Project Manual

Addendum No. 2

DSA SUBMITTAL

ADMINISTRATION SERVICES
INTERIOR IMPROVEMENTS
LAS POSITAS COLLEGE

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-118983 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 08/11/2020

Steinberg Hart
PROJECT NO. 20057.100
July 27, 2020

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DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (Concrete), 2019 CBC

Table 1705A.3; ACI 318-14 Sections 26.12 & 26.13

Application Number: 01-118983 | **School Name:** Las Positas College | **School District:** Chabot Las-Positas Community College District

DSA File Number: 1-C2 | **Increment Number:** | **Date Submitted:** 5/26/2020

	7. CAST-IN-PLACE CONCRETE			
Material Verification and Testing:				
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Verify use of required design mix.	**Periodic**	**SI**	**Table 1705A.3 Item 5, 1910A.1.**
☐	**b.** Identifiy, sample, and test reinforcing steel.	**Test**	**LOR**	**1910A.2;** ACI 318-14 Section 26.6.1.2; DSA IR 17-10. (See Appendix for exemptions.)
☐	**c.** During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	**Test**	**LOR**	**Table 1705A.3 Item 6**; ACI 318-14 Sections 26.5 & 26.12.
☐	**d.** Test concrete (f'_c).	**Test**	**LOR**	**1905A.1.15;** ACI 318-14 Section 26.12.
Inspection:				
☐	**e.** Batch plant inspection:	**See Notes**	**SI**	Default of **'Continuous'** per **1705A.3.3**. If approved by DSA, batch plant inspection may be reduced to **'Periodic'** subject to requirements in Section **1705A.3.3.1,** or eliminated per **1705A.3.3.2.** (See Appendix for exemptions.)
☐	**f.** Welding of reinforcing steel.	Provide special inspection per STEEL, Category 19.1(d) & (e) and/or 19.2(g) & (h) below.		

	8. PRESTRESSED / POST-TENSIONED CONCRETE (in addition to Cast-in-Place Concrete tests and inspections):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Sample and test prestressing tendons and anchorages.	**Test**	**LOR**	**1705A.3.4, 1910A.3**
☐	**b.** Inspect placement of prestressing tendons.	**Periodic**	**SI**	**1705A.3.4, Table 1705A.3 Items 1 & 9.**

☐	**c.** Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	**Periodic**	**SI**	**Table 1705A.3 Item 11.** Special inspector to verify specified concrete strength test prior to stressing.
☐	**d.** Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	**Continuous**	**SI**	**1705A.3.4, Table 1705A.3 Item 9;** ACI 318-14 Section 26.13

	9. PRECAST CONCRETE (in addition to Cast-in-Place Concrete tests and inspections):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Inspect fabrication of precast concrete members.	**Continuous**	**SI**	ACI 318-14 Section 26.13.
☐	**b.** Inspect erection of precast concrete members.	**Periodic**	**SI***	**Table 1705A.3 Item 10.** * May be performed by PI when specifically approved by DSA.

	10. SHOTCRETE (in addition to Cast-in-Place Concrete tests and inspections):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Inspect shotcrete placement for proper application techniques.	**Continuous**	**SI**	**1705A.19, Table 1705A.3 Item 7, 1908A.6, 1908A.7, 1908A.8, 1908A.9, 1908A.11, 1908A.12.** See ACI 506.2-13 Section 3.4, ACI 506R-16.
☐	**b.** Sample and test shotcrete (f'_c).	**Test**	**LOR**	**1908A.5, 1908A.10.**

	11. POST-INSTALLED ANCHORS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Inspect installation of post-installed anchors	**See Notes**	**SI***	**1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8** (See Appendix for exemptions). ACI 318-14

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				Sections 17.8 & 26.13. * May be performed by the project inspector when specifically approved by DSA.
☑	**b.** Test post-installed anchors.	**Test**	**LOR**	**1910A.5.** (See Appendix for exemptions.)

	12. OTHER CONCRETE:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐				

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

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Exempt items given in DSA IR A-22 or the 2019 CBC (including DSA amendments) and those items identified below with an "X" by the design professional are NOT subject to DSA requirements for the structural tests / special inspections noted. **Items marked as exempt shall be identified on the approved construction documents**. The project inspector shall verify all construction complies with the approved construction documents.

	SOILS:
☐	1. Deep foundations acting as a cantilever footing designed based on minimum allowable pressures per CBC Table 1806A.2 and having no geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
☐	2. Shallow foundations, etc. are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception Item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC, Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill.

	CONCRETE/MASONRY:
☐	1. Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment - see Item 7 for "Welding") given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) or B) interior nonstructural wall partitions meeting criteria listed in exempt Item 3 for "Welding."
☐	2. Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.
☐	3. Non-bearing non-shear masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1. Refer to construction documents for specific exemptions accordingly for each applicable wall condition.
☐	4. Epoxy shear dowels in site flatwork and/or other non-structural concrete.
☐	5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

	Welding:
☐	1. Solid-clad and open-mesh gates with maximum leaf span or rolling section for rolling gates of 10' and apex height less than 8’-0” above lowest adjacent grade. When located above circulation or occupied space below, these gates are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
☐	2. Handrails, guardrails and modular or relocatable ramps associated with walking surfaces less than 30” above adjacent grade (excluding post base connections per the 'Exception' language in Section 1705A.2.1); fillet welds shall not be ground flush.
☐	3. Non-structural interior cold-formed steel framing spanning less than 15'-0", such as in interior partitions, interior soffits, etc. supporting only self weight and light-weight finishes or adhered tile, masonry, stone, or terra cotta veneer no more than 5/8" thickness and apex less than 20'-0" in height and not over an exit way. Maximum tributary load to a member shall not exceed the equivalent of that occurring from a 10'x10' opening in a 15' tall wall for a header or king stud.
☐	4. Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections 19, 19.1 and/or 19.2 of listing above).
☐	5. Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections 19, 19.1 and/or 19.2 of listing above).
☐	6. TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection as noted in selected item(s) for section 19, 19.1 and/or 19.2 located in the Steel/Aluminum category).
☐	7. Any support for exempt non-structural components given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) ≤4' above supporting floor/roof, B) when hung from a wall or roof/floor, <20# for discrete units or <5 plf for distributed systems.

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SIGNATURE), 2019 CBC

Application Number: 01-118983 **School Name:** Las Positas College **School District:** Chabot Las-Positas Community College District

DSA File Number: 1-C2 **Increment Number:** **Date Submitted:** 5/26/2020

Name of Architect or Engineer in general responsible charge:

Michael Resch, S.E.

Name of Structural Engineer (When structural design has been delegated):

Signature of Architect or Structural Engineer: 

Date: 07/13/2020

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.

DSA STAMP

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-118983 INC:
REVIEWED FOR
SS ☑ FLS ☐ ACS ☐
DATE: 08/11/2020

DSA 103-19: LIST OF REQUIRED VERIFIED REPORTS, 2019 CBC

Application Number: 01-118983	**School Name:** Las Positas College	**School District:** Chabot Las-Positas Community College District
DSA File Number: 1-C2	**Increment Number:**	**Date Submitted:** 5/26/2020

1. Post-installed Anchors: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

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ISSUED BY OWNER

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Add. 2

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DIVISION 02

EXISTING CONDITIONS

SECTION 02 41 20 – SELECTIVE BUILDING DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Systematic removal of portions of buildings and structures.
   2. Salvage of existing items for reuse.
   3. Salvage of construction materials for recycling.
   4. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 REFERENCES

A. Definitions:
   1. Remove: Means to detach from existing construction and legally dispose off-site.
   2. Demolish: Means the same as “remove”.
   3. Dispose: Means to get rid of by throwing away; or by giving or selling to someone else.
   4. Reuse: Means to use again for the same function without re-processing.
   5. New-Life Reuse: Means to use again for a different function without re-processing.
   6. Remove and Salvage: Means to detach from existing construction, prepare for reuse or storage as applicable, and then deliver to the Owner.
   7. Remove and Reinstall: Means to detach from existing construction, prepare for reuse, and reinstall where indicated.
   8. Recycle: Means to detach from existing construction, break down into raw materials, and then process the materials to make new items.
   9. Existing-to-Remain: Means existing items that are not removed, reused, or recycled.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Demolition drawings are diagrammatic and show existing conditions with information developed from field surveys and to generally show the extent and type of demolition required. The Owner will maintain conditions existing at the time of inspection for bidding purposes as far as practicable.
   1. Make a detailed survey of existing conditions before beginning demolition, and report discrepancies or conflicts between Drawings and actual conditions in writing to the Architect for clarifications and instructions.
   2. Do not proceed, when such conflicts or discrepancies occur, before receipt of the Architect's instructions.

B. Pre-Demolition Conference: To review methods and procedures related to this specification Section, conduct a pre-demolition conference at the project site.
   1. Inspect and discuss condition of construction to be selectively demolished.
   2. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
   3. Review requirements of work that rely on substrates exposed by selective demolition operations.
   4. Review areas where construction is existing-to-remain and requires protection.

1.4 SUBMITTALS

A. Informational Submittals:
   1. Schedule of Selective Demolition Activities: Indicate the following.
      a. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
      b. Interruption of utility services. Indicate how long utility services will be interrupted.
      c. Coordination for shutoff, capping, and continuation of utility services.
      d. Use of elevator and stairs.
      e. Locations of proposed dust- and noise-control temporary partitions and means of egress.
      f. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed work.
      g. Means of protecting existing-to-remain items in the path of waste removal.
   2. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.
   3. Pre-Demolition Photographs or Videos: Submit videos or photographs showing existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by selective demolition operations.

1.5 QUALITY ASSURANCE

A. Quality Standards: Comply with the safety requirements of both American National Standards Institute/ American Society of Safety Engineers publication ANSI/ASSE A10.6. "*Safety Requirements for Demolition Operations*" and National Fire Protection Association publication NFPA 241, "*Standard for Safeguarding Construction, Alteration, and Demolition Operations*".

1.6 PROJECT CONDITIONS

A. Hazardous Materials: Hazardous materials may be encountered in the building or at the project site.
   1. If materials suspected of containing hazardous materials are encountered, do not disturb; promptly notify the Architect and Owner.
   2. The Owner removes asbestos containing materials (ACMs) under separate contract; Contractor removes all others. (e.g., lead-based/containing paint, etc.)

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Oversight: Ensure adequate supervision practices are followed at the project site before demolition work begins and at all times during installation.

3.2 PREPARATION

A. Site Protection: Protect existing-to-remain sitework against damage and soiling during demolition.
   1. Do not begin selective demolition work until temporary partitions, barricades, warning signs, and other forms of protection are installed.
   2. Protect trees, plants, utilities, and existing improvements that are not to be removed from injury or damage. Replace damaged landscaping, improvements, and utilities in kind.
   3. During demolition, provide safeguards for protection of the public, Contractor's employees, and existing improvements existing-to-remain, including warning signs and lights, barricades, and the like.
   4. Provide and maintain shoring, bracing, and structural supports required to preserve stability and prevent movement, settlement, or collapse of existing-to-remain construction and finishes; and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

B. Building Protection: Protect existing-to-remain building construction against damage and soiling during selective demolition.
   1. Do not begin selective demolition work until temporary building bracing, barricades, and other protection necessary to prevent injury to people and damage to adjacent existing-to-remain facilities.
   2. Do not allow water to enter existing-to-remain wall or roof insulation. Replace insulation when it is wetted.

C. Utilities, Services, and Building Systems Protection:

1. Maintain existing-to-remain utility services and mechanical and electrical systems and protect them against damage during selective demolition operations.
2. Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical and electrical systems serving areas indicated for demolition.
   a. Arrange with utility companies to shut off indicated utilities.
   b. If building systems or mechanical and electrical systems are indicated as removed, relocated, or abandoned, provide temporary services and systems that bypass demolition areas and maintain continuity of services and systems to other parts of building before proceeding with selective demolition.
   c. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

3.3 DEMOLITION

A. General Demolition Requirements:
   1. Coordinate demolition to assure the proper sequence, limits, methods, and time of performance. Schedule demolition to impose minimum of hardship on present facility operations and performance of the work.
   2. Conduct selective demolition and debris-removal operations to ensure the least interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
   3. Demolish and remove existing construction only as shown and to the extent required by new construction. Use methods necessary to complete the work within indicated or specified limitations.
      a. Maintain existing building structure (including structural floor and roof decking) and envelope (exterior skin and framing, excluding window assemblies and nonstructural roofing material) not shown as demolished; do not demolish existing construction beyond indicated limits.
      b. Maintain existing interior nonstructural elements (interior walls, doors, floor coverings, and ceiling systems) not shown as demolished.
      c. Do not demolish existing construction beyond indicated limits.
   4. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage existing-to-remain construction or adjoining construction.
   5. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces.
   6. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces. Verify condition and contents of hidden space before starting cutting operations.
   7. Do not use cutting torches until after work areas are cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
   8. Temporarily cover existing-to-remain openings.
   9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

10. Do not remove any item in a manner that that results in any warranty or guarantee becoming void.

B. Special Techniques:
   1. Removed and Salvaged Items:
      a. Clean salvaged items.
      b. Pack or crate items after cleaning. Identify contents of containers.
      c. Store items in a secure area or location until delivery to the Owner.
   2. Removed and Reinstalled Items:
      a. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
      b. Pack or crate items after cleaning and repairing. Identify contents of containers.
      c. Protect items from damage during transport and storage.
      d. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
   3. Existing-to-Remain Items:
      a. When permitted by the Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.4 CORRECTION AND REPAIR

A. Damaged existing-to-remain work must be patched and repaired. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.

B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
   1. written descriptions of non-conforming, damaged, and defective work;
   2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
   3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.

C. Do not correct, repair, or replace any item in a manner that that results in any warranty or guarantee becoming void.

D. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.5 CLEANING

A. Except for recycled, reused, salvaged, and reinstalled items and other existing-to-remain items on Owner's property, remove demolished materials from the project site and legally dispose off-site. Do not burn demolished materials.

B. Removed items not indicated for reuse, reinstallation, or salvage are the property of the Contractor and must be cleared from the project site.
   1. Continuously clean up and clear these items; do not allow them to accumulate in the building or at the project site.
   2. Material and equipment may not be viewed by prospective purchasers nor sold on the site.
   3. The Owner is not responsible for the condition, loss, or damage to removed items.

C. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

END OF SECTION

DIVISION 03

CONCRETE

SECTION 03 54 16 – HYDRAULIC CEMENT UNDERLAYMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Hydraulic cement underlayment.
   2. Repair material.
   3. Surface preparation.
   4. Installation materials.
   5. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

A. Qualifications:
   1. Installer: Company or individuals must have at least 5 years' experience installing cement underlayment for at least 30 previous projects similar to this project in size, material, design, and complexity.
   2. Supervisors: Individuals must have at least 7 years' experience installing cement underlayment for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading cement underlayment installers.

B. Submittals: Submit product data and written descriptions of specified qualifications.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: Provide products manufactured by one of the following, or equal.
   1. ARDEX Group.
   2. Custom Building Products.
   3. Floor Seal Technology, Inc.
   4. LATICRETE International, Inc.
   5. Mapei Corp.

2.2 HYDRAULIC CEMENT UNDERLAYMENT

A. Description: Portland-cement-based, non-structural, engineered cementitious material specifically designed for use as interior flooring cement underlayment. Products with added gypsum are prohibited.

B. Application: Installed over subfloors to help achieve specified floor flatness values; and to smooth and correct surface irregularities prior to flooring installation.

C. Self-Leveling Products:
   1. Pourable Grade Cement underlayment Applications (0 to 1-1/4 inches thick): "ARDEX V-1200" self- leveling, no-troweling cement underlayment manufactured by ARDEX Engineered Cements, or equal. Primer is required.
   2. Thick Cement underlayment Applications (1/16- to 1/4-inch thick): "ARDEX K 55 MICROTEC" microfiber reinforced, self-leveling cement underlayment manufactured by ARDEX Engineered Cements, or equal. Primer is required.
   3. Thicker Cement underlayment Applications (1/4-inch to 5 inches thick): "ARDEX K 15" self-leveling polymer-modified cement underlayment manufactured by ARDEX Engineered Cements, or equal. Primer is required.
      a. For cement underlayment application thickness between 1/4-inch and 1-1/2 inches thick, apply neat.

D. Trowel Grade Products:
   1. Patching and Cement Underlayment Applications (0 to 1/16-inch thick): "ARDEX SD-F Feather Finish" self-drying, finishing cement underlayment manufactured by ARDEX Engineered Cements, or equal. Primer is typically not required.
   2. Non-Structural Flatwork Repair: "ARDEX CP" Portland cement-based concrete patch and fill for indoor and outdoor concrete flatwork manufactured by ARDEX Engineered Cements, or equal.

2.3 SURFACE PREPARATION

A. Substrate Testing and Surface Preparation: Perform testing and corrective work and prepare substrates in conformance with the requirements of Section 09 05 16.

B. Concrete Surface Profiling: Provide ICRI concrete surface profile CSP 3 to CSP 5 (light to medium shotblast between 10 and 40 mils), unless otherwise explicitly required, recommended, or accepted in writing by the covering manufacturer. Conform to the requirements of Section 09 05 16.

2.4 INSTALLATION MATERIALS

A. Primers:
   1. Standard Absorbent Concrete, Gypsum, and Other Porous Substrates (in Specialized Applications): "ARDEX P 51" manufactured by ARDEX Engineered Cements, or equal.
      a. Two applications of primer must be applied over gypsum cement underlayment.

b. Two applications of primer may be required over absorbent concrete cement underlayment.

2. Wood, Cutback Residue, Metal, and Other Non-Porous Substrates: "ARDEX P 82 ULTRA PRIME" manufactured by ARDEX Engineered Cements, or equal.

B. Additive: "ARDEX E 25" resilient emulsion manufactured by ARDEX Engineered Cements, or equal, for use over cutback and other adhesive residues on concrete subfloors only; over metal; and as part of mesh-reinforced wood subfloor systems.

C. Crack Repair Compound: "ARDEX ARDIFIX" 100-percent solids, 2-part polyurethane repair compound manufactured by ARDEX Engineered Cements, or equal, for repair of non-moving joints and cracks.

D. Joint Filler: "ARDEX ARDISEAL Rapid Plus" 2-part, self-leveling, semi-rigid polyurea joint filling compound manufactured by ARDEX Engineered Cements, or equal, for repair of all moving joints.

E. Sand: Washed masonry or plaster sand, 1/8-inch diameter and smaller.

F. Aggregate: Well-graded washed gravel, 1/8- to 1/4-inch diameter or larger, supplied, required, recommended, or accepted by the manufacturer for proposed thicknesses.

G. Mix Water: Provide fresh, clean, clear, potable water from a domestic source. Water must conform to ASTM C 1602 and be free of oil, grease, waxy films, curing compounds, release agents, and other deleterious materials, including salts, acids, alkalis, organic materials, detergents, and other matter that might negatively affect cement underlayment quality, durability, or performance.

2.5 ACCESSORIES

A. Perimeter Isolation Strips: Supplied, required, recommended, or accepted by the manufacturer.

B. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:

1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
2. Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations, and satisfies all other conditions that might

affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.

3. Protect work areas, surfaces, in-place construction, and installed and adjacent items against soiling and damage.
4. Prepare surfaces as required, recommended, or accepted by the manufacturer without limitation; and in a manner that does not result in any warranty or guarantee becoming void.
5. Install cement underlayment using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.

B. Special Techniques:
   1. Thickness: Install screeds as required, recommended, or accepted by manufacturer to meet the following.
      a. Set screeds with a laser level so the minimum cement underlayment thickness is at least 1/8 inch.
      b. Where cement underlayment covers only a small area, grind, chisel, and undercut floor and deck slabs as necessary to ensure a minimum cement underlayment thickness of at least 1/8 inch.
   2. Place cement underlayment in one continuous operation, without cold joints, to produce uniform, level surfaces.
      a. Screed cement underlayment to levels and tolerances required, recommended, or accepted by the finish flooring manufacturer.
      b. Feather edges to match adjacent floor elevations.
   3. Cure cement underlayment in conformance with the manufacturer's instructions. Protect cement underlayment to prevent contamination during application and curing processes.

C. Correction and Repair:
   1. Correct deficiencies that do not conform to the Contract Documents.
   2. Repair non-conforming, damaged, and defective work.
   3. Remove and replace cement underlayment areas that evidence lack of bond with substrate, including areas that emit a “hollow” sound when tapped.
   4. Installed cement underlayment must be warrantable. Do not install, correct, or replace cement underlayment in a manner that is un-warrantable by the manufacturer or that results in any warranty or guarantee becoming void.

END OF SECTION

DIVISION 05

METALS

SECTION 05 05 13 – SHOP-APPLIED STEEL PRIMER

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Shop-applied steel primer.
   2. Repair materials.
   3. Surface preparation.
   4. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

A. Qualifications:
   1. Installer: Company or individuals must have at least 5 years' experience installing primer for at least 30 previous projects similar to this project in size, material, design, and complexity. Only a company certified by the AISC as having a current P3-Sophisticated Painting Endorsement (SPE) certification may apply shop primers.
   2. Supervisors: Individuals must have at least 7 years' experience installing primer for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading primer installers.

