

PROJECT MANUAL

VOLUME II

Campbell-Savona Central School District

2026 CAPITAL IMPROVEMENT PROJECT - PHASE 1

MIDDLE/HIGH SCHOOL: #57-06-03-04-0-001-026

MIDDLE/HIGH SCHOOL (CAPITAL OUTLAY): #57-06-03-04-0-001-027

CONCESSION STAND: #57-06-03-04-7-009-003

ELEMENTARY SCHOOL: #57-06-03-04-0-003-025

BUS GARAGE: #57-06-03-04-5-006-010

STORAGE GARAGE SAVONA: #57-06-03-04-2-004-005

The design of this project conforms to all applicable provisions of the New York State Uniform Fire Prevention and Building Code, the Energy Conservation Construction Code of New York State, and the building standards of the New York State Education Department



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SECTION 02 41 00
DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Building demolition excluding removal of hazardous materials and toxic substances.
- B. Selective demolition of built site elements.
- C. Selective demolition of building elements for alteration purposes.
- D. Demolishing designated building equipment and fixtures.
- E. Demolishing designated construction.
- F. Removing designated items for Owner retention.
- G. Protecting items designated to remain.
- H. Removing demolished materials.

1.2 RELATED REQUIREMENTS

- A. Section 01 10 00 - Summary: Limitations on Contractor's use of site and premises.
- B. Section 01 10 00 - Summary: Description of items to be salvaged or removed for re-use by Contractor.
- C. Section 01 35 17 - Alteration Project Procedures: Protection of existing facilities; cutting and patching requirements.
- D. Section 01 50 00 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
- E. Section 01 60 00 - Product Requirements: Handling and storage of items removed for salvage and relocation.
- F. Section 01 70 00 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.
- G. Section 01 74 19 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.
- H. Section 31 10 00 - Site Clearing: Vegetation and existing debris removal; earth stripping and stockpiling.
- I. Section 31 22 00 - Grading: Rough and fine grading.
- J. Section 31 23 23 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

1.3 DEFINITIONS

- A. Demolition: Dismantle, raze, destroy or wreck any building or structure or any part thereof.

- B. Remove: Detach or dismantle items from existing construction and dispose of them off site, unless items are indicated to be salvaged or reinstalled.
- C. Remove and Salvage: Detach or dismantle items from existing construction in a manner to prevent damage. Clean, package, label and deliver salvaged items to Owner in ready-for-reuse condition.
- D. Remove and Reinstall: Detach or dismantle items from existing construction in a manner to prevent damage. Clean and prepare for reuse and reinstall where indicated.
- E. Existing to Remain: Designation for existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

1.4 REFERENCE STANDARDS

- A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.
- B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Site Plan: Indicate:
 - 1. Areas for temporary construction and field offices.
- C. Demolition Plan: Submit demolition plan as required by OSHA and local AHJs.
 - 1. Indicate extent of demolition, removal sequencing, bracing and shoring, and location and construction of barricades and fences.
 - 2. Demolition firm qualifications.
 - 3. Indicate location of items designated for Owner retention.
- D. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.6 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Company specializing in the type of work required.
 - 1. Minimum of ten years of documented experience.
- B. Design shoring, bracing, underpinning under direct supervision of Professional Engineer experienced in design of this Work and licensed the State of New York.
- C. Conform to applicable code for demolition work, safety of adjacent structures, dust control, products requiring electrical disconnection and re-connection.
- D. Conform to applicable code for procedures when hazardous or contaminated materials are discovered.
- E. Obtain required permits from authorities having jurisdiction.

1.7 SEQUENCING

- A. Section 01 10 00 - Summary: Requirements for sequencing.
- B. Owner will conduct salvage operations before demolition begins to remove materials Owner chooses to retain.

1.8 PRE-INSTALLATION MEETINGS

- A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

1.9 SCHEDULING

- A. Section 01 30 00 - Administrative Requirements: Requirements for scheduling.
- B. Schedule work to coincide with new construction.
- C. Cooperate with Owner in scheduling noisy operations and waste removal that may impact Owner operations.
- D. Performance of noisy, malodorous, dusty, and removal of hazardous material work:
 - 1. Will not be permitted during school hours.
 - 2. All activities must be coordinated with the Owner to ensure that programming and services will be uninterrupted by construction activities and to ensure the safety of the students and occupants.
- E. Coordinate utility and building service interruptions with Owner.
 - 1. Do not disable or disrupt building fire or life safety systems without five days prior written notice to Owner.
 - 2. Schedule tie-ins to existing systems to minimize disruption.
 - 3. Coordinate work to ensure fire sprinklers, fire alarms, smoke detectors, emergency lighting, exit signs and other life safety systems remain in full operation in occupied areas.

1.10 PROJECT CONDITIONS

- A. Buildings indicated to be demolished will be vacated before start of Work.
- B. Owner assumes no responsibility for actual condition of buildings to be demolished.
- C. Hazardous Materials: Known hazardous materials will be removed before start of Work. Notify Architect/Engineer upon discovery of a hazardous material.
- D. Each contractor shall be responsible for the cutting and patching of existing surfaces as required to complete the work of their contract unless noted otherwise.
- E. Conduct demolition to minimize interference with adjacent and occupied building areas.
- F. Cease operations immediately if structure appears to be in danger and notify Architect. Do not resume operations until directed.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.1 DEMOLITION

- A. Remove other items indicated, for salvage, relocation, and recycling.
- B. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 31 22 00.

3.2 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Obtain required permits.
 - 2. Comply with applicable requirements of NFPA 241.
 - 3. Use of explosives is not permitted.
 - 4. Coordinate demolition sequence and procedures to prevent structures from becoming unstable.
 - 5. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 - 6. Layout cuts in post-tensioned concrete elements to avoid cutting concrete within 12 inches of any stressing tendon. Notify Architect five days in advance of cutting post-tensioned concrete.
 - 7. Provide, erect, and maintain temporary barriers and security devices.
 - 8. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
 - 9. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 - 10. Do not close or obstruct roadways or sidewalks or hydrants without permit.
 - 11. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
 - 12. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.
- B. Do not begin removal until receipt of notification to proceed from Owner.
- C. Do not begin removal until built elements to be salvaged or relocated have been removed.
- D. Do not begin removal until vegetation to be relocated has been removed and vegetation to remain has been protected from damage.
- E. Protect existing structures and other elements to remain in place and not removed.
 - 1. Provide bracing and shoring.
 - 2. Prevent movement or settlement of adjacent structures.
 - 3. Stop work immediately if adjacent structures appear to be in danger.
- F. Minimize production of dust due to demolition operations. Do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- G. Hazardous Materials:
 - 1. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCBs, and mercury.
- H. Verify hazardous material abatement is complete before beginning demolition.
- I. Perform demolition in a manner that maximizes salvage and recycling of materials.
 - 1. Dismantle existing construction and separate materials.
 - 2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.
- J. Carefully remove building components indicated to be reused.
 - 1. Mark components and packaged parts to permit reinstallation.
 - 2. Store components, protected from construction operations until reinstalled.
- K. At completion of the demolition work restore, repair or refinish all building systems, components and finishes disturbed as the result of the demolition process.
- L. Remove foundation walls and footings to minimum of two feet below finished grade .

DEMOLITION

3.3 EXISTING UTILITIES

- A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.
- F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
- H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone. Identify and mark, in same manner as other utilities to remain, utilities to be reconnected.

3.4 SELECTIVE DEMOLITION FOR ALTERATIONS

- A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.
 - 1. Verify construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
- B. Separate areas in which demolition is being conducted from areas that remain occupied.
 - 1. Provide sound retardant partitions of construction and in locations indicated on drawings.
- C. Maintain weatherproof exterior building enclosure, except for interruptions required for replacement or modifications; prevent water and humidity damage.
- D. Remove existing work as indicated and required to accomplish new work.
 - 1. Remove items indicated on drawings.
- E. Services including, but not limited to, HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications: Remove existing systems and equipment as indicated.
 - 1. Maintain existing active systems to remain in operation, and maintain access to equipment and operational components.
 - 2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - 3. Verify that abandoned services serve only abandoned facilities before removal.
 - 4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification.
- F. Protect existing work to remain.
 - 1. Prevent movement of structure. Provide shoring and bracing as required.
 - 2. Perform cutting to accomplish removal work neatly and as specified for cutting new work.
 - 3. Repair adjacent construction and finishes damaged during removal work.
 - 4. Patch to match new work.

DEMOLITION

3.5 SALVAGE REQUIREMENTS

- A. Coordinate with Owner to identify building components and equipment required to be removed and delivered to Owner.
- B. Tag components and equipment Owner designates for salvage.
- C. Protect designated salvage items from demolition operations until items can be removed.
- D. Carefully remove building components and equipment indicated to be salvaged.
- E. Disassemble as required to permit removal from building.
- F. Package small and loose parts to avoid loss.
- G. Mark equipment and packaged parts to permit identification and consolidation of components of each salvaged item.
- H. Prepare assembly instructions consistent with disassembled parts. Package assembly instructions in protective envelope and securely attach to each disassembled salvaged item.
- I. Deliver salvaged items to Owner. Obtain signed receipt from Owner.

3.6 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site as work progresses.
- B. Remove materials not to be reused on site; comply with requirements of Section 01 74 19 - Waste Management.
- C. Leave site in clean condition, ready for subsequent work.
- D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Concrete formwork.
- B. Floors and slabs on grade.
- C. Concrete reinforcement.
- D. Joint devices associated with concrete work.
- E. Miscellaneous concrete elements, including equipment pads.
- F. Concrete finishing.
- G. Concrete curing.

1.2 RELATED REQUIREMENTS

- A. Section 32 13 13 - Concrete Paving: Sidewalks, curbs and gutters.

1.3 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products such as joint devices, attachment accessories, and admixtures, showing compliance with specified requirements.
 - 1. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.
- C. Mix Design: Submit proposed concrete mix design.
 - 1. Indicate proposed mix design complies with requirements of ACI SPEC-301, Section 4 - Concrete Mixtures.
- D. Design Data:
 - 1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:
 - a. Hot and cold weather concrete work.
 - b. Air entrained concrete work.
 - 2. Identify mix ingredients and proportions, including admixtures.
 - 3. Identify chloride content of admixtures and whether or not chloride was added during manufacture.
 - 4. Submit 28 day concrete strength test data for each mix design per ACI CODE-318 requirements.
 - a. Provide a minimum of 15 concrete strength tests, where a concrete strength test is the average strength of at least two 6x12 inch or three 4x8 inch cylinders.
 - b. If 15 concrete tests are unavailable, the average strength of the concrete tests must exceed the required strength by 1200psi for up to 5000 psi mix concrete.
- E. Samples: Submit samples of underslab vapor retarder to be used.
- F. Reinforcing Placement Drawings: Comply with requirements of ACI MNL-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices, supporting & spacing devices. Indicate quantities of reinforcing steel and welded wire fabric.

CAST-IN-PLACE CONCRETE

- G. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.
- H. Reports: Submit certified copies of mill test report of reinforcement materials analysis.
- I. Samples: Submit two, 12 inch long samples of waterstops and construction joint devices.
- J. Test Reports: Submit report for each test or series of tests specified.
- K. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.

1.4 CLOSEOUT SUBMITTALS

- A. See Section 01 70 00 - Execution and Closeout Requirements for requirements.
- B. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.
- C. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.5 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI SPEC-301 and ACI CODE-318.
- B. Follow recommendations of ACI PRC-305 when concreting during hot weather.
- C. Follow recommendations of ACI PRC-306 when concreting during cold weather.
- D. For slabs required to include moisture vapor reducing admixture (MVRA), do not proceed with placement unless manufacturer's representative is present for every day of placement.

1.6 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Slabs with Porosity Inhibiting Admixture (PIA) or Moisture Vapor Reducing Admixture (MVRA): Provide warranty to cover cost of flooring failures due to moisture migration from slabs for life of the concrete.
 - 1. Include cost of repair or removal of failed flooring, placement of topical moisture remediation system, and replacement of flooring with comparable flooring system.
 - 2. Provide warranty by admixture manufacturer matching terms of flooring adhesive or primer manufacturer's material defect warranty.

1.7 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

PART 2 PRODUCTS

2.1 FORMWORK

- A. Formwork Design and Construction: Comply with guidelines of ACI PRC-347 to provide formwork that will produce concrete complying with tolerances of ACI SPEC-117.

- B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
 - 1. Form Facing for Exposed Finish Concrete: Steel.
 - 2. Earth Cuts: Do not use earth cuts as forms for vertical surfaces. Natural rock formations that maintain a stable vertical edge may be used as side forms.
 - 3. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
 - 4. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface.

2.2 REINFORCEMENT MATERIALS

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
 - 1. Type: Deformed billet-steel bars.
 - 2. Finish: Unfinished, unless otherwise indicated.
- B. Steel Welded Wire Reinforcement (WWR): Plain type, ASTM A1064/A1064M.
 - 1. Form: Flat Sheets.
 - 2. WWR Style: As indicated on drawings.
- C. Reinforcement Accessories:
 - 1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch.
 - 2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
 - 3. Provide stainless steel, galvanized, plastic, or plastic coated steel components for placement within 1-1/2 inches of weathering surfaces.
- D. Fiber Reinforcement: Alkali-resistant polypropylene monofilament complying with ASTM C1116/C1116M, 24 ksi minimum tensile strength. Mixing rate per manufacturer's recommendations.
 - 1. Fiber Length: 0.75 inch, nominal.
 - 2. Products:
 - a. Fibermesh 150 by Propex Concrete Systems: www.fibermesh.com
 - b. FRC Mono 150 by FRC Industries: www.frcindustries.com
 - c. Substitutions: See Section 01 60 00 - Product Requirements.

2.3 CONCRETE MATERIALS

- A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
 - 1. Acquire cement for entire project from same source.
- B. Fine and Coarse Aggregates: ASTM C33/C33M.
 - 1. Acquire aggregates for entire project from same source.
 - 2. Coarse Aggregate Maximum Size: In accordance with ACI CODE-318.
- C. Fly Ash: ASTM C618, Class F. Loss on ignition requirement waived if used in flowable fill concrete mix.
- D. Water: ACI 318; Clean and not detrimental to concrete.

2.4 ADMIXTURES

- A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- B. Air Entrainment Admixture: ASTM C260/C260M.
- C. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.
- D. High Range Water Reducing Admixture: ASTM C494/C494M Type F.

- E. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.
- F. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
- G. Accelerating Admixture: ASTM C494/C494M Type C.
- H. Retarding Admixture: ASTM C494/C494M Type B.
- I. Water Reducing Admixture: ASTM C494/C494M Type A.
- J. Moisture Vapor Reducing Admixture (MVRA): Liquid, inorganic admixture free of volatile organic compounds (VOCs). Closes capillary systems formed during concrete curing to reduce moisture vapor emission and transmission. Reduces concrete shrinkage with no adverse effect on concrete properties or applied flooring.
 - 1. Provide admixture in slabs to receive adhesively applied flooring or roofing.
 - 2. Products:
 - a. Barrier One, Inc; Barrier One Moisture Vapor Reduction Admixture: www.barrierone.com.
 - b. ISE Logik Industries, Inc; MVRA 900: www.iselogik.com/#sle.
 - c. Specialty Products Group; Vapor Lock 20/20: www.spggogreen.com/#sle.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.

2.5 ACCESSORY MATERIALS

- A. Underslab Vapor Retarder: Multi-layer, fabric-, cord-, grid-, or aluminum-reinforced polyethylene or equivalent, complying with ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. The use of single ply polyethylene is prohibited.
 - 1. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
 - 2. Products:
 - a. ISI Building Products; Viper VaporCheck II 15-mil (Class A): www.isibp.com/#sle.
 - b. Poly-America; Husky Yellow Guard 15-mil Vapor Barrier: www.yellowguard.com/#sle.
 - c. Stego Industries, LLC; Stego Wrap 15-mil: www.stegoindustries.com/#sle.
 - d. Tex-Trude, LP; Xtreme Vapor Barrier (15-mil): www.tex-trude.com/#sle.
 - e. Substitutions: See Section 01 60 00 - Product Requirements.

2.6 BONDING AND JOINTING PRODUCTS

- A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.
- B. Epoxy Bonding System:
 - 1. Complying with ASTM C881/C881M and of Type required for specific application.
 - 2. Products:
 - a. Adhesives Technology Corporation: www.atcepoxy.com/#sle.
 - b. Kaufman Products Inc; SurePoxym HM Class B: www.kaufmanproducts.net/#sle.
 - c. SpecChem, LLC; SpecPoxym 1000, SpecPoxym 2000, SpecPoxym 3000, or SpecPoxym 3000FS: www.specchemllc.com/#sle.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with rectangular or round knockout holes for conduit or rebar to pass through joint form at 6 inches on center; ribbed steel stakes for setting.
 - 1. Provide removable plastic cap strip that forms wedge-shaped joint for sealant installation.
 - 2. Height: To suit slab thickness.

- D. Expansion and Contraction Joint Devices: ASTM B221 alloy, extruded aluminum; resilient elastomeric filler strip with Shore A hardness of 35 to permit plus or minus 25 percent joint movement with full recovery; extruded aluminum cover plate, of longest manufactured length at each location, flush mounted; color as selected.

2.7 CURING MATERIALS

- A. Curing Compound, Naturally Dissipating: Clear, water-based, liquid membrane-forming compound; complying with ASTM C309.
- B. Curing and Sealing Compound, Low Gloss: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C1315 Type 1 Class A.
- C. Moisture-Retaining Sheet: ASTM C171.
 - 1. Polyethylene film, white opaque, minimum nominal thickness of 4 mil, 0.004 inch.
 - 2. Non-staining cotton fabric, weighing not less than 8 oz/per square yd, bonded to prevent separation during handling and placing.
- D. Polyethylene Film: ASTM D2103, 4 mil, 0.004 inch thick, clear.
- E. Water: Potable, not detrimental to concrete.

2.8 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI PRC-211.1 recommendations.
- B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI SPEC-301.
 - 1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- C. Admixtures: Add acceptable admixtures as recommended in ACI PRC-211.1 and at rates recommended or required by manufacturer.
- D. Fiber Reinforcement: Add to mix at rate of 1.5 pounds per cubic yard, or as recommended by manufacturer for specific project conditions.

2.9 MIXING

- A. On Project Site: Mix in drum type batch mixer, complying with ASTM C685/C685M. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.
 - 1. Fiber Reinforcement: Batch and mix as recommended by manufacturer for specific project conditions.
- B. Transit Mixers: Comply with ASTM C94/C94M.
- C. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.
- D. Do not use shrinkage-reducing admixture (SRA) in same concrete batch with MVRA or PIA.

PART 3 EXECUTION

3.1 EXAMINATION

- A. See Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify requirements for concrete cover over reinforcement.

- C. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

3.2 PREPARATION

- A. Formwork: Comply with requirements of ACI SPEC-301. Design and fabricate forms to support all applied loads until concrete is cured and for easy removal without damage to concrete.
- B. Remove debris and ice from formwork, reinforcement, and concrete substrates.
- C. Remove water from areas receiving concrete before concrete is placed.
- D. Verify that forms are clean and free of rust before applying release agent.
- E. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- F. Wet sticking anchor rods shall not be permitted.
- G. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions. Remove laitance, coatings & unsound materials.
 - 1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
 - 2. Use latex bonding agent only for non-load-bearing applications.
- H. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- I. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Comply with ASTM E1643. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.
 - 1. Unroll Vapor Barrier with the longest dimension parallel with the direction of the pour.
 - 2. Lap Vapor Barrier over footings and seal to foundation walls.
 - 3. No penetration of the vapor barrier is allowed except for reinforcing steel and permanent utilities.
 - 4. Seal all penetrations (including pipes) with pipe boot and tape.

3.3 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

- A. Comply with requirements of ACI SPEC-301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
- B. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.

3.4 PLACING CONCRETE

- A. Place concrete in accordance with ACI PRC-304.
- B. Notify testing laboratory and Architect not less than 24 hours prior to commencement of placement operations.
- C. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

3.5 SEPARATE FLOOR TOPPINGS

- A. Prior to placing floor topping, roughen substrate concrete surface and remove deleterious material. Broom and vacuum clean.
- B. Place required dividers, edge strips, reinforcing, and other items to be cast in.
- C. Apply bonding agent to substrate in accordance with manufacturer's instructions.
- D. Place concrete floor toppings to required lines and levels.
 - 1. Place topping in checkerboard panels not to exceed 20 feet in either direction.
- E. Screed toppings level, maintaining surface flatness of maximum 1/8 inch in 10 feet.

3.6 FLOOR FLATNESS AND LEVELNESS TOLERANCES

- A. An independent testing agency, as specified in Section 01 40 00, will inspect finished slabs for compliance with specified tolerances.
- B. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values:
 - 1. Exposed to View and Foot Traffic: F(F) of 35; F(L) of 25, on-grade only.
 - 2. Under Thick-Bed Tile: F(F) of 20; F(L) of 15, on-grade only.
 - 3. Under Carpeting: F(F) of 25; F(L) of 20, on-grade only.
 - 4. Under Thin Resilient Flooring and Thinset Tile: F(F) of 35; F(L) of 25, on-grade only.
- C. Measure F(F) Floor Flatness and F(L) Floor Levelness in accordance with ASTM E1155, within 48 hours after slab installation; report both composite overall values and local values for each measured section.
- D. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value.
- E. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.7 CONCRETE FINISHING

- A. Repair surface defects, including tie holes, immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- C. Concrete Slabs: Finish to requirements of ACI PRC-302.1 and as follows:
 - 1. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI PRC-302.1; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
- D. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1/4 inch per foot nominal if not indicated on the drawings.

3.8 CURING

- A. Comply with requirements of ACI PRC-308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

3.9 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

- B. Field inspection and testing will be performed by Owner's testing laboratory in accordance with ACI 318 and applicable code.
- C. Provide free access to concrete operations at project site and cooperate with appointed firm.
- D. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
- E. Concrete Inspections:
 - 1. Continuous Placement Inspection: Inspect for proper installation procedures.
 - 2. Periodic Curing Inspection: Inspect for specified curing temperature and procedures.
- F. Strength Test Samples:
 - 1. Sampling Procedures: ASTM C172/C172M.
 - 2. Cylinder Molding and Curing Procedures: ASTM C31/C31M, cylinder specimens, field cured.
 - 3. Sample concrete and make one set of four cylinders for every 50 cu yds or less of each class of concrete placed each day and for every 5,000 sf of surface area for slabs and walls.
 - 4. When volume of concrete for any class of concrete would provide less than 5 sets of cylinders, take samples from five randomly selected batches, or from every batch when less than 5 batches are used.
 - 5. Make one additional cylinder during cold weather concreting, and field cure.
- G. Field Testing:
 - 1. Slump Test Method: ASTM C143/C143M.
 - 2. Air Content Test Method: ASTM C173/C173M.
 - 3. Temperature Test Method: ASTM C1064/C1064M.
 - 4. Measure slump and temperature for each compressive strength concrete sample.
 - 5. Measure air content in air entrained concrete for each compressive strength concrete sample.
- H. Cylinder Compressive Strength Testing:
 - 1. Test Method: ASTM C39/C39M.
 - 2. Test Acceptance: In accordance with ACI CODE-318 and applicable code.
 - 3. Test one cylinder at 7 days.
 - 4. Test two cylinders at 28 days.
 - 5. Retain one cylinder for 56 days for testing when requested by Architect.
 - 6. Dispose remaining cylinders when testing is not required.
- I. Slab Testing: Cooperate with manufacturer of specified moisture vapor reducing admixture (MVRA) to allow access for sampling and testing concrete for compliance with warranty requirements.
- J. Maintain records of concrete placement. Record date, location, quantity, air temperature and test samples taken.

3.10 PATCHING

- A. Allow Architect to inspect concrete surfaces immediately upon removal of forms.
- B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Architect upon discovery.
- C. Patch imperfections as directed by Architect in accordance with ACI CODE-318.

3.11 DEFECTIVE CONCRETE

- A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.

- B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.
- C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.12 PROTECTION

- A. If cold weather provisions of ACI PRC-306 are required:
 - 1. Protect fresh concrete from freezing by heating the ground and forms to minimum temperatures of ACI PRC-306.
 - 2. Thermally protect the fresh concrete the following durations
 - a. Concrete footings/walls - 48 hours after placement
 - b. Concrete piers - 72 hours after placement.
 - c. Concrete slabs on grade - 72 hours after placement.
- B. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION

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SECTION 03 54 00
CAST UNDERLAYMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Liquid-applied self-leveling floor underlayment.
 - 1. Use cementitious type at all locations.

1.2 RELATED REQUIREMENTS

- A. Section 01 70 00 - Execution and Closeout Requirements: Alteration project procedures; selective demolition for remodeling.
- B. Section 03 30 00 - Cast-in-place Concrete

1.3 REFERENCE STANDARDS

- A. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2022.
- B. ASTM C348 - Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars; 2021.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data sheets documenting physical characteristics and product limitations of underlayment materials. Include information on surface preparation, mixing instructions, environmental limitations, and installation instructions.
- C. Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer's Instructions.

1.5 QUALITY ASSURANCE

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

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Keep dry and protect from direct sun exposure, freezing, and ambient temperature greater than 105 degrees F.

1.7 FIELD CONDITIONS

- A. Do not install underlayment until floor penetrations and peripheral work are complete.

- B. Maintain minimum ambient temperatures of 50 degrees F 24 hours before, during and 72 hours after installation of underlayment.
- C. During the curing process, ventilate spaces to remove excess moisture.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Cementitious Underlayment:
 - 1. ARDEX Engineered Cements; ARDEX V 1200 with ARDEX P51 Primer: www.ardexamericas.com/#sle.
 - 2. CMP Specialty Products; Level-1 with AS-100 Primer: www.cmpsp.com
 - 3. Dayton Superior Corporation: www.daytonsuperior.com/#sle.
 - 4. Sika Corporation ; Product Sikafloor Level 50.www.sikaconstruction.com

2.2 MATERIALS

- A. Cast Underlayments, General:
 - 1. Comply with applicable code for combustibility or flame spread requirements.
- B. Cementitious Underlayment: Blended cement mix, that when mixed with water in accordance with manufacturer's directions will produce self-leveling underlayment with the following properties:
 - 1. Flexural Strength: Minimum 1000 psi after 28 days, tested per ASTM C348.
 - 2. Density: 125 pounds per cubic foot, nominal.
 - 3. Final Set Time: 1-1/2 to 2 hours, maximum.
 - 4. Thickness: Capable of thicknesses from feather edge to maximum 3-1/2 inch.
 - 5. Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0 in accordance with ASTM E 84.
- C. Aggregate: Dry, well graded, washed silica aggregate, approximately 1/8 inch in size and acceptable to underlayment manufacturer.
- D. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to underlayment mix materials.
- E. Primer: Manufacturer's recommended type.
- F. Joint and Crack Filler: Latex-based filler, as recommended by manufacturer.

2.3 MIXING

- A. Site mix materials in accordance with manufacturer's instructions.
- B. Add aggregate for areas where thickness will exceed 1 inch or as required per product manufacturer. Mix underlayment and water for at least two minutes before adding aggregate, and continue mixing to assure that aggregate has been thoroughly coated.
- C. Mix to self-leveling consistency without over-watering.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

- B. Verify that substrate surfaces are clean, dry, unfrozen, do not contain petroleum byproducts, or other compounds detrimental to underlayment material bond to substrate.

3.2 PREPARATION

- A. Concrete: Mechanically prepare steel troweled concrete to create a textured surface necessary to achieve the best bond; acceptable methods include bead blasting and scarifying. Do not use acid etching.
- B. Remove substrate surface irregularities. Fill voids and deck joints with filler. Finish smooth.
- C. Vacuum clean surfaces.
- D. Prime substrate in accordance with manufacturer's instructions. Allow to dry.
- E. Close floor openings.

3.3 APPLICATION

- A. Install underlayment in accordance with manufacturer's instructions.
- B. Pump or pour material onto substrate. Do not retemper or add water.
 - 1. Pump, move, and screed while the material is still highly flowable.
 - 2. Be careful not to create cold joints.
 - 3. Wear spiked shoes while working in the wet material to avoid leaving marks.
- C. Place to thickness indicated on Drawings or as required to achieve finished floor elevation, with top surface level to 1/16 inch in 10 ft.
- D. For final thickness over 1-1/2 inches, place underlayment in layers. Allow initial layer to harden to the point where the material has lost its evaporative moisture. Immediately prime and begin application of the subsequent layer within 24 hours.
- E. Place before partition installation.
- F. Where additional aggregate has been used in the mix, add a top layer of neat mix (without aggregate), if needed to level and smooth the surface.
- G. If a fine, feathered edge is desired, initial preparation per manufacturers recommendations and steel trowel the edge after initial set, but before it is completely hard.

3.4 CURING

- A. Once underlayment starts to set, prohibit foot traffic until final set has been reached.
- B. Air cure in accordance with manufacturer's instructions.

3.5 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field inspection and testing, as specified in Section 01 40 00 - Quality Requirements.
- B. Placed Material: Agency will inspect and test for compliance with specification requirements.

3.6 PROTECTION

- A. Protect against direct sunlight, heat, and wind; prevent rapid drying to avoid shrinkage and cracking.
- B. Do not permit traffic over unprotected floor underlayment surfaces.

END OF SECTION

SECTION 04 01 00
MAINTENANCE OF MASONRY

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Water cleaning of masonry surfaces.
- B. Replacement of architectural pre-cast stone units.
- C. Repointing mortar joints.
- D. Repair of damaged masonry.
- E. Retrofitting masonry veneer construction with brick ties and weeps.

1.2 RELATED REQUIREMENTS

- A. Section 04 05 11 - Masonry Mortaring and Grouting.
- B. Section 04 20 00 - Unit Masonry: Brick masonry units.
- C. Section 04 20 00 - Unit Masonry: Mortar and grout.

1.3 REFERENCE STANDARDS

- A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week prior to commencing work of this section.
 - 1. Require attendance of parties directly affecting work of this section.
 - 2. Review conditions of installation, installation procedures, and coordination with related work.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on cleaning compounds.
- C. Shop Drawings: Indicate setting details of stone. Detail shoring.
- D. Samples: Submit two samples of face brick units to illustrate matching color, texture and extremes of color range.

1.6 QUALITY ASSURANCE - MASONRY WORK

- A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
 - 1. Maintain one copy of each document on project site.
- B. Restorer: Company specializing in masonry restoration with minimum three years of documented experience.

1.7 MOCK-UPS

- A. See Section 01 40 00 - Quality Requirements for additional requirements.
- B. Restore and repoint an existing masonry wall area sized 8 feet long by 6 feet high; include in mock-up area instances of mortar, accessories, wall openings, and flashings.
- C. Clean a 10 ft by 10 ft panel of wall to determine extent of cleaning.
 - 1. Repeat, using different cleaning methods for up to three different panels.
- D. Locate where directed.
- E. Mock-up may remain as part of the Work.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver masonry neatly stacked and tied on pallets. Store clear of ground with adequate waterproof covering.
- B. Store materials in covered, well-ventilated area protected from exposure to detrimental conditions, including airborne contaminants, dirt, dust, sunlight, temperatures lower than 40 degrees F or greater than 100 degrees F, rainfall, sparks, or flame, and in accordance with the manufacturer's requirements. Store polymer resins and hardeners in separate area from construction materials that can absorb odors.

1.9 FIELD CONDITIONS - MASONRY WORK

- A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Restoration and Cleaning Chemicals:
 - 1. Cathedral Stone Products; Jahn M90- Concrete & Heavy Duty Cleaner
 - 2. Diedrich Technologies, Inc: www.diedrichtechnologies.com/#sle.
 - 3. PROSOCO: www.prosoco.com/#sle.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 CLEANING MATERIALS

- A. Cleaning Agent: Detergent type.
- B. Cleaning Agent: 0.5 lb of sodium hydrosulphite mixture to one gallon of water.
- C. Acid Solution: Clean, stain free, commercial hydrochloric (muriatic) acid, mixed one part to 10 parts of potable water.

2.3 CONCRETE REPAIR MATER

- A. Horizontal and Vertical Concrete Repair: Single component, cementitious, mineral based based mortar.
- B. Compressive Strength: 3000 PS
- C. Tensile Bending Strength: 560 PSI
- D. Tensile Strength: 510 PSI at 28 days

- E. Adhesion: 185 SI
- F. Product shall not contain latex or acrylic bonding agents or additives.
- G. Custom color to match existing masonry shall be provided.
- H. Surface Preparation:
 - 1. Surfaces shall be sound and free of all dust, dirt, grease, laitance and/or any other coating or foreign substance which may prevent proper adhesion of repair material.
 - 2. Remove all loose and deteriorated concrete from the repair area (min depth 1/2") using manual or pneumatic cutting techniques or mechanical abrasion such as sandblasting, water blasting, shot blasting, or chipping.
 - 3. The sides of the repair area should be square cut; incorrect installation will cause repairs to fail prematurely.
 - 4. Wash the prepared surfaces with clean water and a bristle brush to remove dust from the pores.
- I. Application:
 - 1. Moisten the substrate using clean water. Mortar should be applied to a glistening wet surface on vertical application and to a dampened surface on horizontal applications with no water pooling. Do not install the product on any dry surfaces as this will cause the product to fail.
 - 2. Apply a "peanut butter" consistency product over the moist surface at a 1/8" thick.
 - a. Horizontal Surfaces: Apply material flush to the surface and finish to a tight steel troweled finish, float, or broom to achieve a textured effect. When repairing vertical surfaces, building up material beyond the surface of the substrate. After achieving initial set, scrape away excess mortar until the desired profile is reached.
- J. Curing:
 - 1. Traditional Cure:
 - a. Periodically mist concrete repaired area for at least a 72 hour period. The timing for initial water misting will vary with ambient conditions.
- K. Clean up: Remove uncured mortar from the perimeter of the repair before it dries using clean water and a rubber sponge. Repeat several times with clean water to prevent halo effect. Cured mortar may only be removed chemically or mechanically.

2.4 MORTAR MATERIALS

- A. Comply with requirements of Section 04 05 11.

2.5 MASONRY MATERIALS

- A. Brick: Section 04 20 00.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces to be cleaned are ready for work of this section.

3.2 PREPARATION

- A. Protect surrounding elements from damage due to restoration procedures.
- B. Carefully remove and store removable items located in areas to be restored, including fixtures, fittings, finish hardware, and accessories; reinstall upon completion.

- C. Separate areas to be protected from restoration areas using means adequate to prevent damage.
- D. Cover existing landscaping with tarpaulins or similar covers.
- E. Mask immediately adjacent surfaces with material that will withstand cleaning and restoration procedures.
- F. Close off adjacent occupied areas with dust proof and weatherproof partitions.
- G. Protect roof membrane and flashings from damage with 1/2 inch plywood laid on roof surfaces over full extent of work area and traffic route.
- H. When using cleaning methods that involve water or other liquids, install drainage devices to prevent runoff over adjacent surfaces unless those surfaces are impervious to damage from runoff.
- I. Do not allow cleaning runoff to drain into sanitary or storm sewers.

3.3 REBUILDING

- A. Cut out damaged and deteriorated masonry with care in a manner to prevent damage to any adjacent remaining materials.
- B. Support structure as necessary in advance of cutting out units.
- C. Cut away loose or unsound adjoining masonry as directed.
- D. Build in new units following procedures for new work specified in other section(s).
- E. Mortar Mix: Colored and proportioned to match existing work.
- F. Ensure that anchors are correctly located and built in.
- G. Install built in masonry work to match and align with existing, with joints and coursing true and level, faces plumb and in line. Build in all openings, accessories and fittings.

3.4 REPOINTING

- A. Perform repointing prior to cleaning masonry surfaces.
- B. Cut out loose or disintegrated mortar in joints to minimum 1/2 inch depth or until sound mortar is reached.
- C. Do not damage masonry units.
- D. When cutting is complete, remove dust and loose material by brushing.

3.5 CLEANING EXISTING MASONRY

- A. Cleaning Detergent: Brush clean masonry surfaces at all locations with cleaning agent in accordance with the manufacturer's instructions. Saturate masonry with clean water and flush loose mortar and dirt.

3.6 CLEANING NEW MASONRY

- A. Verify mortar is fully set and cured.
- B. Clean surfaces and remove large particles with wood scrapers, brass or nylon wire brushes.
- C. Scrub walls with cleaning agent solution using stiff brush. Thoroughly rinse and wash off cleaning solution, dirt and mortar crumbs using clean, pressurized water.

- D. Use acid solution mixed with water in accordance with manufacturer's instructions. Apply acid solution and scrub masonry with stiff fiber brushes. Do not scrub the mortar joints.
- E. Protect area below cleaning operation and keep masonry soaked with water and flushed free of acid and dissolved mortar continuously for duration of cleaning.
- F. Before solution dries, rinse and remove acid solution and dissolved mortar, using clean, pressurized water.

3.7 RESTORATION CLEANING

- A. Clean surfaces and remove large particles with wood scrapers or non-ferrous wire brush.
- B. Spray coat masonry with restoration cleaner, mixed into solution in accordance with manufacturer's instructions.
- C. Provide a second application if required to match mock-up area.
- D. Allow sufficient time for solution to remain on masonry and agitate with soft fiber brush or sponge.
- E. Rinse from the bottom up with potable water applied at 400 psi and at a rate of 4 gal/min.

3.8 AGING

- A. Rub in new masonry work to match, as close as possible, adjacent original work.
 - 1. Use carbon black in small amounts, rubbing in well with burlap rags.
- B. After each application, dust off surplus and wash down with low pressure hose. Allow surface to dry before proceeding with succeeding applications.
- C. Continue process until acceptance.

3.9 CLEANING

- A. Immediately remove stains, efflorescence, or other excess resulting from the work of this section.
- B. Remove excess mortar, smears, and droppings as work proceeds and upon completion.
- C. Clean surrounding surfaces.

END OF SECTION

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SECTION 04 05 11
MASONRY MORTARING AND GROUTING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Mortar for masonry.
- B. Grout for masonry.

1.2 RELATED REQUIREMENTS

- A. Section 04 20 00 - Unit Masonry: Installation of mortar and grout.
- B. Section 08 11 13 - Hollow Metal Doors and Frames: Products and execution for grouting steel door frames installed in masonry.

1.3 REFERENCE STANDARDS

- A. ASTM C91/C91M - Standard Specification for Masonry Cement; 2023.
- B. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2018.
- C. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2018.
- D. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.
- E. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2024.
- F. ASTM C476 - Standard Specification for Grout for Masonry; 2023.
- G. ASTM C780 - Standard Test Methods for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2023.
- H. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2016.
- I. ASTM C1019 - Standard Test Method for Sampling and Testing Grout for Masonry; 2020.
- J. ASTM C1072 - Standard Test Methods for Measurement of Masonry Flexural Bond Strength; 2022.
- K. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2023b.
- L. ASTM C1714/C1714M - Standard Specification for Preblended Dry Mortar Mix for Unit Masonry; 2019a.
- M. ASTM E518/E518M - Standard Test Methods for Flexural Bond Strength of Masonry; 2022.
- N. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

- B. Product Data: Include design mix and indicate whether the Proportion or Property specification of ASTM C270 is to be used. Also include required environmental conditions and admixture limitations.
- C. Samples: Submit two samples of mortar, illustrating mortar color and color range.
- D. Reports: Submit reports on mortar indicating conformance of mortar to property requirements of ASTM C 270 and test and evaluation reports per ASTM C 780 for aggregate ratio and water content, air content, consistency, and compressive strength.
- E. Reports: Submit reports on grout indicating compliance of component grout materials to requirements of ASTM C476 and test and evaluation reports to requirements of ASTM C1019.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- G. Manufacturer's Installation Instructions: Submit packaged dry mortar manufacturer's installation instructions.

1.5 QUALITY ASSURANCE

- A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.7 FIELD CONDITIONS

- A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.
- B. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

PART 2 PRODUCTS

2.1 MORTAR AND GROUT APPLICATIONS

- A. At Contractor's option, mortar and grout may be field-mixed from packaged dry materials or made from factory premixed dry materials with addition of water only.
- B. Mortar Mix Designs: ASTM C270, Property Specification.
 - 1. Masonry below grade and in contact with earth: Type M.
 - 2. Exterior Masonry Veneer: Type N.
 - 3. Exterior, Loadbearing Masonry: Type S.
 - 4. Exterior, Non-loadbearing Masonry: Type S.
 - 5. Exterior Repointing Mortar: Type N with maximum 2 percent ammonium stearate or calcium stearate per cement weight.
 - 6. Interior, Loadbearing Masonry: Type S.
 - 7. Interior, Non-loadbearing Masonry: Type N.

2.2 MATERIALS

- A. Packaged Dry Material for Mortar for Unit Masonry: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C1714/C1714M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.

MASONRY MORTARING AND GROUTING

1. Color: Custom color to match existing.
- B. Packaged Dry Material for Grout for Masonry: Premixed cementitious materials and dried aggregates; capable of producing grout of the specified strength in accordance with ASTM C476 with the addition of water only.
- C. Portland Cement: ASTM C150/C150M.
 1. Type: Type I - Normal; ASTM C150/C150M.
 2. Color: Custom color to match existing.
- D. Masonry Cement: ASTM C91/C91M.
 1. Type: Type N; ASTM C91/C91M.
 2. Colored Mortar: Custom color to match existing.
- E. Hydrated Lime: ASTM C207, Type S.
- F. Mortar Aggregate: ASTM C144, standard masonry type.
- G. Grout Aggregate: ASTM C404, coarse.
- H. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
- I. Water: Clean and potable.
- J. Bonding Agent: Latex type.

2.3 MORTAR MIXING

- A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C270 and in quantities needed for immediate use.
- B. Maintain sand uniformly damp immediately before the mixing process.
- C. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio; mix in accordance with manufacturer's instructions, uniform in coloration.
- D. Do not use anti-freeze compounds to lower the freezing point of mortar.
- E. If water is lost by evaporation, re-temper only within two hours of mixing.
- F. Use mortar within two hours after mixing at temperatures of 90 degrees F or two-and-one-half hours at temperatures under 50 degrees F.

2.4 GROUT MIXING

- A. Mix grout in accordance with ASTM C94/C94M.
- B. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476 for fine and coarse grout.
- C. Add admixtures in accordance with manufacturer's instructions; mix uniformly.
- D. Do not use anti-freeze compounds to lower the freezing point of grout.

PART 3 EXECUTION

3.1 PREPARATION

- A. Apply bonding agent to existing concrete surfaces.

MASONRY MORTARING AND GROUTING

- B. Plug clean-out holes for grouted masonry with brick masonry units. Brace masonry to resist wet grout pressure.

3.2 INSTALLATION

- A. Install mortar and grout to requirements of section(s) in which masonry is specified.
- B. Install grout in accordance with TMS 402/602 and ASTM C476.
- C. Work grout into masonry cores and cavities to eliminate voids.
- D. Do not install grout in lifts greater than 16 inches without consolidating grout by rodding.
- E. Do not displace reinforcement while placing grout.
- F. Remove excess mortar from grout spaces.

3.3 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field tests, in accordance with provisions of Section 01 40 00 - Quality Requirements.
- B. Test and evaluate mortar mix in accordance with ASTM C780 procedures.
- C. Test and evaluate grout mix in accordance with ASTM C1019 procedures.
- D. Prism Tests: Test masonry and mortar panels for compressive strength in accordance with ASTM C1314, and for flexural bond strength in accordance with ASTM C1072 or ASTM E518/E518M; perform tests and evaluate results as specified in individual masonry sections.

END OF SECTION

SECTION 04 20 00
UNIT MASONRY

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Concrete block.
- B. Clay facing brick.
- C. Reinforcement and anchorage.
- D. Flashings.
- E. Accessories.

1.2 RELATED REQUIREMENTS

- A. Section 01 40 00 - Quality Requirements.
- B. Section 04 01 00 - Maintenance of Masonry.
- C. Section 04 05 11 - Masonry Mortaring and Grouting.
- D. Section 05 50 00 - Metal Fabrications: Loose steel lintels.
- E. Section 07 21 00 - Thermal Insulation: Insulation for cavity spaces.
- F. Section 07 25 00 - Weather Barriers: Water-resistive barriers applied to exterior face of backing sheathing or unit masonry substrate.
- G. Section 07 62 00 - Sheet Metal Flashing and Trim: Through-wall masonry flashings.
- H. Section 07 84 00 - Firestopping: Firestopping at penetrations of fire-rated masonry and at top of fire-rated walls.
- I. Section 07 92 00 - Joint Sealants: Sealing control and expansion joints.

1.3 REFERENCE STANDARDS

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- B. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2024b.
- C. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2019.
- D. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2022.
- E. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2022.
- F. ASTM C67/C67M - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile; 2023.
- G. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2023.

UNIT MASONRY

- H. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2023.
- I. ASTM C140/C140M - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units; 2023a.
- J. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale); 2023.
- K. ASTM C780 - Standard Test Methods for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2023.
- L. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2015, with Editorial Revision (2022).
- M. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2017.
- N. BIA Technical Notes No. 13 - Ceramic Glazed Brick Exterior Walls; 2017.
- O. BIA Technical Notes No. 18A - Accommodating Expansion of Brickwork; 2019.
- P. BIA Technical Notes No. 28B - Brick Veneer/Steel Stud Walls; 2005.
- Q. BIA Technical Notes No. 46 - Maintenance of Brick Masonry; 2017.
- R. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.
- C. Samples: Submit two samples of facing brick units to illustrate color, texture, and extremes of color range. Brick must match the range of color and texture of the existing brick or as selected by Architect.
- D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.
- E. Manufacturer's Certificate: Certify that water repellent admixture manufacturer has certified masonry unit manufacturer as an approved user of water repellent admixture in the manufacture of concrete block.
- F. Test Reports: Concrete masonry manufacturer's test reports for units with integral water repellent admixture.

1.6 QUALITY ASSURANCE

- A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
- B. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum three years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.7 MOCK-UPS

- A. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high; include mortar, accessories, structural backup, and flashings (with lap joint, corner, and end dam) in mock-up.
- B. Locate where directed.
- C. Mock-up may remain as part of work.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.
- B. Handle and store pre-faced concrete block units in protective cartons or trays. Do not remove from protective packaging until ready for installation.

PART 2 PRODUCTS

2.1 CONCRETE MASONRY UNITS

- A. Manufacturers:
 - 1. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
 - a. Southern Tier Concrete Products.
 - b. Dagostino Building Blocks.
 - c. York Building Products, Inc.
 - d. Substitutions: Section 01 60 00 - Product Requirements.
- B. Concrete Block: Comply with referenced standards and as follows:
 - 1. Size: Standard units with nominal face dimensions of 16 by 8 inches and nominal depths as indicated on drawings for specific locations.
 - 2. Special Shapes: Provide nonstandard blocks configured for corners and other detailed conditions.
 - a. Provide bullnose units for outside corners.
 - 3. Load-Bearing Units: ASTM C90, normal weight.
 - 4. Nonloadbearing Units: ASTM C129.

2.2 BRICK UNITS

- A. Manufacturers:
 - 1. Belden Brick: www.beldenbrick.com/#sle.
 - 2. Glen-Gery Brick: www.glengery.com.
 - 3. Substitutions: See section 01 60 00 - Product Requirements.
- B. Facing Brick: ASTM C216, Type FBS Smooth, Grade SW.
 - 1. Color and texture to match Architect's sample.
 - 2. Nominal size: As indicated on drawings.
 - 3. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.

2.3 MORTAR AND GROUT MATERIALS

- A. Mortar and Grout: As specified in Section 04 05 11.

