SECTION 00 01 07 - SEALS PAGE

ARCHITECTURAL

I hereby certify this plan, specification, or report was prepared by myself or under my direct supervision and I am a duly Registered Architect under the laws of the State of Michigan.

_____

Date _____ Registration No. _____

CIVIL

I hereby certify this plan, specification, or report was prepared by myself or under my direct supervision and I am a duly Registered Engineer under the laws of the State of Michigan.

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STRUCTURAL

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PROJECT MANUAL

WAYNE COUNTY COMMUNITY COLLEGE DISTRICT

MARY ELLEN STEMPFLE UNIVERSITY CENTER BUILDING ADDITION & RENOVATION

19305 VERNIER RD
HARPER WOODS, MI 48225

Issued For

REVIEW
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SECTION 02 41 19 - SELECTIVE DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Selective demolition of building elements for alteration purposes.

1.2 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: Limitations on Contractor's use of site and premises.

B. Section 01 50 00 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

C. Section 01 74 19 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.

1.3 DEFINITIONS

A. Demolition (Demo): 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 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

1.6 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Company specializing in the type of work required.
   1. Minimum of five years of documented experience.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.1 DEMOLITION

A. Remove portions of existing buildings as indicated on Drawings.

B. Remove paving and curbs required to accomplish new work.

C. Within area of new construction, remove existing foundation elements completely.

D. Outside area of new construction, remove foundation walls and footings to minimum 2 feet below finished grade.

E. Remove other items as specifically indicated on Drawings.

F. Remove items specifically indicated for salvage, relocation, and recycling.

G. Fill excavations, open pits, and holes in ground areas generated as result of removals, using compacted fill as specified.

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. 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.
   5. Provide, erect, and maintain temporary barriers and security devices.

6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
8. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
9. 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.
10. 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 existing elements to be salvaged or relocated have been removed.

C. 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.

D. 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.

E. 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.

F. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.3 EXISTING UTILITIES

A. Protect existing utilities to remain from damage.

B. Do not disrupt public utilities without permit from authority having jurisdiction.

C. 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.

D. 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.

E. 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.

F. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

G. 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, erect, and maintain temporary dustproof partitions of construction.

C. Maintain weatherproof exterior building enclosure, except for interruptions required for replacement or modifications; prevent water and humidity damage.

D. Maintain building security; take care to prevent unauthorized entry.

E. Remove existing work as indicated and required to accomplish new work.
   1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction indicated.
   2. Remove items indicated on Drawings.
   3. Core Drilling: Core drill slabs as required to install new items as detailed on Drawings. If required based on existing slab conditions, employ methods of detecting existing tensioned and un-tensioned reinforcing, and other embedded items, so as not to damage existing facilities and equipment.
   4. Powder-Actuated Fasteners and Post-installed Anchors: Verify existing slab conditions employing methods of detection specified for core drilling; locate fasteners and anchors to avoid structural damage to existing slabs and existing tensioned reinforcing.

F. 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.

G. 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.

3.5 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Remove from site all materials not to be reused on site; do not burn or bury.

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 02 41 19

SECTION 04 20 00 - UNIT MASONRY

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Concrete block.

B. Clay facing brick veneer.

C. Mortar and grout.

D. Reinforcement and anchorage.

E. Flashings.

F. Lintels.

G. Accessories.

1.2 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications: Loose steel lintels.

B. Section 07 62 00 - Sheet Metal Flashing and Trim: Through-wall masonry flashings.

C. Section 07 92 00 - Joint Sealants: Sealing control and expansion joints.

1.3 REFERENCE STANDARDS

A. ACI 315 - Details and Detailing of Concrete Reinforcement.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

C. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2023a.

D. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

E. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2022.

F. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2023.

G. ASTM C91/C91M - Standard Specification for Masonry Cement; 2023.

H. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2018.

I. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.

J. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2018.

K. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale); 2023.

L. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.

M. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2024.

N. ASTM C476 - Standard Specification for Grout for Masonry; 2023.

O. ASTM C780 - Standard Test Methods for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2023.

P. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2016.

Q. ASTM C1714/C1714M - Standard Specification for Preblended Dry Mortar Mix for Unit Masonry; 2019a.

R. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2017 (Reapproved 2023).

S. BIA Technical Notes No. 28B - Brick Veneer/Cold-Formed Steel Framed Walls; 2025.

T. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2017.

U. BIA Technical Notes No. 13 - Ceramic Glazed Brick Exterior Walls; 2017.

V. BIA Technical Notes No. 46 - Maintenance of Brick Masonry; 2017.

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

X. UL (FRD) - Fire Resistance Directory; Current Edition.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate placement of backing and substrates specified under other Sections for attachment of anchors.

B. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers.
   1. Require attendance by Contractor, Superintendent, all relevant installers, and parties directly affecting the work of this Section.
   2. Review locations of control joints and expansion joints.
   3. Review materials, 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 for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.

C. Shop Drawings: Submit drawings indicating steel reinforcing in compliance with ACI 315.
   1. Indicate bar sizes, spacing, locations, and quantities of reinforcing steel, bending and cutting schedules, and supporting and spacing devices.

D. Samples: Submit two samples of facing brick and pigmented mortar units to illustrate color, texture, and extremes of color range.

E. Samples: Submit samples of all masonry accessories.

F. Manufacturer's Certificates: Certify that masonry units meet or exceed specified requirements.
   1. Include material test reports substantiating compliance with requirements.
   2. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
   3. For exposed brick, include test report for efflorescence according to ASTM C 67.
   4. For masonry units, include data and calculations establishing average net-area compressive strength of units.

G. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
   1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C109 for compressive strength, ASTM C1506 for water retention, and ASTM C91 for air content.
   2. Include test reports, according to ASTM C 1019 for grout mixes required to comply with compressive strength requirement.

H. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.

I. Cold and Hot Weather Procedures: Detailed descriptions of methods, materials, and equipment to be used to comply with requirements.

J. Manufacturer's Qualification Statement.

K. Installer's Qualification Statement.

L. Masonry Material Cleaning Plan: Include products and techniques for each masonry product of assembly and combined masonry assembly. Submit signed and approved by Masonry Unit Manufacturers.

1.6 QUALITY ASSURANCE

A. Conform to TMS 402/602 for masonry inspection and testing requirements.

B. 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.

C. Fire Rated Assemblies: Comply with applicable code for specified requirements for fire rated masonry construction.

D. Designer Qualifications: Perform design under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

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

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

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

B. Store materials on elevated platforms, under cover, and in a dry location. Do not install damp materials.

1.8 FIELD CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
   1. Extend cover a minimum of 24 inches down both sides of walls and hold securely in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after constructing masonry walls or columns.

C. Hot- and Cold-Weather Requirements: Comply with construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer to design wide cavity wall veneer masonry anchors.
   1. Where total cavity dimension exceeds the prescriptive limits, or when other requirements of TMS 402 Section 6.2.2 are not met, veneer anchor(s) shall be designed by a Delegated Design Engineer using the provisions of TMS 402-11, Section 6.2.1. Veneer anchors shall be designed to resist appropriate combinations of loads including but not limited to dead, wind and seismic as indicated in the project documents or in keeping with ASCE 7-10.

2.2 CONCRETE MASONRY UNITS (CMU)

A. 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 the Drawings for specific locations.
   2. Special Shapes: Provide nonstandard blocks configured for corners, lintels, headers, control joint edges, and other detailed conditions.
      a. Provide bullnose units for outside corners.
      b. Provide special shapes for lintels, corners, jambs, sashes, movement joints, bond beams, and other special conditions indicated on drawings.
   3. Load-Bearing Units: ASTM C90, normal weight.
      a. Hollow block.
      b. Unit Compressive Strength: 2,000 psi, average net area, minimum.
      c. Fire Ratings: Fire rated concrete masonry units shall be in compliance when the masonry has been certified through the equivalent thickness method contained in Chapter 3 of ACI 216.1 for concrete masonry and Chapter 5 for effects of finish materials.

2.3 BRICK UNITS

A. Facing Brick: ASTM C216, Type FBS Smooth, Grade SW.
   1. Non-efflorescing when tested in accordance with ASTM C67.
   2. Color and Texture: Match existing brick at the Center for Learning Technology building.
   3. Nominal Size: Match existing brick at the Center for Learning Technology building.
   4. Special Shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.

a. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide 100 percent solid units without cores or frogs and with exposed surfaces finished.
b. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

5. Provide brick units from single runs and factory blended for specified color range.

2.4 MORTAR AND GROUT MATERIALS

A. Masonry Cement: ASTM C91/C91M.
1. Colored Mortar: Premixed cement as required to match existing.

B. Mortar Cement: ASTM C1329.
1. Colored Mortar: Premixed cement as required to match existing.

C. Portland Cement: ASTM C150/C150M, Type I or Type II, except Type III may be used for cold-weather construction; color as required to produce approved color sample.
1. Not more than 0.60 percent alkali.

D. Hydrated Lime: ASTM C207, Type S.

E. Mortar Aggregate: ASTM C144.

F. Grout Aggregate: ASTM C404.

G. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
1. Color(s): As selected by Architect from manufacturer's full range.
2. Acceptable Manufacturers:
a. Davis Colors, a division of Venator Materials PLC: www.daviscolors.com/#sle.
b. Lambert Corporation: www.lambertusa.com/#sle.
c. Solomon Colors, Inc: www.solomoncolors.com/#sle.
d. Substitutions: See Section 01 60 00 - Product Requirements.

H. Water: Clean and potable.

I. Admixtures: Not permitted unless specified, or requested by Contractor in writing and approved in writing by Architect.

J. 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.
1. Color: Mineral pigments added as required to produce approved color sample.

K. 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.

1. Type: Fine.

2.5 REINFORCEMENT AND ANCHORAGE

A. Acceptable Manufacturers:
   1. Blok-Lok Limited: www.blok-lok.com.
   2. Hohmann & Barnard, Inc.: www.h-b.com/sle.
   3. WIRE-BONDwww.wirebond.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Wide Cavity Veneer Anchors: For cavity spaces exceeding the allowable limits of TMS 402, provide engineered (delegated design) wide cavity wall adjustable veneer anchors.

C. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi), deformed billet bars; uncoated.

D. Adjustable Multiple Wythe Joint Reinforcement: ASTM A951/A951M.
   1. Type: Ladder, with adjustable eye and pintle ties spaced at 16 in on center.
   2. Material: As required for single wythe reinforcement.
   3. Size: 0.1483 inch side rods with 0.1483 inch cross rods and adjustable components of 0.1875 inchwire, 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.

E. Ties and Anchors, General: Provide hot dip galvanized ties and anchors as specified, except use Type 304 stainless steel ties and anchors in swimming pool, seating area, locker room, checmical storage rooms, and rooms subject to high humidity and wetting.

F. Flexible Anchors for Connecting to Structure: 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 triangle wire ties 0.1875 inch thick, hot dip galvanized to ASTM A153/A153M Class B.
   2. 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 A153/A153M Class B.

G. Masonry Veneer Anchors - CMU Back-Up with Continuous Insulation: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A153/A153M, Class B.
   1. Anchor Plates: Not less than 0.075 inch thick, designed for fastening to structural backup.
   2. Vertical Adjustment: Not less than 1-1/4 inches.
   3. Acceptable Products:
      a. Hohmann & Barnard; HB-5213.
      b. Blok Lok; BL-407 with insulation washers.
      c. Wirebond; 2407 with insulation washers.
      d. Wirebond RJ-711.

e. Substitutions: See Section 01 6000 - Product Requirements.

H. Anchors and Other Components in Contact with Stone: Stainless steel, ASTM A666, Type 304.
1. Sizes and Configurations: As required for vertical and horizontal support of stone and applicable loads.

I. Setting Buttons and Shims: Plastic type.

2.6 FLASHINGS

A. Metal Flashing Materials: Stainless Steel, as specified in Section 07 62 00.

B. Combination Non-Asphaltic Flashing Materials - Stainless Steel:
1. Stainless Steel Flashing - Self-adhering: ASTM A240/A240M; 2 mil type 304 stainless steel sheet with 8 mil of butyl adhesive and a removable release liner.
a. Acceptable Manufacturers:
1) STS Coatings, Inc; Wall Guardian Self Adhering Stainless Steel Flashing: www.stscoatings.com/#sle.
2) VaproShield, LLC; VAPRO-SS FLASHING: www.vaproshield.com/#sle.
3) WIRE-BOND: www.wirebond.com/#sle.
4) York Manufacturing, Inc; York 304 SA: www.yorkmfg.com/#sle.
5) Hohmann & Barnard, Inc.; Mighty-Flash SA Stainless Flashing: www.h-b.com.
6) Substitutions: See Section 01 60 00 - Product Requirements.

C. Membrane Asphaltic Flashing Materials:
1. Rubberized Asphalt Flashing: Self-adhering polymer modified asphalt sheet; 40 mils (0.040 inch) minimum total thickness; 8 mil cross-laminated polyethylene bonded to adhesive rubberized asphalt, with a removable release liner.
a. Acceptable Manufacturers:
1) Advanced Building Products, Inc; Strip-N-Flash: www.advancedbuildingproducts.com/#sle.
2) Heckmann Building Products, Inc: www.heckmannbuildingprods.com/#sle
3) WIRE-BOND; Aqua Flash 500: www.wirebond.com/#sle.
4) York Manufacturing, Inc; York Seal: www.yorkmfg.com/#sle.
5) Air barrier manufacturer's recommended product.
6) Substitutions: See Section 01 60 00 - Product Requirements.

D. Flashing Sealant/Adhesives: Non-curing butyl, silicone, polyurethane, or silyl-terminated polyether/polyurethane or other type required or recommended by flashing manufacturer; type adhesively and chemically compatible with type of flashing used.

E. Termination Bars: Stainless steel; compatible with membrane and adhesives. Provide flanged type for continuous sealant along top edge.

F. Drip Edge: Stainless steel; angled or flat drip with hemmed edge; compatible with membrane and adhesives.
   1. Type: Unless otherwise indicated, extend drip edge at least 3 inches horizontally into masonry and 3/4 inch out from exterior face of masonry with outer edge bent down 45 degrees and hemmed.
   2. Type at Grade Adjacent to Walking Surfaces: Extend flat hemmed drip edge at least 3 inches horizontally into masonry with outer edge hemmed and flush with face of masonry. Metal should be continuously visible after joints are tooled.
   3. Sealant Between Layers of Sheet Metal: One-part, non-skinning butyl sealant.

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

2.7 ACCESSORIES

A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.

B. Joint Filler: Closed cell neoprene or urethane; oversized 50 percent to joint width; self expanding; in maximum lengths available.
   1. Complying with ASTM D 1056, Grade 2A1.
   2. Acceptable Manufacturers:
      a. Hohmann & Barnard, Inc.: www.h-b.com/sle.
      b. WIRE-BOND: www.wirebond.com/#sle.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

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. Mortar Diverter: Semi-rigid mesh designed for installation at flashing locations.
      a. Acceptable Manufacturers:
         1) Advanced Building Products Inc.; Mortar Break DT: www.advancedbuildingproducts.com/sle.
         2) Mortar Net Solutions; MortarNet: www.mortarnet.com/#sle.
         3) York Manufacturing, Inc; Weep-Net: www.yorkmfg.com/#sle.
         4) Hohmann & Barnard, Inc.; Mortar Trap: www.h-b.com.
         5) Substitutions: See Section 01 60 00 - Product Requirements.

D. Building Paper: ASTM D226/D226M, Type I ("No.15") asphalt felt.

E. Weeps and Cavity Vents: Molded PVC grilles, insect resistant.
   1. Width: Match specified mortar joint thickness.
   2. Color(s): As selected by Architect from manufacturer's full range.
   3. Acceptable Manufacturers:

a. Advanced Building Products, Inc; Mortar Maze Cell Vent: www.advancedbuildingproducts.com/#sle.
b. Blok-Lok Limited; CELLVENT: www.blok-lok.com/#sle.
c. Hohmann & Barnard, Inc.; QV Quadro-Vent: www.h-b.com.
d. Mortar Net Solutions; CellVent: www.mortarnet.com/#sle.
e. WIRE-BOND; Cell Vent: www.wirebond.com/#sle.
f. Substitutions: See Section 01 60 00 - Product Requirements.

F. Sealants: Types required by flashing manufacturer to suit indicated installation and service conditions.

G. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.8 LINTELS

A. Steel Lintels: Specified in Section 05 50 00.

B. Concrete Lintels: ASTM C 1623, matching CMU in density classification; and with reinforcing bars indicated or required to support loads indicated. Provide lintels with net-area compressive strength not less than that of CMU.
1. Concrete lintels may be used where lintel is not exposed to view.

C. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMU matching adjacent CMU in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Cure lintels before handling and installing. Temporarily support build-in-place lintels until cured.
1. Use masonry lintels in concrete masonry unit walls where lintel is exposed, and as specified in Structural Drawings.

2.9 MORTAR AND GROUT MIXING

A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
1. Masonry Below Grade in Contact With Earth: Type M.
2. Exterior Loadbearing Masonry: Type S.
3. Exterior Non-loadbearing Masonry: Type S.
4. Masonry Veneers: Type N
5. Interior Loadbearing Masonry: Type S.
6. Interior Non-loadbearing Masonry: Type N.

B. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

C. Admixtures: Add to mixture at manufacturer's recommended rate and in accordance with manufacturer's instructions; mix uniformly.

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. 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. Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

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.
   2. Coursing: One unit and one mortar joint to equal 8 inches.
   3. Mortar Joints: Concave unless otherwise required for work in other Sections.

D. Brick Units:
   1. Bond, Coursing and Mortar Joints: Match Exiating

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. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.

F. Interlock intersections and external corners.

G. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

H. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

I. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.

J. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.

K. 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 maximum 24 inches on center horizontally above through-wall flashing, above shelf angles and lintels, at bottom of walls, and at rowlock/belt courses where indicated.

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 accommodate accessories.

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.

3.8 REINFORCEMENT AND ANCHORAGE - GENERAL

A. Unless otherwise indicated on Drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Place continuous joint reinforcement in first and second joint below top of walls.

D. Place continuous reinforcement around corners.

E. Embed longitudinal wires of joint reinforcement in mortar joint with at least 5/8 inch mortar cover on each side.

F. Lap joint reinforcement ends minimum 12 inches.

G. Reinforce stack bonded unit joint corners and intersections with strap anchors 16 inches on center.

H. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on Drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 16 inches horizontally and 16 inches vertically.

I. Embed ties and anchors in mortar joint and extend into masonry unit a minimum of 1-1/2 inches with at least 5/8 inch mortar cover to the outside face of the anchor.

3.9 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

A. At concrete masonry veneers, install horizontal joint reinforcement 16 inches on center and in compliance with NCMA TEK 10-04.

B. At horizontal changes betwen clay and cementitious masonry (CMU, concrete brick, cast stone, etc.), provide horizontal joint reinforcement complying with NCMA TEK 05-02A, unless otherwise detailed with bond break material, slip plane, or thru-wall flashing.

C. Secure veneer anchors to back-up substrates and embed into masonry veneer at maximum 16 inches on center vertically and 24 inches on center horizontally.

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 and extending minimum 6 inches above top of cavity drainage material:
   1. Install vertical leg of flashing over air and water-resistive barriers per manufacturer’s directions.
   2. Anchor vertical leg of flashing into backing with a termination bar and continout sealant along top edge.

C. Install flashing in accordance with manufacturer's instructions and BIA Technical Notes No. 7.

D. Extend plastic flashings to within 3/4 inch of exterior face of masonry and adhere to top of stainless steel drip edge.

E. Lap end joints of flexible flashings at least 6 inches, minimum, and seal watertight.

F. Where dowels, reinforcing bars and fastening devices penetrate flashing, seal penetration with sealing compound.

3.11 LINTELS

A. Install loose steel lintels over openings where indicated.

B. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.
   1. Reinforced Lintels: Place reinforcing as indicated on Drawings.

C. Maintain minimum 8 inch bearing on each side of opening.

3.12 GROUTED COMPONENTS

A. Reinforce bond beams as indicated on Drawings.

B. Grout solid all hollow concrete unit masonry located below grade, at bond beams, and at other locations indicated.

C. At bearing locations, fill masonry cores with grout for a minimum 8 inches both sides of opening unless otherwise indicated in drawings.

3.13 CONTROL AND EXPANSION JOINTS

A. Size control joints as indicated on Drawings; if not shown, 3/8 inch wide.

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. If control joint locations are not indicated on drawings, locate control joints in CMU walls complying with the NCMA TEK note recommendations and at wall height changes; within ten feet of corners; at wall thickness changes; at bond beam breaks; at abutments of columns and walls; at abutment of cold garages to warm basements or walls; at openings in walls such as doors and windows; and at intervals in continuous walls not exceeding 20 feet in length, unless more restrictive spacing is recommended in the NCMA TEK notes.

E. Locate expansion joints in masonry veneers as indicated on drawings and in compliance with the Brick Industry Association Technical Notes.
   1. If expansion joints are not indicated on drawings, request Architect clarification.

3.14 BUILT-IN WORK

A. As work progresses, install built-in metal door frames, fabricated metal frames, anchor bolts, and plates 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. Install masonry within the site tolerances found in TMS 402/602.

B. Maximum Variation from Alignment of Columns: 1/4 inch.

C. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.

D. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.

E. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

F. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

G. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/8 inch, plus 1/8 inch.

H. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.16 CUTTING AND FITTING

A. Cut and fit for chases, pipes, conduit, sleeves, and grounds. 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. See Structural Drawings for additional requirements.

B. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C140/C140M for conformance to requirements of this specification.

C. Mortar Tests: Test each type of mortar in accordance with ASTM C780, testing with same frequency as masonry samples.

3.18 CLEANING

A. Remove excess mortar and mortar droppings.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with specified cleaning solution, at low pressure or by hand methods only; do not introduce excessive moisture into masonry wall surfaces during cleaning operations.

D. Use non-metallic tools and stiff brushes 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.
   1. Install required protection of installed work at the end of each work day.

END OF SECTION 04 20 00

SECTION 05 50 00 - METAL FABRICATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Shop fabricated steel items, including:
   1. Loose steel lintels.

1.2 RELATED REQUIREMENTS

A. Section 04 20 00 - Unit Masonry: Placement of metal fabrications in masonry.

B. Section 04 26 13 - Masonry Veneer: Placement of metal fabrications in masonry.

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

D. Section 09 91 23 - Interior 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; 2024.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

D. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2024.

E. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

F. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.

G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

H. 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.

I. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

J. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).

K. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019.

L. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

M. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
   2. Coordinate installation of anchorages and steel weld plates and angles for casting into concrete. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.5 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.
   2. Provide Shop Drawings for the following:
      a. All miscellaneous steel applications.

C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

1.6 QUALITY ASSURANCE

A. Designer Qualifications: Design indicated fabrication items under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

B. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer registered in the project State to design metal fabrications complying with performance requirements and design criteria indicated.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
   1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 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. Slotted Channel Framing: ASTM A653/A653M, Grade 33.

F. Slotted Channel Fittings: ASTM A1011/A1011M.

G. Fasteners: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls. Select for type, grade, and class required.
   1. Provide stainless-steel fasteners for fastening stainless steel.
   2. Dissimilar Metals: Type 304 stainless-steel fasteners.
   3. Uncoated Steel Components: Plated-steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating where concealed; Type 304 stainless-steel fasteners where exposed.

H. Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.

I. Bolts and Nuts (Weathering Conditions): Regular hexagon-head bolts, ASTM A 325, Type 3; with hex nuts, ASTM A 563, Grade C3; and, where indicated, flat washers.

J. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.
   1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

K. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.

L. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized.

M. Post-Installed Anchors: Torque-controlled expansion anchors.
   1. Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.
   2. Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

N. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

O. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
   1. Basis of Design Product: Subject to the requirements provide Sherwin-Williams Alkyd Universal Metal Primer, Kem Kromik B-50 Series or a comparable approved product of one of the following:
      a. AkzoNobel; International Paints/Devoe Coatings.
      b. Benjamin Moore & Co.
      c. PPG Architectural Finishes, Inc.

P. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type II - Organic, complying with VOC limitations of authorities having jurisdiction.
   1. Basis of Design Product: ZRC Galvilite Galvanizing Repair Compound cold galvanizing compound of 95% metallic zinc or a comparable product of an approved manufacturer.

Q. Epoxy Zinc-Rich Primer: Compatible with topcoat.
   1. Basis of Design Product: Subject to the requirements provide Sherwin-Williams Zinc Clad IV or a comparable approved product of one of the following:
      a. AkzoNobel; International Paints/Devoe Coatings.
      b. Benjamin Moore & Co.
      c. PPG Architectural Finishes, Inc.

R. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

S. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.3 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. Form exposed work with accurate angles and surfaces and straight edges.

D. Continuously seal joined members by continuous welds.
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

E. 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.

F. Provide for thermal expansion/contraction of exterior metal railings and similar linear fabrications exceeding 30 feet in running length; and not closer than 24 inches from corners and intersections.

G. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

H. Furnish components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

I. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

J. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

2.4 FABRICATED ITEMS

A. Provide and install items shown on Drawings with anchorage and attachments necessary for installation. The following is a list of principal items only. Refer to Drawing details for items not specifically scheduled.

B. Lintels: As detailed; galvanized finish.
   1. Paint finish as specified in Section 09 91 13 - Exterior Painting for exterior steel.

C. Slotted Channel Framing: Fabricate channels and fittings from structural steel complying with the referenced standards; factory-applied, polyester powder-coat finish.

D. Embed Plates: Fabricate embed plates for casting into concrete, and masonry construction as detailed on Drawings. Weld anchors to plates to provide full transfer of design loads and stresses. Test embed plate assemblies prior to installation under provisions of Section 05 12 00 and Structural Drawings.

2.5 FINISHES - STEEL

A. Unless otherwise recommended by finish coating manufacturer, prepare surfaces to be shop primed in accordance with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning" for exterior items and items indicated to receive zinc-rich primer. For other items, prepare to SSPC-SP 3, "Power Tool Cleaning."

B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

C. Prime paint all steel items, unless otherwise specified.
   1. Exceptions: Galvanize items to be embedded in concrete, items to be embedded in masonry, and miscellaneous framing and supports on exterior of building.
   2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.

D. Prime Painting: One coat.
   1. Shop prime with universal shop primer unless zinc-rich primer is indicated.
   2. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

E. Galvanizing of Specified Items: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.

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. 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 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, except surfaces to be in contact with concrete.

3.4 TOLERANCES

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

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION 05 50 00

SECTION 05 51 33 - METAL LADDERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Shop-fabricated metal ladders.

1.2 RELATED REQUIREMENTS

A. Section 07 72 00 - Roof Accessories: Roof access through roof hatch.

B. Section 09 91 23 - Interior Painting: Paint finish.

1.3 REFERENCE STANDARDS

A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008 (Reaffirmed 2018).

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

C. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

D. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).

E. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

F. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).

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.

1.5 QUALITY ASSURANCE

A. Design ladders under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

PART 2 PRODUCTS

2.1 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M.

B. Mechanical Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.

C. Bolts, Nuts, and Washers: ASTM A307, plain.

D. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

E. Shop and Touch-Up Primer: SSPC-Paint 15, 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. 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.

D. 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 FABRICATED LADDERS

A. Roof Access Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish.
   1. Side Rails: 3/8 by 2 inches, minimum, members spaced at 20 inches.
   2. Rungs: One inch diameter solid round bar spaced 12 inches on center.
   3. Space rungs 7 inches from wall surface.
   4. Weight Capacity:
      a. Rungs shall be capable of supporting a load of 300 pounds applied at the center.
      b. Ladder assembly shall support two loads of 250 pounds each applied between any two consecutive connectors.

2.4 FINISHES - STEEL

A. Prime paint steel items.

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.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 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 05 51 33

SECTION 05 52 13 - PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Wall mounted handrails.

B. Free-standing railings at steps or ramps.

C. Structural design of railing systems.

1.2 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Placement of anchors in concrete.

B. Section 04 20 00 - Unit Masonry: Placement of anchors in masonry.

C. Section 09 22 16 - Non-Structural Metal Framing: Placement of backing plates in stud wall construction.

D. Section 09 91 23 - Interior Painting: Paint finish.

1.3 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. AISC 207 - Standard for Certification Programs; 2025.

C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.

D. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.

E. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 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 - National Ornamental & Miscellaneous Metals Association; www.nomma.org.

I. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

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. Samples: Submit two, 12 inch long samples of handrail. Submit two samples of elbow, wall bracket, and end stop.

D. Designer's Qualification Statement.

E. Fabricator's Qualification Statement.

F. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

1.5 QUALITY ASSURANCE

A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.

B. Welder Qualifications: Show certification of welders employed on the Work, verifying AWS qualification within the previous 12 months.

C. Fabricator Qualifications:
   1. A qualified steel fabricator that is certified by the American Institute for Steel Construction (AISC) under AISC 207.
   2. A company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect mechanical finishes on exposed surfaces from damage.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 PRODUCTS

2.1 RAILINGS - GENERAL REQUIREMENTS

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.

C. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 50 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 E935.

D. 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 E935.

E. Allow for expansion and contraction of members and building movement without damage to connections or members.

F. Dimensions: See Drawings for configurations and heights.
   1. Grip Rails: 1-1/2 inches nominal diameter, round, unless otherwise indicated in Drawings.
   2. Posts: 2 inches diameter, round.
   3. Balusters: 1 inch round pipe ol.

G. 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 concrete, provide inserts to be cast into concrete, for bolting anchors.
   2. For anchorage to masonry, provide brackets to be embedded in masonry, for bolting anchors.
   3. For anchorage to stud walls, provide backing plates, for bolting anchors.

H. 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.

I. Interconnect members by butt-welding, with coped joints and flush radiused bends, wall returns at ends of wall mounted rails, and closed ends.
   1. Provide expansion joints at maximum 75 feet on center, or as recommended by fabricator for indicated conditions.

2.2 STEEL RAILING SYSTEM

A. Steel Tube: ASTM A500/A500M Grade B cold-formed structural tubing.

B. Steel Pipe: ASTM A53/A53M Grade B Schedule 40, black finish.

C. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.

D. Straight Splice Connectors: Steel concealed spigots.

E. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction and compatible with paints specified to be used over it.

2.3 MISCELLANEOUS MATERIALS

A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107 and specifically recommended by manufacturer for exterior applications.

2.4 FASTENERS

A. General: Provide the following:
   1. Steel Railings (uncoated): Plated steel fasteners complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5 for zinc coating.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
   1. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.
   2. Material for Exterior Locations and Where Stainless Steel is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

2.5 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.

D. Welded Joints:
   1. Carbon Steel: Perform welding in accordance with AWS D1.1/D1.1M.

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.
    a. Comply with NOMMA voluntary guidelines for joint finishes; Finish #2 - completely sanded joint, some undercutting and pinholes acceptable.

E. Changes in Direction: Form by bending or by inserting prefabricated elbow fittings.
1. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

F. Close exposed ends of railing members with prefabricated end fittings.

2.6 STEEL AND IRON FINISHES

A. For nongalvanized-steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors to be embedded in exterior concrete or masonry.

B. Preparing Nongalvanized Items for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

C. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.
1. Shop prime uncoated interior railings with primer compatible with paint systems specified in Section 09 91 23 - Interior Painting.

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 ATTACHING RAILINGS

A. Attach railings to wall with wall brackets. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

B. Provide brackets with 1-1/2-inch clearance from inside face of handrail and finished wall surface.

C. Secure wall brackets to building construction as follows:
   1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
   2. For hollow masonry anchorage, use toggle bolts.
   3. For steel-framed partitions, use self-tapping screws fastened to steel framing or to concealed steel reinforcements.

3.5 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

3.6 CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

3.7 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

3.8 SCHEDULE

A. Interior Railings: Shop primed and field painted per Section 09 91 23 - Interior Painting.

END OF SECTION 05 52 13

SECTION 06 10 53 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Roofing nailers.

B. Preservative treated wood materials.

C. Concealed wood blocking, nailers, and supports.

D. Miscellaneous wood nailers, furring, and grounds.

1.2 RELATED REQUIREMENTS

A. Section 04 20 00 - Unit Masonry: Assembly receiving blocking.

B. Section 09 22 16 - Non-Structural Metal Framing: Framing receiving wood blocking.

1.3 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

B. AWPA U1 - Use Category System: User Specification for Treated Wood; 2023.

C. PS 20 - American Softwood Lumber Standard; 2021.

1.4 SUBMITTALS

A. Product Data: Provide technical data on 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.

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 (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 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Sizes: Nominal sizes as indicated on drawings, S4S.

B. Moisture Content: S-dry or MC19.

C. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No.2 or Standard Grade.
   2. Boards: Standard or No.3.

2.3 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

2.4 FACTORY WOOD TREATMENT

A. Treated Lumber: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Preservative Treatment:
   1. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A.
      a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
      b. Treat lumber in contact with roofing or flashing.
      c. Treat lumber in contact with masonry or concrete.

d. Treat lumber less than 18 inches above grade.

PART 3 EXECUTION

3.1 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.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.2 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. Grab bars.
3. Chalkboards and marker boards.

3.3 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

3.4 CLEANING

A. Waste 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 06 10 53

SECTION 06 20 00 - FINISH CARPENTRY

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Window stools.

B. Hardware and attachment accessories.

1.2 RELATED REQUIREMENTS

A. Section 06 10 53 - Miscellaneous Rough Carpentry: Concealed blocking

1.3 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

B. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.

C. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.4 SUBMITTALS

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

B. Product Data:
   1. Provide data for each type of product and finish.
   2. Provide instructions for attachment hardware and finish hardware.

C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
   1. Scale of Drawings: 1-1/2 inch to 1 foot, minimum.

D. Samples: Submit two samples of each type of veneer and finish material, 4 x 4 inch in size illustrating wood grain and specified finish.

E. Samples: Submit two samples of each type of solid surfacing material 12 inch long.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver factory-fabricated units to project site in original packages, containers or bundles bearing brand name and identification.

B. Store finish carpentry items under cover, elevated above grade, and in a dry, well-ventilated area not exposed to heat or sunlight.

C. Store finish carpentry items in installation areas. If finsh carpentry items must be stored in other than installation areas, store only where environmental conditions meet requirements specified for installation areas.

D. Stack lumber and provide for adequate air circulation within and around stacks and under temporary coverings.

E. Protect from moisture damage.

F. Handle materials and products to prevent damage to edges, ends, or surfaces.

1.6 FIELD CONDITIONS

A. Comply with specified standard and as additionally specified.

B. Do not deliver finish carpentry items until environmental conditions meet specified requirements for installation areas.

C. Do not deliver or install finish carpentry items until building is enclosed and weatherproof, wet work in installation areas is complete and nominally dry, and building's environmental control systems are operating and will maintain temperature and relative humidity at designed occupancy levels throughout the remainder of the construction period.

D. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 PRODUCTS

2.1 FINISH CARPENTRY ITEMS

A. Interior Woodwork Items:
   1. Window Stools: Solid surface material.

2.2 SOLID SURFACE MATERIALS

A. Solid Surfacing Window Stools: Solid surfacing sheet or plastic resin casting over continuous substrate.
   1. Flat Sheet Thickness: 1/2 inch, minimum.
   2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
      a. Acceptable Manufacturers:
         1) Dupont: www.corian.com.
         2) Formica Corporation: www.formica.com.
         3) Wilsonart: www.wilsonart.com/#sle.
         4) Substitutions: See Section 01 60 00 - Product Requirements.
   3. Fabricate in accordance with manufacturer's standard requirements.
   4. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
   5. Color and Pattern: As indicated on drawings.

2.3 FASTENINGS

A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.

2.4 HARDWARE

A. Countertop and Workstation Brackets:
   1. Material: Steel.
   2. Load Capacity Per Bracket: 450 pounds.
   3. Finish: Manufacturer's standard, factory-applied powder coat.
   4. Color: Selected by Architect from manufacturer's standard range.
   5. Products:
      a. Rangine Corporation; Rakks EH-Inside Wall Mount - Counter Support Brackets; www.rakks.com.
      b. Rangine Corporation; Rakks EH-Surface Wall Mount - Counter Support Brackets; www.rakks.com.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

2.5 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.

B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Support Bracket Coordination:
   1. Coordinate provision of support brackets with design and fabrication of countertops and shelves to be supported to ensure compatibility of dimensions and load capacity.
   2. Coordinate requirements for stud spacing, blocking, and auxiliary structural supports to ensure adequate means for installation and anchorage of support brackets.
   3. Coordinate installation of support brackets with application of gypsum board finish specified in 09 29 00 - Gypsum Board. Ensure that brackets are delivered to site and installed in a timely manner to allow for vertical bracket leg to be concealed by gypsum board.

C. See Section 06 10 53 for installation of wood blocking.

3.2 INSTALLATION

A. Set and secure materials and components in place, plumb and level.

B. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

C. Install solid surface window stools with wall adhesive by gun application.

D. Install finish carpentry items with minimum number of joints practical, using full length pieces from maximum lengths of lumber available. Do not use individual pieces less than 24 inches long, except where necessary.
   1. Stagger joints in adjacent and related standing and running trim.
   2. Cope at returns and miter at corners to produce tight-fitting joints with full surface contact throughout the length of joints.
   3. Use scarf joints at end-to-end joints.
   4. Plane back surfaces of casings as required to provide uniform thickness and flush finished surfaces across joints.
   5. Match color and grain across joints.

E. Install trim after finishing of substrate surfaces is complete.

3.3 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

3.4 PROTECTION

A. Protect installed finish carpentry items from damage due to subsequent construction operations.

END OF SECTION 06 20 00

SECTION 06 40 00 - ARCHITECTURAL WOODWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Specially fabricated cabinet and architectural woodwork units.

B. Hardware.

C. Preparation for installing utilities.

1.2 RELATED REQUIREMENTS

A. Section 06 10 53 - Miscellaneous Rough Carpentry: Concealed blocking.

B. Section 09 22 16 - Non-Structural Metal Framing: Support framing.

C. Section 12 36 00 - Countertops.

1.3 REFERENCE STANDARDS

A. AWI (QCP) - Quality Certification Program; Current Edition.

B. BHMA A156.9 - Cabinet Hardware; 2020.

C. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate fabrication schedule with construction progress to avoid delaying the Work.
   1. Field verify critical dimensions and clearances prior to fabrication of woodwork items; assure that field conditions are as required to comply with indicated design requirements.
   2. By accurate field measurements before being enclosed, verify locations of concealed framing, blocking, reinforcements, and furring that support woodwork; record measurements on shop drawings.
   3. Where field measurements cannot be made without delaying work, establish required dimensions and maintain those dimensions for fabrication of woodwork.
   4. Coordinate construction to ensure that actual dimensions correspond to established required dimensions.
   5. Coordinate cabinet spacing and clearances to ensure that doors and drawers do not conflict with each other.