B. Submittals: Submit product data, primer schedule, and written descriptions of specified qualifications.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Provide products manufactured by one of the following, or equal.
   1. Carboline Co.
   2. PPG Industries, Inc.
   3. Tnemec Co.

2.2 SHOP APPLIED STEEL PRIMER

A. Acrylic Primer:
   1. Description: Hydrophobic acrylic dry-fall high performance coating primer

2. Application: Applied to interior exposed-in-service steel surfaces.
3. Product: "Uni-Bond DF Series 115" manufactured by the Tnemec Co., or equal.
4. Requisite Properties:
   a. Minimum Thickness: Between 2.0 and 3.5 mils DFT per coat, when measured in conformance with SSPC paint application standard SSPC-PA2, "*Measurement of Dry Coating Thickness with Magnetic Gages*".
   b. Color: Match Tnemec color 10-1009, "Gray".
5. Performance Requirements:
   a. Minimum Dry Film Adhesion: At least a 5B rating, when tested in conformance with ASTM D 3359.
   b. Minimum Humidity Resistance: No blistering, cracking, rusting, or delaminating of film after at least 500 hours exposure, when tested in conformance with ASTM D 4585.
   c. Minimum Salt Spray Resistance: No blistering, cracking, rusting, or delaminating of film and no rust creep at scribe after at least 500 hours exposure, when tested in conformance with ASTM B 117.
   d. Minimum Slip Coefficient Rating: At least 0.50 (AISC Class B surface), when tested in conformance with ASTM A 490.

B. Zinc-Rich Primer:
   1. Description: Zinc-rich high-performance coating primer.
   2. Application: Applied exterior exposed-in-service steel surfaces.
   3. Product: "Tneme-Zinc Series 90-97" manufactured by the Tnemec Co., or equal.
   4. Requisite Properties:
      a. Minimum Thickness: Between 2.0 and 3.5 mils DFT per coat, when measured in conformance with SSPC paint application standard SSPC-PA2, "*Measurement of Dry Coating Thickness with Magnetic Gages*".
      b. Color: Reddish-gray or other standard color.
      c. Zinc Dust Pigment: ASTM D 520 Type III composition classification (not more than 0.002 percent lead).
   5. Performance Requirements:
      a. Minimum Dry Film Adhesion: At least 800 pounds per square inch pull, when tested in conformance with ASTM D 4541.
      b. Minimum Humidity Resistance: No blistering, cracking, rusting, or delaminating of film after at least 1,000 hours exposure, when tested in conformance with ASTM D 4585.
      c. Minimum Salt Spray Resistance: No blistering, cracking, rusting, or delaminating of film, and not more than 1/32-inch rust creep at scribe after at least 10,000 hours exposure, when tested in conformance with ASTM B 117.
      d. Minimum Slip Coefficient Rating: At least 0.50 (AISC Class B surface), when tested in conformance with ASTM A 490.

2.3 REPAIR MATERIALS

A. Acrylic Spot Primer:
   1. Description: Hydrophobic acrylic dry-fall high performance coating primer
   2. Application: Applied to interior exposed-in-service steel surfaces.
   3. Product: "Uni-Bond DF Series 115" manufactured by the Tnemec Co., or equal.
   4. Requisite Properties:
      a. Minimum Thickness: Between 2.0 and 3.5 mils DFT per coat, when measured in conformance with SSPC paint application standard SSPC-PA2, "*Measurement of Dry Coating Thickness with Magnetic Gages*".
      b. Color: Match Tnemec color 00WH, "Tnemec White".
   5. Performance Requirements:
      a. Minimum Dry Film Adhesion: At least a 5B rating, when tested in conformance with ASTM D 3359.
      b. Minimum Humidity Resistance: No blistering, cracking, rusting, or delaminating of film after at least 500 hours exposure, when tested in conformance with ASTM D 4585.
      c. Minimum Salt Spray Resistance: No blistering, cracking, rusting, or delaminating of film and no rust creep at scribe after at least 500 hours exposure, when tested in conformance with ASTM B 117.
      d. Minimum Slip Coefficient Rating: At least 0.50 (AISC Class B surface), when tested in conformance with ASTM A 490.

B. Zinc-Rich Spot Primer:
   1. Description: Zinc-rich aromatic urethane organic primer.
   2. Application: Field-applied to repair damaged shop-applied zinc-rich primer.
   3. Product: "Hydro-Zinc 94-H20" manufactured by the Tnemec Co., or equal.
   4. Requisite Properties:
      a. Minimum Thickness: Between 2.5 and 3.5 mils DFT per coat, when measured in conformance with SSPC paint application standard SSPC-PA2, "*Measurement of Dry Coating Thickness with Magnetic Gages*".
      b. Color: Greenish-gray or other standard color.
      c. Zinc Dust Pigment: ASTM D 520 Type III composition classification (not more than 0.002 percent lead).
   5. Performance Requirements:
      a. Minimum Dry Film Adhesion: At least 800 pounds per square inch pull, when tested in conformance with ASTM D 4541.
      b. Minimum Humidity Resistance: No blistering, cracking, rusting, or delaminating of film after at least 1,000 hours exposure, when tested in conformance with ASTM D 4585.
      c. Minimum Salt Spray Resistance: No blistering, cracking, rusting, or delaminating of film, and not more than 1/32-inch rust creep at scribe after at least 10,000 hours exposure, when tested in conformance with ASTM B 117.

d. Minimum Slip Coefficient Rating: At least 0.50 (AISC Class B surface), when tested in conformance with ASTM A 490.

C. Other Spot Primers: Provide spot primer identical to shop-applied primer originally used to prime surfaces.

2.4 SURFACE PREPARATION

A. Concealed and Interior Exposures:
   1. Application: Applied to steel items installed in SSPC Environmental Zones 0 and 1A (concealed and interior service conditions not subject to wetting).
   2. Surface Preparation: Prepare surfaces in conformance with manufacturer-prepared published and supplemental instructions, and SSPC surface preparation standard SSPC-SP3, "*Power Tool Cleaning*".

B. Exterior Severe Exposures and Immersion Service:
   1. Application: Applied to steel items installed in SSPC Environmental Zone 2B (severe exterior service conditions), Zone 2C (fresh water immersion conditions), and Zone 2D (salt water immersion conditions).
   2. Surface Preparation: Prepare surfaces in conformance with manufacturer-prepared published and supplemental instructions, and SSPC surface preparation standard SSPC-SP10/NACE 2, "*Near-White Blast Cleaning*" to a minimum surface profile of at least 2.0 mils, when measured in conformance with ASTM D 4417 Method B (Surface Profile Depth Micrometer).

C. Unknown or Incompatible Primers:
   1. Application: Use when unknown shop- or factory-applied primers are discovered; or when high-performance steel primers are chemically or adhesively incompatible with shop- or factory-applied primers.
   2. Surface Preparation: Apply specified spot primer as a full prime coat on all surfaces as a tie-coat for subsequent intermediate and top coats.

2.5 ACCESSORIES

A. Flash Rust Inhibitor/Salt Remover:
   1. Description: Blast and wash down-water additive that prevents flash rusting of wet abrasive and water-blasted ferrous metal surfaces; and of dry-blasted surfaces in a pressurized wash down.
   2. Product: "HoldTight 102" manufactured by HoldTight Solutions Inc., or equal.

B. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
   1. Ensure proper supervision practices are followed before the installer begins work and at all times during installation.
   2. Verify surfaces conform to the manufacturer's requirements or recommendations, and satisfies all other conditions that might affect the quality of installation or the durability or performance of installed and adjacent items.
   3. Prepare surfaces as required, recommended, or accepted by the manufacturer without limitation; and in a manner that does not result in any warranty or guarantee becoming void.
   4. Install primer using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.

B. Special Techniques:
   1. To avoid surface contaminant pick-up, promptly prime prepared surfaces as soon as practicable after and within the same day as surface preparation.
   2. Clean and prepare damaged primed surfaces in conformance with manufacturer's published instructions and SSPC surface preparation standard SSPC-SP11 "*Power Tool Cleaning to Bare Metal*".
   3. Sand smooth and re-clean.
   4. Spot-prime bare metal surfaces with specified primer applied to a total spot primer DFT of at least 5 mils.
   5. Overlap undamaged primer areas with spot primer at least 2 inches.

C. Correction and Repair:
   1. Correct deficiencies that do not conform to the Contract Documents.
   2. Repair non-conforming, damaged, and defective work.
   3. Re-prime damaged items that cannot be repaired to the same condition as new.
   4. Installed primer must be warrantable. Do not install, correct, or replace primer in a manner that is un-warrantable by the manufacturer or that results in any warranty or guarantee becoming void.

D. Protection:
   1. Protect installed primer from deterioration and damage until coating or covering primed surfaces.
   2. Remove protection when it's no longer needed and before coating or covering primed surfaces.

END OF SECTION

SECTION 05 40 00 – COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Furring
   2. Stud framing.
   3. Specialty framing.
   4. Connectors.
   5. Wall backings.
   6. Slot metal channel framing.
   7. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

A. Delegated Design Requirements:
   1. Engineer, fabricate, assemble, and install framing that conforms to the profiles indicated and other Contract Document requirements; meets specified performance criteria; and results in structurally sound, non-corroding, and weathertight assemblies that accommodate, resist, distribute, or transfer in-service loads without incipient or catastrophic failure.
   2. Maintain visual design concept indicated, including sizes, profiles, and alignments. Deviation from visual design concept is non-conforming work and prohibited without prior written acceptance by the Architect.

B. Quality Standards:
   1. Design Standards:
      a. Comply with all requirements of the California Building Code (CBC).
      b. Comply with the requirements AISI publications S100, "*North American Specification for the Design of Cold-Formed Steel Structural Members"* and SG03 "*Cold-Formed Steel Design Manual"* for cold-formed steel framing design.
   2. Material Standards:
      a. Comply with the requirements of AISI publication, "*Standard for Cold-Formed Steel Framing - General Provisions"*.
      b. Comply with the requirements of AISI publication, *"Standard for Cold-Formed Steel Framing - Header Design"*.
   3. Welding Standards: Welding procedures must conform to the requirements of the following American Welding Society publications.

a. AWS D1.3, "*Structural Welding Code – Sheet Steel*".
b. AWS D9.1, "*Sheet Metal Welding*".
c. AWS D19.0, "*Welding Zinc Coated Steel*".

C. Qualifications:
1. Installer: Company or individuals must have at least 5 years' experience installing framing for at least 30 previous projects similar to this project in size, material, design, and complexity.
2. Welders: Welding personnel and supervisors must comply with, and welding procedures must conform to, the "*Qualification*" requirements of American Welding Society publications AWS D1.3, "*Structural Welding Code – Sheet Steel*" and AWS D19.0, "*Welding Zinc Coated Steel*" applicable to the project. Only certified welders current in their certification may perform or supervise any welding work.
3. Supervisors: Individuals must have at least 7 years' experience installing framing for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading framing installers.
4. Engineer: Must be a licensed professional structural engineer registered to practice in California having at least 10 years' experience performing the kind of engineering services indicated for at least 20 previous projects similar to this project in size, material, design, and complexity.

D. Submittals: Submit product data, shop drawings, written descriptions of specified qualifications, and delegated design submittals.

E. Mockups: If an *ex-situ* exterior wall integrated mockup is required for this project, then integrate framing into the mockup as part of the work of this specification section.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Provide products manufactured by one of the following, or equal.
1. California Expanded Metal Products Co. (CEMCO)
2. Clarkwestern Dietrich Building Systems LLC.
3. Olmar Supply Inc.
4. SCAFCO Corp.

2.2 MATERIALS

A. HDG Metallic-Coated Steel Sheet for Cold-Formed Framing: ASTM A 1003, ST50 (Structural Grade 50), with at least a G60 coating weight designation (mass designation) on both surfaces with equal coating weight on each surface.

2.3 COLD-FORMED FURRING

A. Hat Furring Channels:
   1. Products: "FC Series Furring Channel" manufactured by Clarkwestern Dietrich Building Systems LLC, or equal.
   2. Requisite Properties:
      a. Depth: 7/8- or 1-1/2-inch deep channels, as indicated.
      b. Minimum Thickness: At least 43 mils BMT (MSG 18).
      c. Web: 1-1/4 inches wide.
      d. Screw Flanges: 3/4-inch wide.

B. Z-shaped Furring Channels:
   1. Products: "Z-Furring (ZF-Series)" manufactured by Clarkwestern Dietrich Building Systems LLC, or equal.
   2. Requisite Properties:
      a. Depth: One to 3 inches deep, as indicated.
      b. Minimum Thickness: At least 43 mils BMT (MSG 18).
      c. Screw Flanges: 1-1/4 inches wide.

2.4 COLD-FORMED STUD FRAMING

A. Studs:
   1. Description: Pre-punched roll-formed C-shaped framing members with manufacturer's standard knockout sizing and spacing.
   2. Product: "Structural Stud S162 (CSJ)" manufactured by Clarkwestern Dietrich Building Systems LLC, or equal. (ICC ES Report No. ESR-1166P and Los Angeles Research Report No. RR 25889)
   3. Requisite Properties:
      a. Depth: Indicated on the Drawings.
      b. Minimum Thickness: At least 54 mils BMT (MSG 16).
      c. Flanges: At least 2-inch (1-1/4- to 3-1/2-inch) wide stiffened flanges with at least 1/2-inch returns (lip).

B. Tracks (Top and Bottom Runners):
   1. Description: Un-punched roll-formed U-shaped runners manufactured from the same material to corresponding stud sizes and gages.
   2. Product: "Structural Track" manufactured by Clarkwestern Dietrich Building Systems LLC, or equal. (ICC ES Report No. ESR-1166P and Los Angeles Research Report No. RR 25889)
   3. Requisite Properties:
      a. Depth: Indicated on the Drawings.
      b. Minimum Thickness: At least 54 mils BMT. (MSG 16)
      c. Flanges: At least 1-1/2-inch wide unstiffened flanges.

C. Deflection Track Systems:
   1. Description: Slotted roll- or brake-formed track installed in head-of-wall deflection conditions to accommodate vertical movement caused by normal head-of-wall and floor extension or compression.
   2. Product: one of the following, or equal.
      a. "MaxTrack" slotted deflection track or "BlazeFrame" fire stop deflection track manufactured by Clarkwestern Dietrich Building Systems LLC. (Intertek Code Compliance Research Reports No. CCRR-0205)
      b. "CEMCO Slotted Track (CST)" manufactured by CEMCO.

D. Manufactured Bridging Channels:
   1. Description: Roll-formed channel- or L-shaped stiffeners with pre-notched slots installed in both load-bearing and non-load bearing walls to help resist stud twisting.
   2. Products: "Spazzer 5400" manufactured by Clarkwestern Dietrich Building Systems LLC, or equal.
   3. Requisite Properties:
      a. Size: 1-1/2-inch wide by 1/2-inch deep.
      b. Minimum Thickness: At least 54 mils BMT (MSG 16).
   4. Bridging Clips: "Spazzer Bar Guard" manufactured by Clarkwestern Dietrich Building Systems LLC, or equal.
   5. Alternative Bridging Clips: As an alternate to manufactured bridging clips, 1-1/2-inch wide by 1/2-inch deep by full stud width cold-rolled angle clips manufactured from at least 54-mil (MSG 16) BMT HDG metallic-coated steel sheet may be provided.

E. Cold Rolled Channel (CRC) Bridging:
   1. Description: Un-punched roll-formed U-shape stiffeners installed in both load-bearing and non-load bearing walls to help resist stud twisting.
   2. Requisite Properties:
      a. Size: 1-1/2-inch wide by 1/2-inch deep.
      b. Minimum Thickness: At least 54 mils BMT (MSG 16).
      c. Flanges: 1-1/2 inches wide unstiffened flanges.
   3. Manufactured Bridging Clips: "EasyClip U-, B-, or X-Series Clip Angles" manufactured by Clarkwestern Dietrich Building Systems LLC, or equal.

F. Flat Strap Bridging (Strapping):
   1. Application: Flat sheet installed to provide resistance to stud rotation and minor axis buckling under loads for studs deeper than 6 inches.
   2. Requisite Properties:
      a. Width: Between 2 and 20 inches, as indicated or necessary.
      b. Minimum Thickness: At least 54 mils BMT (MSG 16).

G. Built-Up Headers:
   1. Built-Up Curtain Wall Headers: Un-punched roll-formed C-shaped framing members and U-channel runners.

2. Load-Bearing Box Beam Headers: Un-punched roll-formed C-shaped framing members.
3. Requisite Properties:
   a. Depth: Indicated on the Drawings.
   b. Minimum Thickness: At least 54 mils BMT (MSG 16).
   c. Flanges: 1-5/8-inch wide stiffened flanges with at least 1/2-inch returns (lip).
4. Header Connectors:
   a. Description: Connectors to attach either beams to columns or headers to jambs.
   b. Product: “DROP'N LOCK CLIP” connectors manufactured by Clarkwestern Dietrich Building Systems LLC, or equal.

2.5 SPECIALTY FRAMING

A. KCS Studs (King Kong Studs):
   1. Description: Pre-punched C-shaped framing members with manufacturer’s standard knockout sizing and spacing.
   2. Requisite Properties:
      a. Depth: Indicated on the Drawings.
      b. Minimum Thickness: At least 54 mils BMT (MSG 16).
      c. Flanges: 3-inch wide stiffened flanges with at least 7/8-inch returns (lip).

B. Manufactured Headers:
   1. Description: One- or 2-piece pre-engineered header with associated inserts and clips.
   2. Products: one of the following, or equal.
      a. “RedHeader RO Rough Opening System” manufactured by Clarkwestern Dietrich Building Systems LLC.
      b. “Pro-X” manufactured by Brady Construction Innovations, Inc.

C. Corner Angles:
   1. Description: Utility angles installed as a connection strut or angle, as corner reinforcement, or other various framing applications.
   2. Requisite Properties:
      a. Minimum Thickness: At least 30 mils BMT (MSG 20).
      b. Legs: 2- or 3-inch wide legs, as indicated, unless a wider or uneven leg size is explicitly indicated; or is otherwise supplied, required, recommended, authorized, or accepted by the manufacturer.

2.6 CONNECTORS

A. Bypass Connectors:
   1. Description: Clips used to attach exterior curtain wall studs to building superstructure and to provide vertical building movement independent of metal stud framing.

2. Bypass Slab Connectors: “Slide Clip” (minimal or no standoff conditions) or “Fast Clip Slide Clip” (medium standoff conditions) manufactured by Clarkwestern Dietrich Building Systems LLC, or equal.
3. Bypass Structure Connectors: “Quick Clip” (medium standoff conditions) and “Extended Fast Clip Slide Clip” or “Fast Strut” (large standoff conditions) manufactured by Clarkwestern Dietrich Building Systems LLC, or equal.

B. Multipurpose Connectors Rigid Connectors: “Uni-Clip” manufactured by Clarkwestern Dietrich Building Systems LLC, or equal.

2.7 WALL BACKINGS

A. Metal Wall Backings:
1. Description: General multipurpose flat sheet and formed metal stock used as backing to support shelves, cabinets, fixtures or handrails when applied to framing. Provide wall backing in addition to, not as a replacement for, tension strapping or cross bracing.
2. Heavy-Duty Backing: Installed to support items distributing not more than 80 pounds per stud.
   a. Material: 6-inch wide un-punched U-shaped runners manufactured from minimum 54-mil BMT (MSG 16) HDG metallic-coated steel sheet.
   b. Provide individual runner in lengths long enough to span across at least 3 studs.
   c. Notch and bend track legs so that backing plate is flush with exterior face of stud.
   d. Do not cut track legs between supporting studs.
   e. Fasten backing track to each stud with at least 3 screw fasteners per stud.
3. Medium-Duty Backing: Installed to support items distributing not more than 20 pounds per stud.
   a. Material: Minimum 6-inch wide un-punched U-shaped runners manufactured from minimum 54-mil BMT (MSG 16) HDG metallic-coated steel sheet.
   b. Provide individual runner in lengths long enough to span across at least 2 studs.
   c. Fasten backing track to each stud with at least 3 screw fasteners per stud.
4. Light-Duty Backing: Installed to support items distributing not more than 5 pounds per stud.
   a. Backing Material: Minimum 6-inch wide backing strip manufactured from minimum 54-mil BMT (MSG 16) HDG metallic-coated steel sheet.
   b. Provide individual runner in lengths long enough to span across at lreast 3 studs.
   c. Fasten backing track to each stud with at least one screw fasteners per stud.

2.8 SLOT METAL CHANNEL FRAMING

A. Description: Continuous slot metal channel framing conforming to MFMA-4, and associated fittings and hardware necessary for supporting cable trays, conduit, pipes and similar items.

B. Material: At least 0.0747-inch BMT (MSG 14) HDG metallic-coated steel sheet complying with ASTM A 653, structural steel (SS), Grade 33 or better, at least a G90 zinc coating designation on both surfaces with equal coating weight on each surface.

C. Manufacturers: Provide products manufactured by one of the following, or equal.
   1. Flex-Strut, Inc.
   2. PHD Manufacturing, Inc.
   3. Unistrut Corp.