2.4 REINFORCEMENT AND ANCHORAGE

- A. Manufacturers:
 - 1. WIRE-BOND www.wirebond.com/#sle.
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Reinforcing Steel: Type specified in Section 03 30 00; size as indicated on drawings; uncoated finish.
- C. Multiple Wythe Joint Reinforcement: ASTM A951/A951M.
 - 1. Type: Truss.
 - 2. Material: ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M Class 3.
 - 3. Size: 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not less than 5/8 inch of mortar coverage on each exposure.
- D. Adjustable Multiple Wythe Joint Reinforcement: ASTM A951/A951M.
 - 1. Type: Truss, with adjustable ties or tabs spaced at 16 in on center.
 - 2. Material: ASTM A1064/A1064M steel wire, hot dip galvanized after fabrication to ASTM A153/A153M Class B.
 - 3. Size: 0.1875 inch side rods with 0.1483 inch cross rods and adjustable components of 0.1875 inch wire, width of components as required to provide not less than 5/8 inch of mortar coverage from each masonry face.
 - 4. Vertical adjustment: Not more than 1 1/4 inches.
 - 5. Insulation Clips: Provide clips at tabs or ties designed to secure insulation against outer face of inner wythe of masonry.
- E. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not less than 5/8 inch of mortar coverage from masonry face.
 - 1. Concrete frame: Dovetail anchors of bent steel strap, nominal 1 inch width x 0.024 in thick, with trapezoidal wire ties 0.1875 inch thick, hot dip galvanized to ASTM A 153/A 153M, Class B.
 - 2. Concrete frame: Dovetail anchors of bent steel strap, nominal 1 inch width x 0.024 in thick, with corrugated strap ties of nominal 1 inch width and 0.075 inch thick, hot dip galvanized to ASTM A 153/A 153M, Class B.
 - 3. Steel frame: Crimped wire anchors for welding to frame, 0.25 inch thick, with trapezoidal wire ties 0.1875 inch thick, hot dip galvanized to ASTM A 153/A 153M, Class B.
- F. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
 - 1. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
 - 2. Wire ties: Manufacturer's standard shape, 0.1875 inch thick.
 - 3. Vertical adjustment: Not less than 3-1/2 inches.

2.5 FLASHINGS

- A. EPDM Flashing: ASTM D4637/D4637M, Type I, 0.040 inch thick.
 - 1. Manufacturers:
 - a. Hohmann & Barnard, Inc: www.h-b.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Termination Bars: Stainless steel; compatible with membrane and adhesives.
 - 1. Manufacturers:
 - a. Hohmann & Barnard, Inc: www.h-b.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Drip Edge: Stainless steel; angled drip with hemmed edge; compatible with membrane and adhesives.

- D. Lap Sealants and Tapes: As recommended by flashing manufacturer; compatible with membrane and adhesives.

2.6 ACCESSORIES

- A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
 - 1. Manufacturers:
 - a. Hohmann & Barnard, Inc: www.h-b.com/#sle.
 - b. WIRE-BOND: www.wirebond.com/#sle.
- B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding; in maximum lengths available.
 - 1. Manufacturers:
 - a. Hohmann & Barnard, Inc: www.h-b.com/#sle.
 - b. WIRE-BOND: www.wirebond.com/#sle.
- C. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
 - 1. Dove Tail Mortar Diverter: Panels designed for installation at flashing locations.
 - a. Manufacturers:
 - 1) Advanced Building Products, Inc; Mortar Break DT: www.advancedbuildingproducts.com/#sle.
 - 2) Mortar Net Solutions: www.mortarnet.com/#sle.
 - 3) WIRE-BOND: www.wirebond.com/#sle.
- D. Weeps:
 - 1. Type: Extruded propylene with honeycomb design.
 - 2. Color(s): Clear.
- E. Cavity Vents:
 - 1. Type: Extruded propylene with honeycomb design.
 - 2. Color(s): Clear.
- F. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials. All material cleaning shall be done as recommended by material supplier.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.2 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
- B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.3 COLD AND HOT WEATHER REQUIREMENTS

- A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.
- B. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

3.4 COURSING

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units:
 - 1. Bond: Running, unless shown otherwise in contract documents.
 - 2. Coursing: One unit and one mortar joint to equal 8 inches.
 - 3. Mortar Joints: Concave.
- D. Brick Units:
 - 1. Bond: Running, unless shown otherwise in contract documents.
 - 2. Coursing: Three units and three mortar joints to equal 8 inches.
 - 3. Mortar Joints: Concave.

3.5 PLACING AND BONDING

- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- B. Lay hollow masonry units with face shell bedding on head and bed joints.
- C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- D. Remove excess mortar and mortar smears as work progresses.
- E. Interlock intersections and external corners.
- F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- H. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.
- I. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.
- J. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.6 WEEPS/CAVITY VENTS

- A. Install weeps in veneer and cavity walls at 24 inches on center horizontally on top of through-wall flashing above shelf angles and lintels and at bottom of walls.
- B. Install cavity vents in veneer and cavity walls at 32 inches on center horizontally below shelf angles and lintels and near top of walls.

3.7 CAVITY MORTAR CONTROL

- A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.

- B. For cavity walls, build inner wythe ahead of outer wythe to receive cavity insulation and air/vapor retarder adhesive.
- C. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.
- D. Install cavity wall vents in veneer at 16 inch o.c. horizontally at top of exterior walls and below windowsills.

3.8 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

- A. Masonry Back-Up: Embed anchors to bond veneer at maximum 16 inches on center vertically and 24 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.
- B. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 24 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

3.9 REINFORCEMENT AND ANCHORAGES - MULTIPLE WYTHER UNIT MASONRY

- A. Use individual metal ties installed in horizontal joints to bond wythes together. Provide ties spaced as indicated on drawings.
- B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

3.10 MASONRY FLASHINGS

- A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
 - 1. Extend flashings full width at such interruptions and at least 6 inches, minimum, into adjacent masonry or turn up flashing ends at least 1 inch, minimum, to form watertight pan at nonmasonry construction.
 - 2. Remove or cover protrusions or sharp edges that could puncture flashings.
 - 3. Seal lapped ends and penetrations of flashing before covering with mortar.
- B. Terminate flashing up 8 inches minimum on vertical surface of backing:
 - 1. Install vertical leg of flashing behind water-resistive barrier sheet over backing.
 - 2. Install vertical leg of flashing over fluid-applied or self-adhered air/vapor barriers over backing or per manufacturer's directions.
 - 3. Terminate vertical leg of flashing into bed joint in masonry or reglet in concrete.
 - 4. Anchor vertical leg of flashing into backing with a termination bar and sealant.
 - 5. Apply cap bead of sealant on top edge of self-adhered flashing.
- C. Install flashing in accordance with manufacturer's instructions and BIA Technical Notes No. 7.
- D. Extend metal flashings through exterior face of masonry and terminate in an angled drip with hemmed edge. Install joint sealer below drip edge to prevent moisture migration under flashing.
- E. Extend EPDM flashings to within 1/2 inch of exterior face of masonry and adhere to top of stainless steel angled drip with hemmed edge.
- F. Lap end joints of flashings at least 6 inches, minimum, and seal watertight with flashing sealant/adhesive.

3.11 LINTELS

- A. Install loose steel lintels over openings.
- B. Maintain minimum 6 inch bearing on each side of opening.

3.12 GROUTED COMPONENTS

- A. Reinforce bond beams with 2, No. 5 bars, 1 inch from bottom web unless noted otherwise on contract documents.
- B. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.

3.13 CONTROL AND EXPANSION JOINTS

- A. Locate control and expansion joints as indicated on drawings and in accordance with recommendations of BIA Technical Notes No. 18A.
 - 1. Where joint locations are not indicated, or discrepancy exists between indicated joints and BIA recommendations, notify Architect for approval prior to proceeding.
- B. Do not continue horizontal joint reinforcement through control or expansion joints.
- C. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
- D. Form expansion joint as detailed on drawings.

3.14 BUILT-IN WORK

- A. As work progresses, install built-in metal door frames and glazed frames and other items to be built into the work and furnished under other sections.
- B. Install built-in items plumb, level, and true to line.
- C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
 - 1. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
- D. Do not build into masonry construction organic materials that are subject to deterioration.

3.15 TOLERANCES

- A. Maximum Variation from Alignment of Columns: 1/4 inch.
- B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- F. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch.
- G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.16 CUTTING AND FITTING

- A. Cut and fit for chases, ductwork, pipes, ductwork, conduit, ductwork, sleeves, ductwork, grounds, ductwork, and ductwork. Coordinate with other sections of work to provide correct size, shape, and location.

- B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.17 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.
 - 1. The agency shall monitor the proportioning, mixing, and consistency of mortar and grout; the placement of mortar, grout and masonry units; and the placement or reinforcing steel for compliance with the contract documents.
- B. Clay Masonry Unit Tests: Test each variety of clay masonry in accordance with ASTM C67/C67M requirements, sampling 5 randomly chosen units for each 50,000 installed.
- C. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C140/C140M for compliance with requirements of this specification.
- D. Mortar Tests: Test each type of mortar in accordance with ASTM C780, testing with same frequency as masonry samples.
- E. The agency shall prepare one set of prisms for testing at 7 days and one set for testing at 28 days. Tests are to be conducted by the agency for each 3,000 square feet of wall installed, but not less than two tests.

3.18 CLEANING

- A. Remove excess mortar and mortar droppings.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.
- D. Use non-metallic tools in cleaning operations.

3.19 PROTECTION

- A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.
- B. Protect base of walls from mud and mortar splatter.
- C. Protect masonry and other items built into masonry walls from mortar droppings and staining caused by mortar.
- D. Protect tops of masonry work with waterproof coverings secured in place without damaging masonry. Provide coverings where masonry is exposed to weather when work is not in progress.

END OF SECTION

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SECTION 05 12 00
STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Structural steel framing members, support members.
- B. Base plates, shear stud connectors, expansion joint plates, and anchors.
- C. Grouting under base plates.

1.2 RELATED REQUIREMENTS

- A. Section 01 30 00 - Administrative Requirements: Coordination and Project Conditions

1.3 REFERENCE STANDARDS

- A. AISC (MAN) - Steel Construction Manual; 2023, with Errata (2024).
- B. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges; 2022, with Errata (2025).
- C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- F. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
- G. ASTM A563/A563M - Window Cleaning Safety Standard; 2001.
- H. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2022.
- I. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel; 2021.
- J. ASTM E164 - Standard Practice for Contact Ultrasonic Testing of Weldments; 2019.
- K. ASTM E165/E165M - Standard Practice for Liquid Penetrant Testing for General Industry; 2023.
- L. ASTM E709 - Standard Guide for Magnetic Particle Testing; 2021.
- M. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions; 2019.
- N. ASTM F959/F959M - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners, Inch and Metric Series; 2017a.
- O. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2020.

- P. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2023.
- Q. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- R. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).
- S. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
- T. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.
- U. SSPC-SP 3 - Power Tool Cleaning; 2024.
- V. UL (FRD) - Fire Resistance Directory; Current Edition.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 - 1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
 - 2. Connections.
 - 3. Indicate cambers.
 - 4. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.
- D. Mill Test Reports: Indicate structural strength, destructive test analysis and non-destructive test analysis.

1.5 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with AISC (MAN) "Steel Construction Manual."
- B. Maintain one copy of each document on site.
- C. Fabricator: Company specializing in performing the work of this section with minimum 5 years of documented experience with current AISC Quality Management Systems (QMS) Certification, Certified Building Fabricator, BU.
 - 1. Non AISC certified companies are acceptable with the following requirements:
 - a. A special inspector hired by the owner will be required to observe all fabrication of the structural steel for this project.
 - b. The cost for the special inspection fees incurred during fabrication shall be reimbursed to the owner by the contractor.
- D. Erector: Company specializing in performing the work of this section with minimum 5 years of documented experience.
- E. Design connections not detailed on drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of New York.
- F. Shop Painter: Company specializing in performing Work of this section with minimum 3 years documented experience with the following current AISC Certification:
 - 1. Sophisticated Paint Endorsement - Enclosed (P1)
 - 2. Sophisticated Paint Endorsement - Covered (P2)
 - 3. Sophisticated Paint Endorsement - Outside (P3)

- G. Welders and Welding Procedures: AWS D1.1 Structural Welding Code - Steel, qualified within previous 12 months.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Steel Angles and Plates: ASTM A36/A36M.
- B. Steel W Shapes and Tees: ASTM A992/A992M.
- C. Rolled Steel Structural Shapes: ASTM A992/A992M.
- D. Cold-Formed Structural Tubing: ASTM A500/A500M, Grade C.
- E. High-Strength Structural Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, with matching compatible ASTM A563/A563M nuts and ASTM F436/F436M washers.
- F. Headed Anchor Rods: ASTM F1554 Grade 36, plain.
- G. Load Indicator Washers: Provide washers complying with ASTM F959/F959M at connections requiring high-strength bolts.
- H. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- I. Sliding Bearing Plates: Teflon coated.
- J. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- K. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.2 FABRICATION

- A. Shop fabricate to greatest extent possible.
- B. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
- C. Fabricate connections for bolt, nut, and washer connectors.

2.3 FINISH

- A. Prepare structural component surfaces in accordance with SSPC-SP 3.
- B. Shop prime structural steel members. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted.
 - 1. Color: Gray
- C. Galvanize structural steel members to comply with ASTM A123/A123M. Provide minimum 1.7 oz/sq ft galvanized coating. Galvanize after fabrication.
- D. All exterior exposed steel to be galvanized.
- E. Galvanizing for Fasteners, connectors and Anchors
 - 1. Hot-dipped Galvanizing: ASTM A153/A153M.
 - 2. Mechanical Galvanizing: ASTM B695; Class 50 minimum.

2.4 SOURCE QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.
- B. Shop test bolted and welded connections as specified for field quality control tests.
- C. When fabricator is approved by authority having jurisdiction, submit certificate of compliance indicating work performed at fabricator's facility conforms to Contract Documents.
 - 1. Specified shop tests are not required for Work performed by approved fabricator.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.
 - 1. Verify bearing surfaces are at correct elevation.
 - 2. Verify anchor rods are set in correct locations and arrangements with correct exposure for steel attachment.

3.2 ERECTION

- A. Erect structural steel in compliance with AISC 303.
- B. Allow for erection loads and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. Field weld components indicated on shop drawings.
- D. Field connect members with threaded fasteners; torque to required resistance. Tighten to snug tight for bearing type connections.
- E. Do not field cut or alter structural members without approval of Architect.
- F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.3 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

3.4 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing, and 01 45 33 - Code-Required Special Inspections and Procedures.
- B. Bolted Connections: Inspect in accordance with AISC specifications.
 - 1. Visually inspect all bolted connections.
 - 2. For Direct Tension Indicators, comply with requirements of ASTM F959/F959M. Verify that gaps are less than specified in Table 2.
- C. Welded Connections: Inspect welds in accordance with AWS D1.1/D1.1M.
 - 1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.

2. Visually inspect all welds.
 3. Radiographic testing performed in accordance with ASTM E94/E94M. Performed when directed by Architect/Engineer.
 4. Ultrasonic testing performed in accordance with ASTM E164. Perform on all full penetration welds.
 5. Liquid penetrant inspection performed in accordance with ASTM E165/E165M.
 6. Magnetic particle inspection performed in accordance with ASTM E709. Performed when directed by Architect/Engineer.
- D. Correct defective bolted connections and welds.

END OF SECTION

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SECTION 05 31 00
STEEL DECKING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Roof deck.
- B. Metal form deck.
- C. Bearing plates and angles.

1.2 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Concrete topping over metal deck; placement of anchors for bearing plates in precast concrete.
- B. Section 04 20 00 - Unit Masonry: Placement of anchors for bearing plates embedded in unit masonry assemblies.
- C. Section 05 12 00 - Structural Steel Framing: Support framing for openings larger than 18 inches and shear stud connectors.
- D. Section 05 50 00 - Metal Fabrications: Steel angle concrete stops at deck edges.

1.3 REFERENCE STANDARDS

- A. ASCE 3 - Standard Practice for the Construction and Inspection of Composite Slabs.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- C. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished; 2018.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- E. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2023, with Editorial Revision.
- F. ASTM A924/A924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process; 2022a.
- G. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).
- H. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018, with Errata (2022).
- I. SDI (DM) - Publication No.30, Design Manual for Composite Decks, Form Decks, and Roof Decks; 2007.
- J. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittals procedures.
- B. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.

- C. Certificates: Certify that products furnished meet or exceed specified requirements.
- D. Submit manufacturer's installation instructions.

1.5 PERFORMANCE REQUIREMENTS

- A. Design metal deck in accordance with SDI 29 Design Manual.

1.6 QUALITY ASSURANCE

- A. Design deck layout, spans, fastening, and joints under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of New York.
- B. Installer Qualifications: Company specializing in performing the work of this Section with minimum 5 years of documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Cut plastic wrap to encourage ventilation.
- C. Separate sheets and store deck on dry wood sleepers; slope for positive drainage.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Steel Deck Manufacturers:
 - 1. United Steel Deck: www.unitedsteel.com
 - 2. Nucor-Vulcraft Group: www.vulcraft.com/#sle.
 - 3. Epic Metals Corporation: www.epicmetals.com
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 STEEL DECK

- A. All Deck Types: Select and design metal deck in accordance with SDI Design Manual.
 - 1. Calculate to structural working stress design and structural properties specified.
 - 2. Maximum Vertical Deflection of Roof Deck: 1/240 of span.
 - 3. Maximum Vertical Deflection of Form Deck: 1/360 of span.
- B. Roof Deck: Non-composite type, fluted steel sheet:
 - 1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating conforming to ASTM A924/A924M.
 - 2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
 - 3. Structural Properties:
 - a. Section Modulus: As indicated on drawings.
 - b. Span Design: Multiple.
 - 4. Minimum Base Metal Thickness: 20 gauge, 0.0359 inch unless noted otherwise on drawings.
 - 5. Nominal Height: 1-1/2 inch.
 - 6. Profile: Fluted; SDI WR.
 - 7. Formed Sheet Width: 36 inch.
 - 8. Side Joints: Lapped.
 - 9. Flute Sides: plain vertical face

STEEL DECKING

2.3 ACCESSORY MATERIALS

- A. Bearing Plates and Angles: ASTM A36/A36M steel unfinished.
- B. Welding Materials: AWS D1.1/D1.1M.
- C. Fasteners: Galvanized hardened steel, self tapping.
- D. Weld Washers: Mild steel, uncoated, 3/4 inch outside diameter, 1/8 inch thick.
- E. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.
- F. Flute Closures: Closed cell foam rubber, 1 inch thick; profiled to fit tight to the deck.
- G. Sheet Steel: ASTM A653, Grade 33 Structural Quality; with G90 galvanized coating conforming to ASTM A924

2.4 FABRICATED DECK ACCESSORIES

- A. Sheet Metal Deck Accessories: Metal closure strips, wet concrete stops, and cover plates, 20 gage thick sheet steel; of profile and size as indicated on drawings; finished same as deck.
- B. Cant Strips: Formed sheet steel, 20 gage, .0359 inch minimum thickness, 45 degree slope, 3-1/2 inch nominal width and height, flange for attachment.
- C. Roof Sump Pans: Formed sheet steel, 14 gauge, 0.0747 inch minimum thickness, flat bottom, sloped sides, recessed 1-1/2 inches below roof deck surface, bearing flange 3 inches wide, sealed watertight.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify existing conditions prior to beginning work.

3.2 INSTALLATION

- A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.
- B. On concrete and masonry surfaces provide minimum 4 inch bearing.
- C. On steel supports provide minimum 1-1/2 inch bearing.
- D. Fasten deck to steel support members at ends and intermediate supports as indicated on drawings.
- E. Mechanically fasten or weld male/female side laps as indicated on drawings.
- F. Weld deck in accordance with AWS D1.3/D1.3M.
- G. At deck openings from 6 inches to 18 inches in size, provide 2 by 2 by 1/4 inch steel angle reinforcement. Place angles perpendicular to flutes; extend minimum two flutes beyond each side of opening and fusion weld to deck at each flute.
- H. Where deck (other than cellular deck electrical raceway) changes direction, install 6 inch minimum wide sheet steel cover plates, of same thickness as deck. Fusion weld 12 inches on center maximum.

STEEL DECKING

- I. At floor edges, install wet concrete stops upturned to top surface of slab, to contain wet concrete. Provide stops of sufficient strength to remain stationary without distortion.
- J. At openings between deck and walls, columns, and openings, provide sheet steel closures and angle flashings to close openings.
- K. Close openings above walls and partitions perpendicular to deck flutes with double row of foam cell closures.
- L. Seal deck joints, laps, ends and penetrations with sealant to achieve permanent air seal consistent with air barrier system specified in Section 07 25 00.
- M. Place metal cant strips in position and fusion weld.
- N. Position roof drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.
- O. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.

3.3 FIELD QUALITY CONTROL

- A. Welding: Inspect welds in accordance with AWS D1.1

END OF SECTION

SECTION 05 50 00
METAL FABRICATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Shop fabricated steel, metal, and metal items including:
 - 1. Lintels
 - 2. Structural supports for miscellaneous attachments

1.2 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- B. Section 04 20 00 - Unit Masonry: Placement of metal fabrications in masonry.
- C. Section 05 12 00 - Structural Steel Framing: Structural steel column anchor bolts.
- D. Section 05 52 13 - Pipe and Tube Railings.
- E. Section 09 91 13 - Exterior Painting: Paint finish.

1.3 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- E. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
- F. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- G. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).
- H. NOMMA Guideline 1 - Joint Finishes
- I. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
- J. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.
- K. SSPC-SP 2 - Hand Tool Cleaning; 2024.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

1.5 QUALITY ASSURANCE

- A. Design metal fabrications under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of New York.
- B. Finish joints in accordance with NOMMA Guideline 1.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Accept metal fabrications on site in labeled shipments. Inspect for damage.
- C. Protect metal fabrications from damage by exposure to weather.

PART 2 PRODUCTS

2.1 MATERIALS - STEEL

- A. Steel Sections: ASTM A 36/A 36M.
- B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
- C. Steel Plates: ASTM A 36/A 36M.
- D. Pipe: ASTM A 53/A 53M Grade B Schedule 40, black finish.
- E. Slotted Channel Framing: ASTM A 653, Grade 33 Structural quality with galvanized coating.
- F. Mechanical Fasteners: Same material as or compatible with materials being fastened; type consistent with design and specified quality level.
- G. Bolts, Nuts, and Washers:
 1. Bolts: ASTM F3125; Type 1
 2. Nuts: ASTM A 563 heavy hex type
 3. Washers: ASTM F 436; Type 1
- H. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- I. Shop and Touch-Up Primer: SSPC-Paint 15, Type 1, complying with VOC limitations of authorities having jurisdiction.
 1. Color: Gray
- J. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.2 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Continuously seal joined members by continuous welds.
- D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- F. Furnish components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.3 FABRICATED ITEMS

- A. Lintels: Steel sections, size and configuration as detailed on drawings, length to allow 8 inches minimum bearing on both sides of opening.
 - 1. Galvanized and Prime paint, one coat
- B. Other Structural Supports: Steel sections, shape and size as indicated on drawings required to support applied loads with maximum deflection of 1/240 of the span; prime paint, one coat.
- C. Anchor bolts: ASTM F 1554; Grade 36, weldable, straight shape, Furnish with nut and washer; unfinished.
- D. Exterior Stair Nosings: 4 inch Wide Cast aluminum with intergrate abrasive treads. Model #801 (Poured Concrete stairs) Model 801SP (Poured concrete-filled steel pan stairs) as manufactured by American Safety Tread Company Inc. Color: Natural Metal Finish.

2.4 FINISHES - STEEL

- A. Prime paint steel items.
 - 1. Exceptions: Galvanize items to be embedded in concrete, items to be embedded in masonry, and items as specified in drawings.
 - 2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- D. Prime Painting: One coat.
- E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements.
- F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A 123/A 123M requirements; minimum 2.0 oz/sq ft coating thickness.
- G. Galvanizing for Fasteners, Connectors and Anchors: Hot-Dipped Galvanizing to ASTM A 153/A 153M.

2.5 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify that field conditions are acceptable and are ready to receive work.

3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Furnish setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.3 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components as indicated on drawings.
- D. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.4 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story or for every 12 ft in height whichever is greater, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

3.5 FIELD QUALITY CONTROL

- A. Welding: Inspect welds in accordance with AWS D1.1.

END OF SECTION

SECTION 05 51 33
METAL LADDERS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Shop-fabricated metal ladders.

1.2 RELATED REQUIREMENTS

- A. Section 09 91 13 - Exterior Painting: Paint finish.

1.3 REFERENCE STANDARDS

- A. 29 CFR 1910.23 - Ladders; Current Edition.
- B. 29 CFR 1926.1053 - Ladders; Current Edition.
- C. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008 (Reaffirmed 2018).
- D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- E. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- F. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.
- G. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2018.
- H. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
- I. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
- J. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
- K. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- L. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).
- M. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata (2020).
- N. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
- O. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.
- P. SSPC-SP 2 - Hand Tool Cleaning; 2024.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:

1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
2. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

C. Specimen warranty.

D. Executed warranty.

1.5 QUALITY ASSURANCE

- A. Design under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of New York.
- B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.2/D1.2M and dated no more than 12 months before start of scheduled welding work.

1.6 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 5-year manufacturer warranty for material and workmanship. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.1 MATERIALS - STEEL

- A. Steel Sections: ASTM A36/A36M.
- B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
- C. Plates: ASTM A283/A283M.
- D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
- E. Mechanical Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.
- F. Bolts, Nuts, and Washers: ASTM A307, plain.
- G. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- H. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- I. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.2 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Continuously seal joined members by continuous welds.

METAL LADDERS

- D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.3 FINISHES - STEEL

- A. Prepare surfaces to be primed in accordance with SSPC-SP2.
- B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- C. Prime Painting: One coat.
- D. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.
- E. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.
- F. All roof ladders to be galvanized and painted. Color to be selected by Architect.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.

3.3 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Obtain approval prior to site cutting or making adjustments not scheduled.

END OF SECTION

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SECTION 05 52 13
PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wall mounted handrails.

1.2 RELATED REQUIREMENTS

- A. Section 04 20 00 - Unit Masonry: Placement of anchors in masonry.
- B. Section 09 21 16 - Gypsum Board Assemblies: Placement of backing plates in stud wall construction.
- C. Section 09 91 23 - Interior Painting: Paint finish.

1.3 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures; 2006.
- C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.
- D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- E. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
- F. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
- G. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.
- H. ASTM B177/B177M - Standard Guide for Engineering Chromium Electroplating; 2011 (Reapproved 2021).
- I. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2019.
- J. ASTM B241/B241M - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube; 2022.
- K. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2021.
- L. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings; 2024.
- M. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- N. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021, with Errata (2023).

- O. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).
- P. AWS D1.6/D1.6M - Structural Welding Code - Stainless Steel; 2017, with Amendment (2021).
- Q. AWS C3.4M/C3.4 - Specification for Torch Brazing; 2016.
- R. AWS C3.5M/C3.5 - Specification for Induction Brazing; 2016, with Amendment (2017).
- S. AWS C3.9M/C3.9 - Specification for Resistance Brazing; 2020.
- T. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019.
- U. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
- V. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
 - 2. Include the design engineer's seal and signature on each sheet of shop drawings.
- C. Delegated Design Data: As required by authorities having jurisdiction.
 - 1. Calculations shall take into account all vertical and lateral loads required by applicable building codes. Calculations shall show all reactions for connection to structural members and shall be designed so that no eccentric or torsional forces are induced in the structural members.
 - 2. Calculations shall be prepared by and signed and sealed by a structural Engineer licensed in the State of New York.
- D. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated within the previous 12 months.

1.5 QUALITY ASSURANCE

- A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State of New York, or personnel under direct supervision of such an engineer.
- B. Welder Qualifications: Welding processes and welding operators qualified within previous 12 months.
- C. Fabricator Qualifications:
 - 1. A qualified steel fabricator that is certified by the American Institute for Steel Construction (AISC) under AISC 201.
 - 2. A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.
 - 3. A company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.

PART 2 PRODUCTS

2.1 RAILINGS - GENERAL REQUIREMENTS

- A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.
- A. Comply with ASTM E985.
- B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 75 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E 935.
- C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E 935.
- D. Allow for expansion and contraction of members and building movement without damage to connections or members.
- E. Dimensions: See drawings for configurations and heights.
 - 1. Top Rails and Wall Rails: 1-1/2 inches diameter, round.
- F. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
 - 1. For anchorage to masonry, provide brackets to be embedded in masonry, for bolting anchors.
 - 2. For anchorage to stud walls, provide backing plates, for bolting anchors.
 - 3. Posts: Provide adjustable flanged brackets.
- G. Provide welding fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.
- H. Welded and Brazed Joints: Make visible joints butt tight, flush, and hairline; use methods that avoid discoloration and damage of finish; grind smooth, polish, and restore to required finish.
 - 1. Ease exposed edges to a small uniform radius.
 - 2. Welded Joints:
 - a. Carbon Steel: Perform welding in accordance with AWS D1.1/D1.1M.
 - b. Stainless Steel: Perform welding in accordance with AWS D1.6/D1.6M.
 - 3. Brass/Bronze Brazed Joints:
 - a. Perform torch brazing in accordance with AWS C3.4M/C3.4.
 - b. Perform induction brazing in accordance with AWS C3.5M/C 3.5.
 - c. Perform resistance brazing in accordance with AWS C3.9M/C3.9.

2.2 STEEL RAILING SYSTEM

- A. Steel Pipe: ASTM A 53/A 53M Grade B Schedule 40, black finish.
- B. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
- C. Straight Splice Connectors: Steel welding collars.
- D. Galvanizing: In accordance with requirements of ASTM A123/A123M.
 - 1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic.
- E. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.3 FABRICATION

- A. Accurately form components to suit specific project conditions and for proper connection to building structure.

- B. Fit and shop assemble components in largest practical sizes for delivery to site.
- C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
- D. Welded Joints:
 - 1. Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
 - 2. Interior Components: Continuously seal joined pieces by continuous welds.
 - 3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- E. Weld connections that cannot be shop welded due to size limitations.
 - 1. Weld in accordance with AWS D1.1/D1.1M.
 - 2. Match shop welding and bolting.
 - 3. Clean welds, bolted connections, and abraded areas.
 - 4. Touch up shop primer and factory-applied finishes.
 - 5. Repair galvanizing with galvanizing repair paint per ASTM A780/A780M.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
- C. Install railings in compliance with ADA Standards for accessible design at applicable locations.
- D. Anchor railings securely to structure.
- E. Field weld anchors as indicated on shop drawings. Touch-up welds with primer. Grind welds smooth.
- F. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

3.4 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
- B. Maximum Offset From True Alignment: 1/8 inch.
- C. Maximum Out-of-Position: 1/8 inch.

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Rough opening framing for doors, windows, and roof openings.
- B. Concealed wood blocking, nailers, and supports.

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 03 30 00 - Cast-in-Place Concrete: Setting anchors in concrete.
- C. Section 03 54 00 - Cast Underlayment.
- D. Section 09 21 16 - Gypsum Board Assemblies: Gypsum-based sheathing.
- E. Section 10 28 00 - Toilet, Bath And Laundry Accessories.
- F. Division 22 and 26 – All products requiring blocking or backboards.

1.3 REFERENCE STANDARDS

- A. ALSC (American Lumber Standards Committee) - Softwood Lumber Standards.; 2011
- B. ANSI A208.1 - American National Standard for Particleboard; 2022.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- D. PS 1 - Structural Plywood; 2023.
- E. PS 20 - American Softwood Lumber Standard; 2025.
- F. SPIB (GR) - Standard Grading Rules; 2021.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide technical data on insulated sheathing, wood preservative materials, and application instructions.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

1.6 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 - 1. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
 - 2. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

2.2 EXPOSED DIMENSION LUMBER

- A. Sizes: Nominal sizes as indicated on drawings.
- B. Surfacing: S4S.
- C. Moisture Content: S-dry or MC19.

2.3 CONSTRUCTION PANELS

- A. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

2.4 ACCESSORIES

- A. Fasteners and Anchors:
 - 1. Metal and Finish: Stainless steel for high humidity and preservative-treated wood locations, hot dipped galvanized per ASTM A153/A153M elsewhere.
 - 2. Anchors: Toggle bolt type for anchorage to hollow masonry.
 - 3. Fasteners for roof replacements must be included in the Singly-Ply Roofing membrane manufacturer's warranty to meet uplift pressures determined in accordance with the Applicable Code using a basic wind speed of 120 MPH.

PART 3 EXECUTION

3.1 PREPARATION

- A. Coordinate installation of rough carpentry members specified in other sections.

3.2 INSTALLATION - GENERAL

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

3.3 BLOCKING, NAILERS, AND SUPPORTS

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- B. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.

- C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
- D. Provide the following specific nonstructural framing and blocking:
 - 1. Cabinets and shelf supports.
 - 2. Wall brackets.
 - 3. Handrails.
 - 4. Grab bars.
 - 5. Towel and bath accessories.
 - 6. Wall-mounted door stops.
 - 7. Chalkboards and marker boards.
 - 8. Wall paneling and trim.
 - 9. Joints of rigid wall coverings that occur between studs.

3.4 ROOF-RELATED CARPENTRY

- A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.
- B. Provide wood curb at each roof opening except where prefabricated curbs are specified and where specifically indicated otherwise; form corners by alternating lapping side members.

3.5 INSTALLATION OF CONSTRUCTION PANELS

- A. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
 - 1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
 - 2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
 - 3. Install adjacent boards without gaps.
 - 4. Size: 48 by 96 inches, installed horizontally at ceiling height.

3.6 TOLERANCES

- A. Variation from Plane, Other than Floors: 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.7 CLEANING

- A. Waste Disposal: See Section 01 74 19 - Construction Waste Management and Disposal.
 - 1. Comply with applicable regulations.
 - 2. Do not burn scrap on project site.
 - 3. Do not burn scraps that have been pressure treated.
 - 4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or "waste-to-energy" facilities.
- B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.
- C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

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SECTION 06 41 00
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Specially fabricated cabinet units.
- B. Hardware.
- C. Preparation for installing utilities.
- D. Custom designed millwork and other items as detailed on drawings.

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 06 10 00 - Rough Carpentry: Support framing, grounds, and concealed blocking.
- C. Section 09 65 00 - Resilient Flooring: Vinyl Base.
- D. Section 12 36 00 - Countertops.
- E. Division 22 - Plumbing utilities and fixtures.
- F. Division 26 and 27 - Power, signal and data wiring.

1.3 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board; 2022.
- C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- E. BHMA A156.9 - Cabinet Hardware; 2020.
- F. GSA CID A-A-1936 - Adhesives, Contact, Neoprene Rubber; 1996a (Validated 2013).
- G. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2020.
- H. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.
- I. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.
- J. WI (MAN) - Manual of Millwork; Woodwork Institute; 2003.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

1. Mock-up to be presented to Architect for approval during or just prior to this meeting.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
 1. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
 2. Include certification program label.
- C. Product Data: Provide data for hardware accessories.
- D. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches square, illustrating proposed cabinet and shelf unit substrate and finish.
- E. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum ten years of documented experience.
 1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.
 2. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
 3. Single Source Responsibility: Provide and install this work from single fabricator.
- B. Quality Certification:
 1. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
 2. Provide designated labels on shop drawings as required by certification program.
 3. Provide designated labels on installed products as required by certification program.
 4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.
 5. Replace, repair, or rework all work for which certification is refused.
- C. Perform work in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Custom quality, unless other quality is indicated for specific items.

1.7 MOCK-UPS

- A. Provide mock-up of typical base cabinet, wall cabinet, and countertop, including hardware, finishes, and plumbing accessories.
- B. See Section 01 40 00 - Quality Requirements for additional requirements.
- C. Locate where directed.
- D. Mock-up may remain as part of the work.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. See Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Protect units from moisture damage.

1.9 FIELD CONDITIONS

- A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.
- B. Do not install cabinets until all mortar, moisture and dust producing work is completed.
- C. Provide portable fans and ventilate rooms receiving new casework for minimum of one week after installation of new cabinets. Continue operation of fans and ventilation of rooms until owner determines that all fumes related to cabinets have been dissipated.
- D. Verify field measurements prior to fabrication.

1.10 REGULATORY REQUIREMENTS

- A. Cabinets and cabinet finish system are to meet Class "C" rating or better for flame spread (200 or less) and shall have a smoke developed rating of less than 450.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Campbell Rhea Division Mohon International, Inc; ICI Scientific: Heritage Maple Series.
- B. CiF Lab Solutions: www.cifsolutions.com.
- C. EM Pfaff & Son; (607) 739-3691.
- D. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Single Source Responsibility: Provide this work from single fabricator.

2.2 CABINETS

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- B. Species of Veneer: Maple.
- C. Cut or Slicing of Veneer: Plain / Flat Sliced.
- D. Matching of Individual Leaves to Each Other: Book matching.
- E. Matching Across the Panel Face: Pair matching.
- F. Matching of Panels to Each Other: Sequence matched uniform size sets.
- G. Cabinet Frame: Solid hardwood lumber with pinned mortise and tenon joints.
- H. Stiles and Rails: Solid Maple lumber.
- I. Wood Drawer Fronts: 3/4" thick solid Maple core with Maple veneer; Interior rabbeted edges with 3/8" exterior radiused edge.
- J. Drawer Boxes: Solid hardwood lumber (1/2" thick) with dovetailed joints.
- K. Drawer Bottoms: 1/4" hardwood plywood.
- L. Cabinet Back: 1/4" hardwood plywood.
- M. Cabinet Sides: 3/4" 7-ply hardwood plywood with Maple veneer on all exposed surfaces.
 - 1. Tall cabinets with 3/4" sides shall be constructed with a fixed center shelf rigidly attached to either side of the cabinet to prevent bowing of the sides.

- N. Cabinet Tops: 1" hardwood plywood for all cabinet tops.
- O. Cabinet Bottoms: 1" hardwood plywood for all wall cabinets.
- P. Shelves: 1" hardwood plywood, full depth, for all shelves, interior or exposed.
 - 1. Maple plywood where exposed.
 - 2. Exposed plywood edge is to be covered with a factory applied one-piece 3/8" thick solid Maple nosing.
- Q. Wood Doors:
 - 1. Maple veneer over 3/4 inch x 1 1/8 inch wide solid Maple frame. Maple veneer to be on front and back of door. Interior rabbeted edges with 3/8" exterior radiused edge.
 - 2. Tall cabinets to be 1 inch thick lipped reveal overlay style.
 - a. Core Construction: particleboard.
- R. Exposed Edges: All exposed plywood edges are to be covered with a factory applied one-piece 3/8" thick solid Maple nosing.
- S. Cabinet Baseboard: 3/4" hardwood plywood.
- T. Finished Baseboard: 4" vinyl base. See finish schedule for color.
- U. Wood Trim: Solid Maple lumber. Size as indicated on drawings.

2.3 PANEL MATERIALS

- A. Veneer Faced Plywood Finish: HPVA HP-1; graded in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, core of veneer (wood plies); type of glue recommended for specific application; thickness as required; face veneer as follows:
 - 1. Exposed Surfaces: Grade AA, Maple, plain sliced, book-matched.
 - 2. Semi-Exposed Surfaces: Grade A, Maple, rotary cut, random-matched.
 - 3. Concealed Surfaces: Grade B, Maple, rotary cut, random-matched.
- B. Particleboard: ANSI A208.1; medium density industrial type as specified in AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, composed of wood chips bonded with moisture resistant adhesive under heat and pressure; sanded faces; thickness as required; use for components indicated on drawings.
- C. Hardwood Edgebanding: Use solid hardwood edgebanding matching species, color, grain, and grade for exposed portions of cabinetry.

2.4 COUNTERTOPS

- A. Countertops: See Section 12 36 00.

2.5 ACCESSORIES

- A. Adhesive: Type recommended by fabricator to suit application.
- B. Fasteners: Size and type to suit application.
- C. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
- D. Concealed Joint Fasteners: Threaded steel.
- E. Tack Board and Fabric: Fiber Board: ASTM C208, cellulosic, dry type, 3/8 inch thick with 1/8 inch thick layer cork for a total thickness of 1/2 inch, Class A rated material.
 - 1. Provide at all casework wall cabinets. Refer to drawings for additional information.
 - 2. Tack board covering: Vinyl coated fabric roll stock, conforming to the following;

- a. Total Thickness: 9 mil.
- b. Total Weight: 14 oz/sq yd.
- c. Vinyl Finish Weight 18 oz/sq yd.
- d. Roll Width: 54 inches
- e. Pattern: Linen
- f. Over-coating Stain resistant Polyvinyl fluoride, .0005 inch thick.

2.6 HARDWARE

- A. Cabinet Hardware: Comply with BHMA A156.9 for hardware types and grades indicated below:
 1. Hardware Types: As indicated on drawings.
 2. Product Grade: Grade 2.
- B. Bumper Pads: All moving items, including but not limited to, doors and drawers shall be provided with manufacturer's standard bumper pads to ensure quiet closure.
- C. Adjustable Shelf Supports: Standard side-mounted system using multiple holes for clip supports and coordinated shelf rests, for nominal 1-1/4" inch spacing adjustments.
 1. Shelf clip supports shall be dual peg, plastic, with minimum length of 2-1/4".
 - a. Clips shall have integral hold down tabs to secure 3/4 and 1 inch shelves.
 - b. Capacity: 300 pounds per clip.
- D. Drawer and Door Pulls: Die cast aluminum pull, Brushed aluminum finish, 4" centers.
 1. Product: MCPTRP2506BSN manufactured by Miseno.
- E. Cabinet Locks: Keyed cylinder, master keyed, steel with satin finish.
 1. All locks within each room keyed the same. Each room keyed differently.
 2. Provide four (4) keys per room.
 3. Equip each lock with removable core, similar to CompX National locks.
 4. Provide locks at all doors and drawers, unless noted otherwise in Contract Drawings.
 5. Tall Hinged Doors: Three-point latching system.
- F. Cabinet Catches:
 1. Type: Nylon roller type. Tall cabinets to have heavy duty rubber rollers.
- G. Drawer Slides:
 1. Type: Full extension.
 2. Static Load Capacity: Heavy Duty grade; 200 lb, minimum.
 3. Mounting: Side mounted.
 4. Action to be progressive movement on precision ball bearings.
 5. Stops: Integral type.
 6. Manufacturers:
 - a. Fulterer USA; FR 5210: www.fultererusa.com.
- H. Hinges: Butt, five knuckle disappearing type, 2-3/4 inch and .090 inch thick with hospital tips, steel with polished finish.
- I. Sliding Door Track Assemblies: Upper and lower track of galvanized steel construction, ball bearing carriers fitted within tracks, multiple pendant suspension attachments for door.

2.7 FABRICATION

- A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
- B. Edging: Fit shelves, doors, and exposed edges with 3/8" thick solid Maple nosing. Do not use more than one piece for any single length.

- C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
- D. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes, and fixtures and fittings. Verify locations of cutouts from on-site dimensions. Seal cut edges.

2.8 SHOP FINISHING

- A. Sand work smooth and set exposed nails and screws.
- B. For opaque finishes, apply wood filler in exposed nail and screw indentations and sand smooth.
- C. On items to receive transparent finishes, use wood filler matching or blending with surrounding surfaces and of types recommended for applied finishes.
- D. Seal surfaces in contact with cementitious materials.
- E. Topcoats are to be baked on.
- F. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
 - 1. Transparent:
 - a. System - 1, Lacquer, Nitrocellulose.
 - b. Stain: As selected by Architect.
 - c. Sheen: Flat.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify adequacy of backing and support framing.
- C. Verify location and sizes of utility rough-in associated with work of this section.

3.2 INSTALLATION

- A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.
- B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
- C. Use fixture attachments in concealed locations for wall mounted components.
- D. Use concealed joint fasteners to align and secure adjoining cabinet units and countertops.
- E. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
- F. Secure cabinets and counter bases to floor using appropriate angles and anchorages.
- G. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.
- H. Provide and install all trim and filler panels required to fill in all gaps between casework, lockers and adjacent wall or ceiling surfaces or to provide closure of mechanical items. Provide a complete seamless installation. (Filler panels must also be installed in gaps on top of casework).

1. Trim and filler panels to match material and finish of cabinets. Filler panels shall be of equivalent length at each side of each run of casework.

3.3 ADJUSTING

- A. Section 01 70 00 - Execution and Closeout Requirements: Testing, adjusting and balancing.
- B. Adjust moving or operating parts to function smoothly and correctly.

3.4 CLEANING

- A. Section 01 70 00 - Execution and Closeout Requirements: Final cleaning.
- B. Clean casework, counters, shelves, hardware, fittings, and fixtures.
- C. Ensure finished work is free of all markings made during fabrication.

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SECTION 07 05 53
FIRE AND SMOKE ASSEMBLY IDENTIFICATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Identification markings for fire and smoke rated partitions, and fire rated walls.

1.2 RELATED REQUIREMENTS

- A. Section 07 84 00 - Firestopping

1.3 REFERENCE STANDARDS

- A. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed product literature for each type of marking, indicating font, foreground and background colors, wording, and overall dimensions.
- C. Schedule: Completely define scope of proposed marking, and indicate location of affected walls and partitions, and number of markings.
- D. Samples: Submit two samples of each type of marking proposed for use, of size similar to that required for project, illustrating font, wording, and method of application.

1.5 QUALITY ASSURANCE

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

1.6 FIELD CONDITIONS

- A. Do not install adhered markings when ambient temperature is lower than recommended by label or sign manufacturer.
- B. Do not install painted markings when ambient temperature is lower than recommended by coating manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Partition Identification Labels:
 - 1. Fire Wall Signs, Inc: www.firewallsigns.com/#sle.
 - 2. Safety Supply Warehouse, Inc: www.safetysupplywarehouse.com/#sle.
 - 3. Stencil Ease: www.stencilease.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 FIRE AND SMOKE ASSEMBLY IDENTIFICATION

- A. Regulatory Requirements: Comply with "Marking and Identification" requirements of "Fire-Resistance Ratings and Fire Tests" chapter of ICC (IBC).
- B. Adhered Fire and Smoke Assembly Identification Signs: Printed vinyl sign with factory applied adhesive backing.
- C. Applied Fire and Smoke Assembly Identification: Identification markings applied to partition with paint or permanent ink and a code compliant stencil.
- D. Location: On fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions; within concealed space where there is an accessible concealed floor, floor-ceiling, or attic space.
- E. Languages: Provide sign markings in English.
- F. Format: Whether adhered or applied, identification shall include, at a minimum:
 - 1. Lettering: Not less than three inches in height with a minimum 3/8 inch stroke, in contrasting color.
 - 2. Wording shall include, as applicable:
 - a. Wall Type, i.e FIRE BARRIER or SMOKE BARRIER, or similar.
 - b. Fire Resistance Rating, i.e. ONE HOUR, TWO HOUR, or similar.
 - c. PROTECT ALL OPENINGS.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.

3.2 INSTALLATION

- A. Locate markings as required by ICC (IBC).
 - 1. No more than fifteen feet from end of each rated wall.
 - 2. No more than thirty feet interval measured horizontally along the rated wall or partition.
 - 3. Rated walls shall be identified on each side.
- B. Install adhered markings in accordance with manufacturer's instructions.
 - 1. Where adhered markings are used, a suitable Class A backer, permanently attached to the wall, may be used when wall surface would preclude adhesion.
- C. Install applied markings in accordance with manufacturer's instructions.
- D. Install neatly, with horizontal edges level.
- E. Protect from damage until Date of Substantial Completion; repair or replace damaged markings.

END OF SECTION

SECTION 07 21 00
THERMAL INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Board insulation and integral vapor retarder at cavity wall construction.

1.2 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Installation requirements for board insulation over steep slope roof sheathing or roof structure.

1.3 DEFINITIONS

- A. Mineral Fiber Material Composition: Insulation referred to as mineral fiber block, board, and blanket insulation is composed of fibers from mineral based substances such as rock, slag, or glass and processed from the molten state into fibrous form.
 - 1. Based on type of insulation substance, the material will be referred to as a mineral fiber when having a rock or slag base, and glass fiber with a glass or silica sand base, also considered a mineral.
 - 2. Insulation blankets are flexible units consisting of felted, bonded, or unbonded fibers formed into rolls or flat cut pieces referred to as batts; rolls are simply longer versions of batts.
 - 3. For additional information about mineral fiber and the various classification types, refer to the following reference standards; ASTM C553, ASTM C612, ASTM C665, and ASTM C726.