6. Coordinate cabinet opening and spacing requirements with approved appliances and plumbing fixtures.

B. Preinstallation Meeting: Convene a preinstallation meeting not less than 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. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
1. Scale of Drawings: 1-1/2 inch to 1 foot, minimum.
2. Provide the information required by AWI/AWMAC/WI (AWS).
3. Shop drawings are required to be generated as separate digital drawings specific to this Project, not utilizing Architect's digital drawing files in any manner.
4. Show all adjacent construction including abutting walls, columns and similar elements affecting woodwork installation.
5. Include certification program label.

C. Product Data: Provide data for hardware accessories.

D. Samples: Submit actual samples of architectural woodwork construction, minimum 12 inches square, illustrating each proposed cabinet and woodwork substrate and finish.

E. Samples: Submit actual sample items of proposed pulls, hinges, locksets, and all other hardware, demonstrating hardware design, quality, and finish.

F. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five 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. Comply with AWI (QCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section: www.awiqcp.org/#sle.
2. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) requirements for grade or grades specified.

3. Provide designated labels on shop drawings as required by certification program.
4. Provide designated labels on installed products as required by certification program.
5. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.
6. Replace, repair, or rework all work for which certification is refused.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver woodwork items to installation areas only after clean, well ventilated, and temperature-controlled installation areas are available. Do not deliver woodwork items to installation areas until painting and similar operations are complete in those areas.

B. Protect units from moisture and impact damage during transit, delivery, and storage; use protective covers during delivery, storage, and handling operations.

1.8 FIELD CONDITIONS

A. During and after installation of woodwork, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Single Source Responsibility: Provide and install this work from single fabricator.

2.2 CABINETS

A. Quality Standard: Grades as indicated, in accordance with AWI/AWMAC/WI (AWS), unless noted otherwise.

B. Plastic Laminate Faced Cabinets:
1. Aesthetic Grade: Custom Grade.
2. Performance Grade: Duty Level 2 - Commercial.
3. Edges of Plastic-Laminate Shelves: PVC edge banding, 0.12 inch thick, matching laminate in color, pattern, and finish.

C. Cabinets:
1. Finish - Exposed Exterior Surfaces: Decorative laminate.

2. Finish - Exposed Interior Surfaces: Decorative laminate.
3. Door and Drawer Front Edge Profiles: Square edge with thin applied band.
4. Door and Drawer Front Retention Profiles: Fixed panel.
5. Casework Construction Type: Type A - Frameless.
6. Interface Style for Cabinet and Door: Style 1 - Overlay; flush overlay.
7. Layout for Cabinet and Door Fronts: Flush panel.
8. Adjustable Shelf Loading: 50 lbs. per sq. ft.
    a. Deflection: L/144.

2.3 WOOD-BASED COMPONENTS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
    1. Wood Moisture Content: 8 to 13 percent.

B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
    1. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.

C. Wood fabricated from old growth timber is not permitted.

2.4 LAMINATE MATERIALS

A. Acceptable Manufacturers:
    1. As indicated in Drawings.

B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.

C. Provide specific types as follows:
    1. Horizontal Surfaces: HGS, 0.048 inch nominal thickness, through color, colors as indicated, finish as indicated.
    2. Vertical Surfaces: VGS, 0.028 inch nominal thickness, through color, colors as indicated, finish as indicated.
    3. Post-Formed Horizontal Surfaces: HGP, 0.039 inch nominal thickness, through color, colors as indicated, finish as indicated.
    4. Post-Formed Vertical Surfaces: VGP, 0.028 inch nominal thickness, through color, colors as indicated, finish as indicated.
    5. Cabinet Liner: CLS, 0.020 inch nominal thickness, through color, colors as indicated, finish as indicated.
    6. Laminate Backer: BKL, 0.020 inch nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.

2.5 COUNTERTOPS

A. Countertops are specified in Section 12 36 00.

2.6 ACCESSORIES

A. Adhesive: Type recommended by AWI/AWMAC to suit application.

B. Edge Banding: Cap exposed edges with material of same finish and pattern.

C. Fasteners: Size and type to suit application.

D. 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.

E. Concealed Joint Fasteners: Threaded steel.

F. Grommets: Standard plastic or rubber grommets for cut-outs, in color to match adjacent surface.

2.7 HARDWARE

A. Hardware: BHMA A156.9, types as indicated for quality grade specified, unless otherwise specified.

B. Adjustable Shelf Supports: Standard side-mounted system using multiple holes for pin supports and coordinated self rests, polished chrome finish, for nominal 1 inch spacing adjustments.

C. Drawer and Door Pulls: As selected by Architect.

D. Drawer Slides:
   1. Type: Full extension.
   2. Static Load Capacity: Commercial grade.
   3. Mounting: Side mounted.
   4. Stops: Integral type.
   5. Finish: Selected from manufacturer's standard line.
   6. Features: Provide self-closing/stay-closed/soft-close type.
   7. Acceptable Manufacturers:
      a. Accuride International, Inc.: www.accuride.com.
      b. Grass America Inc: www.grassusa.com/#sle.
      c. Hettich America, LP: www.hettich.com/sle.
      d. Knape & Vogt Manufacturing Company: www.knapeandvogt.com/#sle.
      e. Substitutions: See Section 01 60 00 - Product Requirements.

E. Hinges: European style concealed, self-closing type, steel with satin finish.

1. Provide self-closing/stay-closed/soft-close type.
2. At 90 degree inside corner conditions, provide restriction clips to limit the opening of cabinet doors to no more than 86 degrees to prevent damage to adjacent surfaces.
3. Acceptable Manufacturers:
   a. Grass America Inc.: www.grassusa.com.
   b. Hardware Resources: www.hardwareresources.com/#sle.
   c. Hettich America, LP: www.hettich.com/sle.
   d. Blum, Inc.: www.blum.com.
   e. Substitutions: See Section 01 60 00 - Product Requirements.

2.8 FABRICATION

A. Assembly: Shop assemble woodwork for delivery to site in units easily handled and to permit passage through building openings.

B. Edging: Fit shelves, doors, and exposed edges with specified edging. 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. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners.

E. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify critical clearances and dimensions prior to installation of woodwork items.

3.2 INSTALLATION

A. Install work in accordance with AWI/AWMAC/WI (AWS) requirements for grade indicated.

B. Set and secure cabinetswoodwork 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.

E. Carefully scribe woodwork abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.

F. Secure cabinets and woodwork to floor using appropriate angles and anchorages.

G. Secure full height cabinets, shelving units, and similar casework items exceeding 60 inches in height to floor using appropriate angles and anchorages.

H. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.3 ADJUSTING

A. Adjust installed work.

B. Adjust moving or operating parts to function smoothly and correctly.

3.4 CLEANING

A. Clean woodwork, casework, counters, shelves, hardware, fittings, and fixtures.

3.5 PROTECTION

A. Protect installed cabinets from damage due to subsequent construction operations.

END OF SECTION 06 40 00

SECTION 06 42 00 - WOOD PANELING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Wood veneer panels.

1.2 SUBMITTALS

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

B. Product Data: Provide data on fire-retardant treatment materials and application instructions.

C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.

D. Samples: Submit two samples of finished panels, 12 x 12 inch in size, illustrating wood grain and specified finish.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Protect work from moisture damage.

B. Do not deliver wood materials to project site until building is fully enclosed and interior temperature and humidity are in accordance with recommendations of AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).

PART 2 PRODUCTS

2.1 PANELING

A. Paneling:
   1. Veneer Species: Maple.
   2. Cut: Plain sawn.
      a. Factory Finish: Wood stain as selected, clear sealer top coat.
   3. Panels: Veneer of full width .
   4. Visible Edges and Reveals: Filled and painted.
   5. Outside Corners: Mitered and splined.
   6. Basis of Design Product:
      a. Rulon International; Flat Panel; https://rulonco.com/products/flat-panels/..

2.2 WOOD-BASED MATERIALS - GENERAL

A. Wood-Based Materials:
   1. Solid Wood: Clear, dry, sound, plain sawn, selected for species, grain and color, no defects.
   2. Composite Wood Panels: Containing no urea-formaldehyde resin binders.

B. Accessories: Manufacturer's standard accessories for installation method indicated.

2.3 WOOD-TREATMENT PROCESSES

A. Fire-Retardant Treatment (FR-S Type) for Lumber: Chemically treated and pressure impregnated; capable of providing flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84.

2.4 FABRICATION

A. Shop fabricate wood panel components to the greatest extent possible.

B. Prepare panels for delivery to site, permitting passage through building openings.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as indicated on shop drawings.

B. Verify adequacy of backing and support framing.

C. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.2 INSTALLATION

A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Do not begin installation until wood materials have been fully acclimated to interior conditions.

C. Set and secure materials and components in place, plumb and level, using concealed fasteners wherever possible.

D. Where necessary to cut and fit on site, scribe work abutting other components. Do not use additional overlay trim to conceal gaps.

E. Set exposed fasteners, fill with wood filler, and finish to match panel finish.

F. Touch up damaged finish to match original, using materials provided by fabricator; replace components that cannot be refinished like new.

3.3 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION 06 42 00

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 09 91 23 - Interior Painting: Paint finish.

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.

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. Acceptable Manufacturers:
   1. Fire Wall Signs, Inc.: www.firewallsigns.com.
   2. Safety Supply Warehouse, Inc.: www.safetysupplywarehouse.com.
   3. SmartSign: www.smartsign.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 FIRE AND SMOKE ASSEMBLY IDENTIFICATION

A. Either adhered or applied (painted) identification signage may be used at Contractor's option.

B. Regulatory Requirements: Where there is an accessible concealed floor, floor-ceiling or attic space, fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations, comply with "Marking and Identification" requirements of "Fire-Resistance Ratings and Fire Tests" chapter of ICC (IBC), and, minimally the following:
   1. Within accessible concealed spaces, locate identification signage within 15 feet of the end of each wall and at intervals not exceeding 30 feet measured horizontally along the wall or partition.
   2. Include lettering not less than 3 inches in height with a minimum 3/8-inch stroke in a contrasting color incorporating the suggested wording, “FIRE AND/OR SMOKE BARRIER—PROTECT ALL OPENINGS,” or other similar wording.

C. Adhered Fire and Smoke Assembly Identification Signs: Printed vinyl sign with factory applied adhesive backing.

D. Applied Fire and Smoke Assembly Identification: Identification markings applied to partition with paint and a code compliant stencil. See Section 09 91 23 for products.

E. Languages: Provide all markings in English.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

A. See Section 09 91 23 for substrate preparation for painted markings.

3.3 INSTALLATION

A. Locate markings as required by the adopted building code and authorities having jurisdiction.

B. Install adhered markings in accordance with manufacturer's instructions.

C. Install applied markings in accordance with Section 09 91 23.

D. Install neatly, with horizontal edges level.

E. Protect from damage until Date of Substantial Completion; repair or replace damaged markings.

END OF SECTION 07 05 53

SECTION 07 21 00 - THERMAL INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Board insulation at perimeter foundation wall and interior side of exterior walls.

B. Batt insulation in exterior wall and ceiling construction.

C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.2 RELATED REQUIREMENTS

A. Section 09 22 16 - Non-Structural Metal Framing: Furring retainingg foam board insulation.

1.3 REFERENCE STANDARDS

A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.

B. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2023.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

D. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 Degrees C; 2024.

E. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2023.

1.4 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. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

1.5 QUALITY ASSURANCE

A. Thicknesses specified are for the thermal conductivity (k-value at 75 degrees F) specified for each material. Provide adjusted thicknesses for approved use of substituted materials with different thermal conductivity ratings. Where insulation is specified to have a specific "R" value, furnish manufacturer's standard thickness required to equal or exceed the specified value.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not allow insulation materials to become wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage, and protection during installation.

B. Protect plastic insulation from exposure to direct sunlight.

C. Do not deliver plastic insulation materials to the project site ahead of time of installation. Protect at all times against ignition. Complete the installation and concealment of plastic materials as soon as possible in each area of work.

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 at Perimeter of Foundation: Extruded polystyrene (XPS) board.

B. Insulation on Inside of Masonry Exterior Walls: Extruded polystyrene (XPS) board.

2.2 INSULATION MATERIALS

A. Where units are included in fire rated wall, ceiling, or floor construction, provide insulation units which have been tested and rated as required for the indicated assembly.

2.3 FOAM BOARD INSULATION MATERIALS

A. Extruded Polystyrene (XPS) Board Insulation: Comply with ASTM C578 with either natural skin or cut cell surfaces.
   1. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.
   2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   3. Type and Thermal Resistance, R-value: Type IV, 5.0 (0.88), minimum, per 1 inch thickness at 75 degrees F mean temperature.

4. Complies with fire resistance requirements specified as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
5. Board Thickness: As indicated on Drawings and equal support furring depth.
6. Board Edges: Square.
7. Water Absorption for Insulation Materials in Ground Contact: Type IV, 0.3 percent by volume, maximum, by total immersion, when tested in accordance with ASTM C272.
8. Acceptable Manufacturers:
    a. Dow Chemical Company; STYROFOAM Extruded Polystyrene Insulation (XPS): www.dow.com/#sle.
    b. Kingspan Insulation LLC; GreenGuard GG25-LG XPS Insulation Board: www.kingspan.com/#sle.
    c. Owens Corning Corporation; FOAMULAR Extruded Polystyrene (XPS) Insulation: www.ocbuildingspec.com/#sle.
    d. Substitutions: See Section 01 60 00 - Product Requirements.

2.4 BATT INSULATION MATERIALS

A. Flexible Glass Fiber Blanket Thermal Insulation: Preformed insulation, complying with ASTM C665; friction fit.
1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
2. Smoke Developed Index: 50 or less, when tested in accordance with ASTM E84.
3. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
4. Thermal Resistance: As indicated in Drawings.
5. Facing: Provide unfaced.
6. Acceptable Manufacturers:
    a. CertainTeed Corporation: www.certainteed.com/#sle.
    b. Johns Manville: www.jm.com/#sle.
    c. Owens Corning Corporation: www.ocbuildingspec.com/#sle.

B. Mineral Wool Blanket Thermal Insulation: Flexible or semi-rigid preformed insulation, complying with ASTM C665.
1. Complies with fire-resistance requirements shown on the Drawings as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
2. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
3. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
4. Acceptable Manufacturers:
    a. Johns Manville; SAFB: www.jm.com/#sle.
    b. ROCKWOOL; COMFORTBATT: www.rockwool.com/#sle.
    c. Thermafiber, Inc.; SAFB: www.thermafiber.com/#sle.

2.5 ACCESSORIES

A. Insulation Fasteners: Appropriate for purpose intendedand approved by insulation manufacturer.
   1. Length as required for thickness of insulation material and penetration of structural backing or framing as indicated, with metal or plastic washers.
   2. Acceptable Manufacturers:
      a. Hilti: www.hilti.com.
      b. Trufast: www.trufast.com.
      c. McMaster-Carr: www.mcmaster.com.

B. Sprayed Polyurethane Foam Sealant for Miscellaneous Voids: 1- or 2-component, closed cell, foamed-in-place, polyurethane foam sealant, 1.5 to 2.0 lb/cu. ft density; flame spread index of 25 or less when tested per ASTM E 84; with primer and noncorrosive substrate cleaner recommended by foam sealant manufacturer.

C. Adhesive: Type recommended by insulation manufacturer for indicated applications.

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, or irregularities.

3.2 INSTALLATION, GENERAL

A. Install insulation to maintain continuity of thermal protection to building elements and spaces.

3.3 BOARD INSTALLATION AT FOUNDATION PERIMETER

A. Install boards as indicated on foundation perimeter.
   1. Place boards to maximize adhesive contact.
   2. Install in running bond pattern.
   3. Butt edges and ends tightly to adjacent boards and to protrusions.

B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

C. Immediately following application of board insulation, place protective boards over exposed insulation surfaces.
   1. Install boards horizontally from base of foundation to top of insulation.
   2. Butt boards tightly, with joints staggered from insulation joints.

3.4 BOARD INSTALLATION AT EXTERIOR WALLS

A. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.5 BATT INSULATION INSTALLATION

A. Installation - General:
   1. Install insulation and vapor retarder at locations indicated and in accordance with manufacturer's instructions.
   2. Install in exterior wall, ceiling, and micellaneous wall and ceiling cavity spaces without gaps or voids. Do not compress insulation.
   3. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
   4. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
   5. Keep insulation minimum 3 inches from heat emitting devices such as recessed light fixtures, and minimum 2 inches from sidewalls of chimneys and vents.

3.6 PROTECTION

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

END OF SECTION 07 21 00

SECTION 07 27 26 - FLUID-APPLIED AIR BARRIERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fluid-applied air barriers.

1.2 RELATED REQUIREMENTS

A. Section 06 16 00 - Sheathing: Substrates requiring prep for air barrier installation.

1.3 DEFINITIONS

A. Air Barrier: Airtight barrier made of material that is virtually air impermeable with water vapor permeance as specified, having sealed seams and sealed joints to adjacent surfaces.

1.4 REFERENCE STANDARDS

A. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).

B. ASTM D751 - Standard Test Methods for Coated Fabrics; 2019.

C. ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds; 1998 (Reapproved 2017).

D. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2021.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

F. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.

G. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.

H. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2023.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the installation with adjacent flashings and weather barriers for compatibility and continuity of those systems.
   2. Coordinate installation of flashings at openings with Sections that specify window, door, and other opening installations.
   3. Do not install air barrier material before the roof assembly has been sufficiently installed to prevent a buildup of water in the interior of the building.

B. Preinstallation Meeting: Conduct a preinstallation meeting at least two weeks prior to the start of the work of this Section.
   1. Agenda shall include quality standards set by approved mock-up, sequence of construction, coordination with substrate preparation, air barrier materials approved for use, compatibility of materials, coordination with installation of adjacent and covering materials, and details of construction.
   2. Attendance is required by Contractor, Architect, Installer, and representatives of related trades including covering materials, substrate materials and adjacent materials.

1.6 SUBMITTALS

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

B. Product Data: Provide data on material characteristics, performance criteria, limitations, and manufacturer's standard flashing and termination details.

C. Shop Drawings: Provide drawings of project-specific flashing, termination, and special joint conditions based on manufacturer's standard details; minimum scale 1-1/2 inch equals 1 foot.
   1. Show extent of air barrier assemblies and details of all typical conditions, intersections with other envelope assemblies and materials, membrane counter-flashings, and details showing how gaps in the construction will be bridged, how inside and outside corners are negotiated, how materials that cover the materials are secured with air-tight condition maintained, and how miscellaneous penetrations such as conduits, pipes, electric boxes and similar items are sealed.

D. Compatibility: Submit letter from primary material manufacturer stating that materials proposed for use are permanently chemically compatible and adhesively compatible with adjacent materials proposed for use.

E. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.

1.7 QUALITY ASSURANCE

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

B. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture, and use secondary materials approved in writing by primary material manufacturer.

C. System Compatibility: Assume responsibility for confirming that weather barrier system components are compatible with each other as as system, and also compatible with substrate surfaces with which they will be in contact, including but not limited to wall and sheathing surfaces, opening materials, other flashings and weather barrier materials, and joint sealants.
   1. Assure that system components are compatible as specified prior to preparing and making specified submittals.
   2. Assume responsibility for removal of incompatible system components and installation of properly compatible components at no additional cost to Owner regardless of when incompatibility is discovered.

D. Basis of Design: Specifications are based on primary systems by specified basis of design manufacturer. Primary systems manufactured by other acceptable manufacturers are permitted, subject to compliance with specified requirements; and provided that deviations in design, weight, and performance are minor, and do not detract substantially from the indicated design intent.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Handle materials in accordance with material manufacturer’s recommendations.

1.9 FIELD CONDITIONS

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

B. Do not install air barrier in snow, rain, fog, or mist. Do not install air barrier when the temperature of substrate surfaces and surrounding air temperatures are below those recommended by the manufacturer.

1.10 WARRANTY

A. Material Warranty: Provide material manufacturer’s standard product warranty, for a minimum five years from date of Substantial Completion.

B. Installation Warranty: Provide a two (2) year installation warranty from date of Substantial Completion, including all accessories and materials of the air barrier assembly, against failures including loss of air tight seal, loss of watertight seal, loss of attachment, loss of adhesion and failure to cure properly.

PART 2 PRODUCTS

2.1 AIR BARRIER MATERIALS (AIR IMPERMEABLE AND WATER VAPOR IMPERMEABLE)

A. Fluid Applied Air and Vapor Barrier:
   1. Dry Film Thickness (DFT): As recommended by manufacturer for each substrate, having a minimum thickness of 25 mil, 0.025 inch.
   2. Air Permeance: 0.004 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
   3. Water Vapor Permeance: 0.1 perm, maximum, when tested in accordance with ASTM E96/E96M using Procedure A - Desiccant Method, at 73.4 degrees F.
   4. Water Penetration Resistance Around Nails: Pass, when tested in accordance with ASTM D1970/D1970M.
   5. Ultraviolet (UV) and Weathering Resistance: Approved in writing by manufacturer for up to 90 days of weather exposure.
   6. Elongation: 250 percent, minimum, when tested in accordance with ASTM D412.
   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. Complies with NFPA 285 requirements for wall assembly.
   9. Seam and Perimeter Tape: As recommended by sheet manufacturer.
   10. Acceptable Products:
      a. Carlisle Coatings and Waterproofing, Inc; Fire Resist Barritech NP: www.carlisleccw.com/#sle.
      b. GCP Applied Technologies; Perm-A-Barrier NPL 10: www.gcpat.com/#sle.
      c. Henry Company; Air-Bloc 16MR: www.henry.com.
      d. Polyglass; VertiWrap NPL: www.polyglass.com.
      e. Tremco Commercial Sealants & Waterproofing; ExoAir 130: www.tremcosealants.com/#sle.
      f. W.R. Meadows, Inc.; Air-Shield LSR: www.wrmeadows.com.
      g. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 ACCESSORIES

A. Sealants, Tapes, and Accessories for Sealing Air Barrier and Adjacent Substrates: As indicated or in compliance with air barrier manufacturer's installation instructions, and as required for a complete and air-tight installation.
   1. All accessory materials shall have air and water vapor permeance performance matching that of the primary air barrier system.

B. Sealant for Cracks and Joints In Substrates: Resilient elastomeric joint sealant compatible with substrate and air barrier materials.
   1. Application: Apply at 30 to 40 mil, 0.030 to 0.040 inch, nominal thickness.
   2. Elongation: 400 percent, minimum, measured in accordance with ASTM D412.
   3. Peel Adhesion: 28 lb/inch, minimum, when tested in accordance with ASTM D903.

4. Hydrostatic Head Pressure: Resists head pressure of 57 feet, maximum, when tested in accordance with ASTM D751.
5. Comply with NFPA 285 requirements for wall assembly.

C. Primer: As recommended by primary air barrier membrane manufacturer.

D. Flexible Flashing: Self-adhesive sheet flashing complying with ASTM D1970/D1970M, except slip resistance requirement waived if not installed on roof.
1. Thickness: 40 mil, 0.040 inch, nominal; exception from ASTM D1970/D1970M.
2. Width: 4 inches, minimum.
3. Water Vapor Permeance: Matching that of primary air barrier, when tested in accordance with ASTM E96/E96M Procedure A (Desiccant Method) at 73.4 degrees F.

E. Preformed Transition Membrane: Semirigid silicone or polyester composition, tapered edges, tear resistant.
1. Products:
   a. Dow; DOWSIL Silicone Transition Strip and System: www.dow.com/#sle.
   b. Henry Company; Moistop Corner Shield: www.henry.com/#sle.
   c. Momentive Performance Materials, Inc/GE Silicones; RF100 Reinforcing Fabric: www.siliconeforbuilding.com/#sle.
   d. Tremco Commercial Sealants & Waterproofing; ProGlaze ETA System 1: www.tremcosealants.com/#sle.
   e. Substitutions: See Section 01 60 00 - Product Requirements.

F. Stainless Steel Flashing: Flexible flashing with 2 mil, 0.002 inch thick Type 304 stainless steel sheet, 8 mil, 0.008 inch of butyl adhesive and siliconized release liner.
1. Width: 6 inches wide, minimum.
2. Overlap joints at least 2 inches.
3. Products:
   a. Hohmann & Barnard, Inc.; Mighty-Flash SA Stainless Flashing: www.h-b.com.
   b. Momentive Performance Materials, Inc/GE Silicones; GE Elemax SS Flashing: www.siliconeforbuilding.com/#sle.
   c. STS Coatings, Inc; Wall Guardian Self Adhering Stainless Steel Flashing: www.stscoatings.com/#sle.
   d. VaproShield, LLC; VAPRO-SS FLASHING: www.vaproshield.com/#sle.
   e. York Manufacturing, Inc; York 304 SA: www.yorkmfg.com/#sle.
   f. Substitutions: See Section 01 60 00 - Product Requirements.

G. Liquid Flashing: One part, fast curing, nonsag, elastomeric, gun grade, trowelable.

H. Thinners and Cleaners: As recommended by material manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that surfaces and conditions are ready for work of this section.

B. Ensure that the following conditions are met:
   1. Surfaces are sound, dry, even, and free of excess mortar or other contaminants.
   2. Inspect substrates to be smooth without large voids or sharp protrusions.

C. Verify substrate is visibly dry and free of moisture.

D. Verify sealants are compatible with membrane proposed for use.

E. Where existing conditions are responsibility of another installer, notify Architect of unsatisfactory conditions.

F. Do not proceed with this work until unsatisfactory conditions have been corrected.

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, sealants, and air barrier materials in accordance with manufacturer's installation instructions.

C. Protection from spray-applied materials:
   1. Mask and cover adjacent areas to protect from over-spray.
   2. Ensure any required foam stop or back up materials are in place to prevent over-spray and achieve complete seal.

3.3 INSTALLATION

A. Install materials in accordance with manufacturer's installation instructions.

B. Air Barriers: Install continuous airtight barrier over exterior face of CMU, with sealed seams and with sealed joints to adjacent surfaces.

C. Apply sealants and adhesives within recommended temperature range in accordance with manufacturer's installation instructions.

D. Refer to air barrier manufacturer's detail drawings for installation procedures including:
   1. Changes in substrate.
   2. Control joints.
   3. Crack treatments.

4. Inside and outside corners.
5. Penetrations.
6. Rough openings.
7. Sheathing joints.

3.4 PROTECTION

A. Protect air barrier materials from damage during installation and the remainder of the construction period, according to material manufacturer's written instructions.

B. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION 07 27 26

SECTION 07 42 13 - METAL WALL PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Manufactured metal panels for exterior wall panels , with insulation, related flashings, and accessory components.

1.2 RELATED REQUIREMENTS

A. Section 05 40 00 - Cold-Formed Metal Framing: Wall and soffit panel substrate.

B. Section 07 92 00 - Joint Sealants: Sealing joints between metal wall panel system and adjacent construction.

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. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

C. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2023.

1.4 SUBMITTALS

A. Product Data - Wall System: Manufacturer's data sheets on each product to be used, including:
   1. Physical characteristics of components shown on shop drawings.
   2. Storage and handling requirements and recommendations.
   3. Installation instructions and recommendations.

B. Shop Drawings: Indicate dimensions, layout, joints, construction details, support clips, _____, and methods of anchorage.

C. Samples: Submit two samples of wall panel and soffit panel, full width by 12 inches in length illustrating finish color, sheen, and texture.

D. Installer's qualification statement.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in installing products specified in this section with minimum three years of documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.

B. Store prefinished material off the ground and protected from weather; prevent twisting, bending, or abrasion; provide ventilation; slope metal sheets to ensure proper drainage.

C. Prevent contact with materials that may cause discoloration or staining of products.

1.7 WARRANTY

A. Finish Warranty: Provide 20-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 warrantor.

PART 2 PRODUCTS

2.1 METAL WALL PANEL SYSTEM

A. Wall Panel System: Factory fabricated prefinished metal panel system, site assembled.
   1. Provide exterior wall panels matching the Center for Learning Technology building.
   2. Design and size components to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of wall.
   3. Design Pressure: In accordance with applicable codes.
   4. Maximum Allowable Deflection of Panel: L/180 for length(L) of span.
   5. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.
   6. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
   7. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.
   8. Corners: Factory-fabricated in one continuous piece with minimum 2-inch returns.

B. Exterior Wall Panels:
   1. Profile, Side Seams and Panel Width: Matching the Center for Learning Technology building.

C. Soffit Panels:

1. Profile: Matching the Center for Learning Technology building.

D. Internal and External Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; shop cut and factory mitered to required angles.

E. Trim: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

F. Anchors: Galvanized steel.

2.2 MATERIALS

A. Precoated Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, Structural Steel (SS) or Forming Steel (FS), with G90/Z275 coating; continuous coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.

B. Precoated Steel Sheet: Aluminum-zinc alloy-coated steel sheet, ASTM A792/A792M, Commercial Steel (CS)) or Forming Steel (FS), with AZ50/AZM150 coating; continuous-coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.

2.3 FINISHES

A. Exposed Surface Finish: Panel manufacturer's standard polyvinylidene fluoride (PVDF) coating, top coat over epoxy primer.

B. Panel Backside Finish: Panel manufacturer's standard siliconized polyester wash coat.

C. Fluoropolymer Coil Coating System: Polyvinylidene fluoride (PVDF) multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent PVDF resin, and at least 80 percent of coil coated metal surfaces having minimum total dry film thickness (DFT) of 0.9 mil, 0.0009 inch; color and gloss as selected by Architect from manufacturer’s standard line.

2.4 ACCESSORIES

A. Gaskets: Manufacturer's standard type suitable for use with system, permanently resilient; ultraviolet and ozone resistant.

B. Concealed Sealants: Non-curing butyl sealant or tape sealant, see Section 07 92 00

C. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.

D. Fasteners: Manufacturer's standard type to suit application; with soft neoprene washers, steel, hot dip galvanized. Fastener cap same color as exterior panel.
1. Metal-to-Metal Fasteners: Self-drilling, self-tapping screws.

E. Field Touch-up Paint: As recommended by panel manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that building framing members are ready to receive panels.

3.2 INSTALLATION

A. Install panels on walls in accordance with manufacturer's instructions.

B. Fasten panels to structural supports; aligned, level, and plumb.

C. Locate joints over supports.

D. Use concealed fasteners unless otherwise indicated by Architect.

3.3 TOLERANCES

A. Offset From True Alignment Between Adjacent Members Abutting or In Line: 1/16 inch, maximum.

B. Variation from Plane or Location As Indicated on Drawings: 1/4 inch, maximum.

3.4 CLEANING

A. Remove site cuttings from finish surfaces.

B. Remove protective material from wall panel surfaces.

C. Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.

3.5 PROTECTION

A. Protect metal wall panels until completion of project.

B. Touch-up, repair, or replace damaged wall panels or accessories before Date of Substantial Completion.

END OF SECTION 07 42 13

SECTION 07 53 00 - ELASTOMERIC MEMBRANE ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Elastomeric roofing membrane application.

B. Insulation, flat.

C. Vapor retarder.

D. Deck sheathing.

E. Cover boards.

F. Roofing stack boots and walkway pads.

1.2 RELATED REQUIREMENTS

A. Section 05 31 00 - Steel Decking: Placement of acoustical insulation for deck flutes.

B. Division 22 - Plumbing: Coordinate for the following:
   1. Penetrations through roof assemblies for plumbing vents and roof drains.
   2. Supports for piping distribution over roof assembly.

C. Division 23 - Heating, Ventilating, and Air Conditioning: Coordinate for the following:
   1. Penetrations through roof assemblies.
   2. Curbs furnished with roof mounted equipment.

D. Division 26 - Electrical: Coordinate for the following:
   1. Penetrations through roof assemblies.
   2. Supports for distribution systems over roof assembly.

1.3 REFERENCE STANDARDS

A. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.

B. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2023a.

C. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).

D. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 2022.

E. ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers; 2000 (Reapproved 2020).

F. ASTM D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact; 2020.

G. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2015, with Editorial Revision (2022).

H. NRCA (WM) - The NRCA Waterproofing Manual; 2021.

I. UL (DIR) - Online Certifications Directory; Current Edition.

1.4 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, and fasteners.

C. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, and walkway layout.

D. Manufacturer's qualification statement.

E. Installer's qualification statement.

F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

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

1.6 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.

1.7 FIELD CONDITIONS

A. Do not apply roofing membrane during unsuitable weather.

B. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

D. Schedule applications so that no partially completed sections of roof are left exposed at end of workday.

1.8 WARRANTY

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

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. EPDM Membrane Materials:
   1. Carlisle SynTec Systems; Sure-Tough EPDM: www.carlisle-syntec.com/#sle.
   2. Elevate; Low Slope Fire Retardant (LSFR) RubberGard EPDM Membrane: www.holcimelevate.com/#sle.
   3. Johns Manville; JM EPDM: www.jm.com/#sle.
   4. Mule-Hide Products Co, Inc; Standard EPDM: www.mulehide.com/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Insulation: As furnished or recommended by the membrane manufacturer.
   1. Substitutions: See Section 01 60 00 - Product Requirements.

C. Cover Boards: As furnished or recommended by the membrane manufacturer.
   1. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 ROOFING

A. Elastomeric Membrane Roofing: One ply membrane, mechanically fastened, over vapor retarder and insulation.

B. Roofing Assembly Requirements:
   1. Roof Covering External Fire Resistance Classification: UL (DIR) certified Class A.
   2. Insulation Thermal Resistance (R-Value): As indicated on drawings; provide insulation of thickness required.

C. Acceptable Insulation Types:
   1. Minimum 2 layers of polyisocyanurate board.

2.3 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

A. Membrane: Ethylene-propylene-diene-monomer (EPDM); externally reinforced with fabric; complying with minimum properties of ASTM D4637/D4637M.
   1. Thickness: 60 mil, 0.060 inch, minimum.
   2. Sheet Width: 76 inches, maximum; factory fabricate into widest possible sheets.
   3. Color: Black.
   4. Tensile Strength: 160 psi, minimum, measured in accordance with ASTM D412.
   5. Tear Strength: 150 lbf per inch, measured in accordance with ASTM D624.
   6. Water Absorption: 2 percent increase in weight, maximum, measured in accordance with ASTM D570, 24 hour immersion.
   7. Brittleness Temperature: -49 degrees F, measured in accordance with ASTM D746.

B. Seaming Materials: As recommended by membrane manufacturer.

C. Membrane Fasteners: As recommended by and approved by membrane manufacturer.

D. Vapor Retarder: Material approved by membrane manufacturer, complying with requirements of fire rating classification; compatible with roofing and insulation materials.
   1. Fire-retardant adhesive.

E. Flexible Flashing Material: Same material as membrane.
   1. Tensile Strength: 1,200 psi.
   2. Elasticity: 50 percent with full recovery without set.
   3. Color: Black.

2.4 DECK SHEATHING

A. Deck Sheathing: Glass mat faced gypsum panels, ASTM C1177/C1177M, fire resistant type, 1/4 inch thick.
   1. Thickness: 5/8 inch, Type X, fire-resistant.
   2. Products:
      a. CertainTeed Corporation; GlasRoc Sheathing: www.certainteed.com.
      b. Georgia-Pacific; DensDeck: www.densdeck.com/#sle.
      c. Georgia-Pacific; DensDeck Prime with EONIC Technology: www.densdeck.com/#sle.

d. USG Corporation; Securock Ultralight Glass-Mat Roof Board: www.usg.com/#sle.

e. Substitutions: See Section 01 60 00 - Product Requirements.

2.5 COVER BOARDS

A. Cover Boards: Faced and with high compressive strength polyisocyanurate (ISO) insulation complying with ASTM C1289.

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 4 - Faced with coated or uncoated glass fiber mat facers on both major surfaces of the core foam. This product is used at a maximum thickness of 1/2 inch (12.7 mm).
         a) Compressive Strength: Grade 1, 80 psi, minimum.
2. Board Thickness: 1/2 inch.
3. Thermal Resistance at 1/2 inch Thick, R-value: 2.0.

2.6 INSULATION

A. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, complying with ASTM C1289.

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 facers on both major surfaces of the core foam.
      2) Compressive Strength: Classes 1-2-3, Grade 3 - 25 psi (172 kPa), minimum.
      3) Thermal Resistance, R-value: At 1-1/2 inches 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: 1.5 inch, minimum.
4. Board Edges: Square.

2.7 ACCESSORIES

A. Compressible Foam Backer Rod: Closed cell foam; 25 to 33 percent larger in diameter than joint width.

B. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.

C. Sheathing Joint Tape: Heat resistant type, miniumum 3 inches wide, self adhering.

D. Insulation Joint Tape: Glass fiber reinforced type as recommended by insulation manufacturer, compatible with roofing materials; 6 inches wide; self adhering.

E. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
   1. Length as required for thickness of cover board, insulation material and penetration of deck substrate, with metal washers.

F. Membrane Adhesive: As recommended by membrane manufacturer.

G. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.

H. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.

I. Insulation Adhesive: As recommended by insulation manufacturer.

J. Roofing Nails: Galvanized, hot-dipped type, size and configuration as required to suit application.

K. Strip Reglet Devices: Galvanized steel, maximum possible lengths per location, with attachment flanges.

L. Walkway Pads: Suitable for maintenance traffic, contrasting color or otherwise visually distinctive from roof membrane.
   1. Composition: Roofing membrane manufacturer's standard.
   2. Size: 18 by 18 inches , minimum.
   3. Surface Color: White.

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 - METAL DECK

A. 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.

B. Mechanically fasten sheathing to roof deck, in accordance with roofing manufacturer's instructions.
1. Over entire roof area, fasten sheathing using six fasteners with washers per sheathing board.
2. At roof perimeter to a distance of 4 feet in from edges, fasten sheathing using 6 fasteners with washers per board.

3.3 INSTALLATION - VAPOR RETARDER AND INSULATION, UNDER MEMBRANE

A. Install vapor retarder to sheathing surface with adhesive in accordance with manufacturer's instructions.
1. Extend vapor retarder under cant strips and blocking to deck edge.
2. Install flexible flashing from vapor retarder to air seal material of wall construction, lap and seal to provide continuity of the air barrier plane.

B. Ensure vapor retarder is clean and dry, continuous, and ready for application of insulation.

C. Attachment of Insulation:
1. Mechanically fasten first layer of insulation to deck in accordance with roofing manufacturer's instructions.
2. Embed second layer of insulation into full bed of adhesive in accordance with roofing and insulation manufacturers' instructions.