D. Product: "P300 SL" manufactured by Unistrut Corp., or equal.

E. Requisite Properties:
   1. Types: standard and welded combination channels as required by conditions of installation and service.
   2. Height: heights as required by engineering calculations to meet load capacities, but not less than 1-3/8 inches.
   3. Suspension System: Hot-dip galvanized coarse-threaded (UNC) carbon steel rods having diameters as required by engineering calculations to meet load capacities, but not less than 3/8-inch.

F. Accessories: kickers, perimeter angle pieces and other accessories as supplied, required, recommended, or accepted by the slotted channel framing manufacturer and necessary for a complete and structurally-sound installation.

G. Finish: Chemically treated where retaining natural zinc finish; bonderized where painted finish is indicated.

2.9 ACCESSORIES

A. Sill Sealer and Liner Gaskets:
   1. Description: Self-adhering closed cell polyethylene foam air and moisture barrier.
   2. Applications:
      a. Sill Sealer: Install on the top of foundation wall, slab-on-grade. or curbs beneath exterior wall runner track or sill plates.
      b. Plate Liner: Install between floor deck and interior wall runner track or sill plates at shafts, hoistways, and other locations where necessary or indicated.
   3. Products: the following products manufactured by Protecto Wrap Co.
      a. Sill Sealer: 3/8-inch thick "Protecto Triple Guard Energy Sill Sealer", or equal.
      b. Plate Liner: 1/4-inch thick "Protecto Energy Plate Liner", or equal.

B. Shims: Load bearing, non-leaching, high-density multimonomer plastic.

C. Screw Fasteners: #8- and #10-32 UNC 2B (0.164- and 0.190-inch shank diameter, 32 threads per inch) by at least one-inch long, pan head, coarse thread, self-drilling uncoated bi-metal screw fasteners, unless another fastener type is explicitly indicated; or

supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

D. Power-Actuated Fasteners:
   1. Description: ICC-ES-approved anchors conforming to California Building Code Occupancy Category III, Seismic Design Category E, unless a more stringent Occupancy Category or Seismic Design Category is indicated on the Structural Drawings.
   2. Manufacturer: Provide products manufactured by Hilti, Inc., or equal.

E. Fastenings: backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

F. Other Accessories: Provide other accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
   1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
   2. Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations, and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items. Securely attach framing in place to supporting construction.
   3. Install framing using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
   4. Set framing true to line; plumb, level, and square without warp or rack; with flush, well-fitted joints; and in alignment with adjacent construction.
   5. Securely attach framing in place to supporting construction.

B. Installation Tolerances: Install framing within the following tolerance variations.
   1. Maximum Out of Plumb: Not more than L/960 of span, or 1/8-inch in 10 feet.
   2. Maximum Out of Level: Not more than L/960 of span, or 1/8-inch in 10 feet,
   3. Maximum Out of Plane: Fastening surfaces of adjacent framing members may not vary by more than 1/8-inch.
   4. Maximum Stud Spacing Variance: Not more than 1/8-inch. Cumulative error may not exceed minimum fastening requirements of sheathing or other finishing materials.

C. Correction and Repair:
   1. Correct deficiencies that do not conform to the Contract Documents.
   2. Repair non-conforming, damaged, and defective work.
   3. Installed framing must be warrantable. Do not install, correct, or replace framing in a manner that is un-warrantable by the manufacturer or that results in any warranty or guarantee becoming void.

D. Protection:
   1. Protect installed framing in place from deterioration and damage until covering framing.
   2. Remove protection when it's no longer needed and before covering framing.

END OF SECTION

SECTION 05 50 00 – METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Shop-fabricated non-decorative metal items.
   1. Dissimilar metal corrosion protection.
   2. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

1. Delegated Design Requirements:
   1. Engineer, fabricate, assemble, and install metal fabrications that conform to the profiles indicated and other Contract Document requirements; meet specified performance criteria; and result in structurally sound non-corroding assemblies that accommodate, resist, distribute, or transfer in-service loads without incipient or catastrophic failure.
   2. Maintain visual design concept indicated, including sizes, profiles, and alignments. Deviation from visual design concept is non-conforming work and prohibited without prior written acceptance by the Architect.

2. Performance Requirements:
   1. Design Loads: Indicated on the Drawings.
   2. Deflection: Not more than 1/8-inch.
   3. Thermal Expansion and Contraction: Accommodate movement resulting from at least 120 deg. F ambient and 180 deg. F material surface temperature differentials (changes).
   4. Dissimilar Metal Corrosion Protection: Permanently isolate metal surfaces from direct contact with incompatible materials and other potentially corrosive substrates as specified below.

3. Quality Standard:
   1. Design Standard for Galvanized Items: Items indicated as galvanized must be designed and fabricated in conformance with the requirements of AGA publication, "*The Design of Products to be Hot-Dip Galvanized after Fabrication"*, and ASTM A 385. Limit the use of vent and drain holes and locate where they drain by gravity and are concealed from view in the finish work.
   2. Welding Standards: Welding procedures must conform to the requirements of the following American Welding Society publications.

1. AWS D1.1, "*Structural Welding Code – Steel*".
2. AWS D1.2, "*Structural Welding Code – Aluminum*".
3. AWS D1.3, "*Structural Welding Code – Sheet Steel*".
4. AWS D1.6, "*Structural Welding Code – Stainless Steel*".
5. AWS D1.8, "*Seismic Supplement*".
6. AWS D9.1, "*Sheet Metal Welding*".
7. AWS D10.10, "*Heating Practices For Pipe And Tube*".
8. AWS D10.11, "*Root Pass Welding For Pipe*".
9. AWS D10.12, "*Pipe Welding – Mild Steel*".
10. AWS D10.18, "*Pipe Welding – Stainless Steel*".
11. AWS D11.2, "*Welding – Cast Iron*".
12. AWS D18.2, "*Stainless Steel Tube Discoloration Guide*".
13. AWS D19.0, "*Welding Zinc Coated Steel*".

4. Qualifications:
   1. Fabricator: Company or individuals must have at least 10 years' experience fabricating metal fabrications installed on at least 100 previous projects similar to this project in size, material, design, and complexity
   2. Installer: Company or individuals must have at least 5 years' experience installing metal fabrications for at least 30 previous projects similar to this project in size, material, design, and complexity.
   3. Welders: Welding personnel and supervisors must comply with the "*Qualification*" requirements of AWS quality standard publications. Only certified welders current in their certification may perform or supervise any welding work.
   4. Supervisors: Individuals must have at least 7 years' experience installing metal fabrications for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading metal fabrication installers.
   5. Engineer: Must be a licensed professional structural engineer registered to practice in California having at least 10 years' experience performing the kind of engineering services indicated for at least 20 previous projects similar to this project in size, material, design, and complexity.

5. Submittals: Submit product data, shop drawings, written descriptions of specified qualifications, and delegated design submittals.

PART 2 - PRODUCTS

2.1 IRON

A. Ductile Iron Castings: ASTM A 536, Grade 70-50-05 or better.

2.2 STEEL

A. Steel Plate: ASTM A 36 (mild steel).

B. Uncoated Steel Coil, Sheet, and Strip: Finished cold-rolled steel coil, sheet, and strip conforming to ASTM A 1008, CS Type B (commercial steel), unexposed (interior items) and exposed, temper rolled (exterior items), regular matte finish (40 to 59 AA), mill phosphatized.

C. HDG Metallic Coated Steel Coil, Sheet, and Strip: ASTM A 653, CS Type B (commercial steel), with equal coating weight on each surface, coating designation indicated below on both surfaces, minimized spangle, chemically treated, oiled, and mill phosphatized.
   1. Natural Finish: At least a G90 minimum coating designation (galvanized), minimized spangle, chemically treated, and oiled.
   2. Painted Finish: At least an A60 minimum coating designation (galvannealed), not chemically treated, not oiled, and mill phosphatized.

D. Hot-Rolled Steel Rods, Bars, and Shapes: ASTM A 36 (mild steel), merchant quality.

E. Steel Pipe: ASTM A 53, black pipe, Type and Grade as indicated below, size and weight class, schedule number, or outside diameter indicated and wall thickness as required by engineering calculations for type of use indicated.
   1. Type: Provide Type S (Seamless) pipe.
   2. Grade: Provide Grade A pipe for cold bending; otherwise provide Grade B pipe.

F. Steel Tubing:
   1. Steel Structural Tubing: ASTM A 500, Grade A, black, round or shaped hot-formed tubing as indicated, outside diameter or dimensions as indicated, and calculated wall thickness as required by engineering calculations for type of use indicated. Provide seamless tubing.
   2. Mechanical Tubing: ASTM A 513, black, Type 5 M.D. (mandrel drawn or Drawn over a Mandrel).

G. Steel Castings: ASTM A 27, Grade 65-35, Class 2 (post-weld heat-treatment not required).

H. Galvanized Carbon Steel Wire: Soft temper zinc-coated wire conforming to ASTM A 641, minimum Class 4 coating weight.

2.3 STAINLESS STEEL

A. Stainless Steel Bars, Hot-Rolled or Extruded Shapes: ASTM A 276, Condition T (hardened and tempered at a relatively high temperature), Type 304L (for welded applications) or Type 304 (for all other applications), passivated in conformance with ASTM A 967.

B. Stainless Steel Pipe: ASTM A 312, Grade TP (pipe), Type 304L (for welded applications) or Type 304 (for all other applications), passivated in conformance with ASTM A 967.

C. Stainless Steel Coil, Sheet, Strip, Plate, and Flat Bar:
   1. Exposed Locations: ASTM A 666 (annealed and tempered), Type 304L (for welded applications) or Type 304 (for all other applications), annealed, No. 4 (soft) temper (hardness not more than Rockwell B-65; can be bent flat upon itself in any direction), passivated in conformance with ASTM A 967.
      a. Uncoated (Bare) or Natural Finish: No. 2B (bright) finish.
      b. Painted Finish: No. 2D (matte) finish.
   2. Concealed Locations: ASTM A 240 (annealed) Type 304L (for welded applications) or Type 304 (for all other applications), No. 2D (matte) finish, annealed, No. 4 (soft) temper (hardness not more than Rockwell B-65; can be bent flat upon itself in any direction), passivated in conformance with ASTM A 967.

D. Stainless Steel Tubing: ASTM A 554, Grade MT (tubing), Type 304L (for welded applications) or Type 304 (for all other applications), No. 2D (matte) finish, passivated in conformance with ASTM A 967.

E. Stainless Steel Castings: ASTM A 743, Grade CF8M or CF3M.

2.4 ALUMINUM

A. General: Unless otherwise indicated, provide aluminum alloy and temper recommended by both the metal producer for the type of use, strength, and welding characteristics; and by the aluminum finisher for color match and compatibility of fabricated items with specified finish.

B. Cold-Rolled Aluminum Bar and Rod: ASTM B 211.

C. Extruded Bars, Shapes and Tubes:
   1. Standard Structural Profiles: ASTM B 308, Alloy 6061-T6.
   2. Extruded Aluminum Bars and Shapes: ASTM B 221.
      a. Alloy and Temper: 6063-T5 or T6 for primary components; 6063-T5 or T6, 6005-T5, 6105-T5 or 6061-T6 for structural components.
      b. Minimum Thickness: At least 0.125-inch.

D. Sheet and Plate: ASTM B 209.
   1. Alloy and Temper: 5005-H32 (for anodic finishing), or alloy 3003-H14 (for painted or unfinished sheet).
   2. Minimum Thickness: At least 0.060-inch.

E. Aluminum Pipe:
   1. Structural Aluminum Pipe and Round Tube: ASTM B 429.
   2. Seamless Aluminum Pipe and Seamless Extruded Tubes: ASTM B 241.

F. Aluminum Tubing:
   1. Seamless Drawn Aluminum Tubes: ASTM B 210.

2. Extruded Aluminum Tubes: ASTM B 221 or ASTM B 483.

G. Aluminum Die and Hand Forgings: ASTM B 247.

H. Aluminum Castings: ASTM B 26.

2.5 ACCESSORIES

A. Flanges and Anchors: Unless otherwise indicated, provide cast or formed metal of the same type, material, and finish as the supported metal fabrications.

B. Grout:
1. Description: Pre-packaged, non-shrink, non-metallic, non-corrosive, non-staining, non-gaseous grout conforming to ASTM C 1107, Grade A (drypack) and Grades B and C (flowable grout) of a consistency suitable for application within a 30-minute working time.
2. Type: Grout specifically recommended by the manufacturer for interior and exterior applications.
3. Minimum 28-day Compressive Strength: At least 7,500 pounds per square inch.

C. Bituminous Paint:
1. Description: Cold-applied asphalt mastic conforming to SSPC publication PS 9.01, "*Cold-Applied Asphalt Mastic Painting System with Extra-Thick Film*" and containing no asbestos fibers; or cold-applied asphalt emulsion conforming to ASTM D 1187.
2. Application: Used for aluminum surfaces in contact with masonry, concrete, or steel.

D. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.6 FABRICATION

A. Shop Fabrication:
1. Fabricate items in largest sections practicable to minimize field jointing.
2. Fabricate exposed work precise, straight, and true to line, size, and shape; plumb, level, and square within allowable tolerances; and with accurate angles and surfaces, and crisp straight edges.
3. Fabricate exposed connections with flush hairline joints, and square and true edges and corners.
4. Form bent metal corners to the smallest radius possible without causing grain separation or otherwise impairing the strength of the material.
5. Bend pipe without collapsing or deforming its walls, to produce a smooth, uniform curved section and to maintain uniform sectional shape.
6. Form simple and compound curves by bending members in 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.

7. Cut, reinforce, drill, punch, thread, and tap metal fabrications as necessary to receive other fabrications, components, accessories, hardware, and similar items, and as required to securely attach to supporting construction
8. Before cleaning, treating, and applying specified finishes, remove blemishes by grinding.
9. Remove sharp or rough areas on exposed traffic surfaces. Ease exposed edges to a nominal 1/32-inch radius.

B. Fabrication Tolerances: Fabricated items must conform to the following; specified tolerances are non-cumulative.

1. Squareness: Not more than 1/8-inch difference in diagonal measurements.
2. Maximum Offset between Components at Joints: 1/16-inch except that at welded joints, offsets are prohibited.
3. Maximum Misalignment of Adjacent Members: 1/16-inch.
4. Maximum Bow: 1/8-inch in 48 inches.
5. Maximum Deviation from Plane: 1/16-inch in 48 inches.

2.7 FINISHES

A. Natural (Uncoated) Steel Finish:

1. Remove visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants from all steel surfaces in conformance with SSPC publication SP1, "*Solvent Cleaning*".
2. After fabrication, remove loose mill scale, rust, paint, and other deleterious material from all steel surfaces in conformance with SSPC publication SP2, "*Hand Tool Cleaning*".

B. Shop Priming: Specified in Section 05 05 13.

2.8 DISSIMILAR METAL CORROSION PROTECTION

A. Review dissimilar metals for potential galvanic action.

B. Ensure metal surfaces are permanently isolated from direct contact with potentially corrosive substrates by

1. applying the alkali-resistant coating specified above to each metal surface in direct contact with concrete, lime mortar, or other masonry materials, or similar cementitious materials;
2. applying either the bituminous coating specified above or a rubberized-asphalt coating to a total DFT of at least 40 mils to each metal surface in direct contact with incompatible metals, wood, or similar corrosive substrates; or to anodic metal surface when incompatible metals are in direct contact; or

3. providing high impact polystyrene shims to provide cathodic isolation between aluminum plates and steel, and metal plates and concrete

C. Ensure runoff is directed or diverted so as to prevent water from passing over or across dissimilar metals.
   1. Arrange metals along water runoff paths in a series from anodic metals (e.g., aluminum) to cathodic metals (e.g., copper) to prevent runoff from cathodic metals (e.g., copper flashings) from flowing over anodic metals (e.g., aluminum gutters).
   2. Where drainage from cathodic metals (e.g., copper roof panels) might pass over anodic metals (e.g., aluminum gutters), apply a protective coating acceptable to the Architect to the surfaces of the anodic metals.

Metal	Electronegativity
Lithium	Anodic (Active) End
Potassium	Less Noble (corrosion occurs this end)
Sodium	
Zinc	
Aluminum 5052, 3004, 3003, 1100, 6053	
Cadmium	
Iron and Mild Steel	
Chrome Iron	
Stainless Steel (active)	
Tin-lead solder	
Lead	
Tin	
Nickel	
Brass	
Copper	
Bronze	
Stainless Steel (passive)	
Silver	
Titanium	More Noble (no corrosion this end)
Platinum	

Metal	Electronegativity
Gold	Cathodic (Passive) End

D. Ensure small anodic metals items (e.g., aluminum rivets) are not placed in contact with large cathodic metals (e.g., a large piece of steel sheet).

E. Provide a non-absorbent insulate between dissimilar metal surfaces that contact one another (e.g., polypropylene tape at least 1.7 mils thick with a dielectric strength of 300-400 volts/mil). Before connecting, prime or paint each dissimilar metal contact surface, even if they have protective coatings.

F. Ensure fasteners are made of the same material being fastened or have a suitable barrier protection coating.
   1. Apply corrosion-inhibiting material (e.g., pastes, washers, compounds, etc.) under the heads of screws or bolts inserted into dissimilar metal, even if they already have been treated or have a protective coating.
   2. Washers, gaskets, and sleeves must be made of plastic or closed-cell polychloroprene (Neoprene).

G. Protect aluminum from the following.
   1. Dissimilar Materials: Where aluminum surfaces come into contact with dissimilar metals other than stainless steel, zinc, or zinc coatings, isolate the aluminum from direct contact by painting the dissimilar metal with a prime coat of alkyd-type zinc primer followed by aluminum paint applied to a total DFT of at least 3.0 mils.
   2. Cementitious Materials: Where aluminum surfaces come into contact with concrete, plaster, or mortar and other cementitious materials, isolate the aluminum surfaces from direct contact by applying bituminous paint to the aluminum surfaces to a total of at least 25 mils DFT.
   3. Wood and Other Absorptive Materials: Where aluminum surfaces come into contact with wood, treated wood, or similar absorptive materials that are subject to repeated wetting, isolate the aluminum surfaces from direct contact by
      a. applying bituminous paint to the aluminum surfaces to a total of at least 25 mils DFT; or
      b. applying aluminum paint to the wood, treated wood, or similar absorptive material surfaces to a total DFT of at least 3.0 mils, and then continuously sealing joints with weather sealing joint sealant specified in Section 07 92 00.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:

1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
2. Verify that in-place construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed items
3. Scribe and cope items as necessary for an accurate fit. Perform required cutting, drilling, and fitting for metal fabrication installation.
4. Set metal fabrications true to line, to required levels and lines, plumb, square, and cut and fitted without warp or rack; sloped or level as required; with flush well-fitted joints; and in alignment with adjacent construction.
5. Shim as required with concealed shims.
6. Dry-pack metal fabrications supported on concrete and masonry to provide firm, level bearing surfaces.
7. Provide temporary bracing or anchors for items indicated as built into concrete, masonry, or similar construction.
8. Fit exposed connections accurately to form flush hairline joints.
9. Securely attach metal fabrications in place to supporting construction.

B. Installation Tolerances: Install metal fabrications to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch and from plumb, level, and alignment.

C. Correction and Repair:
   1. Correct deficiencies that do not conform to the Contract Documents.
   2. Repair non-conforming, damaged, and defective work.

D. Protection:
   1. Protect installed metal fabrications in place from deterioration and damage until Substantial Completion.
   2. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

DIVISION 07

THERMAL AND MOISTURE PROTECTION

SECTION 07 84 00 – FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Through-penetration firestop systems.
   2. Fire-resistive joint systems (fire calks).
   3. Perimeter fire-resistive joint systems (fire safing).
   4. Surface preparation.
   5. Installation materials.
   6. Site tests and inspections.
   7. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

1. Qualifications:
   1. Installer: Company or individuals must have at least 5 years' experience installing firestopping for at least 30 previous projects similar to this project in size, material, design, and complexity.
   2. Supervisors: Individuals must have at least 7 years' experience installing firestopping for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading firestopping installers.

2. Submittals: Submit product data, firestopping schedule, and written descriptions of specified qualifications.

3. Field Samples: Include *in-situ* mockups as part of the work of this specification section.
   1. The Architect reviews field samples for conformance to the Contract Documents and approves or rejects them as the standard by which subsequent work is evaluated.
   2. Revise field samples and repeat reviews, including arranging all revisions and paying all revision costs, until accepted in writing by the Architect. Final acceptance of firestopping is made from field samples.
   3. After acceptance, promptly identify and protect field samples for reference until Substantial Completion.
   4. Approved field samples may remain part of the work after being identified for future reference.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Provide products manufactured by one of the following, or equal.
   1. 3M Fire Protection Products.
   2. Hilti, Inc.
   3. Specified Technologies, Inc.

2.2 FIRESTOPPING ASSEMBLIES

A. Description:
   1. Through-Penetration Firestop Systems: Provide firestop systems tested and identified in UL's "*Fire Resistance Directory*" product Category XHEZ, or equal.
   2. Fire-Resistive Joint Systems (fire calks): Provide firestop systems tested and identified in UL's "*Fire Resistance Directory*" product Category XHBN, or equal.
   3. Perimeter Fire-Resistive Joint Systems (safing insulation): Provide firestop systems tested and identified in UL's "*Fire Resistance Directory*" product Category XHDG, or equal.