1.4 REFERENCE STANDARDS

- A. ASTM C240 - Standard Test Methods for Testing Cellular Glass Insulation Block; 2021.
- B. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation; 2022.
- C. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2013 (Reapproved 2019).
- D. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.
- E. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014 (Reapproved 2019).
- F. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2023.
- G. ASTM C726 - Standard Specification for Mineral Wool Roof Insulation Board; 2017.
- H. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2023a.
- I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- J. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
- C. ABAA Field Quality Control Submittals: Submit third-party reports of testing and inspection required by ABAA QAP.
- D. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.
- E. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.
- F. ABAA Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of contractor accreditation and installer certification on project site during and after installation. Present on-site documentation upon request.

1.6 QUALITY ASSURANCE

- A. Air Barrier Association of America (ABAA) Quality Assurance Program (QAP); www.airbarrier.org/#sle:
 - 1. Installer Qualification: Use accredited contractors, certified installers, evaluated materials, and third-party field quality control audit.
 - 2. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture. Use secondary materials approved in writing by primary material manufacturer.

1.7 FIELD CONDITIONS

- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.1 APPLICATIONS

- A. Insulation Inside Masonry Cavity Walls: Polyisocyanurate board.

2.2 FOAM BOARD INSULATION MATERIALS

- A. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, comply with ASTM C1289.
 - 1. Classifications:
 - a. Type I: Faced with aluminum foil on both major surfaces of the core foam.
 - 1) Class 1 - Non-reinforced core foam.
 - 2) Compressive Strength: 16 psi, minimum.
 - 3) Thermal Resistance, R-value: At 1-1/2 inch thick; 9.0, minimum, at 75 degrees F.
 - 2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
 - 3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
 - 4. Water Vapor Permeance: 1.2 perm, maximum, at 1 inch thickness, and when tested in accordance with ASTM E96/E96M, desiccant method.
 - 5. Board Size: 48 inch by 96 inch.
 - 6. Board Thickness: 2.0 inch min.

7. Board Edges: Square.

2.3 ACCESSORIES

- A. Tape: Reinforced polyethylene film with acrylic pressure sensitive adhesive.
 - 1. Application: Sealing of interior circular penetrations, such as pipes or cables.
 - 2. Width: Are required for application.
- B. Tape joints of rigid insulation in accordance with roofing and insulation manufacturers' instructions.
- C. Insulation Fasteners: Impaling clip of unfinished steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.
- D. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
- B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.2 BOARD INSTALLATION AT CAVITY WALLS

- A. Secure insulation fasteners to substrate at following frequency:
 - 1. Six (6) per insulation board.
- B. Adhere a 6 inches wide strip of polyethylene sheet over expansion joints with double beads of adhesive each side of joint.
 - 1. Tape seal joints between sheets.
 - 2. Extend sheet full height of joint.
- C. Install boards to fit snugly between wall ties.
 - 1. Place membrane surface facing out, and tape seal board joints.
- D. Install boards horizontally on walls.
 - 1. Place boards to maximize adhesive contact.
 - 2. Install in running bond pattern.
 - 3. Butt edges and ends tightly to adjacent boards and protrusions.
 - 4. Place impale fastener locking discs.
- E. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
- F. Place 6 inches wide polyethylene sheet at perimeter of wall openings, from adhesive vapor retarder bed to window and door frames, and tape seal in place to ensure continuity of vapor retarder and air seal.

3.3 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements for additional requirements.
- B. Coordination of Air Barrier Association of America (ABAA) Tests and Inspections:
 - 1. Provide testing and inspection required by ABAA Quality Assurance Program (QAP).

2. Notify ABAA in writing of schedule for air barrier work, and allow adequate time for testing and inspection.
3. Cooperate with ABAA testing agency.
4. Allow access to air barrier work areas and staging.
5. Do not cover air barrier work until tested, inspected, and accepted.

3.4 PROTECTION

- A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 07 25 00
WEATHER BARRIERS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Water-resistive barriers.

1.2 RELATED REQUIREMENTS

- A. Section 07 21 00 - Thermal Insulation: Weather barrier installed in conjunction with batt insulation.

1.3 DEFINITIONS

- A. Weather Barriers: Materials or assemblies forming water-resistive barriers, air barriers, vapor retarders, or combination of one or more assemblies.
- B. Water-Resistive Barriers: Materials or assemblies installed behind exterior wall coverings; designed to prevent liquid water from further penetration into exterior wall assembly.

1.4 REFERENCE STANDARDS

- A. ASTM D5590 - Standard Test Method for Determining the Resistance of Paint Films and Related Coatings to Fungal Defacement by Accelerated Four-Week Agar Plate Assay; 2017 (Reapproved 2021).
- B. ASTM E2357 - Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies; 2024.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- D. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.
- E. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
- F. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. ICC-ES AC212 - Acceptance Criteria for Water-Resistive Coatings Used as Water-Resistive Barriers over Exterior Sheathing; 2015, with Editorial Revision (2020).
- H. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2025.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on material characteristics.
- C. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.

1.6 FIELD CONDITIONS

- A. Maintain temperature and humidity recommended by materials manufacturers before, during, and after installation.

PART 2 PRODUCTS

2.1 WATER-RESISTIVE BARRIERS

- A. Description: Materials installed behind exterior wall coverings; designed to prevent liquid water from further penetration into exterior wall assembly. Primary materials include fluid-applied sheets; accessory materials include flashings and seam tapes.
- B. Regulatory Requirements: For use in ICC (IBC) construction Types I, II, III, and IV buildings greater than 40 feet in height.
 - 1. Comply with NFPA 285 wall assembly requirements in accordance with local building code and authorities having jurisdiction (AHJ).
- C. Water-Resistive Barrier Coating: Fluid-applied air and water-resistive coating for various exterior substrates.
 - 1. Dry Film Thickness (DFT): 17 mils, 0.017 inch, minimum.
 - 2. Air Permeance, Building Assembly Air Leakage Rate: Not greater than 0.04 cfm/sq ft when tested at 1.57 psf in accordance with ASTM E2357.
 - 3. Air Permeance, Building Material Air Leakage Rate: 0.004 cfm/sq ft maximum leakage when tested at 1.57 psf pressure difference in accordance with ASTM E2178.
 - 4. Water-Resistive Barrier over Sheathing Compliance: Complying with ICC-ES AC212.
 - 5. Water Vapor Permeance: Tested in accordance with ASTM E96/E96M.
 - a. Procedure A: Greater than 5 perms.
 - b. Procedure B: Greater than 14 perms.
 - 6. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 120 days of weather exposure.
 - 7. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, Class A when tested in accordance with ASTM E84.
 - 8. Resistance to Fungal Growth: No growth when tested in accordance with ASTM D5590.
 - 9. System Accessory Products: As recommended by coating manufacturer.
 - 10. Products:

2.2 ACCESSORIES

- A. Seal and Perimeter Tapes: As recommended by water-resistive barrier manufacturer.
- B. Flashings and Sealants: As recommended by water-resistive barrier manufacturer for application.
- C. Building Insulation: See Section 07 21 00.
- D. Sealant for Cracks and Joints In Substrates: Resilient elastomeric joint sealant compatible with substrates and weather barrier materials.
 - 1. Application: Apply at 30 to 40 mil, 0.030 to 0.040 inch nominal thickness.
 - 2. Color: Green.
- E. Primer: Liquid applied polymer.
 - 1. Color: Green.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and conditions comply with requirements of this section.

3.2 PREPARATION

- A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
- B. Clean and prime substrate surfaces to receive adhesives and sealants in accordance with manufacturer's installation instructions.

3.3 INSTALLATION

- A. Install materials in accordance with manufacturer's installation instructions.
- B. Apply sealants within recommended temperature range in accordance with manufacturer's installation instructions.
- C. Fluid-Applied Assemblies:
 - 1. Prepare substrate in accordance with coating manufacturer's installation instructions; treat joints in substrate and between dissimilar materials as indicated.
 - 2. Where exterior masonry veneer is being applied, install masonry anchors prior to placement of water-resistive barrier over masonry substrate; seal airtight around anchors.
 - 3. Apply bead or trowel coat of mastic sealant with minimum thickness of 1/4 inch along coating seams, rough cuts, and as recommended by manufacturer.
 - 4. Apply flashing to seal with adjacent construction and to bridge joints in coating substrate.
- D. Openings and Penetrations in Exterior Water-Resistive Barriers:
 - 1. Install flashing over sills, covering entire sill framing member, and extend at least 5 inches onto water-resistive barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
 - 2. At openings filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with sealing tape at least 4 inches wide; do not seal sill flange.
 - 3. At openings filled with nonflanged frames, seal water-resistive barrier to each side of framing at opening using flashing at least 9 inches wide, and covering entire depth of framing.
 - 4. At head of openings, install flashing under water-resistive barrier extending at least 2 inches beyond face of jambs; seal water-resistive barrier to flashing.
 - 5. At interior face of openings, seal gaps between window and door frames and rough framing using appropriate joint sealant over backer rod.
 - 6. Service and Other Penetrations: Form flashing around penetrating items and seal to surface of water-resistive barrier.

3.4 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements for additional requirements.
- B. Owner's Inspection and Testing: Cooperate with Owner's testing agency.
 - 1. Allow access to work areas and staging.
 - 2. Notify Owner's testing agency in writing of schedule for work of this section to allow sufficient time for testing and inspection.
 - 3. Do not cover work of this section until testing and inspection is accepted.
- C. Do not cover installed water-resistive barriers until required inspections have been completed.
- D. Obtain approval of installation procedures from water-resistive barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.

3.5 PROTECTION

- A. Do not leave materials exposed to weather longer than recommended by manufacturer.
- B. Do not leave paper- or felt-based barriers exposed to weather for longer than one week.

END OF SECTION

SECTION 07 53 00
ELASTOMERIC MEMBRANE ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Elastomeric roofing membrane, adhered conventional application.
- B. Insulation, tapered.
- C. Deck sheathing.
- D. Cover boards.
- E. Roofing cant strips, stack boots, roofing expansion joints, and walkway pads.

1.2 RELATED REQUIREMENTS

- A. Section 05 31 00 - Steel Decking: Placement of acoustical insulation for deck flutes.
- B. Section 07 25 00 - Weather Barriers
- C. Section 07 62 00 - Sheet Metal Flashing and Trim: Counterflashings, reglets.

1.3 REFERENCE STANDARDS

- A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- B. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2023a.
- C. ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers; 2000 (Reapproved 2020).
- D. ASTM D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact; 2020.
- E. ASTM D4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method; 1983 (Reapproved 2018).
- F. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2015, with Editorial Revision (2022).
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- H. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.
- I. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.
- J. FM DS 1-28 - Wind Design; 2015, with Editorial Revision (2024).
- K. UL 1256 - Standard for Fire Test of Roof Deck Constructions; 2018.
- L. UL (DIR) - Online Certifications Directory; Current Edition.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with installation of associated counterflashings installed under other sections.
- B. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers; review preparation and installation procedures and coordination and scheduling necessary for related work.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.
- C. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, and setting plan for tapered insulation.
- D. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum ten years documented experience, and approved by manufacturer.
- C. All products including substrate boards, vapor retarders, insulation, fasteners, fastening plates and edgings must be manufactured and/or supplied by the roofing system manufacturer and covered by the warranty.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original containers, dry and undamaged, with seals and labels intact.
- B. Store materials in weather protected environment, clear of ground and moisture.
- C. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.
- D. Protect foam insulation from direct exposure to sunlight.

1.8 FIELD CONDITIONS

- A. Do not apply roofing membrane during unsuitable weather.
- B. Do not apply roofing membrane when ambient temperature is below 40 degrees F or above 90 degrees F.
- C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
- E. Schedule applications so that no partially completed sections of roof are left exposed at end of workday.

1.9 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Correct defective work within a two year period after Date of Substantial Completion.
- C. Provide 30 year manufacturer's material and labor warranty to cover failure to prevent penetration of water.
 - 1. Warranty shall be a non-prorated, full system warranty with no dollar limit and shall include, but not limited to the following:
 - a. Wind warranty coverage up to 90 MPH, three second gust at 33 feet above ground level.
 - 1) Certification is required with submittals indicating the manufacturer has reviewed and agreed to such wind coverage.
 - b. Membrane material warranty on the field membrane.
 - c. Puncture resistance.
 - d. Signed by Manufacturer of primary roof materials and their authorized installer.
 - 2. Evidence of the manufacturer's warranty reserve shall be included as part of the project submittals for the specifier's approval.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. EPDM Membrane Materials:
 - 1. Carlisle SynTec Systems; Sure-Tough EPDM: www.carlisle-syntec.com/#sle.
 - 2. Elevate: www.holcimelevate.com/#sle.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Insulation:
 - 1. Carlisle SynTec: www.carlisle-syntec.com.
 - 2. Firestone Building Products, LLC: www.firestonebpco.com
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 ROOFING - UNBALLASTED APPLICATIONS

- A. Elastomeric Membrane Roofing: Single ply membrane, fully adhered, over vapor retarder and insulation.
- B. Roofing Assembly Requirements:
 - 1. Roof Covering External Fire Resistance Classification: UL (DIR) certified Class A.
 - 2. The specified roofing assembly must have been successfully tested by a qualified testing agency to resist the design uplift pressures calculated according to:
 - a. ANSI/SPRI WD-1 "Wind Design Standard Practice for Roofing Assemblies"
 - b. American Society of Civil Engineers (ASCE 7)
 - c. Applicable Building Code
 - 3. Insulation Thermal Resistance (R-Value): 5.7 per inch, minimum LTTR; provide insulation of thickness required to attain a minimum R-Value of 30.
- C. Acceptable Insulation Types - Constant Thickness Application:
 - 1. Minimum 2 layers of polyisocyanurate board.
- D. Acceptable Insulation Types - Tapered Application:
 - 1. Tapered polyisocyanurate board.

2.3 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

- A. Membrane: Ethylene-propylene-diene-terpolymer (EPDM); non-reinforced; complying with minimum properties of ASTM D4637/D4637M.
 - 1. Thickness: 0.090 inch (90 mil).
 - 2. Color: Black.
 - 3. Tear Strength: 150 lbf per inch, measured in accordance with ASTM D624.
 - 4. Brittleness Temperature: -49 degrees F, measured in accordance with ASTM D746.
- B. Seaming Materials: Minimum 6 inch seam tape.
- C. Vapor Retarder: Vapor retarder is a minimum 40 mil composite sheet consisting of a self-adhering rubberized asphalt membrane. The underlayment board shall be primed with Low VOC CCW-702 Primer or CCW Cav-Grip in accordance with manufacturer's specifications. Vapor retarder must have a perm rating of 0.05 or less as per ASTM E96/E96M. Vapor retarder must be rated by the manufacturer as a temporary roof with an allowable exposure to the elements for 90 days.
- D. Flexible Flashing Material: Same material as membrane.
 - 1. Thickness: 90 mil.
 - 2. Tensile Strength: 1,415 psi.
 - 3. Elasticity: 50 percent with full recovery without set.
 - 4. Color: Black.
- E. Liquid Flashing Material; Carlisle SynTec or approved equal:
 - 1. VapAir Seal Flashing Foam.
 - 2. LiquiSeal Flashing Fleece.
 - 3. LiquiSeal Liquid Flashing Resin.
 - 4. All components of liquid flashing system to be from a a single source manufacturer and be compatible with roofing membrane and design intent.

2.4 DECK SHEATHING AND COVERBOARD

- A. Deck Sheathing and Coverboard: Insulation underlayment board shall be ½ inch. Insulation overlayment board shall be minimum 3/8 inch. Boards shall be an impact resistant, non-structural, fiber reinforced gypsum panel manufactured with a 95% certified recycled content, with moisture and mold resistance throughout the panel core and surface; manufactured to conform to ASTM C1278.
 - 1. Manufacturers:
 - a. Carlisle SynTec: Securock.
 - b. Or Approved Equal.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.

2.5 INSULATION

- A. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, complying with ASTM C1289, and meeting UL 1256, component of a Class A Roof System.
 - 1. Classifications:
 - a. Type II: Faced with either cellulosic facers or glass fiber mat facers on both major surfaces of the core foam.
 - 1) Class 1 - Faced with glass fiber reinforced cellulosic felt facers on both major surfaces of core foam.
 - 2) Compressive Strength: Classes 1-2-3, Grade 2 - 20 psi (138 kPa), minimum.
 - 3) Thermal Resistance, R-value: At 1-1/2 inch thick; Class 1, Grades 1-2-3 - 8.4 (1.48) at 75 degrees F.
 - 2. Board Size: 48 by 96 inches.
 - 3. Board Thickness: 3.0 inch.
 - 4. Tapered Board: Slope as indicated; minimum thickness 1/2 inch; fabricate of fewest layers possible.
 - 5. Board Edges: Square.

2.6 ACCESSORIES

- A. Prefabricated Roofing Expansion Joint Flashing: Sheet butyl over closed-cell foam backing seamed to galvanized steel flanges.
- B. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.
- C. Cant and Edge Strips: Wood fiberboard, compatible with roofing materials ; cants formed to 45 degree angle.
- D. Membrane Adhesive: As recommended by membrane manufacturer.
- E. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.
- F. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.
- G. Insulation Adhesive: Two part low rise foam.
- H. Sealants: As recommended by membrane manufacturer.
- I. Walkway Pads: Suitable for maintenance traffic, contrasting color or otherwise visually distinctive from roof membrane.
 - 1. Composition: Roofing membrane manufacturer's standard.
 - 2. Surface Color: Black.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
- D. Verify deck surfaces are dry and free of snow or ice.
- E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.2 PREPARATION - CONCRETE DECK

- A. Fill surface honeycomb and variations with latex filler.
- B. Do not begin work until elevated concrete substrate has cured at least 28 days and moisture content is five percent or less.
 - 1. Test as Follows:
 - a. Concrete Moisture Content: No beading water under plastic after 16 hours when tested in accordance with ASTM D4263.
 - b. Relative Humidity in Concrete: Not greater than 75 percent when tested in accordance with ASTM F2170.

3.3 PREPARATION - METAL DECK

- A. Install preformed acoustical glass fiber insulation strips in roof deck flutes in accordance with manufacturer's instructions; see Section 05 31 00.

- B. Install deck sheathing on metal deck.
 - 1. Lay with long side at right angle to flutes; stagger end joints; provide support at ends.
 - 2. Cut sheathing cleanly and accurately at roof breaks and protrusions to provide smooth surface.
 - 3. Tape joints.
- C. Mechanically fasten sheathing to roof deck, 1 fastener every 2 sq. ft. in field & perimeter & 1 per 1 sq. ft in the corners..
 - 1. Surfaces to receive vapor barrier must be clean and dry.
 - 2. Prime all surfaces to receive vapor retarder. Prime in accordance with manufacturer's specifications.
 - 3. Prime only areas receiving vapor barrier on the same day. Reprime if area becomes dirty.

3.4 INSTALLATION - VAPOR RETARDER AND INSULATION, UNDER MEMBRANE

- A. Apply rubberized asphalt self adhering vapor retarder to sheathed deck surface with adhesive in accordance with manufacturer's instructions.
 - 1. Apply vapor barrier from low point to high point, in a single fashion, so that laps will shed water.
 - 2. Overlap all edges 2 1/2 inches minimum. End laps shall be staggered.
 - 3. Place membrane carefully so as to avoid wrinkles and fishmouths.
 - 4. Immediately after installation, roll with a 100-150 pound weighted steel roller.
 - 5. Extend vapor retarder under cant strips and blocking to deck edge.
 - 6. Install flexible flashing from vapor retarder to air seal material of wall construction, lap and seal to provide continuity of the air barrier plane.
 - a. Coordinate with Section 07 25 00.
- B. Ensure vapor retarder is clean and dry, continuous, and ready for application of insulation.
- C. Attachment of Insulation:
 - 1. Embed first layer of insulation in adhesive beads 4" on center in accordance with roofing and insulation manufacturers' instructions.
- D. Lay subsequent layers of insulation with joints staggered minimum 6 inches from joints of preceding layer.
- E. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.
- F. On metal deck, place boards parallel to flutes with insulation board edges bearing on deck flutes for support.
- G. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
- H. Secure all insulation, staggering all joints, to the vapor retarder with adhesive in accordance with the manufacturer's specifications in beads 4" on center.
- I. Insulation adhesive must have a nominal free-rise core density of 2.2 pounds per cubic foot, and be a 2 part low rise foam adhesive with 100% adhesion.
- J. At roof drains, use factory-tapered boards to slope down to roof drains over a distance of 18 inches.
- K. Do not apply more insulation than can be covered with membrane in same day.

3.5 INSTALLATION - MEMBRANE

- A. Roll out membrane, free from wrinkles, air pockets or tears. Place sheet into place without stretching.

- B. Allow the membrane to relax for approximately 1/2 hour before bonding.
- C. Fold the sheet back onto itself so half of the underside of the membrane is exposed.
- D. Shingle joints on sloped substrate in direction of drainage.
- E. Fully Adhered Application: Apply adhesive to substrate at rate of manufacturer's published instructions gal/square. Fully embed membrane and substrate in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.
- F. Roll the coated membrane into the coated substrate while avoiding wrinkles. Brush down the bonded half of the membrane sheet with a soft bristle push broom to achieve maximum contact.
- G. Fold back the unbonded half of the membrane sheet and repeat the bonding procedure.
- H. Membrane Splicing: 6 inch pre-applied splice tape is required. All details and splice procedures shall be performed to meet or exceed the specified warranty requirements.
 - 1. Overlap adjacent sheets and mark a line 1/2 inch out from the top sheet.
 - 2. Fold the top sheet back and clean the dry splice area (minimum 6 inches wide) of the membrane with primer as required by the membrane manufacturer.
 - 3. Apply primer to the EPDM sheet. Press membrane and tape onto the sheet using hand pressure.
 - 4. Remove the release film and press the top sheet onto the tape using hand pressure.
 - 5. Roll the seam toward the splice edge with a 2 inch wide steel roller.
 - 6. Splice intersections are to be overlaid with 6" x 6" and 12"x12" T joint cover plates.
- I. At intersections with vertical surfaces:
 - 1. Extend membrane over cant strips and up a minimum of 6 inches onto vertical surfaces. Install expansion joints at locations where structures are separate.
 - 2. Fully adhere flexible flashing over membrane and up to termination bars. Install counterflashings and seal.
 - 3. Do not extend membrane or membrane flashing over existing masonry weep holes or through wall flashing.
- J. At gravel stops, extend membrane under gravel stop and to the outside face of the wall.
- K. Around roof penetrations, seal flanges and flashings with flexible flashing.
- L. Install roofing expansion joints where indicated. Make joints watertight.
 - 1. Install prefabricated joint components in accordance with manufacturer's instructions.
- M. Coordinate installation of roof drains and sumps and related flashings.

3.6 CLEANING

- A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.
- B. Remove bituminous markings from finished surfaces.
- C. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.
- D. Repair or replace defaced or damaged finishes caused by work of this section.

3.7 PROTECTION

- A. Protect installed roofing and flashings from construction operations.
- B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

SECTION 07 54 00
THERMOPLASTIC MEMBRANE ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Flashings.

1.2 REFERENCE STANDARDS

- A. ASTM D6878/D6878M - Standard Specification for Thermoplastic Polyolefin-Based Sheet Roofing; 2021.
- B. NRCA (RM) - The NRCA Roofing Manual; 2024.
- C. NRCA (WM) - The NRCA Waterproofing Manual; 2021.

1.3 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data indicating membrane materials, flashing materials.
- C. Manufacturer's qualification statement.
- D. Installer's qualification statement.
- E. Warranty Documentation:
 - 1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
 - 2. Submit installer's written verification that installation complies with warranty conditions for waterproof membrane.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum 10 years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with at least 10 years of documented experience.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original containers, dry and undamaged, with seals and labels intact, unless otherwise indicated.
- B. Store materials in weather protected environment, clear of ground and moisture.
- C. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.
- D. Protect foam insulation from direct exposure to sunlight.

1.6 FIELD CONDITIONS

- A. Do not apply roofing membrane during unsuitable weather.

- B. Do not apply roofing membrane when ambient temperature is below 40 degrees F or above 90 degrees F.
- C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
- E. Schedule applications so that no partially completed sections of roof are left exposed at end of workday.

1.7 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Material Warranty: Provide membrane manufacturer's warranty agreeing to replace material that shows manufacturing defects within five years after installation.
- C. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
 - 1. Warranty Term: 20 years.
 - 2. For repair and replacement include costs of both material and labor in warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Thermoplastic Polyolefin (TPO) Membrane Roofing Materials:
 - 1. Carlisle Roofing Systems, Inc; Sure-Weld TPO: www.carlisle-syntec.com/#sle.
 - 2. Johns Manville; JM TPO - 60 mil: www.jm.com/#sle.

2.2 MEMBRANE ROOFING AND ASSOCIATED MATERIALS

- A. Membrane Roofing Materials:
 - 1. TPO: Thermoplastic polyolefin (TPO) complying with ASTM D6878/D6878M, sheet contains reinforcing fabrics or scrims.
 - a. Thickness: 60 mil, 0.060 inch, minimum.
 - 2. Sheet Width:
 - a. Adhered Application: Limit width to 120 inches, maximum, when ambient temperatures are less than 40 degrees F for extended period of time during installation.
 - 3. Solar Reflectance: 0.75, minimum, initial, and 0.65, minimum, 3-year, certified by Cool Roof Rating Council.
 - 4. Thermal Emissivity: 0.80, minimum, initial, and 0.79, minimum, 3-year, certified by Cool Roof Rating Council.
 - 5. Color: White.
- B. Seaming Materials: As recommended by membrane manufacturer.
- C. Flexible Flashing Material: Same material as membrane.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.2 INSTALLATION, GENERAL

- A. Perform work in accordance with manufacturer's instructions, NRCA (RM), and NRCA (WM) applicable requirements.
- B. Do not apply roofing membrane during cold or wet weather conditions.
- C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.
- D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

3.3 INSTALLATION - MEMBRANE

- A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.
- B. Shingle joints on sloped substrate in direction of drainage.
- C. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.
- D. At intersections with vertical surfaces:
 - 1. Extend membrane over cant strips and up a minimum of 4 inches onto vertical surfaces.
 - 2. Fully adhere flexible flashing over membrane and up to nailing strips.
- E. Around roof penetrations, seal flanges and flashings with flexible flashing.
- F. Coordinate installation of roof drains and sumps and related flashings.

3.4 CLEANING

- A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.
- B. Remove bituminous markings from finished surfaces.
- C. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.
- D. Repair or replace defaced or damaged finishes caused by work of this section.

3.5 PROTECTION

- A. Protect installed roofing and flashings from construction operations.
- B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

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SECTION 07 62 00
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fabricated sheet metal items, including flashings, counterflashings, gutters, downspouts, and other items indicated in Schedule.
- B. Sealants for joints within sheet metal fabrications.

1.2 REFERENCE STANDARDS

- A. ANSI/SPRI/FM 4435/ES-1 - Test Standard for Edge Systems Used with Low Slope Roofing Systems; 2022.
- B. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
- C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
- D. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2018).
- E. CDA A4050 - Copper in Architecture - Handbook; current edition.
- F. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Samples: Submit two samples, 6 by 6 inches in size, illustrating metal finish color.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.
- B. Perform work in accordance with ANSI/SPRI/FM 4435/ES-1 requirements for pull-off resistance to design wind pressure as defined by applicable local building code.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.1 SHEET MATERIALS

- A. Pre-Finished Aluminum: ASTM B209/B209M, 3005 alloy, H12 or H14 temper; 18 gauge, 0.040 inch thick; plain finish shop pre-coated with silicone modified polyester coating.
 - 1. Polyvinylidene Fluoride (PVDF) Coating: Superior performing organic powder coating, AAMA 2605; pretreated metal with two-coat system including primer and color coat with at least 70 percent PVDF coating.
 - 2. Color: As selected by Architect from manufacturer's full colors.
- B. Stainless Steel: ASTM A666/A666M, Type 304 alloy, soft temper, 28 gauge, 0.0156 inch thick; smooth No. 4 - Brushed finish.

2.2 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest possible lengths.
- C. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- D. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- E. Fabricate corners from one piece with minimum 18-inch long legs; seam for rigidity, seal with sealant.
- F. Fabricate flashings to allow toe to extend 2 inches over roofing membrane. Return and brake edges.

2.3 DOWNSPOUTS

- A. Downspouts: Square profile.
- B. Downspouts: 4"x4" indicated. Verify size to match existing.
- C. Accessories: Profiled to suit downspouts.
 - 1. Anchorage Devices: In accordance with SMACNA (ASMM) requirements.
 - 2. Downspout Supports: Brackets.
- D. Downspout Boots: Cast iron.
- E. Seal metal joints.

2.4 ACCESSORIES

- A. Fasteners: Stainless steel, with soft neoprene washers.
- B. Primer Type: Zinc chromate.
- C. Concealed Sealants: Non-curing butyl sealant.
- D. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.
- E. Asphalt Roof Cement: ASTM D4586/D4586M, Type I, asbestos-free.
- F. Reglets: Surface-mounted type, galvanized steel; face and ends covered with plastic tape.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.2 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Install scuppers to lines and levels indicated on Drawings. Seal top of reglets with sealant
- C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil, 0.015 inch.

3.3 INSTALLATION

- A. Apply plastic cement compound between metal flashings and felt flashings.
- B. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- C. Seal metal joints watertight.
- D. Secure gutters and downspouts in place with concealed fasteners.
- E. Connect downspouts to downspout boots, and grout connection watertight.

3.4 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements for field inspection requirements.
- B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION

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SECTION 07 71 00
ROOF SPECIALTIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Manufactured roof specialties, including copings, fascias, and gravel stops.
- B. Roof control and expansion joint covers.

1.2 RELATED REQUIREMENTS

- A. Section 07 53 00 - Elastomeric Membrane Roofing – Fully Adhered

1.3 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- B. ANSI/SPRI/FM 4435/ES-1 - Test Standard for Edge Systems Used with Low Slope Roofing Systems; 2022.
- C. NRCA (RM) - The NRCA Roofing Manual; 2024.
- D. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.
- C. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.
- D. Samples: Submit two, 6 by 6 inches, illustrating component shape, finish, and color.
- E. Manufacturer's Installation Instructions: Indicate special procedures, fasteners, supporting members, and perimeter conditions requiring special attention.

1.5 WARRANTY

- A. Section 01 70 00 - Execution and Closeout Requirements: Product warranties and product bonds.
- B. Furnish manufacturer's material and labor warranty to cover degradation of material finish.
 - 1. Term: Ten years after Date of Substantial Completion.
 - 2. Coverage: include color fading due to exposure to weather.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Roof Edge Flashings and Copings:
 - 1. Carlisle Syntec Systems: www.carlislesyntec.com.
 - 2. Hickman Edge Systems: www.hickmanedgesystems.com/#sle.
 - 3. Metal-Era Inc: www.metalera.com/#sle.
- B. Control and Expansion Joint Covers:
 - 1. GAF: www.gaf.com/#sle.
 - 2. Johns Manville: www.jm.com/#sle.
 - 3. MM Systems Corp: www.mmsystemscorp.com/#sle.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Pipe and Penetration Flashings:
 - 1. Portals Plus: www.portalsplus.com.
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Counterflashings:
 - 1. Hickman Edge Systems: www.hickmanedgesystems.com/#sle.
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 COMPONENTS

- A. Roof Edge Flashings: Factory fabricated to sizes required; corners mitered; concealed fasteners.
 - 1. Configuration: Fascia, and edge securement for roof membrane. Concealed continuous heavy duty extruded aluminum cleat with snap-on aluminum fascia; internal splice piece at joints of same material, thickness and finish as fascia; concealed stainless steel fasteners.
 - 2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test methods RE-1 and RE-2 to positive and negative design wind pressure as defined by applicable local building code.
 - 3. Material: Formed aluminum sheet, 0.050 inch thick, minimum.
 - 4. Finish: 70 percent polyvinylidene fluoride.
 - 5. Color: As selected by Architect from manufacturer's full range.
 - 6. Products:
 - a. Carlisle Syntec Systems; Securedge 2000HG: www.carlislesyntec.com.
 - b. Hickman Edge Systems; Terminedge HG: www.hickmanedgesystems.com/#sle.
 - c. Metal-Era Inc; Anchor-Tite HG: www.metalera.com/#sle.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Copings: Factory fabricated to sizes required; corners mitered; concealed fasteners.
 - 1. Configuration: Concealed continuous hold down cleat at both legs; internal splice piece at joints of same material, thickness and finish as cap; concealed stainless steel fasteners. Include special supports spaced at 32 inches on center.
 - 2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test method RE-3 to positive and negative design wind pressure as defined by applicable local building code.
 - 3. Material: Formed aluminum sheet, 0.050 inch thick, minimum.
 - 4. Finish: 70 percent polyvinylidene fluoride.
 - 5. Color: As selected by Architect from manufacturer's standard range.
 - 6. Products:
 - a. Carlisle Syntec Systems; Securedge 400 Coping: www.carlislesyntec.com.
 - b. Metal-Era Inc; Leak Tite: www.metalera.com.
- C. Control and Expansion Joint Covers: Composite construction of 2-inch wide flexible EPDM flashing of white color with closed cell urethane foam backing, each edge seamed to aluminum sheet metal flanges, designed for nominal joint width of 1 inch. Include special formed corners, tees, intersections, and wall flashings, each sealed watertight.
- D. Reglet and Counterflashings:

1. .040 extruded aluminum reglet with .032 formed aluminum counter flashing with stainless steel spring clips at 16" o.c. and stainless steel wind clips at 32" o.c.
 - a. Finish of both reglet and counterflashing to be kynar paint.
- E. Pipe Boots: Provide boot of material compatible with new roof system.
 1. Provide retrofit boot for existing pipes.
 2. Products: Pipe boot (new roof system) and retrofit pipe seals (existing roof system)
- F. Multi-Pipe Portal System: Provide curb or base flange with rubber cap which will accept the size and number of pipes and/or conduit required. Materials are to be compatible with new roof system.
 1. Product: Provide boot similar to Quadraseal by Portals Plus, Inc.
- G. Counterflashings: Factory fabricated and finished sheet metal that overlaps top edges of base flashing by at least 4 inches, and designed to snap into through-wall flashing or reglets with lapped joints.
 1. Material: Stainless steel sheet, 26 gauge, 0.019 inch thick, minimum.

2.3 FINISHES

- A. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; custom color to match approved sample.

2.4 ACCESSORIES

- A. Sealant for Joints in Linear Components: As recommended by component manufacturer.
- B. Adhesive for Anchoring to Roof Membrane: Compatible with roof membrane and approved by roof membrane manufacturer.
- C. Fasteners: Stainless Steel with same finish as flashing metal & soft neoprene washers (no exposed fasteners). Fasteners for roof replacements must be included in the Singly-Ply Roofing membrane manufacturer's warranty to meet uplift pressures determined in accordance with the applicable Building Code.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that deck, curbs, roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.
- B. Field verify dimensions of metal fascia and coping. Verify adequate coverage of existing blocking and wall surface. Minimum of 2 inch lap required.

3.2 INSTALLATION

- A. Install components in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
- B. Seal joints within components when required by component manufacturer.
- C. Anchor components securely.
- D. Conform to SMACNA Architectural Sheet Metal Manual drawing details.
- E. Coordinate installation of components of this section with installation of roofing membrane and base flashings.

- F. Coordinate installation of sealants and roofing cement with work of this section to ensure water tightness.
- G. Coordinate installation of flashing flanges into reglets.

END OF SECTION

SECTION 07 84 00
FIRESTOPPING

PART 1 GENERAL

1.1 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.

1.2 RELATED REQUIREMENTS

- A. Section 01 35 17 - Alteration Project Procedures: Cutting and patching.
- B. Section 07 05 53 - Fire and Smoke Assembly Identification.

1.3 REFERENCE STANDARDS

- A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2022.
- B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2023a.
- C. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems; 2015 (Reapproved 2019).
- D. ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed between Rated Wall Assemblies and Nonrated Horizontal Assemblies; 2023a.
- E. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).
- F. ITS (DIR) - Directory of Listed Products; Current Edition.
- G. FM (AG) - FM Approval Guide; Current Edition.
- H. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.
- I. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.
- J. UL (DIR) - Online Certifications Directory; Current Edition.
- K. UL (FRD) - Fire Resistance Directory; Current Edition.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.
- C. Product Data: Provide data on product characteristics, performance ratings, and limitations.
- D. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.

- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Manufacturer's qualification statement.
- G. Installer's qualification statement.

1.5 QUALITY ASSURANCE

- A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
 - 1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section and:
 - 1. Trained by manufacturer.
 - 2. With minimum ten years documented experience installing work of this type.

1.6 MOCK-UPS

- A. Install one firestopping assembly representative of each fire rating design required on project.
 - 1. Where one design may be used for different penetrating items or in different wall constructions, install one assembly for each different combination.
- B. If accepted, mock-up will represent minimum standard for this work.
- C. If accepted, mock-up may remain as part of this work. Remove and replace mock-ups not accepted.

1.7 FIELD CONDITIONS

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.
- B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Firestopping Manufacturers:
 - 1. 3M Fire Protection Products: www.3m.com/firestop.
 - 2. A/D Fire Protection Systems Inc: www.adfire.com.
 - 3. Hilti, Inc: www.us.hilti.com.
 - 4. RectorSeal, a CSW Industrials Company: www.rectorseal.com/firestop-solutions/#sle.
 - 5. Specified Technologies Inc: www.stifirestop.com/#sle.
 - 6. United States Gypsum Co.
 - 7. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 MATERIALS

- A. Mold and Mildew Resistance: Provide firestopping materials with mold and mildew resistance rating of zero(0) in accordance with ASTM G21.

- B. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.
- C. Fire Ratings: Refer to drawings for required systems and ratings.

2.3 FIRESTOPPING ASSEMBLY REQUIREMENTS

- A. Head-of-Wall (HW) Joint System Firestopping at Joints Between Fire-Rated Wall Assemblies and Non-Rated Horizontal Assemblies: Use system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of wall assembly.
 - 1. Movement: Provide systems that have been tested to show movement capability as indicated.
- B. Floor-to-Floor (FF), Floor-to-Wall (FW), Head-of-Wall (HW), and Wall-to-Wall (WW) Joints, Except Perimeter, Where Both Are Fire-Rated: Use system that has been tested according to ASTM E1966 or UL 2079 to have fire resistance F Rating equal to required fire rating of the assembly in which the joint occurs.
 - 1. Movement: Provide systems that have been tested to show movement capability as indicated.
 - 2. Air Leakage: Provide systems that have been tested to show L Rating as indicated.
 - 3. Watertightness: Provide systems that have been tested to show W Rating as indicated.
 - 4. Listing by FM (AG), ITS (DIR), UL (DIR), or UL (FRD) in their certification directories will be considered evidence of successful testing.
- C. Through Penetration Firestopping: Use system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.
 - 1. Temperature Rise: Provide systems that have been tested to show T Rating as indicated.
 - 2. Air Leakage: Provide systems that have been tested to show L Rating as indicated.
 - 3. Watertightness: In addition, provide systems that have been tested to show W Rating as indicated.
 - 4. Listing by FM (AG), ITS (DIR), UL (DIR), or UL (FRD) in their certification directories will be considered evidence of successful testing.

2.4 FIRESTOPPING FOR FLOOR-TO-FLOOR, FLOOR-TO-WALL, HEAD-OF-WALL, AND WALL-TO-WALL JOINTS

- A. Concrete and Concrete Masonry Walls and Floors:
 - 1. Head-of-Wall Joints at Concrete/Concrete Masonry Wall to Concrete Over Metal Deck Floor:
 - a. 2 Hour Construction: UL System HW-D-0755; 3M Co.; FireDam Spray 200.
- B. Gypsum Board Walls:
 - 1. Head-of-Wall Joints at Concrete Over Metal Deck:
 - a. 1 Hour Construction: UL System HW-D-0101, 3M Co.; FireDam Spray 200.

2.5 FIRESTOPPING PENETRATIONS THROUGH CONCRETE AND CONCRETE MASONRY CONSTRUCTION

- A. Blank Openings:
 - 1. In Floors or Walls:
 - a. 2 Hour Construction: UL System C-AJ-0032; USG Inc.; Firecode Compound.
- B. Penetrations Through Floors or Walls By:
 - 1. Uninsulated Metallic Pipe, Conduit, and Tubing:
 - a. 2 Hour Construction: UL System C-AJ-1081; USG Inc.; Firecode Compound.
 - 2. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
 - a. 2 Hour Construction: UL System C-AJ-22015; Rectorseal Sealant.
 - 3. Electrical Cables Not In Conduit:

FIRESTOPPING

- a. 3 Hour Construction: UL System C-AJ-3231; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
- b. 2 Hour Construction: UL System C-AJ-3045; USG Inc.; Firecode Compound.
- 4. Insulated Pipes:
 - a. 2 Hour Construction: UL System C-AJ-5002; 3M Company FS-195+ / CP 25WB+
- 5. HVAC Ducts, Uninsulated:
 - a. 2 Hour Construction: UL System C-AJ-7036; Rectorseal Sealant

2.6 FIRESTOPPING PENETRATIONS THROUGH GYPSUM BOARD WALLS

- A. Blank Openings:
 - 1. 1 Hour Construction: UL System W-L-0031; 3M Company CP 25WB+
- B. Penetrations By:
 - 1. Uninsulated Metallic Pipe, Conduit, and Tubing:
 - a. 2 Hour Construction: UL System W-L-1001; 3M Company CP 25WB+
 - 2. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
 - a. 1 Hour Construction: UL System W-L-2088; 3M Company CP 25WB+ / FB-3000 WT
 - 3. Electrical Cables Not In Conduit:
 - a. 2 Hour Construction: UL System W-L-3218; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
 - b. 1 Hour Construction: UL System W-L-3218; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
 - c. 1 Hour Construction: UL System W-L-3195; 3M Company CP 25WB+
 - 4. Insulated Pipes:
 - a. 1 Hour Construction: UL System W-L-5039; 3M Company CP 25WB+
 - 5. HVAC Ducts, Insulated:
 - a. 1 Hour Construction: UL System W-L-7082; Rectorseal Sealants.

2.7 FIRESTOPPING SYSTEMS

- A. Manufacturers:
 - 1. A/D Fire Protection Systems, Inc.
 - 2. Dow Corning Corp.
 - 3. Hilti Corp.
 - 4. 3M fire Protection Products.
 - 5. Rectorseal Corp.
 - 6. United States Gypsum Co.
 - 7. Substitutions: Section 01 60 00 - Product Requirements .
- B. Firestopping:
 - 1. Fire Ratings: Use system that is listed by FM (AG), ITS (DIR), or UL (FRD) and tested in accordance with ASTM E814, ASTM E119, or UL 1479 with F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and in compliance with other specified requirements.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.

- B. Remove incompatible materials that could adversely affect bond.
- C. Install backing materials to prevent liquid material from leakage.

3.3 INSTALLATION

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- B. Do not cover installed firestopping until inspected by authorities having jurisdiction.
- C. Install labeling required by code.

3.4 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements.
- B. See Section 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- C. Inspect installed firestopping for compliance with specifications and submitted schedule.
- D. Repair or replace penetration firestopping and joints at locations where inspection results indicate firestopping or joints do not meet specified requirements.

3.5 CLEANING

- A. Clean adjacent surfaces of firestopping materials.

3.6 PROTECTION

- A. Protect adjacent surfaces from damage by material installation.

END OF SECTION

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SECTION 07 92 00
JOINT SEALANTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Nonsag gunnable joint sealants.
- B. Self-leveling pourable joint sealants.
- C. Joint backings and accessories.

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Additional requirements for sealants and primers.
- B. Section 09 21 16 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.
- C. Section 09 30 00 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.

1.3 REFERENCE STANDARDS

- A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015 (Reapproved 2022).
- B. ASTM C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2018 (Reapproved 2022).
- C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
- D. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2023.
- E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).
- F. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2022.
- G. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2023.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include 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. Backing material recommended by sealant manufacturer.
 - 4. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
 - 5. Substrates the product should not be used on.

JOINT SEALANTS

6. Substrates for which use of primer is required.
 7. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
 8. Sample product warranty.
 9. Certification by manufacturer indicating that product complies with specification requirements.
- C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
- D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
- E. Samples for Verification: Where custom sealant color is specified, obtain directions from Architect and submit at least two physical samples for verification of color of each required sealant.
- F. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.
- G. Field Quality Control Plan: Submit at least two weeks prior to start of installation.
- H. Field Quality Control Log: Submit filled-out log for each length or instance of sealant installed, within 10 days after completion of inspections/tests; include bagged test samples and photographic records, if any.
- I. Manufacturer's qualification statement.
- J. Installer's qualification statement.
- K. Executed warranty.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.
- C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.
- D. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
1. Adhesion Testing: In accordance with ASTM C794.
 2. Compatibility Testing: In accordance with ASTM C1087.
 3. Allow sufficient time for testing to avoid delaying the work.
 4. Deliver sufficient samples to manufacturer for testing.
 5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
- E. Field Quality Control Plan:
1. Visual inspection of entire length of sealant joints.
 2. Field testing agency's qualifications.
 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.

1.6 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 2-year manufacturer warranty for installed sealants and accessories that fail to achieve a watertight seal, exhibit loss of adhesion or cohesion, or do not cure. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Nonsag Sealants:
 - 1. Dow: www.dow.com/#sle.
 - 2. Hilti, Inc: www.hilti.com/#sle.
 - 3. Sika Corporation: www.usa.sika.com/#sle.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Self-Leveling Sealants:
 - 1. Dow: www.dow.com/#sle.
 - 2. QUIKRETE Companies: www.quikrete.com/#sle.
 - 3. Sika Corporation: www.usa.sika.com/#sle.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 JOINT SEALANT APPLICATIONS

- A. Scope:
 - 1. Exterior Joints:
 - a. Do not seal exterior joints unless indicated on drawings as sealed.
 - b. Seal the following joints:
 - 1) Wall expansion and control joints.
 - 2) Joints between doors, windows, and other frames or adjacent construction.
 - 3) Joints between different exposed materials.
 - 2. Interior Joints:
 - a. Do not seal interior joints indicated on drawings as not sealed.
 - b. Seal the following joints:
 - 1) Joints between door frames and window frames and adjacent construction.
 - 3. Do Not Seal:
 - a. Intentional weep holes in masonry.
 - b. Joints where sealant installation is specified in other sections.
- B. Exterior Joints: Use nonsag nonstaining silicone sealant, unless otherwise indicated.
 - 1. Control and Expansion Joints in Concrete Paving: Self-leveling polyurethane traffic-grade sealant.
- C. Interior Joints: Use nonsag polyurethane sealant, unless otherwise indicated.

2.3 JOINT SEALANTS - GENERAL

- A. Sealants and Primers: Provide products with acceptable levels of volatile organic compound (VOC) content; see Section 01 61 16.

2.4 NONSAG JOINT SEALANTS

- A. Nonstaining Silicone Sealant: ASTM C920, Grade NS, Uses M, A, G, and O; not expected to withstand continuous water immersion or traffic.
 - 1. Movement Capability: Plus and minus 50 percent, minimum.

JOINT SEALANTS

2. Nonstaining to Porous Stone: Nonstaining to light-colored natural stone when tested in accordance with ASTM C1248.
 3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
 4. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
 5. Color: Match adjacent finished surfaces.
 6. Service Temperature Range: Minus 20 to 180 degrees F.
- B. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; multi-component; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus 25 percent, minimum.
 2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
 3. Color: Match adjacent finished surfaces.
 4. Service Temperature Range: Minus 40 to 180 degrees F.

2.5 SELF-LEVELING JOINT SEALANTS

- A. Self-Leveling Polyurethane Sealant: ASTM C920, Grade P, Uses M and A; single or multicomponent; explicitly approved by manufacturer for traffic exposure; not expected to withstand continuous water immersion .
1. Movement Capability: Plus and minus 25 percent, minimum.
 2. Hardness Range: 35 to 55, Shore A, when tested in accordance with ASTM C661.
 3. Color: To be selected by Architect from manufacturer's full range.
 4. Service Temperature Range: Minus 40 to 180 degrees F.
 5. Provide slope grade sealant at all sloped pavement up to 12%.

2.6 ACCESSORIES

- A. Sealant Backing Materials, General: Materials placed in joint before applying sealants; assists sealant performance and service life by developing optimum sealant profile and preventing three-sided adhesion; type and size recommended by sealant manufacturer for compatibility with sealant, substrate, and application.
- B. Sealant Backing Rod, Bi-Cellular Type:
1. Cylindrical flexible sealant backings complying with ASTM C1330 Type B.
 2. Size: 25 to 50 percent larger in diameter than joint width.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.