D. Cover Boards: Mechanically fasten cover boards in accordance with roofing manufacturer's instructions for specified wind uplift requirement.

E. Lay subsequent layers of insulation with joints staggered minimum 6 inches from joints of preceding layer.

F. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.

G. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

H. Tape joints of insulation in accordance with roofing and insulation manufacturers' instructions.

I. At roof drains, use factory-tapered boards to slope down to roof drains over a distance of 18 inches.

J. Do not apply more insulation than can be covered with membrane in same day.

3.4 INSTALLATION - MEMBRANE

A. Install elastomeric membrane roofing system in accordance with manufacturer's recommendations and NRCA (WM) applicable requirements.

B. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

C. Shingle joints on sloped substrate in direction of drainage.

D. Fully Adhered Application: Apply adhesive to substrate at rate recommended by menbrane manufacturer. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.

E. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.

F. Mechanical Attachment: Install membrane and mechanical attachment devices at perimeter edges in accordance with manufacturer's instructions.

G. 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.

H. At gravel stops, extend membrane under gravel stop and to the outside face of the wall.

I. Around roof penetrations, seal flanges and flashings with flexible flashing.

J. Coordinate installation of roof drains and sumps and related flashings.

K. Install walkway pads. Space pad joints to permit drainage.
   1. Clean underside of pad and membrane surface; set pads with adhesive.

3.5 CLEANING

A. Remove bituminous markings from finished surfaces.

B. 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.

C. Repair or replace defaced or damaged finishes caused by work of this section.

3.6 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 07 53 00

SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings and counterflashings.

B. Sealants for joints within sheet metal fabrications.

1.2 RELATED REQUIREMENTS

A. Section 04 20 00 - Unit Masonry: Installation of metal flashings embedded in masonry.

B. Section 06 10 53 - Miscellaneous Rough Carpentry: Wood nailers for sheet metal work.

C. Section 07 53 00 - Elastomeric Membrane Roofing: Warranty requirements for sheet metal copings and edge metals.

D. Section 07 71 00 - Roof Specialties: Manufactured copings and edge flashings.

E. Section 07 92 00 - Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.

1.3 REFERENCE STANDARDS

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2020.

B. ASTM B32 - Standard Specification for Solder Metal; 2020.

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

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

E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

F. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2018).

G. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate with roofing work for scheduling installation of counterflashing, rain drainage and similar items related to roofing.
2. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
3. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.
4. Coordinate with the work of Section 07 92 00 for installation of related sealants.

B. Preinstallation Meeting: Convene one week before starting work of this Section.
1. Require attendance of parties directly concerned with the work of this Section, including those who are required to coordinate with the work, and those who are required to protect the work upon completion.
2. Review preparation and installation procedures and coordinating and scheduling required with related work.

C. Sequencing: Do not proceed with installation of flashing and sheet metal work until substrate construction, cants, blocking, reglets, and other construction are ready to receive the work of this Section.

1.5 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 material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
1. Include identification of material, thickness, weight, and finish for each item and location in Project.
2. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
3. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
4. Include details of connections to adjoining work.
5. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches.

D. Samples: Submit two samples 6 x 6 inch in size illustrating each metal finish color.

1.6 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) requirements and standard details, except as otherwise indicated.

B. Maintain one copy of each document on site.

C. Fabricator and Installer Qualifications: Company specializing in sheet metal work with five years of documented experience.

1.7 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.

C. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.8 WARRANTY

A. Correct defective Work within a five year period after Date of Substantial Completion. Defective work includes failure of watertightness or seals.

B. Provide 20 year manufacturer warranty for prefinished sheet metal materials. Warranty shall include degradation of metal finish.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Sheet Metal Assemblies:
   1. Capable of withstanding structural movement and exposure to wind and weather without failure or permanent deformation.
      a. Design Pressure: Conforming with ASCE 7 or as indicated on structural drawings, whichever is most restrictive.
   2. Physically protect building elements and systems from damage that would permit water leakage into building enclosure assemblies under all weather conditions.

B. Sheet Metal Standards: Comply with SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. Roof Edge Flashing and Coping Assemblies:
   1. Capable of withstanding structural movement, thermally induced movement, and exposure to wind and weather without failure or permanent deformation.
   2. Physically protect roofing systems, roof accessories, and other building elements and systems from damage that would permit water leakage to building interior under all weather conditions.

D. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.
   1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET MATERIALS

A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum gage as scheduled, shop pre-coated with PVDF coating.
   1. Exposed Coating: PVDF (Polyvinylidene Fluoride) Superior Performance Organic Finish, AAMA 621; multiple coat, thermally cured fluoropolymer finish system.
   2. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil.

B. Anodized Aluminum: ASTM B209 (ASTM B209M); minimum gage as scheduled; anodized finish of color as selected.
   1. Clear Anodized Finish: AAMA 611 AA-M12C22A41 Class I clear anodic coating not less than 0.7 mils thick.
   2. Color Anodized Finish: AAMA 611 AA-M12C22A42/44 Class I integrally or electrolytically colored anodic coating not less than 0.7 mils thick.

C. Pre-Finished Aluminum: ASTM B209 (ASTM B209M), minimum gage as scheduled; shop pre-coated with with PVDF coating.
   1. Exposed Coating: PVDF (Polyvinylidene Fluoride) Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
   2. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil.

D. Stainless Steel: ASTM A240, Type 304 alloy, soft temper, fully annealed, minimum gage and finish as scheduled.
   1. Finish: 2D (dull, cold rolled).

2.3 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Fabricate cleats and starter strips of same material as sheet, minimum 12 inches wide, one gage thickness heavier than exposed sheet, and interlocking with exposed sheet.

C. Hem exposed edges on underside 1/2 inch; miter and seam corners.

D. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.

E. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

2.4 SEAMS AND JOINTS

A. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.

B. Non-Moving Seams:
   1. For metal greater than 0.040 inch thick, fabricate with butt seams with backup plates, fastened one side (SMACNA Figure 3-3, Type 19); seal with butyl sealant concealed within joint.
   2. For metals 0.040 inch thick or less, fabricate with flat-lock seams (SMACNA Figure 3-2, Type 2); treat as follows:
      a. Prepainted Steel and Aluminum: Form seams and seal with elastomeric sealant. Rivet joints where necessary for strength.
      b. Unpainted Aluminum (includes mill finish and anodized: Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.
      c. Other Metals: Tin edges to be seamed, form seams, and solder.

C. Moving Seams:
   1. For metal greater than 0.040 inch thick: Form expansion joints of butt seams with backup plates fastened to substrate (SMACNA Figure 3-3, Type 18) with no fasteners exposed through covers. Seal seams with butyl sealant concealed within joints.
   2. For metal 0.040 inch thick or less: Form expansion joints of intermeshing hooked flanges (SMACNA Figure 3-2, Type 1), not less than 1 inch deep, filled with butyl sealant concealed within joint.

D. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches except where pretinned surface would show in finished Work.
   1. Do not solder prepainted metal sheet.

2.5 ROOF SHEET METAL FABRICATIONS

A. Counterflashings: Factory fabricated and finished sheet metal that overlaps top edges of base flashing by at least 4 inches, and designed to snap into thru-wall flashing or reglets with lapped joints. Provide spring action pressure at bottom edge against base flashings.
   1. Type and Finish: See Sheet Metal Schedule.

B. Roof Equipment Support Flashing: Cover raised bases and equipment supports. Fabricate with seamed and soldered joints and corners. Extend flashings over roof base flashings 4 inches minimum, and fold back bottom edge 1/2 inch. Where metal is penetrated for bolt or other fastener connections, use 4 lb sheet lead washers 2 inches larger than fastener hole.
   1. Comply with SMACNA (ASMM) Figure 8-11B.
   2. Type and Finish: See Sheet Metal Schedule.

2.6 WALL SHEET METAL FABRICATIONS

A. Openings Flashing: Fabricate head, sill, jamb and similar flashings to extend 4 inches beyond wall openings. Form head and sill flashing with 2-inch-high end dams.
   1. Type and Finish: See Sheet Metal Schedule.

B. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch-long, but not exceeding 12-foot-long sections, under copings, at shelf angles and where indicated. Fabricate discontinuous lintel, sill and similar flashings to extend 6 inches beyond each side of wall openings. Form with 2 inch high end dams where flashing is discontinous.
   1. Type and Finish: See Sheet Metal Schedule.

2.7 ACCESSORIES

A. Fasteners: Non-corrosive type.
   1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
      a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
      b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
      c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
   2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
   3. Fasteners for Zinc-Coated (Galvanized) and Aluminum-Zinc Alloy-Coated Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.
   4. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.

B. Self-Adhering, High-Temperature Sheet Underlayment: Minimum 30 mils thick, consisting of a slip- resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.
   1. Thermal Stability: Stable after testing at 220 deg F; ASTM D 1970.
   2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F; ASTM D 1970.
   3. Acceptable Products:
      a. Carlisle Residential, a division of Carlisle Construction Materials; WIP 300HT.
      b. Grace Construction Products, a unit of W. R. Grace & Co.; Ultra.
      c. Henry Company; Blueskin PE200 HT.
      d. Metal-Fab Manufacturing, LLC; MetShield.
      e. Owens Corning; WeatherLock Metal High Temperature Underlayment.
      f. Polyguard Products, Inc.; Deck Guard HT.
      g. Substitutions: See Section 01 60 00 - Product Requirements.

C. Slip Sheet: Rosin sized building paper, 3 lb/100 sq. ft.minimum.

D. Primer: Zinc chromate type.

E. Protective Backing Paint: Zinc molybdate alkyd.

F. Bituminous Coating: Cold-applied asphalt mastic, noncorrosive compound free of asbestos, sulfur, and other deleterious impurities; 15 mil dry film thickness per coat.

G. Concealed Sealants: Non-curing butyl sealant.

H. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.

I. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

J. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

K. Plastic Cement: ASTM D4586/D4586M, Type I.

L. Solder: ASTM B32; Provide type as described:
   1. For Stainless Steel: Grade Sn96, with acid flux of type recommended by stainless-steel sheet manufacturer.

2.8 FINISHES

A. PVDF (Polyvinylidene Fluoride) Coating: Superior performance organic finish with minimum 70 percent PVDF fluoropolymer resin by weight, multiple coat, thermally cured finish system.
   1. Acceptable Products:
      a. PPG Metal Coatings; Duranar: www.ppgmetalcoatings.com/#sle.
      b. Sherwin-Williams Company; SHER-NAR 5000: oem.sherwin-williams.com/#sle.
      c. Valspar; Fluropon: www.valsparcoilextrusion.com/#sle.
      d. Arkema; Kynar 500: www.americas.kynar.com.
      e. Substitutions: See Section 01 60 00 - Product Requirements.

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.

C. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of the Work.
   1. Verify compliance with requirements for installation tolerances of substrates.
   2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
   3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

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

3.2 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Install surface mounted reglets true to lines and levels, and seal top of reglets with sealant.

3.3 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated below, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.

3.4 INSTALLATION - GENERAL

A. Comply with SMACNA Architectural Sheet Metal Manual.

B. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
   1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
   2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
   3. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
   4. Torch cutting of sheet metal flashing and trim is not permitted.
   5. Do not use graphite pencils to mark metal surfaces.

C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.

1. Coat back side of uncoated aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where concealed flashing and trim will contact wood, ferrous metal, or cementitious construction.
2. Coat concealed surfaces of aluminum downspout that come into contact with dissimilar metals with two coats of clear lacquer.
3. Underlayment: Where installing metal directly on cementitious or wood substrates, install underlayment.

D. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.

E. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance, but in no case less than 1-1/4 inches for nails and 3/4 inch for wood screws in wood blocking or sheathing.

F. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

G. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

H. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work.
1. Do not solder metallic-coated steel and aluminum sheet.
2. Do not use torches for soldering.
3. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
4. Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

I. Rivets: Rivet joints where necessary for strength.

3.5 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Apply plastic cement compound between metal flashings and felt flashings.

C. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

D. Seal metal joints watertight.

E. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

3.6 INSTALLATION - WALL FLASHINGS

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

3.7 INSTALLATION - PRE-FINISHED SHEET METAL

A. Take special care in the handling and installation to avoid damage to finish.

B. Remove protective film from each unit after installation, but not before adjacent construction is complete.

C. Touch up minor damage or defects to match factory finish. Replace units which are excessively damaged as determined by Architect.

3.8 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean off excess sealants.

C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

3.9 SCHEDULE

A. General:
   1. Where more than one metal material is scheduled, provide sheet metal as indicated on Drawings or, if not indicated, to match metal material of adjacent wall or roof material.
   2. Unless otherwise indicated in drawings, where flashings are adjacent to metal wall and roof panel systems or aluminum glazing system frames, match adjacent metal finish and color.
   3. Counterflashing and flashing receivers used in conjunction with premanufactured roof edge flashings shall be premanufactured by manufacturer of roof edge flashings. Other counterflashing and flashing receivers may be either premanufactured or shop fabricated.
   4. Thicknesses shown are minimums. Increase thicknesses as required to comply with SPRI testing requirements and SMACNA recommendations and to meet performance requirements.
   5. Visible is defined as "able to be seen from normal public areas." Provide factory finished materials in visible locations unless otherwise indicated.

B. Gravel Stops and Roof Edge Metal with Faces Up to 4 inches:
   1. Aluminum: 0.040 inch.
   2. Prefinished Galvanized Steel: 0.0276 inch.
   3. Finish: PVDF

C. Gravel Stops and Roof Edge Metal with Faces 4 to 8 inches:
   1. Aluminum: 0.050 inch.
   2. Prefinished Galvanized Steel: 0.0276 inch.
   3. Finish: PVDF

D. Counterflashings, Concealed:
   1. Stainless Steel: 0.0187 inch.
   2. Finish: 2D dull annealed.

E. Flashing Receivers, Concealed:
   1. Stainless Steel: 0.0187 inch.
   2. Finish: 2D dull annealed.

F. Miscellaneous Sheet Metal Fabrications, Trims, Flashings, and Top of Wall Closures, Visible:
   1. Aluminum: 0.040 inch thick.

2. Prefinished Galvanized Sheet Steel: 0.0276 inch.
3. Finish: PVDF

G. Openings Flashing in Frame Construction, Visible:
1. Aluminum: 0.025 inch thick.
2. Prefinished Galvanized Sheet Steel: 0.0217 inch.
3. Finish: PVDF

H. Openings Flashing in Frame Construction, Concealed:
1. Stainless Steel: 0.0156 inch.
2. Finish: 2D dull annealed.

I. Aluminum Glazing Frame Flashing, Concealed:
1. Stainless Steel: 0.0187 inch.
2. Finish: 2D dull annealed.

J. Aluminum Glazing Frame Flashing, Visible:
1. Aluminum: 0.032 inch.
2. Finish: PVDF

K. Aluminum Glazing Frame Sill Extensions, Visible:
1. Aluminum: 0.040 inch.
2. Finish: PVDF

L. Equipment Support Cap Flashing, Roof Penetration Flashing, and Umbrella Flashing:
1. Stainless Steel: 0.0187 inch.
2. Finish: 2D dull annealed.

M. Masonry Drip Edges:
1. As specified in Section 04 20 00 - Unit Masonry.
2. Stainless Steel: 0.0156 inch
3. Finish: 2D dull annealed.

END OF SECTION 07 62 00

SECTION 07 71 00 - ROOF SPECIALTIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Roof edge flashings and gravel stops.

1.2 RELATED REQUIREMENTS

A. Section 07 62 00 - Sheet Metal Flashing and Trim: Custom and site-fabricated sheet metal fabrications.

B. Section 07 72 00 - Roof Accessories: Manufactured curbs and roof hatches.

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. 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. NRCA (RM) - The NRCA Roofing Manual; 2026.

F. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate installation of components of this Section with installation of roofing system.
   2. Coordinate installation of sealants and roofing cement with work of this Section to ensure water tightness.

B. Preinstallation Meeting: Convene one week before starting work of this Section.
   1. Require attendance of parties directly concerned with the work of this Section, including those who are required to coordinate with the work, and those who are required to protect the work upon completion. Include the manufacturer's technical representative.

2. Review preparation and installation procedures and coordinating and scheduling required with related work.

C. Sequencing: Do not proceed with installation of flashing and sheet metal work until substrate construction, cants, blocking, reglets, and other construction are ready to receive the work of this Section.

1.5 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.
1. Include identification of material, thickness, weight, and finish for each item and location in Project.
2. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
3. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
4. Include details of connections to adjoining work.
5. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches.

D. Selection Samples: Submit at least 5 color chips in architect's designated range for selection of metal finish and color.

E. Verification Samples: Submit two finish samples, 6 x 6 inch, illustrating finish and color.

F. Product Test Reports: For gravel stops and edge metals, for tests performed by a qualified testing agency.

G. Manufacturer's Installation Instructions: Indicate special procedures, fasteners, supporting members, and perimeter conditions requiring special attention.

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.

C. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.7 WARRANTY

A. Correct defective Work within a five year period after Date of Substantial Completion. Defective work includes failure of watertightness or seals.

B. Roofing-System Warranty: Coordinate requirements with roofing system Section.

C. Provide 20 year manufacturer warranty for prefinished sheet metal materials. Warranty shall include degradation of metal finish.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers - Roof Edge Flashings and Gravel Stops:
1. Architectural Products Co: www.archprod.com/#sle.
2. ATAS International, Inc: www.atas.com/#sle.
3. Drexel Metals Inc: www.drexmet.com/#sle.
4. Hickman Edge Systems: www.hickmanedgesystems.com/#sle.
5. Metal-Era Inc: www.metalera.com/#sle.
6. Metal Roofing Systems, Inc: www.metalroofingsystems.biz/#sle.
7. Pac-Clad Petersen, a Carlisle Company: www.pac-clad.com.
8. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 PERFORMANCE REQUIREMENTS

A. General:
1. Capable of withstanding structural movement and exposure to wind and weather without failure or permanent deformation.
a. Design Pressure: Conforming with ASCE 7 or as indicated on structural drawings, whichever is most restrictive.
2. Physically protect building elements and systems from damage that would permit water leakage into building enclosure assemblies under all weather conditions.

B. FM Approvals Listing: Manufacture and install gravel stops and roof edge flashings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, matching Class specified for roofing. Identify materials with name of fabricator and design approved by FM Approvals.

C. Edge Metal Assemblies:
1. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1, RE-1, RE-2, and RE-3 as applicable to positive and negative design wind pressure as defined by SPRI ES-1.
2. Capable of withstanding structural movement, thermally induced movement, and exposure to wind and weather without failure or permanent deformation.

3. Physically protect roofing systems, roof accessories, and other building elements and systems from damage that would permit water leakage to building interior under all weather conditions.
4. Comply with roofing manufacturer's requirements for full system warranty.

D. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.
1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.3 ROOFING COMPONENTS

A. Where more than one material is scheduled, provide sheet metal as indicated on Drawings or, if not indicated, to match adjacent wall or roof material, unless otherwise indicated.

B. Unless otherwise indicated in drawings, where gravel stops and flashings are adjacent to metal panel systems, match adjacent panel finish and color.

C. Roof Edge Flashings: Factory fabricated to sizes required; mitered corners; concealed fasteners.
1. Configuration: Gravel stop and fascia, and edge securement for roof membrane.
2. Exposed Face Height: As indicated on drawings.
3. Material: Formed steel sheet, galvanized, 24 gauge, 0.024 inch thick, minimum.
4. Finish: 70 percent polyvinylidene fluoride.
5. Color: To be selected by Architect from manufacturer's custom range.

2.4 FINISHES

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

B. Superior Performance Coil Coating for Aluminum Sheets: PVDF (Polyvinylidene Fluoride) Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; color as indicated.

C. Concealed Surface Finish: Apply pretreatment and manufacturer's standard acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

2.5 ACCESSORIES

A. Fasteners: Non-corrosive type.
1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.

b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.

2. Fasteners for Zinc-Coated (Galvanized) and Aluminum-Zinc Alloy-Coated Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

B. Sealant for Joints in Linear Components: As recommended by component manufacturer.

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. Adhesive for Anchoring to Roof Membrane: Compatible with roof membrane and approved by roof membrane manufacturer.

F. Asphalt Roof Cement: ASTM D4586/D4586M, Type I, asbestos-free.

G. Self-Adhering, High-Temperature Sheet Underlayment: Minimum 30 mils thick, consisting of a slip- resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.

1. Thermal Stability: Stable after testing at 220 deg F; ASTM D 1970.
2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F; ASTM D 1970.
3. Products:
   a. Carlisle Residential, a division of Carlisle Construction Materials; WIP 300HT.
   b. Grace Construction Products, a unit of W. R. Grace & Co.; Ultra.
   c. Henry Company; Blueskin PE200 HT.
   d. Metal-Fab Manufacturing, LLC; MetShield.
   e. Owens Corning; WeatherLock Metal High Temperature Underlayment.
   f. Polyguard Products, Inc.; Deck Guard HT.

H. Slip Sheet: Rosin sized building paper, 3 lb/100 sq. ft.minimum.

I. Bituminous Coating: Cold-applied asphalt mastic, noncorrosive compound free of asbestos, sulfur, and other deleterious impurities; 15 mil dry film thickness per coat.

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.

3.2 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

3.3 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated below, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.
   1. Apply continuously under gravel stops and roof edge specialties.
   2. Coordinate application of self-adhering sheet underlayment under roof specialties with requirements for continuity with adjacent air barrier materials.

B. Apply slip sheet, wrinkle free, over underlayment before installing sheet metal flashing and trim.

3.4 INSTALLATION

A. Install components in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.

B. Anchor components securely.
   1. Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.
   2. Anchor gravel stops with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

C. Coordinate installation of components of this section with installation of roofing membrane and base flashings.

D. Coordinate installation of sealants and roofing cement with work of this section to ensure water tightness.

E. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
   1. Coat back side of uncoated aluminum and stainless-steel roofing specialties with bituminous coating where concealed flashing and trim will contact wood, ferrous metal, or cementitious construction.

F. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
   1. Space movement joints at a maximum of 12 feet with no joints within 18 inches of corners or intersections.

G. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint.

3.5 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean off excess sealants.

C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 71 00

SECTION 07 72 00 - ROOF ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Roof hatches.

B. Non-penetrating pedestals.

1.2 RELATED REQUIREMENTS

A. Section 07 71 00 - Roof Specialties: Other manufactured roof specialty items.

B. Division 23 - Heating, Ventilating, and Air Conditioning: Curbs furnished with roof mounted equipment.

1.3 REFERENCE STANDARDS

A. 29 CFR 1910.23 - Ladders; Current Edition.

B. 29 CFR 1910.29 - Fall Protection Systems and Falling Object Protection - Criteria and Practices; Current Edition.

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 B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

F. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

G. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2018, with Amendment (2019).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate with installation of roofing system and related flashings for weather tight installation.

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.
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Maintenance requirements.

C. Warranty Documentation:
   1. Submit manufacturer warranty.
   2. Ensure that forms have been completed in Owner's name and registered with manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store products under cover and elevated above grade.

1.7 WARRANTY

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

B. Extended Correction Period: Correct defective work within 5-year period commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.1 ROOF HATCHES

A. Acceptable Manufacturers - Roof Access Hatches:
   1. Acudor Products Inc.: www.acudor.com.
   2. Babcock-Davis: www.babcockdavis.com.
   3. Bilco Company: www.bilco.com/sle.
   4. Dur-Red Products: www.dur-red.com/#sle.
   5. Nystrom, Inc: www.nystrom.com/#sle.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

B. Roof Hatches - General: Factory-assembled aluminum frame and cover, complete with operating and release hardware.
   1. Style: Provide flat metal covers unless otherwise indicated.

2. Mounting: Provide frames and curbs suitable for mounting conditions indicated on the Drawings.
3. Thermally Broken Hatches: Added insulation to frame and cover; outer frame and cover thermally isolated from inner frame and cover.
4. Sizes: As indicated on Drawings; single-leaf style unless indicated as double-leaf.
5. For Ladder Access: Single leaf; 30 by 36 inches.
6. Accessories:
    a. Extension Post: Extension post for mounting to top rungs of ladder.
        1) Finish: Powder coated; safety yellow color.
        2) Basis of Design Product:
            a) Bilco Co.; Model 1 Ladder Up: www.bilco.com.
    b. Deflector Plate: Minimum 20 gauge cold rolled steel with non-corrosive screw attachment to hatch support construction.
        1) Finish: Powder coat; safety yellow color.
        2) Basis of Design Product:
            a) Activar, Inc.; Roof Hatch Deflector Plate Kit.

C. Frames and Curbs: One-piece curb and frame with integral cap flashing to receive roof flashings; extended bottom flange to suit mounting.
1. Material: Galvanized steel, 14 gage, 0.0747 inch thick.
2. Finish: Factory prime paint.
3. Insulation: Manufacturer's standard; 3 inch rigid polyisocyanurate, located on inside hollow curb.
4. Curb Height: 8 inches from finished surface of roof, minimum.

D. Metal Covers: Flush, insulated, hollow metal construction.
1. Capable of supporting 40 psf live load.
2. Material: Galvanized steel; outer cover 14 gauge, 0.0747 inch thick, liner 22 gauge, 0.03 inch thick.
3. Finish: Factory prime paint.
4. Insulation: Manufacturer's standard 3 inch rigid polyisocyanurate.
5. Gasket: Neoprene, continuous around cover perimeter.

E. Safety Railing System: Roof hatch safety rail system mounted directly to curb without penetration of roofing system.
1. Railing Size: As indicated on drawings.
2. Railing: Comply with 29 CFR 1910.23 for ladder safety, with a safety factor of two.
3. Self-Closing Gate: Comply with 29 CFR 1910.29 for safe egress and fall protection through hatch opening.
4. Posts and Rails: Galvanized steel tubing.
5. Gate: Same material as railing; automatic closing with latch.
6. Finish: Manufacturer's standard, factory applied finish.
7. Gate Hinges and Post Guides: ASTM B221 (ASTM B221M), 6063 alloy, T5 temper aluminum.

8. Mounting Brackets: Hot dipped galvanized steel, 1/4 inch thick, minimum.
9. Fasteners: Stainless steel, Type 316.
10. Basis of Design:

F. Hardware: Steel, zinc coated and chromate sealed, unless otherwise indicated or required by manufacturer.
1. Lifting Mechanisms: Compression or torsion spring operator with shock absorbers that automatically opens upon release of latch; capable of lifting covers despite 10 psf load.
2. Hinges: Heavy duty pintle type.
3. Hold open arm with vinyl-coated handle for manual release.
4. Latch: Upon closing, engage latch automatically and reset manual release.
5. Manual Release: Pull handle on interior.
6. Locking: Padlock hasp on interior.

2.2 NON-PENETRATING ROOFTOP SUPPORTS/ASSEMBLIES

A. Non-Penetrating Rooftop Support/Assemblies: Manufacturer-engineered and factory-fabricated, with pedestal bases that rest on top of roofing membrane, and not requiring any attachment to roof structure and not penetrating roofing assembly.
1. Design Loadings and Configurations: As required by applicable codes.
2. Height: Provide minimum clearance of 6 inches under supported items to top of roofing.
3. Support Spacing and Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
4. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
5. Hardware, Bolts, Nuts, and Washers: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A153/A153M.

B. Pipe Supports: Provide attachment fixtures complying with MSS SP-58 and as indicated.
1. Attachment/Support Fixtures: As recommended by manufacturer, same type as indicated for equivalent indoor hangers and supports; corrosion resistant material.
2. See relevant piping system specification Section for additional requirements.

C. Duct Supports: Provide extruded aluminum supports and sized in accordance with diameter of supported ducts, and with base that is non-penetrating of roofing membrane.

D. Non-Penetrating Pedestals: Steel pedestals with square, round, or rectangular bases.
1. Bases: High density polypropylene.
2. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
3. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.

PART 3 EXECUTION

3.1 EXAMINATION

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

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.

B. Apply bituminous paint on surfaces of units in contact with cementitious materials or dissimilar metals.

3.4 CLEANING

A. Clean installed work to like-new condition.

3.5 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 07 72 00

SECTION 07 84 00 - FIRESTOPPING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Firestopping systems, materials, and accessories.

B. Fire-resistive joint systems.

C. Firestopping at electrical junction boxes in fire-rated walls.

D. Firestopping of all membrane penetrations, through penetrations and joint applications within fire rated assemblies, whether indicated on Drawings or not, and other openings indicated.

E. Contractor's responsibility for determining required scope of firestopping system work, and for determining applicable tested/listed systems for the entire project, and for securing jurisdictional authority approval of firestopping systems.

1.2 RELATED REQUIREMENTS

A. Section 07 05 53 - Fire and Smoke Assembly Identification.

1.3 DEFINITIONS

A. Firestopping: A material or combination of materials used to retain the continuity and integrity of fire- and smoke-rated construction by maintaining an effective barrier against the spread of flame, and to impede the passage of smoke, gases, and moisture through penetrations, blank openings, and construction joints in or adjacent to fire-and smoke-rated wall, floor, ceiling, and other rated construction assemblies.

B. Assembly: Particular arrangement of materials specific to type of construction described or detailed in referenced UL or other approved design.

C. Fire-Resistance-Rated Barriers: Fire-resistance-rated fire walls, fire barriers, fire partitions, smoke barrier walls, rated floor/ceiling assemblies, and structural floors.

D. Through Penetration: Opening or foreign material passing through or into a fire-resistance-rated assembly or structural floor such that full thickness of rated materials is interrupted.

E. Membrane Penetration: An opening made through one side of a fire-resistance-rated assembly without passing completely through the assembly.

F. Fire-Resistant Joint System: Gaps between adjacent sections of fire-resistance-rated walls, exterior walls, top of wall and ceiling, structural floors or roof decks, and adjacent sections of structural floors. Where fire-resistance-rated walls meet non-rated wall or floor conditions, reference "Continuity Joint" conditions.

G. 3rd Party Tested Systems: Specific products and applications, classified and numbered by UL or other 3rd party approved testing agency in accordance with specific barrier base designs and through penetration applications.

H. Sleeve: Metal fabrication or pipe section extending through thickness of barrier used to permanently guard penetration in accordancew with tested systems.

I. VOC: Volatile organic compound(s).

1.4 REFERENCE STANDARDS

A. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014 (Reapproved 2019).

B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2023a.

C. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes; 2023.

D. ASTM E1399 - Standard Test Method for Cyclic Movement and Measuring the Minimum and Maximum Joint Widths of Architectural Joint Systems; 1997 (Reapproved 2009).

E. ASTM E1725 - Standard Test Methods for Fire Tests of Fire-Resistive Barrier Systems for Electrical System Components

F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

G. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems; 2015 (Reapproved 2019).

H. ASTM E2174 - Standard Practice for On-Site Inspection of Installed Firestop Systems; 2020a.

I. ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus; 2023b.

J. ASTM E2393 - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers; 2020a.

K. 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.

L. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).

M. ASTM E3038 - Standard Practice for Assessing and Qualifying Candidates as Inspectors of Firestop Systems and Fire-Resistive Joint Systems

N. IFC - International Firestop Council Recommended Guidelines for Evaluating Firestop Systems Engineering Judgements; current edition.

O. ITS (DIR) - Directory of Listed Products; Current Edition.

P. FCIA - Firestop Contractors International Association Manual of Practice; current edition.

Q. FM (AG) - FM Approval Guide; Current Edition.

R. FM 4991 - Approval Standard of Firestop Contractors; 2013.

S. SCAQMD 1168 - Adhesive and Sealant Applications; 1989, with Amendment (2022).

T. UL (DIR) - Online Certifications Directory; Current Edition.

U. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

V. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.

W. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.

X. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations; 2011.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Stage and coordinate installation of firestopping systems with affected trades and adjacent work in accordance with manufacturer's instructions.

B. Preinstallation Meeting: Convene one week before starting work of this Section. Notify Owner, who may request attendance by an independent consultant.
   1. Require attendance of parties directly concerned with the work of this Section, including those who are required to coordinate with the work, and those who are required to protect the work upon completion. Include the manufacturer's technical representative.
   2. Review installation procedures and coordination required with related work, and conditions which could affect successful performance of the work.

C. Sequencing: Sequence work to permit firestopping materials to be installed after adjacent and surrounding work is complete.

1. Do not cover or conceal firestopping installations until Owner's inspection agency and jurisdictional authority have inspected each installation.

1.6 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.
   1. Use Firestopping Systems Schedule Form attached to the end of this Section, or other form approved by Architect.

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. Certificate from authority having jurisdiction indicating approval of materials used.

1.7 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.
   2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.
   3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum three years documented experience.

C. Installer Qualifications: Company specializing in performing the work of this Section and:
   1. Trained by firestop system manufacturer.
   2. Meeting any of the three options below:
      a. Approved by UL in accordance with "UL Solutions Qualified Firestop Contractor Program."
      b. Approved by Factory Mutual Research Corporation under FM 4991
      c. Meeting all three of the following criteria:
         1) Verification of minimum five years documented experience installing work of this type.
         2) Verification of at least five satisfactorily completed projects of comparable size and type.
         3) Acceptable to the local authorities having jurisdiction (AHJ).

D. Obtain firestop systems for each type and condition of penetration from a single manufacturer; intermixing of system components for each type and condition of penetration by different manufacturers is not permitted.

E. Listed and tested assemblies and systems must be utilized, if they exist, before alternative systems requiring Engineering Judgement (EJ)/UL Technical Evaluation (UL TE) or Equivalent Fire Resistance Rated Assembly (EFRRA) will be considered. Comply with IFC and FCIA for EJ and EFRRA design and submittal requirements.

1.8 REGULATORY REQUIREMENTS

A. Comply with execution requirements of authority having jurisdiction including, if applicable, the requirement that all firestopping work be performed by a single qualified firm or subcontractor.

1.9 DELIVERY, STORAGE, AND PROTECTION

A. Deliver materials in original unopened containers identified with manufacturer's brand designation and applicable UL label.

B. Do not use damaged or expired materials.

1.10 FIELD CONDITIONS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions. Maintain uniform temperature of minimum 40 degrees F prior to, during, and after installation of materials

B. Provide ventilation in areas where solvent-cured materials are being installed.

1.11 WARRANTY

A. Include agreement to repair or replace joint sealers which fail in joint adhesion, extrusion resistance, migration resistance, general durability, or apparent deterioration beyond manufacturer's printed limitations for stipulated warranty period from Date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Manufacturer:
   1. Specified Technologies Inc.: www.stifirestop.com/#sle.

B. Other Acceptable Manufacturers:

1. 3M Fire Protection Products: www.3m.com/firestop.
2. A/D Fire Protection Systems Inc.: www.adfire.com.
3. GCP Applied Technologies: www.gcpat.com.
4. Hilti, Inc: www.us.hilti.com/#sle.
5. Nelson FireStop Products: www.nelsonfirestop.com.
6. Pecora Corporation: www.pecora.com.
7. RectorSeal: www.rectorseal.com.
8. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
9. USG: www.usg.com.
10. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 MATERIALS - GENERAL

A. Firestopping Materials: Any materials meeting requirements specified.
   1. Comply with ASTM E814, UL 1479, and UL 2079 as applicable to achieve indicated fire ratings.

B. Volatile Organic Compound (VOC) Content: Provide products having VOC content lower than that required by SCAQMD 1168.

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

D. Fire Ratings: Refer to Drawings for required systems and ratings.

2.3 FIRESTOPPING ASSEMBLY REQUIREMENTS

A. General: Use firestopping systems which are acceptable for those applications for which they are specifically designed. Use of other UL listed systems is Contractor's Option, subject to compliance with specified performance, regulatory, and quality assurance requirements.
   1. Where there is no specific tested and classified firestop system for an indicated condition, obtain from the firestopping system manufacturer an Engineering Judgement (EJ) or Equivalent Fire Resistance Rated Assembly (EFRRA) according to IFC and FCIA.

B. Scope: Install firestopping at all locations requiring protected openings where piping, conduit, cables, sleeves, ductwork and similar items penetrate fire-resistive, fire-rated, and smoke assemblies, including but not limited to:
   1. Penetrations through wall, floor, and roof assemblies, including empty openings and openings containing penetrations.
   2. Membrane penetrations where items penetrate one side of the barrier assembly.
   3. Joints between rated assemblies to allow independent movement.
   4. Perimeter barriers between exterior wall assemblies and floor and roof assemblies.
   5. Joints, through-penetrations, and membrane penetrations in smoke-rated assemblies.

C. Perimeter Fire Containment Firestopping: Use system that has been tested according to ASTM E2307 to have fire resistance F Rating equal to required fire rating of floor assembly.
   1. Movement: Provide systems that have been tested to show movement capability as indicated.
   2. Temperature Rise: Provide systems that have been tested to show T Rating as indicated.
   3. Air Leakage: Provide systems that have been tested to show L Rating as indicated.
   4. Where floor assembly is not required to have a fire rating, provide systems that have been tested to show L Rating as indicated.

D. 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.

E. 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.

F. 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: 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.

G. Fire Rated Joint Systems: Integrity and indicated fire-resistance ratings as determined by UL 2079, ASTM E1399, or ASTM E1996 as applicable.

H. Fire Rated Construction: Maintain barrier and structural floor fire resistance ratings including resistance to cold smoke at all penetrations, connections with other surfaces and types of construction, at separations required to permit building movement and sound or vibration absorption, and at other construction gaps.

I. Smoke Barrier Construction: Maintain fire-resistance-rated wall and floor barrier and structural floor resistance in conformance with UL 1479 F & L ratings at all penetrations, connections with other surfaces and types of construction, at separations required to permit building movement and sound or vibration absorption, and at other construction gaps.

J. Other General Characteristics:
   1. Surface Burning: ASTM E84 and UL 723; flame spread less than 25, smoke developed less than 450.
   2. Air Leakage of Perimeter Firestopping Barriers and Penetrations: UL 2079; L-rating less than 2.0 cfm/sf or 5.0 cfm/lf as applicable to the type and location of joint.
   3. Durability and Longevity: Permanent.

4. Side Effects During Installation: Non-toxic.
5. Side Effects Under Fire Exposure: Non-toxic.
6. Long Term Side Effects: None.

2.4 MATERIALS

A. Putty Compound: 100 percent solids intumescent or vinyl-type formulation, free of asbestos, silicones, solvents, halogens, PCB's, and inorganic fibers; flame spread/smoke developed rating 0/0 when tested in accordance with ASTM E84; paintable, not sensitive to freezing after set.