B. Requisite Properties:
   1. F-Rated Firestop Systems: Provide firestop systems in fire partitions having an F rating that meets or exceeds the fire-resistance rating of the penetrated construction, but not less than one-hour.
   2. T-Rated Firestop Systems: In fire-resistive floor-ceiling or roof-ceiling construction, or other constructions where penetrating items pass through occupied areas and may contact combustible materials, provide firestop systems having both an F- and a T-rating, determined in conformance with ASTM E 814 or UL 1479. T-rated assemblies are required where the following conditions exist with exceptions.
      a. Where firestop systems protect floor penetrations located outside of wall cavities.
      b. Where firestop systems protect floor penetrations located outside fire-resistive shaft enclosures.
      c. Where firestop systems protect penetrations located in fire-resistive construction containing doors required to have a temperature-rise rating.
      d. Where firestop systems protect penetrating items larger than a 4-inch diameter nominal pipe or 16 square inches in overall cross-sectional area.
   3. L-Rated Firestop Systems: Where firestop systems are indicated in smoke barriers and elsewhere, provide penetration firestop systems with an L-rating of not more than 5.0 cubic feet per minute per square foot both at ambient temperatures and at 400 deg. F.
   4. Firestopping Exposed to Traffic, Moisture, or Physical Damage: Provide products that do not deteriorate after curing.

5. Plumbing and Wet-Pipe Sprinkler System Piping Penetrations: Provide moisture-resistant penetration firestop systems.
6. Penetrations with Insulated Piping: Provide penetration firestop systems that do not require piping insulation removal.
7. Floor penetrations with Annular Spaces Exceeding 4 inches Wide and Exposed to Possible Loading and Traffic: Provide firestop systems that support floor loads involved, either by installing floor plates or by other means.
8. Surface-Burning Characteristics: Provide firestopping having a maximum FSI Value of 0 and a maximum SDI Value of 0 (Class A), when tested in conformance with ASTM E 84.

2.3 MATERIALS

A. Latex Sealant: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.

B. Silicone Sealant: Single-component, silicone-based, neutral-curing elastomeric sealants. Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces; non-sag formulation for openings in walls and other vertical and overhead surfaces.

C. Silicone Foam: Multicomponent, silicone-based liquid elastomer that, when mixed, expands and cures in place to produce a flexible, non-shrinking foam.

D. Intumescent Putty: Non-hardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

E. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

F. Intumescent Blocks: Intumescent flexible block based on a two-component polyurethane foam

G. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized steel sheet.

H. Pillows and Bags: Reusable heat-expanding pillows and bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives.

I. Pre-formed Mineral Wool: Designed to fit flutes of metal decking and the gap between the top of wall and metal decking as a backer for spray material.

J. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors, consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket, including similar devices.

K. Pre-Installed Firestop Devices: Factory-assembled devices for use with noncombustible and combustible pipes (closed and open systems), conduit, and cable bundles penetrating concrete floors or gypsum board walls.

L. Metal Track Firestopping:
   1. Description: Top- and bottom-of-wall metal tracks to fills gaps between the metal and concrete surfaces and help seal out fire and smoke sound drafts.
   2. Product: "Firestop Top Track Seal CFS-TTS" manufactured by Hilti, or equal.

M. Fire Rated Cable Pathways:
   1. Description: Gangable device modules consisting of steel raceways with intumescent foam pads requiring no additional action to achieve fire and leakage ratings, including plugs, twisting closure, putty, pillow, or sealant.
   2. Products: "EZ-PATH Series 44+ Fire Rated Pathway" manufactured by Specified Technologies, Inc., or equal.
   3. Requisite Properties:
      a. Size: 4 inches wide by 4-5/8 inches high by 14 inches long.
      b. Material: 0.059-inch BMT (MSG 18) galvanized steel sheet.

2.4 ACCESSORIES

A. Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
   1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
   2. Verify in-place construction, project conditions, and the work of other specification sections conform to the manufacturer's instructions and other requirements and recommendations.
   3. Protect work areas from dust and other airborne contaminants during surface preparation and firestopping installation. Protect adjacent surfaces against soiling and damage. Close and protect drains and other openings and penetrations to prevent firestopping intrusion or migration of liquids.
   4. Prepare substrates as required, recommended, or accepted by the manufacturer without limitation; and in a manner that does not result in any warranty or guarantee becoming void.

5. Install firestopping using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
6. Only install firestopping under conditions that ensure finishes are free from blemishes and defects.
7. Provide smooth surfaces of uniform finish, color, appearance, and coverage. Fireproofing surfaces with cloudiness, spotting, holidays, runs, or other imperfections are prohibited and are rejected as non-conforming work.
8. Do not exceed the application rates recommended by the manufacturer.
9. Completed work must match approved samples and mockups, as accepted by the Architect.
10. Installed fireproofing must be warrantable. Do not install, correct, or replace fireproofing in a manner that results in any warranty or guarantee becoming void.

B. Correction and Repair:
   1. Correct deficiencies that do not conform to the Contract Documents.
   2. Repair non-conforming, damaged and defective work.
   3. Replace soiled firestopping that cannot be cleaned to the same condition as new.

C. Protection: Protect installed firestopping in place from soiling, deterioration, and damage until Substantial Completion.

END OF SECTION

SECTION 07 92 10 – INTERIOR JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Interior joint sealants for use at non-acoustical partitions.
   2. Surface preparation.
   3. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

A. Submittals: Submit product data and samples.

PART 2 - PRODUCTS

2.1 INTERIOR JOINT SEALANTS

A. General Purpose Interior Sealant:
   1. Description: Siliconized acrylic-latex sealant conforming to ASTM C 834 requirements for Type OP, Grade NF classification, as required.
   2. Products: Provide one of the following, or equal.
      a. “Sonneborn Sonolac” manufactured by BASF Building Systems.
      b. “AC-20+Silicone” manufactured by Pecora Corp.
      c. “Tremflex 834” manufactured by Tremco, Inc.
   3. Colors: Selected by the Architect from the manufacturer’s standard colors or to match existing adjacent surface.

2.2 ACCESSORIES

A. Primer and Surface Cleaners:
   1. Application: Applied to enhance and strengthen sealant adhesion to porous and nonporous substrates; and help ensure proper joint preparation
   2. Porous and Cementitious Surfaces: “1200 OS Primer” manufactured by Dow Corning Corp., or equal.
   3. Other Surfaces: “Construction Primer P” manufactured by Dow Corning Corp., or equal.

B. Masking Tape: Provide paper masking tape manufactured by 3M, or equal, unless another kind is supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project

C. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
   1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
   2. Verify in-place construction, project conditions, and the work of other specification sections conform to the manufacturer's instructions and other requirements and recommendations.
   3. Protect work areas from dust and other airborne contaminants during surface preparation and joint sealant installation. Protect adjacent surfaces against soiling and damage.
   4. Prepare substrates as required, recommended, or accepted by the manufacturer without limitation; and in a manner that does not result in any warranty or guarantee becoming void.
   5. Install joint sealants in conformance with ASTM C 1193 using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
   6. Only install joint sealants under conditions that ensure finishes are free from blemishes and defects.
   7. Provide smooth surfaces of uniform finish, color, appearance, and coverage. Joint sealant surfaces with cloudiness, spotting, holidays, runs, or other imperfections are prohibited and are rejected as non-conforming work. Produce sharp and even lines and color breaks.
   8. Completed work must match approved samples, as accepted by the Architect.
   9. Installed joint sealants must be warrantable. Do not install, correct, or replace joint sealants in a manner that results in any warranty or guarantee becoming void.

B. Correction and Repair:
   1. Correct deficiencies that do not conform to the Contract Documents.
   2. Repair non-conforming, damaged and defective work.
   3. Replace soiled joint sealants that cannot be cleaned to the same condition as new.

C. Protection: Protect installed joint sealants in place from soiling, deterioration, and damage until Substantial Completion.

END OF SECTION

DIVISION 08

OPENINGS

SECTION 08 12 13 – STANDARD HOLLOW METAL FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Standard hollow metal door frames.
   2. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

A. Quality Standard Requirements:
   1. Manufacturing Tolerances: Comply with the requirements of ANSI/SDI publication ANSI/SDI A250.8, "*Recommended Specifications for Standard Steel Doors and Frames"*.
   2. Door Frame Installation Standards:
      a. Install fire-resistance rated frames in conformance with NFPA 80, "*Standard for Fire Doors and Other Opening Protectives*".
      b. Install other frames in conformance with of ANSI A250.11, "*Recommended Erection Instructions for Steel Frames*".
   3. Hardware Preparations and Reinforcement: Comply with the requirements of ANSI/SDI A250.6, "*Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames*" with reinforcing plates fabricated from the same material as door face sheets.
   4. Door Hardware Installation Standards: Install door frame hardware in conformance with ANSI/DHI A115-IG, "*Installation Guide for Doors and Hardware*".

B. Qualifications:
   1. Manufacturer: Company or individuals must have at least 10 years' experience manufacturing door frames installed on at least 200 previous projects similar to this project in size, material, design, and complexity. Manufacturer must be a current member of SDI.
   2. Installer: Company or individuals must have at least 5 years' experience installing door frames for at least 30 previous projects similar to this project in size, material, design, and complexity. Installer must be a current member of SDI.
   3. Supervisors: Individuals must have at least 7 years' experience installing door frames for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading door frame installers.

C. Submittals: Submit product data, door schedule, shop drawings, and written descriptions of specified qualifications.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Provide products manufactured by one of the following, or equal.
   1. Allegion PLC.
   2. ASSA ABLOY.
   3. Door Components, Inc.
   4. MPI Custom Steel Doors and Frames.
   5. Republic Doors and Frames.

2.2 STANDARD HOLLOW METAL FRAMES

A. Description: 3-sided (open), fully welded masonry (universal) and flush drywall standard HM frames conforming to the requirements of Steel Door Institute publication SDI-100, "*Recommended Specifications for Standard Steel Doors and Frames"*.

B. Products: "Steelcraft" frames manufactured by Allegion, or equal.
   1. Single Egress Door HM Frames: "F-Series" frames, or equal.
   2. Stainless Steel HM Frames: "FS-Series" frames, or equal.

2.3 COMPONENTS

A. Materials:
   1. Frames with an Uncoated Finish (Bare or Natural Finish): Fabricate from zinc coated (HDG) steel sheet or from stainless steel sheet, as indicated.
   2. Interior Frames Installed Elsewhere: Fabricate from uncoated CRS sheet.
   3. Sidelight and Transom Frames: Fabricate from the same material, thickness, and finish as the adjacent door frame.

B. Material Thickness:
   1. HM Frames for Level 1 and Physical Performance Level C (Standard Duty) Doors: Fabricate from at least 0.0478-inch BMT (MSG 18) uncoated and zinc-coated steel sheet; or from at least 0.0500-inch (USSG 18) stainless steel sheet.
   2. HM Frames for Level 2 (Heavy Duty) and Physical Performance Level B, and for Level 3 and Physical Performance Level B (Extra Heavy Duty) Doors: Fabricate from at least 0.0598-inch BMT (MSG 16) uncoated steel and zinc-coated steel BMT; or from at least 0.0625-inch BMT (USSG 16) stainless steel sheet.

C. Profiles:

1. Types: Indicated on the Drawings.
2. Throat Openings:
   a. Butted Frames: Equal to the wall or partition type thickness minus twice the frame return dimension, unless otherwise indicated.
   b. Wrap-Around Frames: Equal to the wall or partition thickness, unless otherwise indicated.
3. Frame Depth:
   a. Butted Frames: Equal to the wall or partition thickness.
   b. Wrap-Around Frames: Equal to the throat opening plus twice the frame return dimension.
4. Frame Return Dimension: 1/2-inch.
5. Backbend Dimension (Second, Double, or Drywall Return Dimension): At least 3/8-inch.
6. Backbend Type: Indicated on the Drawings.
7. Face Dimension: Provide 4-inch face dimension at heads in CMU construction where required to maintain a masonry module; provide 2-inch face dimension at jambs. Provide 2-inch face dimension elsewhere, unless otherwise indicated.
8. Stop Dimension: 5/8-inch.
9. Rabbet Depth Dimension: Equal to 3/16-inch greater than the door thickness.
10. Opposite Door Rabbet Depth Dimension: 1-9/16 inches.
11. Soffit Dimension: Equal to the frame depth minus the sum of the rabbet dimensions.

D. Corners:
   1. Welded HM Door Frames: Provide square-cut mitered or coped and mitered, set-up arc welded (SUA) and ground smooth, full profile welded frames (fully welded or continuously welded frames) for installation of frames as a complete unit. All corners must be watertight.
   2. HM Frame Glazing Beads: Provide butted corners.

E. Hardware Preparations and Reinforcement: Provide HM frame hardware reinforcing and preparations in conformance with ANSI/SDI publications A250.6, "*Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames"* and A250.8, "*Recommended Specifications for Standard Steel Doors and Frames"*.

2.4 ACCESSORIES

A. Head Reinforcement: For opening widths greater than 48 inches wide, provide channel or angle stiffeners fabricated from at least 0.0747-inch BMT (MSG 14) zinc coated (HDG) steel sheet or at least 0.0781-inch BMT (USSG 14) stainless steel sheet, as applicable.

B. Anchors:
   1. Masonry Anchors: Provide either 3/16-inch minimum diameter (SWG 7) galvanized carbon steel masonry wire anchors or at least 0.0598-inch BMT (MSG 16) zinc coated (HDG) steel sheet masonry tee anchors, as applicable.

2. Existing Opening Anchors: Provide at least 16-gage welded pipe sleeve anchors with 0.0598-inch BMT (MSG 16) zinc coated (HDG) steel sheet straps designed specifically to add support for bolting frames into rough openings of an existing walls.
3. Wood Stud Anchors: Provide either at least 0.0598-inch BMT (MSG 16) zinc coated (HDG) steel sheet anchors designed specifically for attachment to the wood studs of a rough opening.
4. Metal Stud Anchors: Provide either at least 0.0598-inch BMT (MSG 16) zinc coated (HDG) steel sheet anchors designed specifically for attachment to the webbing of the closed steel studs built around the frame.
5. Universal Stud Wall Anchors: Provide either at least 0.0598-inch BMT (MSG 16) zinc coated (HDG) steel sheet universal lock-in jamb anchors designed specifically for use in either wood or steel stud wall applications, as applicable.
6. Base Anchors: Provide either at least 0.0598-inch (MSG 16) BMT zinc coated (HDG) steel sheet or at least 0.0625-inch BMT (USSG 16) stainless steel sheet base anchors, as applicable. Provide adjustable base anchors that allow for installation adjustment when the floor is not level.

C. Electrical Device Requirements: Make provisions for installation of electrified hardware and door electrical devices, and arrange so that wiring is readily installed, removed, and replaced.
   1. Provide cutouts and reinforcement required for installation of devices.
   2. Provide metal conduits or raceways to accommodate wiring between devices. (e.g., from electric hinge to other electric door hardware)

D. Glazing Stops:
   1. Fire-Rated Conditions: Provide 3/4-inch square channel glazing beads.
   2. Elsewhere: Provide 5/8-inch square channel glazing beads.
   3. Material Thickness: Fabricate from at least 0.0478-inch BMT (MSG 18) uncoated and zinc-coated steel sheet.

E. Silencers: Provide loose, 1/8-inch thick by 1/2-inch wide pressure-sensitive-adhesive-backed polychloroprene (Neoprene) or ethylene propylene diene monomer (EPDM) rubber silencers for field installation. Furnish at least 3 for each strike jamb and at least 2 for double door head. Do not provide silencers where they may interfere with other seals, including smoke & draft seals.

F. Filler: Provide material conforming to the requirements of ANSI/SDI publication A250.8, "*Recommended Specifications for Standard Steel Doors and Frames*". Use UL-listed materials in frames scheduled as having a fire-resistance rating.

G. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.5 MATERIALS

A. Uncoated Carbon Steel Sheet:
   1. Frame Material: Finished CRS coil, sheet, and strip conforming to ASTM A 1008, CS Type B (commercial steel), exposed, temper rolled, regular matte surface finish (40 to 59 AA), and oiled (sheet must be thoroughly cleaned to remove the oil prior to painting).
   2. Hardware Reinforcements: HRS coil, sheet, and strip conforming to ASTM A 1011, CS Type B (commercial steel), as-rolled surface finish, with cut edges.

B. Zinc-Iron Alloy Coated (Galvannealed) Steel Sheet: ASTM A 653, CS Type B (commercial steel), with equal coating weight on each surface.
   1. Coating Weight (Mass) Designation: Provide at least a A60 (galvannealed) minimum coating weight (mass) designation.
   2. Surface Finish: Non-spangled matte finish.
   3. Surface Treatment: Provide mill phosphate surface treatment (paint-grip finish - provides enhanced lubricating characteristics).

C. Zinc Coated (HDG) Steel Sheet: ASTM A 653, CS Type B (commercial steel), with equal coating weight on each surface.
   1. Coating Weight (Mass) Designation: Provide at least a G90 (galvanized) minimum coating weight (mass) designation.
   2. Surface Finish: Provide regular spangle surface finish.
   3. Surface Treatment:
      a. Exterior Frames: Provide oil over chemical surface treatment (chemical treatment desired for humid-storage stain resistance and oil treatment needed for enhanced formability).
      b. Interior Frames: Provide oiled surface treatment (needed for enhanced formability).

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
   1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
   2. Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations, and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed door frames and adjacent items.
   3. Install door frames in conformance with the quality standards publications using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.

4. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction.
5. Perform drilling and fitting as required or necessary for an accurate fit and complete installation.
6. Securely attach door frames in place to supporting construction.
7. Installed door frames must be warrantable. Do not install, correct, or replace door frames in a manner that results in any warranty or guarantee becoming void.

B. Special Techniques:
1. Frames: Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
   a. Install frames with removable glazing stops located on secure side of opening.
   b. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
   c. Install door silencers in frames before grouting.
   d. Provide setting spreaders, supplied by the installer, and leave intact until frames are set square and plumb within specified tolerances, and all anchors are securely attached and grouted where required.
   e. Remove frame spreader bars only after frames re properly set and secured. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
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 grout.
4. Concrete Walls: Solidly fill space between frames and concrete with grout. Take precautions, including bracing frames, to ensure that frames are not deformed or damaged by grout forces.
5. Ceiling Struts: Except where anchored to masonry or to other structural support at each jamb, extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame.
   a. Bend top of struts to provide flush contact for securing to supporting construction.
   b. Provide adjustable wedged or bolted anchorage to frame jamb members.
6. Glazing: Comply with installation requirements in Section 08 81 00 and with the manufacturer's instructions. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches O.C. and not more than 2 inches on center from each corner.

C. Installation Tolerances: Install frames within the following tolerance variations.
1. Maximum Out of Square: Not more than 1/16-inch, measured at rabbet on 90 degrees from jamb perpendicular to frame head.

2. Maximum Out of Alignment: Not more than 1/16-inch, measured at jambs on a horizontal line parallel to plane of wall.
3. Maximum Twist: Not more than 1/16-inch, measured at at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
4. Maximum Out of Plumb: Not more than 1/16-inch, measured on floor at jambs.

D. Correction and Repair:
1. Correct deficiencies that do not conform to the Contract Documents.
2. Repair non-conforming, damaged and defective work.
3. Replace soiled items that cannot be cleaned to the same condition as new.

E. Protection:
1. Protect installed door frames in place from soiling, deterioration, and damage until Substantial Completion.
2. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

SECTION 08 14 16 – FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Wood veneer-faced flush wood doors.
   2. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

A. Quality Standard Requirements:
   1. Product Standard: Comply with the requirements Window & Door Manufacturers Association publication ANSI/WDMA I.S.1-A, "*Industry Standard for Interior Architectural Wood Flush Doors"*.
   2. Door Hardware Installation Standards: Install door hardware in conformance with ANSI/DHI A115-IG, "*Installation Guide for Doors and Hardware*".

B. Qualifications:
   1. Manufacturer: Company or individuals must have at least 10 years' experience manufacturing doors installed on at least 200 previous projects similar to this project in size, material, design, and complexity.
   2. Installer: Company or individuals must have at least 5 years' experience installing doors for at least 30 previous projects similar to this project in size, material, design, and complexity.
   3. Supervisors: Individuals must have at least 7 years' experience installing doors for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading door installers.

C. Submittals: Submit product data, door schedule, shop drawings, samples, 5-inch by 5-inch sample of veneer, and written descriptions of specified qualifications.

D. Manufacturer Warranty: Furnish to the Owner a written manufacturer warranty for products, components, and accessories against all patent and latent defects, and incipient and catastrophic failure for 5 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers:
   1. Basis of Design Manufacturer: Design is based on products manufactured by the following.
      a. Eggers Industries.
   2. Acceptable Manufacturers: Other acceptable sources of comparable products include the following and are subject to the approval of the Owner, or equal.
      a. Algoma Hardwoods, Inc.
      b. Marshfield DoorSystems, Inc.
      c. Oshkosh Architectural Door Co.

2.2 WOOD VENEER-FACED DOORS

A. Description: Flush wood doors conforming to WDMA I.S.1-A Performance Grade Heavy Duty.

B. Application: Transparent finish wood doors.

C. Restrictions: Doors manufactured with adhesives and composite wood products containing urea formaldehyde are prohibited.