3.2 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. 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.

3.3 INSTALLATION

- A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Provide joint sealant installations complying with ASTM C1193.
- C. Install bond breaker backing tape where backer rod cannot be used.
- D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- E. 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.
- F. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

3.4 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements for additional requirements.
- B. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.
- C. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

END OF SECTION

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SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fire-rated hollow metal doors and frames.
- B. Hollow metal borrowed lites glazing frames.
- C. Independent testing agency requirements for Fire Door Inspection and testing to be completed on existing doors and frames.

1.2 RELATED REQUIREMENTS

- A. Section 08 80 00 - Glazing: Glass for doors and borrowed lites.
- B. Section 08 81 00 - Fire Rated Glazing: Glass for doors and borrowed lites

1.3 REFERENCE STANDARDS

- A. ADA Standards - 2010 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; 2024.
- C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2023.
- D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2020.
- E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2023, with Editorial Revision.
- 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; 2023.
- H. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.
- I. ASTM C476 - Standard Specification for Grout for Masonry; 2023.
- J. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials,
- K. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.
- L. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- M. ITS (DIR) - Directory of Listed Products; Current Edition.
- N. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
- O. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.

- P. NAAMM HMMA 840 - Guide Specifications for Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2024.
- Q. NFPA 101-2018 - Life Safety Code; 2018.
- R. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025.
- S. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.
- T. UL (DIR) - Online Certifications Directory; Current Edition.
- U. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- V. UL 263 - Standard for Fire Tests of Building Construction and Materials.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
- D. Samples: Submit two samples of metal, 2 by 2 inches in size, showing factory finishes, colors, and surface texture.
- E. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.
- F. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.
- C. Maintain at project site copies of reference standards relating to installation of products specified.
- D. Fire Rated Frame Construction:
 - 1. Conform to one of the following:
 - a. NFPA 252 with neutral pressure level at 40 inches maximum above sill at 5 minutes into test.
 - b. ASTM E119 or UL 263
 - c. UL 10C.
 - 2. Installed fire rated frame assembly shall conform to NFPA 80 for fire rated class same as fire door.
 - 3. Attach label from agency approved by authority having jurisdiction to identify each fire rated door frame.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Steel Frames:
 - 1. Ceco Door, an Assa Abloy Group company; Madera Embossed Woodgrain Stainable Steel Door: www.assaabloydss.com/#sle.
 - 2. Steelcraft, an Allegion brand: www.allegion.com/#sle.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 PERFORMANCE REQUIREMENTS

- A. Requirements for Hollow Metal Doors and Frames:
 - 1. Steel Sheet: Comply with one or more of the following requirements; galvanized 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.
 - 2. Accessibility: Comply with ICC A117.1 and ADA Standards.
 - 3. Door Top Closures: Flush end closure channel, with top and door faces aligned.
 - 4. Door Edge Profile: Manufacturers standard for application indicated.
 - a. Provide continuously welded seamless edge.
 - 5. Typical Door Face Sheets: Flush.
 - 6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturer's standard.
 - 7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
 - a. Min. 7 gauge reinforcement at hinge locations.
 - b. Min. 12 gauge reinforcement at locksets, closers and panic hardware.
 - 8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvanized) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
- B. 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 door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.3 HOLLOW METAL DOORS

- A. Door Finish: Factory finished.
- B. Fire-Rated Doors:
 - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 2 - Heavy-duty.
 - b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Door Face Metal Thickness: 18 gauge, 0.042 inch, minimum.
 - 2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
 - a. Provide units listed and labeled by UL (DIR) or ITS (DIR).

HOLLOW METAL DOORS AND FRAMES

- b. Attach fire rating label to each fire rated unit.
- 3. Door Core Material: Manufacturers standard core material/construction in compliance with requirements.
- 4. Door Thickness: 1-3/4 inches, nominal.
- 5. Door Face Sheets: Flush with wood grain.

2.4 HOLLOW METAL FRAMES

- A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
 - 1. Fabricate frames with hardware reinforcement plates welded in place.
 - a. Hinge: Min. 7 gauge x 1 5/8 x 10 inches.
 - b. Lock Strike: Minimum 14 gauge x template requirements.
- B. Frame Finish: Factory primed and field finished.
- C. Interior Door Frames, Fire-Rated: Full profile/continuously welded type.
 - 1. Fire Rating: Same as door, labeled.
 - 2. Terminated Stops: Provide at interior doors; closed end stop terminated 6 inch, maximum, above floor at 45 degree angle.
- D. Mullions for Pairs of Doors: Fixed, except where removable is indicated, with profile similar to jambs.
- E. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.
- F. Transom Bars: Fixed, of profile same as jamb and head.
- G. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
- H. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.
- I. Frames Wider than 48 inches: Reinforce with steel channel fitted tightly into frame head, flush with top.

2.5 FINISHES

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
- B. Door Finish Color: Wood Grain Embossed, Assa Abloy - CurriStain Oak - Wheat
- C. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15 mil, 0.015 inch dry film thickness (DFT) per coat; provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
 - 1. Fire-Rated Frames: Comply with fire rating requirements indicated.

2.6 ACCESSORIES

- A. Glazing: As specified in Section 08 80 00, factory installed.
- B. Astragals and Edges for Double Doors: Pairs of door astragals, and door edge sealing and protection devices.
 - 1. UL listed products in compliance with requirements of authorities having jurisdiction.
- C. Grout for Frames: Mortar grout complying with ASTM C476 with maximum slump of 4 inches as measured in accordance with ASTM C143/C143M for hand troweling in place; plaster grout and thinner pumpable grout are prohibited.

- D. Silencers: Specified in Section 08 71 00. Resilient vinyl, 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.
- E. Anchors:
 - 1. Stud Wall: Steel stud anchor.
 - 2. New Masonry: Adjustable masonry strap anchor.
 - 3. Existing Masonry: Counter sunk screw with sleeve.
 - a. Counter sunk fasteners shall be covered with a suitable hard setting filling compound, sanded and finished to match frame.
- F. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.1 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.

3.2 PREPARATION

- A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.3 INSTALLATION

- A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
- B. Install fire rated units in accordance with NFPA 80.
- C. Coordinate frame anchor placement with wall construction.
- D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
- E. Coordinate installation of hardware specified in Section 08 71 00.
- F. Coordinate installation of glazing specified in Section 08 80 00.
- G. Coordinate installation of electrical connections to electrical hardware items.
- H. Touch up damaged factory finishes.

3.4 TOLERANCES

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

3.5 ADJUSTING

- A. Adjust for smooth and balanced door movement.

END OF SECTION

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SECTION 08 16 13
FIBERGLASS DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

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

1.2 RELATED REQUIREMENTS

- A. Section 07 92 00 - Joint Sealants.
- B. Section 08 71 00 - Door Hardware.
- C. Section 08 80 00 - Glazing.
- D. Section 09 91 13 - Exterior Painting: Field painting.
- E. Section 09 91 23 - Interior Painting: Field painting.

1.3 REFERENCE STANDARDS

- A. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.
- B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2024.
- C. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2023, with Editorial Revision.
- D. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 2022.
- E. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2022.
- F. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials; 2017.
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- H. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.
- I. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).
- J. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).
- K. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

- L. ITS (DIR) - Directory of Listed Products; Current Edition.
- M. IBC 2603.4.1.7 - Standard for Plastic Foam Insulation in Non-Rated Swinging Doors.
- N. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025.
- O. UL (DIR) - Online Certifications Directory; Current Edition.
- P. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Obtain hardware templates from hardware manufacturer prior to starting fabrication.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturer's standard details, installation instructions, hardware and anchor recommendations.
 - 1. Provide details of core, stile and rail construction, trim for lites and all other components.
 - 2. Include details of finish hardware mounting.
- C. Shop Drawings: Indicate layout and profiles; include assembly methods.
 - 1. Indicate product components, including hardware reinforcement locations and preparations, accessories, finish colors, patterns, and textures.
 - 2. Indicate wall conditions, door and frame elevations, sections, materials, gauges, finishes, location of door hardware by dimension, and details of openings; use same reference numbers indicated on drawings to identify details and openings.
- D. FRP Face Sheet Samples: Submit two complete sets of color chips, illustrating manufacturer's available finishes, colors, and textures.
- E. Door Corner Sample: Submit corner cross sections, 10 inch by 10 inch in size, illustrating face sheets, core, framing, finish, joints, fasteners, accessory items (lites, integral hardware) and quality of workmanship for approval prior to fabrication.
- F. Maintenance Data: Include instructions for repair of minor scratches and damage.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than 10 years of documented experience. Provide comprehensive list of completed projects of similar building type and size as this project with submittal package.
- B. The manufacturer or his representative shall be available for consultation to all parties engaged in the project including instruction to installation personnel.
- C. Unless otherwise indicated, obtain FRP doors and frames from a single company specializing in the type of construction required so that there will be undivided responsibility for the specified performance of all component parts including glazing for FRP doors and factory installation of door hardware.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

- B. Store materials in original packaging, under cover, protected from exposure to harmful weather conditions and from direct contact with water.
 - 1. Store at temperature and humidity conditions recommended by manufacturer.
 - 2. Do not use non-vented plastic or canvas shelters.
 - 3. Immediately remove wet wrappers.
- C. Store in position recommended by manufacturer, elevated minimum 4 inches above grade, with minimum 1/4 inch space between doors.

1.8 FIELD CONDITIONS

- A. Do not install doors until structure is enclosed.
- B. Maintain temperature and humidity at manufacturer's recommended levels during and after installation of doors.

1.9 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Provide written warranty signed by manufacturer, installer and contractor, agreeing to replace, at no cost to the Owner, any doors, frames or factory hardware installation against failure in materials or workmanship within the warranty period. Failure of materials or workmanship includes: excessive deflection, faulty operation of entrances, deterioration of finish or construction in excess of normal weathering and defects in hardware installation. The minimum time period of warranty is ten (10) years from Date of Substantial Completion .

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Fiberglass Composite Doors:
 - 1. Chem Pruf; P Series: www.chem-pruf.com.
 - 2. FRP Architectural Doors, Inc.; CF34: www.frparch.com.
 - 3. Special-Lite, Inc; AF-220 Sandstone: www.special-lite.com/#sle.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 DOOR AND FRAME ASSEMBLIES

- A. Door and Frame Assemblies: Factory-fabricated, prepared and machined for hardware.
 - 1. Physical Endurance: Swinging door cycle test to ANSI/SDI A250.4, Level A (1,000,000 cycles) minimum; tested with hardware and fasteners intended for use on project.
 - 2. Screw-Holding Capacity: Tested to 890 pounds, minimum.
 - 3. 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.
 - 4. Flammability: Self-extinguishing when tested in accordance with ASTM D635.
 - 5. Chemical Resistance: Resist degradation due to exposure to tap water and distilled water.
 - 6. Sizes: As indicated on drawings.
 - 7. Clearance Between Door and Frame: 1/8 inch, maximum.
 - 8. Clearance Between Meeting Stiles of Pairs of Doors: 1/8 inch, maximum.
 - 9. Clearance Between Bottom of Door and Finished Floor: 3/4 inch, maximum; not less than 1/4 inch clearance to threshold.
 - 10. Provide frame anchors that allow for variation in rough opening size; field cutting of doors or frames to fit is not permitted.
- B. Fire-Rated Doors and Frames: Comply with fire-ratings as indicated on drawings.

FIBERGLASS DOORS

1. Tested in accordance with ICC (IBC) for positive pressure or UL 10C.
2. ITS (DIR) or UL (DIR) listed and labeled.
3. Visible seals when doors are open or closed is not permitted.
4. Provide mineral fiber or intumescent core as required for fire-rating as indicated.
5. Manufacturer to supply smoke/draft and intumescent gasketing to meet positive pressure requirements.

2.3 COMPONENTS

- A. Doors: Fiberglass construction with reinforced core.
 1. Type: As indicated on drawings, including swinging doors.
 2. Thickness: 1-3/4 inch, nominal.
 3. Core Material: Polypropylene (PP) honeycomb.
 4. Construction:
 - a. Molded fiberglass shells with color gel coating, bonded into seamless unit; manufacturer's standard subframe and hardware reinforcements.
 - b. Fiberglass ultraviolet resistant mylar coated, with 1/8 inch thick through color face sheets laminated to core.
 5. Door Panel Configuration: As indicated on drawings.
 6. Subframe and Reinforcements: Fiberglass pultrusions; no metal or wood.
 7. 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.
 8. 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.
- B. Door Frames: Provide type in compliance with performance requirements specified for doors.
 1. Type: Factory assembled with chemically welded joints.
 2. Profiles: As indicated on drawings.
 3. Door Stop: 5/8 inch wide, by 1-7/8 inches deep.
 4. Non-Fire-Rated:
 - a. Fiberglass pultrusions primed for field painting.
 - 1) See Section 09 91 13 and 09 91 23 for additional painting requirements.
 5. Mullions: Removable, fiberglass centerpost; 2 inches wide by 5-3/4 inches deep, nominal.
 6. Corner Joints: Mitered with concealed corner blocks or angles of same material as frame; fiberglass joined with screws; sealed watertight with silicone sealant; field assemble knock-down type frames as required.
 - a. Allow for thermal expansion on exterior units.
 7. Hardware Cut-outs: Provide continuous backing or mortar guards of same material as frame, with watertight seal.
 8. Frame Anchors: Stainless steel, Type 304; provide three anchors in each jamb for heights up to 84 inches with one additional anchor for each additional 24 inches in height.
 9. Reinforcing: Provide manufacturer's standard reinforcing at hinge, strike, and closer locations.

2.4 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 7.5 psf.
- C. Air Leakage: Maximum 0.1 cfm/sf, when tested in accordance with ASTM E283/E283M at differential pressure of 6.24 psf across assembly.

- D. Structural Performance: Withstand positive and negative wind loads equal to 1.5 times design wind loads specified by local code without damage or permanent set, when tested in accordance with ASTM E330/E330M, using 10 second duration of maximum load.
- E. Thermal Transmittance, Exterior Doors: AAMA 1503, U-value of 0.35, maximum, measured on exterior door in size required for this project.
- F. Fiberglass Reinforced Plastic (FRP) Face Sheet Properties:
 - 1. Izod Impact Resistance: ASTM D256, 7 foot-pound force per inch of width, minimum, with notched izod.
 - 2. Water Absorption: ASTM D570, 0.16 percent, maximum, after 24 hours at 74 degrees F.
 - 3. Flexural Strength: ASTM D790, 27,000 psi, minimum.

2.5 FINISHES

- A. Abuse resistant engineered surface with protective coating and through-molded color.
 - 1. Panel Texture: Sandstone.
 - 2. Color: As selected by Architect from manufacturer's full line of colors.
- B. Primer: Aliphatic urethane for field finishing.

2.6 HARDWARE

- A. Door Hardware: See Section 08 71 00.
 - 1. Pre-machine doors in accordance with templates from specified hardware supplier.

2.7 ACCESSORIES

- A. Stops for Glazing and Louver: Fiberglass, unless otherwise indicated or required by fire rating; provided by door manufacturer to fit factory made openings, with color and texture to match door; fasteners shall maintain waterproof integrity.
 - 1. Exterior Doors: Provide non-removable stops on exterior side with continuous compression gasket weatherseal.
 - 2. Glazed Openings: Provide removable stops on interior side.
 - 3. Fire-Rated Doors: Provide stop kit listed by labeling authority.
 - 4. Opening Sizes and Shapes: As indicated on drawings.
- B. Glazing: See Section 08 80 00.
 - 1. Allow for thermal expansion on exterior units.
 - 2. Glazing shall be factory glazed into doors.

2.8 FABRICATION

- A. Field measure before fabrication and show recorded measurements on final shop drawings.
- B. Maintain continuity of line and accurate relation of planes and angles. Secure attachments and support at mechanical joints with hairline fit at contacting members.
- C. All hardware with the exception of door closer, threshold and weatherstripping to be shipped to door manufacturer. Door manufacturer shall install hardware on doors and warranty attachment for ten years. Complete fabrication, assembly, finishing and other work before shipment to project site. Disassemble components only as necessary for shipment and installation.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify actual dimensions of openings by field measurements before door fabrication; show recorded measurements on shop drawings.
- B. Do not begin installation until substrates have been properly prepared.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Remove existing doors and frames, and dispose of all removed materials in accordance with local authorities having jurisdiction.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Clean and prepare substrate in accordance with manufacturer's directions.
- D. Protect adjacent work and finish surfaces from damage during installation.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions; do not penetrate frames with anchors.
- B. Install fire-rated assemblies in accordance with NFPA 80.
- C. Install door hardware as specified in Section 08 71 00.
- D. Set units plumb, level, and true-to-line, without warping or racking doors, and with specified clearances; anchor in place.
- E. Set thresholds in continuous bed of sealant and backseal.
- F. In masonry walls, install frames prior to laying masonry; anchor frames into masonry mortar joints; fill jambs with grout as walls are laid up.
- G. In stud walls, install frames prior to building walls; anchor frames to studs using concealed anchors.
- H. Separate aluminum and other metal surfaces from sources of corrosion or electrolytic action at points of contact with other materials.
- I. Provide thermal isolation where components penetrate or disrupt building insulation. Coordinate attachment and seal of perimeter air and vapor retarder materials. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- J. Repair or replace damaged installed products.

3.4 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.

3.5 CLEANING

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

- B. Do not use harsh cleaning materials or methods that would damage finish.

3.6 PROTECTION

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

END OF SECTION

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SECTION 08 31 00
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wall and ceiling mounted access units.

1.2 RELATED REQUIREMENTS

- A. Section 04 20 00 - Unit Masonry: Openings in masonry.
- B. Section 09 21 16 - Gypsum Board Assemblies: Openings in partitions.
- C. Section 09 91 23 - Interior Painting: Field paint finish.

1.3 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2023, with Editorial Revision.
- C. 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; 2023.
- D. ITS (DIR) - Directory of Listed Products; Current Edition.
- E. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025.
- F. UL (FRD) - Fire Resistance Directory; Current Edition.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, fire resistance listings, 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 and rough-in dimensions.
- E. Project Record Documents: Record actual locations of each access unit.

1.5 QUALITY ASSURANCE

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

PART 2 PRODUCTS

2.1 ACCESS DOORS AND PANELS ASSEMBLIES

- A. Access door and frame units, fire-rated and non-fire-rated, in wall and ceiling locations.
 - 1. Provide for access to controls, valves, traps, dampers, cleanouts, and similar items requiring operation behind inaccessible finished surfaces.
 - 2. Coordinate exact locations with various trades to assure proper placement of access doors and panels.
- B. Wall-Mounted Units:
 - 1. Location: As indicated on drawings, and additional locations as required.
 - 2. Panel Material: Steel.
 - 3. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
 - 4. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
 - 5. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.
 - 6. Masonry Mounting Criteria: Provide surface-mounted frame with door surface flush with frame surface.
- C. Wall-Mounted Units in Wet Areas:
 - 1. Location: As indicated on drawings, and additional locations as required.
 - 2. Material: Stainless steel.
 - 3. Size: 12 by 12 inches.
 - 4. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
 - 5. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
 - 6. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.
 - 7. Masonry Mounting Criteria: Provide surface-mounted frame with door surface flush with frame surface.
- D. Fire-Rated Wall-Mounted Units:
 - 1. Location: As indicated on drawings, and additional locations as required.
 - 2. Wall Fire-Rating: To match rating of assembly in which unit is installed .
 - 3. Panel Material: Steel.
 - 4. Door/Panel: Insulated double-surface panel, with tool-operated spring or cam lock and no handle.
- E. Ceiling-Mounted Units:
 - 1. Location: As indicated on drawings, and additional locations as required.
 - 2. Panel Material: Steel.
 - 3. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.

2.2 WALL- AND CEILING-MOUNTED ACCESS UNITS

- A. Manufacturers:
 - 1. ACUDOR Products Inc: www.acudor.com/#sle.
 - 2. Cendrex, Inc: www.cendrex.com/#sle.
 - a. Wall- and Ceiling-Mounted Units: Cendrex AHD, flush door, face frame, hinged.
 - b. Fire-Rated Ceiling-Mounted Units: Cendrex PFI-00 Fire-Rated Insulated Access Door with Exposed Flange.
 - 3. Karp Associates, Inc: www.karpinc.com/#sle.
 - 4. Milcor, Inc: www.milcorinc.com.
 - 5. Nystrom, Inc: www.nystrom.com/#sle.

- B. Wall- and Ceiling-Mounted Units: Factory-fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.
 - 1. Style: Exposed frame with door surface flush with frame surface.
 - a. Gypsum Board Ceiling Mounting Criteria: Use drywall bead type frame.
 - 2. Door Style Non-rated: Single thickness with rolled or turned in edges.
 - 3. Door Style Fire-Rated: Double-skinned hollow panel, insulated.
 - a. Insulation: Non-combustible mineral wool.
 - 4. Frames: 16-gauge, 0.0598-inch minimum thickness.
 - 5. Single Steel Sheet Door Panels: 16 gage, minimum thickness.
 - 6. Double-Skinned Hollow Steel Sheet Door Panels: 20 gage, .0359 inch, minimum thickness, on both sides and along each edge.
 - 7. Units in Fire-Rated Assemblies: Fire rating as required by applicable code for fire-rated assembly that access doors are being installed.
 - a. Provide products listed by ITS (DIR) or UL (FRD) as suitable for purpose indicated.
 - b. Provide certificate of compliance from authorities having jurisdiction indicating approval of fire rated doors.
 - 8. Steel Finish: Primed.
 - 9. Factory Primed: Polyester powder coat.
 - 10. Hardware:
 - a. Hardware for Fire-Rated Units: As required for listing.
 - b. Hinges for Non-Fire-Rated Units: Continuous piano hinge.
 - c. Latch/Lock: Screw driver slot for quarter turn cam latch.
 - d. Number of Locks/Latches Required: As recommended by manufacturer for size of unit.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that rough openings are correctly sized and located.
- B. Begin installation only after substrates have been properly prepared, and if the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to proceeding with this work.
- B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

3.3 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Install frames plumb and level in openings with plane of door and panel face aligned with adjacent finished surfaces. Secure rigidly in place.
- C. Position units to provide convenient access to concealed equipment when necessary.
- D. Install fire rated units in accordance with NFPA 80 and requirements for fire listing.

END OF SECTION

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SECTION 08 36 13
SECTIONAL DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Overhead sectional doors, electrically operated.
- B. Operating hardware and supports.
- C. Electrical controls.

1.2 RELATED REQUIREMENTS

- A. Section 05 50 00 - Metal Fabrications: Steel channel opening frame.
- B. Section 08 71 00 - Door Hardware: Lock cylinders.
- C. Section 26 05 33.13 - Conduit for Electrical Systems: Empty conduit from control units to door operator.
- D. Section 26 05 83 - Wiring Connections.

1.3 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; 2023.
- B. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.
- 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 (Reapproved 2021).
- D. DASMA 102 - American National Standard Specifications for Sectional Doors; 2018.
- E. ITS (DIR) - Directory of Listed Products; Current Edition.
- F. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2008 (Reaffirmed 2020).
- G. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
- H. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- I. UL (DIR) - Online Certifications Directory; Current Edition.
- J. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

- B. Shop Drawings: Indicate opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations, and installation details.
- C. Product Data: Show component construction, anchorage method, and hardware.
- D. Manufacturer's Installation Instructions: Include any special procedures required by project conditions.
- E. Operation Data: Include normal operation, troubleshooting, and adjusting.
- F. Maintenance Data: Include data for motor and transmission, shaft and gearing, lubrication frequency, spare part sources.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- B. Comply with applicable code for motor and motor control requirements.
- C. Products Requiring Electrical Connection: Listed and classified by ITS (DIR), UL (DIR), or testing firm acceptable to authorities having jurisdiction, as suitable for purpose specified.

1.6 WARRANTY

- A. Furnish ten year warranty for door panels against delamination of insulation from steel skin.
- B. Manufacturer Warranty: Provide 5-year manufacturer warranty for electric operating equipment. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Sectional Doors:
 - 1. Overhead Door Corporation; Model 592 Sectional: www.overheaddoor.com/#sle.
 - 2. Wayne-Dalton, a Division of Overhead Door Corporation: www.wayne-dalton.com/#sle.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 PERFORMANCE REQUIREMENTS

- A. Performance: Withstand positive and negative wind loads equal to 1.5 times design wind loads specified by local code without damage or permanent set, when tested in accordance with ASTM E330/E330M, using 10 second duration of maximum load.
- B. Air Leakage Rate: Less than .08 cfm/sq ft when tested in accordance with ASTM E283/E283M at test pressure difference of 1.57 psf.
- C. Thermal Transmittance: U-factor of .10 Btu/hr sq ft degrees F, maximum, in accordance with DASMA 102.

2.3 STEEL DOORS

- A. Steel Doors: Flush steel, insulated; standard lift and high lift and angled lift operating styles with track and hardware; complying with DASMA 102, Commercial application. Refer to drawings for locations of lift types.
 - 1. Door Nominal Thickness: 2 inches thick.
 - 2. Exterior Finish:

- a. Factory finished with acrylic baked enamel; White at Bus Garage. Industrial Brown, Tan, or Trinar Brown at Savona Storage Building..
- 3. Interior Finish:
 - a. Factory finished with acrylic baked enamel; Color to be same as exterior.
- 4. Glazed Lites: Full panel width, one row; set in place with resilient glazing channel.
- 5. Electric Operation: Electric control station.

2.4 COMPONENTS

- A. Track: Rolled galvanized steel, 11 gage thick; 3 inch wide, continuous one piece per side; galvanized steel mounting brackets 1/4 inch thick, min. Provide type of track recommended by manufacturer to suit clearances available. Primarily standard lift in bus storage bays and high lift in maintenance bays.
- B. Hinge and Roller Assemblies: Heavy duty hinges and graduated roller holders of galvanized steel; floating hardened steel bearing rollers, located at top and bottom of each panel, each side.
- C. Sill Weatherstripping: Resilient hollow rubber strip, one piece; fitted to bottom of door panel, full length contact.
- D. Jamb Weatherstripping: Roll formed steel section full height of jamb, fitted with heavy duty EPDM resilient weatherstripping, placed in moderate contact with door panels. Color to match door.
- E. Head Weatherstripping: EPDM rubber seal, one piece full length.
- F. Panel Joint Weatherstripping: Neoprene foam seal, one piece full length.
- G. Lock: Inside center mounted, adjustable keeper, spring activated latch bar with feature to retain in locked or retracted position; interior and exterior handle.
- H. Lock Cylinders: Master keyed to building keying system.

2.5 MATERIALS

- A. Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating, plain surface.
- B. Glazing: Refer to specification section 08 80 00.
- C. Insulation: CFC-free and HCFC-free Rigid polyurethane, bonded to facing.
 - 1. R value of 17.40.
 - 2. Same thickness as core framing members.
- D. Metal Primer Paint: Zinc molybdate type.

2.6 ELECTRIC OPERATION

- A. Electric Operators:
 - 1. Mounting: Center mounted on cross head shaft and side mounted on cross head shaft. Refer to drawing for locations.
 - 2. Motor Rating: 1/3 hp; continuous duty.
 - 3. Motor Voltage: 120 volts, single phase, 60 Hz.
 - 4. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
 - 5. Controller Enclosure: NEMA EN 10250, Type 1.
 - 6. Opening Speed: 12 inches per second.
 - 7. Brake: Adjustable friction clutch type, activated by motor controller.
 - 8. Manual override in case of power failure.
 - 9. See Section 26 05 83 for electrical connections.

- B. Control Station: Provide standard three button (Open-Close-Stop) momentary-contact control device for each operator complying with UL 325.
 - 1. 24 volt circuit.
 - 2. Surface mounted, at interior door jamb.
 - 3. At Bus Storage garage doors, provide one exterior key station with surface mounted momentary contact (open-close) and spring return to center. Provide Lock cylinders master keyed to school's system.
 - 4. Entrapment Protection Devices: Provide sensing devices and safety mechanisms complying with UL 325.
 - a. Primary Device: Provide wireless sensing, NEMA 1 photo eye sensors, or NEMA 4X photo eye sensors as required with momentary-contact control device. Provide (2) two sets at each door opening. One set to be mounted at 18 inches above finished floor, second set to be mounted 48 inches above finished floor.
- C. Conduit, wiring and connection from control stations to motor and electric hook-up to motor from disconnect switch, is to be by electrical contractor. Coordinate requirements and hook-up with the electrical contractor.
- D. Hand Held Transmitter: Digital control, and resettable. Provide (2) for each door opening.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that wall openings are ready to receive work and opening dimensions and tolerances are within specified limits prior to starting installation.
- B. Verify that electric power is available and of the correct characteristics.

3.2 PREPARATION

- A. Prepare opening to permit correct installation of door unit to perimeter air and vapor barrier seal.
- B. Apply primer to wood frame.

3.3 INSTALLATION

- A. Install door unit assembly in accordance with manufacturer's instructions.
- B. Anchor assembly to wall construction and building framing without distortion or stress.
- C. Securely brace door tracks suspended from structure. Secure tracks to structural members only.
- D. Fit and align door assembly including hardware.
- E. Coordinate installation of electrical service. Complete power and control wiring from disconnect to unit components.
- F. Install perimeter trim, weatherstripping, and weatherstripping.

3.4 TOLERANCES

- A. Maximum Variation from Plumb: 1/16 inch.
- B. Maximum Variation from Level: 1/16 inch.
- C. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch from 10 ft straight edge.

- D. Maintain dimensional tolerances and alignment with adjacent work.

3.5 ADJUSTING

- A. Adjust door assembly for smooth operation and full contact with weatherstripping.
- B. Have manufacturer's field representative present to confirm proper operation and identify adjustments to door assembly for specified operation.

3.6 CLEANING

- A. Clean doors and frames and glazing.
- B. Remove temporary labels and visible markings.

3.7 PROTECTION

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

END OF SECTION

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SECTION 08 51 13
ALUMINUM WINDOWS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Extruded aluminum windows with fixed sash, operating sash, and infill panels.
- B. Factory glazing.
- C. Operating hardware.
- D. Insect screens.

1.2 RELATED REQUIREMENTS

- A. Section 05 50 00 - Metal Fabrications: Steel lintels.
- B. Section 06 10 00 - Rough Carpentry: Rough opening framing.
- C. Section 07 25 00 - Weather Barriers: Sealing frame to water-resistive barrier installed on adjacent construction.
- D. Section 07 92 00 - Joint Sealants: Sealing joints between window frames and adjacent construction.
- E. Section 08 80 00 - Glazing.

1.3 REFERENCE STANDARDS

- A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights; 2022, with Errata (2023).
- B. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.
- C. AAMA 502 - Voluntary Specification for Field Testing of Newly Installed Fenestration Products; 2021.
- D. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.
- E. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.
- F. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.
- G. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- H. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- I. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- J. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

- K. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- L. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.
- M. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).
- N. ASTM E783 - Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors; 2002 (Reapproved 2018).
- O. 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 (Reapproved 2023).
- P. ASTM E2112 - Standard Practice for Installation of Exterior Windows, Doors and Skylights; 2023.
- Q. ASTM F588 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact; 2017 (Reapproved 2023).
- R. NFRC 100 - Procedures for Determining Fenestration Product U-Factors and Solar Heat Gain Coefficients at Normal Incidence.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Include component dimensions, information on glass and glazing, internal drainage details, and descriptions of hardware and accessories.
- C. Shop Drawings: Indicate opening dimensions, elevations of different types, framed opening tolerances, method for achieving air and vapor barrier seal to adjacent construction, anchorage locations, and installation requirements.
- D. Grade Substantiation: Prior to submitting shop drawings or starting fabrication, submit one of the following showing compliance with specified grade:
 - 1. Evidence of AAMA Certification.
 - 2. Evidence of WDMA Certification.
 - 3. Evidence of CSA Certification.
 - 4. Test report(s) by independent testing agency itemizing compliance and acceptable to authorities having jurisdiction.
- 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. Manufacturer's Installation Instructions: Include complete preparation, installation, and cleaning requirements.
- G. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.
- H. Submit NFRC 100- CMA Bid Report for the project showing compliance with the project thermal requirements at time of initial submission. Bid report shall be based on NFRC test sizes utilizing project specific glazing.

1.5 QUALITY ASSURANCE

- A. Aluminum Windows: Fabricate window assemblies in accordance with AAMA 101 for types of windows required.
- B. Insulated Glass: Fabricate insulated glass units in accordance with GANA (formerly FGMA) Glazing Manual.
- C. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of AAMA CW-10.
- B. Protect finished surfaces with wrapping paper or strippable coating during installation. Do not use adhesive papers or sprayed coatings that bond to substrate when exposed to sunlight or weather.

1.7 FIELD CONDITIONS

- A. Section 01 60 00 - Product Requirements
- B. Do not install sealants when ambient temperature is less than 40 degrees F.
- C. Maintain this minimum temperature during and 24 hours after installation of sealants.

1.8 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Correct defective work within a five year period after Date of Substantial Completion.
- C. Manufacturer Warranty: Provide 15 -year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: EFCO 450X.
- B. Other Acceptable - Aluminum Windows Manufacturers:
 - 1. TRACO: www.traco.com/#sle.
 - 2. Kawneer: <https://www.kawneer.us/>
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 ALUMINUM WINDOWS

- A. Aluminum Windows: Extruded aluminum frame and sash, factory fabricated, factory finished, with operating hardware, related flashings, and anchorage and attachment devices.
 - 1. Frame Depth: 4 1/2 inch.
 - 2. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for operating hardware and imposed loads.
 - 3. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
 - 4. Movement: Accommodate movement between window and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.

5. 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.
 6. Thermal Movement: Design to accommodate thermal movement caused by 180 degrees F surface temperature without buckling stress on glass, joint seal failure, damaging loads on structural elements, damaging loads on fasteners, reduction in performance or other detrimental effects.
 7. Thermal Performance: Installed system shall conform to the following minimum standards:
 - a. Fabricator will be required to thermally model each head, sill and jamb, including adjacent construction, using thermal computer modeling software by an NFRC certified simulator to conform to the following:
 - b. Inside air temperature of 72 degrees F at 30 percent RH and an outside air temperature of -10 degrees F with a 15 mph wind speed.
 - c. An NFRC Component Modeling Approach (CMA) generated label certificate shall be provided by the manufacturer. The label certificate shall be project specific and will contain the thermal performance ratings of the manufacturer's framing combined with the specified glass, and the glass spacer used in the fabrication of the glass, at NFRC standard test size as defined in table 4-3 in NFRC 100-2010.
 8. Windows shall meet exiting requirements for egress windows as stipulated by New York State Education department. Rescue windows shall have a minimum clear opening area of 6 square feet with a minimum clear opening dimension of 24 inches in height and 24 inches in width. Modify standard limiters to meet this standard.
- B. Fixed, Non-Operable Type:
1. Construction: Thermally broken.
 2. Glazing: As specified in 08 80 00.
 3. Exterior Finish: Superior performing powder coatings.
 4. Interior Finish: Superior performing powder coatings.

2.3 PERFORMANCE REQUIREMENTS

- A. Grade: AAMA/WDMA/CSA 101/I.S.2/A440 requirements for specific window type:
 1. Performance Class (PC): AW.
 2. Performance Grade (PG): 40, with minimum design pressure (DP) of 40.10 psf.
- B. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
- C. Water Leakage: No uncontrolled leakage on interior face when tested in accordance with ASTM E331 at differential pressure of 12.11 psf.
- D. Air Leakage: 0.1 cfm/sq ft maximum leakage per unit area of outside window frame dimension when tested at 1.57 psf pressure difference in accordance with ASTM E283/E283M.
- E. Condensation Resistance Factor of Frame: 58, measured in accordance with AAMA 1503.
- F. Overall Thermal Transmittance (U-value): 36, maximum, including glazing, measured on window sizes required for this project. Based on glass/ spacer per Section 08 80 00, and based on NFRC 100 sizes.

2.4 COMPONENTS

- A. Frames: 4 1/2 inch wide by 2 inch deep profile, of .080 inch thick section; thermally broken with interior portion of frame insulated from exterior portion; flush glass stops of snap-on type.
- B. Subframe (Receptor System): .070 inch minimum thickness extruded aluminum, 6065 T6; one piece full width or height of opening.

- C. Sills and Sill Extenders: .070 inch thick, extruded aluminum; sloped for positive wash; fit under sash leg to 1/2 inch beyond wall face; one piece full width of opening; jamb angles to terminate sill end.
- D. Infill Panel: 2 inch thick aluminum.
- E. Insect Screens: Extruded aluminum frame with mitered and reinforced corners; screen mesh taut and secure to frame; secured to window with adjustable hardware allowing screen removal without use of tools.
 - 1. Hardware: Spring loaded steel pins; four per screen unit.
 - 2. Screen Mesh: Vinyl-coated fiberglass, window manufacturer's standard mesh.
 - 3. Frame Finish: Same as frame and sash.
 - 4. Screens at rescue windows shall be hinged or sliding and shall be operable from the inside with one hand, and without the use of a key or other device.
- F. Operable Sash Weatherstripping: Resilient plastic; permanently resilient, profiled to achieve effective weather seal.
- G. Fasteners: Stainless steel.
- H. Glazing Materials: See Section 08 80 00.
- I. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.

2.5 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.
- B. Sheet Aluminum: ASTM B209/B209M, 5005 alloy, H12 or H14 temper.

2.6 FINISHES

- A. Superior Performing Organic Coatings System: Manufacturer's standard multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent polyvinylidene fluoride (PVDF) resin, and at least 80 percent of aluminum extrusion and panels surfaces having minimum total dry film thickness (DFT) of 1.2 mils, 0.0012 inch.
- B. Operator and Exposed Hardware: Enameled to color as selected from manufacturer's standard line.
- C. Shop and Touch-Up Primer for Steel Components: Zinc oxide, alkyd, linseed oil primer appropriate for use over hand cleaned steel.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that wall openings and adjoining water-resistive barrier materials are ready to receive aluminum windows; see Section 07 25 00.

3.2 PRIME WINDOW INSTALLATION

- A. Install windows in accordance with manufacturer's instructions.
- B. Install window assembly in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.
- C. Install windows in accordance with ASTM E2112.

- D. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.
- E. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.
- F. Install sill and sill end angles.
- G. Set sill members and sill flashing in continuous bead of sealant.
- H. 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.
- I. Install glass and infill panels in accordance with requirements; see Section 08 80 00.

3.3 TOLERANCES

- A. Maximum Variation from Level or Plumb: 1/16 inches every 3 ft non-cumulative or 1/8 inches per 10 ft, whichever is less.

3.4 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements for independent field testing and inspection requirements, and requirements for monitoring quality of specified product installations.
- B. Provide field testing of installed aluminum 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 1.57 psf.
- C. Repair or replace fenestration components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.5 ADJUSTING

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

3.6 CLEANING

- A. See Section 01 74 19 - Construction Waste Management and Disposal for additional requirements.
- B. Remove protective material from factory finished aluminum surfaces.
- C. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.
- D. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.
- E. Remove excess glazing sealant by moderate use of mineral spirits or other solvent acceptable to sealant and window manufacturer.

END OF SECTION

**SECTION 087100
DOOR HARDWARE**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Hardware for wood, aluminum, hollow metal, and FRP doors.
- B. Hardware for fire-rated doors.
- C. Lock cylinders for doors with balance of hardware specified in other sections.
- D. Thresholds.
- E. Weatherstripping and gasketing.

1.02 RELATED REQUIREMENTS

- A. Section 081113 - Hollow Metal Doors and Frames.
- B. Section 081416 - Flush Wood Doors.
- C. Section 081613 - Fiberglass Doors.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. BHMA A156.1 - Standard for Butts and Hinges; 2021.
- C. BHMA A156.3 - Exit Devices; 2020.
- D. BHMA A156.4 - Door Controls - Closers; 2019.
- E. BHMA A156.5 - Cylinders and Input Devices for Locks; 2020.
- F. BHMA A156.6 - Standard for Architectural Door Trim; 2021.
- G. BHMA A156.7 - Template Hinge Dimensions; 2016.
- H. BHMA A156.13 - Mortise Locks & Latches Series 1000; 2022.
- I. BHMA A156.16 - Auxiliary Hardware; 2018.
- J. BHMA A156.18 - Materials and Finishes; 2020.
- K. BHMA A156.21 - Thresholds; 2019.
- L. BHMA A156.22 - Standard for Gasketing; 2021.
- M. BHMA A156.26 - Standard for Continuous Hinges; 2021.
- N. BHMA A156.28 - Standard for Recommended Practices for Mechanical Keying Systems; 2018.
- O. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames; 2016.
- P. BHMA A156.115W - Hardware Preparation in Wood Doors with Wood or Steel Frames; 2006.
- Q. DHI (H&S) - Sequence and Format for the Hardware Schedule; 2019.
- R. DHI (KSN) - Keying Systems and Nomenclature; 2019.
- S. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames; 2004.
- T. DHI WDHS.3 - Recommended Locations for Architectural Hardware for Flush Wood Doors; 1993; also in WDHS-1/WDHS-5 Series, 1996.
- U. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- V. ITS (DIR) - Directory of Listed Products; Current Edition.
- W. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.
- X. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2022.

- Y. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.
- Z. UL (DIR) - Online Certifications Directory; Current Edition.
- AA. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- BB. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.
- B. Sequence installation to ensure facility services connections are achieved in an orderly and expeditious manner.
- C. Preinstallation Meeting: Convene a preinstallation meeting one week prior to commencing work of this section; require attendance by affected installers and the following:
 - 1. Architect.
 - 2. Installer's Architectural Hardware Consultant (AHC).
 - 3. Hardware Installer.
 - 4. Owner's Security Consultant.
- D. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
- E. Keying Requirements Meeting:
 - 1. Schedule meeting at project site prior to Contractor occupancy.
 - 2. Attendance Required:
 - a. Contractor.
 - b. Owner.
 - c. Architect.
 - d. Door Hardware Installer.
 - 3. Agenda:
 - a. Establish keying requirements.
 - b. Verify locksets and locking hardware are functionally correct for project requirements.
 - c. Verify that keying and programming complies with project requirements.
 - d. Establish keying submittal schedule and update requirements.
 - 4. Incorporate "Keying Requirements Meeting" decisions into keying submittal upon review of door hardware keying system including, but not limited to, the following:
 - a. Key control system requirements.
 - b. Schematic diagram of preliminary key system.
 - c. Flow of traffic and extent of security required.
 - 5. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.
 - 6. Deliver established keying requirements to manufacturers.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.
- C. Shop Drawings - Door Hardware Schedule: A detailed listing that includes each item of hardware to be installed on each door.
 - 1. Prepared by or under supervision of Architectural Hardware Consultant (AHC).

2. Comply with DHI (H&S) using door numbering scheme and hardware set numbers as indicated in Contract Documents.
 - a. Submit in vertical format.
3. Include complete description for each door listed.
- D. Shop Drawings - Electrified Door Hardware: Include diagrams for power, signal, and control wiring for electrified door hardware that include details of interface with building safety and security systems. Provide elevations and diagrams for each electrified door opening as follows:
 1. Prepared by or under supervision of Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC).
 2. Elevations: Include front and back elevations of each door opening showing electrified devices with connections installed and an operations narrative describing how opening operates from either side at any given time.
 3. Diagrams: Include point-to-point wiring diagrams that show each device in door opening system with related colored wire connections to each device.
- E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- F. Manufacturer's qualification statement.
- G. Installer's qualification statement.
- H. Supplier's qualification statement.
- I. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- J. Keying Schedule:
 1. Submit three (3) copies of Keying Schedule in compliance with requirements established during Keying Requirements Meeting unless otherwise indicated.
- K. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- L. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.
- M. Maintenance Materials and Tools: Furnish the following for Owner's use in maintenance of project.
 1. See Section 016000 - Product Requirements, for additional provisions.

1.06 QUALITY ASSURANCE

- A. Standards for Fire-Rated Doors: Maintain one copy of each referenced standard on site, for use by Architect and Contractor.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified for commercial door hardware with at least three years of documented experience.
- D. Supplier Qualifications: Company with certified Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC) to assist in work of this section.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

1.08 WARRANTY

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

- B. Manufacturer Warranty: Provide manufacturer warranty against defects in material and workmanship for period indicated, from Date of Substantial Completion. Complete forms in Owner's name and register with manufacturer.
 - 1. Closers: Five years, minimum.
 - 2. Exit Devices: Three years, minimum.
 - 3. Locksets and Cylinders: Three years, minimum.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.
- B. Provide individual items of single type, of same model, and by same manufacturer.
- C. Locks: Provide a lock for each door, unless it's indicated that lock is not required.
 - 1. Lock Function: Provide lock and latch function numbers and descriptions of manufacturer's Series. As indicated in hardware sets.
 - 2. Trim: Provide lever handle or pull trim on outside of each lock, unless otherwise indicated.
 - 3. Strikes:
 - a. Finish: To match lock or latch.
 - b. Curved-Lip Strikes: Provide as standard, with extended lip to protect frame, unless otherwise indicated.
 - c. Center Strike At Pairs of Doors: 7/8 inch (22.2 mm) lip.
- D. Door Pulls and Push Plates:
 - 1. Provide door pulls and push plates on doors without a lockset, latchset, exit device, or auxiliary lock unless otherwise indicated.
 - 2. On solid doors, provide matching door pull and push plate on opposite faces.
 - 3. On glazed storefront doors, provide matching door pulls/push plates on both faces unless otherwise indicated.
- E. Closers:
 - 1. Provide door closer on each exterior door, unless otherwise indicated.
 - 2. Provide door closer on each fire-rated and smoke-rated door.
 - 3. Spring hinges are not an acceptable self-closing device, unless otherwise indicated.
- F. Overhead Stops and Holders (Door Checks):
 - 1. Provide stop for every swinging door, unless otherwise indicated.
 - 2. Overhead Stop is not required if positive stop feature is specified for door closer; positive stop feature of door closer is not an acceptable substitute for a stop, unless otherwise indicated.
 - 3. Overhead stop is not required if a floor or wall stop has been specified for the door.
- G. Drip Guards: Provide at head of outswinging exterior doors unless protected by roof or canopy directly overhead.
- H. Thresholds:
 - 1. Interior Applications: Provide when specified at interior doors for transition between two different floor types, and over building expansion joints, unless otherwise indicated.
 - 2. Exterior Applications: Provide at each exterior door, unless otherwise indicated.
- I. Weatherstripping and Gasketing:
 - 1. Provide weatherstripping on each exterior door at head, jambs, and meeting stiles of door pairs, unless otherwise indicated.
 - 2. Provide door bottom sweep on each exterior door, unless otherwise indicated.
 - 3. Fabricate as continuous gasketing, do not cut or notch gasketing material.
- J. Fasteners:

1. Provide fasteners of proper type, size, quantity, and finish that comply with commercially recognized standards for proposed applications.
 - a. Aluminum fasteners are not permitted.
 - b. Provide phillips flat-head screws with heads finished to match door surface hardware unless otherwise indicated.
2. Provide machine screws for attachment to reinforced hollow metal and aluminum frames.
 - a. Self-drilling (Tek) type screws are not permitted.
3. Provide stainless steel machine screws and lead expansion shields for concrete and masonry substrates.
4. Provide wall grip inserts for hollow wall construction.
5. Fire-Resistance-Rated Applications: Comply with NFPA 80.
 - a. Provide wood or machine screws for hinges mortised to doors or frames, strike plates to frames, and closers to doors and frames.
 - b. Provide steel through bolts for attachment of surface mounted closers, hinges, or exit devices to door panels unless proper door blocking is provided.

2.02 PERFORMANCE REQUIREMENTS

- A. Provide door hardware products that comply with the following requirements:
 1. Applicable provisions of federal, state, and local codes.
 2. Accessibility: ADA Standards and ICC A117.1.
 3. Fire-Resistance-Rated Doors: NFPA 80, listed and labeled by qualified testing agency for fire protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
 4. Hardware on Fire-Resistance-Rated Doors: Listed and classified by UL (DIR), ITS (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for application indicated.
 5. Hardware for Smoke and Draft Control Doors (Indicated as "S" on Drawings): Provide door hardware that complies with local codes, and requirements of assemblies tested in accordance with UL 1784.
 6. Hardware Preparation for Steel Doors and Steel Frames: BHMA A156.115.
 7. Hardware Preparation for Wood Doors with Wood or Steel Frames: BHMA A156.115W.
 8. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified.