B. Sealant Compound: One-part intumescent, endothermic, ablative, or elastomeric acrylic water-based calking material required by applicable UL Design; flame spread/smoke developed rating 0/0 when tested in accordance with ASTM E84.

C. Spray-Applied Compound: Water-based, flexible coating which drys to form a flexible seal; tested in accordance with ASTM E1399, complying with wind sway and thermal category, 500 cycles at minimum 10 cycles/minute.

D. Foam Compound: Two-part, liquid-silicone elastomer formulated to foam in place when mixed; flame spread/smoke developed rating 0/0 when tested in accordance with ASTM E84.

E. Plastic Pipe Device: Intumescent strip material, factory or site fabricated in flexible metal collar with adjustable, screw-tightened stainless steel clamp; UL classified for use with PVC, CPVC, CCPVC, CCABS, PVDF, PP, PB, PEX, and FRPP plastic pipe.

F. Composite Sheet: Composite, intumescent sheet, designed for firestopping large openings in conjunction with other firestopping components, capable of being cut to size in the field and fabricated to fit required penetration openings.

G. Blanket Material: Refractory ceramic fiber blanket encapsulated with aluminum foil scrim complying with NFPA 96; widths and thicknesses required by applicable UL Design; specifically designed as a flexible, fireproof enclosure for kitchen exhaust ducts and fire-rated air ductwork.

H. Fire-Safing Insulation: ASTM C612, Type I; high-melt mineral fibers and resinous binders formed into blankets, density not less than 4.0 lbs/cu ft, tested for 3-hour fire containment for required depths and dimensions.

I. Firestopping Putty Pads: Non-hardening intumescent, putty pad formed to 7.25 x 7.25 x 3/16 inch or 9 x 9 x 3/16 inch self-adhering pads, 2-hour fire rating listed by UL.

J. EP Powershield Electrical Box Insert Pad: Intumescent, non-curing insert pad for protection of electrical switch and receptacle boxes to reduce horizontal separation to less than 24 inches.

2.5 ACCESSORIES

A. Provide necessary accessory materials specified in UL Design to achieve complete firestop system at each penetration. Include collars, sleeves, attachment devices, intumescent materials, and other items required.

B. Primers, Sleeves, Forms, and Accessories: Type required for tested assembly design, and as recommended by firestopping manufacturer for specific substrate surfaces.

C. Dam Material: Mineral fiberboard, mineral fiber matting, sheet metal, alumina silicate fire board, or other permanent material required as part of the firestopping system, or removable if not specifically required as part of the firestopping system.

D. Retainers: Impale type clips to support mineral fiber safing blankets.

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 or damming materials required to arrest liquid material leakage.

3.3 INSTALLATION - GENERAL

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 Owner's Independent Testing Agency or in accordance with ASTM E2174 or ASTM E2393 where applicable.

C. Apply firestopping materials in sufficient thicknesses to achieve scheduled fire ratings, to uniform density and texture.

D. Install firestop materials within annular spaces at openings which contain penetrating sleeves, piping, ductwork, conduit and other items requiring firestopping.

E. Remove dam material after firestopping material has cured only if dam material is not required as part of the firestopping system; otherwise dam material to remain permanently in place.

F. Do not cover installed firestopping until inspected by authorities having jurisdiction.

G. Install labeling required by code.

3.4 INSTALLATION - FIRE SAFING INSULATION

A. Install safing insulation to completely fill spaces between floor slab edges and spandrel construction as detailed.

B. Install safing insulation to completely fill voids between floor and roof deck flutes and top of wall construction where wall ratings are indicated.

C. Install and support safing insulation permanently in position with gaged metal to comply with tested fire assembly and applicable building code requirements.

3.5 INSTALLATION - FIRESTOPPING PADS

A. Install firestopping putty pads on back side of electrical junction boxes or EP Powershield Electrical Box (Insert Pads) in fire-rated walls where boxes are located in same stud space on opposite sides of same wall, and elsewhere required by jurisdictional authority and local fire department.

3.6 THROUGH-PENETRATION FIRESTOPPING IDENTIFICATION

A. Labeling: Identify firestopping systems with pre-printed metal or plastic labels in accordance with FM 4991. Attach label permanently to surfaces immediately adjacent to and within 6 inches of edge of firestop installation so that label will be visible to anyone seeking to remove penetrating items or firestop system.
   1. Metal Labels: Use mechanical fasteners.
   2. Plastic Labels: Use self-adhering type with adhesive capable of permanently bonding lebel to substrate and, in combination with label material, will result in partial destruction of label if removal is attempted.

B. Include following information on each label:
   1. The words "Warning - Through-Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage."
   2. Installing contractor's name, address, and phone number.
   3. Firestop system designation, including applicable testing and inspection agency.
   4. Date of installation.
   5. Firestop system manufacturer's name.
   6. Installer's name.

C. Wall and Partition Identification: Refer to Section 07 05 53 - Fire and Smoke Assembly Identification.

3.7 FIELD QUALITY CONTROL

A. Independent Testing and Inspection Agency: Inspection agency employed and paid by Owner, will examine penetration firestopping in accordance with ASTM E2174 and ASTM E2393.

B. Repair or replace penetration firestopping and joints at locations where inspection results indicate firestopping or joints do not meet specified requirements.

3.8 CLEANING

A. Clean adjacent surfaces of firestopping materials.

3.9 PROTECTION

A. Protect adjacent surfaces from damage by material installation.

END OF SECTION 07 84 00

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 09 29 00 - Gypsum Board: Sealing acoustical and sound-rated walls and ceilings.

B. 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 C834 - Standard Specification for Latex Sealants; 2017 (Reapproved 2023).

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

D. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).

E. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2022.

F. 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.
6. Substrates for which use of primer is required.
7. Substrates for which laboratory adhesion and/or compatibility testing is required.
8. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
9. Sample product warranty.
10. 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. Joint-Sealant Schedule: Include the following information:
1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

G. Submit sealant manufacturer's data based on previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility with substrates matching those indicated for the Porject.

H. 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.

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.

C. Extended Correction Period: Correct defective work within 2-year period commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.1 JOINT SEALANT APPLICATIONS

A. Scope:
   1. Exterior Joints:
      a. Seal open joints except open joints indicated on drawings as not sealed.
   2. Interior Joints:
      a. Do not seal through-penetrations in sound-rated assemblies that are also fire-rated assemblies. Refer to Section 07 84 00 Firestopping.
      b. Seal open joints except specific open joints indicated on drawings as not sealed.
      c. Seal the following joints:
         1) Joints between door frames and window frames and adjacent construction.
         2) In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, and piping penetrations.
         3) In sound-rated wall and ceiling assemblies, seal joints between wall assemblies and ceiling assemblies; between wall assemblies and other construction; between ceiling assemblies and other construction.
   3. Do Not Seal:
      a. Intentional weep holes in masonry.
      b. Joints indicated to be covered with expansion joint cover assemblies.
      c. Joints where sealant is specified to be furnished and installed by manufacturer of product to be sealed.
      d. Joints where sealant installation is specified in other sections.
      e. Joints between suspended ceilings and walls.

2.2 EXTERIOR JOINT APPLICATIONS

A. Type S - Exterior Joints: Use nonsag nonstaining silicone sealant, unless otherwise indicated.

B. Type B - Bedding sealant at thresholds and sills: Butyl rubber.
   1. Type Bn - Lap Joints in Sheet Metal Fabrications: Butyl rubber, noncuring.
   2. Type Bn - Lap Joints between Manufactured Metal Panels: Butyl rubber, noncuring.

C. Type Psl - Control and Expansion Joints in Concrete Paving: Self-leveling polyurethane sealant.

D. Type[P]- Exterior Joints to be Painted: Use nonsag polyurethane sealant, unless otherwise indicated. STPE and STPU sealants will be considered.

2.3 INTERIOR JOINT APPLICATIONS

A. Type P - Interior Joints: Use nonsag, paintable polyurethane sealant at perimeter joints around exterior fenestration frames.

B. Type L - Wall and Ceiling Joints in Nonwet Areas: Acrylic emulsion latex sealant.

C. Type Sm - Joints between plumbing fixtures and adjoining walls, floors, and counters: Mildew-resistant silicone sealant.
   1. Type Sm - Joints between Tile in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant.

D. Type Psl - Other Floor Joints not concealed with floor coverings: Self-leveling polyurethane traffic-grade sealant.

E. Definitions:
   1. Interior Wet Areas: Restrooms; fixtures in wet areas include plumbing fixtures, countertops, cabinets, and other similar items.
   2. Sound-Rated Assemblies: Walls and ceilings identified as STC-rated, sound-rated, or acoustical.

2.4 JOINT SEALANTS - GENERAL

A. Colors for Concealed Locations: Manufacturer's standard.

B. Colors for Locations Exposed to View: As selected by Architect from Manufacturer's Full Range.

C. Custom Color-Matched Colors: Where indicated.

2.5 NONSAG JOINT SEALANTS

A. Type S - Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
   1. Exterior joints in vertical surfaces and horizontal non-traffic surfaces:
      a. Construction joints in cast-in-place concrete.
      b. Control and expansion joints in unit masonry.
      c. Joints between metal panels or metal materials.
      d. Joints between different materials listed above.
   2. Movement Capability: Plus 100 percent, minus 50 percent, minimum.
   3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
   4. Color: Match adjacent finished surfaces.
   5. Products:

a. Dow; DOWSIL 790 Silicone Building Sealant: www.dow.com/#sle.
b. Pecora Corporation; Pecora 890 NST (Non-Staining Technology): www.pecora.com/#sle.
c. Sika Corporation; Sikasil WS-290: www.usa.sika.com/#sle.
d. Tremco Commercial Sealants & Waterproofing; Spectrem 1: www.tremcosealants.com/#sle.
e. Substitutions: See Section 01 60 00 - Product Requirements.

B. Type Sm - Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
1. Color: To be selected by Architect from manufacturer's standard range.
2. Products:
a. Momentive Performance Materials, Inc/GE Silicones; SCS1700 Sanitary Sealant: www.siliconeforbuilding.com.
b. Pecora Corporation898 NST: www.pecora.com.
c. Dow Corning Corporation; 786-M.
d. Tremco Incorporated; Tremsil 200.

C. Type P - Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single component; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus 50 percent, minimum.
2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
3. Color: To be selected by Architect from manufacturer's standard range.
4. Service Temperature Range: Minus 40 to 180 degrees F.
5. Products:
a. Pecora Corporation; Dynatrol I-XL: www.pecora.com.
b. Sika Corporation; Sikaflex-15 LM: www.usa.sika.com/#sle.
c. Tremco Commercial Sealants & Waterproofing; Dymonic 100: www.tremcosealants.com/#sle.
d. Tremco Incorporated; Dymonic 100.

D. Type L - Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
1. Color: To be selected by Architect from manufacturer's standard range.
2. Grade: ASTM C834; Grade 0 Degrees F (Minus 18 Degrees C).
3. Products:
a. Momentive Performance Materials, Inc/GE Silicones; RCS20 Acoustical Latex Sealant: www.siliconeforbuilding.com.
b. Pecora Corporation AVW-920 High Performance Acrylic Latex: www.pecora.com.
c. Tremco Commercial Sealants & Waterproofing; Tremflex 834: www.tremcosealants.com/#sle.

E. Type B - Butyl Sealant: Solvent-based; ASTM C1311; single component, nonsag; not expected to withstand continuous water immersion or traffic.
1. Service Temperature Range: Minus 13 to 180 degrees F.

2. Products:
    a. Sherwin-Williams Company; Storm Blaster All Season Sealant: www.sherwin-williams.com/#sle.
    b. Pecora Corporation; BC-158.
    c. Tremco Incorporated; Tremco Butyl Sealant

F. Type Bn - Noncuring Butyl Sealant: Solvent-based, single component, nonsag, nonskinning, nonhardening, nonbleeding; nonvapor permeable; intended for fully concealed applications.
1. Products:
    a. Pecora Corporation; Pecora BA-98 Non-Skinning Butyl Sealant: www.pecora.com/#sle.
    b. Tremco Commercial Sealants & Waterproofing; Acoustical/Curtainwall Sealant: www.tremcosealants.com/#sle.
    c. Substitutions: See Section 01 60 00 - Product Requirements.

2.6 SELF-LEVELING JOINT SEALANTS

A. Type Psl - Self-Leveling Polyurethane Sealant for Continuous Water Immersion: Polyurethane; ASTM C920, Grade P, Uses M and A; single component; explicitly approved by manufacturer for traffic exposure and continuous water immersion.
1. Movement Capability: Plus and minus 50 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 standard range.
4. Service Temperature Range: Minus 40 to 180 degrees F.
5. Products:
    a. Sika Corporation; Sikaflex 15 LM: www.usa.sika.com/#sle.
    b. Tremco Incorporated; Dymonic 100.
    c. Pecora Corporation; NR-201.
    d. Substitutions: See Section 01 60 00 - Product Requirements.

2.7 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, Closed-Cell Type: For exterior applications and joints subject to pedestrian or vehicular traffic.
1. Cylindrical flexible sealant backings complying with ASTM C1330 Type C.
2. Size: 25 to 50 percent larger in diameter than joint width.

C. Sealant Backing Rod, Open-Cell Type: For interior applications not subject to pedestrian or vehicular traffic.

D. Sealant Backing Rod, Bi-Cellular Type: For exterior applications and joints subject to pedestrian or vehicular traffic.
   1. Cylindrical flexible sealant backings complying with ASTM C1330 Type B.
   2. Size: 25 to 50 percent larger in diameter than joint width.

E. Preformed Extruded Silicone Joint Seal: Pre-cured low-modulus silicone extrusion, in sizes to fit applications indicated on drawings, combined with a neutral-curing liquid silicone sealant for bonding joint seal to substrates.
   1. Size: 1 inch wide, in rolls 100 feet long.
   2. Thickness: 0.78 inch, with ridges along outside bottom edges for bonding area.
   3. Color: As selected by Architect..
   4. Products:
      a. Tremco Commercial Sealants & Waterproofing; Spectrem Simple Seal: www.tremcosealants.com/#sle.

F. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

G. Masking Tape: Self-adhesive, nonabsorbent, nonstaining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

H. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.

I. Primers: Type recommended by sealant manufacturer to suit application; nonstaining.

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.

D. Preinstallation Adhesion Testing: Install a sample for each test location indicated in the test plan.
   1. Test each sample as specified in PART 1 under QUALITY ASSURANCE article.
   2. Notify Architect of date and time that tests will be performed, at least seven days in advance.
   3. Record each test on Preinstallation Adhesion Test Log as indicated.
   4. If any sample fails, review products and installation procedures, consult manufacturer, or take other measures that are necessary to ensure adhesion; retest in a different location; if unable to obtain satisfactory adhesion, report to Architect.

5. After completion of tests, remove remaining sample material and prepare joints for new sealant installation.

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.

E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in an inconspicuous area to verify that it does not stain or discolor slab.

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. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

D. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:
   1. Width/depth ratio of 2:1.
   2. Neck dimension no greater than 1/3 of the joint width.
   3. Surface bond area on each side not less than 75 percent of joint width.

E. Install bond breaker backing tape where backer rod cannot be used.

F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

G. 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.

H. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

I. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

END OF SECTION 07 92 00

SECTION 080671 – DOOR HARDWARE SCHEDULE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section references specification sections relating to commercial door hardware for the following:

1. Swinging doors.
2. Sliding Doors.
3. Other doors to the extent indicated.

B. Commercial door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical and access control door hardware.
3. Electromechanical and access control door hardware power supplies, back-ups and surge protection.
4. Automatic operators.
5. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section “Door Hardware”.

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

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

E. Standards: Reference Related Sections for requirements regarding compliance with applicable industry standards.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

a. Type, style, function, size, label, hand, and finish of each door hardware item.
b. Manufacturer of each item.
c. Fastenings and other pertinent information.
d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
e. Explanation of abbreviations, symbols, and codes contained in schedule.
f. Mounting locations for door hardware.
g. Door and frame sizes and materials.

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

C. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.

D. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service

representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.

F. Warranties and Maintenance: Special warranties and maintenance agreements specified in the Related Sections.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.5 WARRANTY

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

1.6 MAINTENANCE SERVICE

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

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. Refer to “PART 3 – EXECUTION” for required specification sections.

PART 3 - EXECUTION

3.1 DOOR HARDWARE SETS

A. The door hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a

hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.

2. The supplier is responsible for handing and sizing all products.

3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Products listed in the hardware sets shall be supplied by and in accordance with the requirements described in the specification section as noted for each item.

1. Section 08 71 00 – Door Hardware.

C. Manufacturer's Abbreviations:

1. MK - McKinney
2. PE - Pemko
3. SU - Securitron
4. RU - Corbin Russwin
5. OT - Other
6. RO - Rockwood
7. NO - Norton Rixson

Hardware Sets

Set: 1.0

Doors: 001, 046, 052

2 Continuous Hinge	CFM-SLF-HD1 PT		PE	087100
2 Electric Power Transfer	EL-CEPT	630	SU	087100
1 Mullion	CR9__KM		RU	087100
1 Rim Exit Device, Nightlatch	PED4247 MELR M52 K157ET M92	630	RU	087100
1 Rim Exit Device, Exit Only	PED4201 MELR M52 EO M92	630	RU	087100
4 Cylinder	- Match Owner's existing key system	626	OT	087100
1 Cylinder Kit	CRMCK1 LC	630	RU	087100

2	Pull	RM201 Mtg-Type 12XHD	US32D-316	RO	087100
2	Concealed Overhead Holder/Stop	6-X36	630	NO	087100
2	Surface Closer	DC8220 x mounting plate to suit application	689	RU	087100
1	Weatherstrip	- Integral to door and frame assembly		OT	08 4113
2	Sweep	29326CNB TKSP		PE	087100
1	Threshold	1715AK MSES25SS		PE	087100
2	ElectroLynx Harness	QC-C1500P (power transfer or electric strike to junction box above)		MK	087100
2	ElectroLynx Harness	QC-C (power transfer to exit device rail)		MK	087100
1	Card Reader	- Provided by Security Contractor		OT	281300
2	Position Switch	DPS-M-BK		SU	087100
1	Power Supply	AQL4-R8E1		SU	087100
1	Wiring Diagram	- Elevation and Point to Point as Specified		OT	

Notes:

Doors normally closed and locked.
Presentation of valid credential at card reader retracts exit device latch bolts allowing ingress.
Door position switches to monitor / report open closed status of opening to security system.
Exit devices equipped with request to exit switches at rail to shunt door monitoring at egress.
Free egress at all times.
Fail-secure.

Set: 2.0

Doors: 029

2	Continuous Hinge	CFM-HD1 PT		PE	087100
2	Electric Power Transfer	EL-CEPT	630	SU	087100
1	Mullion	CR9__KM		RU	087100
1	Rim Exit Device, Nightlatch	PED5247 MELR M52 K157ET M92	630	RU	087100
1	Rim Exit Device, Exit Only	PED5201 M52 EO M92	630	RU	087100
4	Cylinder	- Match Owner's existing key	626	OT	087100

	system			
1 Cylinder Kit	CRMCK1 LC	630	RU	087100
1 Vandal Resistant Trim	VRT22	US32D	RO	087100
1 Vandal Resistant Trim	VRT22 C	US32D	RO	087100
2 Surface Closer	DC8210 A11	689	RU	087100
2 Kick Plate	K1050 10" high CSK BEV	US32D	RO	087100
2 Astragal	316APK TKSP8		PE	087100
1 Gasketing	2891APK TKSP8		PE	087100
1 Rain Guard	346C TKSP8		PE	087100
2 Gasketing	290APK TKSP		PE	087100
2 Door Bottom	216AFG TKSP		PE	087100
1 Threshold	252x3AFG Pemkote MSES25SS		PE	087100
2 ElectroLynx Harness	QC-C1500P (power transfer or electric strike to junction box above)		MK	087100
2 ElectroLynx Harness	QC-C (power transfer to exit device rail)		MK	087100
1 Card Reader	- Provided by Security Contractor		OT	281300
2 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQL4-R8E1		SU	087100
1 Wiring Diagram	- Elevation and Point to Point as Specified		OT	

Notes:

Doors normally closed and locked.
Presentation of valid credential at card reader retracts exit device latch bolts allowing ingress.
Door position switches to monitor / report open closed status of opening to security system.
Exit devices equipped with request to exit switches at rail to shunt door monitoring at egress.
Free egress at all times.
Fail-secure.

Set: 3.0

Doors: 028, 038

2 Continuous Hinge	CFM-HD1-M		PE	087100
1 Mullion	CR9__KM		RU	087100
1 Rim Exit Device, Nightlatch	PED5247 M52 K157ET	630	RU	087100
1 Rim Exit Device, Exit Only	PED5201 M52 EO	630	RU	087100
4 Cylinder	- Match Owner's existing key	626	OT	087100

	system			
1 Cylinder Kit	CRMCK1 LC	630	RU	087100
1 Vandal Resistant Trim	VRT22	US32D	RO	087100
1 Vandal Resistant Trim	VRT22 C	US32D	RO	087100
2 Surface Closer	DC8210 A11	689	RU	087100
2 Kick Plate	K1050 10" high CSK BEV	US32D	RO	087100
2 Astragal	316APK TKSP8		PE	087100
1 Gasketing	2891APK TKSP8		PE	087100
1 Rain Guard	346C TKSP8		PE	087100
2 Gasketing	290APK TKSP		PE	087100
2 Door Bottom	216AFG TKSP		PE	087100
1 Threshold	252x3AFG Pemkote MSES25SS		PE	087100
2 Position Switch	DPS-M-BK		SU	087100
1 Wiring Diagram	- Elevation and Point to Point as Specified		OT	

Notes:

Door position switches to monitor / report open closed status of opening to security system.

Set: 4.0

Doors: 002, 047, 051

2 Continuous Hinge	CFM-SLF-HD1-M		PE	087100
2 Dummy Bar	PED5000DB	630	RU	087100
2 Pull	RM201 Mtg-Type 12XHD	US32D-316	RO	087100
2 Concealed Overhead Holder/Stop	6-X36	630	NO	087100
2 Surface Closer	DC8220 x mounting plate to suit application	689	RU	087100

Set: 5.0

Doors: 058

3 Hinge (heavy weight)	T4A3786	US26D	MK	087100
1 Rim Exit Device	PED5247 N947PT	630	RU	087100
1 Cylinder	- Match Owner's existing key system	626	OT	087100

1 Surface Closer	DC6210 A3	689	RU	087100
1 Kick Plate	K1050 10" high CSK BEV	US32D	RO	087100
1 Wall Stop	406 / 409	US32D	RO	087100
3 Silencer	608 / 609		RO	087100

Set: 6.0

Doors: 036, 039

6 Hinge (heavy weight)	T4A3786	US26D	MK	087100
2 Surface Vert Rod Exit	PED5455 N9M55PT M55	630	RU	087100
2 Cylinder	- Match Owner's existing key system	626	OT	087100
2 Surface Closer	DC6210 A2	689	RU	087100
2 Kick Plate	K1050 10" high CSK BEV	US32D	RO	087100
2 Wall Stop	406 / 409	US32D	RO	087100
2 Silencer	608 / 609		RO	087100

Set: 7.0

Doors: 015

3 Hinge, Full Mortise	TA2714-MCK	US26D	MK	087100
1 Electric Power Transfer	EL-CEPT	630	SU	087100
1 Fail Safe Lockset	CLX33903 NZD LC	626	RU	087100
1 Cylinder	- Match Owner's existing key system	626	OT	087100
1 Surface Closer	DC6210 A3	689	RU	087100
1 Kick Plate	K1050 10" high CSK BEV	US32D	RO	087100
1 Wall Stop	406 / 409	US32D	RO	087100
3 Silencer	608 / 609		RO	087100
1 ElectroLynx Harness	QC-C1500P (power transfer or electric strike to junction box above)		MK	087100
1 ElectroLynx Harness	QC-C (power transfer to lock or electric strike location)		MK	087100
1 Card Reader	- Provided by Security Contractor		OT	281300
1 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQL4-R8E1		SU	087100

1 Wiring Diagram	- Elevation and Point to Point as Specified	OT

Notes:

Door normally closed and locked.
Presentation of valid credential at card reader unlocks electric lock allowing ingress.
Door position switch to monitor / report open closed status of opening to security system.
Electric lock equipped with request to exit switch at interior lever to shunt door monitoring at egress.
Free egress at all times.
Fail-safe.

Set: 8.0

Doors: 020, 021, 023, 024

3 Hinge, Full Mortise	TA2714-MCK	US26D	MK	087100
1 Storeroom Lock	CLX3357 NZD LC	626	RU	087100
1 Cylinder	- Match Owner's existing key system	626	OT	087100
1 Surface Closer	DC6200 - pull side mount	689	RU	087100
1 Kick Plate	K1050 10" high CSK BEV	US32D	RO	087100
1 Wall Stop	406 / 409	US32D	RO	087100
3 Silencer	608 / 609		RO	087100

Set: 9.0

Doors: 014

3 Hinge, Full Mortise	TA2714-MCK	US26D	MK	087100
1 Storeroom Lock	CLX3357 NZD LC	626	RU	087100
1 Cylinder	- Match Owner's existing key system	626	OT	087100
1 Surface Closer	DC6210 A3	689	RU	087100
1 Kick Plate	K1050 10" high CSK BEV	US32D	RO	087100
1 Wall Stop	406 / 409	US32D	RO	087100
3 Silencer	608 / 609		RO	087100

Set: 10.0

Doors: 045

3 Hinge, Full Mortise	TA2714-MCK	US26D	MK	087100
1 Storeroom Lock	CLX3357 NZD LC	626	RU	087100
1 Cylinder	- Match Owner's existing key system	626	OT	087100
1 Surface Closer	DC6210 A4	689	RU	087100
1 Kick Plate	K1050 10" high CSK BEV	US32D	RO	087100
3 Silencer	608 / 609		RO	087100

Set: 11.0

Doors: 004, 005, 006

3 Hinge, Full Mortise	TA2714-MCK	US26D	MK	087100
1 Entrance Lock	CLX3351 NZD LC	626	RU	087100
1 Cylinder	- Match Owner's existing key system	626	OT	087100
1 Wall Stop	406 / 409	US32D	RO	087100
3 Silencer	608 / 609		RO	087100

Set: 12.0

Doors: 022, 025, 031, 032, 033, 034, 042, 043, 044, 048, 049, 050, 055, 056, 057

3 Hinge (heavy weight)	T4A3786	US26D	MK	087100
1 Classroom Lock	CLX3355 NZD LC	626	RU	087100
1 Cylinder	- Match Owner's existing key system	626	OT	087100
1 Wall Stop	406 / 409	US32D	RO	087100
3 Silencer	608 / 609		RO	087100

Set: 13.0

Doors: 053, 054

3 Hinge (heavy weight)	T4A3786	US26D	MK	087100
1 Deadbolt	DL4117 LC	626	RU	087100
1 Mortise Cylinder	- Match Owner's existing key system	626	OT	087100
1 Pull Plate	BF 111x70B	US32D	RO	087100
1 Push Plate	70E	US32D-316	RO	087100

1 Surface Closer	DC6200 - pull side mount	689	RU	087100
1 Kick Plate	K1050 10" high CSK BEV	US32D	RO	087100
1 Wall Stop	406 / 409	US32D	RO	087100
3 Silencer	608 / 609		RO	087100

Set: 14.0

Doors: 013

3 Hinge (heavy weight)	T4A3786	US26D	MK	087100
1 Deadbolt	DL4117 LC	626	RU	087100
1 Mortise Cylinder	- Match Owner's existing key system	626	OT	087100
1 Pull Plate	BF 111x70B	US32D	RO	087100
1 Push Plate	70E	US32D-316	RO	087100
1 Surface Closer	DC6210 A3	689	RU	087100
1 Kick Plate	K1050 10" high CSK BEV	US32D	RO	087100
1 Wall Stop	406 / 409	US32D	RO	087100
3 Silencer	608 / 609		RO	087100

Set: 15.0

Doors: 040

3 Hinge (heavy weight)	T4A3786	US26D	MK	087100
1 Deadbolt	DL4117 LC	626	RU	087100
1 Mortise Cylinder	- Match Owner's existing key system	626	OT	087100
1 Pull Plate	BF 111x70B	US32D	RO	087100
1 Push Plate	70E	US32D-316	RO	087100
1 Surface Closer	DC6210 A4	689	RU	087100
1 Kick Plate	K1050 10" high CSK BEV	US32D	RO	087100
3 Silencer	608 / 609		RO	087100

Set: 16.0

Doors: 017, 019, 026, 027, 030, 035, 037, 041

1 Hardware	- Existing hardware to remain, verify in field		OT	087100

Set: 17.0

Doors: MISC

1 Repair Kit	QC-R001	MK 087100
1 Crimp Tool	QC-R003	MK 087100

END OF SECTION 080671

SECTION 080671.1 – DOOR HARDWARE SCHEDULE – ALLSTEEL DEMOUNTABLE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section references specification sections relating to commercial door hardware for the following:

1. Swinging doors.
2. Sliding Doors.
3. Other doors to the extent indicated.

B. Commercial door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical and access control door hardware.
3. Electromechanical and access control door hardware power supplies, back-ups and surge protection.
4. Automatic operators.
5. Cylinders specified for doors in other sections.

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

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

D. Standards: Reference Related Sections for requirements regarding compliance with applicable industry standards.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

a. Type, style, function, size, label, hand, and finish of each door hardware item.
b. Manufacturer of each item.
c. Fastenings and other pertinent information.
d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
e. Explanation of abbreviations, symbols, and codes contained in schedule.
f. Mounting locations for door hardware.
g. Door and frame sizes and materials.

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

C. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.

D. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.

F. Warranties and Maintenance: Special warranties and maintenance agreements specified in the Related Sections.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.5 WARRANTY

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

1.6 MAINTENANCE SERVICE

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

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. Refer to “PART 3 – EXECUTION” for required specification sections.

PART 3 - EXECUTION

3.1 DOOR HARDWARE SETS

A. The door hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.

2. The supplier is responsible for handing and sizing all products.

3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Products listed in the hardware sets shall be supplied by and in accordance with the requirements described in the specification section as noted for each item.

C. Manufacturer's Abbreviations:

1. GS - ASSA ABLOY Glass Solutions
2. AK - Alarm Controls
3. OT - Other
4. RO - Rockwood
5. SU - Securitron

Hardware Sets

Set: 1.0

Doors: 003, 007

1	Door Top Rail	DRT-275BD-T	US32D / BSP	GS	
1	Door Bottom Rail	DRT-275BD-B	US32D	GS	
1	Top Pivot	PV-WALKBEAM	US32D	GS	
1	Bottom Pivot	PV-FM-300END	US32D	GS	
1	Top Pivot Insert	DRP-275 TOP		GS	
1	Magnetic Lock	600LB		AK	⚡
1	Door Pull / Push	RM3301- BTB (CTC and OA to be dictated by manufacturer / client preference)	US32D	GS	
1	Concealed Closer	OHC-609 (90HO / 90NHO / 105HO / 105NHO)		GS	
1	Bottom Pivot Closer Arm	DOHC-275		GS	
1	Door Stop (Floor Mounted)	441CU (Optional)	US26D / BSP	RO	
1	Pushbutton	EEB2		SU	⚡
1	Power Supply	AQL Series (Amperage as required) - Provided by Security Contractor		SU	⚡
1	Card Reader	RP10 - Provided by Security		OT	

Contractor

Notes:

Hardware provided by demountable manufacturer

Door normally closed and locked by fail-safe electromagnetic lock.
Valid use of card reader temporarily unlocks electromagnetic lock allowing access.
Electromagnetic lock unlocks upon person approaching door is direction of egress, loss of power, or activation of fire alarm system.
Additional push button, located egress side of door, unlocks electromagnetic lock for 30 seconds and is re-triggerable for 30 second release. Push button wired independent of the access control system electronics. Locate push button 40 to 48 inches vertically above the floor and within 5 feet of the door.
Fail-safe.

Set: 2.0

Doors: 008, 009, 010, 011, 012, 016, 018

1	Mortise Cylinder	- Match Owner's existing key system	626	OT
1	Dust Proof Strike	570 (Bottom locking)	US26D	GS
1	Top Locking Pull Strike	LPS01 (Top Mount) / LPS07 (Side Mount for 2" Header)	US32D	RO
1	Locking Pull	LP3301 x ADA (Available as full or half height)	US32D	GS
1	Door Stop (Floor Mounted)	441CU (Optional)	US26D / BSP	RO

Notes:

Hardware provided by demountable manufacturer

END OF SECTION 080671

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Standard and custom hollow metal doors and frames.
2. Steel sidelight, borrowed lite and transom frames.
3. Louvers installed in hollow metal doors.
4. Light frames and glazing installed in hollow metal doors.

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

1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
8. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
9. SDI-113 Standard Practice for Determining the Steady-State Thermal Transmittance of Steel Door & Frame Assemblies.
10. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
11. ASTM C1199 - Standard Test Method for Measuring the Steady-State Thermal Transmittance of Fenestration Systems Using Hot Box Methods
12. ASTM E1423 - Practice for Determining Steady State Thermal Transmittance of Fenestration Systems.
13. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
14. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.

15. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
16. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
17. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
18. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
19. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.

B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.

C. Shop Drawings: Include the following:

1. Elevations of each door design.
2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of anchorages, joints, field splices, and connections.
6. Details of accessories.
7. Details of moldings, removable stops, and glazing.
8. Details of conduit and preparations for power, signal, and control systems.

D. Samples for Verification:

1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.

B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".

C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40” above sill) or UL 10C.

1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.

2. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
3. Smoke Control Door Assemblies: Comply with NFPA 105.

    a. Smoke "S" Label: Doors to bear “S” label and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.

D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.

E. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

B. Building Information Modeling (BIM) Support: Utilize designated BIM software tools and obtain training needed to successfully participate in the Project BIM processes. All technical disciplines are responsible for the product data integration and data reliability of their Work into the coordinated BIM applications.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames from a SDI Certified manufacturer:

1. CECO Door Products (C).
2. Curries Company (CU).

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 HOLLOW METAL DOORS

A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.

B. Exterior Doors: Face sheets fabricated of commercial quality hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Design: Flush panel.
2. Core Construction: Manufacturer’s thermally enhanced QMax core. Where indicated provide doors fabricated as thermal-rated assemblies with a minimum operable thermal rating of 0.35 BTU/hr-ft2-F.
3. Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), Minimum 16 gauge (0.053-inch - 1.3-mm) thick steel, Model 2.
4. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw

attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.

5. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
6. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

C. Manufacturers Basis of Design:

1. Curries Company (CU) - QMax Core - 707 Series.

2.4 HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

B. Thermal Break Frames: Subject to the same compliance standards and requirements as standard hollow metal frames. Tested for thermal performance in accordance with SDI-113, ASTM C1363, ASTM C1119, ASTM E1423, NFRC 102 and resistance to air infiltration in accordance with ASTM-E283. Where indicated provide thermally broken frame profiles available for use in both masonry and drywall construction. Fabricate with 1/16” positive thermal break and integral vinyl weatherstripping.

C. Exterior Frames: Fabricated of hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60.

1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
2. Frames: Minimum 14 gauge (0.067-inch -1.7-mm) thick steel sheet.
3. Manufacturers Basis of Design:

a. Curries Company (CU) - Mercury 3 Thermal Break TQ Series.

D. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.

1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
3. Manufacturers Basis of Design:

a. Curries Company (CU) - CM Series.
b. Curries Company (CU) - M Series.

E. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.

F. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.5 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
2. Existing Masonry Type: Provide steel pipe spacers welded to plate reinforcing at jamb stops or hat shaped formed strap spacers welded to jamb near the stop. Drill jamb stop and strap spacers for flat head bolts to pass through frame and spacers.
3. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.

B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.

C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.6 LIGHT OPENINGS AND GLAZING

A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator’s shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.

B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.

C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.

D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

2.7 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.8 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.

C. Hollow Metal Doors:

1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.
2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
3. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
4. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".

D. Hollow Metal Frames:

1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

    a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.

3. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
5. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
7. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
8. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
9. Jamb Anchors: Provide number and spacing of anchors as follows:

    a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches on-center and as follows:

        1) Two anchors per jamb up to 60 inches high.
        2) Three anchors per jamb from 60 to 90 inches high.
        3) Four anchors per jamb from 90 to 120 inches high.
        4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

1) Three anchors per jamb up to 60 inches high.
2) Four anchors per jamb from 60 to 90 inches high.
3) Five anchors per jamb from 90 to 96 inches high.
4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.

10. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".
11. Bituminous Coating: Where frames are fully grouted with an approved Portland Cement based grout or mortar, coat inside of frame throat with a water based bituminous or asphaltic emulsion coating to a minimum thickness of 3 mils DFT, tested in accordance with UL 10C and applied to the frame under a 3rd party independent follow-up service procedure.

E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.9 STEEL FINISHES

A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.1 EXAMINATION

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

B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).

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

3.2 PREPARATION

A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.

C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."

D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

E. Verify tolerances against manufacturers installations instructions for tornado and hurricane storm shelter openings.

3.3 INSTALLATION

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

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.

1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Standard Steel Doors:

a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.

c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow metal work immediately after installation.

C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

3.5 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

END OF SECTION 081113

SECTION 08 14 16 - FLUSH WOOD DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Flush wood doors; flush configuration; fire-rated and non-rated.

1.2 RELATED REQUIREMENTS

A. Section 08 11 13 - Hollow Metal Doors and Frames.

B. Section 08 71 00 - Door Hardware.

C. Section 08 80 00 - Glazing.

1.3 REFERENCE STANDARDS

A. AWI (QCP) - Quality Certification Program; Current Edition.

B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

C. ITS (DIR) - Directory of Listed Products; Current Edition.

D. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.

E. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2022.

F. UL (DIR) - Online Certifications Directory; Current Edition.

G. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

H. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2021, with Errata (2022).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the work with door opening construction, door frame and door hardware installation.
   2. Coordinate installation of glazing.

1.5 SUBMITTALS

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

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

C. Door Schedule: Provide schedule coordinated with numbering on drawings and hardware schedule. Indicate door types and openings receiving electrified hardware.

D. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
   1. Provide information as required by AWI/AWMAC/WI (AWS).
   2. Include certification program label.

E. Selection Samples: Submit manufacturer’s stain color selector guide.

F. Verification Samples: Submit two samples of door veneer, 6 by 6 inch in size illustrating wood grain, stain color, and sheen.

G. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

H. Specimen warranty.

I. Warranty, executed in Owner's name.

1.6 QUALITY ASSURANCE

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

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum three years of documented experience.
   1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

C. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

D. Quality Certification:
   1. Comply with AWI (QCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section: www.awiqcp.org/#sle.
   2. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) requirements for grade or grades specified.
   3. Provide designated labels on shop drawings as required by certification program.
   4. Provide designated labels on installed products as required by certification program.

5. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

E. Obtain all doors of each type specified from a single manufacturer to assure uniformity of appearance and construction.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging, and inspect for damage.

C. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

1.8 WARRANTY

A. Interior Doors: Provide manufacturer's warranty for the life of the installation.

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

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers - Wood Veneer Faced Doors:
1. Algoma Hardwoods, Inc.: www.algomahardwoods.com.
2. Haley Brothers: www.haleybros.com/#sle.
3. Marshfield DoorSystems, Inc.: www.marshfielddoors.com.
4. Oregon Door: www.oregondoor.com/sle.
5. VT Industries, Inc: www.vtindustries.com/#sle.
6. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 DOORS

A. Doors: Refer to Drawings for locations and additional requirements.
1. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with WDMA I.S. 1A.
2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
3. Low Emitting Materials: Provide doors made with adhesives and composite wood products that do not contain urea formaldehyde.
a. Formaldehyde Emmission: Not greater than 0.05 mg/m2/hr.

b. 2 Ethyl-1 Hexanol Emission: Not greater than 3.00 mg/m2/hr.

c. Total VOC Emission: Not greater than 10.00 mg/m2/hr.

B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.

1. Provide solid core doors at each location.
2. Fire Rated Doors: Tested to ratings indicated on Drawings in accordance with UL 10C - Positive Pressure; Underwriters Laboratories Inc (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.
3. Smoke and Draft Control Doors: In addition to required fire rating, provide flush wood door assemblies in compliance with WDMA I.S. 1A requirements for "S" label; no additional gasketing or edge sealing allowed.

2.3 DOOR AND PANEL CORES

A. General Requirement: Provide door cores fully bonded to stiles and rails.

B. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.

1. Particleboard Core Grade: LD-1 or Grade LD-2.
2. At Contractor’s option, provide doors with structural composite lumber core (SCLC) instead of particleboard cores with mid-rail blocking for doors indicated to receive exit devices.
3. Provide structural composite lumber core (SCLC) at doors with full lite glazing.

C. Fire-Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

2.4 DOOR FACINGS

A. Veneer Facing for Transparent Finish: Species to match existing, veneer grade in accordance with quality standard indicated, with veneer matching between leaves and spliced veneer leaves assembled on door or panel face to be same as existing.

B. Veneer Facing for Opaque Finish: MDF or closed-grained hardwood veneer, in compliance with indicated quality standard.

C. Facing Adhesive: Type II - water resistant.

2.5 DOOR CONSTRUCTION

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

B. Cores constructed with stiles and rails:

1. Provide solid blocks at lock edge and top of door for closer for hardware reinforcement.
   a. Provide solid blocking for other throughbolted hardware.

2. Provide minimum 6 inch high solid wood top rail and minimum 16 inch high solid wood bottom rail, all doors; fire-resistant treated at fire-rated doors.

C. Glazed Openings: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.

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

E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
1. Exception: Doors to be field finished.

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

2.6 FACTORY FINISHING - WOOD VENEER DOORS

A. Finish work in accordance with WDMA I.S. 1A for grade specified and as follows:
1. Transparent:
a. System - WDMA TR-6 or manufacturer's standard water-based stain and ultraviolet (UV) cured polyurethane sealer meeting or exceeding performance standards of System TR-6.
b. Stain: As selected by Architect.
c. Sheen: Satin.

B. Factory finish doors to match existing doors.

C. Seal door top edge with color sealer to match door facing.

2.7 ACCESSORIES

A. Hollow Metal Door Frames: See Section 08 11 13.

B. Glazing: See Section 08 80 00.

C. Glazing Stops - Doors Up to and Including 20-minute Ratings: Wood, of same species as door facing, butted corners; prepared for countersink style tamper proof screws.
1. Profile: Flush bead.
2. At wood core doors with 20-minute fire protection ratings, provide wood beads and metal glazing clips approved for such use.

D. Glazing Stops - Doors with Ratings Exceeding 20-minutes: Unfinished wood veneer laminated over extruded PVC core with mitered corners; fastenable to manufacturer's glazing frame with double-sided adhesive tape or proprietary adhesive to maintain tested assembly rating.
1. Veneer Type: Match specified door veneer.
2. Acceptable Product:

a. Anemostat; WoodPro Wood Veneer Metal Vision Frame Kit: www.anemostat.com.
b. Substitutions: See Section 01 6000 - Product Requirements.

E. Door Hardware: See Section 08 71 00.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.2 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.
1. Install fire-rated doors in accordance with NFPA 80, ITS (DIR), and UL (DIR) requirements.
2. Install smoke and draft control doors in accordance with NFPA 105 requirements.

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

C. Field-Finished Doors: Trimming to fit is acceptable.

D. Adjust width of non-rated doors by cutting equally on both jamb edges.
1. Trim maximum of 3/4 inch off bottom edges.
2. Trim fire-rated doors in strict compliance with fire rating limitations.

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

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

G. Coordinate installation of glazing.

3.3 TOLERANCES

A. Comply with specified quality standard for fit and clearance tolerances.

B. Comply with specified quality standard for telegraphing, warp, and squareness.

C. Maximum Undercut at Fire-Rated Doors: 3/4 inch clearance to non-combustible finish floor surface.

3.4 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

C. Restore finish on all edges of shop finished doors before installation, if fitting or machining is required on site.

3.5 SCHEDULE

A. Refer to Door and Frame Schedule on the Drawings.

END OF SECTION 08 14 16

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 09 91 23 - Interior Painting: Field paint finish.

1.3 REFERENCE STANDARDS

A. ITS (DIR) - Directory of Listed Products; Current Edition.

B. UL (FRD) - Fire Resistance Directory; Current Edition.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate installation with work of other trades, and obtain information on door sizes and exact locations from other trades.
   2. Coordinate placement of rough-in openings with Architect in tiled walls and gypsum board ceilings.
   3. Coordinate placement of access doors and panels with locations of toilet partitions and urinal screens so that doors or panels are not placed in conflict with partition or screen locations.

1.5 SUBMITTALS

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

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

C. Product Schedule: Include types, locations, sizes, latching or locking provisions & other data pertinent to installation.

D. Manufacturer's Installation Instructions: Indicate installation requirements and rough-in dimensions.

E. Project Record Documents: Record actual locations of each access unit.

1.6 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.

C. Basis of Design: Specifications are based on access door types and model numbers by the specified basis of design manufacturer. Access door types manufactured by other acceptable manufacturers are permitted, subject to compliance with specified requirements; and provided that deviations in dimensions and profile are minor, and do not detract substantially from the indicated design intent.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Manufacturer:
   1. Babcock-Davis: www.babcockdavis.com/sle.
      a. Non-Fire-Rated Units: BNW Series, areas viewable by the public.
      b. Non-Fire-Rated Units: BNT Series, back of house areas.
      c. Fire-Rated Units: BIW Series, areas viewable by the public.
      d. Fire-Rated Units: BIT Series, back of house areas.

B. Other Acceptable Manufacturers:
   1. Acudor Products Inc.: www.acudor.com.
   2. Bauco Access Panel Solutions: www.accesspanelsolutions.com.
   3. Bilco Company: www.bilco.com.
   4. J. L. Industries: www.jlindustries.com.
   5. Karp Associates, Inc.: www.karpinc.com.
   6. Larsen's Manufacturing Co.: www.larsensmfg.com.
   7. Milcor by Commercial Products Group of Hart & Cooley, Inc.: www.milcorinc.com.
   8. Substitutions: See Section 01 6000 - Product Requirements.

C. 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. Panel Material: Steel.
   2. Style: Exposed frame with door surface flush with frame surface.
      a. Gypsum Board Mounting Criteria: Use drywall bead type frame.
   3. Doors:
      a. Doors for Fire-Rated Units: Double-skinned hollow panel, 20 gage minimum thickness.

b. Doors for Non-Fire-Rated Units: Single thickness with rolled or turned in edges, 16 gage minimum thickness.

4. Frames: 16 gauge, 0.0598 inch, minimum thickness.
5. Insulation for Rated Doors: Non-combustible mineral wool or glass fiber.
6. 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.
7. Finish: Primed.
8. Size: Fabricate access door frame assemblies to sizes indicated on drawings or, if not indicated, to smallest size which allows free access to concealed work requiring access. Obtain Architect’s approval for rectangular sizes.
   a. Where access to controls, etc. requiring one handed operation within arm's reach is required, provide 8 by 8 inches.
   b. Where access to controls, etc. requiring two-handed operation or rotation within arm's reach is required, provide 12 by 12 inches.
   c. Where upper body access is required (such as above ceilings or beyond arm’s length) provide 18 by 18 inches.
   d. Where full body access is required (such as entering a shaft) provide 24 by 24 inches.
9. Hardware:
   a. Hinge for Fire-Rated-Units: 175 degree steel hinges with non-removable pin.
   b. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
   c. Latch/Lock: Tamperproof tool-operated cam latch.
   d. Number of Locks/Latches Required: As recommended by manufacturer for size of unit.
   e. Gasketing: Extruded neoprene, around perimeter of door panel.

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.

C. Review access panel locations during wall framing rough-in to confirm location is coordinated with interior wall finishes.

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, and secure units rigidly in place.

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

D. Adjust hardware and panels for proper operation.

E. Remove and replace panels that are warped, bowed, or otherwise damaged.

END OF SECTION 08 31 00

SECTION 08 34 73 - SOUND CONTROL DOOR ASSEMBLIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Sound control door assemblies.
   1. Wood doors and metal frames.
   2. Fire-rated doors and frames.

1.2 RELATED REQUIREMENTS

A. Section 08 71 00 - Door Hardware.

B. Section 08 80 00 - Glazing: Glass for doors and borrowed lites.

1.3 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2023.

C. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2020.

D. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

E. ASTM E413 - Classification for Rating Sound Insulation; 2022.

F. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.

G. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

H. ITS (DIR) - Directory of Listed Products; Current Edition.

I. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.

J. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.

K. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.

L. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.

M. UL (DIR) - Online Certifications Directory; Current Edition.

N. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

O. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2021, with Errata (2022).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate installation of glazing.

1.5 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. Selection Samples: Submit manufacturer’s stain color selector guide.

E. Verification Samples: Submit two samples of metal, 6 inch by 6 inch in size showing factory finishes, colors, and surface texture.

F. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

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

B. Maintain at project site copies of reference standards relating to installation of products specified.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store wood doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas, or in areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Wood Sound Control Door Assemblies:
   1. Acoustical Surfaces, Inc.; Studio 3D: www.acousticalsurfaces.com.
   2. ISOSTORE; ISODOOR HD: www.isostore.com.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 REGULATORY REQUIREMENTS

A. Accessibility: Comply with ICC A117.1 and ADA Standards.

B. Opening Force of Sound Control Doors, Non-Fire Rated: 5 lbs, maximum, in compliance with ADA Standards.

C. 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.

D. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with specified requirements for each type; for instance, a sound control door is also indicated as being an exterior door must comply with requirements specified for sound control doors and exterior doors; where two requirements conflict, comply with most stringent.

2.3 COMPONENTS

A. Door Edge Profile: Manufacturer's standard for application indicated.

2.4 SOUND CONTROL DOORS

A. Wood Sound Control Interior Doors: Provide fire-rated door construction as indicated.
   1. Wood Doors: Refer to drawings for locations and additional requirements.
      a. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
         1) Wood veneer facing with factory finish as indicated on drawings.
   2. Sound Transmission Class (STC) Rating of Sound Control Door Assembly: STC as indicated on drawings, minimum, calculated in accordance with ASTM E413, and tested in accordance with ASTM E90.
   3. Sound Seals: As required by manufacturer to meet indicated sound control ratings.
   4. Fire-Rated Doors:
      a. Fire Rating: As indicated on Door Schedule, complying with NFPA 80 and tested in accordance with UL 10C and NFPA 252 as positive pressure fire tests.
      b. Provide units listed and labeled by UL (DIR) or ITS (DIR).

1) Attach fire rating label to each fire rated unit.

c. Door Core Material: As required by manufacturer to meet indicated fire and sound control ratings.

2.5 SOUND CONTROL DOOR FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Metal Sound Control Interior Door Frames: Face-welded type.
1. Frame Finish: Factory primed and field finished.
2. Interior Door Frames, Non-Fire Rated:
3. Fire-Rated Door Frames:
a. Fire Rating: Same as door, and labeled.

2.6 DOOR HARDWARE

A. Hinges: Cam lift type by door manufacturer; see Section 08 71 00.

B. Threshold: Provide sound control/acoustic seal for sill of door in closed position by door manufacturer.

2.7 FINISHES

A. Primer, Metal Frames: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard, in compliance with local VOC requirements.

B. Wood Door Finish: Complying with WDMA I.S. 1A, premium grade, manufacturer's standard coating.
1. Veneer Species: As selected by Architect from manufacturer's standard range.
a. Matching: Same method of existing wood doors.
b. Finish: To match existing wood doors.

2.8 ACCESSORIES

A. Glazing: See Section 08 80 00, factory installed, and tested to comply with specified sound control and fire ratings as indicated.

PART 3 EXECUTION

3.1 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.

3.2 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 light test of installed sound control doors by independent labaoraty to verify there are no gaps between door and the frame, as well as the floor..

C. Repair or replace sound control door components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.3 ADJUSTING

A. Adjust for smooth and balanced sound control door movement.

3.4 SCHEDULE

A. Refer to Door and Frame Schedule on the Drawings.

END OF SECTION 08 34 73

SECTION 08 41 13 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Aluminum-framed storefront, with vision glass.

B. Aluminum doors and frames.

C. Weatherstripping.

1.2 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Sealing joints between frames and adjacent construction.

B. Section 08 71 00 - Door Hardware: Hardware items other than specified in this section.

C. Section 08 80 00 - Glazing: Glass and glazing accessories.

1.3 REFERENCE STANDARDS

A. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.

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

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

D. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

E. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

F. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

G. 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).

H. ASTM E2112 - Standard Practice for Installation of Exterior Windows, Doors and Skylights; 2023.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate air sealing of perimeter with adjacent air barrier materials.
   2. Coordinate with installation of other components that comprise the exterior enclosure.

B. Preinstallation Meeting: Conduct a preinstallation 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 component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.

D. Selection Samples: For each color specified, submit at least 5 color chips representing Architect's designated color range.

E. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

F. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.

G. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.

H. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.

I. Designer's qualification statement.

J. Manufacturer's qualification statement.

K. Installer's qualification statement.

L. Specimen warranty.

1.6 QUALITY ASSURANCE

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

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

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

1.7 DELIVERY, STORAGE, AND HANDLING

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

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

1.8 FIELD CONDITIONS

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

1.9 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 20 year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design:
   1. Kawneer North America: www.kawneer.com.
      a. Interior Frame Series: TriFab VG 451, center set glass.
      b. Exterior Frame Series: TriFab VG 451T, front set glass.
      c. Door Style: 350 Medium Stile.

B. Other Acceptable Manufacturers:
   1. Boyd Aluminum: www.boydaluminum.com/#sle.

2. Oldcastle BuildingEnvelope: www.oldcastlebe.com/#sle.
3. Tubelite, Inc: www.tubeliteinc.com/#sle.
4. YKK AP America, Inc: www.ykkap.com/commercial/#sle.
5. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 ALUMINUM-FRAMED STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Finish: Match existing.
      a. Factory finish all surfaces that will be exposed in completed assemblies.
      b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
      c. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
   2. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
   3. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
   4. 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.
   5. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
   6. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
   7. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
   8. Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glazing and heel bead of glazing compound.

2.3 PERFORMANCE REQUIREMENTS

A. Design Requirements: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
   1. Design Wind Loads: Comply with requirements of applicable code.
   2. Member Deflection: Limit member deflection to L/175 of clear span, 3/4 inch total, or to flexure limit of glass in any direction, whichever is less, with full recovery of glazing materials.

3. Provide reinforced mullion sections as may be required to comply with specified design requirements, for manufacturer's specified system.

B. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 10 psf.
   1. Fastener Heads must be seated and sealed against sill flashing on any fasteners that penetrate through the sill flashing.

C. Air Leakage Laboratory Test: Maximum of 0.06 cu ft/min sq ft of wall area, when tested in accordance with ASTM E283 at 6.24 psf pressure differential across assembly.

D. Condensation Resistance Factor of Framing: 60, minimum, measured in accordance with AAMA 1503.

E. Overall U-factor Including Glazing: 0.40 Btu/(hr sq ft deg F), maximum.

2.4 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken at exterior applications, drainage holes and internal weep drainage system.
   1. Glazing Stops: Flush.
   2. Cross-Section: 2 by 4-1/2 inch nominal dimension.
   3. Corner Assemblies:
      a. 90-Degree Corners: Manufacturer's standard combination of two pocket corner extrusions.
      b. Corners Other Than 90 Degrees: Manufacturer's standard varying degree pocket corner extrusions with aluminum sheet metal fillers and closures.
   4. Reinforced Mullions: As required or recommended by manufacturer using manufacturer's standard profile of extruded aluminum with internal reinforcement of steel shaped structural section.

B. Glazing: See Section 08 80 00.

C. Swing Doors: Glazed aluminum.
   1. Thickness: 1-3/4 inches.
   2. Top Rail: 3-1/2 inches wide.
   3. Vertical Stiles: 3-1/2 inches wide.
   4. Bottom Rail: 10 inches wide.
   5. Glazing Stops: Manufacturer's standard snap-in glazing stops with gasketing; removable from inside.

2.5 MATERIALS

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

B. Sheet Aluminum: ASTM B209/B209M.

C. Structural Steel Sections: ASTM A36/A36M; shop primed.

D. Fasteners: Stainless steel.

E. Exposed Flashings: Aluminum sheet, 20 gauge, 0.032 inch minimum thickness; finish to match framing members.

F. Concealed Flashings: Stainless steel, 26 gauge, 0.0187 inch minimum thickness.

G. Sill Flashing Sealant: Elastomeric, silicone or polyurethane, compatible with flashing material.

H. Sealant for Setting Thresholds: Non-curing butyl type.

I. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
   1. Size gaskets as required by manufacturer of glazing channel frame to provide proper pressure and bite on glazing units.

J. Glazing Accessories: See Section 08 80 00.

2.6 ACCESSORIES

A. Reinforcement: Where fasteners screw-anchor into aluminum less than 1/8 inch thick, reinforce the interior with aluminum or non-magnetic stainless steel to receive screw threads, or provide standard non-corrosive, pressed-in splined grommet nuts.

B. Brackets: High-strength aluminum brackets and reinforcements where possible; otherwise provide non-magnetic stainless steel or galvanized steel complying with ASTM A123/A123M.

C. Bituminous Coatings: Cold-applied asphalt mastic, compounded for 30 mil thickness per coat.

D. Internal System Sealants and Gaskets: As recommended by manufacturer for use within the framing system for fabrication, assembly, and installation. Use products which will remain permanently elastic, non-shrinking, and waterproof.

2.7 HARDWARE

A. Door Hardware: As specified in Section 08 71 00, except as specified in this Section.

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

C. Reinforce components internally for door hardware .

PART 3 EXECUTION

3.1 EXAMINATION

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

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

3.2 INSTALLATION

A. Install wall system in accordance with manufacturer's instructions.
   1. Install storefronts in accordance with ASTM E2112.

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

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

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

E. Provide thermal isolation where components penetrate or disrupt building insulation.

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

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

H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

I. Set thresholds in bed of sealant and secure.

J. Install hardware using templates provided.

K. Install glass in accordance with Section 08 80 00, using glazing method required to achieve performance criteria.

L. Install internal system sealants as installation progresses. Seal sill pan splices, end dams, water deflectors, and other components to ensure that proper water weepage paths are established and maintained within the system.

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

3.3 TOLERANCES

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

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

C. Location: Limit variation from plane or dimensioned location to 1/8 inch in 12 feet, non-cumulative, and 1/2 inch in overall length of member.

3.4 FIELD QUALITY CONTROL

A. Provide services of storefront manufacturer's field representative to observe for proper installation of system and submit report.

3.5 ADJUSTING

A. Adjust operating hardware for smooth operation.

3.6 CLEANING

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

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

3.7 PROTECTION

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

END OF SECTION 08 41 13

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Sliding doors.
3. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 01 Section "General Conditions”.
2. Division 06 Section “Rough Carpentry”.
3. Division 06 Section “Finish Carpentry”.
4. Division 08 Section “Operations and Maintenance”.
5. Division 08 Section “Hollow Metal Doors and Frames”.
6. Division 08 Section “Flush Wood Doors”.
7. Division 08 Section “Aluminum-Framed Entrances and Storefronts”.
8. Division 08 Section “All-Glass Entrances”.
9. Division 26 Section "Electrical”

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

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

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.
5. ANSI/UL 437- Key Locks.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
3. Content: Include the following information:

    a. Type, style, function, size, label, hand, and finish of each door hardware item.
    b. Manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    e. Explanation of abbreviations, symbols, and codes contained in schedule.
    f. Mounting locations for door hardware.
    g. Door and frame sizes and materials.
    h. Warranty information for each product.

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

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

    a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
    b. Complete (risers, point-to-point) access control system block wiring diagrams.
    c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

1.4 CLOSEOUT SUBMITTALS

A. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.5 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that

indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

F. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

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

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

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

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

I. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

1.6 DELIVERY, STORAGE AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.7 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.8 WARRANTY

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

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

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

C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Hardware shall not have any visible manufacturer names on exposed materials, except cylinders, when the door is in a closed position.

2.2 BUTT HINGES

A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

   a. Two Hinges: For doors with heights up to 60 inches.
   b. Three Hinges: For doors with heights 61 to 90 inches.
   c. Four Hinges: For doors with heights 91 to 120 inches.
   d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

   a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
   b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

   a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
   b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following:

   a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for all out-swinging lockable doors.

5. Manufacturers:

   a. McKinney (MK) - TA/T4A Series, 5-knuckle.

2.3 CONTINUOUS HINGES

A. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 continuous geared hinge. with minimum 0.120-inch thick extruded 6063-T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Where specified, provide modular continuous geared hinges that ship in two or three pieces and form a single continuous hinge upon installation.
2. Manufacturers:.

    a. Pemko (PE).

2.4 POWER TRANSFER DEVICES

A. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:

    a. Pemko (PE) - EL-CEPT Series.
    b. Securitron (SU) - EL-CEPT Series.

B. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:

    a. McKinney (MK) - Electrical Connecting Kit: QC-R001.
    b. McKinney (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:

    a. McKinney (MK) - QC-C Series.

2.5 DOOR OPERATING TRIM

A. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.

3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Pulls shall be provided with a 10” clearance from the finished floor on the push side to accommodate wheelchair accessibility.
5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets. When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.
6. Manufacturers:

    a. Rockwood (RO).

2.6 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

1. Manufacturers:

    a. Corbin Russwin Hardware (RU).
    b. Match Existing, Field Verify.

B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:

1. Threaded mortise cylinders with rings and cams to suit hardware application.
2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
4. Tubular deadlocks and other auxiliary locks.
5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
6. Keyway: Manufacturer’s Standard.

C. Keying System: Each type of lock and cylinders to be factory keyed.

1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. Existing System: Field verify and key cylinders to match Owner's existing system.

D. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)
2. Master Keys (per Master Key Level/Group): Five (5).
3. Construction Keys (where required): Ten (10).

E. Construction Keying: Provide construction master keyed cylinders.

F. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.7 CYLINDRICAL LOCKS AND LATCHING DEVICES

A. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Operational Grade 1 Certified Products Directory (CPD) listed cylindrical locksets. Listed manufacturers shall meet all functions and features as specified herein.

1. Electromechanical locksets shall have the following functions and features:

a. Universal Molex plug-in connectors that have standardized color-coded wiring and are field configurable in fail safe or fail secure and operate from 12vdc to 24vdc regulated.
b. EcoFlex or equivalent technology that reduces energy consumption up to 92% as certified by GreenCircle.
c. Options to be available for request-to-exit or enter signaling.
d. Two-year limited warranty on electrified functions.

2. Manufacturers:

a. Corbin Russwin Hardware (RU) - CLX3300 Series.
b. Sargent Manufacturing (SA) - 10X Line.

2.8 DEADLOCKS AND LATCHES

A. Mortise Deadlocks, Small Case: ANSI/BHMA A156.36, Grade 1, small case mortise type deadlocks constructed of heavy gauge wrought corrosion resistant steel. Steel or stainless steel bolts with a 1" throw and hardened steel roller pins. Deadlocks to be products of the same source manufacturer and keyway as other specified locksets.

1. Manufacturers:

a. Corbin Russwin Hardware (RU) - DL4000 Series.
b. Sargent Manufacturing (SA) - 4870 Series.

2.9 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.

3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.10 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. Exit devices shall have a five-year warranty.
2. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
3. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.
4. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
5. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.

    a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
    b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.

7. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
8. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.
9. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
10. Rail Sizing: Provide exit device rails factory sized for proper door width application.
11. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed exit devices. Listed manufacturers shall meet all functions and features as specified herein.

1. Provide exit devices with functions and features as follows:

a. Where required by code, provide knurling or abrasive coating on all levers leading to hazardous areas.
b. Meets UL and CUL Standard 10C Positive Pressure, Fire Test of Door Assemblies with levers that meet A117.1 Accessibility Code.
c. No catch points: addition of applied deflectors or other added components are not allowed.
d. No visible plastic.
e. Heavy duty end caps with flush and overlapping options made of stainless steel, brass, or bronze with architectural finishes.
f. Constructed of all stainless steel.
g. Stainless steel pullman type latch with deadlock feature.
h. Narrow or wide style exterior trim as specified in the hardware sets.
i. Center case adjustability on concealed vertical rod exit devices; single operation with hex key individually adjusts top or bottom latches. No retainer screws or clips required to maintain adjustment.
j. Ten-year limited warranty for mechanical features.

2. Manufacturers:

a. Corbin Russwin Hardware (RU) - PED4000 / PED5000 Series.
b. Sargent Manufacturing (SA) - PE80 Series.

2.11 SURFACE DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Large Body Cast Iron): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.

1. Large body cast iron surface mounted door closers shall have a 30-year warranty.
2. Manufacturers:

a. Corbin Russwin Hardware (RU) - DC8000 Series.
b. Norton Rixson (NO) - 9500 Series.
c. Sargent Manufacturing (SA) - 281 Series.

C. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard..

1. Manufacturers:

a. Corbin Russwin Hardware (RU) - DC6000 Series.
b. Norton Rixson (NO) - 7500 Series.
c. Sargent Manufacturing (SA) - 351 Series.

2.12 ARCHITECTURAL TRIM AND ACCESSORIES

A. Door, Frame and Wall Protective Trim: ANSI/BHMA A156.6, protective products as specified in the hardware sets. Door protection plates shall be not more than 2" less than door width on stop side and 1” less door width on the pull side or on stop side of pairs of doors. Listed manufacturers shall meet all functions and features as specified herein.

1. Provide protective trim with functions and features as follows:

a. Meets ADA requirements for smooth bottom door surfaces.
b. UL Classified options for use on fire-rated doors up to 3 hours.
c. Fabricated from stainless steel, brass, bronze, aluminum, or high-impact plastic.
d. Available in a variety of sizes, finishes, and profiles to suit aesthetic and functional requirements.
e. Designed to protect doors, frames, and adjacent walls from damage due to impact, abrasion, or traffic.
f. Fasteners included; adhesive-backed options available for select models.
g. Ten-year limited warranty.

2. Manufacturers:

a. Rockwood (RO).

2.13 DOOR STOPS AND HOLDERS

A. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:

a. Rockwood (RO).

B. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Manufacturers:

a. Norton Rixson (NO).

2.14 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

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

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NFPA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

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

F. Manufacturers:

1. Pemko (PE).

2.15 ELECTRONIC ACCESSORIES

A. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.

1. Manufacturers:

a. Alarm Controls (AK) - CP1-1026 Series.
b. Sargent Manufacturing (SA) - 3280 Series.
c. Securitron (SU) - DPS Series.

B. Intelligent Switching Power Supplies: Provide the least number of power supplies at the appropriate amperage level sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.

1. Power supplies shall meet all functions and features as specified herein.

a. UL listed dual voltage 12 or 24 VDC field selectable continuous output.
b. Dedicated fast charger to prolong battery life with low battery cutoff to protect batteries from deep discharge.
c. Enhanced surge immunity for input/output protection
d. Separate, dedicated battery charging circuit to keep locks cooler.
e. Dual-color LED visual notification to prevent applying incorrect voltages to the power supply.
f. Instant auto-switch to battery on AC loss.
g. Expandable up to 16 outputs in the standard enclosure
h. Integrated fire alarm interface to allow main output shutdown or disconnect on a per output basis when using an R8 output module.
i. Network ready and remotely manage locks and connected devices when using an M8 managed output module on network models.
j. Lifetime replacement, no-fault, no questions asked warranty.

2. Manufacturers:

a. Life Safety Power (LP).
b. Securitron (SU) - AQL Series.

2.16 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.17 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

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

PART 3 - EXECUTION

3.1 EXAMINATION

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

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Paint prime coated mullions to match frames.

C. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

D. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

E. Push Plates and Door Pulls: When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.

F. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

G. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5 ADJUSTING

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

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.
2. The supplier is responsible for handing and sizing all products.
3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Refer to Section 080671, Door Hardware Sets, for hardware sets.

END OF SECTION 087100

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 92 00 - Joint Sealants: Sealants for other than glazing purposes.

B. Section 08 11 13 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.

C. Section 08 14 16 - Flush Wood Doors: Glazed lites in doors.

D. Section 08 41 13 - Aluminum-Framed Entrances and Storefronts: Frames for storefront assemblies.

1.3 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.

B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).

C. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2019).

D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

E. ASTM C1036 - Standard Specification for Flat Glass; 2021.

F. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.

G. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).

H. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2021a.

I. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2016.

J. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2019.

K. GANA (GM) - GANA Glazing Manual; 2022.

L. GANA (LGRM) - Laminated Glazing Reference Manual; 2019.

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

N. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (Reaffirmed 2016).

O. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2023.

P. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2023.

Q. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2023.

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. Discuss installation requirements and limitations, coordination with other affected installers, and special applications.

1.5 SUBMITTALS

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

B. Product Data on Each Glazing Type: 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 12 by 12 inch in size of insulating, laminated, and decorative glass units.

E. Certificate: Certify that products of this section meet or exceed specified requirements.

F. Product Test Reports: For coated glass, insulating glass and glazing sealants, for tests performed by a qualified testing agency.
   1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.

G. Preconstruction adhesion and compatibility test report.

H. 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 five years of documented experience.
   1. Provide certified glass products through ANSI accredited certifications that include plant audits and independent laboratory performance testing.

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

D. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.
   1. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

E. Provide each type of glass, primary sealant, and gasket from a single manufacturer with not less than five years documented experience in the production of required materials.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturer's instructions for shipping, handling, storing, and protection of glass and glazing materials. Exercise exceptional care to prevent edge damage to glass, and damage to coatings.

1.8 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.

C. Install sealants only when ambient temperature conditions can be maintained at or above 40 degrees F during installation and 48 hours immediately following installation.

1.9 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 providing products to replace failed units.

C. Laminated Glass: Provide a five (5) year manufacturer warranty to include coverage for delamination, including providing products to replace failed units.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Float Glass Manufacturers:
1. Guardian Glass, LLC: www.guardianglass.com/#sle.
2. Pilkington North America Inc: www.pilkington.com/na/#sle.
3. Saint Gobain North America: www.saint-gobain.com/#sle.
4. Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com/#sle.
5. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
1. Design Pressure: Calculated in accordance with ASCE 7 and requirements in Structural Drawings.
2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
3. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
4. Design glazing units to reliably perform and remain reliably engaged on all edges under all service and thermal stresses, including those associated with partial shading.
5. Limit center of glass deflection to the lesser of 3/4 inch or L/100 (where L is short side dimension of glass unit), or flexure limit of glass, whichever is less, with full recovery of glazing materials.
6. Assure and confirm compatibility of all materials in contact with each other.
7. 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. Air Barriers: See Division 07
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 6.3 computer program.
2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
3. Solar Optical Properties: Comply with NFRC 300 test method.

2.3 GLASS MATERIALS

A. Float Glass: Provide float glass based glazing unless otherwise indicated.
1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality - Q3.
2. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
3. Kind FT - Fully Tempered Type: Complies with ASTM C1048.
4. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.
5. Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.

2.4 INSULATING GLASS UNITS

A. Manufacturers:
1. Glass: Any of the manufacturers specified for float glass.
2. Viracon, Apogee Enterprises, Inc: www.viracon.com/#sle.
3. Substitutions: See Section 01 60 00 - Product Requirements.

B. Fabricator: Certified by glass manufacturer for type of glass, coating, and treatment involved and capable of providing specified warranty.

C. Insulating Glass Units - General: Types as indicated.
1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
3. Metal-Edge Spacers: Aluminum, bent and soldered corners.
4. Spacer Color: Black.
5. 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.

6. Purge interpane space with dry air, hermetically sealed.

D. Type IG-1 - 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: Match existing.
b. Coating: Low-E (passive type), on #2 surface.
4. Inboard Lite: Heat-strengthened float glass, 1/4 inch thick, minimum.
a. Tint: Clear.
5. Total Thickness: 1 inch.
6. Thermal Transmittance (U-Value): 0.24, nominal.
7. Visible Light Transmittance (VLT): 68 percent, nominal.
8. Solar Heat Gain Coefficient (SHGC): 0.28, nominal.
9. Glazing Method: Dry glazing method, gasket glazing.

E. Type IG-2 - Insulating Glass Units: Safety glazing.
1. Applications:
a. Glazed lites in exterior doors.
b. Glazed sidelights and panels within 48 inches of doors.
c. Other locations required by applicable federal, state, and local codes and regulations.
d. Other locations indicated on drawings.
2. Space between lites filled with argon.
3. Glass Type: Same as typical exterior glazing type except use fully tempered float glass for both outboard and inboard lites.
4. Total Thickness: 1 inch.

2.5 MONOLITHIC GLAZING UNITS

A. General - Combined Requirements: If a particular glass unit is indicated to comply with more than one type of requirement, such as color, safety characteristics, or other requirements. Comply with all specified requirements for each type as scheduled on Drawings.

B. Type G-1 - Monolithic Interior Vision Glazing:
1. Applications: Interior glazing unless otherwise indicated.
2. Glass Type: Annealed float glass.
3. Tint: Clear.
4. Thickness: 1/4 inch, nominal.

C. Type G-2 - Monolithic Safety Glazing: Non-fire-rated.
1. Applications:
a. Glazed lites in doors, except fire doors.

b. Glazed sidelights within 48 inches of doors, except in fire-rated walls and partitions.
c. Other locations required by applicable federal, state, and local codes and regulations.
d. Other locations indicated on drawings.

2. Glass Type: Fully tempered safety glass as specified.
3. Tint: Clear.
4. Thickness: 1/4 inch, nominal.

2.6 GLASS COATINGS

A. Solar Control Coating:
1. Application: As specified.
2. Color: Clear, fade resistant.
3. Basis of Design Product: Vitro Architectural Glass; Solarban 60: www.vitroglazings.com/#sle.
a. Substitutions: See Section 01 60 00 - Product Requirements.

2.7 GLAZING COMPOUNDS

A. General Requirements:
1. Provide black exposed glazing accessory materials, unless specifically indicated otherwise.
2. Provide materials of hardness as recommended by manufacturer for required application and condition of installation in each case. Provide only compounds which are known to be fully compatible with surfaces contacted, including glass products, seals, and glazing channel surfaces.

B. Preformed Butyl Rubber Glazing Sealant: Tape or ribbon (coiled on release paper) of polymerized butyl, or mixture of butyl and polyisobutylene, compounded with inert fillers and pigments, solvent-based with minimum 95 percent solids, thread or fabric reinforcement, tack-free within 24 hours, paintable, non-staining.

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

D. Manufacturers:
1. Bostik Inc: www.bostik-us.com/#sle.
2. Dow Corning Corporation: www.dowcorning.com/construction/#sle.
3. Master Builders Solutions: www.master-builders-solutions.com/en-us/#sle.
4. Momentive Performance Materials, Inc: www.momentive.com/#sle.
5. Pecora Corporation: www.pecora.com/#sle.
6. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.

2.8 ACCESSORIES

A. Setting Blocks: Silicone, 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 by width of glazing rabbet space minus 1/16 inch by 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.

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.
   1. Width: As required for application.
   2. Thickness: As required for application.
   3. Spacer Rod Diameter: As required for application.

D. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.
   1. Size gaskets as required by manufacturer of glazing channel frame to provide proper pressure and bite on glazing units.

E. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.

F. Glazing Clips: Manufacturer's standard type.

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

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.

B. Verify that the minimum required face and edge clearances are being provided.

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

D. Verify that sealing between joints of glass framing members has been completed effectively.

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

3.2 PREPARATION

A. Clean contact surfaces with appropriate solvent and wipe dry immediately 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. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.

C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.

D. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.

E. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.

F. 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 (GASKET GLAZING)

A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.

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

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

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

3.5 INSTALLATION - WET/DRY GLAZING METHOD (TAPE AND SEALANT)

A. Application - Interior Glazed Doors: Set glazing infills from the interior of the building.

B. Cut glazing tape to length and install against permanent stops, projecting 1/16 inch above sight line.

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 tape to ensure full contact at perimeter of pane or unit.

E. Install removable stops, spacer shims inserted between glazing and applied stops at 24 inch intervals, 1/4 inch below sight line.

F. Fill gaps between pane and applied stop with _____ type sealant to depth equal to bite on glazing, to uniform and level line.

G. Carefully trim protruding tape with knife.

3.6 FIELD QUALITY CONTROL

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

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.

3.7 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.

3.8 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 08 80 00

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 tile.
   4. Other adhesively applied flooring.

B. Removal of existing floor coverings.

C. Preparation of new concrete floor slabs for installation of floor coverings.

D. Testing of concrete floor slabs for moisture and alkalinity (pH).

E. Adhesive bond testing.

F. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
   1. Perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.

G. Patching compound.

H. Remedial floor coatings.

1.2 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Moisture emission reducing curing and sealing compound for slabs to receive adhered flooring, to prevent moisture content-related flooring failures; to remain in place, not to be removed.

1.3 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 C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2019.

C. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters, and Gypsum Concrete; 2020.

D. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete; 2019.

E. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.

F. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

G. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

H. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; Resilient Floor Covering Institute; October 2011.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination: 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 floor 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. Floor Moisture Testing Technician Certificate: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician- Grade I certificate.