D. Products: Provide products manufactured by Eggers Industries, or equal.

E. Requisite Properties:
   1. Type: Solid Core.
   2. Grade: Premium.
   3. Thickness: 1-3/4 inches.
   4. Construction: 5-ply.
   5. Core: Manufacturer's standard wood-based particleboard, structural composite lumber, or fire-resistant composite or mineral core, or specialty core.
   6. Edge Construction: Structural composite lumber or hardwood lumber stiles and rails securely bonded to core components and machine calibrated before veneering, with edge banding veneer matching face veneer species and grade.
   7. Meeting Edge: Beveled at lock stile, square edged at strike stiles.
   8. Hardware Blocking: As required by hardware manufacturer to eliminate through-bolting hardware.
      a. 5-by-18-inch lock blocks at both stiles.
      b. 5-inch top rail blocking for closers and 5-inch bottom rail blocking where automatic door bottoms are indicated.
      c. 2-1/2-inch mid-rail blocking.
   9. Exposed Vertical Surfaces: Wood veneer.

a. Veneer Grade: Indicated on the Drawings or selected by the Architect.
b. Face Cut and Veneer Species: Riff cut slip match premium grade, or selected by the Architect to match existing.

10. Transparent Finish:
    a. Grade: Premium.
    b. Surface Finish: Clear conversion varnish.
    c. Stain: Match existing.
    d. Sheen: Match existing.
11. Horizontal Surfaces: Structural composite lumber.
12. Openings: Cut and trim openings through doors in factory.
    a. Light Openings: Trim openings with materials and profiles indicated.
    b. Glazing: Field install glazing.
    c. Louvers: Factory install louvers in prepared openings.

2.3 ACCESSORIES

A. Vision Lights: "Vision Lite Kits" manufactured by TRUDOOR, LLC, or equal.
   1. Frames: At least at least 0.0359-inch BMT (MSG 20) uncoated steel sheet, with mitered and welded corners and countersunk mounting holes.
   2. Finish: Manufacturer's standard powder coat finish.
   3. Frame Color: Indicated on the Drawings or selected by the Architect.
   4. Safety-Rated Glass: Fully-tempered or laminated clear glass specified in Section 08 81 00.

B. Door Louvers:
   1. Products: Provide the following manufactured by USA Fire Door LLC, or equal.
      a. Standard Door Louvers: "800 Series", or equal, 0.0478-inch BMT (MSG 18) uncoated steel louver door inserts.
      b. Fire-Rated Door Louvers: "1900 Series", or equal, 0.0478-inch BMT (MSG 18) uncoated steel louver door inserts.
   2. Requisite Properties:
      a. Blades: Inverted Y or Z blades.
      b. Minimum Free Area: Between 40 and 50 percent.
      c. Finish: Manufacturer's standard powder coat finish; custom colors selected by the Architect.

C. Electrical Device Requirements: Make provisions for installation of electrified hardware and door electrical devices, and arrange so that wiring is readily installed, removed, and replaced.
   1. Provide cutouts and reinforcement required for installation of devices.
   2. Provide metal conduits or raceways to accommodate wiring between devices. (e.g., from electric hinge to other electric door hardware)

D. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

E. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
   1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
   2. Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations, and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed doors and adjacent items.
   3. Install doors in conformance with the quality standards publications using using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
   4. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction.
   5. Perform drilling and fitting as required or necessary for an accurate fit and complete installation.
   6. Securely attach doors in place to supporting construction.
   7. Installed doors must be warrantable. Do not install, correct, or replace doors in a manner that results in any warranty or guarantee becoming void.

B. Special Techniques:
   1. Factory-Fitted Doors: Align in frames for uniform clearance at each edge. Hang doors to operate freely for their entire travel, but not loosely, without sticking or hinge binding, with hardware adjusted and functioning properly.
   2. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.
   3. Glazing: Comply with installation requirements in Section 08 81 00 and with the manufacturer's instructions.

C. Installation Tolerances:
   1. Fire-Rated Doors: Install doors with clearances in conforming to NFPA 80.
   2. Smoke- Control Doors: Install doors with clearances in conforming to NFPA 105.
   3. Other Doors: Install doors within the following clearance variations.

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 1/4-inch.
d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 1/4-inch.

D. Adjusting:
1. Lubricate and adjust doors and hardware to function properly, free from warp, twist, binding, and distortion.
2. Confirm latches and locks engage securely without forcing or binding.

E. Correction and Repair:
1. Correct deficiencies that do not conform to the Contract Documents.
2. Repair non-conforming, damaged and defective work.
3. Replace soiled items that cannot be cleaned to the same condition as new.

F. Protection:
1. Protect installed doors in place from soiling, deterioration, and damage until Substantial Completion.
2. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

SECTION 08 51 14 – INTERIOR ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Interior aluminum-framed windows.
   2. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

A. Submittals: Submit product data, shop drawings, and samples.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers:
   1. Basis of Design Manufacturer: Design is based on products manufactured by the following.
      a. Kawneer Co., Inc.
   2. Acceptable Manufacturers: Other acceptable sources of comparable products include the following and are subject to the approval of the Owner, or equal.
      a. Arcadia.
      b. EFCO Corp.
      c. Wausau Window and Wall Systems.

2.2 INTERIOR WINDOWS

A. Products: “Trifab VersaGlaze 450 Framing System” manufactured by Kawneer, or equal.

B. Requisite Properties:
   1. Nominal Faming Size: 1-3/4 by 4-1/2 inches.
   2. Glazing Thickness: 6mm. (1/4-inch)
   3. Glazing Installation: Center glazed.
   4. Finish: Custom Kynar color to match existing.

2.3 ACCESSORIES

A. Glazing Gaskets: Manufacturer's standard ethylene propylene diene monomer (EPDM) conforming to ASTM C 864 and having a Shore A hardness value of at least 70, unless another type of gasket is supplied, required, recommended, or accepted by the manufacturer.

B. Brackets: Provide high-strength aluminum or non-magnetic austenitic stainless steel brackets and reinforcements.

C. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

D. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
   1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
   2. Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
   3. Install interior windows using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
   4. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
   5. Installed interior windows must be warrantable. Do not install, correct, or replace interior windows in a manner that results in any warranty or guarantee becoming void.

B. Installation Tolerances: Install windows to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch from plumb, level, and alignment.

C. Correction and Repair:
   1. Correct deficiencies that do not conform to the Contract Documents.
   2. Repair non-conforming, damaged and defective work.

D. Protection:
   1. Protect installed interior windows in place from soiling, deterioration, and damage until Substantial Completion.
   2. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Hardware for doors, aluminum entrances and gates.

1.2 RELATED SECTIONS

A. Section 08 11 13 – Hollow Metal Doors and Frames.

B. Section 08 14 16 – Flush Wood Doors.

C. Section 10 14 00 - Signage: Door mounted signage.

D. Section 10 22 19 – Manufactured Partition Assemblies.

1.3 REFERENCES

A. ANSI A115.1 through A115.4 - Door and frame preparation standards.

B. ANSI A156.1 through A156.20 - Standards for various hardware items.

C. BHMA - Builders' Hardware Manufacturers Association.

D. CBC - California Building Code, 2010 edition.

E. DHI - Door and Hardware Institute.

F. NFPA 80 - Standard for Fire Doors and Fire Windows.

G. UL 10C - Positive Pressure Fire Tests of Door Assemblies.

H. UL 325 - Door, Drapery, Gate, Louver and Window Operators and Systems.

I. UL 1998 - Standard for Software in Programmable Components.

1.4 SYSTEM DESCRIPTION

A. Door Hardware: Items known commercially as finish hardware that are required for proper hanging and functioning of swinging, sliding and folding doors other than special types of unique hardware specified in same section as door and door frames on which unique hardware is installed. Includes but is not necessarily limited to:

1. Door operating hardware.

2. Thresholds and gasketing.

3. Door silencers.

1.5 SUBMITTALS

A. Coordinate hardware submittals with submittals of related work. Include product data, samples, and shop drawings of other work affected by door hardware and other information necessary to coordinated review of hardware submittals with hardware submittals.

B. Submit following at earliest possible date to ensure that fabrication of other work dependent upon acceptance of hardware submittals and critical to project construction schedule is not delayed.

C. Hardware Schedule: Indicate complete designation of every item required for each door or opening organized into hardware sets and coordinated with doors, frames, and related work to ensure proper size, thickness, hand, and function of door hardware. Include following information:

1. Type, style, function, size and finish of each hardware item.
2. Name, part number and manufacturer of each hardware item.

3. Fastenings and other pertinent information.

4. Location of each hardware set cross referenced to indications on Drawings on floor plans and in door schedule.

5. Explanation of abbreviations, symbols, and codes contained in schedule.

6. Mounting locations for hardware.

7. Door and frame sizes and materials.

8. Keying information

D. Product Data: Provide manufacturer's technical product data on each item of hardware. Include parts lists, templates, finishes, maintenance of operating parts and other information necessary to show compliance with Contract Documents.

E. Samples: Provide, as requested, samples of hardware items in finish indicated and tagged with full description coordinated with hardware schedule. Samples will be returned to Contractor.

F. Wiring Diagrams: Provide wiring and riser diagrams for electrical hardware items.

G. Keying Schedule: Submit separate detailed schedule clearly indicating implementation of Owner's final instructions on keying of locks.

1.6 OPERATION AND MAINTENANCE DATA

A. Provide data on operating hardware including installation instructions, names of manufacturers with addresses and telephone numbers of nearest manufacturer's representative, lubrication requirements, and inspection procedures related to preventative maintenance.

B. Provide instructions for continued adjustment, maintenance, and removal and replacement of door hardware by Owner's personnel.

1.7 PROJECT RECORD DOCUMENTS

A. Submit as-installed hardware schedule, keying schedule and wiring/riser diagrams.

1.8 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of hardware, such as hinges or closers, from single manufacturer except as otherwise specified.

1.9 QUALIFICATIONS

A. Manufacturers: Companies specializing in manufacturing door hardware with minimum 5 years documented experience.

B. Hardware Supplier: Company specializing in supplying institutional door hardware with minimum 5 years documented experience and:

1. Record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this project.

2. Warehousing facilities in vicinity of project.

3. Experienced architectural hardware consultant on staff available to Owner, Architect, and Contractor, at reasonable times during course of Work for consultation.

C. Hardware Installer: Company specializing in installation of institutional hardware with minimum 5 years documented experience.

D. Locksmith: Bonded company specializing in keying institutional door hardware with 5 years documented experienced, approved by manufacturer.

1.10 REGULATORY REQUIREMENTS

A. Conform to applicable sections of CBC.

1. Effort to Operate Doors: Comply with requirements of CBC Section 1133B.2.5.

2. Hand Activated Door Opening Hardware: Comply with requirements of CBC Section 1133B.2.5.2.

3. Closers: Comply with requirements of CBC Section 1133B.2.5.1.

B. Thresholds: Comply with requirements of CBC Section 1133B.2.4.1. Exit Doors: Operable from inside with single motion by lever type lockset, lever type latchsets, lever handled thumb turn dead bolts and panic and fire exit hardware without use of key or special knowledge or effort.

1.11 PREINSTALLATION CONFERENCE

A. Convene preinstallation conference minimum 1 week prior to beginning work of this section.

B. Attendance: Contractor, hardware supplier, hardware installer, locksmith, security system installer, Construction Manager, Project Inspector and Architect.

C. Agenda: Review hardware schedule, products, installation procedures and coordination with related work. Review Owner's keying instructions.

1.12 DELIVERY, STORAGE AND HANDLING

A. Deliver products, store, handle and protect in accordance with manufacturer's instructions and recommendations.

B. Package hardware items individually in manufacturer’s original containers with proper fasteners. Clearly label to indicate contents and identify installation location with door opening code matching that on hardware schedule.

C. Coordinate delivery of packaged hardware items to site or shops as appropriate for installation.

D. Store door hardware in secure locked area protected from moisture, sunlight, paint and chemicals.

E. Inventory door hardware jointly with supplier and installer until each is satisfied quantities are correct.

F. Ship permanent keys, cylinders and cores directly to Owner from lock manufacturer.

1.13 COORDINATION

A. Coordinate work of this section with other directly affected sections involving manufacture of internal reinforcement for door hardware.

B. Coordinate hardware for fire rated assemblies with doors and frames for fire rated assemblies. Ensure fire rated hardware in combination with doors and frames meet positive pressure testing requirements for rated assemblies in accordance with UL 10C.

1.14 WARRANTY

A. Manufacturer’s Warranty: Provide warranties of respective manufacturers’ regular terms of sale from day of final acceptance as follows:

1. Closers: 10 years, except electronic closers which shall be 2 years.

2. Locksets: 7 years, except for electronic locksets which shall be 1 year.

3. Other Hardware: 2 years.

1.15 MAINTENANCE MATERIALS

A. Provide 2 extra key lock cylinders for each master keyed group.

B. Furnish complete set of specialized tools for continued adjustment, maintenance, and removal and replacement of door hardware. Include instructions for use of tools.

1.16 MAINTENANCE SERVICE

A. Approximately 6 months after completion of project, return to project accompanied by Architectural Hardware Consultant and re-adjust every item of hardware to restore proper functions of doors and hardware.

1. Consult with and instruct Owner's personnel in recommended additions to maintenance procedures.

2. Replace hardware items which have deteriorated or failed due to faulty design, materials or installation of hardware units.

3. Prepare written report of current and predictable problems of substantial nature in performance of hardware.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Hinges:

1. Ives.

2. Manufacturers Offering Acceptable Equivalent Product:

a. Hager Companies.

b. McKinney Products Co.

c. Stanley Works - Hardware Division.

B. Latchsets, Locksets, Cylinders, Cores, Cabinet Locks and Padlocks: Schlage Lock Company.

C. Surface Closers: LCN Closers..

D. Flush Bolts and Dust Proof Strikes:

1. Ives.

2. Manufacturer Offering Acceptable Equivalent Product: Triangle Brass Manufacturing Company.

E. Coordinators:

1. Ives.

2. Manufacturer Offering Acceptable Equivalent Product: Triangle Brass Manufacturing Company.

F. Floor and Wall Stops and Holders:

1. Ives.

2. Manufacturer Offering Acceptable Equivalent Product: Triangle Brass Manufacturing Company.

G. Astragals, Seals, Door Bottoms and Door Sweeps:

1. National Guard Products, Inc.

2. Manufacturers Offering Acceptable Equivalent Products:

a. Pemko Manufacturing Co.

b. Zero International, Inc.

H. Silencers:

1. Ives.

2. Manufacturer Offering Acceptable Equivalent Product: Rockwood Manufacturing Company.

I. Substitutions: Under provisions of Division 1.

2.2 KEYING

A. Key System: High-security utility-patented keyway and interchangeably core throughout; utility patent protection to extend at least until 2014; key blanks available only from factory-direct sources and not available from after-market keyblank manufacturers; Schlage Primus of type and level directed by Owner and Architect.

1. Initiate and conduct meetings with Owner and Security and I-R Security and Safety Consultants representative to determine system keyways, keybow styles, structure and degree of physical security and degree of geographic exclusivity.

a. Assist Owner in development of detailed keying schedule. Ensure each keyed cylinder on every keyed lock is listed separately with door number, key group in BHMA terminology , cylinder type, finish and location of door.

2. For purpose of bid, use factory GMK charge.

B. Construction Keying: Furnish temporary keyed-alike cores. Remove at Substantial completion and install permanent cylinders and cores in Owner’s presence. Demonstrate that construction key no longer operates. Temporary cylinders and keys remain suppliers property.

1. Furnish 10 construction keys.

2. Furnish 2 construction control keys.

C. Cylinders and Cores: Keyed at factory of lock manufacture where permanent records are maintained; use secured shipment direct from point of origin to Owner.

1. Cylinders: 6-pin brass construction; full size interchangeable cores.

2. Locksets and cylinders to be products of same manufacturer.

D. Permanent Keys: Use secured shipment direct from point of origin to Owner; pack independently. For purpose of bid, assume keys to be supplied as follows:

1. 2 keys per change combination.

2. 5 master keys per group.

3. 5 grandmaster keys.

4. 2 control keys.

2.3 HINGES

A. Butt Hinges: Conforming to applicable requirements of ANSI A156.1 and ANSI A156.7 except where specified otherwise.

1. Provide butt hinges for exterior outswinging doors of non-ferrous material with stainless steel hinge pins.

2. Provide non-rising hinge pins throughout.

3. Provide non-removable pins at exterior outswinging doors and at interior key locked doors with reverse bevels.

4. Provide removable pins on butt hinges for exterior inswinging doors and interior doors.

5. Provide butt hinges in following sizes and quantities:

a. Height:

1) Doors up to 41 inches wide: 4-1/2 inches.

2) Doors 42 to 48 inches wide: 5 inches.

b. Width: Sufficient to clear frame and trim when door swings 180 degrees.

c. Number of Hinges: Provide 3 hinges per leaf to 7'-5" in height; add 1 additional hinge for each 2 additional 2 feet in height.

2.4 LATCHSETS, LOCKSETS AND CYLINDERS

A. Provide latchsets, locksets and cylinders of types specified from same manufacturer.

B. Conform to requirements of ANSI A156.

C. Latchsets and locksets shall be equipped with lever handles of shape that is easy to grasp with one hand and permits operation without tight grasping, tight pinching and twisting of wrist to conform to requirements of CBC Section 1133B.2.5.2.

D. Cylindrical Locks and Latches: Heavy duty commercial meeting or exceeding ANSI A156.2 Series 4000, Grade 1 Operational; lever trim free-wheeling in locked position.

1. Lock Chassis: Cylindrical design, corrosion-resistant zinc plated cold-rolled steel.

2. Locking Spindle: Stainless steel; 1 piece interlocking design.

3. Latch Retractors: Forged steel with balance of inner parts corrosion-resistant plated steel or stainless steel.

4. Springs: Full compression type.

5. Latch Bolt: Steel; deadlocking on keyed and exterior functions; 1/2 inch throw typical; 3/4 inch throw on pairs of fire rated doors.

6. Exposed Trim:

a. Levers: Pressure cast zinc with plated finish; accessible design; independent operation; spring cage supported.

b. Roses: Solid brass with plated finish; minimum 3-7/16 inch diameter.

7. Strike: Curved lip with 1 inch deep dust box; 16 gauge; 1-1/4 x 4-7/8 x 1-3/16 inch lip to center.

D. Cylinders:

1. Minimum six-pin type with steel cylindrical cases, and interior non-corrosive parts. Do not supply plastic, die-cast or aluminum mechanisms.

2. Cylinders: Capable of receiving cores specified in article titled "Keying" in this section.

3. Plugs: Extruded brass bar material fully round without flattened areas.

2.5 CLOSERS

A. Manufacture closers to meet ANSI A156.4 standards when tested after completing 10,000,000 cycles.

B. Closers shall be full hydraulic with full rack and pinion action.

1. Cylinders shall be of high strength cast iron construction with double heat treated pinion shaft to provide low wear operating capabilities of internal parts throughout life of installation.

    a. Minimum Shaft Diameter: 11/16 inch.

    b. Minimum Piston Diameter: 1 inch.

2. Closers shall utilize stable fluid withstanding temperature range of 120 degrees F. to -30 degrees F. without requiring seasonal adjustment of closer speed to properly close door.

C. Arm type shall suit individual conditions and permit doors to swing full 180 degrees.

1. Parallel Arm Closers: 1 piece solid forged steel arms with bronze bushings.

2. Other Closers: Forged steel main arms; 1-9/16 steel stud shoulder bolts incorporated in regular arms, hold-open arms, arms with hold open and stop built in.

D. Provide through bolt, internally threaded fasteners for closers in wood doors.

E. Provide installation accessories such as plates, shoe supports, spacers and adapters as required to secure closers to doors and frames. Provide drop brackets at narrow head rails.

F. Provide templates and adapters as required to install closers on doors with overhead stops.

2.6 DOOR STOPS

A. Provide wall type, floor type or overhead type stops as scheduled. Where not stop is specified:

1. Provide wall type with appropriate fasteners.

2. Where wall type cannot be used, provide floor type.

3. If neither can be used, provide overhead type.

B. Provide overhead stops made of stainless steel and non-plastic mechanisms and finished metal end caps with field-changeable hold-open, friction and stop-only functions.

2.7 SEALS

A. Provide seals at fire-rated doors and exterior doors.

B. Resilient Seals for Fire Rated Doors: UL10C compliant. Coordinate with selected door manufacturers' and selected frame manufacturers' requirements.

C. Intumescent Seals for Fire Rated Doors: Furnished by selected door manufacturer. Furnish fire-labeled opening assembly complete and in full compliance with UL10C. Where required, intumescent seals vary in requirement by door type and door manufacture; careful coordination is required.

D. Seals for Smoke & Draft Control Doors: Provide UL10C compliant for use on “S” labeled Positive Pressure door assemblies.

2.12 SILENCERS

A. Provide silencers on frames without weatherstripping or gasketing.

B. Provide type designated by manufacturer for specific frame material.

2.13 FASTENERS

A Supply fasteners of proper type, quality, size and finish with hardware.

B Exposed fasteners shall be of non-ferrous metal and shall match finish of item being fastened, as close as possible.

