this section. Coordinate the location, type and size of hangers and supports, housekeeping pads (thickness/perimeter overhang dimensions) and roof curbs with Architectural and Structural elements utilizing the shop drawing review process.
- B. Submit shop drawings required by this section coordinated with the seismic design and associated shop drawings required by Section 20 0548 – Mechanical Vibration and Seismic Control as a single submittal.
- C. Do not install hangers and supports without approved shop drawings.

3.3 INSTALLATION

A. Special Techniques:

1. Install vibration isolators, seismic control and wind restraint systems in compliance with the manufacturer's written instructions and certified and approved application engineering installation drawings and details.
2. Attachment Installation:
 - a. Attach mechanical equipment to structure as follows:
 - 1). Hollow masonry: Toggle bolts.
 - 2). Solid masonry and concrete: Preset inserts or expansion bolts.
 - 3). Structural steel: Beam clamps which engage both sides of structural member or have retaining clips or other approved means for positive engagement.
 - 4). Metal surfaces: Machine screws, bolts or welding.
 - 5). Wood construction: Wood or sheet metal screws.
 - 6). Do not use powder-actuated fasteners for anchorage in tension applications. Obtain written permission from the Owner prior to using any type of powder powered studs.
3. Pipe Hanger and Support Installation:
 - a. Install hangers and supports in accordance with manufacturer's instructions, applicable Code requirements and approved shop drawings.
 - b. Support horizontal piping as scheduled.
 - c. Independently support piping at equipment, so that the equipment supports no weight.
 - d. Insulated piping shall have insulation saddles or 18 gauge steel insulation shields combined with sections of calcium silicate or cellular glass. Piping shall always be supported over the insulation and vapor barrier.
 - e. Trapeze hangers shall be used when more than three pipes run parallel and at same elevation. Provide rollers for hot pipes. Design rods and cross members to support three times the weight of pipes and contents plus 250 pounds.
 - f. Install hangers to provide minimum 1/2-inch space between finished covering and adjacent work.
 - g. Place hangers within 12 inches of each horizontal elbow.
 - h. Use hangers with 1-1/2 inch minimum vertical adjustment.
 - i. Support horizontal cast iron pipe adjacent to each hub, with five feet maximum spacing between hangers.
 - j. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.
 - k. Support riser piping independently of connected horizontal piping.
 - l. Provide saddles where roller type support is used, or where the pipe hanger is installed outside insulation for protection of insulating jacket.
4. Equipment Bases and Support Installation:

- a. For cast-in-place concrete requirements refer to Division 3 - Concrete.
 - b. Provide 3-1/2 inch (2x4 form) concrete housekeeping pads for floor mounted mechanical equipment. Coordinate perimeter overhang dimensional requirements (8 inches typical) with Section 20 0548 - Mechanical Vibration and Seismic Control, such that equipment anchor bolts achieve proper embedment.
 - c. Construct field fabricated equipment bases and supports from steel members and/or pre-engineered support systems. Prime and paint bases and supports black in accordance with Division 9 - Finishes. Pre-engineered support systems which are factory coated are not required to be painted.
5. Roof Curb Installation:
- a. Coordinate with Architectural and provide roof curb locations and dimensional and support requirements for roof mounted equipment.
6. Mechanical Equipment Installation:
- a. Provide hardware and accessories necessary to mount fixtures and equipment. Adapt to field conditions.
 - b. Securely fasten fixtures and equipment to the building structure in accordance with the manufacturer's installation recommendations.
 - c. Provide fabricated steel supports frames and bases for equipment not directly mounted on floor. For belt driven equipment provide rigid structural base in common with motor to maintain belt tension.
 - d. Provide steel base plates for floor mounted fixtures and equipment to distribute the weight such that the floor load is not more than 100 PSF, unless special structural reinforcement is submitted for approval.
 - e. At wall attached fixtures and equipment weighing less than 50 pounds, provide backing plates at least 1/8 by 10 inch square sheet steel or two by 10 inch fire retardant treated wood securely built into the structural walls. Submit attachment details of heavier equipment for approval.
 - f. Painted fabricated steel support black in accordance with Division 9 - Finishes.
7. Penetrations:
- a. Coordinate mechanical penetrations with architectural and structural construction details prior to installation. Set sleeves in position in concrete formwork. Provide reinforcement around sleeves as required.
 - b. Provide compatible materials, fasteners, adhesives, sealants, and other products required for proper installation.
 - c. Provide penetrations through roof, exterior walls and floors (See floor penetration seals) to be weather and watertight.
 - d. Fire-Stopping: Provide UL rated fire-stopping assemblies for rated roof, wall and floor penetrations in accordance with Division 7.
 - e. Pipe and Duct Sleeves/Framed Openings:
 - 1). Provide sleeves for pipe and round ducts less than 16 inches diameter passing through floors, walls, ceilings, or roofs. Fabricate sleeves in non-load bearing walls from 20 gauge galvanized sheet steel conforming to ASTM A924 / A924M. Fabricate sleeves in load-bearing walls from standard-weight galvanized steel pipe conforming to ASTM A53 / A53M. Provide 1 inch

- clearance between the pipe or duct and sleeve opening. Oversize sleeves for cold piping to allow continuous insulation through sleeve.
- 2). Provide framed openings for round ducts 16 inch diameter and greater and rectangular ductwork passing through floors, walls, ceilings, or roofs. Provide structural steel members for framed openings conforming to ASTM A36 / A36M. Provide 1 inch clearance between the duct and framed opening.
 - 3). Provide closure collars not less than 4 inches wide on each side of duct wall or floor penetration where sleeves or framed openings are provided. Fabricate collars for round and rectangular ducts with a minimum dimension less than 16 inches from 20 gauge galvanized steel. Fabricate collars for round and rectangular ducts with a minimum dimension of 16 inches or greater from 18 gauge galvanized steel.
 - 4). Provide escutcheons for piping and conduit passing through walls, floors and ceilings in finished areas, below counters and inside closets and casework subject to view when doors are open. Size escutcheons to cover sleeves. Secure escutcheons in position.

B. Interface with Other Work: Coordinate and sequence installation of hangers and supports with trades responsible for portions of this and other related sections of the Project Manual.

3.4 REPAIR/RESTORATION

A. Repair any product components broken during installation or startup with replacement parts supplied by the product manufacturer.

B. Substitute replacement parts from other manufacturers are not acceptable.

3.5 SITE QUALITY CONTROL

A. Non-Conforming Work: Rework required as a result of failure to follow the manufacturer's written installation instructions or to properly coordinate with related Work shall be completed at no additional expense to the Owner.

3.6 CLEANING

A. Waste Management: After construction is completed, clean and wipe down exposed surfaces.

3.7 ATTACHMENTS

A. Tables:

1. Pipe Support: Provide pipe support spacing as indicated in the table below, except where spacing is more restrictive by Code.

PIPE SIZE (Inches)	HANGER SPACING MAX (Feet)			
	Steel		Copper	Polyethylene (1)
	Water Filled	Gas Filled		
1/2	7	9	5	
3/4	7	9	5	
1	7	9	6	
1-1/4	7	9	7	

PIPE SIZE (Inches)	HANGER SPACING MAX (Feet)			
	Steel		Copper	Polyethylene (1)
	Water Filled	Gas Filled		
1-1/2	9	12	8	4
2	10	13	8	4-1/2
2-1/2	11	14	9	
3	12	15	10	5
4	14	17	12	6
6	17	21	14	
8	19	24	16	

(1)(Based on manufacturer's data)

END OF SECTION 20 0529