H. Copy of RFCI (RWP).

1.6 QUALITY ASSURANCE

A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.

B. Contractor may perform adhesive and bond test with Contractor's own personnel or hire a testing agency.

C. 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.

D. 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.

E. Floor Moisture Testing Technician Qualifications: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician Certification- Grade I.

F. 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.

1.7 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.

1.8 FIELD CONDITIONS

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

B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

1.9 WARRANTY

A. Moisture Emission Reducing Sealing Compound: Provide warranty to cost of flooring delamination failures for 10 years, minimum.
   1. Include cost of repair or removal of failed flooring, remediation with a moisture vapor impermeable surface coating, and replacement of flooring with comparable flooring system.

PART 2 PRODUCTS

2.1 MATERIALS

A. Self-Leveling 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
   1. Compressive Strength: Minimum 5000 pounds per square inch after 28 days, tested per ASTM C109/C109M.
   2. Flexural Strength: Minimum 1000 psi after 28 days, tested according to ASTM C348.
   3. Thickness: Capable of thicknesses from 1/2 inch minimum to maximum [10] inch.

B. 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. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.

3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
4. Acceptable Manufacturers:
    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. LATICRETE International, Inc; SKIM LITE: www.laticrete.com/#sle.
    d. USG Corporation; Durock Brand Advanced Skim Coat Floor Patch: www.usg.com/#sle.
    e. Schonox HPS North America; Schonox SL Moisture Resistant Floor Patch and Skim Coat.
    f. Custom Building Products.
    g. Henry Company.
    h. Sika; Level SkimCoat.
    i. Mapei.
    j. Substitutions: See Section 01 60 00 - Product Requirements.

C. 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.

D. Remedial Floor Coating: Single- or multi-layer 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. Thickness: As required for application and in accordance with manufacturer's installation instructions.
2. Use product recommended by flooring manufacturer. In the absence of a recommendation from flooring manufacturer, use testing agency recommendation. In the absence of testing agnency recommendation, use one of the following systems.
3. Acceptable Products:
    a. ARDEX Engineered Cements; ARDEX VB 100: www.ardexamericas.com/#sle.
    b. Custom Building Products; TechMVC Moisture Vapor and Alkalinity Barrier: www.custombuildingproducts.com/#sle.
    c. Floor Seal Technology, Inc; MES 100: www.floorseal.com/#sle.
    d. LATICRETE International, Inc; LATICRETE VAPOR BAN E: www.laticrete.com/#sle.
    e. Sika Corporation; Sikafloor Moisture Tolerance Epoxy Primer: www.sikafloorusa.com/#sle.
    f. USG Corporation; Durock CoverPrep: www.usg.com/#sle.
    g. UZIN UTZ NORTH AMERICA, INC; UZIN PE 460 with UZIN PE 280: https://us.uzin.com/#sle.
    h. Substitutions: See Section 01 60 00 - Product Requirements.

E. Floor Sealer: Clear, penetrating sealer for application to surfaces of newly placed concrete intended by its manufacturer to cure, vapor-proof, seal, harden, dust-proof, and weather-proof concrete slabs by closing capillary system of concrete, and eliminating route of moisture vapor emission allowing application of moisture-sensitive adhesives and coatings.
   1. Comply with ASTM C309 and ASTM C1315, Type I Class A or C.
   2. Solids Content: 25 percent, minimum.
   3. Acceptable Products:
      a. Allied Construction Technologies, Inc.; AC-Tech 2170 FC Vapor Reducing System: www.actechperforms.com.
      b. Creteseal Concrete Waterproofing Products, Inc.; Creteseal 2000: www.creteseal.com.
      c. Floor Seal Technology, Inc.; VaporSeal 309 System: www.floorseal.com.
      d. SINAK Corporation; VC5: www.sinak.com.
      e. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.1 CONCRETE SLAB PREPARATION

A. Perform following operations in the order indicated:
   1. Preliminary cleaning.
   2. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
   3. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
   4. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
   5. Specified remediation, if required.
   6. Patching, smoothing, and leveling, as required.
   7. Other preparation specified.
   8. Adhesive bond and compatibility test.
   9. Protection.

B. Remediations:
   1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
   2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.

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

3.2 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.
   1. 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.

D. 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.

E. 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. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.

D. Do not fill expansion joints, isolation joints, or other moving joints.

3.8 ADHESIVE BOND AND COMPATIBILITY TESTING

A. 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.

3.10 PROTECTION

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

END OF SECTION 09 05 61

SECTION 09 22 16 - NON-STRUCTURAL METAL FRAMING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Metal partition, ceiling, and soffit framing.

B. Framing accessories.

1.2 RELATED REQUIREMENTS

A. Section 06 10 53 - Miscellaneous Rough Carpentry: Wood blocking within stud framing.

B. Section 07 21 00 - Thermal Insulation: Acoustic insulation.

C. Section 09 29 00 - Gypsum Board: Execution requirements for anchors for attaching work of this section.

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 S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2012.

C. AISI S220 – North American Specification for the Design of Cold-Formed Steel Framing – Nonstructural members.

D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

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

G. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2018.

H. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.

I. 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.

J. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

K. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

L. ASTM E413 - Classification for Rating Sound Insulation; 2022.

1.4 SUBMITTALS

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

B. Shop Drawings:
   1. Indicate prefabricated work, component details, framed openings, anchorage to structure, acoustic details, and accessories.
   2. Describe method for securing studs to tracks, and for blocking and reinforcement of framing connections.

C. Product Data: Provide data describing framing member materials and finish, product criteria, load charts, and limitations.

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

E. Evaluation Reports: Submit evaluation reports for framing, tracks, anchors, and fasteners from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.5 QUALITY ASSURANCE

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

B. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified in accordance with the product-certification program of the the Certified Steel Stud Association, the Steel Framing Industry Association, or the Steel Stud Manufacturers Association.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required by AISI S202 "Code of Standard Practice."

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Metal Framing, Connectors, and Accessories:
1. CEMCO: www.cemcosteel.com/#sle.
2. ClarkDietrich Building Systems: www.clarkdietrich.com/#sle.
3. Jaimes Industries: www.jaimesind.com/#sle.
4. Marino: www.marinoware.com/#sle.
5. MBA Building Supplies, Inc.: www.mbastuds.com.
6. MRI Steel Framing LLC: www.mristeelframing.com.
7. State Building Products, Inc.: http://www.statebp.com.
8. Steel Construction Systems: www.steelconsystems.com/#sle.
9. The Steel Network, Inc: www.SteelNetwork.com/#sle.
10. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 FRAMING MATERIALS

A. Design Requirements: Design metal framing to comply with performance requirements, including anchorage to structural system and necessary modifications to meet specified requirements and maintain visual design concepts.
1. Design framing systems in accordance with AISI S220, "North American Specification for the Design of Cold-Formed Steel Framing - Nonstructural Members" and ASTM C645, Section 10, unless otherwise indicated.

B. Performance Requirements:
1. Interior Suspended Gypsum Board Ceilings, Soffits, and Bulkheads: Design and install to provide deflection of not more than L/360 of distance between supports.
2. Interior Metal Stud/Gypsum Board Assemblies: Design and install to withstand lateral loading (air pressure) of 5 PSF with deflection limit not more than L/240 of partition height.
3. Interior Metal Stud/Gypsum Board Assemblies at Locations with Ceramic Tile or Other Hard Surface Finishes: Design and install to withstand lateral loading (air pressure) with deflection limit not more than L/360 of partition height.
4. Where documents indicate a stud size, size shall be considered minimum. Increase gage to meet minimum performance requirements.
5. Accommodate building structure deflections in connections to structure.

C. Fire Rated Assemblies: Comply with applicable code and tested according to ASTM E 119 and as scheduled in Drawings.

D. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

E. Non-Loadbearing Framing System Components: AISI S220 and ASTM C645, Section 10; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of limits listed above.
   1. Protective Coating: AISI S220, ASTM A 653/A 653M, G40, (Z120); or coating with equivalent corrosion resistance of ASTM A653/A653M, G40 (Z120), hot-dip galvanized unless otherwise indicated.
      a. Galvannealed products are unacceptable.
   2. Studs: C shaped with flat or formed webs.
      a. Minimum Depth: 3-1/2 inches unless otherwise indicated.
      b. Minimum Base-Steel Thickness: 0.0296 inch (20-gage drywall) unless otherwise indicated.
      c. Minimum Base-Steel Thickness at Wall Tile: 0.033 inch.
      d. Minimum Base-Steel Thickness at Opening Jambs: 0.033 inch.
   3. Runners: U shaped, sized to match studs.
      a. Minimum Base-Steel Thickness: Same as studs.
   4. Equivalent Gauge Studs and Runners:
      a. High strength, roll-formed and embossed with surface deformations to stiffen the framing members so they are structurally comparable to conventional ASTM C645 steel studs and tracks.
      b. Minimum Base Steel Thickness: 0.0181 inch (20 EQ).
      c. Prohibited Locations: High-strength (EQ) studs may not be used at the following locations:
         1) Walls at vestibules or other areas expected to be exposed to wind loads greater than 5 psf.
         2) Walls to receive tile or other inflexible finishes.
         3) Walls used to support countertop construction, casework, audio/visual equipment, or other similar elements.
         4) Walls greater than 15 feet in height.
      d. Acceptable Product: ClarkDietrich; ProSTUD20 and ProTRAK20 with Smart Edge technology.
   5. Ceiling Carrying Channels: C shaped (Main Runners).
      a. Minimum Base-Steel Thickness: 0.053 inch.
      b. Minimum Depth: 1-1/2 inches.
      c. Minimum flange width: 1/2 inch.
   6. Ceiling Furring Channels (Furring Members):
      a. Cold-Rolled Channels: 0.053-inch uncoated-steel thickness, with minimum 1/2-inch-wide flanges, 3/4 inch deep.
      b. Steel Studs and Runners: 0.0296-inch minimum base-steel thickness.
      c. Equivalent Gauge Studs and Runners: 0.0181 inch (20 EQ) minimum base-steel thickness.
         1) Acceptable Product: ClarkDietrich; ProSTUD20 and ProTRAK20 with Smart Edge technology.
      d. Hat-Shaped, Rigid Furring Channels: 0.0296-inch minimum base-steel thickness, 7/8-inch deep.

7. Furring: Hat-shaped sections, minimum depth of 7/8 inch.
   a. Minimum Base-Steel Thickness: 0.0296 inch.
8. Resilient Furring Channels: Single leg configuration; 1/2 inch channel depth.
   a. Products:
      1) ClarkDietrich; RC Deluxe Resilient Channel: www.clarkdietrich.com/#sle.
9. Cold-Rolled U-Channel Bridging: Steel, 0.0538-inch minimum base-steel thickness, with minimum 1/2-inch- wide flanges.
   a. Depth: 1-1/2 inches.
10. Z-Shaped Furring: With slotted or non-slotted web, face flange of 1-1/4 inches, wall attachment flange of 3/4 inch, minimum uncoated-steel thickness of 0.018 inch, and depth required to fit insulation thickness indicated.

F. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung, non-rated system unless otherwise rnoted, composed of main beams and cross-furring members that interlock.
   1. Where fire-rated grid system may be required by authorities having jurisdiction provide hanger wire suspension 8-inches off fire breaks in accordance with system manufacturer’s written guidelines.
   2. Acceptable Products:
      a. Armstrong World Industries, Inc.; Drywall Grid Systems (non-rated).
      b. Chicago Metallic Corporation; Drywall Grid System (non-rated).
      c. USG Corporation; Drywall Suspension System (non-rated).

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

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

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

J. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws, and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
   1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100.
   2. Material: ASTM A653/A653M steel sheet, SS Grade 50, 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 top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 12 feet.

K. Deflection and Firestop Track: Intumescent strip factory-applied to track flanges expands when exposed to heat or flames to provide a perimeter joint seal.
   1. Products:
      a. ClarkDietrich; BlazeFrame Firestop Deflection Track: www.clarkdietrich.com/#sle.

b. Fire Trak Corp.; Fire Trak System.
c. Metal-Lite, Inc; The System.
d. Slip Trak Systems; SLP-TRK.
e. Steel Network, Inc. (The); VertiTrack Series.
f. Substitutions: See Section 01 60 00 - Product Requirements.

L. Preformed Top Track Firestop Seal:
1. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems specified in Section 078400.
2. Products:
a. Hilti, Inc; Top Track Seal CFS TTS: www.us.hilti.com/#sle.
b. Specified Technologies Inc; SpeedFlex TTG Track Top Gasket: www.stfirestop.com/#sle.
c. Substitutions: See Section 01 60 00 - Product Requirements.

M. Non-Loadbearing Framing Accessories:
1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
2. Partial Height Wall Framing Support: Provides stud reinforcement and anchored connection to floor.
a. Materials: ASTM A36/A36M formed sheet steel support member with factory-welded ASTM A1003/A1003M steel plate base.
b. Products:
1) ClarkDietrich; Pony Wall (PW): www.clarkdietrich.com/#sle.
2) Substitutions: See Section 01 60 00 - Product Requirements.
3. Framing Connectors: ASTM A653/A653M G90 galvanized steel clips; secures cold rolled channel to wall studs for lateral bracing.
4. Flexible Wood Backing: Fire-retardant-treated wood with sheet steel connectors.
a. Products:
1) ClarkDietrich; Danback: www.clarkdietrich.com/#sle.
2) Substitutions: See Section 01 60 00 - Product Requirements.
5. Sheet Metal Backing: 0.0538 inch thick, galvanized.
6. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
7. Fasteners: ASTM C1002 self-piercing tapping screws.
8. Anchorage Devices: Powder actuated.
9. Acoustic Insulation: As specified in Section 09 29 00.
10. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.

N. Sound Isolation Tape: Elastomeric foam tape for sound decoupling.
1. Surface Burning Characteristics: Provide assemblies with flame spread index of 75 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
2. Tape Thickness: 1/4 inch.

3. Products:
   a. Armacell LLC; ArmaSound MTD: www.armacell.us/#sle.
   b. Substitutions: See Section 01 60 00 - Product Requirements.

O. Tracks and Runners: Same material and thickness as studs, bent leg retainer notched to receive studs.

P. Isolation Strip at Exterior Walls: Provide one of the following:
   1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
   2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

2.3 FABRICATION

A. Fabricate assemblies of framed sections to sizes and profiles required.

B. Fit, reinforce, and brace framing members to suit design requirements.

C. Fit and assemble in largest practical sections for delivery to site, ready for installation.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that rough-in utilities are in proper location.

C. Examine areas and substrates for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

3.3 INSTALLATION OF STUD FRAMING

A. Comply with requirements of ASTM C754.

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

C. Install bracing at terminations in assemblies.
   1. For interior non-load bearing walls indicated to terminate above suspended ceilings provide 20-gauge stud diagonal bracing of walls at door openings, corner wall intersections and at maximum 10’-0” intervals to structural supports or substrates above. Otherwise extend framing full height to structural supports or substrates above suspended ceilings.

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

E. Extend partition framing to structure where indicated and to ceiling in other locations.

F. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.

G. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.

H. Align and secure top and bottom runners at 24 inches on center unless otherwise indicated.

I. At partitions indicated with an acoustic rating:
   1. Install acoustic insulation, sealants, and accessories as described in Section 09 21 16.
   2. Provide components and install as required to produce STC ratings as indicated, based on published tests by manufacturer conducted in accordance with ASTM E90 with STC rating calculated in accordance with ASTM E413.
   3. Sound Isolation Tape: Apply to vertical studs and top and bottom tracks/runners in accordance with manufacturer's instructions.

J. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
   1. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.

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

L. Install studs vertically at 16 inches on center.

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

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

O. Align stud web openings horizontally.

P. Secure studs to tracks using crimping method. Do not weld.

Q. Stud splicing is not permissible.

R. Fabricate corners using a minimum of three studs.

S. Install double studs at wall openings, door and window jambs, not more than 2 inches from each side of openings.
   1. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
   2. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.

T. Brace stud framing system rigid.

U. Coordinate erection of studs with requirements of door frames and window frames; install supports and attachments.

V. Coordinate installation of bucks, anchors, and blocking with electrical, mechanical, and other work to be placed within or behind stud framing.

W. Furring: Coordinate with sound isolation clip spacing and locations. Lap splices a minimum of 6 inches.

X. Use sheet metal backing/blocking for reinforcement of the following:
   1. Framed openings.
   2. Wall mounted cabinets.
   3. Plumbing fixtures.
   4. Toilet accessories.
   5. Wall mounted door hardware.
   6. Wall mounted televisions or other equipment.

3.4 CEILING AND SOFFIT FRAMING

A. Contractor’s Option: At the Contractor’s option suspended ceiling systems may be either suspended steel framing system or grid suspension system.

B. Comply with requirements of ASTM C754.

C. Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.

D. Install furring independent of walls, columns, and above-ceiling work.

E. Securely anchor hangers to structural members or embed in structural slab. Space hangers as required to limit deflection to criteria indicated.
   1. Hanger spacing not to exceed 48 inches on center.

F. Suspend hangers from building structure as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
    a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
4. Do not attach hangers to steel roof deck.
5. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
6. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
7. Do not connect or suspend steel framing from ducts, pipes, or conduit.

G. Space main carrying channels at maximum 48 inch on center, and not more than 6 inches from wall surfaces. Lap splice securely.

H. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.

I. Place furring channels perpendicular to carrying channels, not more than 2 inches from perimeter walls, and rigidly secure. Lap splices securely.

J. Reinforce openings in suspension system that interrupt main carrying channels or furring channels with lateral channel bracing. Extend bracing minimum 24 inches past each opening.

K. Laterally brace suspension system.

L. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.

M. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

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

3.5 INSTALATION OF RESILIENT CHANNELS

A. Attach channels directly to the framing system only. Do not install channels on gypsum board, shear plywood, or like material.

B. Attach single leg resilient channels at 24 inch center-to-center spacing perpendicular to framing at 16 inches on center. Use 16 inch channel spacing if framing is at 24 inches on center. Refer to Drawings for detail.

C. Walls:
   1. Install channels with mounting flange facing down and open side facing up.
   2. Channel may be inverted at floor to accommodate attachment of base.
   3. Locate channels within 3 inches from floor and within 6 inches of ceiling.
   4. Resilient channels shall not touch abutting wall surfaces
   5. Extend channels into corners and attach to corner framing.
   6. Cantilever channel ends no more than 6 inches.
   7. Splice channel by nesting directly over framing member, screw-attach through both flanges. Reinforce with 3/8 pan head screws located at both ends of splice.
   8. Where more than one layer of gypsum board is scheduled, offset seams of gypsum board, as well as seams on the opposite side of the wall.

D. Installation at Cabinets: Attach channels to studs at center of top and bottom cabinet hanger brackets. When distance between hangers exceeds 24 inches on center, install additional channel at mid-point between hangers.
   1. Place screws attaching cabinets to resilient channels between studs.

E. Ceilings and Soffits: Apply resilient channels at 16 inches on center perpendicular to joists.

F. Locate screws attaching gypsum board to the resilient channel between framing members. Screws shall never be located over a stud or make contact with framing members. Screw depth shall be gypsum board thickness plus 3/8".

G. Install acoustical sealant and acoustical accessories as specified in Section 09 29 00 - Gypsum Board.

3.6 TOLERANCES

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

B. Maximum Variation From Plumb: 1/8 inch in 10 feet.

END OF SECTION 09 22 16

SECTION 09 29 00 - GYPSUM BOARD

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.

B. Acoustic insulation.

C. Gypsum wallboard.

D. Joint treatment and accessories.

1.2 RELATED REQUIREMENTS

A. Section 06 10 53 - Miscellaneous Rough Carpentry: Wood blocking.

B. Section 07 92 00 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

C. Section 09 22 16 - Non-Structural Metal Framing.

1.3 REFERENCE STANDARDS

A. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).

B. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2017).

C. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.

D. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2023.

E. 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.

F. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2022.

G. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.

H. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2022, with Editorial Revision (2023).

I. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.

J. ASTM C1658/C1658M - Standard Specification for Glass Mat Gypsum Panels; 2019, with Editorial Revision (2020).

K. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

L. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

M. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

N. ASTM E413 - Classification for Rating Sound Insulation; 2022.

O. GA-216 - Application and Finishing of Gypsum Panel Products; 2021.

P. GA-600 - Fire Resistance and Sound Control Design Manual; 2021.

Q. UL (FRD) - Fire Resistance Directory; Current Edition.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the installation of gypsum board assemblies with size, location, and installation of service utilities.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

C. Sequencing: Install service utilities in an orderly and expeditious manner.

1.5 SUBMITTALS

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

B. Product Data: Provide data on gypsum board, accessories, joint finishing system, and acoustic insulation and sealants.

C. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.

B. Store gypsum products and accessories indoors and keep above freezing. Elevate boards above floor, on nonwicking supports, in accordance with manufacturer's recommendations.

C. Protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Stack gypsum panels flat to prevent sagging.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Comply with requirements of ASTM C840 or gypsum board manufacturer's written recommendations, whichever are more stringent.

PART 2 PRODUCTS

2.1 GYPSUM BOARD ASSEMBLIES

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

B. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:
   1. Acoustic Attenuation: STC as indicated calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

C. NFPA Assemblies: Provide completed exterior assemblies tested in accordance with NFPA 285 where indicated.

D. Fire Rated Assemblies: Provide completed assemblies tested according to ASTM E 119 and as scheduled in Drawings.
   1. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL (FRD).

2.2 BOARD MATERIALS

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

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
   2. Glass mat faced gypsum panels as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board unless otherwise required below.
      a. Glass mat faced gypsum panels are required for all pre-rock applications and gypsum installation prior to building being enclosed.
   3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
      a. Mold-resistant board is required whenever board is being installed before the building is enclosed and conditioned.
      b. Mold resistant board is required in areas subject to wetting, steam, or high humidity.
   4. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
   5. At Above Grade Assemblies Indicated to Comply with NFPA 285: Use Type X board for interior drywall.
   6. Thickness:
      a. Vertical Surfaces: 5/8 inch.
      b. Ceilings: 5/8 inch, unless otherwise noted.
      c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
   7. Mold-Resistant, Paper-Faced Products:
      a. American Gypsum Company; M-Bloc Type X: www.americangypsum.com/#sle.
      b. CertainTeed Corporation; M2Tech 5/8" Type X Moisture & Mold Resistant Drywall: www.certainteed.com/#sle.
      c. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold-Guard: www.gpgypsum.com/#sle.
      d. National Gypsum Company; Gold Bond XP Gypsum Board.
      e. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond XP Fire-Shield Gypsum Board: www.goldbondbuilding.com/#sle.
      f. USG Corporation; Sheetrock Mold Tough Firecode Type X.
      g. Substitutions: See Section 01 60 00 - Product Requirements.

C. Tile Backing Board For Non-Wet Areas: Glass mat faced gypsum panels as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board unless otherwise required below.
   1. Application: Vertical surfaces behind thinset tile, except in wet areas or where otherwise scheduled to receive Cement-Based Board.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   3. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
   4. Type X Thickness: 5/8 inch.
   5. Regular Board Thickness: 5/8 inch.
   6. Edges: Tapered.
   7. Products:

a. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold-Guard Gypsum Board.
b. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond XP Fire-Shield Gypsum Board: www.goldbondbuilding.com/#sle.
c. CertainTeed Gypsum M2Tech Type X.
d. USG Corporation; Sheetrock Mold Tough Firecode Type X.
e. Substitutions: See Section 01 60 00 - Product Requirements.

2.3 ACCESSORIES

A. Sound Attenuation Insulation: ASTM C665; mineral fiber or glass fiber batt, friction fit type, unfaced, produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
1. Thickness: As indicated on Drawings, minimum 2 inches.
2. Fire-Rated Assemblies: Use insulation type required by indicated tested assembly.

B. Sound Isolation Tape: Elastomeric foam tape for sound decoupling.
1. Surface Burning Characteristics: Provide assemblies with flame spread index of 75 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
2. Tape Thickness: 1/4 inch.

C. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
1. Products:
a. Franklin International, Inc; Titebond GREENchoice Professional Acoustical Smoke and Sound Sealant: www.titebond.com/#sle.
b. Liquid Nails, a brand of PPG Architectural Coatings; _____: www.liquidnails.com/#sle.
c. Specified Technologies Inc; Smoke N Sound Acoustical Sealant: www.stifirestop.com/#sle.
d. Pecora Corporation; AC-20 FTR.
e. Specified Technologies, Inc.; Smoke N Sound Acoustical Sealant.
f. Grabber Construction Products; Acoustical Sealant GSC.
g. Accumetric LLC; BOSS 826 Acoustical Sound Sealant.
h. USG Corporation; SHEETROCK Acoustical Sealant.
i. Substitutions: See Section 01 60 00 - Product Requirements.
2. Acoustical joint sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Color of exposed acoustical joint sealants: Match adjacent surface.

D. Acoustical Outlet Box Pads:
1. Minimum thickness - 1/8 inch.
2. Adhesion - adheres readily to metal or plastic.
3. Service temperature - 30 degrees to 200 degrees F.

4. Shall contain no asbestos.
5. Minimum shelf life - 1 year.
6. Non Fire Rated Products:
    a. Lowry's Outlet Box Pads as manufactured by Harry A. Lowry & Associates, Inc., Sun Valley, CA.
    b. Sound Pad #68 as manufactured by L.H. Dottie Co., City of Commerce, CA.
7. Fire Rated Products:
    a. Flamesafe FSP 1077 Putty Pads as manufactured by W.R. Grace & Co., Hartfield, PA.
    b. Putty Pads as manufactured by Specified Technologies Inc., Somerville, NJ.
    c. Hilti CP617 Putty Pads as manufactured by Hilti, Tulsa, OK.
    d. 3M Fire Barrier Moldable Putty Pads type MPP-X to fit box size as manufactured by 3M, St. Paul, MN.
    e. Metacaulk ® Putty Pads as manufactured by RectorSeal, Houston, TX.

E. Finishing Accessories: ASTM C1047, galvanized steel, rolled zinc, rigid plastic, or composite, 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, L-bead, LC-bead, and Casing Bead at exposed panel edges.
3. Acceptable Products:
    a. ClarkDietrich (Finishing Accessories) www.clarkdietrich.com
    b. Phillips Manufacturing Co: www.phillipsmfg.com/#sle.
    c. Trim-tex, Inc: www.trim-tex.com/#sle.
    d. Substitutions: See Section 01 60 00 - Product Requirements.

F. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
1. Tape: 2 inch wide, coated glass fiber tape for joints and cornersglass-mat gypsum board .
2. Tape: 2 inch wide, creased paper tape for joints and cornersfor interior gypsum board.
3. Tape for Tile Backing Panels: As recommended by panel manufacturer.
4. Joint Compound: Drying type, vinyl-based, ready-mixed.

G. Finishing Compound: Surface coat and primer, takes the place of skim coating.

H. High Build Drywall Surfacer: 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.

I. 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.

J. 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.

K. Adhesive for Attachment to Metal:

1. Products:
   a. Franklin International, Inc; Titebond PROvantage Professional Drywall Adhesive: www.titebond.com/#sle.
   b. Liquid Nails, a brand of PPG Architectural Coatings: www.liquidnails.com/#sle.
   c. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.1 EXAMINATION

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

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

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

3.2 ACOUSTIC ACCESSORIES INSTALLATION

A. General: Limit installation of outlet boxes and other penetrations to one penetration per stud bay. Seal all penetrations and gaps with acoustic sealant, outlet box pads, or other acoustic shielding materials as approved by Architect in accordance with manufacturer's written instructions and tested assembly instructions.

B. Preparation for acoustic sealant:
   1. Surface Cleaning of Joints: Clean out joints immediately before installing acoustical joint sealants to comply with joint-sealant manufacturer's written instructions.
   2. Joint Priming: Prime joint substrates where recommended by acoustical-joint-sealant manufacturer. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
   3. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

C. 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.

D. Sound Isolation Tape: Apply to vertical studs and top and bottom tracks/runners in accordance with manufacturer's instructions.

E. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

F. Acoustic Sealant: Install as follows:

1. Comply with ASTM C 919, ASTM C 1193, and manufacturer's written recommendations for closing off sound-flanking paths around or through assemblies, including sealing partitions to underside of floor slabs above acoustical ceilings.
2. Acoustical Ceiling Areas: Apply acoustical joint sealant at perimeter edge moldings of acoustical ceiling areas in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
3. Place one bead continuously on substrate before installation of perimeter framing members.
4. Place continuous bead at perimeter of each layer of gypsum board.
5. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

G. Acoustical Outlet Box Pads: Install as follows within acoustic partitions:
1. Remove any water, excess dust, dirt and oil from the surfaces.
2. Comply with manufacturer's written instructions and UL requirements.
3. Ensure the entire surface is covered. Seal around conduit where it connects to outlet box using manufacturer's recommended materials.

3.3 BOARD INSTALLATION

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

B. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

C. Form control and expansion joints with space between edges of adjoining gypsum panels.

D. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.

E. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

F. Double-Layer Non-Rated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.

G. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

H. Installation on Metal Framing: Use screws for attachment of gypsum board.

I. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

J. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

3.4 INSTALLATION OF TRIM AND ACCESSORIES

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

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

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

D. Decorative Trim: Install at locations shown on drawings and in accordance with manufacturer's instructions.

3.5 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. Paper Faced Gypsum Board: Use paper joint tape, embed with drying type joint compound and finish with drying type joint compound.

C. 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, walls to receive wallcoverings, and other areas specifically indicated.
   2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   3. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
   4. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.

D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.

E. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

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

3.6 TOLERANCES

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

3.7 PROTECTION

A. Protect installed gypsum board assemblies from subsequent construction operations.

B. Repair damage from construction operations.

END OF SECTION 09 29 00

SECTION 09 30 00 - TILING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Tile for floor applications.

B. Tile for wall applications.

C. Non-ceramic trim.

D. Tile accessories, setting, and grouting materials.

1.2 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.

B. Section 09 05 61 - Common Work Results For Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

C. Section 09 29 00 - Gypsum Board: Tile backer board.

1.3 REFERENCE STANDARDS

A. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2019.

B. ASTM C499 - Standard Test Method for Facial Dimensions and Thickness of Flat, Rectangular Ceramic Wall and Floor Tile; 2009.

C. TCNA (HB-GP) - Handbook for Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs Installation; 2023.

D. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2024.

1.4 DEFINITIONS

A. DCOF: Dynamic Coefficient of Friction.

B. Module Size: Actual tile size, with minor facial dimension as measured by ASTM C499, plus joint width indicated.

C. Facial Dimension: Actual tile size, with minor facial dimension as measured by ASTM C499.

D. Large Format Tile: Any tile unit that maintains an edge of 15 inches or greater in any dimension.

E. Slip-Resistant: Installed flooring surface which has a wet coeffecient of friction of 0.42, minimum, as measured according to ANSI 323.3 (BOT-3000E DCOF AcuTest).

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate location of tiling movement joints on concrete floor substrates with locations of concrete floor expansion and control joints; align substrate joints and tiling system joints where required by specified reference standards.

B. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this Section; require attendance by all affected installers.
   1. Review installation procedures and coordination requirements.

1.6 SUBMITTALS

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. Verification Samples:
   1. Full-sized units of each type and composition of tile and for each color and finish specified. For ceramic mosaic tile in color blend patterns, provide one full sheet of each specified color blend.
   2. Full-sized units of each type of trim and accessory for each color and finish specified.
   3. Grout color samples for each type and color specified.

D. Concrete Sub-floor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Installer's Qualification Statement:
   1. Submit documentation of National Tile Contractors Association (NTCA) or Tile Contractors' Association of America (TCAA) accreditation.

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. Extra Tile: 5 percent of each size, color, and surface finish combination.

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 five 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).

D. Provide materials obtained from only one manufacturer for each type and color of tile, and for each type of mortar, grout, adhesive, and sealant.

1.8 DELIVERY, STORAGE, AND HANDLING

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

B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

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

1.9 FIELD CONDITIONS

A. Comply with referenced standards and manufacturer's recommendations for protection and maintenance of environmental conditions during and after installation.

B. Do not install solvent-based products in an unventilated environment.

C. Maintain ambient and substrate temperature of 50 degrees F during installation, and for at least seven days after installation. Maintain higher temperatures for proprietary mortars and grouts when recommended by manufacturer.

D. Vent temporary heaters to the exterior to prevent damage to tile work due to carbon dioxide accumulation.

1.10 WARRANTY

A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace materials that fail within specified warranty period.
   1. Warranty Period: 10 years from date of Substantial Completion.

B. Installer's Special Warranty: Specified form, signed by Installer, covering Work of this Section, for warranty period of 2 years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:
   1. Manufacturers and products specified on Drawings.
   2. Substitutions: See Section 01 60 00 - Product Requirements.
      a. Acceptability of substituted items may be determined solely on the basis of design, appearance or finish.

2.2 TILING MATERIALS

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

B. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

C. Ceramic Tile: ANSI A137.1, standard grade. Characteristics corresponding to manufacturers and products indicated on drawings.
   1. Trim Units: Matching cove and surface bullnose shapes in sizes coordinated with field tile.

2.3 TRIM AND ACCESSORIES

A. Ceramic Accessories: Matching finish, same color and finish as adjacent field tile; same manufacturer as tile.

B. Metal Trim: Finish as selected by Architect, style and dimensions to suit application, for setting using tile mortar or adhesive. Provide trim height to match tile and setting bed thickness.
   1. Basis of Design Applications, Unless Otherwise Indicated:
      a. Tile to Carpet or Flooring of Same Thickness: Schluter Schiene.
      b. Floor Edge Terminations or Reducer Strip Transitions: Schluter Reno.
      c. Coved Inside Corner: Schluter Dilex-AHK with corner transitions, end caps, and accessories.
      d. Movement Joints: Schluter Dilex-BWS: PVC, color as selected.
      e. Wall Tile Edge Termination: Schluter Schiene.
      f. Outside Corners: Schluter Quadec.
   2. Other Acceptable Manufacturers:
      a. Genesis APS International: www.genesis-aps.com/#sle.
      b. Ceramic Tool Company, Inc.
      c. Futura Industries.

d. National Metal Shapes, Inc. Aluminum L-S Profiles.

e. Substitutions: See Section 01 60 00 - Product Requirements.

C. Thresholds and Transitions - General: Provide transitions that are uniform in color and finish, fabricated to sizes and profiles indicated to provide transition between tile surfaces and adjoining finished floor surfaces. Fabricate thresholds to heights indicated, but not more than 1/2 inch above adjoining floor surfaces, with transition edges beveled on a slope not exceeding 1:2.

2.4 SETTING MATERIALS

A. Modified Dry Set Cement Mortar Bond Coat: ANSI A118.4 and ANSI A118.11.

1. Applications: Use this type of bond coat where no other type of bond coat is indicated.
2. Products:
   a. ARDEX Engineered Cements; X 3+: www.ardexamericas.com/#sle.
   b. Custom Building Products; MegaLite Crack Prevention Mortar, ProLite Tile & Stone Mortar, or Complete Contact Fortified Mortar: www.custombuildingproducts.com/#sle.
   c. H.B. Fuller Construction Products, Inc; TEC Ultimate Large Tile Mortar or Utimate 6 Plus Mortar: www.tecspecialty.com/#sle.
   d. LATICRETE International, Inc; 4-XLT: www.laticrete.com/#sle.
   e. Mapei Corporation; Ultralite or Ultracontact: www.mapei.com.
   f. Substitutions: See Section 01 60 00 - Product Requirements.

2.5 GROUTS

A. High Performance Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.

1. Applications: Use this type of grout where no other type of grout is indicated.
2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
3. Color(s): As selected by Architect from manufacturer's full line.
4. Acceptable Products:
   a. ARDEX Engineered Cements; ARDEX FL (Sanded) or FGC (Unsanded): www.ardexamericas.com/#sle.
   b. Custom Building Products; Prism Color Consistent Grout: www.custombuildingproducts.com/#sle.
   c. H.B. Fuller Construction Products, Inc; TEC AccuColor Plus Grout: www.tecspecialty.com/#sle.
   d. LATICRETE International, Inc.; LATICRETE PermaColor: www.laticrete.com.
   e. Mapei Corporation; Ultracolor Plus FA: www.mapei.com/#sle.
   f. _____.
   g. Substitutions: See Section 01 60 00 - Product Requirements.

2.6 ACCESSORY MATERIALS

A. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.
   1. Crack Resistance: No failure at 1/16 inch gap, minimum.
   2. Fluid or Trowel Applied Type:
      a. Material: Synthetic rubber or Acrylic.
      b. Thickness: 40 mils, maximum.
      c. Products:
         1) ARDEX; S1-K.
         2) Custom Building Products; RedGard Crack Prevention and Waterproofing Membrane: www.custombuildingproducts.com/#sle.
         3) H.B. Fuller Construction Products, Inc; TEC HydraFlex Waterproofing Crack Isolation Membrane: www.tecspecialty.com/#sle.
         4) LATICRETE International, Inc; LATICRETE Blue 92 Anti-Fracture Membrane: www.laticrete.com/#sle.
         5) Mapei Corporation; Mapelastic CI: www.mapei.com/#sle.
         6) Merkrete, by Parex USA, Inc; Merkrete Fracture Guard: www.merkrete.com/#sle.
         7) Substitutions: See Section 01 60 00 - Product Requirements.

B. Self-leveling Underlayment: Flowable, pre-formulated, water-mixed latex-Portland cement-based material; self-leveling to provide flat, level surface on tiling substrates, and meeting the requirements of ASTM C627.
   1. Applications: On concrete substrates.
   2. Acceptable Manufacturers:
      a. ARDEX; TL1000.
      b. Custom Building Products; "LevelQuick RS" Self Leveling Underlayment: www.custombuildingproducts.com.
      c. LATICRETE International, Inc.; 86 Latilevel Thin Pour: www.laticrete.com.
      d. Mapei Corporation; Ultraplan M20 Plus: www.mapei.com.
      e. Substitutions: See Section 01 60 00 - Product Requirements.

C. Backing Board: Specified in Section 09 29 00 - Gypsum Board.

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 tile.
   1. Large Format Tile Installations Greater than 500 Square Feet: When specified tile is 24 by 24 inches or larger, or when planks exceed 30 inches in the long dimension, install 1/4 inch application of self-leveling underlayment under the entire installation.

2. At all other tile installations, Tile contractor shall be responsible for floor prep up to 25% of the total area to be tiled at an average of 1/8 inch thickness, using pourable or trowelable materials supplied by the setting system manufacturer.

B. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values:
   1. Under Thinset Tile: F(F) of 35; F(L) of 25.

C. 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.

D. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.

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. Prepare floor substrates for installation of flooring in accordance with Section 09 05 61.

D. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

E. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.

3.3 INSTALLATION - GENERAL

A. Blending: For tile exhibiting color or pattern variations within the ranges of accepted submittals, verify that tile has been blended in the packages so that tile units taken from one package show same range in colors or patterns as those taken from other packages. If not blended in the packages, blend tile in the field before installation.

B. Floor System Coverage: Where specified for individual setting methods, install floor tile units with 100 percent mortar coverage by complying with applicable special requirements for back buttering of tile units in referenced ANSI A108 specifications.

C. Wall System Coverage: Where specified for individual setting methods, install wall tile units with 100 percent mortar coverage by complying with applicable special requirements for back buttering of tile units in referenced ANSI A108 specifications.

D. Install crack isolation membrane to comply with ANSI A118.10 and membrane manufacturer's written instructions for full floor coverage.

E. Movement Joints: Comply with TCNA (HB) Method EJ171F requirements for locations, spacing, and installation of applicable movement joints, whether or not specifically indicated or detailed on Drawings, and as follows:
   1. Field Joint Spacing - Interior: Maximum 24 feet on center in each direction; reduce spacing to maximum 10 feet on center in areas exposed to direct sunlight or moisture.
   2. Field Joint Spacing - Exterior and Above-Ground Concrete Slabs: Maximum 12 feet on center in each direction.
   3. Joint Width: Match adjacent grouted joint widths, unless TCNA EJ171 requires a specific joint width based on joint location or joint service conditions.
   4. Apply sealant joint to junction of tile and dissimilar materials and junction of dissimilar planes, including but not limited to floor to wall joints, corners, and metal trim and non-ceramic accessory items.
   5. Keep movement joints free of setting adhesive and grout.
   6. Where metal trims are not specified, form internal angles and corners square, not grouted, with sealant joint.
   7. Where metal trims are not specified, form external angles and corners square, not grouted, with sealant joint.
   8. Apply specified sealant to joints.

F. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

G. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly.
   1. Where floor and wall tile are of same dimensional module, align floor and wall joints.

H. 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.

I. Install ceramic accessories rigidly in prepared openings.

J. Install non-ceramic trim in accordance with manufacturer's instructions.

K. Sound tile after setting. Replace hollow sounding units.

L. Keep control and expansion joints free of mortar, grout, and adhesive.

M. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

N. Grout tile joints, except where movement joints are indicated or specified.

O. 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.

P. Allow completed tiling assemblies to cure full 72 hours before allowing heavy foot or equipment traffic on final installations.

3.4 INSTALLATION - FLOORS - THIN-SET METHODS

A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, latex-Portland cement bond coat, with high performance grout, unless otherwise indicated.
   1. Provide 100 percent coverage of setting mortar over tile back surfaces.
   2. Use full coverage crack isolation membrane under all tile not otherwise specified to receive uncoupling or waterproofing membranes.

3.5 INSTALLATION - WALL TILE

A. Over coated glass-mat W.R. gypsum backer board on studs, install in accordance with TCNA (HB) Method W245 .
   1. Provide 100 percent coverage of setting mortar over tile back surfaces.

3.6 TOLERANCES

A. Comply with applicable requirements of ANSI A108.2, unless otherwise specified in this Section.

B. Flatness - Finished Tiling Surfaces:
   1. Ceramic Tile: 1/4 inch in 10 feet.

C. Lippage - Adjacent Tile Units:
   1. Glazed Wall Tile and Mosaic Tile: 1/32 inch; joint width 1/16 inch to 1/8 inch; 1 x 1 inch to 6 x 6 inch tile size.
   2. Porcelain Tile: 1/32 inch; joint width 1/16 inch to less than 1/4 inch; all tile sizes.
   3. Porcelain Tile: 1/16 inch; joint width greater than 1/4 inch; all tile sizes.

3.7 CLEANING

A. Clean tile and grout surfaces.

B. Remove grout efflorescence as required with product approved by tile and grout manufacturer.

C. Unglazed tile may be cleaned with sulfamic acid solutions only when permitted by the tile and grout manufacturer's printed instructions, but not sooner than 14 days after completion of installation. Protect metal surfaces, iron, and vitreous fixtures from effects of acid cleaning. Flush surfaces with clean water before and after acid cleaning.

D. Leave finished installation clean and free of cracked, chipped, broken, un-bonded, or otherwise defective tile work.

3.8 PROTECTION

A. Do not permit traffic over finished floor surface for minimum 7 days after installation.

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

END OF SECTION 09 30 00

SECTION 09 51 13 - ACOUSTICAL PANEL CEILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.2 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; 2025a.

B. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.

C. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2019 (Reapproved 2025).

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

E. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Sequencing: 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.
   1. Do not install acoustical units until after interior wet work is dry.

1.4 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 minimum 6 x 6 inch in size illustrating material and finish of acoustical units.

D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. Extra Acoustical Units: Quantity equal to 5 percent of total installed.

1.5 QUALITY ASSURANCE

A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum three years documented experience.

B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum three years documented experience.

C. System Installer Qualifications: Company specializing in the installation of products specified in this Section with minimum three years documented experience.

1.6 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 20 to 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Manufacturer: As indicated on drawings.

B. Other Acceptable Manufacturers - Acoustic Panels:
   1. Armstrong World Industries, Inc.: www.armstrong.com.
   2. CertainTeed Corporation: www.certainteed.com/#sle.
   3. USG Corporation: www.usg.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

C. Acceptable Manufacturers - Suspension Systems:
   1. Same as for acoustical units.

2.2 PERFORMANCE REQUIREMENTS

A. Interior Suspended Ceilings, Soffits, and Bulkheads: Maintain deflection of not more than L/360 of distance between supports.

B. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.

2.3 ACOUSTICAL CEILINGS

A. Acoustical Units - General: ASTM E1264, Class A.
   1. Provide units having same classification, form, pattern, light reflectence, edge and color as existing units.
   2. Provide units with manufacturer's proprietary anti-humidity, sag-resistant composition and anti-microbial treatment to inhibit the propagation of mold and mildew.

B. Basis of Design Products: Provide products as indicated by manufacturer's designations in Finish Material Schedule or comparable products.

2.4 SUSPENSION SYSTEMS

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, except provide not less than G60 coating for severe or wet environments.
   2. Provide suspension system having same structural classification, profile, face width, finish and color as existing suspension system.

2.5 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.
   1. Size: As required for installation conditions.
   2. Angle Molding: L-shaped, for mounting at same elevation as face of grid.
   3. At Circular Penetrations: Provide edge moldings fabricated to diameter required to fit penetration precisely.

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.

C. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

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

3.2 PREPARATION

A. Install after major above-ceiling work is complete.

B. Coordinate the location of hangers with other work.

3.3 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C636/C636M 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. Use longest practical lengths.

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. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.

I. Do not eccentrically load system or induce rotation of runners.

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. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

E. Cutting Acoustical Units:
   1. Cut to fit irregular grid and perimeter edge trim.
   2. Make field cut edges of same profile as factory edges; finish cut edges to match factory finished edges if cut edge is exposed to view.
   3. Double cut and field paint exposed reveal edges to match factory finished edges.

F. Where round obstructions occur, provide preformed closures to match perimeter molding.

G. Install hold-down clips on panels within 10 ft of an exterior door.

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. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09 51 13

SECTION 09 54 26 - SUSPENDED WOOD CEILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Wood veneer panels.

B. Wood grilles.

C. Metal suspension system.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure ceilings are not installed until building is enclosed, dust generating activities have terminated, and overhead work is completed.

1.3 SUBMITTALS

A. Shop Drawings: Indicate grid layout and related dimensioning, attachment of wood ceiling components to grid, accessory attachments, junctions with other ceiling finishes, and mechanical and electrical items installed in the ceiling.

B. Product Data: Provide data on wood ceiling components and suspension system components.

C. Samples: Submit two 12 by 12 inch samples illustrating material and finish of wood ceiling components.

D. Test Reports: Certified test data from an independent test agency verifying that panels meet specified requirements for fire performance.

E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

F. Installer's qualification statement.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with at least 10 years documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience on at least five projects of similar scope and complexity, and approved by manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver wood ceiling components to project site in original, unopened packages.

B. Store in fully enclosed space, flat, level and off the floor.

1.6 FIELD CONDITIONS

A. Do not install suspended wood ceiling system until wet construction work is complete and permanent heat and air conditioning is installed and operating.

B. Maintain room temperature between 60 degrees F and 75 degrees F and relative humidity between 35 to 55 percent before, during, and after installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Suspended Wood Ceilings:
1. 9Wood; _____: www.9wood.com/#sle.
2. Certainteed Architectural; _____: www.certainteed.com/ceilings-and-walls/#sle.
3. Madrid, Inc; _____: www.madridinc.com/#sle.
4. Rulon International; _____: www.rulonco.com/#sle (Basis of Design).

2.2 SUSPENDED WOOD CEILING SYSTEM

A. Performance Requirements:
1. Design for maximum deflection of 1/360 of span.
2. Surface Burning Characteristics: Class 1 or A when tested in accordance with ASTM E84.

B. Wood-Based Materials:
1. Solid Wood: Clear, dry, sound, plain sawn, selected for species, grain and color, no defects.
2. Composite Wood Panels: Containing no urea-formaldehyde resin binders.

C. Curved Wood Veneer Panels: Composite wood core with wood veneer finish.
1. Panel Size: As indicated; 48 by 120 inches maximum.
2. Veneer Species: Maple.
a. Factory Finish: Clear sealer.
3. Attachment to Suspension Grid: Manufacturer's recommended method according to panel product selected.
4. Edge Profile: Square.
5. Suspension System: Type specified below.

6. Basis of Design Product:
    a. Rulon International; Curvalon; https://rulonco.com/products/curvalon/.

D. Wood Grilles: Pre-assembled module of solid wood or wood veneer grilles with dowels.
1. Module Size: 12 inces wide by 24 to 120 inches long, nominal.
2. Slat Size: 3/4 inch width by 2 inch depth.
3. Slat Spacing (Reveal): 3/4 inch.
4. Backer: Manufacturer's standard fabric except none below supply diffusers.
    a. Color: Black.
5. Veneer Species: Maple.
    a. Factory Finish: Wood stain as selected, clear sealer top coat.
6. Solid Wood Species: Maple.
    a. Factory Finish: Wood stain as selected, clear sealer top coat.
7. Attachment to Suspension Grid: Direct screw attachment to suspension grid.
8. Suspension System: Type specified below.
9. Products:
    a. Rulon International; Panel Grill; https://rulonco.com/products/grilles/.
    b. Substitutions: See Section 01 60 00 - Product Requirements.

E. Metal Suspension System:
1. General: Comply with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold down clips, stabilizer bars, clips, and splices as required.
    a. Materials:
        1) Steel Grid: ASTM A653/A653M, G30 coating, unless otherwise indicated.
2. Curved Ceiling Suspension System:
    a. Description: Engineered grid, with slotted faces in main tees, cross tees, hangers, trim molding, load resisting struts, hinge assemblies, and other suspension components required to support ceiling and other ceiling supported construction. Panels installed from below by inserting torsion springs into slots in faces of main tees of ceiling grid.
    b. Structural Classification: Heavy-duty, when tested in accordance with ASTM C635/C635M.
    c. Profile: Manufacturer's standard.
    d. Finish: Powder coat.
    e. Color: Black.

F. Accessories: Manufacturer's standard accessories for installation method indicated, above-ceiling accessibility.

G. C-Hangers: Suspension hangers that are direct-screwed to the panel and hang over the heavy duty-grid; spring-steel with phosphate pre-treatment and corrosion-resistant coating.

H. Torsion Springs and Saddle Clips: Two parts of a suspension system in which the torsion spring is direct-screwed to the panel and compressed to attach to the saddle clip that is fitted over the heavy duty-grid; spring-steel with phosphate pre-treatment and corrosion-resistant coating.

I. Lighting System: Coordinate ceiling panels with lighting specified in Division 26 Sections specifying interior lighting.

2.3 FABRICATION

A. Shop fabricate wood ceiling components to the greatest extent possible.

B. Fabricate components to allow access to ceiling plenum as required.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Do not install ceiling until after interior wet work is dry.

3.2 PREPARATION

A. Coordinate the location of hangers with other work.

B. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.

C. Layout wood ceiling components in pattern according to reflected ceiling plan and as shown on shop drawings.

D. Acclimate wood ceiling materials by removing from packaging in installation area a minimum of 72 hours prior to installation.

3.3 INSTALLATION

A. General: Install suspended wood ceiling system in accordance with CISCA (WC).

B. Suspension System:
1. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.
2. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
3. 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.
4. 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.

5. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
6. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
7. Do not eccentrically load system or induce rotation of runners.

C. Wood Ceiling:
1. Install wood ceilings in accordance with manufacturer's instructions.
2. Fit wood components in place, free from damaged edges or other defects detrimental to appearance and function.
3. Install components in uniform plane, and free from twist, warp, and dents.
4. Cut to fit irregular grid and perimeter edge trim.
5. Make field cut edges of same profile as factory edges, seal and finish according to manufacturer.
6. Install clips, stabilizer bars, and other attachments as indicated to secure wood ceiling components tight to the grid system.
7. Install acoustical backer above wood ceiling components; fit tight between grid members.

3.4 CLEANING

A. Clean and touch up minor finish damage. Remove and replace components that cannot be successfully cleaned and repaired.

END OF SECTION 09 54 26

SECTION 09 65 00 - RESILIENT FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Resilient sheet flooring.

B. Resilient tile flooring.

C. Resilient stair accessories.

D. Installation accessories.

1.2 RELATED REQUIREMENTS

A. Section 09 05 61 - Common Work Results For Flooring Preparation: Independent agency testing of concrete slabs, cleaning, or preparation.

B. Section 09 65 13 - Resilient Wall Base and Accessories.

1.3 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. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.

D. Verification Samples: Submit two samples, minimum 6 x 12 inch in size illustrating color and pattern for each resilient flooring product specified.

E. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

F. Manufacturer's Qualification Statement.

G. Installer's Qualification Statement.

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 Flooring Material: Additional quantity equivalent to 2 percent of each type and color.
   3. Extra Stair Materials: Quantity equivalent to 5 percent of each type and color.
   4. Clearly identify each package.

1.4 QUALITY ASSURANCE

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

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

1.5 DELIVERY, STORAGE, AND HANDLING

A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.

B. Store all materials off of the floor in an acclimatized, weather-tight space.

C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

D. Deliver and store materials in manufacturer's original unopened containers, with brand names and production lot numbers clearly marked.

E. Protect roll materials from damage by storing on end.

F. Do not double stack pallets.

1.6 FIELD CONDITIONS

A. Store materials for not less than 48 hours prior to installation in area of installation at a minimum temperature of 65 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

B. Install resilient flooring and accessories after other finishing operations, including painting have been completed.

C. Do not install resilient flooring over concrete slabs until slabs have been fully cured, and are sufficiently dry to achieve proper bond with adhesive as determined by resilient flooring manufacturer's recommended bond and moisture test.

1.7 WARRANTY

A. Resilient Flooring: Provide manufacturer's warranty, as follows:
   1. Materials: Minimum 15 years from date of purchase, covering manufacturing defects and wear due to normal foot traffic.
   2. Installation: Minimum 2 years from date of installation; warrant entire installation against loss of adhesion to substrates.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:
   1. Manufacturers and products specified on Drawings.
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.2 SHEET FLOORING

A. General: Comply with adhesives and sealants, volatile organic compound (VOC), and flooring system product requirements specified in Section 6000 and Section 01 6116 as applicable.

B. Vinyl Sheet Flooring: Transparent or translucent vinyl wear layer over interlayer and backing.
   1. Minimum Requirements: Comply with ASTM F1303, Type I, with Class A fibrous backing.
   2. Wear Layer Thickness: 0.020 inch minimum.
   3. Total Thickness: 0.080 inch minimum.
   4. Pattern: _____.

2.3 TILE FLOORING

A. Luxury Vinyl Tile:
   1. Minimum Requirements: Comply with ASTM F1700, of Class corresponding to type specified.
   2. Plank Tile Size: 7 by 48 inch.
   3. Wear Layer Thickness: 0.020 inch.
   4. Total Thickness: 0.125 inch.
   5. Type and Color: As indicated on drawings.

2.4 ACCESSORIES

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

B. Adhesives: Waterproof; types recommended by flooring manufacturer.
   1. Provide only products having lower volatile organic compound (VOC) content than required by the more stringent of the South Coast Air Quality Management District Rule No.1168 and the Bay Area Air Quality Management District Regulation 8, Rule 51.

C. Resilient Wall Base, Edge Strips, and Accessories: Specified in Section 09 65 13.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

B. Minimum F(F) Floor Flatness Values:
   1. Under Resilient Flooring: F(F) of 35.

C. 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.

D. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient 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 resilient flooring manufacturer and adhesive materials manufacturer.
   3. If flooring manufacturer does not reccomend specific remediation materials and procedures, 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. Prepare floor substrates for installation of flooring in accordance with Section 09 05 61.

B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

C. Clean substrate.

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.
   3. Set flooring in place, press with heavy roller to attain full adhesion.

D. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

E. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

1. Resilient Strips: Attach to substrate using adhesive.

F. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.4 INSTALLATION - SHEET FLOORING

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

3.5 INSTALLATION - TILE FLOORING

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

B. Install flooring in pattern as indicated in drawings. Allow minimum 1/2 full size tile width at room or area perimeter.

C. Install plank tile with a random offset of at least 6 inches from adjacent rows.

3.6 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

3.7 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.

B. Place protective coverings over finished floors; do not remove coverings until Date of Substantial Completion.

END OF SECTION 09 65 00

SECTION 09 65 13 - RESILIENT WALL BASE AND ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Resilient wall base.

B. Resilient edge and transition strips.

C. Flooring system accessories.

1.2 RELATED REQUIREMENTS

A. Section 09 68 13 - Tile Carpeting.

1.3 REFERENCE STANDARDS

A. ASTM F1861 - Standard Specification for Resilient Wall Base; 2021.

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. Selection Samples: If basis of design color is not provided, submit manufacturer's complete set of color samples for Architect's selection.

D. Verification Samples: Submit two samples, minimum 4x4 inch in size illustrating color and pattern for each resilient flooring product specified.

E. 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 Wall Base: 24 linear feet of each type and color.
   3. Clearly identify each package.

1.5 QUALITY ASSURANCE

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

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

1.6 DELIVERY, STORAGE, AND HANDLING

A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.

B. Store all materials off of the floor in an acclimatized, weather-tight space.

C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

D. Deliver and store materials in manufacturer's original unopened containers, with brand names and production lot numbers clearly marked.

E. Protect roll materials from damage by storing on end.

F. Do not double stack pallets.

1.7 FIELD CONDITIONS

A. Store materials for not less than 48 hours prior to installation in area of installation at a minimum temperature of 65 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

B. Install resilient accessories after other finishing operations, including painting have been completed.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Manufacturers:
   1. Manufacturers and products specified on Drawings.
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.2 RESILIENT BASE

A. General: Comply with adhesives and sealants and flooring system product requirements specified.

B. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set, Style B, Cove.
   1. Acceptable Manufacturers:
      a. Mannington Commercial: www.manningtoncommercial.com.
      b. Johnsonite, a Tarkett Company: www.commercial.tarkett.com

c. Roppe Corp.: www.roppe.com.
d. ShawContract: www.shawcontract.com.
e. Substitutions: See Section 01 60 00 - Product Requirements.

2. Group: I (solid, homogeneous).
3. Height: 4 inch.
4. Thickness: 0.125 inch.
5. Finish: Satin.
6. Color: As indicated on drawings.

2.3 ACCESSORIES

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

B. Adhesives: Waterproof; types recommended by flooring manufacturer.
1. Compatible with materials being adhered; maximum VOC content of 50 g/L.

C. Moldings and Edge Strips: Homogeneous vinyl or rubber type; tapered or bullnose edge; one inch wide; color selected by Architect.

D. Moldings, Transition and Edge Strips: As scheduled in drawings.

PART 3 EXECUTION

3.1 EXAMINATION

A. 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. Remove substrate ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
1. Prohibit traffic until filler is fully cured.

C. Clean substrate.

3.3 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of 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.

3.4 INSTALLATION - RESILIENT BASE

A. Apply wall base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

B. Fit joints tightly and make vertical. Install in longest lengths possible; maintain minimum dimension of 18 inches between joints.

C. Miter internal corners. At external corners, 'V' cut back of base strip to 2/3 of its thickness and fold.
   1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends.

D. Install base on solid backing. Bond tightly to wall and floor surfaces.

E. Do not stretch wall base during installation.

F. Scribe and fit to door frames and other interruptions.

3.5 INSTALLATION - RESILIENT ACCESORIES

A. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
   1. Type and Location: As indicated in Drawings.
   2. Resilient Strips: Attach to substrate using adhesive.

3.6 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

3.7 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION 09 65 13

SECTION 09 68 13 - TILE CARPETING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Carpet tile, fully adhered.

1.2 RELATED REQUIREMENTS

A. Section 09 05 61 - Common Work Results For Flooring Preparation: Cleaning, and preparation.

B. Section 09 65 13 - Resilient Wall Base and Accessories.

1.3 REFERENCE STANDARDS

A. CRI 104 - Standard for Installation of Commercial Carpet; 2015.

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. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

E. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

F. Product Schedule: Use same room and product designations indicated on Drawings and in schedules.

G. Qualification Data: For qualified Installers indicating they are certified INSTALL (International Standards & Training Alliance) professionals.

H. 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. 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 three years documented experience.

B. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. General: Comply with CRI 104 section for "Storage and Handling."

B. Deliver carpeting materials in original mill protective wrapping, with mill register numbers and tags attached.

C. Store inside, in well ventilated area, protected from weather, moisture, and soiling.

1.7 FIELD CONDITIONS

A. Sub-floor preparation is to include all required work to prepare the existing floor for installation of the product as specified in this document and Manufacturer’s installation instructions.
   1. All material used in sub-floor preparation and repair shall be recommended by the flooring manufacturer and shall be chemically and physically compatible with the flooring system.

B. Stage materials in area of installation for minimum period of 24 hours prior to installation.

C. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation.

D. Ventilate installation area during installation and for 72 hours after installation.

E. Do not commence with carpet installation until painting and finishing work is complete and ceilings and overhead work has been tested, approved, and completed.

F. Do not install carpet tile over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.

1.8 WARRANTY

A. Special Carpet Tile Warranty: Written warranty, signed by carpet tile manufacturer agreeing to replace carpet tile that does not comply with requirements or that fails within specified warranty period. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, and delamination.
   1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer:
   1. Manufacturers and products specified on Drawings.
   2. Substitutions: Not permitted.

2.2 ACCESSORIES

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

B. Resilient Wall Base and Accessories: Specified in Section 09 65 13.

C. Adhesives:
   1. Compatible with materials being adhered; maximum VOC content of 50 g/L; CRI (GLP) certified.

D. Carpet Tile Adhesive: Recommended by carpet tile manufacturer; releasable type.

E. Miscellaneous Materials: Provide other items recommended by carpet manufacturer and installer for the indicated conditions of carpet use, and as required for complete installation.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.

B. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.

C. 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. If flooring manufacturer does not reccomend specific remediation materials and procedures, follow moisture and alkalinity remediation procedures in Section 09 05 61.

D. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

A. General: Comply with CRI 104 sections for "Site Conditions" and "Floor Preparation" for preparing substrates indicated to receive carpet tile installation.

B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

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

D. Remove subfloor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with subfloor filler.

E. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.

F. Vacuum clean substrate.

G. There will be no exceptions to the provisions stated in the Manufacturer’s installation instructions.

3.3 INSTALLATION

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install carpet tile in accordance with manufacturer's instructions and CRI 104 (Commercial).

C. Blend carpet from different cartons to ensure minimal variation in color match.

D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.

E. Locate change of color or pattern between rooms under door centerline.

F. Fully adhere carpet tile to substrate.

G. Trim carpet tile neatly at walls and around interruptions.

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

I. Complete installation of edge strips, concealing exposed edges.

3.4 CLEANING

A. Remove excess adhesive without damage, from floor, base, and wall surfaces.

B. Clean and vacuum carpet surfaces.

3.5 PROTECTION

A. Protect installed carpet tile to comply with CRI 104.
   1. Do not use plastic protection. Use kraft paper, corrugated box material or hardboard as recommended by carpet tile manufacturers.

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

END OF SECTION 09 68 13

SECTION 09 84 30 - SOUND-ABSORBING WALL AND CEILING UNITS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Sound-absorbing panels.

1.2 SUBMITTALS

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

B. Product Data: Manufacturer's printed data sheets for products specified.

C. Shop Drawings: Fabrication and installation details, panel layout and fabric orientation.

D. Verification Samples: Fabricated samples of each type of panel specified; 12 by 12 inch, showing construction, edge details, and fabric covering.

E. Test Reports: Certified test data from an independent test agency verifying that panels meet specified requirements for acoustical and fire performance.

1.3 QUALITY ASSURANCE

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

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect acoustical units from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until units are needed for installation.

B. Store units flat, in dry, well-ventilated space; do not stand on end.

C. Protect edges from damage.

PART 2 PRODUCTS

2.1 FABRIC-COVERED SOUND-ABSORBING UNITS

A. Manufacturers:
   1. DecraSound Acoustics; Dimensional Triangle 3D Acoustic Wall Panels; https://decrasound.com/dimension-3d-panels/ (Basis of Design).

B. General:
   1. Prefinished, factory assembled fabric-covered panels.
   2. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.

C. Fabric-Covered Acoustical Panels for Walls:
   1. Sound Absorption: Noise Reduction Coefficient (NRC) or Sound Absorption Average (SAA) of 0.85 when tested in accordance with ASTM C423 for Type A mounting, per ASTM E795.
   2. Panel Size: 585 mm square.
   3. Panel Thickness: 60 mm.
   4. Corners: Square.
   5. Fabric: PET.
   6. Color: As indicated or, if not indicated, as selected from manufacturer's full range.
   7. Mounting Method: Direct applied with adhesive.

2.2 FABRICATION

A. Fabric Wrapped, General: Fabricate panels to sizes and configurations as indicated, with fabric facing installed without sagging, wrinkles, blisters, or visible seams.

B. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 inch for thickness, overall length and width, and squareness from corner to corner.

2.3 ACCESSORIES

A. Panel Adhesive: Acceptable to acoustical panel manufacturer for application as indicated.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install acoustical units in locations as indicated, following manufacturer's installation instructions.

B. Install mounting accessories and supports in accordance with shop drawings.

C. Install acoustical units to construction tolerances of plus or minus 1/16 inch for the following:
   1. Plumb and level.
   2. Panel-to-panel alignment.
   3. Width of joints.

3.2 CLEANING

A. Clean sound-absorptive panels upon completion of installation from dust and other foreign materials, following manufacturer's instructions.

3.3 PROTECTION

A. Provide protection of installed acoustical panels until Date of Substantial Completion.

B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

END OF SECTION 09 84 30

SECTION 09 91 13 - EXTERIOR PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Materials for backpriming woodwork.

D. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.

E. Do Not Paint or Finish the Following Items:
1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
2. Items indicated to receive other finishes.
3. Items indicated to remain unfinished.
4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
5. Non-metallic roofing and flashing.
6. Stainless steel, anodized aluminum, bronze, terne coated stainless steel, zinc, and lead.
7. Weathering steel.
8. Floors, unless specifically indicated.
9. Ceramic and other types of tiles.
10. Glass.
11. Concealed pipes, ducts, and conduits.

1.2 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications: Shop-primed items.

B. Section 09 91 23 - Interior Painting.

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

D. SCAQMD 1113 - Architectural Coatings; 1977, with Amendment (2016).

E. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

F. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).

G. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

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(s) product is to be used in; include description of each system.

C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.
   2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens definitely not required.
   3. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as masonry, siding, and factory finished metals, 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 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.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum five years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five years experience.

1.7 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.

1.8 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior paint and finishes during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Minimum Application Temperatures for Latex Paints: 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

E. 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.
3. Benjamin Moore: www.benjaminmoore.com.

C. Primer Sealers: Same manufacturer as top coats.

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 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. SCAQMD 1113 Rule.
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: To be selected from manufacturer's full range of available colors.

1. Extend colors to surface edges; colors may change at any edge as directed by Architect.

2.3 PAINT SYSTEMS - EXTERIOR

A. Paint E-OP - Exterior Surfaces to be Painted, Unless Otherwise Indicated: Including applications listed below.
   1. Two top coats and one coat primer.
      a. If flash rusting occurs, use two coats of primer.
   2. Top Coat(s): Exterior Latex; MPI #10, 11, 15.
      a. Application: Concrete and brick substrates, where indicated.
      b. Products:
         1) PPG Paints Speedhide Exterior 100% Acrylic Latex.
         2) Benjamin Moore Ben 100% Acrylic Exterior Finish.
         3) Sherwin Williams A-100 Exterior Acrylic Latex.
   3. Top Coat(s): Exterior Light Industrial Coating, Water Based; MPI #161, 163, or 164.
      a. Application: Primed and galvanized metals (doors, fences, lintels, etc).
      b. Products:
         1) PPG Paints Pitt-Tech Plus WB DTM Industrial Enamel.
         2) Benjamin Moore Super Spec HP DTM Acrylic.
         3) Sherwin Williams Pro Industrial DTM Acrylic B66 Series.
   4. Top Coat Sheen:
      a. Flat: MPI gloss level 1; use this sheen for overhead surfaces.
      b. Satin: MPI gloss level 4; use this sheen at wood, cementitous or masonry substrates unless otherwise noted.
      c. Semi-Gloss: MPI gloss level 5; use this sheen at metal substrates unless otherwise noted.
   5. Primer: As recommended by top coat manufacturer for specific substrate.

2.4 PRIMERS

A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.
   1. Alkali Resistant Water Based Primer; MPI #3.
      a. Products:
         1) Pittsburgh Paints: 4-603XI Perma-Crete Interior/Exterior Alkali Resistant Primer. (MPI #3)
         2) Benjamin Moore Ultra Spec Acrylic High-Build Masonry Primer.
         3) Sherwin Williams Loxon Concrete & Masonry Primer (MPI #3).
   2. Interior/Exterior Latex Block Filler; MPI #4.
      a. Products:
         1) Kilz Pro-X p50 Block Filler Primer.
         2) Pittsburgh Paints: 6-15XI Speedhide Masonry Hi Fill Latex Block Filler. (MPI #4)

3) Benjamin Moore Ultra Spec High-Build Masonry Block Filler.
4) Sherwin Williams B25W25 Preprite Block Filler. (MPI #4).

3. Water Based Primer for Galvanized Metal; MPI #134.
   a. Products:
      1) Pittsburgh Paints: 4020 PF Pitt-Tech Plus Interior/Exterior Waterborne Acrylic Primer Finish DTM Industrial Enamel. (MPI #134).
      2) Sherwin Williams Pro-Cryl Universal Metal Primer B-66 Series.
4. Rust-Inhibitive Water Based Primer.
   a. Products:
      1) Benjamin Moore: MO4 Acrylic Metal Primer.
      2) ICI Paints: Devoe Coatings DevFlex 4020PF Direct to Metal Primer & Flat Finish.
      3) PPG Industries: 90-708 Series, Pitt-Tech One-Pack Interior/Exterior Industrial Primer.
      4) Sherwin Williams: DTM Acrylic Primer Finish B66W1.

2.5 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 effect proper application.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

E. Test shop-applied primer for compatibility with subsequent cover materials.

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. Remove efflorescence and chalk. Do not coat surfaces if moisture content or 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.
3. Clean surfaces with pressurized water. Use pressure range of 600 to 1,500 psi at 6 to 12 inches. Allow to dry.

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.
2. Prepare surface according to SSPC-SP 2.

J. 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.
3. Remove rust, loose mill scale, and other foreign substances using using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

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. Sand 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 CLEANING

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

3.5 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

3.6 SCHEDULE

A. Paint ME-OP-3L - Ferrous Metals, Unprimed, Opaque, 3 Coat:
   1. One coat of primer.
   2. Semi-gloss: Two coats of light industrial coating.

B. Paint ME-OP-2L - Ferrous Metals, Primed, Opaque, 2 Coat:
   1. Touch-up with rust-inhibitive primer recommended by top coat manufacturer.
   2. Semi-gloss: Two coats of light industrial coating.

C. Paint MgE-OP-3L - Galvanized Metals, Opaque, 3 Coat:
   1. One coat galvanize primer.
   2. Semi-gloss: Two coats of light industrial coating.

D. Paint CE-OP-3L - Brick Masonry/Concrete, Opaque, 3 Coat:
   1. One coat of latex primer sealer.

2. Satin: Two coats of latex enamel.

END OF SECTION 09 91 13

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. Prime surfaces to receive wall coverings.
   2. 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 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 convector 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. Ceramic and other tiles.
   9. Brick, architectural concrete, cast stone, integrally colored plaster, and stucco.
   10. Glass.
   11. Acoustical materials, unless specifically indicated.
   12. Concealed pipes, ducts, and conduits.

1.2 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications: Shop-primed items.

B. Section 09 91 13 - Exterior Painting.

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

E. SCAQMD 1113 - Architectural Coatings; 1977, with Amendment (2016).

F. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

G. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).

H. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

I. SSPC-SP 13 - 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.

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 factory finished metals, 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. Extra Paint and Finish Materials: 1 gal of each color; from the same product run, store where directed.
2. 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 five years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five years experience.

1.7 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.

1.8 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.

B. Paints:
1. Pittsburgh Paints: www.ppgpaints.com/#sle.
2. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
3. Benjamin Moore: www.benjaminmoore.com.

C. Primer Sealers: Same manufacturer as top coats.

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. SCAQMD 1113 Rule.
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. Extend colors to surface edges; colors may change at any edge as directed by Architect.
2. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling under which they are mounted.

2.3 PAINT SYSTEMS - INTERIOR

A. LATEX PAINTS
1. Paint I-OP-3L - Interior Latex Enamel.
a. Products:
1) PPG Paints Speedhide Zero Interior Latex, 6-4110XI Series, Flat. (MPI #53)
2) PPG Paints Speedhide Zero Interior Latex, 6-4310XI Series, Eggshell. (MPI #44)
3) PPG Paints Speedhide Zero Interior Latex, 6-4410XI Series, Satin. (MPI #52)
4) PPG Paints Speedhide Zero Interior Latex, 6-4510XI Series, Semi-Gloss. (MPI #54)
5) Sherwin-Williams ProMar 200 Zero VOC Interior Latex, Flat. (MPI #53)
6) Sherwin-Williams ProMar 200 Zero VOC Interior Latex, Semi-Gloss. (MPI #43)
7) Sherwin-Williams ProMar 200 Zero VOC Interior Latex, Low Sheen. (MPI #44)
8) Sherwin-Williams ProMar 200 Zero VOC Interior Latex, Eg-Shel. (MPI #52)
9) Benjamin Moore Ultra Spec 500 Flat N536. (MPI #53)
10) Benjamin Moore Ultra Spec 500 Low Sheen N537. (MPI #44)
11) Benjamin Moore Ultra Spec 500 Eggshell N538. (MPI #52)
12) Benjamin Moore Ultra Spec 500 Semi-Gloss N539. (MPI #43)
b. Products:

B. ACRYLIC PAINTS
1. Paint MI-OP-3LA - Acrylic Enamel.
a. Products:
1) PPG Paints Pitt-Tech Plus WB DTM Industrial Enamel, 90-1210 Series, Semi-Gloss. (MPI #153)
2) Sherwin-Williams Pro Industrial DTM Acrylic, B66 Series, Semi-Gloss (MPI #153)
3) Benjamin Moore Super Spec HP DTM Acrylic, Semi-Gloss. (MPI #153)
2. Paint WI-OP-3LA - Acrylic Enamel.
a. Products:

1) PPG Paints Speedhide Zero Interior Zero VOC Latex, 6-4510XI, Semi-Gloss. (MPI #147)
2) Sherwin-Williams Pro Industrial Acrylic, B66 Series, Semi-Gloss. (MPI #147)
3) Benjamin Moore Ultra Spec 500, 539 Series, Semi-Gloss. (MPI #147)

3. Paint I-GP-3L - Vinyl Acrylic Enamel.
   a. Products:
      1) Rosco Chroma Key Paint

2.4 PRIMERS

A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.
   1. Alkali Resistant Water Based Primer.
      a. Products:
         1) Pittsburgh Paints Perma-Crete Interior/Exterior Alkali Resistant Primer, 4-603XI. (MPI #3)
         2) Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50. (MPI #3)
         3) Benjamin Moore High Build Acrylic Masonry Primer, 068.
   2. Interior/Exterior Latex Block Filler.
      a. Products:
         1) Kilz Pro-X p50 Block Filler Primer.
         2) PPG Paints Speedhide Masonry Hi Fill Latex Block Filler, 6-15XI .
         3) Sherwin-Williams PrepRite Block Filler.
   3. Interior Drywall Primer Sealer.
      a. Products:
         1) PPG Paints Speedhide Zero Interior Latex Sealer, 6-4900XI.
         2) Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28 Series.
         3) Benjamin Moore Ultra Spec 500 Primer 534.
   4. Interior Rust-Inhibitive Water Based Primer.
      a. Products:
         1) Pittsburgh Paints Pitt-Tech Plus Interior/Exterior EP DTM Waterborne Acrylic Primer/Finish, 90-1908. (MPI #107)
         2) Sherwin-Williams Pro-Cryl Universal Waterbased Primer.
         3) Benjamin Moore Ultra Spec HP Acrylic Metal Primer, HP04.
   5. Interior Water Based Primer for Galvanized Metal.
      a. Products:
         1) Pittsburgh Paints Pitt-Tech Plus EP DTM Industrial Primer, 90-1912. (MPI #134)
         2) Sherwin-Williams Pro-Cryl Universal Waterbased Primer.
         3) Benjamin Moore Ultra Spec HP Acrylic Metal Primer, HP04.

2.5 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. 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 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. 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 surfaces with pressurized water. Use pressure range of 1,500 to 4,000 psi at 6 to 12 inches. Allow to dry.
3. Clean concrete according to ASTM D4258. Allow to dry.
4. Prepare surface as recommended by top coat manufacturer and according to SSPC-SP 13.

G. 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.
3. Clean surfaces with pressurized water. Use pressure range of 600 to 1,500 psi at 6 to 12 inches. Allow to dry.

H. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.