2.03 HINGES

- A. Manufacturers: Conventional butt hinges.
 1. BEST; dormakaba Group.
 2. McKinney.
 3. Hager.
- B. Properties:
 1. Butt Hinges: As applicable to each item specified.
 - a. Heavy Weight Hinges: Minimum of two (2) permanently lubricated non-detachable bearings.
 - b. Template screw hole locations.
 - c. Bearing assembly installed after plating.
 - d. Bearings: Exposed fully hardened bearings.
 - e. Bearing Shells: Shapes consistent with barrels.
 - f. Pins: Easily seated, non-rising pins.
 - 1) Fully plate hinge pins.
 - 2) Non-Removable Pins: Slotted stainless steel screws.
 - g. UL 10C listed for fire-resistance-rated doors.
 2. Continuous Hinges: As applicable to each item specified.

- a. Geared Continuous Hinges: As applicable to each item specified.
 - 1) Non-handed.
 - 2) Anti-spinning through-fastener.
 - 3) UL 10C listed for fire-resistance-rated doors.
 - (a) Metal Door Installation: Rated up to 90 minutes.
 - (b) Wood Door Installation: Rated up to 60 minutes.
 - 4) Sufficient size to permit door to swing 180 degrees
- C. Sizes:
 - 1. Hinge Heights: 4.5".
 - 2. Hinge Widths: As required to clear surrounding trim.
 - 3. Sufficient size to allow 180 degree swing of door.
- D. Finishes: See Door Hardware Schedule.
 - 1. Fully polish hinges; front, back, and barrel.
- E. Grades:
 - 1. Butt Hinges: Comply with BHMA A156.1 and BHMA A156.7 for templated hinges.
 - 2. Continuous Hinges: Comply with BHMA A156.26, Grade 1.
- F. Material: Base metal as indicated for each item by BHMA material and finish designation.
- G. Types:
 - 1. Butt Hinges: Include full mortise hinges.
 - 2. Continuous Hinges: Include geared hinges.
- H. Options: As applicable to each item specified.
- I. Quantities:
 - 1. Butt Hinges: Three (3) hinges per leaves up to 90 inches (2286 mm) in height. Add one (1) for each additional 30 inches (762 mm) in height or fraction thereof.
 - a. Hinge weight and size unless otherwise indicated in hardware sets:
 - 1) For doors up to 36 inches (914 mm) wide and up to 1-3/4 inches (44.5 mm) thick provide hinges with a minimum thickness of 0.134 inch (3.4 mm) and a minimum of 4-1/2 inches (114 mm) in height.
 - 2) For doors from 36 inches (914 mm) wide up to 42 inches (1067 mm) wide and up to 1-3/4 inches (44.5 mm) thick provide hinges with a minimum thickness of 0.145 inch (3.7 mm) and a minimum of 4-1/2 inches (114 mm) in height.
 - 3) For doors from 42 inches (1067 mm) wide up to 48 inches (1219 mm) wide and up to 1-3/4 inches (44.5 mm) thick provide hinges with a minimum thickness of 0.180 inch (4.6 mm) and a minimum of 5 inches (127 mm) in height.
 - 4) For doors greater than 1-3/4 inches (44.5 mm) thick provide hinges with a minimum thickness of 0.180 inch (4.6 mm) and a minimum of 5 inches (127 mm) in height.
 - 2. Continuous Hinges: One per door leaf.
- J. Applications: At swinging doors.
 - 1. Provide non-removable pins at out-swinging doors with locking hardware and all exterior doors.
- K. Products:
 - 1. Butt Hinges:
 - a. Ball Bearing, Five (5) Knuckle.
 - 2. Continuous Hinges:
 - a. Aluminum geared hinges.

2.04 BOLTS

- A. Manufacturers:

1. ABH.
 2. Burns.
 3. Don-Jo.
- B. Properties:
1. Flush Bolts:
 - a. Self-Latching Flush Bolts: Automatically latching upon closing of door; manually retracted; located on inactive leaf of pair.
 - 1) Bolt Throw: 3/4 inch (19 mm), minimum.
 2. Dustproof Strikes: For bolting into floor, provide except at metal thresholds.
- C. Options:
1. Lever extensions: Provide for top bolt at oversized doors.
- D. Products:
1. Self-Latching flush bolts: 1863.

2.05 EXIT DEVICES

- A. Manufacturers:
1. BEST, dormakaba Group.
 2. Sargent.
 3. Corbin Russwin.
- B. Properties:
1. Actuation: Full-length touchpad.
 2. Touchpads: 'T' style metal touchpads and rail assemblies with matching chassis covers end caps.
 3. Latch Bolts: Stainless steel deadlocking with 3/4 inch (19 mm) projection using latch bolt.
 4. Lever Design: Match project standard lockset trims.
 5. Cylinder: Include where cylinder dogging or locking trim is indicated.
 6. Strike as recommended by manufacturer for application indicated.
 7. Sound dampening on touch bar.
 8. Dogging:
 - a. Non-Fire-Resistance-Rated Devices: Cylinder 1/4 inch (6 mm) hex key dogging.
 - b. Fire-Resistance-Rated Devices: Manual dogging not permitted.
 9. Touch bar assembly on wide style exit devices to have a 1/4 inch (6.3 mm) clearance to allow for vision frames.
 10. All exposed exit device components to be of architectural metals and "true" architectural finishes.
 11. Hanging: Field-reversible.
 12. Fasteners on Back Side of Device Channel: Concealed - exposed fasteners not allowed.
 13. Vertical Latch Assemblies' Operation: Gravity, without use of springs.
- C. Grades: Complying with BHMA A156.3, Grade 1.
1. Provide exit devices 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.
- D. Code Compliance: As required by authorities having jurisdiction in the State in which the Project is located.
- E. Products:
1. 2000.

2.06 LOCK CYLINDERS

- A. Manufacturers:
1. BEST, dormakaba Group.

2. Substitutions: See Section 016000 - Product Requirements.
- B. Properties:
 1. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.
 - a. Provide cylinders from same manufacturer as locking device.
 - b. Provide cams and/or tailpieces as required for locking devices.
 - c. Provide cylinders with appropriate format interchangeable cores where indicated.
- C. Grades:
 1. Standard Security Cylinders: Comply with BHMA A156.5.
- D. Material:
 1. Manufacturer's standard corrosion-resistant brass alloy.
- E. Types: As applicable to each item specified.
- F. Applications: At locations indicated in hardware sets, and as follows
 1. As required for items with locking devices provided by other sections, including at elevator controls and cabinets.
 - a. When provisions for lock cylinders are referenced elsewhere in the Project Manual to this Section, provide compatible type of lock cylinder, keyed to building keying system, unless otherwise indicated.
- G. Products:
 1. Rim/mortise.

2.07 MORTISE LOCKS

- A. Manufacturers:
 1. BEST, dormakaba Group.
 2. Schlage.
 3. Corbin Russwin
- B. Properties:
 1. Mechanical Locks: Manufacturer's standard.
 - a. Fitting modified ANSI A115.1 door preparation.
 - b. Door Thickness Coordination Fitting 1-3/4 inch (44 mm) to 2-1/4 inch (57 mm) thick doors.
 - c. Latch: Solid, one-piece, anti-friction, self-lubricating stainless steel.
 - 1) Latchbolt Throw: 3/4 inch (19 mm), minimum.
 - d. Auxiliary Deadlatch: One piece stainless steel, permanently lubricated.
 - e. Backset: 2-3/4 inch (70 mm).
 - f. Lever Trim:
 - 1) Functionality: Allow the lever handle to move up to 45 degrees from horizontal position prior to engaging the latchbolt assembly.
 - 2) Strength: Locksets outside locked lever designed to withstand minimum 1,400 inch-lbs (158.2 Nm) of torque. In excess of that, a replaceable part will shear. Key from outside and/or inside lever will still operate lockset.
 - 3) Spindle: Designed to prevent forced entry from attacking of lever.
 - 4) Independent spring mechanism for each lever.
 - (a) Trim to be self-aligning and thru-bolted.
 - 5) Handles: Made of forged or cast brass, bronze, or stainless steel construction. Levers that contain a hollow cavity are not acceptable.
 - 6) Levers to operate a roller bearing spindle hub mechanism.
 2. Electrified Locks: Same properties as standard locks, and as follows:
 - a. Voltage: 12 VDC.

- b. Function: Electrically locked (Fail Safe) or unlocked (Fail Secure), as indicated for each lock in Door Hardware Schedule.
- C. Finishes: See Door Hardware Schedule.
 - 1. Core Faces: Match finish of lockset.
- D. Grades:
 - 1. Comply with BHMA A156.13, Grade 1, Security; Grade 2.
- E. Options:
 - 1. Provide locksets made in a manufacturing facility to compliant with ISO 9001-Quality Management and ISO 14001-Environmental Management.
 - 2. Regulatory Compliance: As required by authorities having jurisdiction the State in which the Project is located.
- F. Products: Mortise locks, including standard and electrified types.
 - 1. 40H.

2.08 DOOR PULLS AND PUSH BARS

- A. Manufacturers:
 - 1. Burns.
 - 2. Don-Jo.
 - 3. Rockwood.
- B. Properties:
 - 1. Bar Type: Bar set, unless otherwise indicated.
 - 2. Pulls and Handles:
- C. Grades: Comply with BHMA A156.6.
- D. Material: Stainless steel, unless otherwise indicated.
- E. Products:
 - 1. M422 x M26G.

2.09 COORDINATORS

- A. Manufacturers:
 - 1. Burns.
 - 2. ABH.
 - 3. Don-Jo.
- B. Properties:
 - 1. General: Non-handed devices, with field-selectable active door leaf.
 - 2. Active door to be field-selectable.
 - 3. Combined Coordinators and Closers: Single devices performing both functions.
 - a. System consisting of a steel cam, roller and adjustable spring incorporating a track arm coordinator assembly for controlling sequential closing of pairs of doors.
 - 1) Coordinator element installs on frame.
 - 2) Closer elements install on doors.
 - b. Two separate temperature-compensating noncritical adjustment valves for controlling sweep and latch closing speeds.
 - c. Adjustable hydraulic backcheck effective from approximately 65 degrees.
 - d. Delayed Action: Range effective from approximately 125 to 70 degrees.
 - e. Maximum Opening Range: Approximately 175 degrees on pull-side opening and 120 degrees on push-side opening, project conditions permitting.
 - f. Field-selectable active leaf.
- C. Grades:
 - 1. Closer and Coordinator Combinations: Comply with BHMA A156.4, Grade 1.

- D. Code Compliance: As required by authorities having jurisdiction in the State in which the Project is located.
 - 1. Meet UL 10C for Positive Pressure.
- E. Types:
 - 1. Closer & Coordinator Combinations.
 - 2. Coordinators: Bar.
- F. Installation:
 - 1. Mounting: Provide necessary mounting brackets and filler bars to ensure proper installation of coordinator and related hardware.
 - a. Pull Side: Mount with electrically-held single-point hold open for the inactive door from approximately 80 to 130 degrees.
 - b. Push Side: Mount with electrically-held selective single-point hold open function for the active and inactive doors from approximately 80 to 120 degrees.
 - 2. Coordination: Properly sequence installation of other door hardware affected by placement of coordinators and carry bars.
- G. Products:
 - 1. 3700 Series.

2.10 CLOSERS

- A. Manufacturers:
 - 1. BEST, dormakaba Group.
 - 2. Norton.
 - 3. Sargent.
- B. Properties:
 - 1. Surface Mounted Closers: Manufacturer's standard.
 - a. Construction: Single piece casted cast iron..
 - b. Hydraulic Fluid: All-weather type.
 - c. Arm Assembly: Standard for product specified.
 - 1) Include hold-open, integral stop, or spring-loaded stop feature, as specified in Door Hardware Schedule.
 - 2) Parallel arm to be a heavy-duty rigid arm.
 - 3) Where "IS" or "S-IS" arms are specified in hardware sets, if manufacturer does not offer this arm provide a regular arm mount closer in conjunction with a heavy-duty overhead stop equal to a dormakaba 900 Series.
 - d. Covers:
 - 1) Type: Standard for product selected.
 - 2) Material: Plastic.
 - 3) Finish: Painted.
- C. Grades:
 - 1. Closers: Comply with BHMA A156.4, Grade 1.
 - a. Underwriters Laboratories Compliance:
 - 1) Product Listing: UL (DIR) and ULC for use on fire-resistance-rated doors.
 - (a) UL 228 - Door Closers-Holders, With or Without Integral Smoke Detectors.
- D. Code Compliance: As required by authorities having jurisdiction in the State in which the Project is located.
 - 1. Devices listed with California Department of Forestry and Fire Protection, Office of the State Fire Marshal.
- E. Types:
 - 1. Rack-and-pinion, surface-mounted. 1-1/2 inches (38 mm) minimum bore.

- F. Installation:
 - 1. Mounting: Includes surface mounted installations.
 - 2. Mount closers on non-public side of door and stair side of stair doors unless otherwise noted in hardware sets.
 - 3. At outswinging exterior doors, mount closer on interior side of door.
 - 4. Provide adapter plates, shim spacers, and blade stop spacers as required by frame and door conditions.
 - 5. Where an overlapping astragal is included on pairs of swinging doors, provide coordinator to ensure door leaves close in proper order.
- G. Products:
 - 1. Surface Mounted:
 - a. EHD9000

2.11 PROTECTION PLATES

- A. Manufacturers:
 - 1. Burns.
 - 2. ABH.
 - 3. Don-Jo.
- B. Properties:
 - 1. Plates:
 - a. Kick Plates: Provide along bottom edge of push side of every wood door with closer, except aluminum storefront and glass entry doors, unless otherwise indicated.
 - b. Mop Plates: Provide along bottom edge of push side of doors to provide protection from cleaning liquids and equipment damage to door surface.
 - c. Edges: Beveled, on four (4) unless otherwise indicated.
- C. Grades: Comply with BHMA A156.6.
- D. Material: As indicated for each item by BHMA material and finish designation.
 - 1. Metal Properties: Stainless steel.
- E. Installation:
 - 1. Fasteners: Countersunk screw fasteners
- F. Products:
 - 1. Mop Plates: MP50.

2.12 STOPS AND HOLDERS

- A. Manufacturers:
 - 1. Burns.
 - 2. Don-Jo.
 - 3. Rockwood.
- B. General: Provide overhead stop/holder when wall or floor stop is not feasible.
- C. Grades:
 - 1. Door Holders, Wall Bumpers, and Floor Stops: Comply with BHMA A156.16 and Resilient Material Retention Test as described in this standard.
- D. Material: Base metal as indicated for each item by BHMA material and finish designation.
- E. Types:
 - 1. Wall Bumpers: Bumper, convex, wall stop.
 - 2. Floor Stops: Provide with bumper floor stop.
- F. Installation:

1. Non-Masonry Walls: Confirm adequate wall reinforcement has been installed to allow lasting installation of wall bumpers.
- G. Products:
 1. Wall Bumpers: 560.
 2. Floor Stops: 520.

2.13 THRESHOLDS

- A. Manufacturers:
 1. National Guard Products, Inc.
 2. Reese.
 3. Pemko.
- B. Properties:
 1. Threshold Surface: Fluted horizontal grooves across full width.
- C. Grades: Thresholds: Comply with BHMA A156.21.
- D. Types: As applicable to project conditions. Provide barrier-free type at every location where specified.
- E. Products:
 1. See Door Hardware Schedule.

2.14 WEATHERSTRIPPING AND GASKETING

- A. Manufacturers:
 1. National Guard Products, Inc.
 2. Zero.
 3. Pemko.
- B. Properties:
 1. Adhesive-Backed Perimeter Gasketing: Silicone gasket material applied to frame with self- adhesive.
 2. Rigid, Housed, Perimeter Gasketing: Sponge silicone gasket material held in place by aluminum housing; fastened to frame stop with screws.
 3. Overlapping Astragals for Meeting Stiles: Neoprene strip gasket material held in place by aluminum housing and overlapping when doors are closed; mounted to face of meeting stile with screws; surface mounted to door.
 4. Door Sweeps: Neoprene gasket material held in place by flat aluminum housing or flange; surface mounted to face of door with screws.
- C. Grades: Comply with BHMA A156.22.
- D. Products:
 1. Weatherstripping: See Door Hardware Schedule.
 2. Smoke Seals: See Door Hardware Schedule.
 3. Meeting Stile Seals: See Door Hardware Schedule.
 4. Door Bottom Seals:
 - a. Door Sweeps: See Door Hardware Schedule.

2.15 MISCELLANEOUS ITEMS

- A. Properties:
 1. Silencers: Provide at equal locations on door frame to mute sound of door's impact upon closing.
 - a. Single Door: Provide three on strike jamb of frame.
 - b. Pair of Doors: Provide two on head of frame, one for each door at latch side.
 - c. Material: Rubber, gray color.

- B. Products:
 - 1. Silencers.

2.16 ELECTRIFIED HARDWARE

- A. Manufacturers:
 - 1. RCI; dormakaba Group. (Basis of Design)
 - 2. Substitutions: See Section 016000 - Product Requirements.
- B. Properties:
 - 1. Door Position Switches: Recessed devices with balanced magnetic contacts.
 - a. Power Requirement: 50mA Max, 100 VDC.
 - b. SPDT configuration with magnetic tamper.
- C. Products:
 - 1. Door Position Switches:
 - a. Basis of Design: 9540 Recessed Magnetic Contact/Door Position Switch.

2.17 KEYS AND CORES

- A. Manufacturers:
 - 1. BEST, dormakaba Group.
 - 2. Substitutions: See Section 016000 - Product Requirements.
- B. Properties: Complying with guidelines of BHMA A156.28.
 - 1. Provide small format interchangeable core.
 - 2. Provide Patented CORMAX keys and cores.
 - 3. Provide keying information in compliance with DHI (KSN) standards.
 - 4. Keying Schedule: Arrange for a keying meeting, with Architect, Owner and hardware supplier, and other involved parties to ensure locksets and locking hardware, are functionally correct and keying complies with project requirements.
 - 5. Keying: Master keyed.
 - 6. Include construction keying and control keying with removable core cylinders.
 - 7. Supply keys in following quantities:
 - a. Master Keys: 4 each.
 - b. Construction Master Keys: 6 each.
 - c. Construction Keys: 15 each.
 - d. Construction Control Keys: 2 each.
 - e. Control Keys if New System: 2 each.
 - 8. Provide key collection envelopes, receipt cards, and index cards in quantity suitable to manage number of keys.
 - 9. Deliver keys with identifying tags to Owner by security shipment direct from manufacturer.
 - 10. Permanent Keys and Cores: Stamped with applicable key marking for identification. Do not include actual key cuts within visual key control marks or codes. Stamp permanent keys "Do Not Duplicate."
 - 11. Include installation of permanent cores and return construction cores to hardware supplier. Construction cores and keys to remain property of hardware supplier.
- C. Products:
 - 1. Patented:
 - a. CORMAX.

2.18 FINISHES

- A. Finishes: All finishes should match existing hardware finish colors currently being used in the building.
- B. GC to verify all finish colors before hardware order is placed.

- C. Exceptions:
 - 1. Where base material metal is specified to be different, provide finish that is an equivalent appearance in accordance with BHMA A156.18.
 - 2. Hinges for Fire-Rated Doors: Steel base material with painted finish, in compliance with NFPA 80.
 - 3. Door Closer Covers and Arms: Color as selected by Architect from manufacturer's standard colors unless otherwise indicated.
 - 4. Aluminum Surface Trim and Gasket Housings: Anodized to match door panel finish, not other hardware, unless otherwise indicated.
 - 5. Hardware for Aluminum Storefront Doors: Finished to match door panel finish, except at hand contact surfaces provide stainless steel with satin finish, unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.
- B. Correct all defects prior to proceeding with installation.
- C. Verify that electric power is available to power operated devices and of correct characteristics.

3.02 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
- B. Install hardware using the manufacturer's fasteners provided. Drill and tap all screw holes located in metallic materials. Do not use "Riv-Nuts" or similar products.
- C. Install hardware on fire-rated doors and frames in accordance with applicable codes and NFPA 80.
- D. Install hardware for smoke and draft control doors in accordance with NFPA 105.
- E. Use templates provided by hardware item manufacturer.
- F. Do not install surface mounted items until application of finishes to substrate are fully completed.
- G. Wash down masonry walls and complete painting or staining of doors and frames.
- H. Complete finish flooring prior to installation of thresholds.
- I. Door Hardware Mounting Heights: Match mounting heights of existing hardware.
- J. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.
- K. Include in installation for existing doors and frames any necessary field modification and field preparation of doors and frames for new hardware. Provide necessary fillers, reinforcements, and fasteners for mounting new hardware and to cover existing door and frame preparations.

3.03 FIELD QUALITY CONTROL

- A. Perform field inspection and testing under provisions of Section 014000 - Quality Requirements.
- B. Provide an Architectural Hardware Consultant (AHC) to inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

3.04 ADJUSTING

- A. Adjust work under provisions of Section 017000 - Execution and Closeout Requirements.
- B. Adjust hardware for smooth operation.

- C. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

3.05 CLEANING

- A. Clean finished hardware in accordance with manufacturer's written instructions after final adjustments have been made.
- B. Clean adjacent surfaces soiled by hardware installation activities.
- C. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.
- D. See Section 017419 - Construction Waste Management and Disposal, for additional requirements.

3.06 PROTECTION

- A. Protect finished Work under provisions of Section 017000 - Execution and Closeout Requirements.
- B. Do not permit adjacent work to damage hardware or finish.

3.07 HARDWARE SETS

Manufacturer list

<u>Code:</u>	<u>Name:</u>
ABH	Architectural Builders Hardware
BES	Best
BES	BEST
PRE	BEST (Precision)
BRN	Burns Manufacturing
NGP	National Guard Products

Option list

<u>Code:</u>	<u>Name:</u>
B4E	Heavy Bevel Edges
FL	Fire Rated Hardware
CSK	CounterSunk Holes
PATD	Patented keyed core
4" ODW	4" Over Door Width
CD	Cylinder Dogging: 1-1/4" Mortise Cylinder not included
Head & Jambs (2)	Provide at the head and both jambs
NRP	NON-REMOVABLE PINS

Finish list

<u>Code:</u>	<u>Name:</u>
DKB	Dark Oxidized Oil Rubbed
DB	Dark Bronze
613	Satin Dark Oxidized Bronze
10B	STN BRZ DK OXDZ OL RBBD
690	690 Statuary Bronze
Gray	Gray

S5 Painted DB
C Charcoal

Hardware Sets

Set #1 - EXT FRP PAIR - DOOR CONTACTS - WALL PADS ON DOOR – MULLION X RIM EXIT DEVICE

2.0	Hinge	661HD	DB	BES
1.0	Removable Mullion	KR822	695	PRE
1.0	Exit Device	2103 CD CA-03	690	PRE
1.0	Exit Device	2101 CD	690	PRE
2.0	Rim Cylinder	12E 7 2 PATD	690	BES
2.0	Mortise Cylinder	1E 7 4 PATD	690	BES
2.0	Pull Bar	M26G	DB	BRN
1.0	Threshold	896S-ADJ	DKB	NGP
1.0	Gasketing	134S Head & Jambs (2)	DKB	NGP
1.0	Gasketing	5100S MULLION		NGP
2.0	Sweep	200S	DKB	NGP
1.0	Drip Cap	16 4" ODW	DKB	NGP
2.0	Door Position Switch	By Security Contractor		
1.0	Request to Exit	By Security Contractor		

NOTE: Operational Narrative: Free egress always. Door normally closed and locked. Bar can be dogged with valid key in cylinder. Door position switch monitors door status. Request to exit switch above door shunts alarm signal to security panel on egress. Coordinate all wiring and installation with Divisions 26 & 28.

Set #2 - EXT FRP PAIR - DOOR CONTACTS – STOREROOM LOCK

1.0	Hinge	661HD	DB	BES
1.0	Flush Bolt	1863P	US10B	ABH
1.0	Mortise Lock	45H 7 D 15 H PATD (STOREROOM)	690	BES
2.0	Kick Plate	KP50 CSK B4E 10" Door Width less 1"	DB	BRN
1.0	Threshold	896S-ADJ	DKB	NGP
1.0	Gasketing	134S Head & Jambs (2)	DKB	NGP
2.0	Sweep	200S	DKB	NGP
1.0	Drip Cap	16 4" ODW	DKB	NGP
2.0	Door Position Switch	By Security Contractor		
1.0	Request to Exit	By Security Contractor		

NOTE: Operational Narrative: Free egress always. Doors normally closed and locked. Door position switch monitors door status. Request to exit switch above door shunts alarm signal to security panel on egress. Coordinate all wiring and installation with Divisions 26 & 28.

Set #3 - EXT FRP SGL - DOOR CONTACTS – EXTERIOR PULL

1.0 Hinge	661HD	DB	BES
1.0 Mortise Lock	45H 7 XR 15 H PATD	690	BES
1.0 Pull	29 X LAR	DB	BRN
1.0 Threshold	896S-ADJ	DKB	NGP
1.0 Gasketing	134S Head & Jambs (2)	DKB	NGP
1.0 Sweep	200S	DKB	NGP
1.0 Drip Cap	16 4" ODW	DKB	NGP
1.0 Door Position Switch	By Security Contractor		
1.0 Request to Exit	By Security Contractor		

NOTE: Operational Narrative: Free egress always. Door normally closed and locked. Door position switch monitors door status. Request to exit switch above door shunts alarm signal to security system on egress. Coordinate all wiring and installation with Divisions 26 & 28.

Set #4 - INT FRP PAIR RATED - CLASSROOM LOCK

6.0 Hinge	FBF168 (NRP AS REQ'D)	10B	BES
1.0 Flush Bolt	1863S	US10B	ABH
1.0 Mortise Lock	45H 7 R 15 H PATD (CLASSROOM)	613	BES
1.0 Coordinator	3700 SERIES	S5	ABH
2.0 Mounting Bracket	3751/3752 (AS REQ'D)	S5	ABH
2.0 Door Closer	EHD90 16 AF90P	690	BES
2.0 Kick Plate	KP50 CSK B4E 10" Door Width less 1"	DB	BRN
2.0 Floor Stop	520/560 (AS REQ'D)	US10B	BRN
1.0 Gasketing	5050 Head & Jambs (2)	C	NGP

Set #5 - INT FRP PAIR - MAG HOLD OPENS - WALL PADS ON DOOR – CVR EXIT DEVICE

6.0 Hinge	FBF168 (NRP AS REQ'D)	10B	BES
2.0 Exit Device	FL LBR 2708 4908 A	613	PRE
2.0 Rim Cylinder	12E 7 2 PATD	690	BES
2.0 Door Closer	EHD90 16 SDS90	690	BES
1.0 Gasketing	5050 Head & Jambs (2)	C	NGP
2.0 Magnetic Door Holder	EM 500 SERIES	695	DKA

NOTE: Operational Narrative: Free egress always. Doors normally held open via magnetic holders. Doors will close and latch on power outage or fire alarm activation. Coordinate all wiring and installation with

Divisions 26 & 28.

Set #6 - INT FRP & HM SGL RATED - STOREROOM LOCK

3.0 Hinge	FBB168 (NRP AS REQ'D)	10B	BES
1.0 Mortise Lock	45H 7 R 15 H PATD (CLASSROOM)	690	BES
1.0 Door Closer	EHD90 16 AF90P	689	BES
1.0 Door Closer	MOUNTING BRACKETS/STOPS (AS REQ'D)	690	BES
1.0 Kick Plate	KP50 CSK B4E 10" Door Width less 2"	613	BRN
1.0 Floor Stop	520/560 (AS REQ'D)	US10B	BRN
1.0 Gasketing	5050 Head & Jambs (2)	C	NGP

Set #7 - INT FRP SGL RATED – MAG HOLD OPEN - WALL PADS ON DOOR- CLASSROOM LOCK

3.0 Hinge	FBB168 (NRP AS REQ'D)	10B	BES
1.0 Mortise Lock	45H 7 R 15 H PATD (CLASSROOM)	690	BES
1.0 Door Closer	EHD90 16 AF90P	689	BES
1.0 Floor Stop	520/560 (AS REQ'D)	US10B	BRN
1.0 Magnetic Door Holder	EM 500 SERIES	695	DKA
1.0 Gasketing	5050 Head & Jambs (2)	C	NGP

NOTE: Operational Narrative: Free egress always. Doors normally held open via magnetic holders. Doors will close and latch on power outage or fire alarm activation. Coordinate all wiring and installation with Divisions 26 & 28.

Set #8 - INT FRP SGL RATED – CARD ACCESS – STOREROOM LOCK

3.0 Hinge	FBB168 (NRP AS REQ'D)	10B	BES
1.0 Mortise Lock	45H 7 D 15 H PATD (STOREROOM)	690	BES
1.0 Electric Strike	F2164 (fail secure)		RCI
1.0 Door Closer	EHD90 16 AF90P	689	BES
1.0 Kick Plate	KP50 CSK B4E 10" Door Width less 2"	613	BRN
1.0 Floor Stop	520/560 (AS REQ'D)	US10B	BRN
1.0 Gasketing	5050 Head & Jambs (2)	C	NGP
1.0 Card Reader	By Security Contractor		

NOTE: Operational Narrative: Free egress always. Door normally closed and locked. Valid credentials at card reader will release strike and allow entry. Door will remain closed and locked during power outage. Coordinate all wiring and installation with Divisions 26 & 28.

Set #9 - INT FRP SGL RATED - CLASSROOM LOCK

3.0 Hinge	FBB168 (NRP AS REQ'D)	10B	BES
1.0 Mortise Lock	45H 0 R 15 H (CLASSROOM)	690	BES

1.0	Door Closer	EHD90 16 AF90P	689	BES
1.0	Kick Plate	KP50 CSK B4E 10" Door Width less 2"	613	BRN
1.0	Mop Plate	MP50 CSK B4E 6" Door Width less 2"	613	BRN
1.0	Floor Stop	520/560 (AS REQ'D)	US10B	BRN
1.0	Gasketing	5050 Head & Jambs (2)	C	NGP

Set #10 - INT FRP SGL RATED - STOREROOM LOCK

3.0	Hinge	FBF168 (NRP AS REQ'D)	10B	BES
1.0	Mortise Lock	45H 7 D 15 H PATD (STOREROOM)	690	BES
1.0	Door Closer	EHD90 16 AF90P	689	BES
1.0	Door Closer	MOUNTING BRACKETS/STOPS (AS REQ'D)	690	BES
1.0	Kick Plate	KP50 CSK B4E 10" Door Width less 2"	613	BRN
1.0	Floor Stop	520/560 (AS REQ'D)	US10B	BRN
1.0	Gasketing	5050 Head & Jambs (2)	C	NGP

Set #11 - OVERHEAD DOOR

NOTE: ALL HARDWARE BY DOOR MANUFACTURER

Set #12 - EXT PAIR – ACCESS CONTROL - DOOR CONTACTS –MULLION RIM EXIT DEVICE

2.0	Hinge	661HD	DB	BES
1.0	Removable Mullion	KR822	695	PRE
1.0	Exit Device	2103 CD CA-03	690	PRE
1.0	Exit Device	2101 CD	690	PRE
2.0	Rim Cylinder	12E 7 2 PATD	690	BES
2.0	Mortise Cylinder	1E 7 4 PATD	690	BES
2.0	Pull Bar	M26G	DB	BRN
1.0	Electric Strike	0162 (fail secure)		RCI
2.0	Kick Plate	KP50 CSK B4E 10" Door Width less 1"	DB	BRN
1.0	Threshold	896S-ADJ	DKB	NGP
1.0	Gasketing	134S Head & Jambs (2)	DKB	NGP
1.0	Gasketing	5100S MULLION		NGP
2.0	Sweep	200S	DKB	NGP
1.0	Drip Cap	16 4" ODW	DKB	NGP
2.0	Door Position Switch	By Security Contractor		
1.0	Request to Exit	By Security Contractor		
1.0	Card Reader	By Security Contractor		

NOTE: Operational Narrative: Free egress always. Doors normally closed and locked. Valid credentials at card reader will release strike and allow entry. Bars can be dogged with valid key in cylinder. Door position switch monitors door status. Request to exit switch above door shunts alarm signal to security panel on egress. Coordinate all wiring and installation with Divisions 26 & 28.

Set #13 - EXT PAIR – ACCESS CONTROL - DOOR CONTACTS –MULLION RIM EXIT DEVICE

1.0	Electric Strike	0162 (fail secure)	RCI
2.0	Door Position Switch	By Security Contractor	
1.0	Request to Exit	By Security Contractor	
1.0	Card Reader	By Security Contractor	

NOTE: Operational Narrative: Free egress always. Doors normally closed and locked. Valid credentials at card reader will release strike and allow entry. Bars can be dogged with valid key in cylinder. Door position switch monitors door status. Request to exit switch above door shunts alarm signal to security panel on egress. Coordinate all wiring and installation with Divisions 26 & 28.

END OF SECTION

SECTION 08 80 00
GLAZING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Insulating glass units.
- B. Glazing units.
- C. Glazing compounds.

1.2 RELATED REQUIREMENTS

- A. Section 07 25 00 - Weather Barriers.
- B. Section 07 92 00 - Joint Sealants: Sealants for other than glazing purposes.
- C. Section 08 11 13 - Hollow Metal Doors and Frames: Glazed door lites and borrowed lights in non-rated frames.
- D. Section 08 51 13 - Aluminum Windows: Glazing provided by window manufacturer.

1.3 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.
- B. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- C. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2019).
- D. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2016.
- E. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2019.
- F. ASTM F1233 - Standard Test Method for Security Glazing Materials And Systems; 2021.
- G. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2023.
- H. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2023.
- I. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2023.
- J. UL 972 - Standard for Burglary Resisting Glazing Material; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data on Insulating Glass Unit and Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Samples: Submit two samples 10 by 10 inch in size of glass units, showing coloration and design.
- E. Certificate: Certify that sealed insulated glazing units meet or exceed specified requirements.
 - 1. Submit NFRC 100- CMA Bid Report for the project showing compliance with the project thermal requirements at time of initial submission. Bid report shall be based on NFRC test sizes utilizing project specific glazing.
- F. Installer's Certificate: Certify that glass furnished without identification label is installed in accordance with Construction documents and applicable code.
- G. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA (GM), GANA (SM), GANA (LGRM), and IGMA TM-3000 for glazing installation methods.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.7 FIELD CONDITIONS

- A. Do not install glazing when ambient temperature is less than 40 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.8 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Insulating Glass Units: Provide a ten (10) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.

PART 2 PRODUCTS

2.1 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: In accordance with ASCE 7.

GLAZING

- a. Positive Design Pressure: 20 psf.
 - b. Negative Design Pressure: 20 psf.
2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
3. Seismic Loads: Design and size glazing components to withstand seismic loads and sway displacement in accordance with the requirements of ASCE 7
4. 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.
5. Glass thicknesses listed are minimum.
- B. Weather-Resistive Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure water-resistive barrier, vapor retarder, and/or air barrier.
 1. In conjunction with weather barrier related materials described in other sections, as follows:
 - a. Water-Resistive Barriers: See Section 07 25 00.
 2. To utilize inner pane of multiple pane insulating glass units for continuity of vapor retarder and/or air barrier seal.
 3. To maintain a continuous vapor retarder and/or air barrier throughout glazed assembly from glass pane to heel bead of glazing sealant.
- C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
 1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 7 computer program.
 2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 7 computer program.
 3. Solar Optical Properties: Comply with NFRC 300 test method.

2.2 INSULATING GLASS UNITS

- A. Manufacturers:
 1. Guardian Glass, LLC: www.guardianglass.com/#sle.
 2. Pilkington North America Inc: www.pilkington.com/na/#sle.
 3. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Insulating Glass Units: Types as indicated.
 1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
 2. Metal-Edge Spacers: Aluminum, bent and soldered corners.
 3. Spacer Color: Black.
 4. Edge Seal:
 - a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.
 - b. Color: Black.
 5. Purge interpane space with dry air, hermetically sealed.
 6. Capillary Tubes: Provide tubes from air space for insulating glass units without inert type gas that have a change of altitude greater than 2500 feet between point of fabrication and point of installation to permit pressure equalization of air space.
 - a. Capillary Tubes: Tubes to remain open and be of length and material type in accordance with insulating glass fabricator's requirements.
- C. Type IG-A - Insulating Glass Units: Vision glass, double glazed.
 1. Applications: Exterior glazing unless otherwise indicated.
 2. Space between lites filled with argon.
 3. Outboard Lite: Heat-strengthened float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 4. Inboard Lite: Heat-strengthened float glass, 1/4 inch thick, minimum.

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- a. Tint: Clear.
 - b. Coating: Solarban 70 Low-E film, on #3 surface.
5. Total Thickness: 1 inch.
6. Thermal Transmittance (U-Value), Winter - Center of Glass: 0.24, nominal.
7. Visible Light Transmittance (VLT): 60 percent, nominal.
8. Solar Heat Gain Coefficient (SHGC): 0.38 percent, nominal.
9. Glazing Method: Dry glazing method, tape and gasket spline.
- D. Type IG-B - Insulating Glass Units: Translucent glazing.
 1. Applications: Exterior glazing as indicated on drawings.
 2. Space between lites filled with light diffusing capillary insert and glass fiber tissue and Argon gas.
 3. Outboard Lite: Heat-strengthened float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 - b. Coating: Self-cleaning type, on #1 surface.
 - c. Coating: Low-E (solar control type), on #2 surface.
 4. Metal edge spacer.
 5. Inboard Lite: Heat-strengthened float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 6. Total Thickness: 1-1/4 inch.
 7. Thermal Transmittance (U-Value): 0.24, nominal.
 8. Visible Light Transmittance (VLT): 24 percent, nominal.
 9. Shading Coefficient: 0.20, nominal.
 10. Solar Heat Gain Coefficient (SHGC): 16 percent, nominal.
 11. Product:
 - a. Okalux; Okalux+ Type 24/16: www.okaluxna.com.
 - b. Or Approved Equal.

2.3 GLAZING UNITS

- A. Type G-1 - Monolithic Safety Glazing: Non-fire-rated.
 1. Applications:
 - a. Display units sliding glass
 - b. Other locations required by applicable federal, state, and local codes and regulations.
 - c. Other locations indicated on drawings.
 2. Glass Type: Fully tempered safety glass as specified.
 3. Tint: Clear.
 4. Thickness: 1/4 inch, nominal.

2.4 ACCESSORIES

- A. Setting Blocks: Neoprene, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.
- C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
- D. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color to match frame.

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PART 3 EXECUTION

3.1 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 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.
- C. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.2 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.

3.3 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. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.
- E. 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, and paint.

3.4 INSTALLATION - DRY GLAZING METHOD (TAPE AND GASKET SPLINE GLAZING)

- A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.
- B. Cut glazing tape to length; install on glazing pane. Seal corners by butting tape and sealing junctions with butyl sealant.
- C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- D. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
- E. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.
- F. Carefully trim protruding tape with knife.

3.5 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements for additional requirements.

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- B. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.
- C. Monitor and report installation procedures and unacceptable conditions.

3.6 CLEANING

- A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- B. Remove nonpermanent 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.

3.7 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 08 81 00
FIRE RATED GLASS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fire rated and safety rated glass for installation in steel frames and vision panels for fire rated doors.

1.2 RELATED SECTIONS:

- A. Section 07 92 00 - Joint Sealants: Sealant and back-up materials.
- B. Section 08 11 13 - Hollow Metal Doors and Frames: Glazing for fire rated frames.
- C. Section 08 71 00 – Door Hardware.
- D. Section 08 80 00 - Glazing.

1.3 REFERENCES

- A. ANSI Z97.1 - American National Standard for Safety Glazing Materials used in Buildings - Safety Glazing Specifications and Methods of Test.
- B. ASTM E119 - Standard Test Method for Fire Tests of Building Construction and Materials.
- C. GANA - FGMA Sealant Manual.
- D. GANA - Glazing Manual.
- E. GANA PCR for Flat Glass: UN CPC 3711 Product Category Rule for Environmental Product Declarations.
- F. NFPA 80 - Standard for Fire Doors, Fire Windows.
- G. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.
- H. NFPA 257 - Standard on Fire Test for Window and Glass Block Assemblies.
- I. UL 9 - Fire Tests of Window Assemblies
- J. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
- K. UL 10B – Fire Tests of Window Assemblies.
- L. UL 263 - Fire Resistance Ratings
- M. CPSC 16 CFR, Part 1201 - Consumer Product Safety Standard - Safety Standard for Architectural Glazing.

1.4 SUBMITTALS

- A. Section 01 30 00 - Administrative Requirements, for Submittal procedures.
- B. Shop Drawings: Show dimensioned plans, elevations and details for doors, frames, and hardware components as shown on drawings and schedules. Provide templates for the location of embeds and anchor locations required any adjoining work.

- C. Product Data: Submit latest edition of manufacturer's product data providing product descriptions, technical data and installation instructions.
- D. Samples:
 - 1. Provide 12-inch square samples for each type glass specified.
 - 2. Provide manufacturer's color charts showing full range of powder coating colors for framing.
- E. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
- F. Certificates of compliance from glass and glazing materials manufacturers attesting that glass and glazing materials furnished for project comply with requirements. Separate certification will not be required for glazing materials bearing manufacturer's permanent label designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authority having jurisdiction.
- G. Product Test Listings: From UL indicating fire-rated glass complies with requirements, based on comprehensive testing of current product.
- H. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.5 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing aluminum glazing systems with minimum ten years of documented experience.
- B. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance; and who employs glass installers for this Project who are certified under the National Glass Association Glazier Certification Program as Level 2 (Senior Glaziers) or Level 3 (Master Glaziers).
- C. Source Limitations for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.
- D. Fire-Rated Window Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by UL, for fire ratings indicated, based on testing according to NFPA 252, ASTM E119. Assemblies must be factory-welded or come complete with factory-installed mechanical joints and must not require job site fabrication.
- E. Fire-Rated Window Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to ASTM E119 and NFPA 257.
 - 1. Window assemblies with ratings of less than 60 minutes may be tested in accordance with NFPA 257, UL 9, CAN4-S106 Standard Test Methods.
- F. Certification: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.
 - 1. Door assemblies shall be tested to the acceptance criteria of ASTM E2074-00, NFPA 252, UL 9, UL 10-C Standard Methods of Fire Tests of Door Assemblies.
 - 2. Window assemblies shall be tested to the acceptance criteria of NFPA 257, UL 10-B, UL 10-C Standard methods for Fire Tests of Window Assemblies.
 - 3. Wall assemblies shall be tested to the acceptance criteria of ASTM E119, UL 263 Standard Test Methods for Fire Tests of Building Construction and Materials.
 - 4. An approved independent testing laboratory equal to UL shall conduct fire test

FIRE RATED GLASS

- G. Listings and Labels -Fire Rated Assemblies: Under current follow-up service by an approved independent agency maintaining a current listing or certification. Label assemblies accordance with limits of manufacturer's listing.
- H. Fire Protective Rated Glass: Each lite shall bear permanent, non-removable label of UL certifying it for use in tested and rated fire protective assemblies.
- I. Door assemblies shall be marked with the hourly rating followed by the letter "S". The letter "S" indicates air leakage resistance testing conformance to UBC 7-2 Parts I and II.
- J. Regulatory Requirements: Comply with provisions of the following:
 - 1. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," and ANSI A117.1 as follows:
 - 2. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
 - 3. Door Closers: Comply with the following maximum opening-force requirements indicated:
 - 4. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

1.6 PRE-INSTALLATION MEETING

- A. Section 01 30 00 - Administrative Requirements: Preinstallation meeting.
- B. Convene minimum one week before starting Work of this section.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle under provisions specified by manufacturer. For details on storage and product handling, please contact Manufacturer and request information on storage and product handling.
- B. Deliver materials to specified destination in manufacturer or distributor's packaging undamaged, complete with installation instructions.
- C. Store off ground, under cover, protected from weather and construction activities.
- D. Do not expose fire rated glass to temperatures greater than 120 degrees or less than minimum 40 Degrees F during storage and transportation.
- E. Do not expose the non-PVB side of glass to UV light.
- F. Store sheets of glass vertically. DO NOT lean.

1.8 WARRANTY

- A. Section 01 70 00 - Execution and Closeout Requirements: Product warranties and product bonds.
- B. Provide the Manufacturer's limited five year warranty from Date of Substantial Completion.

PART 2 PRODUCTS

2.1 FIRE RATED GLASS

- A. Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following manufacturers:
 - 1. Vetrotech Saint Gobain North America Inc; www.vetrotech.com.
 - 2. Safti First; www.safti.com.

3. Substitutions: Section 01 60 00 - Product Requirements.

B. Fire Rated Glazing Type FRG -1:

1. Basis of Design: Keralite Standard Laminated (L) as manufactured by Vetrotech Saint Gobain
2. Fire and impact safety-rated laminated glazing material for use in fire rated door, window, transom and borrowed lite assemblies.
3. Properties:
 - a. Thickness: 5/16 inch (8 mm).
 - b. Weight: 4.5 lbs./sq. ft.
 - c. Approximate Visible Transmission: 80 percent.
 - d. Fire-ratings, tested and listed by Underwriters Laboratories; tested in accordance with UL 9, UL 10c, NFPA 252, NFPA 257, and ASTM 2074, as indicated on drawings:
 - 1) Fire Rating: 20 minutes (with hose stream test) for doors, windows, sidelites, transoms and borrowed lites.
 - 2) Fire Rating: 45 minutes (with hose stream test) for doors, windows, sidelites, transoms and borrowed lites.
 - 3) Fire Rating: 60 minutes (with hose stream test) for doors, windows, sidelites and transoms.
 - 4) Fire Rating: 90 minutes (with hose stream test) for doors, windows, sidelites and transoms
 - e. Impact Safety Resistance: ANSI Z97.1 and CPSC 16CFR1201 (Cat. I and II).
4. Labeling: Each piece of fire-rated glazing shall be permanently labeled with the Manufacturer's, Warnock Hersey, and/or, Underwriters Laboratories' Logos on sizes up to 3325 sq. inches. Label is also to include name of product, fire rating period, safety glazing standards, and date of manufacture.
5. Framing System: Standard fire rated doors and frames as specified.

2.2 ACCESSORIES

- A. Glazing Tape: Closed cell polyvinyl chloride (PVC) foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent. Glass panels that exceed 1,393 sq. inches for 90-minute ratings must be glazed with fire-rated glazing tape supplied by manufacturer.
- B. Glazing Compound: DAP 33 putty.
- C. Silicone Sealant: One-part neutral curing silicone, medium modulus sealant, Type S; Grade NS; Class 25 with additional movement capability of 50 percent in both extension and compression (total 100 percent); Use (Exposure) NT; Uses (Substrates) G, A, and O as applicable. Available Products:
 1. Dow Corning 795 - Dow Corning Corp.
 2. Silglaze-II 2800 - General Electric Co.
 3. Spectrem 2 - Tremco Inc.
- D. Setting Blocks: Neoprene, EPDM, or silicone; tested for compatibility with glazing compound; of 70 to 90 Shore A hardness.
- E. Cleaners, Primers, and Sealers: Type recommended by manufacturer of glass and gaskets.

2.3 FABRICATION

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirement.

- B. Fabrication Dimensions: Fabricate fire rated assembly to approved dimensions. Guarantee dimensions where practicable within required tolerance.
- C. Fabrication Dimensions: Fabricate fire rated assembly to dimensions verified in field.
- D. Obtain approved Shop Drawings prior to fabrication.