C. Screws for strikes, face plates and similar items shall be flat head, countersunk type; provide machine screws for metal and standard wood screws for wood.

D. Screws for butt hinges shall be flathead, countersunk, full-thread type.

E. Fasten closer bases or closer shoes to doors with sex bolts; spray paint bolts to match closer finish.

F. Fasten exit devices and lock protectors to door with sex bolts or through bolts.

G. Provide expansion anchors for attaching hardware items to concrete or masonry.

H. Exposed fasteners shall have Phillips head drives.

2.14 FINISHES

A. Finishes are identified in schedule at end of this section. They shall match existing door

hardware.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine installed work of other trades to determine acceptability for installation. Verify that such work is complete to point where work of this section may begin and is acceptable for product installation in accordance with manufacturer’s instructions and recommendations.

B. Verify that doors and frames are ready to receive work and dimensions are as instructed by manufacturer.

C. Verify that doors, frames and hardware are free from damage and defects and are suitable for intended use.

D. Do not begin installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and requirements of DHI. Install hardware on fire rated doors in accordance with hardware listing.

B. Use templates provided by hardware item manufacturer.

C. Accurately and properly fit hardware.

1. Securely fasten fixed parts for smooth trouble-free non-binding operation; fit faces of mortised parts snug and flush.

2. Operating parts shall move freely without binding, sticking or excessive clearance.

D. Protect hardware from damage or marring of finish during construction; use strippable coatings; removable tapes or other acceptable means.

E. Ensure hardware displays no evidence of finish paint after final building cleanup with exception of prime coated hardware installed for finish painting. Achieve by sequencing installation, removing after fitting and reinstalling after painting is completed, providing protection, cleaning to original hardware finish, or other acceptable means available.

F. Mounting heights for hardware shall be as recommended by DHI and conforming with CBC Sections 1008.1.9 and 1133B.2.5.2.

1. Ensure touchbars for panic hardware are mounted between 36 and 44 inches from finished floor.

2. Ensure other door operating hardware including levers, key cylinders and turn pieces is mounted between 30 and 44 inches from finished floor.

G. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

H. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

I. Install latches and bolts to automatically engage in keeper whether activated by closer or by manual operation.

J. Mount closers on room side or pull side unless otherwise indicated.

K. Adjust door closers to operate noiselessly and smoothly.

1. Set closer to minimum force needed to latch door.

a. Ensure that opening effort measured perpendicular to door face at door opening hardware or 30 inches from hinged side, whichever is further from hinge, does not exceed 5 pounds for interior doors and 5 pounds for exterior doors.

b. Authority having jurisdiction may increase maximum effort to operate fire doors to achieve positive latching but not to exceed 15 pounds maximum.

2. Adjust sweep period of closers so that doors take minimum 3 seconds to move from open position of 70 degrees to point 3 inches from latches measured to leading edges of doors.

L. Do not install projecting hardware within lower 10 inches of door.

M. Set exterior thresholds in full bed of butyl rubber sealant. Secure thresholds to concrete slabs with flat head machine screws and expansion anchors.

N. Set interior thresholds of acoustically gasketed doors in full bed of sealant. Secure with mechanical fasteners.

O. Set aluminum/vinyl fire and sound seals at acoustically gasketed doors in acoustical sealant.

P. Set floor mounted door stops within 4 inches of wall. Secure with mechanical fasteners.

Q. Completely remove protective materials and devices. Thoroughly clean exposed surfaces of hardware; check for surface damage prior to final cleaning.

R. Coordinate with security installer to route cable to connect electrified locks, panic hardware and fire exit hardware to power transfers or electric hinges at time these items are installed so as to avoid disassembly and reinstallation of hardware.

1. Be present with security installer when power is turned on for testing of electronic hardware applications.
2. Make adjustments to solenoids, latches, vertical rods and closers to ensure proper and secure operation

3.3 REPAIR

A. Replace, rework or otherwise make good hardware found defective as follows:

1. Unauthorized substitutions.

2. Items delivered with missing, broken, damaged or defaced parts.

3. Items of incorrect hand or functions.

3.4 FIELD QUALITY CONTROL

A. Provide services of AHC or DAHC member of American Society of Architectural Hardware Consultants to inspect installation of hardware.

B. Make adjustments required and report to Architect upon completion of project.

C. In addition, schedule separate inspection with hardware installer, locksmith and Project Inspector upon completion of work of this section. Demonstrate that locksets and exit devices are properly keyed and completely functional.

3.5 ADJUSTING AND CLEANING

A. Adjust and check each operating item of hardware to ensure proper operation and function.

1. Lubricate moving parts in conformance with manufacturer's instructions. Use graphite type lubricant if no other type is recommended.

2. Remove hardware items which cannot be adjusted to operate smoothly and freely and replace with properly functioning hardware.

B. Clean adjacent surfaces soiled by hardware installation.

C. Final Adjustment:

1. Recheck, relubricate and readjust hardware installed more than 1 month prior to acceptance or occupancy of building immediately prior to final inspection.

2. Adjust door closers after building heating and cooling systems have been balanced.

3.6 DEMONSTRATION

A. Provide instruction for Owner's personnel in proper adjustment and maintenance of hardware and hardware finishes prior to final inspection.

3.7 SCHEDULE

A. Items listed in following schedule shall conform to requirements of foregoing specifications.

B. Door Schedule on Drawings indicates which hardware set is used with each door.

C. Manufacturer’s Abbreviations:

GLY = Glynn-Johnson Corporation	Overhead Holders and Stops
IVE = Ives	Butt Hinges, Flush, Bolts, Dust Proof Strikes, Coordinators, Kick Plates, Stops, Lock Guards, Silencers
LCN = LCN	Door Closers, Automatic Closers
NGP = National Guard Products	Thresholds, Seals, Door Bottoms, Door Sweeps, Astragals
SCE = Schlage Electronics	Transfer Switches
SCH = Schlage	Locks, Latches, Cylinders, Cores, Padlocks
VON = Von Duprin	Exit Devices, Panic Hardware, Power Transfers, Removable Mullions

D. Hardware Sets:

HARDWARE SET 01: For interior file storage room doors; each door to have:

3	EA	HINGE	5BB1 4.5 X 4.5	652 IVE
1	EA	STOREROOM LOCK	ND80 RHO	626 SCH
1	EA	PRIMUS CORE ONLY	20-740	626 SCH
1	EA	SURFACE CLOSER	4041 X TB	689 LCN
1	EA	DOME STOP	FS436	626 IVE
1	SET	GASKET	PER SELECTED DOOR MFGR	

HARDWARE SET 02: For interior office; each door to have:

3	EA	HINGE	5BB1 4.5 X 4.5	652 IVE
1	EA	OFFICE LOCK	ND91TD RHO	626 SCH
1	EA	PRIMUS CORE ONLY	20-740	626 SCH
1	EA	DOME STOP	FS436	626 IVE
3	EA	SILENCER	SR64	GRY IVE

HARDWARE SET 03: For interior office at manufactured partition assembly; each door to have:

3	EA	HINGE	PER MANUFACTURED PARTITION ASSEMBLY	
1	EA	OFFICE LOCK	ND91TD RHO	626 SCH
1	EA	PRIMUS CORE ONLY	20-740	626 SCH
1	EA	DOME STOP	FS436	626 IVE
3	EA	SILENCER	SR64	GRY IVE

- END OF SECTION

SECTION 08 81 10 – INTERIOR GLASS GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Tempered glass.
   2. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

A. Performance Requirements:
   1. Minimum Glass Bite Depth: At least 3/8-inch glass bite depth for 6mm (nominal 1/4-inch) monolithic lites, unless otherwise indicated.
   2. Minimum Edge Clearance: At least 1/4-inch for 6mm (nominal 1/4-inch) monolithic lites, unless otherwise indicated
   3. Minimum Face Clearance: At least 1/8-inch inch for 6mm (nominal 1/4-inch) monolithic lites, unless otherwise indicated.
   4. Safety Glazing Requirements: Provided either fully tempered or laminated glass conforming to ANSI Z97.1 requirements for Drop Height Class A wherever safety glazing is indicated or required. Wire glass is prohibited.
   5. Other Requirements: Installed glass must be free from rattle.

B. Qualifications:
   1. Manufacturer: Company or individuals must have at least 10 years' experience manufacturing glazing installed on at least 200 previous projects similar to this project in size, material, design, and complexity.
   2. Fabricator: Must have at least 10 years' experience fabricating custom glazing for at least 100 previous projects similar to this project in similar to this project in size, material, design, and complexity.
   3. Installer: Company or individuals must have at least 5 years' experience installing glazing for at least 30 previous projects similar to this project in size, material, design, and complexity.
   4. Supervisors: Individuals must have at least 7 years' experience installing glazing for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading glazing installers.

C. Submittals: Submit product data, glazing schedule, samples, and written descriptions of specified qualifications, and delegated design submittals.

PART 2 - PRODUCTS

2.1 PRIMARY GLASS MANUFACTURERS

A. Manufacturers: Provide products manufactured by one of the following, or equal.
   1. Guardian Industries Corp.
   2. Pilkington North America, Inc.
   3. PPG Industries.
   4. Saint-Gobain Corp.

2.2 MANUFACTURED GLASS

A. Ultra-Clear (Low Iron) Annealed Vision Glass:
   1. Description: ASTM C 1036, Type I (transparent flat glass), Class 1 (clear), Quality Q3 (select glazing applications).
   2. Products: Provide one of the following, or equal.
      a. “Starphire” manufactured by PPG Industries.
      b. “UltraWhite” manufactured by Guardian Industries Corp.
      c. “OptiWhite” manufactured by Pilkington North America, Inc.
      d. “DIAMANT” manufactured by Saint-Gobain Glass.
   3. Performance Requirements:
      a. Visible Light Transmittance (VLT): At least 90 percent at 6mm thickness.

2.3 SECONDARY GLASS FABRICATORS

A. Fabricators: Provide products fabricated by one of the following, or equal.
   1. Oldcastle BuildingEnvelope Corp.
   2. PPG Industries.
   3. Viracon, Inc.

2.4 TEMPERED GLASS

A. Description: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated surfaces), fabricated from ultra-clear (low iron) annealed vision glass.

B. Minimum Surface Compression Strength: At least 10,000 pounds per square inch.

C. Fabrication:
   1. Fabricate tempered glass by the horizontal (roller hearth) process with roll wave distortion parallel to the bottom glass edge when installed, unless otherwise indicated.

2. Glazing materials must be free from bubbles, smoke vanes, air holes, scratches and other defects, having ground and arrised edges; provide polished edges where exposed.

D. Source Quality Control:
   1. Individual tempered glass lites installed overhead, and floor-to-ceiling tempered glass lites installed adjacent to walking surfaces must be fully heat soak tested by the manufacturer or fabricator before delivery to the project site.
   2. Other tempered glass lites may have statistical heat soak testing performed to demonstrate nickel sulfide breakage does not exceed 0.1 percent.

2.5 ACCESSORIES

A. Shims: Continuous shims fabricated from load-bearing, non-leaching, high-impact polystyrene.

B. Setting Blocks: Elastomeric silicone rubber conforming to ASTM C 1115, CH9.

C. Spacers and End Blocks: Provide the following, unless another type, hardness, class, or surface is supplied, required, recommended, authorized, sanctioned, or accepted by the glass installer.

D. Glazing Gaskets: Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
   1. Firm, Dense Gaskets: Elastomeric silicone or EPDM rubber conforming to ASTM C 1115, CH7S2 unless another type, hardness, class or surface is supplied, required, recommended, approved, or accepted by the glass installer.
   2. Soft, Closed Cell Gaskets: ASTM C 509. Provide silicone or EPDM rubber with pre-molded corners.

E. Cleaners, Primers, Sealers: Supplied, required, recommended, or accepted by the manufacturer or fabricator.

F. Other Accessories: Provide other accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
   1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
   2. Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations, and satisfies all other conditions that might

affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.

3. Install glazing using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
4. Set glazing true to line; plumb, level, and square without warp or rack; with flush, well-fitted joints; and in alignment with adjacent construction.
5. Securely attach glazing in place to supporting construction.

B. Correction and Repair:
   1. Correct deficiencies that do not conform to the Contract Documents.
   2. Repair non-conforming, damaged, and defective work.
   3. Replace soiled items that cannot be cleaned to the same condition as new.
   4. Installed glazing must be warrantable. Do not install, correct, or replace glazing in a manner that is un-warrantable by the manufacturer or that results in any other warranty or guarantee becoming void.

C. Protection:
   1. Protect installed glazing in place from soiling, deterioration, and damage until Substantial Completion.
   2. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

DIVISION 09

FINISHES

SECTION 09 05 16– PREPARATION OF CONCRETE SUBSTRATES FOR FINISH FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Concrete substrate testing equipment.
   2. Corrective (remedial) MVECS.
   3. Surface preparation.
   4. Site tests and inspections.
   5. Supplementary components, accessories, and detail work normally furnished or otherwise necessary for complete testing and preparation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:
   1. Section 03 54 16 for definition of the term “underlayment”.
   2. Section 09 29 00 for definition of “permanent enclosure”.

1.2 SECTION REQUIREMENTS

A. Qualifications:
   1. Substrate Testing: Individuals performing substrate testing must be certified as ICRI Concrete Slab Moisture Testing Technicians, Grade 1 and current in their certification.
   2. Substrate Repair: Individuals performing substrate repair must be certified as ICRI Concrete Surface Repair Technicians, Grade 1 and current in their certification.

B. Submittals: Submit product data, shop drawings, written descriptions of specified qualifications, and manufacturer’s representative reports.

C. Preinstallation Meeting:
   1. MVECS manufacturer’s representative and MVECS installer must attend the preinstallation meeting.
   2. Schedule a separate additional preinstallation meeting between the Contractor, the Architect, penetrant, overlay and covering manufacturers’ representatives and installers, the MVECS manufacturer’s representative and installer, and the entities and individuals responsible for conducting concrete substrate testing.
   3. Hold the meeting after submittal approval and at least 10 business days before beginning installation.
   4. During the meeting, review

a. substrate design and installation, including concrete mix design, water-cement ratio, slab thickness at each test location, below grade VDRs and concrete placement and pour dates;
b. curing, sealing, or bond breaking compounds used on substrates, along with requirements and techniques used for complete removal of compounds prior to testing and floor covering installation;
c. trenching, including mix design, water-cement ratio, thickness, and pour dates of concrete or slurry backfill;
d. bonding agents selected for overlay installation or application;
e. primers and adhesives selected for covering installation;
f. qualifications of the testing agency and testing agency personnel that are scheduled to complete testing, and that interpret test results;
g. calibration and verification of test equipment prior to beginning each round of testing;
h. HVAC system operation and requirements during testing, including temperature and RH limits;
i. preparation of testing sites, including procedures to assure slab surfaces are free from any material or substance that may hinder the free release of moisture from the slab;
j. testing procedures and sequence for each test, including sequence, frequency, and location of test sites;
k. requirements for testing and inspection reports;
l. the construction schedule;
m. temporary procedures required to protect concrete surfaces from re-wetting after initial testing; and
n. redistribution of moisture within the substrate after floor coverings are applied;

5. Identify and discuss adverse or unfavorable conditions detrimental to testing and floor preparation.
6. Finalize construction schedule.
7. Record significant discussions and distribute meeting minutes. Do not begin installation until disagreements are successfully resolved to the satisfaction of all parties.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Provide products manufactured by one of the following, or equal.
   1. American Moisture Test, Inc.
   2. Vaisala
   3. Wagner Electronics.

2.2 CONCRETE SUBSTRATE TESTING EQUIPMENT

A. Description: Commercially-produced and -packaged test kits and equipment delivered to testing sites in factory-sealed wrappings.

B. MVER Testing Kits (CC Moisture Test Kits):
   1. Description: ASTM F 1869-compliant anhydrous calcium chloride moisture vapor testing kits consisting of a sealed dish of anhydrous calcium chloride, a metering dome with gasket, and instructions.
   2. Product: "AMT Calcium Chloride Moisture Test Kit" manufactured by American Moisture Test, Inc., or equal.
   3. Components:
      a. Non-pre-weighed, non-recycled, 94-percent pure anhydrous calcium chloride sealed in air-tight dishes.
      b. Virgin resin non-recycled plastic dome having a maximum U.S. perm rating of 0.10-perm or less.
      c. Butyl adhesive sealant system.
      d. Dish container size of 69mm plus or minus one millimeter; calcium chloride weight of 16 grams plus or minus one gram.

C. pH Testing Kits:
   1. Description: ASTM F 710-compliant digital alkalinity-pH meter.
   2. Product: "AMT Concrete Digital Alkalinity-pH Meter" manufactured by American Moisture Test, Inc., or equal.
   3. Components:
      a. Meter must return wide range (1-14) pH readings.
      b. Provide clean distilled or deionized water.

D. RH Testing Equipment:
   1. Description: ASTM F 2170-compliant temperature and RH meter, cable, RH probes, and concrete sleeves.
   2. Product: "AMT RH System" manufactured by American Moisture Test, Inc., or equal.

2.3 CORRECTIVE (REMEDIAL) MVECS

A. Description: Corrective MVER remediation system consisting of concrete mechanical surface profiling, sealer, and cementitious covering.

B. Application: MVER remediation system are applied when test results indicate slab MVER, pH, or RH exceed selected coating or covering manufacturer's required, recommended, or accepted limits.

C. Concrete Surface Profiling: ICRI concrete surface profile CSP 2 to CSP 3 (grind to light blast between 4 and 10 mils), unless otherwise explicitly required, recommended, accepted in writing by the sealer manufacturer.

D. Sealer:
   1. Description: Moisture seal applied to substrates as a topical remediation.
   2. Products: “MES 100” manufactured by Floor Seal Technology, Inc., or equal.
   3. Requisite Properties:
      a. Composition: Products may not contain latex, organic additives or chemistries that have a potential to either re-emulsify or support micro-organism growth.
      b. Growth Resistance: Product must not support the growth of mold, mildew or biological growth.
      c. Safety: Non-corrosive, non-toxic, and non-hazardous to installers.
      d. Water Pollution: Product must be a non-marine pollutant, and safe for natural water sources.
      e. Maximum VOC Material Content: Less than 100 grams per liter.
   4. Performance Requirements:
      a. Water Vapor Transmission: Products must bring emission rates of up to 20 pounds to within a range conforming to the flooring manufactures’ requirements, when measured in conformance with ASTM F 1869.
      b. Alkali Resistance: Tolerant to 14pH alkali exposure, when tested in conformance with ASTM D 1308 and ASTM F 710.
      c. Minimum Adhesion Strength: Between 370 and 500 pounds per square inch, when tested in conformance with ASTM D 4541.
      d. Adhesive Compatibility: Complete compatibility with all covering primers, adhesive, and materials.
      e. Minimum RH Tolerance: Tolerant to at least 95 percent RH exposure, when determined in conformance with ASTM F 2170.

E. Covering:
   1. Description: Cementitious topping applied directly over sealer to provide smooth substrate for finish flooring.
   2. Products: Hydraulic cement underlayment specified in Section 03 35 16.
   3. Minimum Thickness: Install underlayment to thickness required by either the sealer manufacturer or the finish flooring manufacturer (whichever is thicker), but not less than 1/8-inch.

2.4 ACCESSORIES

A. Trowelable Patch and Fill Materials: Specified in Section 03 54 16 unless other products are supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

B. Other Accessories: Provide accessories and other similar secondary items supplied, required, recommended, or accepted by the MVECS manufacturer.

2.5 SURFACE PREPARATION

A. Penetrants:
   1. Remove all dirt, dust, debris, and other foreign matter from concrete surfaces

B. Marker Removal:
   1. Remove all slab markings by sanding or bead blasting surface clean.
   2. Completely remove all marker markings (i.e. Sharpie markers), marker paint, spray paint, and other markings.

C. Floor Coatings and Fluid-Applied Flooring:
   1. Provide one or more of the following ICRI concrete surface profiles, as applicable, unless otherwise explicitly required, recommended, or accepted in writing by the flooring manufacturer.
      a. Sealers: CSP 1 to CSP 2. (grind to between 0 and 3 mils)
      b. Thin-Film Coatings: CSP 2 to CSP 3. (grind to light blast between 4 and 10 mils)
      c. High-Build Coatings and Resurfacing Applications: CSP 3 to CSP 5. (light to medium shotblast between 10 and 40 mils)
      d. Self-Leveling Overlays: CSP 4 to CSP 6. (medium to heavy shotblast between 50 mils and 1/8-inch)
      e. Polymer Overlays: CSP 5 to CSP 9. (medium shotblast to coarse planing between 1/8- and 1/4- inch)
      f. Concrete Overlays, Toppings, and Repairs: CSP 5 to CSP 10. (medium shotblast to coarse planing greater than 1/4- inch)
   2. To reduce the risk of introducing microcracking into the substrate, all concrete surface profiling must be achieved through abrasive blasting, grinding, or shot blasting; or through the use of surface retarders.
      a. Handheld concrete breakers, rotomilling, needle scaling, scabbling, and scarifying are prohibited, unless explicitly required or recommended in writing by the covering manufacturer (scarifying grooves/lines may become visible through a newly laid coverings).
      b. Ultra-high- and high-pressure water jetting, and low-pressure water jetting surface preparation methods are also prohibited.
      c. Chemical cleaning and acid etching are also prohibited. (residual chemicals not removed may adversely affect the flooring performance and adhesion – ASTM D 4262 covers procedures for determining the acidity or alkalinity of concrete surfaces prepared by chemical cleaning or etching prior to coating)
   3. Repair damaged sub-floor. Produce a uniform and smooth substrate. Fill cracks, holes, depressions, and similar substrate defects with trowelable leveling and patching compound; remove bumps and ridges.
   4. Sweep and vacuum-clean substrates just prior to beginning floor covering installation.
   5. Move floor coverings and installation materials into spaces at least 48 before installation.