I. Aluminum: Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.

J. 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.

K. Ferrous Metal:
1. Solvent clean according to SSPC-SP 1.
2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 Commercial Blast Cleaning. Protect from corrosion until coated.

L. 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 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 CLEANING

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

B. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
   1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.5 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

3.6 SCHEDULE - PAINT SYSTEMS

A. Paint I-OP-3L - CMU Substrates, Latex Enamel (Eggshell):
   1. Block Filler: Block Filler 10 mils DFT.
   2. Intermediate Coat: Latex Enamel, 1.6 mils DFT.
   3. Topcoats: Latex Enamel, 1.6 mils DFT.

B. Paint MI-OP-3LA - Steel Substrates, Acrylic Enamel (Semi-gloss):
   1. Prime Coat: Rust-Inhibitive Water Based Primer, 3.0 mils DFT.
   2. Intermediate Coat: Acrylic Enamel, 1.4 mils DFT.
   3. Topcoats: Acrylic Enamel, 1.4 mils DFT.

C. Paint MsI-OP-3D - Steel Substrates, Acrylic Dry-Fall (Exposed Overhead Steel - Flat):

1. Prime Coat: Rust-Inhibitive Water Based Primer, 3.0 mils DFT.
2. Intermediate Coat: Interior Acrylic Dry-Fall, 3.0-4.5 mils DFT.
3. Topcoats: Interior Acrylic Dry-Fall, 3.0-4.5 mils DFT.

D. Paint I-OP-3L - Gypsum Board Substrates, Latex Enamel (Ceilings - Flat; Walls Other Than Corridor and Toilet Room Walls - Eggshell, Unless Otherwise Noted):
1. Prime Coat: Interior Latex Primer Sealer, 1.4 mils DFT.
2. Intermediate Coat: Latex Enamel, 1.6 mils DFT.
3. Topcoats: Latex Enamel, 1.6 mils DFT.

E. Paint I-GP-3L - Gypsum Board Substrates, Latex Enamel (Ceilings - Flat; Walls Other Than Corridor and Toilet Room Walls - Eggshell, Unless Otherwise Noted):
1. Prime Coat: Interior Latex Primer Sealer, 1.4 mils DFT.
2. Green Screen Topcoats: Vinyl Acrylic Enamel, 2.0 mils DFT.
3. Green Screen Topcoats: Vinyl Acrylic Enamel, 2.0 mils DFT.

F. Sealer I-TR-C - Concrete Floor Substrates, Clear Sealer (Eggshell or Satin):
1. Intermediate Coat: Sealer, 1.0 mils DFT.
2. Topcoats: Sealer, 1.0 mils DFT.

END OF SECTION 09 91 23

SECTION 10 14 00 - SIGNAGE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Room and door signs.

B. Interior directional and informational signs.

C. Dimensional letter signs.

D. Signs required for Building Code compliance and building occupancy.

1.2 RELATED REQUIREMENTS

A. Section 07 05 53 - Fire and Smoke Assembly Identification: Code-Required wall, barrier, and partition signs

1.3 REFERENCE STANDARDS

A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.

B. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

C. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

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 sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.

C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.

1. When room numbers to appear on signs differ from those on Drawings, include the drawing room number on schedule.
2. 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.
3. 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, illustrating sign style, font, and method of attachment.

E. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.

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 DELIVERY, STORAGE, AND HANDLING

A. Package signs as required to prevent damage before installation.

B. Package room and door signs in sequential order of installation, labeled by floor or building.

C. Store tape adhesive at normal room temperature.

1.7 FIELD CONDITIONS

A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.

B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.1 SIGNAGE APPLICATIONS

A. Accessibility Compliance: Signs are required to 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 comprehensive and specific requirements.

B. Room and Door Signs:
   1. Sign Type: Flat signs with graphic symbols and panel media as specified.
   2. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
   3. Character Height: 1 inch.
   4. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", and braille.
   5. Interior Rooms: Identify with room names and numbers to be determined later, not those shown on the Drawings, and braille.

C. Interior Directional and Informational Signs:
   1. Sign Type: Flat signs with panel media as specified.

2. Tactile Exit Signs: Identify with either "EXIT" or "EMERGENCY EXIT" and braille.
    a. Locations: Adjacent to each door to an egress stairway, exit passageway, and exit discharge.

D. Stairway Signs:
1. Sign Type: Flat signs with panel media as specified.
2. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
3. Stairway Identification Signs: Provide one sign at each floor landing in each exit stairway connecting more than three stories designating the floor level, the terminus of the top and bottom of the exit stairway, and the identification of the stairway. The signage shall also state the story of, and the direction to, the exit discharge and the availability of roof access from the exit stairway for the fire department.
    a. Minimum Size: 18 by 12 inches.
    b. Letters Designating the Identification of the Interior Stair: Minimum 1-1/2 inches in height.
    c. Numbers Designating the Floor Level: Minimum 5 inches in height and centered in sign.
    d. Other Lettering and Numbering: Minimum 1 inches in height.
4. Tactile Level ID Signs: Provide one floor-level sign in visual characters, raised characters and braille complying with ICC A117.1 at each floor-level landing adjacent to the door leading from the exit stairway into the corridor to identify the floor level.

E. Code-Required Door and Room Signs: Provide all signs required by Authority Having Jurisdiction (AHJ) for building occupancy; determine requirements and report to Owner and Architect prior to making specified submittals. Include cost of these signs in Contract Sum.

2.2 FLAT SIGNS

A. Flat Signs: Signage media without frame.
1. Material: Plastic or acrylic having a non-glare finish.
2. Edges: Square.
3. Corners: Square.
4. Wall Mounting of One-Sided Signs: Tape adhesive.
5. Signs Mounted on Glass: Where signs are mounted on glass, provide blank back-panel of matching size and material to conceal mounting unless otherwise noted.

B. Color and Font: Unless otherwise indicated:
1. Character Font: Helvetica, Arial, or other sans serif font.
2. Character Case: Upper case only.
3. Background Color: As selected by Architect from manufacturer's standard range.
4. Character Color: Contrasting color as selected.

2.3 DIMENSIONAL LETTERS

A. Metal Letters:

1. Metal: Aluminum sheet, flat.
2. Metal Thickness: 1/8 inch minimum.
3. Letter Height: As indicated on drawings.
4. Finish: Brushed, satin.
5. Mounting: Tape adhesive.

B. Plastic Letters:
1. Material: Acrylic or other formed plastic signage.
2. Color: As selected.
3. Mounting: Tape adhesive.

2.4 ACCESSORIES

A. Mounting Devices: Except as specified for each sign type, provide mounting devices specifically recommended by manufacturer for indicated application; concealed upon finished installation.

B. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install neatly, with horizontal edges level.

C. Locate signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.

D. Locate signs where indicated:
1. Emergency Evacuation Maps: Locate centered between elevator doors, or where indicated on Drawings.
2. If no location is indicated obtain Architect's instructions.

E. Protect from damage until Date of Substantial Completion; repair or replace damaged items.

END OF SECTION 10 14 00

SECTION 10 21 13.17 - PHENOLIC TOILET COMPARTMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Phenolic toilet compartments.

1.2 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Blocking and supports.

B. 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.

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. Product Data: Provide data on panel construction, hardware, and accessories.

C. Samples: Submit two samples of partition panels, not less than 6 by 6 inch in size illustrating panel finish, color, and sheen.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Phenolic Toilet Compartments:
   1. ASI Accurate Partitions: www.asi-accuratepartitions.com/#sle.
   2. Bradley Corp.; Mills Partitions: www.bradleycorp.com
   3. Scranton Products: www.scrantonproducts.com.

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

2.2 PHENOLIC TOILET COMPARTMENTS

A. Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solid phenolic core panels with integral melamine finish, floor-mounted headrail-braced.

B. Doors:
1. Thickness: 3/4 inch.
2. Width: 24 inch.
3. Width for Handicapped Use: 36 inch, out-swinging.
4. Height: 58 inch.

C. Panels:
1. Thickness: 1/2 inch.
2. Height: 58 inch.
3. Depth: As indicated on drawings.

D. Pilasters:
1. Thickness: 3/4 inch.
2. Width: As required to fit space; minimum 3 inch.

2.3 ACCESSORIES

A. Pilaster Shoes: Formed ASTM A666 Type 304 stainless steel with No. 4 finish, 3 inch high, concealing floor fastenings.

B. Head Rails: Hollow anodized aluminum, 1 inch by 1-1/2 inch size, with anti-grip profile and cast socket wall brackets.

C. Wall and Pilaster Brackets: Natural anodized aluminum; continuous type.

D. Attachments, Screws, and Bolts: Stainless steel , tamper proof type.

E. Hardware: Polished stainless steel:
1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
2. Door Latch: Slide type with exterior emergency access feature.
3. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
4. Coat hook with rubber bumper; one per compartment, mounted on door.
5. Provide door pull for outswinging doors.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as indicated on shop drawings.

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.

3.3 ADJUSTING

A. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.

B. Adjust adjacent components for consistency of line or plane.

END OF SECTION 10 21 13.17

SECTION 10 22 19.63 - DEMOUNTABLE GLASS PARTITIONS - AVANTI

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Frames for doors and glazed openings.

B. Frameless glass sliding doors and door hardware.

C. Glazing.

D. Integrated power and technology components where indicated.

E. Trim, connectors, leveling devices, hardware, and accessories required for complete installation.

1.2 SUBMITTALS

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

B. Manufacturer's Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of this section approved by manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer; Beyond Demountable Wall System by Allsteel or comparable product.

B. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 DEMOUNTABLE GLASS PARTITIONS

A. System Characteristics:
   1. Factory-unitized panel construction.

2. Modular, non-progressive panel design allowing removal and replacement of individual panels without dismantling adjacent panels.
3. Integrated leveling mechanism providing adjustment of approximately ±3/4 inch over a six foot run.
4. Reconfigurable construction suitable for future relocation.
5. Glass Panels: Tempered or laminated clear safety glass.
6. Maximum panel dimensions as permitted by manufacturer.
7. Vertical joints utilizing manufacturer's modular filler system without field-applied wet glazing.

B. Framing and Trim:
1. Extruded aluminum.
2. Manufacturer's standard finish as indicated or, if not indicated, as selected from manufacturer's full range..
3. Flush base and ceiling trim.

C. Doors:
1. Sliding glass doors.
2. Hardware as selected by Architect.

D. Electrical Integration:
1. Factory-integrated power raceways where indicated.
2. Receptacles and technology mounting provisions as scheduled.

E. Performance Requirements:
1. Acoustic Attenuation: STC of 35 minimum calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

2.3 MATERIALS

A. Glass:
1. Tempered Glass: Annealed flat glass meeting requirements of ASTM C1036, Type 1-Transparent Flat, Class 1-Clear, Quality Q3, and fully tempered in accordance with ASTM C1048, Kind FT.
   a. Thickness: 3/8 inch.
   b. Prepare glazing panels for indicated fittings and hardware before tempering.
   c. Provide exposed glazing edges with flat polished/ground glass finish.
   d. Temper glass materials horizontally; visible tong marks or tong mark distortions are not permitted.
2. Laminated Glass: Fully tempered float glass laminated in accordance with ASTM C1172, with eased and polished edges.
   a. Plastic Interlayer: 0.060 inch thick, minimum.
   b. Thickness: 7/16 inch.

B. Aluminum Extrusions: ASTM B221 (ASTM B221M).

2.4 DOOR AND WINDOW COMPONENTS

A. Frames: Extruded aluminum, manufacturers standard profile and thickness.
   1. Finish: Integral finish.
   2. Color: As selected by Architect.
   3. Prepare and reinforce door frames for door hardware; provide resilient silencers color matched to frame color.

B. Doors and Panels: Manufacturer's standard.

C. Door Hardware: Manufacturer's standard; finish as selected by Architect.
   1. Locksets: Office function, lock cylinder master keyed to building keying system.

D. Glazing: Manufacturer's standard.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that building conditions are ready to receive partitions and that field measured dimensions are as indicated on shop drawings.

B. Verify that required utilities are available, in proper location, and ready for use.

3.2 INSTALLATION

A. Install partitions before placement of carpet.

B. Partition Glass Panels:
   1. Install panels in accordance with partition system manufacturer's instructions.

C. Frames: Install in accordance with partition system manufacturer's instructions; erect vertical members plumb, and horizontal members level.

D. Doors: Install in accordance with partition system manufacturer's instructions; hang to fit square within frame and to swing freely, without binding.

E. Door Hardware: Install in accordance with partition system manufacturer's instructions.

F. Glazing: Install in accordance with partition system manufacturer's instructions.

3.3 TOLERANCES

A. Maximum Variation from True Plane of Partition Surfaces: 1/8 inch in 10 feet in any direction.

B. Maximum Variation from Dimensioned Locations: 1/4 inch in any direction.

3.4 ADJUSTING

A. Adjust doors and frames to provide smooth door operation from open to closed position without gravity movement of door from any position.

3.5 PROTECTION

A. Do not permit subsequent construction activities to cause damage to appearance or operation of installed partition components until Date of Substantial Completion.

END OF SECTION 10 22 19.63

SECTION 10 28 00 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Commercial toilet accessories.

1.2 RELATED REQUIREMENTS

A. Section 10 21 13.17 - Phenolic Toilet Compartments

1.3 REFERENCE STANDARDS

A. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2022.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

C. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

D. ASTM C1036 - Standard Specification for Flat Glass; 2021.

E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.

1.4 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.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Commercial Toilet, Shower, and Bath Accessories:
   1. AJW Architectural Products: www.ajw.com/#sle.
   2. American Specialties, Inc: www.americanspecialties.com/#sle.

3. Bobrick Washroom Equipment, Inc.: www.bobrick.com.
4. Bradley Corporation: www.bradleycorp.com/#sle.

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 4 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.

H. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

I. Hollow Wall Anchors: Expanding metal sleeve or conical plastic plug 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. See Schedule at the end of this Section.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.

B. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.
1. Grab Bars: As indicated on drawings.

3.2 PROTECTION

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

3.3 TOILET ROOM ACCESSORIES SCHEDULE

ID #	Description	Basis od Design Manufacturer	Basis of Design Model	Finish / Color	Mounting / Options / Remarks
CH	Clothes Hook - Double	Bobrick	B-549	Satin Stainless	Surface / concealed screws
TW	Combination Towel Dispenser/Waste Receptacle	Bobrick	B-38032	Satin Stainless	Semi-recessed
GB	Grab Bar, Straight 1-1/2" dia	Bobrick	B-6806.99 Series	Peened Stainless	Surface / length as indicated
HD	Hand Dryer	Excel	XL-SB	Satin Stainless	Surface / Automatic
HK	Towel & Clothes Hook	Bobrick	B-682	Bright Stainless	Surface
MR	Mirror, Angle-Framed	Bobrick	B-2908 Series	Satin Stainless	Tempered glass
MH	Mop Holder, Shelf, Hooks, Rod	Bobrick	B-224	Satin Stainless	Surface / 36" length
PT	Paper Towel Dispenser	Bobrick	B-262	Satin Stainless	Surface
RH	Robe Hook, Double	Bobrick	B-6727	Satin Stainless	Surface
SD	Sanitary Disposal	Bobrick	B-270	Satin Stainless	Surface
SV	Sanitary Supplies Vendor	Bobrick	B-47069 25	Satin Stainless	Surface / 25 cent
SC	Shower Curtain Rod, 1-1/4" dia	Bobrick	B-6047	Satin Stainless	length as required
SS	Shower Seat	Bobrick	B-5192	Solid Phenolic	Surface / 22" x 16"
SD	Soap Dispenser	Bobrick	B-42	Plastic, black	Surface
TP	Toilet Tissue Dispenser	Bobrick	B-274	Satin Aluminum	Surface / Dbl Roll / Controlled delivery
US	Under Sink Guard	Trubro	Lav Guard 2	White, antimicrobial, molded-vinyl	Wrap-around covers for trap and supplies

END OF SECTION 10 28 00

SECTION 10 41 16 - EMERGENCY KEY CABINETS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Lock box holding keys for fire department use.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Verify lock box requirements with local Fire Department to assure compatibility.

B. Coordinate location of lock box requirements with local Fire Department.

1.3 SUBMITTALS

A. See Section 01 30 00 - 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.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Knox Company; KnoxBox Rapid Entry System, 3200: www.knoxbox.com..

B. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 FIRE DEPARTMENT LOCK BOX

A. Characteristics:
   1. Heavy-duty, solid stainless-steel box with hinged door and interior gasket seal; single drill resistant lock with dust covers.
   2. Mounting: As selected by Architect.
   3. Capacity: Holds 10 keys.
   4. Finish: Manufacturer's standard.dark bronze.

B. Location: Outside entry where required by authority having jurisdiction.

2.3 INSTALLATION ACCESSORIES

A. Provide fasteners and anchors not furnished by product manufacturer and required for installation of secure units.

PART 3 EXECUTION

3.1 INSTALLATION

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

B. Secure key box to solid substrate such as framing, concealed wood blocking, masonry or cementitious panels. Use of hollow wall anchors on gyspum board sheathing is not permitted

3.2 CLEANING

A. Clean exposed surfaces in accordance with manufacturer's written instructions.

END OF SECTION 10 41 16

SECTION 10 44 00 - FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fire extinguishers.

B. Fire extinguisher cabinets.

C. Accessories.

1.2 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.

B. Section 09 22 16 - Non-Structural Metal Framing: Roughed-in wall openings.

C. Section 09 91 23 - Interior Painting: Field paint finish.

1.3 REFERENCE STANDARDS

A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2023a.

B. FM (AG) - FM Approval Guide; Current Edition.

C. NFPA 10 - Standard for Portable Fire Extinguishers; 2022.

D. UL (DIR) - Online Certifications Directory; Current Edition.

1.4 SUBMITTALS

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

B. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

D. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

1.5 QUALITY ASSURANCE

A. Basis of Design: Specifications are based on specialty types and model numbers by the specified basis of design manufacturer. Specialty types manufactured by other acceptable manufacturers are permitted, subject to compliance with all specified requirements, and provided that deviations in dimensions and profile are minor, and do not detract substantially from the indicated design intent.

1.6 FIELD CONDITIONS

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

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Fire Extinguishers:
   1. Activar Construction Products Group, Inc. - JL Industries: www.activarcpg.com/#sle.
   2. Kidde, a unit of United Technologies Corp.: www.kidde.com.
   3. Larsen's Manufacturing Co.: www.larsensmfg.com.
   4. Nystrom, Inc.: www.nystrom.com.
   5. Potter-Roemer: www.potterroemer.com/#sle.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

B. Cabinet Basis of Design Manufacturer:
   1. Larsen's Manufacturing Co.: www.larsensmfg.com.
      a. Fire Extinguisher Cabinets: Architectural Series, 2409 semi-recessed with full glass door.

C. Other Acceptable Cabinet Manufacturers:
   1. Activar Construction Products Group: www.activarcpg.com/#sle.
   2. Kidde, a unit of United Technologies Corp.: www.kidde.com.
   3. Nystrom, Inc.: www.nystrom.com.
   4. Potter-Roemer: www.potterroemer.com/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 FIRE EXTINGUISHERS

A. General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
   1. Provide extinguishers labeled by UL (DIR) or FM (AG) for purpose specified and as indicated.

B. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gauge.
   1. Stored Pressure Operated: Deep Drawn.
   2. Class: A:B:C type.
   3. Size: 10 pound.
   4. Finish: Baked polyester powder coat red color.
   5. Temperature Range: -65 degrees F to 120 degrees F.

2.3 CABINETS

A. Fire Rating: Listed and labeled in accordance with ASTM E814 requirements for fire resistance rating of walls where being installed.

B. Cabinet Construction: Non-fire rated.
   1. Formed steel sheet; 0.036 inch thick base metal.

C. Fire Rated Cabinet Construction: Fire rating to match wall rating.
   1. Steel; double wall or outer and inner boxes with 5/8 inch thick fire barrier material.

D. Cabinet Configuration: Semi-recessed type, unless otherwise indicated or specified.
   1. Sized to accommodate scheduled items and accessories.
   2. Semi-Recessed Cabinets: Maximum 4 inch projection from wall surface, including handles and other components.
      a. Provided recessed handle.
   3. Provide cabinet enclosure with right angle inside corners and seams, and with formed perimeter trim and door stiles.

E. Door Glazing: Tempered glass, clear, 1/8 inch thick, and set in resilient channel glazing gasket.
   1. Glazing Style: Provide full glass door.

F. Cabinet Mounting Hardware: Appropriate to cabinet, with pre-drilled holes for placement of anchors.

G. Fabrication: Weld, fill, and grind components smooth.

H. Finish of Cabinet Exterior Trim and Door: No. 4 - Brushed stainless steel.

I. Finish of Cabinet Interior: White colored enamel.

2.4 ACCESSORIES

A. Extinguisher Brackets: Formed steel, chrome-plated.

B. Lettering: FIRE EXTINGUISHER decal, or vinyl self-adhering, pre-spaced red lettering in accordance with authorities having jurisdiction (AHJ).

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify rough openings for cabinet are correctly sized and located.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Fire Extinguisher Cabinets: Install cabinets plumb and level in wall openings, maximum 30 inches from finished floor to inside bottom of cabinet.

C. Secure rigidly in place.

D. Place extinguishers in cabinets.

E. Position cabinet signage at locations required by Authorities Having Jurisdiction.

END OF SECTION 10 44 00

SECTION 11 52 00 - AUDIO-VISUAL EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Front projection screen assemblies.

B. Motorized projector mount.

1.2 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Wood blocking in walls and ceilings.

B. Section 26 05 83 - Wiring Connections: Electrical supply, conduit, and wiring for electric motor operated projection screens.

1.3 SUBMITTALS

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

B. Product Data: Manufacturer's catalog cuts and descriptive information on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Shop Drawings: For custom installations, indicate dimensions, verified field measurements, mounting details, and interface with adjacent construction.

D. Manufacturer's Qualification Statement.

E. Operation and Maintenance Data: Provide manufacturer's operation and maintenance instructions.

F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver projection screens to project site in manufacturer's original unopened packaging, and inspect for damage and proper size before accepting delivery.

B. Store in a protected, clean, dry area with temperature maintained above 50 degrees F, and stack in accordance with manufacturer's recommendations.

C. Acclimate screens to building temperatures for 24 hours prior to installation, in accordance with manufacturer's recommendations.

1.6 FIELD CONDITIONS

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

B. Maintain ambient temperatures within range recommended by manufacturer, but not less than 60 deg F or more than 95 deg F, in spaces to receive work of this Section during the following time periods:
   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.

1.7 WARRANTY

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

B. Provide ____ year manufacturer warranty for projection screen assembly.

PART 2 PRODUCTS

2.1 FRONT PROJECTION SCREENS

A. Manufacturers:
   1. Bretford; _____: www.bretford.com/#sle.
   2. Da-Lite Screen Company; _____: www.da-lite.com/#sle.
   3. Draper, Inc; _____: www.draperinc.com/#sle.
   4. Elite Screens; https://elitescreens.com/products/evanesce-tab-tension-b-series (Basis of Design).

B. Front Projection Screens: Factory assembled unless otherwise indicated.
   1. Located in Auditorium: Motorized, matte light diffusing fabric screen, horizontally tensioned, wall mounted.
      a. Screen Viewing Area: 67-1/2 inch high by 120 inch wide.

C. Matte Light Diffusing Fabric: Light diffusing screen fabric; washable, flame retardant and mildew resistant.
   1. Material: Matte white vinyl on fiberglass backing, with nominal gain of 1.0 over viewing angle not less than 70 degrees from axis, horizontally and vertically.

D. Masking Borders: Black, on four sides.

E. Extra Drops: As indicated.

F. Exposed Screen Cases: Steel, with integral roller brackets.
   1. Finish: Baked enamel.
   2. Color: White.
   3. End Caps: Steel; finished to match case.
   4. Mounting: Wall.

G. Concealed-in-Ceiling Screen Cases: Steel, with integral roller brackets.
   1. Door Slat: Self trim; self-closing and -opening.
   2. Case Finish: Powder coat.
   3. Case Color: As indicated or, if not indicated, as selected by Architect from manufacturer's full range of colors..
   4. End Caps: Steel; finished to match case.
   5. Electrically-Operated Screens: 1-1/2 inch aluminum door roller.

H. Electrically-Operated Screens:
   1. Roller: Steel, 2 inch in diameter, with locking device.
   2. Horizontal Tensioning: Tab-guided cable system.

I. Provide mounting hardware, brackets, supports, fasteners, and other mounting accessories required for a complete installation, in accordance with manufacturer's recommendations for specified substrates and mountings.

2.2 MOTORIZED PROJECTOR LIFT

A. Manufacturers:
   1. Chief Manufacturing.
   2. Da-Lite Screen Co.
   3. Draper, Inc. (Basis of Design)
   4. SVS Lifts.

B. Electrically Operated, Scissor Lift: Electrically operated, tight stacking scissor type, projector lift for lowering and retracting projector from ceiling storage location to position for show or service. Include controls, mounting hardware, wiring, and other components required for complete operation.
   1. Basis-of-Design Product: Scissor Lift SL-4 by Draper, Inc. or a comparable product by one of the other named manufacturers.

C. Operating Mechanism: Three sets of steel stabilizing scissors, positioned on sides and rear of operating pan, and two 3/16 inch diameter cables with 4200 foot-pounds tensile strength per cable, raise and lower operating pan with instantly reversible, thermally protected, lifetime lubricated, 3-wire motor with electric brake specified above.

D. Safety Belt: Provide lift with fail-safe inertial safety belt system.

E. Projector pan: 2-3/4 by 24 by 24 inches, 1/8 inch steel pan with dove grey powdercoat paint finish for attachment of suspended projector.

F. Travel: 48 inches; field adjustable.

G. Cable Management System: Provide lift with means for attachment of cables to rear scissor to eliminate cord tangles.

H. Maximum Lift Capacity: **[35][26]** pounds.

I. Approximate travel speed: 18 inches per second.

J. Voltage: 120 VAC.

K. Provide lift with 110 VAC, 60 HZ fused, switched duplex outlet to power projector. Outlet automatically energized in down position.

2.3 ELECTRICAL COMPONENTS

A. Electrical Components: Listed and classified by UL as suitable for the purpose specified and indicated.

B. Motors: Direct drive, 110 V, 60 Hz.
   1. Screen Motor: Mounted in roller or at end of roller; three wire with ground; quick reverse type and lifetime lubricated; equipped with thermal overload cut-off, internal junction box, electric brake, and pre-set accessible limit switches.
      a. Electrical Characteristics: 1.2 amps.
      b. Motor mounted on sound absorber.
   2. Door Motor: Mountedin roller or at end of roller; three wire with ground; quick reverse type; equipped with thermal overload cut-off.
      a. Electrical Characteristics: 1.2 amps.

C. Controls: Three (3) position control switch with plate.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate is finished and ready to accept screen installation.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Verify that openings for recessed screens are correctly sized.

D. Verify that entrances to installation area are sized to permit entry of rigid screen.

E. Verify type and location of electrical connections.

F. Do not install projection screens until climate control systems are in place and interior painting and other finishes are completed.

3.2 PREPARATION

A. Coordinate screen installation with installation of projection systems.

B. Coordinate installation with adjacent construction and fixtures, including ceilings, walls, lighting, fire suppression, and registers and grilles.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions, using manufacturer's recommended hardware for relevant substrates.

B. Do not field cut screens.

C. Install screens in mountings as specified and as indicated on drawings.

D. Install plumb and level.

E. Install electrically operated screens ready for connection to power and control systems by others.

F. Adjust projection screens and related hardware in accordance with manufacturer's instructions for proper placement and operation.

G. Test electrical screens for proper working condition. Adjust as needed.

H. Install motorized projector lifts and controls at locations and heights indicated on Drawings.

I. Install motorized projector lifts complete with necessary hardware, anchors, brackets and fasteners; according to manufacturer's written instructions and as specified.

3.4 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 11 52 00

SECTION 12 36 00 - COUNTERTOPS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Countertops for architectural cabinet work.

B. Wall-hung counters and vanity tops.

1.2 RELATED REQUIREMENTS

A. Section 06 40 00 - Architectural Woodwork.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate sizing and configuration of countertops with associated casework and adjacent construction.
   2. Coordinate sizing and locations of cutouts for plumbing fixtures with base cabinet configurations for proper alignments as indicated on Drawings.

1.4 SUBMITTALS

A. See Division 01 Sections 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. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other Sections.
   1. Indicate plans, sections, dimensions, seam locations, component sizes, edge details, fabrication details, attachment provisions, sizes of furring, blocking, and coordination requirements with adjacent work. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, waste receptacles and other items installed in countertops.

D. Verification Samples: For each finish product specified, minimum size 4 inches square, representing actual product, color, and patterns.

E. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

F. Installation Instructions: Manufacturer's installation instructions and recommendations.

G. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified in this Section, with not less than three years of documented experience.

1.6 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.

1.7 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.

B. Field Measurements: Verify dimensions of construction to receive countertops by field measurements before fabrication and indicate measurements on Shop Drawings.

1.8 WARRANTY

A. Solid Surface Material Manufacturer Warranty: Provide manufacturer’s standard warranty for solid surface material for period of 10 years against material defects.

PART 2 PRODUCTS

2.1 COUNTERTOPS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS), unless noted otherwise.

B. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.
   1. Flat Sheet Thickness: 3/4 inch, minimum.

2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
    a. Acceptable Manufacturers:
        1) Dupont: www.corian.com.
        2) Formica Corporation: www.formica.com.
        3) Wilsonart: www.wilsonart.com/#sle.
        4) Substitutions: See Section 01 60 00 - Product Requirements.
    b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
    c. Finish on Exposed Surfaces: Polished, gloss rating of 55 to 80.
    d. Color and Pattern: As indicated or, if not indicated, as selected from manufacturer's full range..
3. Exposed Edge Treatment: Built up to minimum 1-1/2 inch thick; square edge.
4. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
5. Skirts/Aprons: As indicated on Drawings.
6. Fabricate in accordance with manufacturer's standard requirements.

2.2 MATERIALS

A. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.

B. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

C. Joint Sealant: Mildew-resistant silicone sealant, clear.

2.3 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 1-1/2 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 walls with contact surfaces set in waterproof adhesive.
2. Height: 4 inches, unless otherwise indicated.

C. Solid Surfacing: Fabricate tops up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.

1. Adhere top to continuous wood panel subtop using mounting adhesive.
2. Arrange seams symmetrically or in orderly locations, minimum 12 inches from edges of sink and similar cutouts.

D. Cutouts and Holes:
1. Undercounter Fixtures: Make cutouts for undercounter fixtures in shop using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.
2. Provide vertical edges, slightly eased at juncture of cutout edges with top and bottom surfaces of countertop and projecting 3/16 inch into fixture opening.
3. Counter-Mounted Fixtures: Prepare countertops in shop for field cutting openings for counter-mounted fixtures. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.
4. Fittings: Drill countertops in shop for plumbing fittings, undercounter soap dispensers, and similar items.

E. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on Drawings, finished to match.
1. Fabricate undercounter braces from matching solid surface material as indicated.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that blocking/backing has been installed prior to installation of countertop brackets and prefabricated vanities.

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.

D. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

E. Verify actual site dimensions and location of adjacent materials prior to commencing work.

F. Examine cabinets upon which counter tops are to be installed. Verify cabinets are level to within 1/8" in 10' - 0"

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.

3.3 INSTALLATION

A. Install vanities in accordance with manufacturer’s instructions and approved shop drawings

B. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.

C. Attach wood substrates using screws with minimum penetration into substrate board of 5/8 inch.

D. Set countertops to comply with requirements indicated. Shim and adjust, with uniform joints of widths indicated and with edges and faces aligned according to established relationships and indicated tolerances. Install anchors and other attachments indicated or necessary to secure countertops in place.

E. Bond joints with countertop manufacturer's recommended adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.

F. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.

G. 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.

C. Field Joints: 1/8 inch wide, maximum.

3.5 CLEANING

A. Clean countertops surfaces thoroughly.

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 12 36 00

SECTION 12 61 00 - FIXED AUDIENCE SEATING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fixed, upholstered theater chairs.

B. Support standards.

C. Chair accessories.

1.2 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

C. ASTM A879/A879M - Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface; 2022.

D. ASTM D3597 - Standard Performance Specification for Woven Upholstery Fabrics—Plain, Tufted, or Flocked; 2002, with Editorial Revision (2018).

E. ASTM E1352 - Standard Test Method for Cigarette Ignition Resistance of Mock-Up Upholstered Furniture Assemblies; 2016.

F. ASTM E1537 - Standard Test Method for Fire Testing of Upholstered Furniture; 2022.

G. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.3 SUBMITTALS

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

B. Product Data: Manufacturer's printed data sheets for products specified.

C. Shop Drawings: Fabrication and installation details, chair layouts and dimensions and seat numbering scheme.

1. Field Measurements: Verify seating layout by field measurements and record field dimensions on shop drawings.

D. Selection Samples: Manufacturer's color charts and swatches for fabric upholstery, indicating full range of materials, colors, and patterns available.

E. Verification Samples: Full-size two-seat fabricated sample of each type of chair specified, including all accessories and one end panel, illustrating all finishes and workmanship to be expected in the finished Work; approved sample may be incorporated into the Work.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer certified in writing by the seating manufacturer to be qualified for installation of specified seating.

B. Fire Test Characteristics:
   1. Upholstered Assembly: Class 1, complying with component-testing requirements of California Technical Bulletin 117.

C. Fire Retardance of Upholstered Seating: Self-extinguishing when mock-up is exposed to smoldering cigarettes in accordance with ASTM E1352 or NFPA 261.

D. Fire Retardance of Fixed Theater Seating: Maximum instantaneous net peak rate of heat release of 250 kW or less, and total energy released during first 5 minutes of 40 mJ or less, when tested in accordance with ASTM E1537.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver seats to project site in unopened containers clearly labeled with manufacturer's name and identification of contents.

B. Store seating units in dry and clean location until needed for installation. During installation, handle in a manner that will prevent marring and soiling of finished surfaces.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design:
   1. Sedia Systems; FT20 Auditorium Chair.

B. Other Acceptable Manufacturers:
   1. American Seating: www.americanseating.com.
   2. Ducharme Seating: www.ducharmeseating.com.
   3. Hussey Seating Company: www.husseyseating.com/#sle.
   4. Irwin Seating: www.irwinseating.com.
   5. KI: www.ki.com.
   6. Theater Solutions, Inc.: https://tsi.limited/.

C. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 MATERIALS

A. Sheet Steel: ASTM A879/A879M, Commercial Steel (CS) or Drawing Steel (DS) electrogalvanized sheet, 04Z (12G) coating class on both surfaces; chemically treated for baked enamel finish.

B. Steel Plates, Bars, and Tubes: ASTM A36/A36M.

C. Laminated Plastic: NEMA LD 3, Type 1, Grade GP 50, nominal thickness 0.050 in; colors and patterns as selected from manufacturer's standards.

D. Polypropylene Sheet: Molded high density plastic with minimum tensile strength of 3300 psi, integral color pigments, and textured, scuff-resistant surface finish.

E. Polyurethane Foam: Density not less than 1.8 lb/cu ft, fire retardant, non-hardening and non-oxidizing, with high resistance to alkalis, oils, moisture, and mildew.

F. Upholstery Fabric: ASTM D3597 heavy-duty plain woven nylon fabric, treated to resist cigarette ignition and staining; color and pattern as selected from manufacturer's standards.

2.3 UPHOLSTERED CHAIRS

A. Fixed seating system designed to permit radial installation using common middle support standards in each row and aisle standards aligned as indicated on drawings. Width of seats not less than 22 inches, except exit seat locations may be reduced to 20 inches to complete specific row dimensions.

B. Back Panels: Fixed type; back panel with installed height between 35 inches and 38 inches above finished floor.
   1. Concealed Structural Support: Manufacturer's standard.
   2. Padding: Polyurethane foam not less than 1 in thick bonded to structural support.
   3. Covering: Fabric bonded to padding and fastened by upholstery technique that facilitates replacement.

C. Seats: Hinged type, constructed to permit reupholstering without removing seat from chair.
   1. Concealed Seat Construction: Manufacturer's standard construction, reinforced at stress points; supporting not fewer than 16 coil springs or five non-sag serpentine springs. Separate padding from springs with burlap sheeting cemented to polyurethane foam padding formed with minimum thickness of 1-3/4 in. Upholster with fabric sewn into box construction without welts and securely fastened to supporting frame to provide smooth, wrinkle-free surface.
      a. For serpentine spring construction, provide not less than 3 in thick foam padding at front edge of seat.
      b. Upholstry: As selected from manufacturer's full range of fabric options.

D. Hinges: Self-lubricating, noiseless steel hinges with brass alloy bearings or nylon bushings, equipped with spring mechanism or counterweight system that causes unoccupied seat to rise automatically to vertical position.

E. Arm Rests: Locate at aisles and between chairs; mount to support standard with concealed fasteners; exposed surfaces of molded high-impact plastic.

2.4 STANDARDS

A. Support Standards: Tubular steel with welded mounting points for backs, seats, and arm rests, and welded floor anchor plates.

2.5 ACCESSORIES

A. Folding Tablet Arms: At standard to right side of each seat, provide manufacturer's standard fold-away tablet arm assembly, with hinge and swivel mechanism securely fastened to underside of writing surface and designed to provide solid support in the open position and semi-automatic return to stowed position beneath right arm rest and parallel to right standard.
   1. Finish: Plastic laminate both sides, with smooth, rounded edges.
   2. Size: Extra Large (Type T3 Tablet Size).

2.6 FINISHES

A. Ferrous Metals: Manufacturer's standard two-coat baked enamel finish, applied over conversion coating appropriate to base metal.
   1. Color and Gloss: As selected from manufacturer's standard choices.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates for conditions detrimental to installation of fixed theater seating. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's installation instructions and approved shop drawings.

B. Anchor support standards securely to substrate with at least two anchoring devices recommended by manufacturer.
   1. Place standards in each row laterally so the standards at the aisle will be in alignment.
   2. Vary width of seats and backs as required to optimize sightlines, and comply with the ADA Standards for row and aisle widths.
   3. In curved rows, install standards to form smooth radius, without breaks or angled chords
   4. Attach components to standards with sufficient flexibility to compensate for convergence of seats toward the center.

3.3 ADJUSTING

A. Adjust seat mechanisms to ensure that seats in each row are aligned when unoccupied.

B. Repair minor abrasions and imperfections in painted finishes with a coating that matches factory-applied finish; replace units that cannot be repaired to unblemished appearance.

C. Replace upholstery fabric damaged or soiled during installation.

END OF SECTION 12 61 00