2.4 FINISHES

- A. Comply with NAAMM's (National Association of Architectural Metal Manufacturers) "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect finishes on exposed surfaces from damage by applying a removable, temporary protective cladding before shipping.
- C. Appearance of Finished Work: Variations in appearance of adjacent frame sections are acceptable. Noticeable variations in the same piece are not acceptable.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify openings for glazing are correctly sized and within acceptable tolerance.
- C. Examine glass framing, with glazier present, for compliance with the following.
 - 1. Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.
 - 2. Minimum required face or edge clearances.
 - 3. Observable edge damage or face imperfections.
- D. Do not proceed with glazing until unsatisfactory conditions have been corrected.
- E. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

3.2 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant.
- D. Install sealant in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. Perform installation in accordance with GANA Glazing Manual.
 - 1. Glazing Sealants: Comply with FGMA and ASTM C1193.
 - 2. Fire Rated Openings: Comply with NFPA 80.
- B. Protect glass from edge damage during handling and installation. Inspect glass during installation and discard pieces with edge damage that could affect glass performance.
- C. Set units of glass in each series with uniformity of pattern, draw, bow, and similar characteristics.

- D. Cut glazing tape to length and set against permanent stops, flush with sight lines to fit openings exactly, with stretch allowance during installation.
- E. Place setting blocks located at quarter points of glass with edge block no more than 6 inches from corners.
- F. Glaze vertically into labeled fire-rated metal frames or partition walls with same fire rating as glass and push against tape for full contact at perimeter of pane or unit.
- G. Place glazing tape on free perimeter of glazing in same manner described above.
- H. Install removable stop and secure without displacement of tape.
- I. Install in vision panels in fire-rated doors to requirements of NFPA 80.
- J. Install so that appropriate UL markings remain permanently visible.

3.4 PROTECTION AND CLEANING

- A. Protect glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove non-permanent labels, and clean surfaces.
 - 1. Do not clean with astringent cleaners. Use a clean "grit free" cloth and a small amount of mild soap and water or mild detergent.
 - 2. Bullet resistant glazing materials with sensitive protect surface applied film on exterior surface. Do not use any of the following:
 - a. Steam jets.
 - b. Abrasives.
 - c. Strong acidic or alkaline detergents, or surface-reactive agents.
 - d. Detergents not recommended by manufacturer.
 - e. Detergent above 77 degrees F (25 degrees C).
 - f. Organic solvents including but not limited to those containing ester, ketones, alcohols, aromatic compounds, glycol ether, or halogenated hydrocarbons.
 - g. Metal or hard parts of cleaning equipment must not touch the glass surface.
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

3.5 REPAIR AND TOUCH UP

- A. Limited to minor repair of small scratches. Use only manufacturer's recommended products.
 - 1. Such repairs shall match original finish for quality or material and view.
 - 2. Repairs and touch-up not visible from a distance of 5 feet (1.5 m). Owner and Architect to approve.
- B. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged

END OF SECTION

SECTION 09 05 61
COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
 - 1. Resilient flooring.
 - 2. Carpet tile.
 - 3. Thin-set ceramic tile and stone tile.
 - 4. Resinous Matrix Terrazzo.
 - 5. Fluid applied flooring..
- B. Removal of existing floor coverings.
- C. Preparation of new and existing concrete floor slabs for installation of floor coverings.
- D. Testing of concrete floor slabs for moisture and alkalinity (pH).
- E. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
 - 1. Contractor shall include, in base bid, specified remediation work of all interior concrete floor slabs receiving floor coverings outlined below. If such remediation is indicated as not necessary following testing agency's report, a contract modification will be issued.
 - 2. Remedial Floor Coating to include in base bid at:
 - a. Existing concrete slabs receiving adhesively applied flooring.
 - b. Existing concrete slabs receiving Resinous Matrix Terrazzo.
 - c. New concrete slabs receiving Resinous Matrix Terrazzo.
 - d. Existing concrete slabs receiving Wood athletic flooring.
 - 3. Remedial Floor Coating not included in base bid at:
 - a. New concrete slabs receiving adhesively applied flooring where Moisture Vapor Reduction Admixture (MVRA) is integral in the new slab.
 - b. Existing concrete slabs receiving thin-set applied flooring, including but not limited to ceramic, quarry, and stone tile.
 - c. New concrete slabs receiving thin-set applied flooring, including but not limited to ceramic, quarry, and stone tile.
- F. Patching compound.
- G. Remedial floor coatings.

1.2 RELATED REQUIREMENTS

- A. Section 01 40 00 - Quality Requirements: Additional requirements relating to testing agencies and testing.
- B. Section 01 74 19 - Construction Waste Management and Disposal: Handling of existing floor coverings removed.
- C. Section 03 30 00 - Cast-in-Place Concrete: Concrete admixture for slabs to receive adhered flooring, to prevent moisture content-related flooring failures.
- D. Section 03 30 00 - Cast-in-Place Concrete: Limitations on curing requirements for new concrete floor slabs.

- E. Section 03 54 00 - Cast Underlayment: Self-leveling underlayment applied as remediation treatment.

1.3 REFERENCE STANDARDS

- A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens); 2023.
- B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters, and Gypsum Concrete; 2020.
- C. ASTM D4259 - Standard Practice for Preparation of Concrete by Abrasion Prior to Coating Application; 2018.
- D. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.
- E. ASTM F3010 - Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings; 2018.
- F. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.
- G. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.
- H. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.
- I. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; 2018.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Visual Observation Report: For existing floor coverings to be removed.
- C. 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.
- D. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.
 - 1. Manufacturer's qualification statement.
 - 2. Certificate: Manufacturer's certification of compatibility with types of flooring applied over remedial product.
 - 3. Test reports indicating compliance with specified performance requirements, performed by nationally recognized independent testing agency.
 - 4. Manufacturer's installation instructions.
 - 5. Specimen Warranty: Copy of warranty to be issued by coating manufacturer and certificate of underwriter's coverage of warranty.
- E. Testing Agency's Report:
 - 1. Description of areas tested; include marked up floor finish plans and photographs if helpful.

2. Summary of conditions encountered.
3. Moisture and alkalinity (pH) test reports.
4. Copies of specified test methods.
5. Recommendations for remediation of unsatisfactory surfaces.
6. Product data for recommended remedial coating.
7. Submit report to Architect.
8. Submit report not more than two business days after conclusion of testing.

F. Adhesive Bond and Compatibility Test Report.

G. Copy of RFCI (RWP).

1.6 PERFORMANCE REQUIREMENTS

- A. Manufacturer must provide Independent lab test reports documenting performance per the following:
1. ASTM E 96, Water Vapor Transmission (wet method) Performance shall be documented by an independent testing laboratory at a minimum of 97% water vapor transmission reduction compared to untreated concrete.
 2. ASTM E96- Perm Rating - Standard Test Method for Water Vapor Transmission of Materials – Perm Rate results must not exceed 0.1 Perms.
 3. ASTM D 1308; Insensitivity to alkaline environment up to, and including, pH 14. A 14 day test is required with no degradation of sample reported.
 4. Certify acceptance and exposure to continuous topical water exposure after final cure.

1.7 QUALITY ASSURANCE

- A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.
- B. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.
- C. Contractor's Responsibility Relating to Independent Agency Testing:
1. Provide access for and cooperate with testing agency.
 2. Confirm date of start of testing at least 10 days prior to actual start.
 3. Allow at least 4 business days on site for testing agency activities.
 4. Achieve and maintain specified ambient conditions.
 5. Notify Architect when specified ambient conditions have been achieved and when testing will start.
- D. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years' experience installing moisture emission coatings.

1.8 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.

1.9 FIELD CONDITIONS

- A. Only conduct calcium chloride tests at the same temperature and humidity expected during normal use, maintained 48 hours prior to and during testing. If this is not possible, use the following guidelines:
- B. 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.
- C. 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

2.1 MATERIALS

- A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, 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: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
 - 3. Basis of Design Products:
 - a. ARDEX Engineered Cements; ARDEX Feather Finish: www.ardexamericas.com/#sle.
 - b. H.B. Fuller Construction Products, Inc; TEC Feather Edge Skim Coat: www.tecspecialty.com/#sle.
 - c. CMP Specialty Products; Prepstar: www.cmpsp.com.
 - d. Or as approved by manufacturer of flooring system..
- B. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.
- C. Remedial Floor Coating: Single-layer epoxy based coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.
 - 1. System shall comply with requirements of ASTM F3010.
 - 2. Thickness: As required for application and in accordance with manufacturer's installation instructions.
 - 3. Water Vapor reduction system shall be a single coat, stand alone system with no requirements for additional components such as sand broadcast for adhesion of flooring systems.
 - 4. System must reduce Calcium Chloride readings of up to 25lbs/1000 ft2/24 hrs by 97% in one coat. System must be able to perform as required with RH Probe readings of 100%.
 - 5. Basis of Design Products:
 - a. ARDEX Engineered Cements; ARDEX MC RAPID: www.ardexamericas.com/#sle.
 - b. CMP Specialty Products; Lockdown: www.cmpsp.com.
 - c. Koster American Corporation; VAP I 2000: www.kosterusa.com/#sle.
 - d. Or as approved by manufacturer of flooring system.

PART 3 EXECUTION

COMMON WORK RESULTS FOR FLOORING PREPARATION

3.1 CONCRETE SLAB PREPARATION

- A. Follow recommendations of testing agency.
- B. Perform following operations in the order indicated:
 - 1. Existing concrete slabs (on-grade and elevated) with existing floor coverings:
 - a. Visual observation of existing floor covering, for adhesion, water damage, alkaline deposits, and other defects.
 - b. Removal of existing floor covering.
 - 2. Existing concrete slabs with coatings or penetrating sealers/hardeners/dustproofers:
 - a. Prepare surface according to recommendations of remedial coating manufacturer and according to ASTM D4259.
 - 3. Preliminary cleaning.
 - 4. 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.
 - 5. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
 - 6. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
 - 7. Specified remediation, if required.
 - 8. Patching, smoothing, and leveling, as required.
 - 9. Other preparation specified.
 - 10. Adhesive bond and compatibility test.
 - 11. Protection.
- C. 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: Apply remedial floor coating 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.

3.2 REMOVAL OF EXISTING FLOOR COVERINGS

- A. Comply with local, State, and federal regulations and recommendations of RFCI (RWP), as applicable to floor covering being removed.
- B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.3 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.

3.4 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.

3.5 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.

3.6 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.
 - 1. Use a wide range alkalinity (pH) test paper, its associated chart, and distilled or deionized water.
 - 2. 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.
 - 3. Use of a digital pH meter with probe is acceptable; follow meter manufacturer's instructions.
- C. 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.

3.7 PREPARATION

- A. See individual floor covering section(s) for additional requirements.
- B. Comply with requirements and recommendations of floor covering manufacturer.

- C. Comply with recommendations for preparation and application in accordance with ASTM F3010.
- D. Clean all surfaces to receive moisture vapor reduction system. Shot blast all floors to a Concrete Surface Profile (CSP) #3 or #4 and clean surfaces with an industrial vacuum cleaner and remove all residues from the substrate. Grinding is allowed only in areas not accessible by shot blasting. Remove ALL defective materials, and foreign matter such as dust, adhesives, leveling compounds, paint, dirt, floor hardeners, bond breakers, oil, grease, curing agents, form release agents, efflorescence, laitance, Shot blast bee bees, etc. Repair all cracks, expansion joints, control joints, and open surface honeycombs and fill in accordance with Manufacturer's recommendations. If concrete additives such as chlorides or any other soluble compounds that may contaminate surfaces have been used in the concrete mix do not use this product on that floor without written approval from manufacturer. Reinforcing fibers that are visible after shot blasting must be removed and vacuumed leaving no fibers left on the concrete surfaces. Provide an uncontaminated, sound surface. DO NOT ACID ETCH!
- E. Repair concrete prior to moisture vapor reduction system installation by using MVRS manufacturer's approved concrete repair materials. Comply with all requirements as listed in Manufacturer's technical data information. Consult with vapor reduction manufacturer.
- F. Ensure surfaces to be treated with moisture vapor reduction system have NOT previously been treated with other materials such as underlayments, screeds, penetrating sealants, silicates, etc. If this is the case, consult with the Manufacturer's Representative prior to any application of moisture vapor reduction system.
- G. Any testing for concrete deficiencies or contamination such as alkali silica reaction, untreated silicates, organic residue, etc. is recommended and is the responsibility of the Building owner.
- H. Shot blast a small test area and review surface profile with the finished flooring applicator.
- I. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.
- J. Do not fill expansion joints, isolation joints, or other moving joints.

3.8 ADHESIVE BOND AND COMPATIBILITY TESTING

- A. The Owner's Special Inspector shall verify proper adhesion of flooring adhesives, coatings, and leveling compounds to the final vapor reduction coating system for acceptability. Contact Manufacturer's Representatives for recommendations.
- B. Comply with requirements and recommendations of floor covering manufacturer.

3.9 APPLICATION OF REMEDIAL FLOOR COATING

- A. Comply with requirements and recommendations of coating manufacturer.
- B. Allow to cure a minimum of 12 hours before installing flooring system.

3.10 INSTALLATION OF REMEDIAL FLOOR SHEET MEMBRANE

- A. Install in accordance with sheet membrane manufacturer's instructions.

3.11 PROTECTION

- A. Cover prepared floors with building paper or other durable covering.
- B. Protect each coat during specified cure period from any kind of traffic, topical water and contaminants.

END OF SECTION

SECTION 09 21 16
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Performance criteria for gypsum board assemblies.
- B. Metal stud wall framing.
- C. Acoustic insulation.
- D. Gypsum sheathing.
- E. Gypsum wallboard.
- F. Joint treatment and accessories.

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.
- C. Section 07 21 00 - Thermal Insulation: Acoustic insulation.
- D. Section 07 84 00 - Firestopping: Top-of-wall assemblies at fire-resistance-rated walls.
- E. Section 07 92 00 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

1.3 REFERENCE STANDARDS

- A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2020).
- B. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.
- C. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- E. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.
- F. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020.
- G. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).
- H. ASTM C514 - Standard Specification for Nails for the Application of Gypsum Board; 2004 (Reapproved 2020).
- I. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2017).

- J. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2023.
- K. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.
- L. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2023.
- M. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2022.
- N. 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; 2022.
- O. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.
- P. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.
- Q. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2018.
- R. ASTM C1278/C1278M - Standard Specification for Fiber-Reinforced Gypsum Panel; 2017.
- S. ASTM C1280 - Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing; 2018 (Reapproved 2023).
- T. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2022, with Editorial Revision (2023).
- U. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.
- V. ASTM C1658/C1658M - Standard Specification for Glass Mat Gypsum Panels; 2019, with Editorial Revision (2020).
- W. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
- X. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- Y. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
- Z. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 Degrees C; 2024.
- AA. ASTM E413 - Classification for Rating Sound Insulation; 2022.
- BB. GA-216 - Application and Finishing of Gypsum Panel Products; 2024.
- CC. GA-224 - Installation of Predecorated Gypsum Board; Gypsum Association; 2008.
- DD. GA-226 - Application of Gypsum Board to Form Curved Surfaces; 2019.
- EE. GA-600 - Fire Resistance and Sound Control Design Manual; 2024.
- FF. UL (FRD) - Fire Resistance Directory; Current Edition.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

GYPSUM BOARD ASSEMBLIES

- B. Product Data:
 - 1. Provide data on metal framing, gypsum board, glass mat faced gypsum board, accessories, joint finishing system, and cementitious backer board.
 - 2. Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
- C. Test Reports: For stud framing products that do not comply with AISI S220 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

1.5 QUALITY ASSURANCE

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

PART 2 PRODUCTS

2.1 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
- B. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:
 - 1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- C. Fire Rated Assemblies: Provide completed assemblies (Tested rating determined in accordance with ASTM119) with rating as indicated on drawings.
 - 1. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL (FRD).

2.2 METAL FRAMING MATERIALS

- A. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S220 or equivalent.
- B. Manufacturers - Metal Framing, Connectors, and Accessories:
 - 1. ClarkDietrich: www.clarkdietrich.com/#sle.
 - 2. Marino: www.marinoware.com/#sle.
 - 3. MBA Studs: www.mbastuds.com
- C. Nonstructural Framing System Components: AISI S220; 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 knurled or embossed faces.
 - 2. Minimum Base Metal Thickness: 18 mils; 0.018 inch, or as required to meet design or code requirements.
 - 3. Runners: U shaped, sized to match studs.
 - 4. Furring Members: Hat-shaped sections, minimum depth of 7/8 inch.
- D. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection and prevent 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 S100.

GYPSUM BOARD ASSEMBLIES

2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot-dipped galvanized coating.
3. Provide components UL-listed for use in UL-listed fire-resistance-rated head of partition joint systems indicated on drawings.
4. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-resistance rating of the wall assembly.
 - a. Products:
 - 1) ClarkDietrich; MaxTrak Slotted Deflection Track: www.clarkdietrich.com/#sle.
 - 2) Marino; Slotted Track: www.marinoware.com/#sle.
 - 3) MBA Building Supplies; Slotted Slip Track: www.mbastuds.com/#sle.
 - 4) Substitutions: See Section 01 60 00 - Product Requirements.

2.3 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
 1. CertainTeed Corporation: www.certainteed.com/#sle.
 2. Georgia-Pacific Gypsum: www.gpgypsum.com/#sle.
 3. National Gypsum Company: www.nationalgypsum.com/#sle.
 4. USG Corporation: www.usg.com/#sle.
 5. Substitutions: See Section 01 60 00 - Product Requirements.

2.4 GYPSUM BOARD ACCESSORIES

- A. Acoustic Insulation: ASTM C665; preformed mineral wool, friction fit type, unfaced.
 1. Flame Spread Index: 25 or less, and Smoke Developed Index: 450 or less when tested in accordance with ASTM E84.
 2. Combustibility: Non-combustible, when tested in accordance with ASTM E136.
 3. Formaldehyde Content: Zero.
 4. Facing: Unfaced.
 5. Products:
 - a. CertainTeed Corporation: www.certainteed.com/#sle.
 - b. Johns Manville: www.jm.com/#sle.
 - c. Owens Corning Corporation: www.ocbuildingspec.com/#sle.
 - d. Knauf Insulation: www.knaufinsulation.com.
 6. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
- C. Finishing Accessories: ASTM C1047, galvanized steel, rolled zinc, or rolled zinc, unless noted otherwise.
 1. Types: As detailed or required for finished appearance.
 2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.
 3. Products:
 - a. Same manufacturer as framing materials.
- D. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
 1. Fiberglass Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
 2. Paper Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
 3. Joint Compound: Drying type, vinyl-based, ready-mixed.
 4. Joint Compound: Setting type, field-mixed.
- E. 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.

1. Products:
 - a. CertainTeed Corporation; Level V Wall and Ceiling Primer/Surfacer with M2Tech: www.certainteed.com/#sle.
 - b. USG Corporation; USG Sheetrock Brand Tuff-Hide Primer-Surfacer: www.usg.com/#sle.
- F. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.
- G. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion-resistant.
- H. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify that project conditions are ready to receive work and opening dimensions are as indicated on shop drawings to commence.

3.2 EXISTING WORK

- A. Extend existing gypsum board installations using materials and methods as specified.
- B. Repair and remodel existing gypsum board assemblies which remain or are to be altered.

3.3 FRAMING INSTALLATION

- A. Metal Framing: Install in accordance with ASTM C1007/AISI S220 and manufacturer's instructions.
- B. Studs: Space studs at 16 inches on center.
 1. Extend partition framing to structure where indicated and to ceiling in other locations.
 2. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging. Provide extended leg ceiling runners with compressible fire rated fill.
- C. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.
- D. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.
- E. Acoustic Furring: Install resilient channels at maximum 24 inches on center. Locate joints over framing members.
- F. Furring for Fire-Resistance Ratings: Install as required for fire-resistance ratings indicated and to GA-600 requirements.
- G. Blocking: Install wood blocking for support of:
 1. Wall-mounted cabinets.
 2. Plumbing fixtures.

GYPSUM BOARD ASSEMBLIES

3. Toilet partitions.
4. Toilet accessories.
5. Wall-mounted door hardware.
6. Wood frame opening.
7. Or any other materials requiring blocking. Coordinate blocking requirements with other contractors.

3.4 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.
 1. Place two beads continuously on substrate before installation of perimeter framing members.
 2. In non-fire-rated construction, seal around all penetrations by conduit, pipe, ducts, rough-in boxes, and other equipment. Do Not seal penetrations scheduled to receive firestopping.

3.5 BOARD INSTALLATION

- A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
 1. Use screws when fastening gypsum board to metal furring or framing.
- B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
- C. Double-Layer Non-Rated:
 1. Use gypsum backing board for first layer, placed perpendicular to framing or furring members, with ends and edges occurring over firm bearing. [Use fire rated gypsum backing board for fire rated partitions and ceilings.]
 2. Place second layer parallel to framing or furring members.
 3. Offset joints of second layer from joints of first layer.
 4. Treat cut edges and holes in moisture resistant gypsum board with sealant.
- D. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
 1. Erect single layer fire rated gypsum board vertically, with edges and ends occurring over firm bearing.
- E. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.
- F. Curved Surfaces: Apply gypsum board to curved substrates in accordance with GA-226.

3.6 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 for exposed interior linear construction.
 2. Not more than 25 feet where ceramic wall tile is installed on an interior wall.
 3. Not more than 12 feet where ceramic wall tile is installed on an exterior wall, in direct sunlight or wet conditions.
 4. At metal door frames and windows above each jamb.
 5. At exterior soffits, not more than 30 feet apart in both directions.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.7 JOINT TREATMENT

- A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, embed and finish with setting type joint compound.
- B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
 - 1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
 - 2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
 - 3. Level 3: Walls to receive textured wall finish.
 - 4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
 - 5. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.
 - 6. Level 0: Temporary partitions.
- C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
 - 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
- D. 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.
- E. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.8 TOLERANCES

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

END OF SECTION

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SECTION 09 26 13
GYPSUM VENEER PLASTERING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Gypsum veneer plaster on gypsum veneer base, masonry, concrete, existing plaster, and other substrates.
- B. Gypsum veneer base and accessories.

1.2 RELATED REQUIREMENTS

- A. Section 09 21 16 - Gypsum Board Assemblies: Metal stud framing and furring for plaster.

1.3 REFERENCE STANDARDS

- A. ASTM C587 - Standard Specification for Gypsum Veneer Plaster; 2004 (Reapproved 2018).
- B. ASTM C631 - Standard Specification for Bonding Compounds for Interior Gypsum Plastering; 2009 (Reapproved 2020).
- C. ASTM C843 - Standard Specification for Application of Gypsum Veneer Plaster; 2023.
- D. ASTM C844 - Standard Specification for Application of Gypsum Base to Receive Gypsum Veneer Plaster; 2015 (Reapproved 2021).
- E. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.
- F. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.
- G. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
- H. GA-216 - Application and Finishing of Gypsum Panel Products; 2024.
- I. GA-600 - Fire Resistance and Sound Control Design Manual; 2024.
- J. ITS (DIR) - Directory of Listed Products; Current Edition.
- K. UL (FRD) - Fire Resistance Directory; Current Edition.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittals procedures.
- B. Product Data: Provide data on veneer plaster products.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with the following:
 - 1. Apply gypsum base in accordance with ASTM C844 and GA 216.
 - 2. Apply gypsum veneer plaster in accordance with ASTM C843.
 - 3. Veneer plaster work in accordance with GA 216.

- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of experience.
- C. Installer Qualifications: Company specializing in performing the work of this section with minimum three years of experience.

1.6 FIELD CONDITIONS

- A. See Section 01 60 00 - Product Requirements.
- B. Do not apply veneer plaster when substrate or ambient air temperature is less than 50 degrees F nor more than 80 degrees F; for 24 hours prior to, during operations and after, until building heating system can maintain the above minimum temperature.

1.7 PRE-INSTALLATION MEETINGS

- A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Gypsum Veneer Plaster:
 - 1. National Gypsum Company: www.nationalgypsum.com/#sle.
 - 2. USG: www.usg.com/#sle.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 MATERIALS

- A. Gypsum Veneer Plaster: ASTM C587, mixed in accordance with manufacturer's instructions.
- B. Maximum Variation From Specified Thickness: Plus or minus 1/64 inch.
- C. Standard Gypsum Veneer Base: ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 - 1. Thickness: 5/8 inch.
 - 2. Edges: Square.
- D. Gypsum Veneer Base Trim Accessories: Zinc-coated steel or plastic, comply with ASTM C1047.
- E. Gypsum Board Accessories: metal corner beads, edge trim and expansion joints. Complying with ASTM C 1047.
 - 1. Metal Accessories: Galvanized steel.
 - 2. Edge Trim: Type L bead.
- F. Joint Reinforcing for Gypsum Veneer Base: Comply with ASTM C587.
- G. Bond Coat: ASTM C631, vinyl polymer type, bonding compound.

PART 3 EXECUTION

3.1 EXAMINATION

- A. See Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

GYPSUM VENEER PLASTERING

- B. Verify masonry mortar joints are cut flush; verify surface is ready to receive work of this section. Verify no bituminous or water repellent coatings exist on masonry surface.
- C. Verify concrete surfaces are flat, honeycombs are filled flush, and surface is ready to receive work of this section. Verify no bituminous, water repellent, or form release agents exist on concrete surfaces.
- D. Verify gypsum plaster base is flat, smooth and surface is ready to receive work. Verify joint and surface perimeter accessories are in place.

3.2 PREPARATION

- A. Clean surfaces of dust or loose matter.
- B. Remove projections greater than 1/8 inch and fill depressions greater than 1/4 inch with Portland cement mortar.
- C. Apply color tinted bond coat to prepare masonry surfaces within 24 hours of veneer plaster application. Apply in accordance with manufacturer's instructions.

3.3 INSTALLATION - GYPSUM PLASTER BASE

- A. Install gypsum base in accordance with ASTM C844.
- B. Use drywall screws to fasten gypsum base to framing substrate.
- C. Single Layer Base:
 - 1. Install gypsum board vertical, with ends and edges occurring over firm bearing.
- D. Install accessories.
- E. Tape, fill, and sand filled joints, edges, corners, openings, and trim to produce surface ready to receive veneer finish.
- F. Feather coats onto adjoining surfaces so that joint camber is maximum 1/32 inch.

3.4 INSTALLATION - VENEER PLASTER

- A. Install gypsum veneer plaster in accordance with ASTM C843 and manufacturer's instructions.
- B. Finish surface to flat, smooth, hard trowel finish.

END OF SECTION

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SECTION 09 30 00
TILING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Tile for floor applications.
- B. Tile for wall applications.
- C. Coated glass mat backer board as tile substrate.
- D. Ceramic trim.
- E. Non-ceramic trim.
- F. Waterproofing membrane.
- G. Crack isolation membrane.
- H. Setting materials, grouts, maintenance materials, & accessory materials.

1.2 RELATED REQUIREMENTS

- A. Section 03 54 00 - Cast Underlayment.
- B. Section 07 92 00 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.
- C. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.
- D. Section 09 21 16 - Gypsum Board Assemblies: Tile backer board.

1.3 REFERENCE STANDARDS

- A. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2024.
 - 1. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2023.
 - 2. ANSI A108.1b - Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set, Modified Dry-Set, or Improved Modified Dry-Set Cement Mortar; 2023.
 - 3. ANSI A108.1c - Contractor's 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 Setting Bed with Dry-Set, Modified Dry-Set, or Improved Modified Dry-Set Cement Mortar; 2023.
 - 4. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesive or Water Cleanable Tile-Setting Epoxy Adhesive; 2023.
 - 5. ANSI A108.5 - Setting of Ceramic Tile with Dry-Set Cement Mortar, Modified Dry-Set Cement Mortar, EGP (Exterior Glue Plywood) Modified Dry-Set Cement Mortar, or Improved Modified Dry-Set Cement Mortar; 2023.
 - 6. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grout Epoxy; 2023.
 - 7. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2024).

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8. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 2023.
9. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 2017 (Reaffirmed 2022).
10. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2023.
11. ANSI A108.12 - Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Modified Dry-Set Mortar; 2023.
12. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2021).
13. ANSI A108.19 - American National Standard Specifications for Interior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs by the Thin-Bed Method Bonded with Modified Dry-Set Cement Mortar or Improved Modified Dry-Set Cement Mortar; 2020.
14. ANSI A108.20 - American National Standard Specifications for Exterior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs; 2020.
15. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2021.
16. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2023.
17. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation; 2019.
18. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2023.
19. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2023.
20. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2014 (Reaffirmed 2024).
21. ANSI A118.15 - American National Standard Specifications for Improved Modified Dry-Set Cement Mortar; 2023.

- B. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2022.
- C. ASTM C373 - Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products; 2018 (Reapproved 2023).
- D. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2018.
- E. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2024.
- F. TCNA (HB-GP) - Handbook for Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs Installation; 2023.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. See Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
- B. Pre-installation Meeting: Convene a pre-installation meeting one week before starting work of this section; require attendance by all affected installers.

1.5 SUBMITTALS

TILING

- A. See Section 01 30 00 - 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. Samples: Submit two sets of samples of the following for color selection or verification of color and finish variations:
 - 1. Tile products.
 - 2. Threshold, trims, and accessories.
 - 3. Grouts.
 - 4. Sealants.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Master Grade Certificate: Submit for each type of tile, signed by the tile manufacturer and tile installer.
- F. Installer's Qualification Statement:
 - 1. Submit documentation of National Tile Contractors Association (NTCA) or Tile Contractors' Association of America (TCAA) accreditation; www.tile-assn.com/#sle
 - 2. Submit documentation of completion of apprenticeship and certification programs.
- G. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.
- H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Tile: 5 percent of each size, color, and surface finish combination, but not less than 2 of each type.

1.6 CLOSEOUT SUBMITTALS

- A. See Section 01 70 00 - Execution and Closeout Requirements for closeout procedures.

1.7 QUALITY ASSURANCE

- A. Maintain one copy of ANSI A108/A118/A136, TCNA (HB), and TCNA (HB-GP) on-site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum ten years of documented experience.
- C. Installer Qualifications:
 - 1. Company specializing in performing tile installation, with minimum of five years of documented experience.
 - a. Accredited Five-Star member of the National Tile Contractors Association (NTCA) or Trowel of Excellence member of the Tile Contractors' Association of America (TCAA).
 - 2. Installer Certification:
 - a. Ceramic Tile Education Foundation (CTEF): Certified Tile Installer (CTI).
 - b. Apprenticeship Program: Installer has achieved Journeyworker status through an apprenticeship from the International Union of Bricklayers and Allied Craftworkers (IUBAC) or a U.S. Department of Labor (DOL)-recognized program.
 - c. Advanced Certifications for Tile Installers (ACT): Certification in the installation of membranes, mortar bed (mud) floors, mortar (mud) walls, shower receptors, large format tile, gauged porcelain tile/panels/slabs, and grouts.
 - d. International Masonry Training and Education Foundation (IMTEF): Supervisor Certification Program (SCP).
- D. Warranty: Installer of work contained in this Section to warrant installation for minimum of 1 year from date of completion for defects in workmanship.

TILING

1.8 MOCK-UPS

- A. See Section 01 40 00 - Quality Requirements for general requirements for mock-up.
- B. Construct tile mock-up where directed by Architect, incorporating all components specified for the location.
 - 1. Minimum size of mock-up shall be determined by Architect.
 - 2. Approved mock-up may remain as part of work.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. See Section 01 60 00 - Product Requirements for product storage and handling requirements.
- B. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.10 FIELD CONDITIONS

- A. Do not install adhesives and grouts in an unventilated environment.
- B. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.
- C. Provide ambient lighting level of 80 ft candles minimum, measured mid-height at substrate surface.

PART 2 PRODUCTS

2.1 TILE

- A. Manufacturers:
 - 1. American Olean Corporation: www.americanolean.com/#sle.
 - 2. Crossville, Inc.: www.crossvilleinc.com
 - 3. Dal-Tile Corporation: www.daltile.com/#sle.
- B. Colorbody Porcelain Mosaic Tile, Type FT-1: ANSI A137.1, standard grade.
 - 1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
 - 2. Size: 2 by 2 inch, nominal.
 - 3. Edges: Cushioned.
 - 4. Surface Finish: Slip resistant.
 - 5. Color(s): Custom Blend, Refer to Finish Key.
 - 6. Mounted Sheet Size: 12 by 24 inches.
 - 7. Products:
 - a. Dal-Tile Corporation; Keystones Mosaics: www.daltile.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Glazed Wall Tile, Type WT-6: ANSI A137.1, standard grade.
 - 1. Moisture Absorption: 14.0 - 20.0 percent as tested in accordance with ASTM C373.
 - 2. Size: 4 by 4 inch, nominal.
 - 3. Edges: Square.
 - 4. Surface Finish: High gloss.
 - 5. Color(s): As indicated on drawings.
 - 6. Pattern: As indicated on drawings.
 - 7. Trim Units: Matching bullnose shapes in sizes coordinated with field tile.
 - 8. Basis of Design Products:
 - a. Dal-Tile Corporation; Color Wheel Collection - Classic: www.daltile.com/#sle.
- D. Colorbody Porcelain Floor Tile, Type FT-2: ANSI A137.1, standard grade.

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1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
 2. Size: 12 by 24 inch, nominal.
 3. Thickness: 5/16 inch.
 4. Edges: Square.
 5. Surface Finish: Unglazed.
 6. Color(s): As indicated on drawings.
 7. Products:
 - a. American Olean; Color Story Floor Tile: www.daltile.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Porcelain Tile, Type WT-1,2,3,4: ANSI A137.1, standard grade.
1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
 2. Size: 6 by 24 inch, nominal, Cross-Grid Rectified.
 3. Size 4 x 12 inch, nominal, Cross-Grid Rectified.
 4. Thickness: 5/16 inch.
 5. Edges: Cushioned.
 6. Surface Finish: Polished.
 7. Color(s): As indicated on drawings.
 8. Trim Units: Matching cove base shapes in sizes indicated. Type; CB-1.
 9. Products:
 - a. Crossville Inc.; Retroactive 2.0: www.crossvilleinc.com.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 TRIM AND ACCESSORIES

- A. Ceramic Trim: Matching bullnose, double bullnose, and cove base shapes in sizes coordinated with field tile.
1. Applications:
 - a. Open Edges: Bullnose.
 - b. Inside Corners: Jointed.
 - c. Floor to Wall Joints: Cove base.
 2. Manufacturers: Same as for tile.
- B. Non-Ceramic Trim: Brushed stainless steel and Polished Stainless, style and dimensions to suit application, for setting using tile mortar or adhesive.
1. Thickness: As required by installation and to comply with ADA Regulations.
 2. Applications:
 - a. Open edges of wall tile.
 - b. Outside wall corners.
 - c. Transition between floor finishes of different heights.
 - d. Thresholds at door openings.
 - e. Floor-to-wall joints.
 3. Basis of Design Products:
 - a. LATICRETE International, Inc; Profiles and Trims: www.laticrete.com/#sle.
 - b. Profilitec; Profiles: www.us.profilitec.com.
 - c. Schluter-Systems; Jolly, ; Rondec, and ; Reno-U: www.schluter.com/#sle.
- C. Non-Ceramic Trim, Type TS-1: Brushed stainless steel, style and dimensions to suit application, for setting using tile mortar or adhesive.
1. Thickness: As required by installation and to comply with ADA Regulations.
 2. Applications:
 - a. Tile flooring to existing flooring.
 3. Basis of Design Products:
 - a. Schluter-Systems; Reno-U: www.schluter.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Non-Ceramic Trim, Type TS-2: Brushed stainless steel, style and dimensions to suit application, for setting using tile mortar or adhesive.

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1. Thickness: As required by installation and to comply with ADA Regulations.
 2. Applications:
 - a. Exposed edges of wall tile.
 3. Basis of Design Products:
 - a. Schluter-Systems; Rondec: www.schluter.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Non-Ceramic Trim, Type TS-3: Brushed stainless steel, style and dimensions to suit application, for setting using tile mortar or adhesive.
1. Thickness: As required by installation and to comply with ADA Regulations.
 2. Applications:
 - a. Tile to same-height flooring.
 3. Basis of Design Products:
 - a. Schluter-Systems; [JOLLY]: www.schluter.com/#sle.
 - b. Substitutions: See Section 01 60 00-Product Requirements.
- F. Non-Ceramic Trim, Type TS-4: Polished Stainless Steel, style and dimensions to suit application, for setting using tile mortar or adhesive.
1. Thickness: As required by installation and to comply with ADA Regulations.
 2. Applications:
 - a. Tile flooring to wall transition.
 3. Basis of Design Products:
 - a. Profilitec; Interjolly: www.us.profilitec.com.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

2.3 SETTING MATERIALS

- A. Provide setting and grout materials from same manufacturer.
- B. Manufacturers:
1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
 2. Bostik Inc: www.bostik-us.com/#sle.
 3. Custom Building Products: www.custombuildingproducts.com/#sle.
 4. LATICRETE International, Inc: www.laticrete.com/#sle.
- C. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.
1. Applications: Use this type of bond coat where indicated, and where no other type of bond coat is indicated.
 2. Basis of Design Products:
 - a. LATICRETE International, Inc; 253 Gold: www.laticrete.com/#sle.
 - b. LATICRETE International, Inc; Tri-lite: www.laticrete.com/#sle.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Improved Latex-Portland Cement Mortar Bond Coat: ANSI A118.15.
1. Applications: Use this type of bond coat where Large and Heavy Tile (LHT) mortar is indicated for tile with any edge longer than 15 inches.
 2. Basis of Design Products:
 - a. LATICRETE International, Inc; MULTIMAX LITE: www.laticrete.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

2.4 GROUTS

- A. Provide setting and grout materials from same manufacturer.
- B. Manufacturers:
1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
 2. Bostik Inc: www.bostik-us.com.
 3. Custom Building Products: www.custombuildingproducts.com/#sle.
 4. LATICRETE International, Inc: www.laticrete.com/#sle.

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- C. Epoxy Grout: Type G-1 ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
 - 1. Applications: Where indicated Refer to Finish Key.
 - 2. Color(s): As scheduled. Refer to Finish Key
 - 3. Products:
 - a. LATICRETE International, Inc; LATICRETE SPECTRALOCK PRO Premium Grout: www.laticrete.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Premixed Polymer Modified Grout, Type G-2 & 3: Single component, stain resistant grout.
 - 1. Applications: Where indicated. Refer to Finish Key.
 - 2. Color(s): As scheduled. Refer to Finish Key.
 - 3. Basis of Design Products:
 - a. LATICRETE International, Inc; SPECTRALOCK 1 Pre-Mixed Grout: www.laticrete.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

2.5 MAINTENANCE MATERIALS

- A. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.
 - 1. Applications: Between tile and plumbing fixtures.
 - 2. Color(s): As selected by Architect from manufacturer's full line.
 - 3. Basis of Design Products:
 - a. LATICRETE International, Inc; LATICRETE LATASIL: www.laticrete.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Epoxy Grout Haze Remover: Water based gel for vertical and horizontal surfaces.
 - 1. Products:
 - a. STONETECH, a division of LATICRETE international, Inc; STONETECH Epoxy Grout Haze and Coating Stripper: www.laticrete.com.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

2.6 ACCESSORY MATERIALS

- A. Waterproofing and Slab Crack Isolation Membrane at Floors: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
 - 1. Crack Resistance: No failure at 1/8 inch gap, minimum; comply with ANSI A118.12.
 - 2. Fluid or Trowel Applied Type:
 - a. Material: Synthetic rubber.
 - b. Thickness: 25 mils, minimum, dry film thickness.
 - c. Basis of Design Products:
 - 1) LATICRETE International, Inc; LATICRETE HYDRO BAN: www.laticrete.com/#sle.
 - 2) Substitutions: See Section 01 60 00 - Product Requirements.
- B. Backer Board: Coated glass mat type complying with ASTM C1178/C1178M; inorganic fiberglass mat on both surfaces and integral acrylic coating vapor retarder.
 - 1. Standard Type: Thickness 5/8 inch.
- C. Mesh Tape: 2 inch wide self-adhesive fiberglass mesh tape.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

TILING

- 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 subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.
- D. Verify that sub-floor surfaces, in areas with floor drains, are pitched uniformly to drains at 1/4 inch per foot nominal if not indicated on the drawings.
 - 1. Exception: Where tile is installed in areas of previously removed floor covering, and the sub-floor does not meet the stated pitch, build up thinset during installation to provide a positive pitch to drains of 1/8" per foot, minimum in all directions.
- E. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).
 - 1. Test in accordance with Section 09 05 61.
 - 2. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.
 - 3. Follow moisture and alkalinity remediation procedures in Section 09 05 61.
- F. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
- D. 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.
- E. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.
- F. Scarify existing glazed structural block prior to installation of wall tile.
- G. Place thresholds and edge strips at exposed tile edges.

3.3 INSTALLATION - GENERAL

- A. Install tile and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.20, manufacturer's instructions, and TCNA (HB) or TCNA (HB-GP) recommendations, as applicable.
- B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings. Arrange pattern so that a full tile or joint is centered on each wall and that no tile less than 1/2" width is used.
- 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.
 - 1. Tile joint width shall be as recommended by manufacturer for the individual tile type indicated, however, tile joint shall be no less than 1/8 inch, unless otherwise noted.
- E. Form internal angles square and external angles bullnosed.
- F. Install ceramic accessories rigidly in prepared openings.
- G. Maintain specified positive pitch to all floor drains in all directions.

TILING

- H. Install non-ceramic trim in accordance with manufacturer's instructions.
- I. Install thresholds where indicated.
- J. Sound tile after setting. Replace hollow sounding units.
- K. Control and Expansion Joints:
 - 1. Keep control and expansion joints free of mortar, grout, and adhesive.
 - 2. Provide interior control joints in tiled surfaces at 20'-25' in each direction.
 - 3. Provide exterior control joints in tiled surfaces at 8'-12' in each direction.
 - 4. Provide interior control joints in tiled surfaces exposed to direct sunlight or moisture at 8' to 12' in each direction.
 - 5. Provide movement joints where tile work abuts restraining surfaces, including perimeter walls, dissimilar floors, curbs, columns, pipes, door and window frames and where changes occur in backing materials.
 - 6. Joints through tilework directly over structural joints must never be narrower than the structural joint.
 - 7. Apply sealant to joints.
- L. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- M. Grout tile joints unless otherwise indicated.
- N. 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.
- O. When installation requires varying tile thickness due to patterning, build up thinset so that the entire installation is flush.
- P. Seal all sanded and unsanded grout, with the exception of epoxy grout, per grout manufacturer's installation instructions.

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

3.5 INSTALLATION - WALL TILE

- A. Over coated glass mat backer board on studs, install in accordance with TCNA (HB) Method W245.
- B. 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.
- C. Over interior concrete and masonry install in accordance with TCNA (HB) Method W202, thin-set with dry-set or latex-Portland cement bond coat.

3.6 CLEANING

- A. Section 01 70 00 - Execution and Closeout Requirements: Final Cleaning.
- B. Clean tile and grout surfaces per manufacturer's recommendations.

3.7 PROTECTION

- A. Section 01 70 00 - Execution and Closeout Requirements: Protecting installed construction.
- B. Do not permit traffic over finished floor surface for 4 days after installation.
- C. Protect installed tile from damage due to subsequent construction until Date of Substantial Completion.

3.8 SCHEDULE

- A. Refer to Finish Key and Schedules.

END OF SECTION

SECTION 09 51 00
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

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

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

1.3 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; 2023.
- B. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
- C. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- D. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.
- E. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2019.
- F. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.
- G. CHPS (HPPD) - High Performance Products Database; Current Edition.
- H. Cisca (AC) - Acoustical Ceilings: Use and Practice; 1999.
- I. UL (GGG) - GREENGUARD Gold Certified Products; Current Edition.

1.4 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.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on suspension system components and acoustical units.
- C. Samples: Submit two samples 6 x 6 inch size illustrating material and finish of acoustical units.

- D. Samples: Submit two samples each, 12 inches long, of suspension system main runner, cross runner, and perimeter molding.
- E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- F. Manufacturer's qualification statement.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Acoustical Units: Quantity equal to 5 percent of total installed.
 - 3. Extra Exposed Grid: Quantity equal to 2 percent of total installed.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.
- B. Installer Qualifications: Company specializing in performing the work specified in this section with minimum five years documented experience.
- C. Conform to CISCA (AC) requirements.
- D. Single Source Responsibility: To obtain combined warranty for the suspension system and the acoustical panel, color match or ceiling panel and suspension system compatibility, all acoustical panel and suspension system components shall be produced and supplied by one manufacturer. Materials supplied by more than one manufacturer are not acceptable.
- E. Source quality control:
 - 1. Test reports: Manufacturer will provide test certification for minimum requirements as tested in accordance with applicable industry standards and/or to meet performance standards specified by various agencies.
 - 2. Changes from system: System performance following any substitution of materials or change in assembly design shall be certified by the manufacturer.
 - 3. All ceiling panel cartons must contain UL label for acoustical compliance.
 - 4. All suspension system cartons must contain UL label for load compliance per ASTM C635.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements.
- B. Storage:
 - 1. Panels: Storage time of materials at the job site should be as short as possible and environmental conditions should be as near as possible to those specified for occupancy.
 - 2. Suspension System: Store in manner that will prevent warping, scratches and damage of any kind.
- C. Handling: Handle in such manner to ensure against racking, distortion, or physical damage of any kind.
- D. Damaged or deteriorated materials shall be removed from the premises.

1.8 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.

1.9 WARRANTY

- A. Provide written warranty executed by the manufacturer, agreeing to repair or replace acoustical ceiling products that fail within the warranty period. Failures include, but are not limited to:
 - 1. Acoustical Panels: Sagging and warping as a result of defects in materials or factory workmanship.
 - 2. Grid System: Rusting and manufacturer's defects.
 - 3. Warranty Period:
 - a. Acoustical panels: Ten years from date of substantial completion.
 - b. Grid: Ten years from date of substantial completion.
 - c. Combined single source panel and grid: Thirty years from date of substantial completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acoustic Tiles/Panels:
 - 1. Armstrong World Industries, Inc: www.armstrong.com/#sle.
 - 2. USG: www.usg.com/#sle.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Suspension Systems:
 - 1. Same as for acoustical units.

2.2 ACOUSTICAL UNITS

- A. Acoustical Units - General: ASTM E1264, Class A.
 - 1. VOC Content: As specified in Section 01 61 16.
 - 2. VOC Content: Certified as Low Emission by one of the following:
 - a. Product listing in UL (GGG).
 - b. Product listing in CHPS (HPPD).
 - 3. Inherently resistant to humidity, sag, mold, and mildew.
- B. Acoustical Panels, Type ACT-2: Painted mineral fiber, with the following characteristics:
 - 1. Classification: ASTM E1264 Type III.
 - a. Form: 2, water felted.
 - b. Pattern: CE - perforated, small holes; lightly textured.
 - 2. Size: 24 by 24 inches.
 - 3. Thickness: 3/4 inch.
 - 4. Light Reflectance: 82 percent, minimum, determined in accordance with ASTM E1264.
 - 5. NRC Range: 65 to .70, determined in accordance with ASTM E1264.
 - 6. Ceiling Attenuation Class (CAC): 35 - 40, determined in accordance with ASTM E1264.
 - 7. Panel Edge: Square.
 - 8. Color: White.
 - 9. Suspension System: Exposed grid.
 - 10. Products:
 - a. Armstrong World Industries, Inc; School Zone Fine Fissured: www.armstrongceilings.com/#sle.
 - b. USG Corporation; Radar Educational: www.usg.com/ceilings/#sle.
- C. Acoustical Panels, Type ACT-1: Mineral fiber with membrane-faced overlay, with the following characteristics:
 - 1. Classification: ASTM E1264 Type A.
 - a. Form: A2.2.
 - b. Pattern: "E" - lightly textured.
 - 2. Size: 24 by 24 inches.

3. Thickness: 7/8 inch.
4. Light Reflectance: 86 percent, determined in accordance with ASTM E1264.
5. NRC Range: 80 to .85, determined in accordance with ASTM E1264.
6. Ceiling Attenuation Class (CAC): 35, determined in accordance with ASTM E1264.
7. Panel Edge: Square.
8. Color: White.
9. Suspension System: Exposed grid.
10. Basis of Design Products:
 - a. Armstrong World Industries, Inc; Ultima Health Zone High NRC:
www.armstrongceilings.com/#sle.
 - b. USG Corporation; Mars Healthcare High-NRC Acoustical Panels:
www.usg.com/ceilings/#sle.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.

2.3 SUSPENSION SYSTEM(S)

- A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold down clips, stabilizer bars, clips, and splices as required.
 1. Materials:
 - a. Steel Grid: ASTM A653/A653M, G30 coating, unless otherwise indicated.
 - b. Aluminum Grid: Aluminum sheet, ASTM B209/B209M.
 - c. Stainless Steel Grid: ASTM A666/A666M, Type 304.
- B. Exposed Suspension System: Hot-dipped galvanized (G-90) steel grid with aluminum cap.
 1. Structural Classification: Heavy-duty, when tested in accordance with ASTM C635/C635M.
 2. Profile: Tee; 15/16 inch face width.
 3. Finish: Baked enamel.
 4. Color: White.
 5. Basis of Design Products:
 - a. Armstrong World Industries, Inc; Prelude XL: www.armstrongceilings.com/#sle.
 - b. USG Corporation; Donn Brand ZXLA 15/16 inch Acoustical Suspension System:
www.usg.com/ceilings/#sle.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.

2.4 ACCESSORIES

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.
- B. Hanger Wire: 12 gauge, 0.08 inch galvanized steel wire.
- C. Hold-Down Clips: Manufacturer's standard clips to suit application.
- D. Perimeter Moldings: Same metal and finish as grid.
- E. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Install after major above-ceiling work is complete.
- B. Coordinate the location of hangers with other work.
- C. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.

3.3 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C 636/C 636M 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. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 - 1. Install in bed of acoustical sealant.
 - 2. Use longest practical lengths.
 - 3. Overlap and rivet corners.
- E. Suspension System, Non-Seismic: 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. Do not eccentrically load system or induce rotation of runners.
- I. Form expansion joints as detailed. Form to accommodate plus or minus 1 inch movement. Maintain visual closure.
- J. Where installing sheet metal trim between two overlapping ceiling planes, provide a StrongBack Support (SB-12) as an attachment point for the lower ceiling plane. Span entire length of connection.

3.4 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. For some pattern edge details, if perimeter panels must be cut smaller, the cut edge must be field-rabbeted, or the wall angle must be lowered by reveal depth.
- E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- F. Cutting Acoustical Units:
 - 1. Cut to fit irregular grid and perimeter edge trim.
 - 2. Make field cut edges of same profile as factory edges.
 - 3. Double cut and field paint exposed reveal edges.

- G. Where round obstructions and bullnose concrete block corners occur, provide preformed closures to match perimeter molding.

3.5 TOLERANCES

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

3.6 CLEANING

- A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.
- B. Clean surfaces.
- C. Replace damaged or abraded components.

3.7 SCHEDULE

- A. Refer to drawings for Finish Key and Schedule

END OF SECTION

SECTION 09 64 30
WOOD FLOOR REFINISHING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Site Refinishing of Wood Gymnasium Flooring including Game Lines and Logos.

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 11 66 23 - Gymnasium Equipment: Anchorage and mounting for equipment.

1.3 REFERENCE STANDARDS

- A. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020.
- B. MFMA (PUR) - Performance and Uniformity Rating Sport Specific Standards; current edition.
- C. MFMA (SPEC) - Guide Specifications for Maple Flooring Systems; current edition.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. See Section 01 30 00 - Administrative Requirements for coordination and preinstallation meeting requirements.
- B. Coordination:
 - 1. Coordinate work of this section with other trades, including but not limited to installers requiring lifts on the existing floor and mechanical work involving air handling equipment.
 - 2. Coordinate work of this section with new floor mounted equipment or anchorage specified in Section 11 66 23 - Gymnasium Equipment.
- C. Preinstallation Meetings: Convene minimum one week prior to commencing work of this section. Include all other affected trades. Review installation procedures including procedures for acclimation of flooring materials.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturer's data sheets for all floor finish materials, including fillers, sealers, paints, and finishes.
- C. Installation instructions including product limitations and special requirements.
- D. Shop Drawings: Provide complete layout indicating court lines, location, design, size, grap and color game markings for approval of Architect and Owner.
 - 1. Incorporate Owner furnished logo(s) into layout.
- E. Samples: Submit two samples of sealers, paint, and finishes illustrating range of colors and sheens available for selection.

- F. Verification Samples: Submit two samples, illustrating selected colors and sheens for each system with specified coats cascaded. Submit on wood substrate of same species being refinished, 6 by 12 inch in size.
- G. Manufacturer's Certification: Submit certification that floor finish materials meet federal and state VOC regulations.
- H. Manufacturer's Qualifications statement.
- I. Installer's Qualifications statement.

1.6 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
- B. Operation and Maintenance Data: Submit maintenance procedures, recommended maintenance materials, suggested schedule for cleaning, stripping, and re-finishing, stain removal methods, and polishes and waxes.

1.7 QUALITY ASSURANCE

- A. Perform Work of this section in accordance with MFMA (SPEC) and MFMA (PUR)- Maple Flooring Manufacturer's Association.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
- C. Installer: Company specializing in performing work of this section with minimum five years documented experience.
 - 1. The Contractor shall be an MFMA Mill Accredited Installation Company with MFMA Accredited Installers on-site for the duration of the refinish.

1.8 EXTRA MATERIALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Spare parts and maintenance products.

1.9 FIELD CONDITIONS

- A. Resurfacing of an existing floor system shall not commence until all masonry, finish and/or wet trades, such as, concrete, painting, tile and overhead mechanical trades are complete. The building must be enclosed and weather tight.
- B. Permanent heat, light and ventilation shall be installed and operating before, during and after the resurfacing is complete.
- C. Do not refinish when temperature is below 50 degrees F or above 90 degrees F.
- D. Maintain ambient and substrate temperature within specified range 24 hours before, during, and 72 hours after installation of finish.
- E. Prior to and during installation, the Contractor shall verify that the dew point is at least 5 degrees Fahrenheit less than the substrate and air temperature.
- F. Provide ambient lighting level of 50 ft candles, measured at floor surface.

1.10 WARRANTY

- A. Provide floor finish and game marking warranty against defects and premature finish failure for two years after substantial completion date.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Gymnasium Wood Floors:
 - 1. Bona: www.bona.com.
 - 2. Buckeye International Inc.: www.buckeyeinternational.com.
 - 3. Duraseal: www.duraseal.com.
 - 4. Or Approved Equal.
 - 5. Substitutions: See Section 01 60 00 - Product Requirements for substitution procedures.

2.2 FLOOR FINISH - GENERAL

- A. Finishes:
 - 1. 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.
 - 2. Provide finishes from the same manufacturer to the greatest extent possible.
 - 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.
- B. Volatile Organic Compound (VOC) Content: Comply with Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

2.3 FLOOR FINISH SYSTEMS

- A. Gymnasium Wood Floors:
 - 1. Two coat(s) sanding sealer.
 - 2. Minimum one coat paint for game lines and logos. Second coat may be required for some colors and patterns.
 - 3. Three coat(s) finish.

2.4 ACCESSORIES

- A. Accessory Materials: Cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of finished surfaces.
 - 1. Abrasive pads shall be synthetic type; steel wool shall not be used.
- B. Wood Plugs: Round shape, of same species and grain orientation as flooring.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- C. 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. Wood: 15 percent, measured in accordance with ASTM D4442.
- D. Do not begin application of stains and finishes until substrates have been properly prepared.

3.2 PREPARATION

- A. Remove all cover plates and accessories subject to damage during sanding operations.
- B. Mask off adjacent surfaces before beginning sanding.
- C. Coordinate work of this section with installation of new products and systems. Ensure all other trades have completed work in the area of refinishing.

3.3 INSTALLATION - GYMNASIUM WOOD FLOOR FINISHES

- A. Remove existing gym floor finish in its entirety, including all floor mounted tape, game markings and logos and any other surface mounted accessories.
- B. Sand flooring with an appropriate power sander to smooth even finish with no evidence of existing finish, game lines or sander marks. Sand transitions to existing finish surfaces smooth. Use smaller hand held power sanders in areas not accessible by larger sanding units.
- C. Take precautions to contain dust. Remove dust by vacuum.
- D. Conduct post-sanding inspection, notify Architect immediately if any wood plank floors have splintered or cracked. Do not finish floors that until unsatisfactory conditions are addressed.
- E. Finishing: Apply finish in accordance with manufacturer's instructions.
 - 1. Apply first sealer coat, allow to dry, then buff lightly with synthetic abrasive pads to remove irregularities. Vacuum clean and wipe with tack cloth before applying succeeding coat.
 - 2. Apply second sealer coat in same manner as first coat and prepare for successive finishes.
 - 3. Apply colored game lines, logos, and floor markings as shown on Approved Shop Drawings.
 - 4. Apply finish coat(s), allowing sufficient drying time between coats. Lightly buff between coats and vacuum clean and tack cloth before applying succeeding finishes.
 - 5. Reinstall all cover plates and accessories.

3.4 CLEANING

- A. Section 01 70 00 - Execution and Closeout Requirements: Final cleaning.
- B. Clean and polish entire floor surfaces in accordance with MFMA - Maple Flooring Manufacturer Association.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01 70 00 - Execution and Closeout Requirements: Protecting installed construction.
- B. Prohibit traffic on floor finish for one week after installation.

END OF SECTION

SECTION 09 64 66
WOOD ATHLETIC FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wood athletic flooring.
- B. Sleepers.
- C. Sheet vapor retarder.
- D. Floor finishes.
- E. Surface finishing.

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 09 05 61 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.

1.3 REFERENCE STANDARDS

- A. MFMA (SPEC) - Guide Specifications for Maple Flooring Systems; current edition.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meetings: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers; review preparation and installation procedures and coordination and scheduling necessary for related work.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for floor finish materials.
- C. Shop Drawings: Indicate floor joint pattern and termination details.
 - 1. Indicate wall base.
 - 2. Indicate location, size, design, and color of game markings.
- D. Samples: Submit two samples 6 by 6 inch in size showing floor finish, color, and sheen.
- E. Manufacturer's Instructions: Indicate standard and special installation procedures.
- F. Sustainable Design Submittals: Submit VOC content documentation for field-applied adhesives, stains, finish coatings, and sealers.
- G. Maintenance Data: Include maintenance procedures and recommended maintenance materials.
- H. Manufacturer's qualification statement.
- I. Installer's qualification statement.

1.6 QUALITY ASSURANCE

- A. Perform work of this section in accordance with MFMA (SPEC).
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section.
 - 1. Minimum three years of documented experience.
 - 2. Member mill of the Maple Flooring Manufacturers Association, Inc (MFMA).
- C. Installer Qualifications: Company specializing in installing products specified in this section.
 - 1. Minimum three years of documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Deliver materials and store off the floor in a well-ventilated, weather-tight space.

1.8 FIELD CONDITIONS

- A. Maintain room temperature between 55 degrees F and 75 degrees F and relative humidity between 35 to 50 percent for a period of seven days prior to delivery of materials to installation space, during installation, and after installation.

PART 2 PRODUCTS

2.1 WOOD ATHLETIC FLOORING

- A. General: Refinishing existing wood athletic flooring, system components provided by single manufacturer.

2.2 COMPONENTS

- A. Wood Strip Flooring:
 - 1. Species: Northern hard maple, kiln dried; tongue and groove edges, end matched.
 - 2. Grade: First.
 - 3. Moisture Content: 7 to 9 percent.
 - 4. Thickness: 25/32 inch. Match existing widths
 - 5. Width: 2-1/4 inches. Match existing widths
 - 6. Length: Random, match existing lengths.
- B. Sleepers:
 - 1. Softwood lumber, 2 by 4 inch nominal.
 - 2. Plywood, 7/8 inch by 4 inch nominal.
- C. Vapor Retarder: Polyethylene sheet, 6 mil thick; 2 inch wide tape for sealing sheet seams.

2.3 FINISHES

- A. Refer to specification section 09 64 30.

2.4 ACCESSORIES

- A. Ventilating Base: Molded rubber, 4 inch high with a 3 inch toe, pre-molded outside corners; black color.
- B. Adhesives: Types recommended by flooring manufacturer.

WOOD ATHLETIC FLOORING

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting this work.
- B. Verify that concrete subfloor surface is smooth and flat to plus or minus 1/4 inch in 10 feet.
- C. Cementitious Subfloor Surfaces: Verify that substrates are ready for flooring installation by testing for moisture and alkalinity (pH).
 - 1. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
- D. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

- A. Prepare substrate to receive wood flooring in accordance with manufacturer's and MFMA instructions.
- B. Vacuum clean substrate.

3.3 INSTALLATION

- A. Sleepers:
 - 1. Place sleepers at 90 degree angle to direction of finished floor; space 12 inches on center. Stagger end joints a minimum of 24 inches.
- B. Finishing:
 - 1. Mask off adjacent surfaces before beginning sanding.
 - 2. Sand flooring to smooth even finish with no evidence of sander marks. Remove dust by vacuum.
 - 3. Apply finishes in accordance with floor finish manufacturer's and MFMA instructions.
 - 4. Apply one sealer coat and three finish coats.
 - 5. Apply first coat, allow to dry, then buff lightly with recommended pad to remove irregularities. Vacuum clean and wipe with damp, lint-free cloth before applying succeeding coats.
 - 6. Apply game lines/markers in accordance with layout indicated on drawings.
 - 7. Apply last coat of finish.

3.4 CLEANING

- A. Clean floor surfaces in accordance with floor finish manufacturer's instructions.

3.5 PROTECTION

- A. Prohibit traffic on finished floor for 72 hours after installation.
- B. Place protective coverings over finished floors; do not remove coverings until Date of Substantial Completion.

END OF SECTION

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SECTION 09 65 00
RESILIENT FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Resilient base.
- B. Installation accessories.

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied resilient flooring.
- C. Section 09 05 61 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.
- D. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

1.3 REFERENCE STANDARDS

- A. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2023.
- B. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.
- C. ASTM F970 - Standard Test Method for Measuring Recovery Properties of Floor Coverings after Static Loading; 2022.
- D. ASTM F1861 - Standard Specification for Resilient Wall Base; 2021.
- E. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2023.

1.4 SUBMITTALS

- A. See Section 01 30 00 - 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. Verification Samples: Submit two samples, 2" x 2" illustrating color and pattern for each resilient product specified.
- D. Manufacturer's Qualification Statement.
- E. Installer's Qualification Statement.
- F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.5 QUALITY ASSURANCE

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

1.6 DELIVERY, STORAGE, AND HANDLING

- A. See Section 01 60 00 - Product Requirements for additional storage and handling requirements.
- B. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
- C. Store all materials off of the floor in an acclimatized, weather-tight space.
- D. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

1.7 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.

1.8 CLOSEOUT SUBMITTALS

- A. See Section 01 70 00 - Execution and Closeout Requirements for closeout procedures.
- B. Furnish 10 percent of installed vinyl tile flooring and base, 5 percent of installed linoleum flooring and 5 percent of rubber flooring of each type and color specified. Deliver all required overage and maintenance stock to owner's specified location prior to start of installation.
- C. Operation and Maintenance Data: Submit maintenance procedures, recommended maintenance materials and suggested schedule for cleaning, stripping and re-waxing.

PART 2 PRODUCTS

2.1 RESILIENT BASE

- A. Resilient Base - Type RB-1: ASTM F1861, Type TV, vinyl, thermoplastic; Style B, Cove.
 - 1. Manufacturers:
 - a. Johnsonite, a Tarkett Company: www.johnsonite.com/#sle.
 - b. Roppe Corporation: www.roppe.com/#sle.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.
 - 2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648, NFPA 253, ASTM E 648, or NFPA 253.
 - 3. Height: 4 inch.
 - 4. Thickness: 0.125 inch.
 - 5. Finish: Matte.
 - 6. Length: Roll.
 - 7. Color: As indicated on drawings.
 - 8. Accessories: Premolded external corners and end stops.
- B. Resilient Base - Type RB-2: ASTM F1861, Type TV, vinyl, thermoplastic; Vented Cove.
 - 1. Manufacturers:
 - a. Johnsonite, a Tarkett Company: www.johnsonite.com/#sle.
 - b. Roppe Corporation: www.roppe.com/#sle.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.

2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648, NFPA 253, ASTM E 648, or NFPA 253.
3. Height: 4 inch.
4. Thickness: 0.125 inch.
5. Finish: Matte.
6. Length: 4 foot sections.
7. Color: As indicated on drawings.
8. Accessories: Premolded external corners and end stops.

2.2 ACCESSORIES

- A. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.
 1. VOC Content Limits: As specified in Section 01 61 16.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.
- 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 resilient base.

3.2 PREPARATION

- A. Prepare substrates as recommended by flooring and adhesive manufacturers.
- B. Prohibit traffic until filler is fully cured.
- C. Clean substrate to remove adhesives, coatings or contaminants that will inhibit adhesion of the new system. Use chemical treatment or bead blast as dictated by the existing conditions and as recommended by the flooring manufacturer .
- D. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.3 INSTALLATION - GENERAL

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install in accordance with manufacturer's written instructions.
- C. Adhesive-Applied Installation:
 1. Spread only enough adhesive to permit installation of materials before initial set.
 2. Fit joints and butt seams tightly.
- D. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.4 INSTALLATION - RESILIENT BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.

- D. Scribe and fit to door frames and other interruptions.
- E. Reveal Base: Miter all corners.

3.5 CLEANING

- A. Section 01 70 00 - Execution and Closeout Requirements: Final Cleaning.
- B. Remove excess adhesive from floor, base, and wall surfaces without damage.
- C. Clean, seal and maintain in accordance with manufacturer's instructions.

3.6 PROTECTION

- A. Section 01 70 00 - Execution and Closeout Requirements: Protecting installed construction.
- B. Prohibit traffic on resilient flooring for 48 hours after installation.
- C. Upon completion of installation, protect resilient flooring in traffic areas with heavy duty kraft paper.

3.7 SCHEDULE

- A. Refer to Finish Keys and Schedules

END OF SECTION

SECTION 09 66 23
RESINOUS MATRIX TERRAZZO FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Epoxy matrix terrazzo with ground and polished finish.

1.2 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Concrete subfloor with steel trowel finish.
- B. Section 07 92 00 - Joint Sealants: Sealing joints between terrazzo work and adjacent construction and fixtures.
- C. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

1.3 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; 2022.
- B. ASTM D648 - Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position; 2018.
- C. NTMA (GRAD) - Aggregate Gradation Standards; Current Edition.
- D. NTMA (EPOXY) - Epoxy Terrazzo Specifications; Current Edition.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for sealer; include printed copy of current NTMA recommendations for type of terrazzo specified.
- C. Manufacturer's Qualification Statement.
- D. Installer's Qualification Statement.
- E. Cleaning and Maintenance Data: Include procedures for stain removal, stripping, and sealing.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with NTMA recommendations as posted at their web site at www.ntma.com unless more stringent requirements are specified.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section.
 - 1. Minimum ten years of documented experience.
 - 2. Associate member firm of the National Terrazzo and Mosaic Association, Inc.
- C. Surface Burning Characteristics: When tested in accordance with ASTM D635, the Epoxy terrazzo shall comply with the following value: Self-Extinguishing, extent of burning 0.25 inches maximum. ASTM D648, Critical radiant flux, 1.0.

- D. Installer Qualifications: Company specializing in performing the type of work specified in this section.
 - 1. Minimum ten years of documented experience.
 - 2. Approved by matrix manufacturer.
 - 3. Contractor member of the National Terrazzo and Mosaic Association, Inc.
- E. Single Source Responsibility: To obtain combined warranty for the installed flooring system from manufacturer; obtain primary epoxy terrazzo flooring system materials including membranes, primers, moisture vapor primers, resins and hardening agents from a single manufacturer with proof of NTMA membership. Obtain aggregates, divider strips, sealers and cleaners from source recommended by primary materials manufacturer.
- F. Warranty: Installer to warrant installation for two years upon completion of work in this Section for defects in workmanship.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Products Requirements: Product storage and handling requirements.
- B. Store terrazzo materials in a dry, secure area.
- C. Maintain optimal storage temperature of between 50 and 80 degrees F.
- D. Keep products away from fire or open flame.

1.7 PRE-INSTALLATION MEETINGS

- A. Section 01 30 00 - Administrative Requirements: Pre-installation meetings.
- B. Convene minimum one week prior to commencing work of this section.

1.8 FIELD CONDITIONS

- A. Do not install terrazzo when temperature is below 50 degrees F or above 90 degrees F.
- B. Maintain ambient and substrate temperature within specified range 72 hours before, during, and 72 hours after installation of flooring.
- C. Prior to and during installation, the terrazzo contractor shall verify that the dew point is at least 5 degrees Fahrenheit less than the slab and air temperature.
- D. Provide ambient lighting level of 50 ft candles, measured at floor surface.

1.9 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Terrazzo & Marble Supply Companies; Terroxy Resin Systems: www.tmsupply.com.
- B. Other Acceptable Manufacturers - Resinous Matrix Terrazzo Flooring:
 - 1. Key Resin Company; Key Epoxy Terrazzo System: www.keyresin.com/#sle.
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 EPOXY MATRIX TERRAZZO APPLICATIONS

- A. Existing Floors.

2.3 MATERIALS

- A. Finishing Grout: Epoxy, color to match terrazzo matrix.

2.4 ACCESSORIES

- A. Patching and Fill Material: 100% epoxy fill and selected aggregates as recommended by epoxy matrix manufacturer.
- B. Sealer: Colorless, non-yellowing, penetrating liquid type to completely seal matrix surface; not detrimental to terrazzo components.
 - 1. Basis of Design Products:
 - a. Terrazzo & Marble Supply Companies; T-Rx: www.tmsupply.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

3.2 PREPARATION

- A. Clean existing terrazzo of foreign matter.

3.3 FINISHING

- A. Finish terrazzo to NTMA requirements.
- B. Produce terrazzo finish surface to match approved mock-up, with 70 percent chip exposed.
- C. Grind terrazzo surfaces with power disc machine; sequence with coarse to fine grit abrasive, using a wet method or using a dry grinder with vacuum to control dust to a 120 grit finish prior to grouting.
- D. Cleanse: Clean the floor with water and rinse. Remove excess rinse water by wet vacuum and repeat process if necessary to remove all water and grinding dust. Allow the floor to completely dry before continuing with grouting.
- E. Apply grout to fill voids exposed from grinding.
- F. Remove grout coat by grinding, using a fine grit abrasive.
- G. Hand grind vertical and curved surfaces similarly.
- H. Final finish using successive grits down to 200 - 250 grit abrasive to achieve desired final appearance.

3.4 TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Maximum Variation from Flat Surface: 1/4 inch in 10 feet.
- C. Maximum Variation from Level (Except Surfaces Sloping to Drain): 1/8 inch.

3.5 CLEANING

- A. Section 01 70 00 - Execution and Closeout Requirements: Final Cleaning.
- B. Scrub and clean terrazzo surfaces with neutral pH cleaner in accordance with manufacturer's instructions. Let dry.
- C. Immediately after terrazzo has dried, apply a minimum of 2 coats of sealer in accordance with manufacturer's instructions.
- D. Polish surfaces in accordance with manufacturer's instructions.

END OF SECTION

SECTION 09 67 00
FLUID-APPLIED FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fluid-applied flooring and base.

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 09 05 61 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.
- C. Section 09 05 61 - Common Work Results for Flooring Preparation 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing, testing, remediation procedures, and remediation procedures.

1.3 REFERENCE STANDARDS

- A. ANSI/ESD STM7.1 - The Protection of Electrostatic Discharge Susceptible Items Flooring Systems Resistive Characterization; 2021.
- B. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 2022.
- C. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. See Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
- B. Pre-installation Meeting: Convene a pre-installation meeting one week before starting work of this section; require attendance by all affected installers.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.
- C. Samples: Submit two samples, produced by flooring contractor, 12 by 12 inch in size illustrating color and pattern for each floor material for each color specified.
 - 1. Provide samples illustrating available levels and types of slip resistance.
- D. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.
- E. Manufacturer's Installation Instructions: Indicate special procedures.
- F. Manufacturer's Qualification Statement.
- G. Applicator's Qualification Statement.
- H. Maintenance Data: Include maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.

- I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Top Coat Materials: 2 gallons.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section.
 - 1. Minimum 10 years of documented experience.
 - 2. Approved by manufacturer.
- C. Supervisor Qualifications: Trained by product manufacturer .
- D. Single Source Responsibility: To obtain combined warranty for the installed flooring system from manufacturer, obtain flooring system materials from a single manufacturer throughout project.

1.7 MOCK-UPS

- A. See Section 01 40 00 - Quality Requirements for additional requirements.
- B. Construct mock-up(s) of fluid applied flooring to serve as basis for evaluation of texture, slip resistance, and workmanship.
 - 1. Number of Mock-Ups to be Prepared: One.
 - 2. Use same materials and methods for use in the work.
 - 3. Use approved design samples as basis for mock-ups.
 - 4. Locate where directed.
 - 5. Minimum Size: 48 inches by 48 inches.
- C. Obtain approval of mock-up by Architect and Owner before proceeding with work.
- D. Approved mock-up may remain as part of the work.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store resin materials in a dry, secure area.
- B. Maintain optimal storage temperature of between 50 and 80 degrees F.
- C. Store materials for three days prior to installation in area of installation to achieve temperature stability.

1.9 FIELD CONDITIONS

- A. Maintain optimal storage temperature in storage area of between 60 and 85 degrees F.
- B. Store materials in area of installation for minimum period of 24 hours prior to installation.
- C. Maintain ambient and substrate temperature required by manufacturer 72 hours prior to, during, and 72 hours after installation of materials.
- D. Prior to and during installation, the flooring contractor shall verify that the dew point is at least 5 degrees Fahrenheit less than the slab and air temperature.
- E. Provide ambient lighting level of 50 ft candles, measured at floor surface.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Fluid-Applied Flooring:
 - 1. Sherwin-Williams High Performance Flooring: <https://industrial.sherwin-williams.com/na/us/en/resin-flooring.html>.
 - 2. Terrazzo & Marble Supply Companies; Terroxy Resin Systems: www.tmsupply.com/#sle.
 - 3. Eco-Corflex Molecular Industrial Polymers; <https://eco-corflex.com/>; <https://www.garagefloorcoating.com/>.

2.2 FLUID-APPLIED FLOORING SYSTEMS

- A. Fluid-Applied Flooring Type SC-1 (BG): Epoxy, without aggregate.
 - 1. System Thickness: 19-25 mils, nominal, dry film thickness (DFT).
 - 2. System Components:
 - a. Primer Coat: Resuflor MPE, 3-5 mils.
 - b. Build Coat: Resuflor MPE, 13-17 mils.
 - c. Topcoat: Resutile HTS 100; 3 mils.
 - 3. Texture: Smooth.
 - 4. Sheen: Satin.
 - 5. Product Properties:
 - a. Primer Coat & Build Coat shall consist of a neutral, two-component, high solids epoxy with the following properties:
 - 1) Percent solids: 95.45%
 - 2) Maximum VOC Content: 49 g/L
 - 3) Adhesion to Concrete: 732 psi concrete failed.
 - 4) Compressive Strength: 13,500 psi
 - b. Top Coat shall consist of a clear high solids, three-component, satin finish, aliphatic, moisture-cure urethane with the following properties:
 - 1) Percent Solids, by weight: 94.02%
 - 2) Max VOC Content: 6 g/L
 - 3) Abrasion Resistance: ASTM D4060: 18
 - 4) Wet Static Coefficient of Friction, ANSI/NFSI B101.10: 0.94
 - 6. Color: Refer to Finish Key.
 - 7. Products:
 - a. Sherwin-Williams High Performance Flooring; Resuflor HTS: <https://industrial.sherwin-williams.com/na/us/en/resin-flooring.html>
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Fluid-Applied Flooring Type SC-1 (HS): Two-component polyamine water-based epoxy, without aggregate.
 - 1. System Thickness: 5 mils, nominal, dry film thickness (DFT).
 - 2. Texture: Smooth.
 - 3. Sheen: Satin.
 - 4. Color: Refer to Finish Key.
 - 5. Products:
 - a. Sherwin-Williams High Performance Flooring; Armorseal 8100: <https://industrial.sherwin-williams.com/na/us/en/resin-flooring.html>
- C. Fluid-Applied Flooring Type EPX-1: Epoxy base coat(s), with broadcast aggregate.
 - 1. Aggregate: 1/8 inch PVA Chips.
 - 2. Color(s): Custom blend, refer to Finish Key.
 - 3. Chemical and Stain Resistant.
 - 4. Slip resistance: As selected by architect & owner from manufacturer's standard slip-resistance options.
 - 5. Coatings: <0.010% water absorption of plastics, in accordance with ASTM D-570.
 - a. Prime Coating: 100% Solids Polymer (Pigmented)
 - 1) Cure Time:

- (a) Cure to Tack-Free: 4-6 hours.
 - (b) Full Cure: 5-7 days.
 - 2) Finish: Super High Gloss.
 - 3) Vehicle Type: Bisphenol A / Epichlorohydrin.
 - 4) Thickness: As recommended by Manufacturer.
 - 5) Resistance to moisture, stains, chemicals, and abrasion.
 - b. Second Coating: 100% Solids Polymer (Clear) with PVA Chip Broadcast
 - 1) Cure Time:
 - (a) Cure to Tack-Free: 4-6 hours.
 - (b) Full Cure: 5-7 days.
 - 2) Finish: Super High Gloss.
 - 3) Chemical Composition: Modified bisphenol A epoxy resin crosslinked with aliphatic and cycloaliphatic polyamines.
 - 4) Thickness: As recommended by Manufacturer.
 - 5) Resistance to moisture, stains, chemicals, and abrasion.
 - c. Finish Coating: Poly-Pro II
 - 1) Cure Time:
 - (a) Dry to Touch: 6 hours.
 - (b) Full Cure: 7 days.
 - 2) Finish: High Gloss.
 - 3) Vehicle Type: Water-based aliphatic polyurethane.
 - 4) Thickness: As recommended by Manufacturer.
 - 5) Resistance to stains, chemicals, and abrasion.
6. Texture: Slip resistant.
7. Basis of Design Products:
 - a. Eco-Corflex Molecular Industrial Polymers; <https://eco-corflex.com/>;
<https://www.garagefloorcoating.com/>.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

2.3 ACCESSORIES

- A. Base Caps, Type CS TS-1: Brushed Stainless Steel with projecting base of 1/8 inch; color as selected.
 - 1. Basis of Design Product: Schiene manufactured by Schluter Systems.
- B. Subfloor Filler: Type recommended by fluid-applied flooring manufacturer.
- C. Primer: Type recommended by fluid-applied flooring manufacturer.
- D. Coordinate with Section 09 05 61, provide moisture guard as required.
 - 1. Basis of Design Product: Hydro Polymer (Clear & Pigmented)

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive flooring.
- 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 flooring.
- C. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of materials to subfloor surfaces.
- D. Cementitious Subfloor Surfaces: Verify that substrates are ready for fluid-applied flooring installation by testing for moisture and alkalinity (pH).

1. Test in accordance with Section 09 05 61.
2. Obtain instructions if test results are not within limits recommended by fluid-applied flooring manufacturer.
3. Follow moisture and alkalinity remediation procedures in Section 09 05 61.

E. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

- A. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.
- B. Prepare concrete surfaces according to ICRI 310.2R.
- C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Grind irregularities above the surface level. Prohibit traffic until filler is cured.
- D. Vacuum clean substrate.
- E. Apply primer to surfaces required by flooring manufacturer.

3.3 INSTALLATION - ACCESSORIES

- A. Install access panel recess frames.
- B. Install cant strips at base of walls where flooring is to be extended up wall as base.
- C. Install terminating cap strip at top of base; attach securely to wall substrate.

3.4 INSTALLATION - FLOORING

- A. Apply in accordance with manufacturer's instructions.
- B. Apply each coat to minimum thickness required by manufacturer.
- C. Finish to smooth level surface.
- D. Provide slip resistant texture with final coat to match approved mockup.
- E. Install flooring in recessed type floor access covers.
- F. At movable partitions install flooring under partitions without interrupting floor pattern.
- G. Cove at vertical surfaces.

3.5 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for additional requirements.
- B. Test installed floor surface in accordance with ANSI/ESD STM7.1 .

3.6 PROTECTION

- A. Prohibit traffic on floor finish for 48 hours after installation.
- B. Barricade area to protect flooring until fully cured.

3.7 SCHEDULE

- A. Refer to Finish Key and Schedule.

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SECTION 09 68 13
TILE CARPETING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Carpet tile, fully adhered, and accessories.

1.2 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied flooring.
- B. Section 09 05 61 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.
- C. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.
- D. Section 09 65 00 -Resilient Flooring: Base finish and termination edging of adjacent floor finish.

1.3 REFERENCE STANDARDS

- A. AATCC TM16.3 - Test Method for Colorfastness to Light: Xenon-Arc; 2020.
- B. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2016 (Reapproved 2021).
- C. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2023.
- D. CRI 104 - Standard for Installation of Commercial Carpet; 2015.
- E. CRI (GLP) - Green Label Plus Testing Program - Certified Products; Current Edition.
- F. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2023.

1.4 SUBMITTALS

- A. See Section 01 30 00 - 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. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.
- D. Submit two, two inch long samples of edge strip.
- E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- F. Manufacturer's Qualification Statement.
- G. Installer's Qualification Statement.

- H. Operation and Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
- I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum five years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet with minimum 5 years experience.
- C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

1.6 CLOSEOUT SUBMITTALS

- A. See Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
- B. Operation and Maintenance Data: submit maintenance procedures, recommended maintenance materials and suggested schedule for cleaning.

1.7 PRE-INSTALLATION MEETINGS

- A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum two week prior to commencing work of this section.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver carpeting materials in original mill protective wrapping with mill register numbers and tags attached. Maintain wrappers and protective covers in place until carpet is ready for installation.
- B. Deliver all required overages and maintenance stock to Owner's specified location prior to beginning installation.
- C. Store materials inside, protected from weather, moisture and soiling.

1.9 EXTRA MATERIALS

- A. See Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
- B. Supply 5 percent of carpet of each type, color, and pattern specified.

1.10 FIELD CONDITIONS

- A. Store materials in area of installation for minimum period of 48 hours prior to installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Tile Carpeting:

1. Interface, Inc: www.interface.com/#sle.
2. Mannington Commercial: www.manningtoncommercial.com/#sle.
3. Shaw Contract: www.shawcontract.com.

2.2 MATERIALS

- A. Carpet Tile Type CPT-1 Tufted Walk Off Matt, manufactured in one color dye lot
 1. Tile Size: 19.69 x 19.69 inch, nominal.
 2. Backing system: GlasBac Tile.
 3. Yarn manufacturer: Aquafil.
 4. Yarn system: 100% Recycled Content Type 6 Nylon.
 5. Color System: 100% Solution Dyed.
 6. Construction: Tufted Textured Loop.
 7. Lifetime Antimicrobial: Intersept.
 8. Soil Stain Protection: Protekt.
 9. Tufted Yarn Weight: 27 oz.
 10. Pile Height: 0.17 inch.
 11. Color: Refer to Finish Key.
 12. Critical Radiant Flux: Minimum of 0.45 watts/sq cm, when tested in accordance with ASTM E648 or NFPA 253.
 13. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").
 14. VOC Content: CRI Green Label Plus certified product.
 15. Light Fastness: > 4.0 @ 60 AFU's, minimum per AATCC TM16.3.
 16. Warranty: 15 years.
 17. Basis of Design Products:
 - a. Interface: Step Repeat SR999; <https://www.interface.com>.

2.3 ACCESSORIES

- A. Sub-Floor Filler: type recommended by flooring material manufacturer.
- B. Moldings and Edge Strips; Type TS-1 (BG): Embossed aluminum, Refer to finish key for color.
- C. Carpet Tile Adhesive: Recommended by carpet tile manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
- C. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.
- D. Cementitious Subfloor Surfaces: Verify that substrates are ready for flooring installation by testing for moisture and alkalinity (pH).
 1. Test in accordance with Section 09 05 61.
 2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
 3. Follow moisture and alkalinity remediation procedures in Section 09 05 61.

3.2 PREPARATION

- A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- B. Remove subfloor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with subfloor filler.
- C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
- D. Vacuum clean substrate.
- E. Ventilate installation area during installation and for 72 hours after installation.
- F. Maintain minimum 70 degrees F ambient temperature 72 hours prior to, during and 24 hours after installation.
- G. Precondition: All of the carpet shall be spread in a room on site 14 days prior to actual installation with the room preconditioned at a minimum of 70 degree F with humidity between 35% to 65%.

3.3 INSTALLATION

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install carpet tile in accordance with manufacturer's instructions.
- C. Do not mix carpet from different cartons unless from the same dye lot.
- D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- E. Lay carpet tile as specified, set, aligned and patterned as indicated on drawings.
- F. Locate change of color or pattern between rooms under door centerline.
- G. Fully adhere carpet tile to substrate.
- H. Trim carpet tile neatly at walls and around interruptions.
- I. Complete installation of edge strips, concealing exposed edges.

3.4 SCHEDULE

- A. Refer to Finish Key and Schedules.

3.5 CLEANING

- A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.
- B. Remove excess adhesive without damage, from floor, base, and wall surfaces.
- C. Clean and vacuum carpet surfaces.

END OF SECTION

SECTION 09 91 13
EXTERIOR PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
- D. 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.
 - 7. Concealed pipes, ducts, and conduits.

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 05 50 00 - Metal Fabrications: Shop-primed items.
- C. Section 09 96 00 - High-Performance Coatings.

1.3 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; Current Edition.
- B. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.
- C. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
- D. SSPC-SP 6/NACE No.3 - Commercial Blast Cleaning; 2006.

1.4 SUBMITTALS

- A. See Section 01 30 00 - 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.

5. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.
- 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 not required.
 3. Allow 30 days for approval process, after receipt of complete samples by Architect.
- D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.
- E. Manufacturer's Instructions: Indicate special surface preparation procedures.
- F. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 1. See Section 01 60 00 - 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.

1.5 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 10 years experience and approved by manufacturer.

1.6 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.

1.7 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the paint product manufacturer's temperature ranges.
- 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

2.1 MANUFACTURERS

- A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.
- B. Paints:
 - 1. PPG Paints: www.ppgpaints.com/#sle.
 - 2. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
- C. Primer Sealers: Same manufacturer as top coats.
- D. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready-mixed, unless required 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. 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. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
 - 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 described explicitly in manufacturer's product instructions.
- B. Volatile Organic Compound (VOC) Content:
 - 1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. 6 CRR-NY, Chapter III, Subpart A.
 - c. Ozone Transport Commission (OTC) Model Rule, Architectural, Industrial, and Maintenance Coatings; www.otcair.org; specifically:
 - 1) Opaque, Flat: 50 g/L, maximum.
 - 2) Opaque, Nonflat: 100 g/L, maximum.
 - 3) Opaque, High Gloss: 150 g/L, maximum.
 - d. Architectural coatings VOC limits of the State of New York.
 - 2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- C. Flammability: Comply with applicable code for surface burning characteristics.
- D. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
- E. Colors: As indicated on drawings.
 - 1. Allow for minimum of three colors for each system, unless otherwise indicated, without additional cost to Owner.
 - 2. Extend colors to surface edges; colors may change at any edge as directed by Architect.

2.3 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: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.1 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 affect 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. Masonry, Concrete, and Concrete Masonry Units: 12 percent.

3.2 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 repair existing paints or finishes that exhibit surface defects.
- D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.
- E. Seal surfaces that might cause bleed through or staining of topcoat.
- F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- G. Masonry:
 - 1. Prepare surface as recommended by top coat manufacturer.
- H. Aluminum: Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
- I. Galvanized Surfaces:
 - 1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
- J. Ferrous Metal:
 - 1. Solvent clean according to SSPC-SP 1.
 - 2. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning in accordance with SSPC-SP 6/NACE No.3. Protect from corrosion until coated.
- K. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.3 APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
- 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. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- H. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.4 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection.

3.5 CLEANING

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

3.6 PROTECTION

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

3.7 SCHEDULE - PAINT SYSTEMS: ALL MATERIALS ARE BASED ON SHERWIN WILLIAMS UNLESS NOTED OTHERWISE.

- A. Concrete, Concrete Masonry Units (CMU), Concrete Block, Brick Masonry: Finish surfaces exposed to view.
 - 1. One coat of Loxon Block Surfacers(LX01W0200) @ 8.8 MDFT.
 - 2. Two coats of ConFlex Acrylic Coating (CF13W0051) @ 3.5 MDFT.
- B. Aluminum: Finish surfaces exposed to view.
- C. Steel - Exposed steel lintels, Overhead doors, Frames, other Ferrous metal:
 - 1. One coat Pro Industrial Pro-Cryl Primer (B66-1300 Series) @ 1.9-3.8 MDFT.
 - 2. Two coats DTM Acrylic Semi gloss Coating (B66-200 Series).
 - 3. Application: Preparation and prime coat is to be applied in factory by steel fabricator.
- D. Steel - Exposed steel columns and beams:
 - 1. Minimum surface preparation is to meet SSPC-SP6.
 - 2. Prime coat Pro Industrial Pro-Cryl Primer (B66-1300 Series) @ 1.9-3.8 MDFT.
 - 3. Two coats Sher-Cryl HPA High Performance Acrylic (B66-300 Series) @ 2.5-4.0 MDFT.
 - 4. Application: Preparation and prime coat is to be applied in factory by steel fabricator.
- E. Galvanized Steel: Finish surfaces exposed to view.
 - 1. Two coats of Sher-Cryl HPA High Performance Acrylic (B66-300 Series) @ 2.5-4.0 MDFT.

2. Application: Preparation and prime coat is to be applied in factory by fabricator.

3.8 SCHEDULE - PAINT SYSTEMS: ALL MATERIALS ARE BASED ON PPG UNLESS NOTED OTHERWISE.

- A. Concrete, Concrete Masonry Units (CMU), Concrete Block, Brick Masonry: Finish surfaces exposed to view.
 1. One coat of Perma-Crete Block & Masonry Surfacers/Filler 4-100XI @ 8.0 to 11.0 MDFT.
 2. Two coats of Perma-Crete 4-22 HB Acrylic Flat @ 3.2 to 5.8 MDFT.
- B. Steel - Exposed steel lintels, Overhead doors, Frames, other Ferrous metal:
 1. One coat of Speed Hide One-component, interior/exterior rust inhibitive steel primer 6-208 Series.
 2. Two coats of Pitt-Tech Plus Int./Ext Semi-Gloss Industrial Coating 90-1610 HP Series.
 3. Application: Preparation and prime coat is to be applied in factory by steel fabricator.
- C. Steel - Exposed steel columns and beams:
 1. Minimum surface preparation is to meet SSPC-SP6.
 2. One coat of Speed Hide One-component, interior/exterior rust inhibitive steel primer 6-208 Series.
 3. Two coats Sil-Shield Silicone Alkyd Enamel High Gloss 95-5000 Series.
 4. Application: Preparation and prime coat is to be applied in factory by steel fabricator.
- D. Galvanized Steel: Finish surfaces exposed to view.
 1. Two coats of Pitt-Tech Plus Int./Ext. Gloss Industrial Coating 90-1310 Series @ 2.0 - 4.0 MDFT, minimum.
 2. Application: Preparation and prime coat is to be applied in factory by fabricator.

END OF SECTION

SECTION 09 91 23
INTERIOR PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
 - 1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
 - 2. Elevator pit ladders.
 - 3. Surfaces inside cabinets.
 - 4. Prime surfaces to receive wall coverings.
 - 5. Exposed walls and bottom of swimming pools and fountains.
 - 6. Mechanical and Electrical:
 - a. In finished areas, paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
 - b. In finished areas, paint shop-primed items.
 - c. Paint interior surfaces of air ducts and convactor and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
 - d. Paint dampers exposed behind louvers, grilles, and convactor and baseboard cabinets to match face panels.
- D. 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. Marble, granite, slate, and other natural stones.
 - 7. Floors, unless specifically indicated.
 - 8. Glass.
 - 9. Acoustical materials, unless specifically indicated.
 - 10. Concealed pipes, ducts, and conduits.

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 05 50 00 - Metal Fabrications: Shop-primed items.
- C. Section 09 91 13 - Exterior Painting.
- D. Section 09 96 00 - High-Performance Coatings.

1.3 DEFINITIONS

- A. Comply with ASTM D16 for interpretation of terms used in this section.

1.4 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; Current Edition.
- B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2024.
- C. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating; 2023.
- D. ASTM D4259 - Standard Practice for Preparation of Concrete by Abrasion Prior to Coating Application; 2018.
- E. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020.
- F. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; Current Edition.
- G. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.
- H. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
- I. SSPC-SP 2 - Hand Tool Cleaning; 2024.
- J. SSPC-SP 3 - Power Tool Cleaning; 2024.
- K. SSPC-SP 6/NACE No.3 - Commercial Blast Cleaning; 2006.
- L. SSPC-SP 13/NACE No.6 - Surface Preparation of Concrete; 2018.

1.5 SUBMITTALS

- A. See Section 01 30 00 - 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 products to be used in project; include description of each system.
 - 4. Manufacturer's installation instructions.
 - 5. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.
- 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 not required.
 - 3. Allow 30 days for approval process, after receipt of complete samples by Architect.
 - 4. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as masonry, have been approved.
- D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.
- E. Manufacturer's Instructions: Indicate special surface preparation procedures.

- F. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Paint and Finish Materials: 1 gal of each color; from the same product run, store where directed.
 - 3. Label each container with color in addition to the manufacturer's label.

1.6 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 10 years experience and approved by manufacturer.

1.7 MOCK-UP

- A. See Section 01 40 00 - Quality Requirements, for general requirements for mock-up.
- B. Provide panel, 10 feet long by 10 feet wide, illustrating paint color, texture, and finish.
- C. Provide door and frame assembly illustrating paint color, texture, and finish.
- D. Locate where directed by Architect.
- E. Mock-up may remain as part of the work.

1.8 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.

1.9 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 materials when relative humidity exceeds 85 percent, at temperatures less than 5 degrees F above the dew point, or to damp or wet surfaces.
- D. Minimum Application Temperatures for Paints: 50 degrees F for interiors unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 fc measured mid-height at substrate surface.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.

2.2 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. 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. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
 - 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. Volatile Organic Compound (VOC) Content:
 - 1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. 6 CRR-NY, Chapter III, Subpart A.
 - c. Ozone Transport Commission (OTC) Model Rule, Architectural, Industrial, and Maintenance Coatings; www.otcair.org; specifically:
 - 1) Opaque, Flat: 50 g/L, maximum.
 - 2) Opaque, Nonflat: 100 g/L, maximum.
 - 3) Opaque, High Gloss: 150 g/L, maximum.
 - d. Architectural coatings VOC limits of the State of New York.
 - 2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- C. Flammability: Comply with applicable code for surface burning characteristics.
- D. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
- E. Colors: As indicated on drawings.
 - 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 under which they are mounted.

2.3 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: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin application of paints and finishes until substrates have been adequately 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 affect 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 is below the following maximums:
 - 1. Gypsum Wallboard: 12 percent.
 - 2. Plaster and Stucco: 12 percent.
 - 3. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
 - 4. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
 - 5. Concrete Floors and Traffic Surfaces: 8 percent.

3.2 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 repair existing paints or finishes that exhibit surface defects.
- D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- E. Seal surfaces that might cause bleed through or staining of topcoat.
- F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- G. Concrete:
 - 1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
 - 2. Clean concrete according to ASTM D4258. Allow to dry.
 - 3. Prepare surface as recommended by top coat manufacturer and in accordance with SSPC-SP 13/NACE No.6.
- H. Masonry:
 - 1. Remove efflorescence and chalk. Do not coat surfaces if moisture content, alkalinity of surfaces, or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.
 - 2. Prepare surface as recommended by top coat manufacturer.
- I. Concrete Floors and Traffic Surfaces: Remove contamination, using alkaline based cleaners where required, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.
- J. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.

- K. Plaster: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high-alkali surfaces.
- L. Aluminum: Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
- M. 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.
- N. 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 in accordance with SSPC-SP 6/NACE No.3. Protect from corrosion until coated.
- O. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer.
- P. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.3 APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
- 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 in thicknesses specified by manufacturer.
- F. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.
- 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. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.4 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection.
- B. Owner will provide field inspection.

3.5 CLEANING

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

3.6 PROTECTION

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

3.7 SCHEDULE - PAINT SYSTEMS: ALL MATERIALS ARE BASED ON SHERWIN WILLIAMS UNLESS NOTED OTHERWISE.

- A. Concrete Block:
 - 1. One coat Preprite Block Filler (B25) DFT- 8.0. (MPI #4)
 - 2. Two coats SuperPaint Air Purifying Technology (A86) @ 1.8 MDFT
- B. Concrete:
 - 1. One coat Preprite Masonry Primer (B28W300) @ 3.0 MDFT. (MPI #149)
 - 2. Two coats SuperPaint Air Purifying Technology (A86) @ 1.8 MDFT
- C. Concrete Floors (Lt. - Med. Duty):
 - 1. Unpainted Floors:
 - a. One coat ArmorSeal 8100 Water Based Epoxy Floor Coating (B70 Series) reduced with one pint of water per gallon @ 2.0-4.0 DMFT.
 - b. Two coats ArmorSeal 8100 Water Based Epoxy Floor Coating (B70 Series) unreduced @ 2.0-4.0 MDFT per coat.
 - 2. Previously Painted Floors:
 - a. Spot Prime bare areas with one coat ArmorSeal 8100 Water Based Epoxy Floor Coating (B70 Series) unreduced @ 2.0-4.0 DMFT.
 - b. Two coats ArmorSeal 8100 Water Based Epoxy Floor Coating (B70 Series) unreduced @ 2.0-4.0 MDFT per coat.
- D. Steel and Metal - Steel access doors and frames, hollow metal doors and frames, all new removable mullions, stair railings, hollow metal Windows frames, existing painted fire extinguisher cabinets:
 - 1. One coat Pro Industrial Pro-Cryl Primer (B66-1300 Series) @ 1.9-3.8 MDFT.
 - 2. Two coats DTM Acrylic Semi-Gloss Coating (B66-200) @ 2.5-5.0 MDFT per coat.
- E. Galvanized Metal: Exposed miscellaneous metal, exposed ducts, conduits, mechanical and electrical devices.
 - 1. One coat DTM Acrylic Primer/Finish (B66W1) @ 2.5-5.0 MDFT. (MPI #134)
 - 2. Two coats DTM Acrylic Semi-Gloss Coating (B66-200) @ 2.5-4.0 MDFT per coat. (MPI #153)
- F. Aluminum - Mill Finish:
 - 1. Two coats DTM Acrylic Gloss Coating (B66-100) @ 2.5-4.0 MDFT per coat. (MPI #114)
- G. Steel - Exposed steel lintels:
 - 1. One coat Pro Industrial Pro-Cryl Primer (B66-1300 Series) @ 1.9-3.8 MDFT.
 - 2. Two coats Sher-Cryl HPA High Performance Acrylic, (B66-300 Series) @ 2.5-4.0 MDFT.
 - 3. Application: Preparation and prime coat is to be applied including previously primed in factory by steel fabricator.
- H. Gypsum Board: Finish surfaces exposed to view.
 - 1. All interior drywall gypsum board wall surfaces for a painted finish. (Spot prime all areas containing joint compound with primer first)
 - a. Walls and ceilings: One coat Pro Mar 200 Zero VOC Primer (B28) DFT- 1.0. (MPI #50).
 - b. Walls: Two coats SuperPaint Air Purifying Technology (A87 - Satin) @ 1.8 MDFT
 - c. Ceilings: Two coats SuperPaint Air Purifying Technology (A86 - Flat) @ 1.8 MDFT
- I. Plaster: Finish surfaces exposed to view.

1. All interior plastered wall surfaces for a painted finish. (Spot prime all areas containing raw plaster with primer first)
 - a. Walls and ceilings: One coat Pro Mar 200 Zero VOC Primer (B28) DFT- 1.0. (MPI #50).
 - b. Walls: Two coats SuperPaint Air Purifying Technology (A87 - Satin) @ 1.8 MDFT
 - c. Ceilings: Two coats SuperPaint Air Purifying Technology (A86 - Flat) @ 1.8 MDFT
- J. New Wood Casework: See Section 06 41 00 - Architectural Wood Casework, for required factory finish.
- K. New Wood Doors: Refer to appropriate door specification for required factory finish.
- L. Wood (Existing) - Varnished:
 1. Two coats Minwax Performance Series Interior Wood Stain 250 VOC A 49 Series.
 2. Two coats Minwax Fast Dry Polyurethane (154-3453 Satin, 154-8890 Semi-Gloss, or 154-3479 Gloss finish.
 3. ** Number of coats dependent upon final inspection by architect/owner.

3.8 SCHEDULE - PAINT SYSTEMS: ALL MATERIALS ARE BASED ON PPG UNLESS NOTED OTHERWISE.

- A. Concrete Block:
 1. One coat Speedhide Masonry Hi Fill Latex Block Filler, 6-15XI. (MPI #4)
 2. Two coats Pure Performance Interior Latex, 9-510XI Series, Semi-Gloss. (MPI #147)
- B. Concrete:
 1. One coat Perma-Crete Interior/Exterior Alkali Resistant Primer, 4-603XI Series. (MPI #3)
 2. Two coats Pure Performance Interior Latex, 9-510XI Series, Semi-Gloss. (MPI #147)
- C. Concrete Floors (Lt. - Med. Duty):
 1. One coat Perma-Crete Plex-Seal WB Interior/Exterior Clear Sealer Stain, 4-6200XI. (MPI #99)
 2. Two coats Perma-Crete Plex-Seal WB Interior/Exterior Clear Sealer Stain, 4-6200XI. (MPI #99)
- D. Steel and Metal - Steel access doors and frames, hollow metal doors and frames, all new removable mullions, stair railings, hollow metal Windows frames, existing painted fire extinguisher cabinets:
 1. One coat Pitt-Tech Plus DTM Industrial Primer/Finish 4020.
 2. Two coats Pitt-Tech Plus EP DTM Acrylic, Semi-Gloss 90-1610 Series.
- E. Galvanized Metal: Exposed miscellaneous metal, exposed ducts, conduits, mechanical and electrical devices.
 1. One coat Pitt-Tech Plus DTM Industrial Primer/Finish, 4020.
 2. Two coats Pitt-Tech Plus EP DTM Acrylic, Semi-Gloss 90-1610 Series. (MPI #153)
- F. Aluminum - Mill Finish:
 1. One Coat Pitt-Tech Plus DTM Industrial Primer/Finish 4020 over abraded surface.
 2. Two coats Pitt-Tech Plus WB DTM Industrial Enamel, 90-1310 Series, Gloss. (MPI #154).
- G. Steel - Exposed steel lintels:
 1. One coat Pitt-Tech Plus DTM Industrial Primer/Finish 4020.
 2. Two coats Pitt-Tech Plus EP DTM Acrylic Gloss 90-1510.
- H. Gypsum Board: Finish surfaces exposed to view.
 1. All interior drywall gypsum board wall surfaces for a painted finish. (Spot prime all joints and spots with primer first)
 - a. Walls and ceilings: Two coats Pure Performance Interior Latex Primer, 9-900.

- b. Walls: Two coats Pure Performance Interior Latex, 9-510XI Series, Semi-Gloss. (MPI #144)
 - c. Ceilings: Two coats Pure Performance Interior Latex, 9-100 Series, Flat. (MPI #144)
- I. Plaster: Finish surfaces exposed to view.
 - 1. All interior plastered wall surfaces for a painted finish. (Spot prime all joints and spots with primer first)
 - a. Walls and ceilings: Two coats Pure Performance Interior Latex Primer, 9-900.
 - b. Walls: Two coats Pure Performance Interior Latex, 9-510XI Series, Semi-Gloss
 - c. Ceilings: Two coats Copper Armor Interior Latex, 29-1310, Eggshell. (MPI #144)
- J. New Wood Casework: See Section 06 41 00 - Architectural Wood Casework, for required factory finish.
- K. New Wood Doors: Refer to appropriate door specification for required factory finish.
- L. Wood (Existing) - Varnished:
 - 1. Two coats Deft Water Based Wood Stain DFT300 Series.
 - 2. Two coats Deft Polyurethane Interior Oil Based 350 g/L (154-3453 Satin, 154-8890 Semi-Gloss, or 154-3479 Gloss finish.
 - 3. ** Number of coats dependent upon final inspection by Architect/Owner. Satin DFT129

3.9 SCHEDULE

- A. Refer to Finish Key and Schedule on Drawings.

END OF SECTION

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SECTION 09 96 00
HIGH-PERFORMANCE COATINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. High performance coatings.
- B. Surface preparation.

1.2 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; Current Edition.
- B. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating; 2023.
- C. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.
- D. SSPC-SP 13/NACE No.6 - Surface Preparation of Concrete; 2018.

1.3 SUBMITTALS

- A. See Section 01 30 00 - 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.
 - 5. If proposal of substitutions is allowed under submittal procedures, explanation of all substitutions proposed.
- C. Samples: Submit two samples 8 by 8 inch in size illustrating colors available for selection.
- D. Manufacturer's Certificate: Certify that high-performance coatings comply with VOC limits specified.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Manufacturer's Installation Instructions: Indicate special procedures.
- G. Maintenance Data: Include cleaning procedures and repair and patching techniques.

1.4 QUALITY ASSURANCE

- A. Maintain one copy of each referenced document that applies to application on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- C. Applicator Qualifications: Company specializing in performing the work of this section with minimum 10 years documented experience.

1.5 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.

1.6 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. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the coating product manufacturer.
- C. Do not install materials when temperature is below 55 degrees F or above 90 degrees F.
- D. Maintain this temperature range, 24 hours before, during, and 72 hours after installation of coating.
- E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.
- F. Restrict traffic from area where coating is being applied or is curing.

1.7 WARRANTY

- A. See Section 01 78 00 - 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.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Provide high performance coating products from the same manufacturer.
- B. High-Performance Coatings:
 - 1. PPG Paints: www.ppgpaints.com/#sle.
 - 2. Sherwin-Williams Company: www.protective.sherwin-williams.com/industries/#sle.
 - 3. Substitutions: Section 01 60 00 - Product Requirements.

2.2 HIGH PERFORMANCE PAINT SYSTEMS

- A. CONCRETE FLOORS -MEDIUM DUTY
 - 1. 1 ct. ArmorSeal 33 Epoxy Primer/Sealer B58 Series 8.0 Mils (200) Microns Duty
 - 2. 1-2 cts. ArmorSeal 1000 HS B67 Series 3.0-5.0 Mils (75-125) Microns
 - 3. 1 ct ArmorSeal Rextthane B65 Series 3.0 Mils (75) Microns

2.3 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.

HIGH-PERFORMANCE COATINGS

1. Volatile Organic Compound (VOC) Content:
 - a. Provide coatings that comply with the most stringent requirements specified in the following:
 - 1) 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - 2) Ozone Transport Commission (OTC) Model Rule, Architectural, Industrial, and Maintenance Coatings: www.otcair.org.
 - (a) Opaque, Flat: 50 g/L, maximum.
 - (b) Opaque, Nonflat: 150 g/L, maximum.
 - (c) Opaque, High Gloss: 250 g/L, maximum.
 - (d) Varnishes: 350 g/L, maximum.
 - 3) Architectural coatings VOC limits of the State of New York.
 - b. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
 2. Colors: Selected from manufacturer's standard colors.
- B. Shellac: Pure, white type.

PART 3 EXECUTION

3.1 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. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- 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. Cementitious Substrates: Do not begin application until substrate has cured 28 days minimum and measured moisture content is not greater than 12 percent.
 2. Concrete Floors and Traffic Surfaces: 8 percent.

3.2 PREPARATION

- A. Protect adjacent surfaces and materials not receiving coating from spatter and overspray; mask if necessary to provide adequate protection. Repair damage.
- B. Clean surfaces of loose foreign matter.
- C. Remove substances that would bleed through finished coatings. If unremovable, seal surface with shellac.
- D. Remove finish hardware, fixture covers, and accessories and store.
- E. Concrete:

1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
2. Clean concrete according to ASTM D4258. Allow to dry.
3. Prepare surface as recommended by coating manufacturer and in accordance with SSPC-SP 13/NACE No.6.

3.3 PRIMING

- A. Apply primer to all surfaces, unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.
- B. Concrete: Prior to priming, patch with masonry filler to produce smooth surface.

3.4 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.

3.5 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements for general requirements for field inspection.

3.6 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.
- D. See Section 01 74 19 - Construction Waste Management and Disposal for additional requirements.

3.7 PROTECTION

- A. Protect finished work from damage.

END OF SECTION

SECTION 10 14 19
DIMENSIONAL LETTER SIGNAGE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Illuminated Metal Cutout Signage
- B. Illumination system.

1.2 REFERENCE STANDARDS

- A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- B. UL 879 - Electric Sign Components; Current Edition, Including All Revisions.

1.3 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's product literature for each type of dimensional letter sign, indicating style, font, colors, locations, and overall dimensions of each sign.
- C. Shop Drawings:
 - 1. Include dimensions, locations, elevations, materials, text and graphic layout, and attachment details.
 - 2. Show locations of electrical service connections.
 - 3. Include diagrams for power, signal, and control wiring.
- D. Selection Samples: Where materials, colors, and finishes are not specified, submit two sets of selection charts or chips.
- E. Verification Samples: Submit samples showing colors and finishes specified.
- F. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

1.4 QUALITY ASSURANCE

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

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Package dimensional letter signs as required to prevent damage before installation.
- B. Store under cover and elevated above grade.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Illuminated Cutout Metal Signs:

1. ASI Sign Systems, Inc; LPS Series Cut Metal Signage: www.asisignage.com
2. Takeform: www.takeform.net/#sle.

2.2 DIMENSIONAL LOGO

- A. Applications: Custom Backlit Dimensional Logo.
 1. Mounting Location: Interior as indicated on drawings.
- B. Metal Panel:
 1. Material: Aluminum sheet, fabricated reverse channel.
 2. Thickness: 1/8 inch minimum.
 3. Finish: Brushed, satin.
 4. Color: As selected.
 5. Mounting: Concealed stand-off mounting..
 6. Illumination System: Adjustable White LED Sheet mounted behind translucent acrylic..
 - a. Provide products that are listed and labeled as complying with UL 879, where applicable.
 - b. Power: 120 V, 60 Hz, 1 phase, 15 A.
 7. Basis of Design Product:
 - a. ASI LPS Series Cut Metal Dimensional Signage.
 - b.

2.3 ACCESSORIES

- A. Concealed Screws: Noncorroding metal; stainless steel, galvanized steel, chrome plated, or other.
- B. Electrical Components and Devices: Listed and labeled as defined in NFPA 70 by a qualified testing agency.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify that electrical service is correctly sized and located to accommodate cut metal signs.
- C. Notify Architect if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install with horizontal edges level.
- C. Protect from damage until Date of Substantial Completion; repair or replace damaged items.

3.3 CLEANING, PROTECTION AND REPAIR

- A. Repair scratches and other damage which might have occurred during installation. Replace components where repairs were made but are still visible to the unaided eye from a distance of 5 feet interior and 10 feet exterior.
- B. Remove temporary coverings and protection to adjacent work areas. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance.

- C. Dispose of construction debris.

3.4 SCHEDULE

- A. Refer to Signage Schedule, Signage Type Schedule and Drawings for sizes, locations and layout of signage types, sign text copy and graphics.

END OF SECTION

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SECTION 10 14 23
PANEL SIGNAGE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Panel signage.

1.2 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- C. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.3 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's product literature for each type of panel sign, indicating styles, font, foreground and background colors, locations, and overall dimensions of each sign.
- C. Shop Drawings:
 - 1. Include dimensions, locations, elevations, materials, text and graphic layout, attachment details, and schedules.
 - 2. Schedule: Provide information sufficient to completely define each panel sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
 - a. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.
 - b. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
 - c. Submit for approval by Owner through Architect prior to fabrication.
- D. Samples: Submit two samples of each type of sign, of size similar to that required for project, indicating sign style, font, and method of attachment.
- E. Selection Samples: Where colors, materials, and finishes are not specified, submit two sets of color selection charts or chips.
- F. Verification Samples: Submit samples showing colors, materials, and finishes specified.
- G. Manufacturer's Installation Instructions: Include installation templates and attachment devices.
- H. Manufacturer's qualification statement.

1.4 QUALITY ASSURANCE

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

1.5 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 under cover and elevated above grade.
- D. Store tape adhesive at normal room temperature.

1.6 FIELD CONDITIONS

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

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Panel Signage:
 - 1. ASI Sign Systems, Inc: www.asisignage.com
 - 2. ID Signsystems: www.idsignsystems.com.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 REGULATORY REQUIREMENTS

- A. Accessibility Requirements: Comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most restrictive requirements.
- B. Surface burning characteristics: Maximum flame spread of 25 (Class A) when tested in accordance with ASTM E84.

2.3 PANEL SIGNAGE

- A. Panel Signage:
 - 1. Application: Room and door signs.
 - 2. Description: Flat signs co-molded media, tactile characters.
 - 3. Sign Size: As indicated on drawings.
 - 4. Total Thickness: 1/8 inch.
 - 5. Sign Edges: Squared.
 - 6. Corners: Squared.
 - 7. Color and Font, unless otherwise indicated:
 - a. Character Font: Helvetica, Arial, or other sans serif font.
 - b. Character Case: Upper case only.
 - c. Background Color: Clear.
 - d. Character Color: Contrasting color.
 - 8. Material: One-piece injection molded polycarbonate plastic with raised letters and braille.
 - 9. Profile: Flat panel without frame.
 - 10. Tactile Letters: Raised 1/32 inch minimum.
 - 11. Braille: Grade II, ADA-compliant.
 - 12. One-Sided Wall Mounting: Tape adhesive.
 - 13. Basis of Design Product:
 - a. ASI: InForm-FR.
 - b. Or Approved Equal.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.

2.4 SIGNAGE APPLICATIONS

- A. Room and Door Signs:
 - 1. Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.
 - 2. Rest Rooms: Identify with pictograms, the names as indicated on room finish schedule located on drawings, and braille.

2.5 ACCESSORIES

- A. Tape Adhesive: Double-sided tape, permanent adhesive.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Notify Architect if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

3.2 INSTALLATION

- A. Ensure new and existing substrate surfaces are suitably cleaned prior to installation to remove dust, dirt, and other contaminants that would adversely affect tape adhesive attachment.
- B. Install in accordance with manufacturer's instructions.
- C. Install with horizontal edges level.
- D. Locate panel signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.
- E. Protect from damage until Date of Substantial Completion; repair or replace damaged items.

3.3 CLEANING, PROTECTION AND REPAIR

- A. Repair scratches and other damage which might have occurred during installation. Replace components where repairs were made but are still visible to the unaided eye from a distance of 5 feet interior and 10 feet exterior.
- B. Remove temporary coverings and protection to adjacent work areas. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance.
- C. Dispose of construction debris.

3.4 SCHEDULE

- A. Refer to Signage Schedule, Signage Type Schedule and Drawings for sizes, locations and layout of signage types, sign text copy and graphics.

END OF SECTION

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SECTION 10 15 00
VIDEO DISPLAY SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Panelized LED video display systems.
- B. Display support structure.

1.2 RELATED REQUIREMENTS

- A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
- B. Section 26 05 33.13 - Conduit for Electrical Systems.
- C. Section 26 05 33.16 - Boxes for Electrical Systems.

1.3 REFERENCE STANDARDS

- A. ANSI/Infocomm 10 - Audiovisual Systems Performance Verification; 2013.
- B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. UL 879 - Electric Sign Components; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Conduct a preinstallation meeting two weeks prior to the start of the work of this section; require attendance by all affected installers.

1.5 DESIGN CRITERIA - EXTERIOR MOUNTED

- A. Wind Resistance: Signage system and foundation shall be engineered to withstand wind loads calculated for Risk Category II, Exposure C, as designed for current Applicable Code.

1.6 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data sheets on panelized LED display systems including recommendations for preparation, storage and handling, and installation.
- C. Shop Drawings: Indicate cable routing, connections between equipment, framing, anchor and support details, and adjacent construction.
 - 1. Include Design Engineer's signature and seal on submitted shop drawings and calculations.
 - 2. Include renderings that incorporate Owner furnished identification logo for approval.
- D. Manufacturer's Qualification Statement.
- E. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- F. Project Record Documents: Provide quantities, type, and location for components, cabling and accessories.

- G. Security Items:
 - 1. Provide one set of keys for each locked equipment enclosure.
 - 2. Provide passwords to access control functions for hardware and software user interfaces.

1.7 QUALITY ASSURANCE

- A. Design structural components, develop shop drawings, and calculations under direct supervision of a Professional Engineer experienced in design of this work and licensed in the State of New York.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
- C. Authorized Manufacturer Representative: System shall be configured and commissioned by an authorized manufacturer representative.
- D. Installer Qualifications: Company specializing in performing the work of this section with minimum three years of documented experience.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in compliance with manufacturer instructions.
- B. Protect electronic and finish materials from damage by wind, weather, and construction activities including concrete splatter.
- C. Lift components by means and at specific points designated by the manufacturer.

1.9 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer warranty for electronic sign and components.
- C. Provide one year warranty for all parts of the sign structure and identification logo cabinet. This does not include damage from neglect, accident, abuse, misuse, or natural disasters.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Daktronics, Inc.: www.daktronics.com/#sle.
- B. Or Approved Equal.
- C. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 PANELIZED LED VIDEO DISPLAY

- A. Performance Requirements:
 - 1. Comply with performance standards based on tests conducted in accordance with ANSI/Infocomm 10.
 - 2. Provide products that are listed and labeled as complying with UL 879, where applicable.
- B. System Type: Flat.
 - 1. Pixel Pitch: 3.8 mm
 - 2. Horizontal Viewing Angle: 170 degrees (plus/minus 85 degrees off center).
 - 3. Vertical Viewing Angle: 160 degrees (plus/minus 80 degrees off center).
 - 4. Brightness: 1000 Nits adjustable

VIDEO DISPLAY SYSTEMS

5. Mount Type: Free Standing/Self Supporting.
6. Location: Outdoor.
7. Sized to fit existing foundation and structure.
8. Service Access: Front.
9. Data Connections: Fiber Optic.
10. Power Consumption: 7.50 watts/sf.
11. Working Voltage: 120 VAC at 60Hz.
12. Heat Flow: 24 BTU/hr/sf.

C. Display Configuration:

1. Double Sided: Each LED display side shall have independent controllers. System shall be configured to display different, independent content on each side. Capable of displaying same content on both sides. Initial configuration to be same graphic on both sides.
2. Capable of displaying three-dimensional graphics, video clips and animations.

D. Identification Logo:

1. Display system shall include separate cabinet, with same display configuration as LED display, to accommodate name, logo, or other identification properties as determined by Owner.
2. Identification logo cabinet shall be internally backlit, timer or photo-electrically controlled.
3. Identification logo shall be furnished and approved by Owner prior to production.

E. Cabinets and Closure Panels:

1. Heavy Gauge Formed Aluminum.
2. Weather resistant cabinets designed to meet the classification requirements of NEMA 4X construction.
3. Dimensions: As indicated on Drawings
4. Ventilation: By convection across LED face or through closure panels.
5. Internal display component hardware (nuts, bolts, screws, standoffs, rivets, fasteners, etc.) shall be fabricated from stainless steel, aluminum, nylon, or other durable corrosion-resistant materials suitable for the signage application.
6. Finish: Industrial, automotive-grade acrylic urethane paint.
7. Protective Covers: Provide Tuffak Polycarbonate lens to protect LED display area on both sides of double sided display. Mount with stand-offs per manufactures standard detail.
 - a. Protective Cover Lift: Gas cylinder assist lifts one on each end of LED protective covers.

2.3 SUPPORT STRUCTURE

- A. Fabrication: Structural steel in accordance with AISC specifications.
- B. Shop Finish: All components of steel support structure shall be properly cleaned and coated with corrosion resistant paint prior to installation. Touch up any coating damaged during installation.

2.4 ELECTRICAL AND DATA:

- A. Electrical and Data Lines: Contained in separate conduits; terminating inside support column or fully contained within shrouded base area, installed in accordance with NFPA 70.
 1. Exposed conduit shall not be acceptable.

2.5 CONTROL SOFTWARE

- A. Display content and scheduling shall be an interactive cloud-based solution hosted by sign manufacturer. Application shall be accessible through any internet connected device, utilizing HTML5 platform technology providing consistent look and operation regardless of device connected.
 - 1. Software access shall be password protected allowing up to 10 unique users. Passwords shall be configurable to varying levels of security.
- B. System shall provide ability to store multiple images, playlists, and customizable schedules.
- C. Scheduler and playlists shall be stored on signs onboard nonvolatile memory processor and capable of rebooting following power outages.
 - 1. System clock and calendar will continue to function during power failure. Message display shall hold memory for a minimum of 60 days without power.
- D. Scheduling can be pre-programmed more than 1 year in advance.
- E. Text Modules: Various, with scalable fonts and traveling text.
 - 1. Text recognition shall prevent display of objectionable words. List of words shall be password protected and fully editable to add or delete words.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that required power and data sources are provided.
- B. Verify that space is available for centrally located components.
- C. Notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Prepare substrates using the methods recommended by the manufacturer for achieving the best result under the project conditions.
- B. Install foundation and anchor rods in compliance with manufacturer's recommendations and approved shop drawings and details using templates for accurate placement of anchor rods.
- C. Allow foundation concrete to reach minimum compressive strength of 3000 psi prior to installation of sign.

3.3 INSTALLATION

- A. Do not proceed with installation until support structure and substrates have been prepared using the methods recommended by the manufacturer and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.
- B. Install in accordance with manufacturer's instructions .
- C. Install message center and signs level and plumb with fasteners recommended by the manufacturer.
- D. Ensure display is grounded in accordance with NFPA 70, to prevent electrical disturbances and protect from lightning strikes.
- E. Record any necessary changes to the system design.

3.4 CLOSEOUT ACTIVITIES

- A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.
- B. Demonstrate proper operation and maintenance of equipment to Owner's designated representative.
- C. Review service and support contacts.

3.5 PROTECTION

- A. Protect installed products from subsequent construction operations.

END OF SECTION

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SECTION 10 21 13.19
PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Solid plastic toilet compartments.
- B. Urinal screens.

1.2 RELATED REQUIREMENTS

- A. Section 05 50 00 - Metal Fabrications: Concealed steel support members.
- B. Section 06 10 00 - Rough Carpentry: Blocking and supports.
- C. Section 10 28 00 - Toilet, Bath, and Laundry Accessories.

1.3 REFERENCE STANDARDS

- A. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
- B. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.
- C. ANSI A117.1 - America National Standard- Accessible and Usable Buildings and Facilities.

1.4 ADMINISTRATIVE REQUIREMENTS

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

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall, floor, and ceiling supports, door swings.
- C. Samples: Submit two samples of partition panels, 6 x 6 inch in size illustrating panel finish, color, and sheen.
- D. Manufacturer's Installation Instructions: Indicate special procedures.

1.6 WARRANTY

- A. Manufacturer to supply a written warranty covering all components against breakage corrosion and delamination for a period of five years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Solid Plastic Privacy Toilet Compartments:
 - 1. All American Metal Corp - AAMCO: www.allamericanmetal.com/#sle.
 - 2. ASI Global Partitions: www.asi-globalpartitions.com/#sle.
 - 3. Metpar Corp: www.metpar.com/#sle.
 - 4. Scranton Products (Santana/Comtec/Capital): www.scrantonproducts.com/#sle.

2.2 PLASTIC TOILET COMPARTMENTS

- A. Solid Plastic Privacy Toilet Compartments: Factory fabricated doors overlapping seams, pilasters, and overlapping divider panels made of solid molded high density polyethylene (HDPE), tested in accordance with NFPA 286; floor-mounted headrail-braced.
 - 1. Color: Refer to Finish Key.
- B. Doors:
 - 1. Thickness: 1 inch.
 - 2. Width: 24 inch.
 - 3. Width for Handicapped Use: 36 inch, out-swinging.
 - 4. Height: 94 inch.
- C. Panels:
 - 1. Thickness: 1 inch.
 - 2. Height: 94 inch.
 - 3. Depth: As indicated on drawings.
- D. Pilasters:
 - 1. Thickness: 1 inch.
 - 2. Width: As required to fit space; minimum 3 inch.
- E. Screens: Without doors; to match compartments; mounted to wall with two panel brackets.
 - 1. Panel bottom not more than 12" above finished floor.
 - 2. Panel top not less than 60" above finished floor.
 - 3. Panel depth not less than 18" or less than 6" beyond the outermost front lip of urinal, whichever is greater.

2.3 ACCESSORIES

- A. Pilaster Shoes: Stainless steel, satin finish, 3 inches high; concealing floor fastenings.
 - 1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.
- B. Head Rails: Extruded aluminum, anti-grip profile.
 - 1. Size: Manufacturer's standard size.
- C. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.
 - 1. For attaching panels and pilasters to brackets: Through-bolts and nuts; tamper proof.
- D. Door Hardware: Stainless steel, manufacturer's standard finish.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 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.

3.3 TOLERANCES

- A. Maximum Variation From True Position: 1/4 inch.
- B. Maximum Variation From Plumb: 1/8 inch.

3.4 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.
- C. Adjust adjacent components for consistency of line or plane.

END OF SECTION

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SECTION 10 28 00
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Commercial toilet accessories.
- B. Electric hand/hair dryers.

1.2 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Placement of concealed wood blocking and backing plates for support of accessories.
- B. Section 09 30 00 - Tiling: Ceramic washroom accessories.
- C. Section 10 21 13.19 - Plastic Toilet Compartments.

1.3 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- B. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2022.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- D. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
- E. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2017 (Reapproved 2022).
- F. ASTM C1036 - Standard Specification for Flat Glass; 2021.
- G. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.
- H. GSA CID A-A-3002 - Mirrors, Glass; U.S. General Services Administration; 1996.

1.4 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.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.
- C. Samples: Submit two samples of each accessory, illustrating color and finish.

- D. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Commercial Toilet, Shower, and Bath Accessories:
1. American Specialties, Inc (ASI): www.americanspecialties.com.
 2. Bobrick Washroom Equipment, Inc.: www.bobrick.com
 3. Bradley Corporation: www.bradleycorp.com/#sle.
 4. Substitutions: Section 01 60 00 - Product Requirements.
- B. Electric Hand/Hair Dryers:
1. Excel Dryer; Model XL-SB - ADA Compliant Recess Kit: www.exceldryer.com/#sle.
 2. Substitutions: Section 01 60 00 - Product Requirements.
- C. Provide products of each category type by single manufacturer.

2.2 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. Keys: Provide three keys for each accessory to Owner; master key lockable accessories.
- C. Stainless Steel Sheet: ASTM A666/A666M, Type 304.
- D. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.
- E. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
- F. Mirror Glass: Tempered safety glass, ASTM C1048; and ASTM C1036 Type I, Class 1, Quality Q2, with silvering as required.
- G. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.
- H. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.3 FINISHES

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

2.4 COMMERCIAL TOILET ACCESSORIES

- A. Mirrors: 1/4 inch thick tempered safety glass; ASTM C1048 frameless.
1. Manufacture: ASI, Model; 8287
 2. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.
- B. Grab Bars: Stainless steel, smooth surface.
1. Heavy Duty Grab Bars: Floor supports are acceptable if necessary to achieve load rating.
 - a. Push/Pull Point Load: Minimum 1000 pound-force, minimum.

TOILET, BATH, AND LAUNDRY ACCESSORIES

- b. Dimensions: 1-1/2 inch outside diameter, minimum 0.125 inch wall thickness, concealed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
 - c. Length and Configuration: As indicated on drawings.
 - d. Products:
 - 1) American Specialties, Inc; 3800 Series: www.american-specialties.com.
 - 2) Substitutions: Section 01 60 00 - Product Requirements.
- C. Combination Sanitary Napkin/Tampon Dispenser with Disposal: Stainless steel, surface-mounted.
- 1. Door: Seamless 0.05 inch door with returned edges and tumbler lock.
 - 2. Cabinet: Fully welded, 0.03 inch thick sheet.
 - 3. Operation: No charge; no coin slots.
 - 4. Identify dispensers slots without using brand names.
 - 5. Minimum capacity: 15 napkins and 20 tampons.
- D. Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.

2.5 ELECTRIC HAND/HAIR DRYERS

- A. Electric Hand Dryers: Traditional fan-in-case type, with downward fixed nozzle.
- 1. Operation: Automatic, sensor-operated on and off.
 - 2. Controls: Automatic, activated by infrared optical sensor located next to the air outlet. Dryer will operate as long as hands are under the air outlet and has a 35 second lockout feature if hands are not removed. Control includes adjustable sound and speed control mechanism, adjustable heat control with high, medium, low and off settings and a filter sensor which is activated should the filter become clogged. Sensor equipped with externally visible red LED light that flashes error codes to assist in troubleshooting. Control assembly sealed for protection against moisture, lint, dust, and vandalism.
 - 3. Mounting: Wall-mounted - semi-recessed.
 - 4. Cover: Stainless steel with brushed finish.
 - a. Tamper-resistant screw attachment of cover to mounting plate.
 - 5. Air Intake: Inlet opening on bottom of cover.
 - 6. Air Outlet: 19,000 LFM at nozzle and 16,000 LFM at average hand position of 4 inches below air outlet.
 - 7. Combination Motor/Blower: Series commutated, through-flow discharge, vacuum type; 5/8 HP, 20,000 RPM.
 - 8. Prefilter to be provided.
 - 9. Air Temperature: 135 degrees F measure at average hand position of 4 inches below air outlet.
 - 10. Heater: 970 W, minimum, at full power. Nichrome wire element, mounted inside blower housing to be vandal resistant. Heater Safeguard: Automatic resetting thermostat to open when airflow is restricted and close when airflow is resumed.
 - 11. Fan/Heater Control: Field adjustable down to approximately half-speed with corresponding reduction in heat output.
 - 12. Total Wattage: 1450, maximum.
 - 13. Accessories: ADA Compliant Recess Kit, 22 GA 18-8 type 304 stainless steel with #4 satin finish with 16 GA 18-8 type 304 stainless steel dryer mounting plate. All welded construction. 16 3/8 inches wide by 26 inches high by 3 3/8 inches deep.
 - a. Color: Brushed St

PART 3 EXECUTION

3.1 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.
- E. See Section 06 10 00 for installation of blocking, reinforcing plates, and concealed anchors in walls and ceilings.

3.2 PREPARATION

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

3.3 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.

3.4 PROTECTION

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

END OF SECTION

SECTION 10 75 00
FLAGPOLES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum Flagpoles.

1.2 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Concrete base and foundation construction.

1.3 REFERENCE STANDARDS

- A. ASTM A312/A312M - Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes; 2022a.
- B. ASTM B43 - Standard Specification for Seamless Red Brass Pipe, Standard Sizes; 2020.
- C. ASTM B135/B135M - Standard Specification for Seamless Brass Tube; 2017.
- D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- E. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- F. NAAMM FP 1001 - Guide Specifications for Design Loads of Metal Flagpoles; 2007.

1.4 PERFORMANCE REQUIREMENTS

- A. Flagpole With Flag Flying: Resistant without permanent deformation to 90 miles/hr wind velocity; non-resonant, safety design factor of 2.5.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on pole, accessories, and configurations. Submit manufacturer's technical data and standard instructions, including preparation instructions, storage and handling requirements, and installation instructions.
- C. Shop Drawings: Indicate detailed dimensions, base details, jointing, anchor requirements, and imposed loads.
- D. Structural Calculations and Analysis Data: Required to be provided if requested by owner. Detailed calculations performed in accordance with NAAMM FP 1001 are necessary for any alternative proposed flagpole with geometry differing from recommended specifications listed in Part 2.

1.6 QUALITY ASSURANCE

- A. Source: Obtain each flagpole as a complete unit from flagpole manufacturer/authorized dealer, including fittings, accessories, bases, and anchoring devices.

- B. Installer Qualifications: Five years' experience installing flagpoles of similar height and complexity in locale of project. The installer will also be authorized by flagpole manufacturer.
- C. Designer Qualifications: Design flagpole foundation under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State of New York.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. General: Spiral wrap flagpole with protective covering and pack in protective shipping tubes or containers. Store products in manufacturer's unopened packaging until ready for installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Flagpoles:
 - 1. Concord Industries, Inc: www.concordindustries.com/#sle.
 - 2. Pole-Tech Co, Inc: www.polettech.com/#sle.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 FLAGPOLES

- A. Flagpoles: Designed in accordance with NAAMM FP 1001
 - 1. Material: Aluminum.
 - 2. Design: Cone tapered.
 - 3. Mounting: Ground mounted type.
 - 4. Halyard: Internal type, manual winch operation.

2.3 POLE MATERIALS

- A. Aluminum: ASTM B221 (ASTM B 221M), 6063 alloy, T6 temper. To have a tensile strength not less than 30,000 psi with yield point of 25000 psi.
- B. Steel: ASTM A 53/A 53M Type S Grade B.
- C. Stainless Steel: ASTM A312/A312M TP304 grade.
- D. Bronze: ASTM B43 or ASTM B135/B135M, UNS C23000 copper-zinc alloy.
- E. *Preferred origin for flagpole shaft fabrication is United States or European Union.

2.4 ACCESSORIES

- A. Finial Ball: Aluminum, 6 inch diameter.

2.5 FINISHING

- A. Aluminum: Mill finish.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that concrete foundation is ready to receive work and dimensions are as indicated on shop drawings.

3.2 INSTALLATION

- A. Install flagpole , base assembly, and fittings in accordance with manufacturer's instructions.
- B. Test halyard system/flag hoisting mechanism in accordance with Manufacturer's written instructions. Ensure that counterweight, retaining ring, and other components are installed correctly and that the truck assembly rotates properly.

3.3 TOLERANCES

- A. Maximum Variation From Plumb: 1 inch.

3.4 ADJUSTING

- A. Adjust operating devices so that halyard and flag function smoothly.

END OF SECTION

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SECTION 11 66 23
GYMNASIUM EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Basketball backboards accessories.
- B. Wall mounted protection pads.

1.2 RELATED REQUIREMENTS

- A. Section 26 05 83 - Wiring Connections.

1.3 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- B. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).
- C. NFHS (Guide) - Court and Field Diagram Guide; current edition.
- D. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.
- E. International Basketball Federation: FIBA-Official Basketball Rules for Men and Women.
- F. Underwriters Laboratories Inc.: UL - Electrical Construction Equipment Directory.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Large Components: Ensure that large components can be moved into final position without damage to other construction.
- B. Electrically Operated Equipment: Coordinate location and electrical characteristics of service connection.
- C. Preinstallation Meeting: Convene minimum one week prior to commencing work of this section.
- D. Coordination:
 - 1. Coordinate layout of backstops and support framing with the following to avoid interferences:
 - a. HVAC equipment, ductwork, outlets, and inlets.
 - b. Fire suppression system piping and sprinkler heads.
 - c. Lighting.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data showing configuration, sizes, materials, finishes, hardware, and accessories; include:
 - 1. Electrical characteristics and connection locations.
 - 2. Fire rating certifications.

3. Manufacturer's installation instructions.
 4. Colors available.
 5. Submit general construction, component connections and details, wiring diagram and electrical equipment.
- C. Shop Drawings: For custom fabricated equipment indicated, in large scale detail, construction methods; method of attachment or installation; type and gauge of metal, hardware, and fittings; plan front elevation; elevations and dimensions; minimum one cross section; utility requirements as to types, sizes, and locations.
1. Shop drawings and calculations shall be signed and sealed by Professional Engineer, licensed in the State of New York.
- D. Samples: Submit samples of wall pad coverings and roll-up curtain fabrics in manufacturer's available range of colors.
- E. Operating and maintenance data for each operating equipment item.
- F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.6 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.
- B. Operation and Maintenance Data: Include the following:
1. Description of method of operation and motor control system.
 2. Parts catalog with complete list of replacement parts.
 3. Lubrication requirements and frequency, and periodic adjustments required.
 4. Schematic wiring diagrams of installed electrical equipment.
- C. Certificates: Affidavit, signed by the Company field advisor and notarized, certifying that the equipment meets the contract requirements and is operating properly.

1.7 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 work of the type specified with minimum 10 years of experience.
- C. Manufacturer shall be represented by a local agency to provide maintenance and service of specified equipment.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to project site in manufacturer's original packaging with factory original labels attached. Inspect for damage.
- B. Store products indoors and elevated above floor; prevent warping, twisting, or sagging.
- C. Store products in accordance with manufacturer's instructions; protect from extremes of weather, temperature, moisture, and other damage.

1.9 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

1.10 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Gymnasium Equipment:
 - 1. Draper, Inc: www.draperinc.com/#sle.
 - 2. Performance Sports Systems: www.perfsports.com/#sle.
 - 3. Porter Athletic Equipment Company: www.porterathletic.com/#sle.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 GENERAL REQUIREMENTS

- A. See drawings for sizes and locations, unless noted otherwise.
- B. Where mounting dimensions or sizes are not indicated, comply with applicable requirements of the following:
 - 1. NFHS (Guide) - National Federation of State High School Associations sports rules.
- C. Provide mounting plates, brackets, and anchors of sufficient size and strength to securely attach equipment to building structure; comply with requirements of Contract Documents.
- D. Hardware: Heavy duty steel hardware, as recommended by manufacturer.
- E. Structural Steel Fabrications: Welded in accordance with AWS D1.1/D1.1M, using certified welders.

2.3 BASKETBALL

- A. Basketball System Accessories:
 - 1. Porter 821208 LED Perimeter Backboard Lights.
 - a. Provide at perimeter of existing backboards. Tie into shot clock/timing system.
 - b. Mount to existing backstops.

2.4 WALL PADDING

- A. Wall Padding, Type WP-1
 - 1. Surface Burning Characteristics: Flame spread index (FSI) of 25 or less, smoke developed index (SDI) of 450 or less, Class A, when tested in accordance with ASTM E84 as a complete panel.
 - 2. Flammability: Comply with NFPA 286.
 - 3. Covering: Vinyl Laminated Nylon Material, mildew and rot resistant; stapled to back of board.
 - a. Cover material shall have a certificate of flame resistance from the State of California (registered fabric No. F-140). The cover material shall be non-tear vinyl with a rip resistant quality utilizing industrial polyester filament yarn.
 - b. Color: As selected from manufacturer's full range..
 - c. Texture: Embossed leather-look.
 - d. Custom Graphics: To be supplied by Owner.
 - e. Fabric Weight: 14 oz/sq yd, minimum.
 - 4. Foam, Fire-Rated: Open cell polychloroprene (Neoprene), with 5.5 pcf nominal density.
 - 5. Foam Thickness: 1-1/2 inches.
 - 6. Backing Board: Oriented strand board.
 - a. Thickness: 7/16 inch, minimum.
 - 7. Panel Dimensions: 24 inches wide by 72 inches long, including nailing/fastening margins.

8. Door Mounting: Permanent; using screws. Provide grommets to reinforce screw locations. Applied to doors as indicated on drawings.
9. Wall Mounting: Removable; Z-clips fixed to wall and to padding.
10. Manufacturers:
 - a. Draper, Inc: www.draperinc.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Take field measurements to ensure proper fitting of work. If taking field measurements before fabrication will delay work, allow for adjustments within recommended tolerances.
- B. Inspect areas and conditions before installation, and notify Architect in writing of unsatisfactory or detrimental conditions.
- C. Do not proceed with this work until conditions have been corrected; commencing installation constitutes acceptance of work site conditions.
- D. Verify that electrical services are correctly located and have proper characteristics.
- E. Verify building structural frame and wall surfaces are ready to receive equipment.
- F. Verify finishing operations, including painting, are complete before installing equipment.

3.2 INSTALLATION

- A. Install in accordance with contract documents approved shop drawings and manufacturer's instructions.
- B. Coordinate installation of inserts and anchors that must be built in to flooring or subflooring.
- C. Install equipment rigid, straight, plumb, and level.
- D. Secure equipment with manufacturer's recommended anchoring devices.
- E. Install wall padding securely, with edges tight to wall and without wrinkles in fabric covering.
- F. Separate dissimilar metals to prevent electrolytic corrosion.
- G. Coordinate installation schedule with the schedules of other trades to ensure orderly and timely progress of the total work.
- H. Assemble components furnished loose for field assembly.
- I. Touch up damaged finishes to match shop finish.

3.3 ADJUSTING

- A. Verify proper placement of equipment.
- B. Verify proper placement of equipment anchors and sleeves, and use actual movable equipment to be anchored if available.
- C. Adjust operating equipment for proper operation; remove and replace equipment causing noise or vibration; lubricate equipment as recommended by manufacturer.
- D. Adjust limit switches to prevent damage to equipment.

3.4 CLEANING

- A. Remove masking or protective covering from finished surfaces.
- B. Clean equipment in accordance with manufacturer's recommendations.

3.5 PROTECTION

- A. Protect installed products until Date of Substantial Completion.
- B. Replace damaged products before Date of Substantial Completion.

END OF SECTION

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SECTION 12 36 00
COUNTERTOPS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Countertops for manufactured casework.
- B. Wall-hung counters and vanity tops.

1.2 RELATED REQUIREMENTS

- A. Section 06 41 00 - Architectural Wood Casework.
- B. Section 08 51 13 - Aluminum Windows: Solid surface sills.
- C. Section 22 40 00 - Plumbing Fixtures: Sinks.

1.3 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. See Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
- B. Pre-installation Meeting: Convene a pre-installation meeting one week before starting work of this section; require attendance by all affected installers.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Specimen warranty.
- C. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.
- D. Installation Instructions: Manufacturer's installation instructions and recommendations.
- E. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Natural Stone Institute (NSI) Accredited Natural Stone Fabricator; www.naturalstoneinstitute.org/#sle.
- B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.8 FIELD CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.1 COUNTERTOPS

- A. Stainless Steel Countertops: ASTM A666/A666M, Type 304, stainless steel sheet; 14 gage, .0781 inch nominal sheet thickness.
 - 1. Finish: 4B satin brushed finish.
 - 2. Exposed Edge Shape: Bullnose with return; 5/8 inch radius, return to face of case; reinforced with hardwood or steel.
 - 3. Back and End Splashes: Same material; welded 1/4 inch radius coved joint to countertop; square top edge with 1 inch wide top surface and minimum 1/2 inch turndown.
 - 4. Splash Dimensions: 4 inch high by 1 inch thick, unless otherwise indicated.
 - 5. Sinks: Same material, same thickness; flush welded to counter; bottom sloped to outlet; radiused interior corners; drain outlet located in back corner.

2.2 MATERIALS

- A. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

2.3 ACCESSORIES

- A. Steel Fixed Countertop Support Brackets:
 - 1. Material: Steel; ASTM A36/A36M.
 - 2. Finish: Manufacturer's standard, factory-applied, textured powder coat.
 - 3. Color: Black.
 - 4. Products:
 - a. Top-Mounted: Standard Bracket.
 - b. Face Mounted: Front Mounting Bracket.
 - 5. Manufacturer:
 - a. Centerline Brackets: www.countertopbracket.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

2.4 FABRICATION

- A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
 - 1. Join lengths of tops using best method recommended by manufacturer.
 - 2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
 - 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

- B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
 - 1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
 - 2. Height: 4 inches, unless otherwise indicated.
- C. Stainless Steel: Fabricate tops up to 144 inches long in one piece including nosings and back and end splashes; accurately fitted mechanical field joints in lengths over that dimension are permitted.
 - 1. Weld joints; grind smooth and polish to match.
 - 2. Provide stainless steel hat channel stiffeners, welded or soldered to underside, where indicated on drawings.
 - 3. Provide stainless steel grommets for openings, where indicated on drawings.
 - 4. Provide wall clips for support of back/end splash turn downs.
 - 5. Sound Deadening: Apply water resistant, fire resistant sound deadening mastic to entire bottom surface.
 - 6. Integral sinks: Fabricate with corners rounded and coved, double-walls for sink compartment partitions, and drainboards. Factory-punch holes for fittings, and weld sinks to countertops.
- D. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings, finished to match.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Provide solid wood blocking at all walls and countertops connected to brackets.

3.3 INSTALLATION

- A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- B. Attach stainless steel countertops using stainless steel fasteners and clips.
- C. Seal joint between back/end splashes and vertical surfaces.

3.4 TOLERANCES

- A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.
- B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.

COUNTERTOPS

- C. Field Joints: 1/8 inch wide, maximum.

3.5 CLEANING

3.6 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