D. Floor Coverings: Prepare substrates in conformance with the requirements of ASTM F 710 and as required, recommended, or accepted by the manufacturer without limitation; and in a manner that does not result in any warranty or guarantee becoming void.
   1. Verify substrates are dry and free of curing compounds, sealers, and hardeners.
   2. Remove substrate coatings and other substances that are incompatible with adhesives or that contain soap, wax, oil, or silicone; or that may negatively affect the quality of installation, durability, appearance, or performance of furnished flooring. Comply with the flooring manufacturers' instructions using manufacturer-recommended techniques and equipment. Do not use solvents.
   3. Remove subfloor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with leveling and patching compound. Apply, trowel, and float patching compound to achieve smooth, flat, hard surface. Prohibit traffic until patching compound is cured.
   4. Repair damaged sub-floor. Produce a uniform and smooth substrate. Fill cracks, holes, depressions, and similar substrate defects with trowelable leveling and patching compound; remove bumps and ridges.
   5. Sweep and vacuum-clean substrates just prior to beginning floor covering installation.
   6. Do not install floor coverings until both they and the installation materials are acclimated to the same temperatures as the spaces into which they are installed. Move floor coverings and installation materials into spaces at least 48 before installation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Before beginning testing, examine project conditions and field-verify measurements affecting the work of this specification section.
   1. Examine substrates scheduled for testing, and other conditions under which such items are tested, including HVAC operation and building enclosure.
   2. Verify that work performed as part of the work of other specification sections conforms to the testing equipment or testing kit manufacturer's requirements; and satisfies all other conditions relating to the quality of testing.

3.2 FIELD QUALITY CONTROL

A. Site Tests and Inspections:
   1. General: Include site tests and inspections as part of the work of this specification section. The Owner's testing and inspection agency performs tests and inspections.
      a. Schedule and arrange all tests and inspections.
      b. Coordinate all work and the final construction schedule with all tests and inspections.

c. Coordinate tests and inspections with the work of other specification sections, and other specified, required, or necessary tests and inspections.
d. Furnish all work, equipment, tools, facilities, personnel, and controls necessary for each test and inspection.
e. Arrange tests and inspections by notifying the Owner, the testing and inspection agency, the installer, the manufacturer's representative, and the Architect at least 5 business days before work is ready for testing or inspection.
f. Witness all site tests and inspections.
g. Receive test and inspection reports and distribute to the installer and the manufacturer's representative.

2. Required Tests: Conduct the following tests on all concrete substrates prior to the installation of any flooring material or component regardless of substrate grade level or age.
   a. MVER Testing (Anhydrous Calcium Chloride Test): Conduct CC tests in conformance with ASTM F 1869.
      1) Test area environmental conditions must match that of the finished floor covering.
      2) Doors, windows, and roofing must be installed and the building temperature controlled to a finished building atmosphere.
      3) Do not perform tests when the interior building temperature is below 65 deg. F for 72 hours prior to and throughout the duration of testing.
      4) The minim required number of test kits is determined by the square footage of areas scheduled to receive finish flooring. Provide at least 3 test kits for the first 1,000 square feet, and at least one additional test kit for each additional 1,000 square feet or fraction thereof, with consideration given to separation of test areas.
      5) Time of exposure must be between 60 hours 72 hours.
      6) Clean substrate in area to be tested by removing dust solvent, paint, wax, oil, grease, residual adhesive, adhesive removers, curing, sealing, hardening, or parting compounds, alkaline salts, excessive carbonation, or laitance, mold mildew and other foreign materials.
      7) Weigh the tape sealed dish on a gram scale with 1/10th gram gradation. Record start weight, date and time on dish's label and instruction document.
      8) Unseal dish and expose test according to preprinted test kit instructions.
      9) After exposure time has elapsed, retrieve test dish re-seal and re-weigh according to the manufacturer's instructions.
      10) Moisture emission rates exceeding 3 pounds may affect coating or covering. Verify permissible RH levels with individual flooring manufacturers.
   b. Alkalinity (pH) Testing: Conduct pH test in conformance with ASTM F 710.
      1) Perform tests after abrasive removal of concrete surfaces.
      2) Place several drops of water on a clean portion of the substrate surface; form a puddle approximately one-inch in diameter. Allow the puddle to set for at least 60 seconds, and then insert the digital alkalinity-pH meter probe into the puddle. Allow the meter to calculate results for 15 seconds and record the meter readings.

3) Concrete substrates must test between pH 8.0 and 10.0 before flooring materials are installed; slabs may not exceed pH 10.0.
4) Readings exceeding pH 10.0 may affect coating or covering. Verify permissible pH levels with individual flooring manufacturers.

c. RH Probe Test: Conduct *in situ* RH probe testing in conformance with ASTM F 2170
1) Concrete floor slabs must be at the in-service temperature and the occupied air space above the slab must be at the in-service temperature and RH far at least 48 hours before taking RH measurements in the substrate.
2) Perform at least 3 tests for the first 1,000 square feet and at least one test for every additional 1,000 square feet or fraction thereof.
3) At below-grade substrates, choose testing locations within 3 feet of each exterior wall.
4) Drill probe holes 40 percent down into the slab for slabs drying from the top only; 20 percent into the slab for slabs drying from top and bottom.
5) Use a vacuum cleaner to remove dust from drilled holes, and allow at least 72 hours for holes to achieve moisture equilibrium within each hole before taking RH measurements.
6) After the 72-hour equilibrium period, insert probes and allow a 30-minute period for each probe to reach temperature equilibrium before measuring RH.
7) Use the RH probe to measure the ambient air temperature and RH above the slab in the vicinity of the hole.
8) RH readings exceeding 75 percent may affect coating or covering. Verify permissible RH levels with individual flooring manufacturers.

3.3 CORRECTION AND REPAIR

A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.

B. Corrective and repair work must be performed in conformance with a correction and repair plan submitted to and accepted in writing by the Architect before correction or repair work begins. At a minimum, correction and repair plans must include
1. written descriptions of non-conforming, damaged, and defective work;
2. supporting sketches, diagrams, photographs, and other visual depictions of non-conforming, damaged, and defective work; and
3. similar written descriptions and visual depictions of Contractor-proposed corrections and repairs.

C. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

END OF SECTION

SECTION 09 29 00 – GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Gypsum board.
   2. Metal trim.
   3. Installation materials.
   4. Joint treatment materials.
   5. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

A. Submittals: Submit product data, shop drawings, and written descriptions of specified qualifications.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: Provide products manufactured by one of the following, or equal.
   1. CertainTeed Corp.
   2. GP Building Products.
   3. National Gypsum Co.
   4. USG Corp.

2.2 REGULAR GYPSUM BOARD

A. Flexible Gypsum Board:
   1. Description: Flexible gypsum board conforming to ASTM C 1396.
   2. Application: Installed in curved (radiused) interior partition assemblies constructed in dry locations.
   3. Products: Provide one of the following, or equal.
      a. “ProRoc 1/4” Flex” manufactured by CertainTeed Corp.
      b. “ToughRock Flexroc” manufactured by GP Building Products.
      c. “Gold Bond High Flex Gypsum Board” manufactured by National Gypsum Co.

d. "SHEETROCK 1/4 Flexible" manufactured by USG Corp.

4. Requisite Properties:
   a. Minimum Size: At least 4-foot by 8-foot sheets.
   b. Thickness: 1/4-inch.
   c. Core: Provide regular core panels.
   d. Minimum Mass: At least 2.2 pounds per square foot.
   e. Edges: Tapered long edges and square ends.
   f. Facers: Paper face, back, and long edges.

B. Regular Core Gypsum Board:
   1. Description: Gypsum board conforming to ASTM C 1396.
   2. Application: Installed in non-rated interior partition assemblies constructed in dry locations.
   3. Products: Provide one of the following, or equal.
      a. "ProRoc Regular" manufactured by CertainTeed Corp.
      b. "ToughRock Gypsum Wallboard" manufactured by GP Building Products.
      c. "Gold Bond Gypsum Board" manufactured by National Gypsum Co.
      d. "SHEETROCK" manufactured by USG Corp.
   4. Requisite Properties:
      a. Minimum Size: At least 4-foot by 8-foot sheets.
      b. Minimum Thickness: At least 1/2-inch.
      c. Core: Provide regular core panels.
      d. Minimum Mass: At least 2.2 pounds per square foot.
      e. Edges: Tapered long edges and square ends.
      f. Facers: Paper face, back, and long edges.

2.3 METAL TRIM

A. Steel Trim:
   1. Description: Paper-faced galvanized steel sheet trim pieces conforming to ASTM C 1047.
   2. Manufacturers: Provide products manufactured by one of the following, or equal.
      a. CEMCO.
      b. Clinch-On Cornerbead Co.
      c. Stockton Products.
      d. Western Metal Lath.
      e. USG Corp.
   3. Products: "BEADEX" paper-faced metal bead and trim manufactured by USG Corp., or equal.
      a. Corner Beads: Provide to protect exterior corners. Provide corner beads with notched or flexible flanges at curved edges.
         1) 90-degree Outside Corner Bead: "Micro Bead Style", or equal.

2) 90-degree Inside Corner Bead: “B2 Style”, or equal.

b. Casing Beads: Provide long-flanged L- or LC-beads at exposed panel edges indicated as receiving joint compound; provide short-flanged U-beads at exposed panel edges that do not receive joint compound.

1) J Trims (J-shaped with exposed long flange): “B9J Style”, or equal.

2) L Trims (L-shaped with exposed long flange): “B4 Style”, or equal.

B. Metal Control Joints:

1. Description: One-piece solid zinc control joint supplied with factory-applied removable tape to ensure a clean joint.
2. Products: Provide one of the following, or equal.
   a. “NO93 Control Joint” manufactured by Alabama Metal Industries Corp. Building Products (AMICO).
   b. “Niles-093 Zinc Control Joint” manufactured by Niles Building Products Co.
   c. “SHEETROCK Zinc Control Joint No. 093” manufactured by USG Corp.
3. Requisite Properties:
   a. Minimum Length: At least 10 feet long; provide longest possible lengths to avoid joints.

2.4 INSTALLATION MATERIALS

A. Fasteners: Provide #6-32 UNC 2B (0.138-inch shank diameter, 32 threads per inch) by at least 1-1/4-inch long, Philips bugle head, coarse thread, self- piercing or self-drilling (as applicable) phosphate coated steel screw fasteners, unless another fastener type is explicitly indicated; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

B. Laminating Adhesive:

1. Description: Lightweight, sandable, chemically-setting powder compound conforming to ASTM C 475.
2. Application: Used for bonding gypsum board to wood or metal studs, laminating gypsum board to gypsum board, and for bonding gypsum board to concrete or CMU walls.
3. Product: “SHEETROCK Easy Sand Joint Compound” manufactured by USG Corp., or equal.

2.5 JOINT TREATMENT MATERIALS

A. Joint Tape:

1. Description: Nominal 2-inch wide gypsum panel joint and corner reinforcement conforming to ASTM C 475.
2. Products:
   a. Fiberglass Joint Tape: “SHEETROCK Fiberglass Drywall Tape” manufactured by USG Corp., or equal.

b. Paper Joint Tape: "BEADEX Drywall Joint Tape" manufactured by USG Corp., or equal.
c. Fiberglass Mesh Tape: Prohibited.

B. Setting-Type Joint Compound:
1. Description: Lightweight, sandable, chemically setting powder compound conforming to ASTM C 475, and used for embedding joint tape and finishing interior gypsum panels.
2. Applications:
a. Pre-Filling Gypsum Panel Joints throughout the Project: Use setting-type compound for open joints, beveled panel edges, and at damaged surface areas at all locations.
b. All Other Coats: Use setting-type compound for embedding and first coat, fill coat, finish coat, and skim coat at wet locations; and at locations where panels are subject to moisture and high humidity.
3. Product: "SHEETROCK DURABOND" manufactured by USG Corp., or equal.

C. Drying-Type Joint Compound:
1. Description: Vinyl-type compound conforming to ASTM C 475, and used for embedding joint tape, finishing interior gypsum panels, and hand-applying simple texturing.
2. Application: Use for embedding and first coat, fill coat, finish coat, and skim coat at dry locations, and at locations where joint is subject to moisture and high humidity.
3. Product: "SHEETROCK All Purpose Joint Compound – SELECT" and "SHEETROCK Brand Plus 3 Lightweight All-Purpose Joint Compound" manufactured by USG Corp., or equal.

2.6 ACCESSORIES

A. Spray Applied Level 5 Wallboard Finish Products: Prohibited.

B. Repair Clips: "SHEETROCK Drywall Repair Clips" manufactured by USG Corp., or equal.

C. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.7 MARKING AND IDENTIFICATION

A. Description: Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions, and other walls required by the California Building Code to have protected openings or penetrations must be effectively and permanently identified with stenciling located in accessible concealed floors, floor-ceiling assemblies, plenums, and attic spaces

B. Paint Products: Specified in Section 09 91 00.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
   1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
   2. Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed gypsum board and adjacent items.
   3. Install gypsum board using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
   4. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction.
   5. Securely attach gypsum board in place to supporting construction.
   6. Installed gypsum board must be warrantable. Do not install, correct, or replace gypsum board in a manner that results in any warranty or guarantee becoming void.

B. Special Techniques:
   1. Single-Layer Application:
      a. On ceilings, apply gypsum panels before wall or partition board application to greatest extent possible, and at right angles to framing, unless otherwise indicated.
      b. On partitions and walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated or required by fire-resistance-rated assemblies; minimize end joints.
      c. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assemblies.
      d. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
      e. Stagger abutting end joints not less than one framing member in alternate courses of panels.
      f. Securely attach gypsum panels to supports with steel drill screws.
   2. Multilayer Application:
      a. On partitions and wall assemblies, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
      b. Securely attach base layers and face layers separately to supports with screws. Do not glue multiple layers of gypsum board together.
   3. Trim:

a. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim in conformance with manufacturer's instructions.
b. Control Joints: Install control joints in conformance with ASTM C 840 and in specific locations indicated or accepted by the Architect.
C. Trim: Install cornerbead at outside corners; install LC-Bead or U-Bead at exposed panel edges.

4. Finishing Gypsum Board:
   a. Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and other items and conditions as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
   b. Prefill open joints, beveled edges, and damaged surface areas.
   c. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

C. Installation Tolerances: Install gypsum board to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch and from plumb, level, and alignment.

D. Correction and Repair:
   1. Correct deficiencies that do not conform to the Contract Documents.
   2. Repair non-conforming, damaged and defective work.
   3. Replace soiled items that cannot be cleaned to the same condition as new.

E. Protection:
   1. Protect installed gypsum board in place from soiling, deterioration, and damage until Substantial Completion.
   2. Remove protection when it’s no longer needed and before Substantial Completion.

3.2 GYPSUM BOARD FINISH SCHEDULE

A. General: Finish gypsum board surfaces with exposed joints, corners and edges reinforced or trimmed in conformance with ASTM C 840, Gypsum Association publication GA-214, “*Recommended Levels of Gypsum Board Finish*”, and the following.

B. Levels of Gypsum Board Finish:
   1. Level 0: Use for first layer of multiple layer construction.
   2. Level 5 (spray and roller-applied products are prohibited): Use everywhere.

END OF SECTION

SECTION 09 51 13 – ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Suspended acoustical ceiling panels.
   2. Suspension system.
   3. Installation materials.
   4. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

1. Quality Standards
   1. Seismic Standard: Provide acoustical ceilings designed and installed to withstand the effects of earthquake motions in conformance with ASCE/SEI 7, "*Minimum Design Loads For Buildings and Other Structures*"; CISCA publication, "*Seismic Construction Handbook*"; and California Building Code Sections 803.9.1.1, 1614, 1616A.1.20, and 2506.2.1; DSA IR 25-2.13 for ceilings grid suspension.
   2. Installation Standard: Comply with CISCA publication "*Ceiling Systems Handbook*" requirements for installation.

2. Regulatory Requirements:
   1. Surface-Burning Characteristics: Provide acoustical ceilings having a maximum FSI Value of 25 or less and a maximum SDI Value of less than 450 (Class A), when tested in conformance with ASTM E 84.
   2. Ceiling panels, other than acoustical panels, weighing more than 1/2-pound per square foot must be positively attached to ceiling suspension runners in conformance with California Building Code Section1616A.1.21.

A. Qualifications:
   1. Installer: Company or individuals must have at least 5 years' experience installing acoustical ceilings for at least 30 previous projects similar to this project in size, material, design, and complexity.
   2. Supervisors: Individuals must have at least 7 years' experience installing acoustical ceilings for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading acoustical ceiling installers.

2. Submittals: Submit product data, shop drawings, samples, coordination drawings, and written descriptions of specified qualifications.

3. Maintenance Material Submittals:
   1. Deliver to the Owner acoustical ceiling cleaning materials, equipment, accessories, and instructions; and extra stock materials to replace those worn or damaged as a result of normal occupancy.
   2. Furnish at least 2 percent of the total installed for each acoustical ceiling type, color, composition, grade, finish, and variety, but not less than one unopened box or container.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers:
   1. Basis of Design Manufacturer: Design is based on products manufactured by the following.
      a. Armstrong World Industries.
   2. Acceptable Manufacturers: Other acceptable sources of comparable products include the following and are subject to the approval of the Owner, or equal.
      a. CertainTeed Corp.
      b. USG Interiors, Inc.

2.2 ACOUSTICAL CEILING PANELS

A. Description: Mineral fiber ceiling panels conforming to ASTM E 1264 Type XII (glass fiber base with membrane-faced overlay), Form 2 (cloth), Pattern E (lightly textured).

B. Product: “Fine Fissured” manufactured by Armstrong World Industries, or equal.

C. Requisite Properties:
   1. Style: “Fine Fissured 1824”.
   2. Size: 24 inches by 48 inches by 3/4-inch.
   3. Color: Match Armstrong color WH, “White” to match existing.
   4. Surface Finish: Factory-applied latex paint.
   5. Edge Detail: Angled tegular.
   6. Surface Pattern: Non-directional medium fissured texture.

D. Performance Requirements:
   1. Minimum Noise Reduction Coefficient (NRC): At least NRC 0.70, when tested in conformance with ASTM E 492 and ASTM E 989.
   2. Minimum Ceiling Attenuation Class (CAC): At least CAC 35, when tested in conformance with ASTM E 492 and ASTM E 1414.

3. Minimum Light Reflectance (LR): Provide LR value of at least 0.85, when tested in conformance with ASTM E 1477.

2.3 SUSPENSION SYSTEMS

A. Description: Non-rated direct hung ceiling suspension system conforming to ASTM C 635 requirements for Heavy Duty structural classification.

B. Product: "Prelude XL Exposed Tee with Seismic Rx Solution" manufactured by Armstrong World Industries, or equal.

C. Requisite Properties:
   1. Size: 15/16-inch bottom flange face dimension by 1-11/16-inch web height.
   2. Profile Type: Exposed tee.
   3. Material: Hot dip galvanized steel sheet.
   4. Finish: Manufacturer's standard shop-applied pre-treatment and baked enamel finish.
   5. Color: Match Armstrong color WH, "White".

2.4 INSTALLATION MATERIALS

A. Attachment Devices: Sized for 5 times the design load indicated in ASTM C 635, Table 1, Direct Hung, unless otherwise indicated. Comply with seismic design requirements.

B. Wire: Soft temper, zinc-coated, pre-stretched, galvanized carbon steel wire conforming to ASTM A 641 Class 3 or A coating and having a minimum yield-stress load of 3 times the design load.
   1. Hanger Wire: Minimum 0.106-inch diameter. (12-gage ASW)
   2. Diagonal Bracing Wire: Minimum 0.106-inch diameter. (12-gage ASW)
   3. Provide heavier gage hanger wire for ceiling systems heavier than 4 pounds per square foot.

C. Compression Struts: Provide one of the following.
   1. Cold or hot rolled angles, loadbearing or non-loadbearing studs, EMT or rigid conduit, or black iron.
   2. Cold-rolled steel section with maximum L/R ratio of 200.

D. Engineered Compression Struts:
   1. Description: Pre-engineered telescoping seismic compression posts manufactured from heavy-wall galvanized tubing.
   2. Application: Manufactured compression struts may be provided in lieu of compression struts indicated above when installed in conformance with its manufacturer's instructions.

3. Products: “ARMSTRONG 5594 Ceiling Tile Compression Strut” manufactured by Armstrong World Industries or “Donn Brand Compression Post VSA” manufactured by USG Interiors, Inc. (ICC ES Report No. ESR-1222), or equal.

E. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.5 ACCESSORIES

A. Seismic Clips:
1. Description: 2-inch beam end retaining clip that joins main beam or cross tee to wall molding and web of grid with no visible pop rivets.
2. Restrictions: Use of seismic clips is permitted only when specifically detailed on the Drawings. Alternative method of construction plan-review approval is required for use of seismic clips.
3. Products: “BERC 2” clips manufactured by Armstrong World Industries or “ACM7” clips by USG Interiors, Inc., or equal.

B. Seismic Separation Joints: Provide ceiling system manufacturer’s standard at seismic separation joints at ceiling locations where the contiguous area of non-broken ceiling is 2,500 square feet or greater.

C. Wall Molding: Provide the following, with prefinished exposed flanges matching suspension system.
1. Perimeter Molding: “No. 7808” 2- by 2-inch hemmed-edge perimeter wall angle molding manufactured by Armstrong World Industries, or equal.
2. Shadow Molding: “No. 7823” 2-inch flange by 1-1/4-inch high by 3/4-inch reveal hemmed-edge shadow molding manufactured by Armstrong World Industries, or equal.
3. Shadow Molding Installed with Seismic Clips: “No. 7897” 15/16-inch flange by 15/16-inch-inch high by 1/2-inch shadow molding manufactured by Armstrong World Industries, or equal.

D. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.

2. Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations, and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed acoustical ceiling and adjacent items.
3. Install acoustical ceilings using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
4. Set acoustical ceilings true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
5. Securely attach acoustical ceilings in place to supporting construction.
6. Installed acoustical ceilings must be warrantable. Do not install, correct, or replace acoustical ceilings in a manner that results in any warranty or guarantee becoming void.

B. Special Techniques:
1. Suspend acoustical ceiling hangers from building's structural members.
2. Secure bracing wires to suspension members and to supports with at least four tight turns. Suspend bracing from building's structural members as for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Attach bracing wires to concrete with cast-in-place or post installed anchors.
3. Install edge moldings and trim at acoustical ceiling perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
4. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
5. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

C. Installation Tolerances: Ceilings must conform to the following tolerances, which are non-cumulative.
1. Maximum Out of Plane: Surfaces may not vary by more than 1/8-inch in 10 feet.
2. Carrying Channel Maximum Out of Level: Not more than 1/8-inch in 12 feet,
3. Main Runner Maximum Out of Level: Not more than 1/4-inch in 10 feet,
4. Main Runner Maximum Deflection: Not more than L/360 of span,
5. Maximum Misalignment of Main Runners: 0.015-inch.
6. Maximum Misalignment of Intersection Members: 0.020-inch.
7. Main Runner Bow, Camber, and Twist: Not more than 1/32-inch in 2 feet bow or camber; not more than one degree twist.

D. Correction and Repair:
1. Correct deficiencies that do not conform to the Contract Documents.
2. Repair non-conforming, damaged and defective work.
3. Replace soiled items that cannot be cleaned to the same condition as new.

E. Protection:
   1. Protect installed acoustical ceilings in place from soiling, deterioration, and damage until Substantial Completion.
   2. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

SECTION 09 65 13 – RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Resilient wall base.
   2. Installation materials.
   3. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

1. Regulatory Requirements:
   1. Surface-Burning Characteristics: base having a maximum FSI Value of 25 or less and a maximum SDI Value of less than 450 (Class A), when tested in conformance with ASTM E 84.
   2. Radiant Flux Classification: resilient accessories having an average critical radiant flux value of at least 0.45 (Class I), when tested in conformance with ASTM E 648.

2. Qualifications:
   1. Installer: Company or individuals must have at least 5 years' experience installing resilient base and accessories for at least 30 previous projects similar to this project in size, material, design, and complexity.
   2. Supervisors: Individuals must have at least 7 years' experience installing resilient base and accessories for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading resilient base and accessory installers.

3. Submittals: Submit product data, material samples, seam samples, and written descriptions of specified qualifications.

4. Maintenance Material Submittals:
   1. Before Final Completion, deliver to the Owner resilient base and accessory cleaning materials, equipment, accessories, and instructions; and extra stock materials to replace those worn or damaged as a result of normal occupancy.
   2. Furnish at least 2 percent of the total installed for each resilient base and accessory type, color, composition, grade, finish, and variety, but not less than one unopened box or container.

PART 2 - PRODUCTS

2.1 RESILIENT WALL BASE

A. Description: Solid thermoset vulcanized SBR rubber base conforming to ASTM F 1861 requirements for Type TS (vulcanized thermoset rubber), Group 1-solid (homogenous), Styles A (straight base) and B (cove base).

B. Manufacturers:
   1. Basis of Design Manufacturer: Design is based on products manufactured by the following.
      a. Burke Flooring.
   2. Acceptable Manufacturers: Other acceptable sources of comparable products include the following and are subject to the approval of the Owner, or equal.
      a. Flexco Inc.
      b. Johnsonite.

C. Product: “Burkebase Type TP” manufactured by Burke Flooring, or equal.

D. Requisite Properties:
   1. Size: 4 inches high.
   2. Minimum Thickness: At least 1/8-inch thick.
   3. Profiles: Style A (straight base) at carpeting; provide Style B (cove base) at all other flooring, unless otherwise indicated.
   4. Colors: “597 Mocha”.
   5. Lengths: at least 100-foot coiled lengths. Provide at least 4-foot straight lengths.

2.2 INSTALLATION MATERIALS

A. Primer: Water-based, low- or zero-VOC, solvent-free primer supplied, required, recommended, or accepted by the manufacturer for in-service installation conditions, including temperature, relative humidity, and substrate porosity; and expected foot traffic, rolling traffic, and fire-resistance ratings.

B. Adhesive:
   1. Water-based, low- or zero-VOC adhesive supplied, required, recommended, or accepted by the manufacturer for ease of installation; and for adequate bonding of resilient base and accessories to substrates for all in-service installation conditions, including temperature, relative humidity, and substrate porosity; and expected foot traffic, rolling traffic, and fire-resistance ratings.
   2. Wet-tack, percent solids, open-time, stripability, and ease of application must be explicitly formulated for each resilient base and accessory type and application.
   3. Provide hard-set adhesive supplied, required, recommended, or accepted by the manufacturer under resilient base and accessories subject to concentrated static or dynamic rolling loads.

2.3 ACCESSORIES

A. Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
   1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
   2. Verify in-place construction, project conditions, and the work of other specification sections conform to the manufacturer's instructions and other requirements and recommendations.
   3. Verify substrates are dry and free of curing compounds, sealers, hardeners, and deleterious and other substances that might interfere with resilient base and accessory adhesion,
   4. Prepare substrates as required, recommended, or accepted by the manufacturer without limitation; and in a manner that does not result in any warranty or guarantee becoming void.
   5. Install resilient base and accessories using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
   6. Only install resilient base and accessories under conditions that ensure finishes are free from blemishes and defects.
   7. Completed work must match approved samples and mockups, as accepted by the Architect.
   8. Installed resilient base and accessories must be warrantable. Do not install, correct, or replace resilient base and accessories in a manner that results in any warranty or guarantee becoming void.

B. Resilient Base Special Techniques:
   1. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
   2. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
   3. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
   4. Do not stretch resilient base during installation.
   5. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

6. Use straight pieces of maximum lengths possible to form corners; form without producing discoloration (whitening) at bends.

C. Transitional Molding Special Techniques: Butt resilient transitional moldings to adjacent materials, and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of resilient base and accessorythat would otherwise be exposed.

D. Correction and Repair:
   1. Correct deficiencies that do not conform to the Contract Documents.
   2. Repair non-conforming, damaged and defective work.
   3. Replace soiled items that cannot be cleaned to the same condition as new.

E. Protection:
   1. Protect installed equipment in place from soiling, deterioration, and damage until Substantial Completion.
   2. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

SECTION 09 68 13 – TILE CARPETING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Modular carpet tile.
   2. Surface preparation.
   3. Installation materials.
   4. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

A. Regulatory Requirements:
   1. Carpeting must conform to the requirements of California Building Code Section 11B-302.2
   2. Carpet must be securely attached and must have a firm cushion, pad, or backing or no cushion or pad. It must have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. Pile height must be 1/2-inch maximum.
   3. Exposed edges must be fastened to floor surfaces and must have trim on the entire length. Carpet edges must conform to the requirements of California Building Code Section 11B-303.
   4. Radiant Flux Classification: Provide carpet having an average critical radiant flux value of at least 0.45 (Class I), when tested in conformance with ASTM E 648.

B. Quality Standards:
   1. Installation Standard: Comply with The Carpet and Rug Institute publication CRI 104, "*Standard for Installation of Commercial Carpet*" requirements that apply to each in-service condition indicated.

C. Qualifications:
   1. Installer: Company or individuals must have at least 5 years' experience installing carpet for at least 30 previous projects similar to this project in size, material, design, and complexity.
   2. Supervisors: Individuals must have at least 7 years' experience installing carpet for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading carpet installers.

D. Submittals: Submit product data, shop drawings, samples, and written descriptions of specified qualifications.

E. Maintenance Material Submittals:
   1. Before Final Completion, deliver to the Owner floor cleaning materials, equipment, accessories, and instructions; and extra stock materials to replace those worn or damaged as a result of normal occupancy.
   2. Furnish at least 2 percent of the total installed for each carpet type, color, composition, grade, finish, and variety, but not less than one unopened gallon or container.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers:
   1. Basis of Design Manufacturer: Design is based on products manufactured by the following.
      a. Tandus Centiva.
   2. Acceptable Manufacturers: Other acceptable sources of comparable products include the following and are subject to the approval of the Owner, or equal.
      a. Bently Mills.
      b. Interface, Inc.
      c. Mannington Commercial.
      d. Shaw Contract.

2.2 COMMERCIAL TILE CARPETING

A. Description: CRI Green Label Plus Certified heavy-use commercial tile carpet floor covering.

B. Products: “Haphazard II” manufactured by Tandus Centiva, or equal.

C. Requisite Properties:
   1. Size: 24 by 24 inches.
   2. Product Number: 03366.
   3. Color: 13505 “Bay”.
   4. Primary Backing: Synthetic non-woven.
   5. Secondary Backing: “Modular ER3”.
   6. Fiber System: TDX nylon.
   7. Dye: Solution dyed.
   8. Construction: Patterned loop pile.
   9. Soil/Stain Protection: “Eco-Ensure” manufactured by Tandus Centiva, or equal.

10. Minimum Pile Thickness: At least 0.080-inch.
11. Minimum Pile Density Rating: At least 6,462.
12. Installation: Indicated on the Drawings.

2.3 SURFACE PREPARATION

A. Trowelable Patch and Fill Materials: Specified in Section 03 54 16, unless other products are supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

B. Moisture Vapor Transmission Reduction Coating: Specified in Section 09 05 16 (remedial), unless another coating is supplied, required, recommended, accepted by the by manufacturer for actual in-service conditions applicable to the project.

C. Substrate Testing and Surface Preparation: Perform testing and corrective work and prepare substrates in conformance with the requirements of Section 09 05 16.

2.4 INSTALLATION MATERIALS

A. Primer: Water-based, low- or zero-VOC, solvent-free primer supplied, required, recommended, or accepted by the manufacturer for in-service installation conditions, including temperature, relative humidity, and substrate porosity; and expected foot traffic, rolling traffic, and fire-resistance ratings.

B. Adhesive:
   1. Water-based, low- or zero-VOC adhesive supplied, required, recommended, or accepted by the manufacturer for ease of carpet installation; and for adequate bonding of carpet to substrates for all in-service installation conditions, including temperature, relative humidity, and substrate porosity; and expected foot traffic, rolling traffic, and fire-resistance ratings.
   2. Wet-tack, percent solids, open-time, stripability, and ease of application must be explicitly formulated for each carpet type and application.

2.5 ACCESSORIES

A. Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:

1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
2. Verify in-place construction, project conditions, and the work of other specification sections conform to the manufacturer's instructions and other requirements and recommendations.
3. Verify substrates are dry and free of curing compounds, sealers, hardeners, and deleterious and other substances that might interfere with carpet adhesion,
4. Test substrates for alkalinity (pH), MVER, and relative humidity (RH) and perfrom corrective work, and substrate preparation as specified in Section 09 05 16 and required by the manufacturer.
5. Prepare substrates as required, recommended, or accepted by the manufacturer without limitation; and in a manner that does not result in any warranty or guarantee becoming void.
6. Install carpet using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
7. Only install carpet under conditions that ensure finishes are free from blemishes and defects.
8. Completed work must match approved samples and mockups, as accepted by the Architect.
9. Installed carpet must be warrantable. Do not install, correct, or replace carpet in a manner that results in any warranty or guarantee becoming void.

B. Special Techniques:
1. Scribe, cut, and fit flooring to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
2. Extend flooring into toe spaces, door reveals, closets, and similar openings. Extend flooring to centerline of doors in the closed position.
3. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on flooring as marked on substrates. Use pencil, chalk, or other nonpermanent, non-staining marking device. The use of markers is prohibited.
4. Adhere flooring to substrate using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

C. Correction and Repair:
1. Correct deficiencies that do not conform to the Contract Documents.
2. Repair non-conforming, damaged and defective work.
3. Replace soiled items that cannot be cleaned to the same condition as new.

D. Protection:
1. Protect installed carpet in place from soiling, deterioration, and damage until Substantial Completion.
2. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

SECTION 09 81 33 – ACOUSTICAL INSULATION, SEALANTS, AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Concealed acoustical insulation.
   2. Acoustical sealants.
   3. Installation materials.
   4. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

A. Submittals: Submit product data.

PART 2 - PRODUCTS

2.1 CONCEALED ACOUSTICAL INSULATION

A. Acoustical Blanket Insulation:
   1. Description: Unfaced inorganic glass-fiber blanket acoustical insulation conforming to ASTM C 665 Type I acoustical insulation (blankets without membrane coverings).
   2. Manufacturers: Provide one of the following, or equal.
      a. “CertaPro AcoustaTherm” manufactured by CertainTeed Corp.
      b. “Sound Control Batts” manufactured by Johns Manville.
      c. “Sound Attenuation Batts/MW” manufactured by Owens Corning Fiberglass Corp.

B. Sound Attenuating Fire Blanket Insulation:
   1. Description: Asbestos-free mineral fiber blanket acoustical insulation conforming to ASTM C 665 requirements for Type I acoustical insulation (blankets without membrane coverings), manufactured from slag and naturally occurring rock.
   2. Products: Provide one of the following, or equal.
      a. “FIBREX Sound Attenuation Fire Batt Acoustical insulation (SAFB)” manufactured by Fibrex Insulations Inc.
      b. “Thermafiber Sound Attenuating Fire Blankets (SAFB)” manufactured by Owens Corning.
      c. “ROCKWOOL AFB” manufactured by Roxul Inc.

2.2 ACOUSTICAL SEALANTS

A. Latex Sealants:
   1. Description: Non-sag, paintable, non-staining siliconized acrylic-latex sealant conforming to ASTM C 834 requirements for Type OP (opaque sealant), Grade NF (does not meet the requirements for low temperature flexibility of Grade 0°C classification). Verify material compatibility with adjacent materials such as chlorinated polyvinyl chloride (CPVC) pipe.
   2. Application: Used where indicated at exposed and concealed joints and annular spaces around through-penetrations.
   3. Products: Provide one of the following, or equal.
      a. "CP 506 Smoke and Acoustic Sealant" manufactured by Hilti, Inc.
      b. "QuietZone Acoustic Sealant" manufactured by Owens Corning.
      c. "AC-20 FTR" manufactured by Pecora Corp.
      d. "Tremflex 834" manufactured by Tremco, Inc.
      e. "Sheetrock Acoustical Sealant" manufactured by USG Corp.
   4. Requisite Properties:
      a. Color: White.

B. Non-Drying, Non-Hardening, Non-Skinning Sealants:
   1. Description: Single-component butyl rubber sound dampening elastomeric sealant conforming to ASTM Standard D 217. Verify material compatibility with adjacent materials such as chlorinated polyvinyl chloride (CPVC) pipe.
   2. Application: Installed at concealed joints in acoustical partitions and between partitions and existing curtain wall systems for concealed joints.
   3. Products: Provide one of the following, or equal.
      a. "BA-98" manufactured by Pecora Corp.
      b. "Acoustical Sealant" manufactured by USG Corp.

C. Expanding Foam Sealant:
   1. Description: Gun-applied, expanding spray foam sealant.
   2. Application: Used to seal and insulate around pipe penetrations, and conduit penetrations at sound-rated partitions, etc.
   3. Products: Provide one of the following, or equal.
      a. "GREAT STUFF PRO Gaps & Cracks" manufactured by The Dow Chemical Co.
      b. "Polycell" manufactured by M-D Building Products, Inc.
      c. "Expanding Foam Polyfilla" manufactured by Polyfilla.
   4. Elsewhere:
      a. Description: Compressible, closed cell polyvinyl chloride foam tape with pressure sensitive adhesive.
      b. Application: Installed at concealed joints, where indicated.
      c. Product: "Norseal V730" manufactured by Norton Performance Plastics Corp., or equal.
      d. Requisite Properties:

1) Size: One-inch minimum roll width.
2) Thickness: At least 3/8-inch.
3) Density: At least 6 pounds per cubic foot.
4) Facing: Furnish tape in rolls with protective release liner on non-adhesive face.

2.3 FIRESTOP PUTTY PADS

A. Application: Used to seal the external surfaces (back side) of metallic and nonmetallic switch and receptacle boxes to reduce airborne sound transmission in interior partitions.

B. Products: "TREMstop MP" manufactured by Tremco, Inc., or equal.

2.4 INSTALLATION MATERIALS

A. Acoustical Insulation Hangers:
   1. Application: Used to attach acoustical insulation to clean, dry, smooth, non-porous solid surfaces.
   2. Manufacturer: Provide products manufactured by AGM Industries, Inc., or equal.
   3. Products: Provide the following, or equal.
      a. Anchors: "TACTOO Insul-Hangers" adhesively attached spindle-type anchors.
      b. Adhesive: "BOSS 348 Multi-Purpose Construction Adhesive" manufactured by Accumetric, LLC or other VOC-compliant acoustical insulation hanger adhesive.
      c. Acoustical insulation Standoff: One-inch "Clutch Clip".
      d. Acoustical insulation Retaining Washers: "Style RC 200" round or "SC 250" square washers.
   4. Requisite Properties:
      a. Base Plate and Acoustical insulation Standoff and Retaining Washers: At least 2-inch square by at least 0.149-inch (MSG 28) base metal thickness galvanized perforated steel sheet.
      b. Retaining Washers: At least 1-1/2-inch square or diameter by at least 0.149-inch (MSG 28) base metal thickness galvanized perforated steel sheet.
      c. Spindle: At least 0.106-inch diameter (SWG 12), zinc-coated wire, depth to suit depth of acoustical insulation indicated.
      d. Adhesive: Adhesive used with impaling pins must either be manufactured or accepted by the acoustical insulation hanger manufacturer. "Peel and press" hangers with self-adhering adhesive backings are prohibited.

B. Mechanical Fasteners: Tape, staples, and other devices for fastening acoustical insulation supplied, required, recommended, or accepted by the acoustical insulation manufacturer.

C. Hanger Wire: At least 0.106-inch diameter (SWG 12) soft temper zinc-coated wire conforming to ASTM A 641, Class 3 or A coating.

D. Adhesive: Supplied, require, recommended, or accepted by the acoustical insulation manufacturer to bond acoustical insulation securely to substrates indicated without damaging acoustical insulation or substrates.

2.5 ACCESSORIES

A. Joint Backing:
   1. Description: Extruded closed-cell polyethylene foam cylindrical sealant backings conforming to ASTM C 1330, Type C.
   2. Products: Provide one of the following, or equal.
      a. “Mile High Foam” manufactured by Backer Rod Mfg. Inc.
      b. “HBR” or “Green Rod” manufactured by Nomaco, Inc.
      c. “NuFlex 870” manufactured by TVM Building Products.
   3. Performance Requirements:
      a. Maximum Water Absorption: Not more than 0.10 grams per cubic centiliter when tested in conformance with conformance with ASTM C 1016, Procedure B.
      b. Minimum Density: At least 24 per cubic meter when tested in conformance with conformance with ASTM D 1622.
      c. Maximum Outgassing: Less than 1 bubble when tested in conformance with conformance with ASTM D 1253.
      d. Minimum Compression Recovery: At least 90 percent, when tested in conformance with conformance with ASTM D 5249.
      e. Minimum Compression Deflection: At least 20.5 percent, when tested in conformance with conformance with ASTM D 5249.
      f. Minimum Tensile Strength: At least 200 kPa, when tested in conformance with conformance with ASTM D 1623.

B. Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
   1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
   2. Verify in-place supporting and adjacent construction conforms to the manufacturer’s requirements or recommendations, and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed acoustical insulation and adjacent items.

3. Install acoustical insulation in conformance with ASTM C 919 using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
4. Extend acoustical insulation to envelop entire area insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
5. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of acoustical insulation to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.
6. Installed acoustical insulation must be warrantable. Do not install, correct, or replace acoustical insulation in a manner that results in any warranty or guarantee becoming void.

B. Special Techniques:
   1. Wall Insulation:
      a. Install acoustical insulation in cavities formed by framing members.
      b. Use acoustical insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
      c. Place acoustical insulation to produce a friction fit between edges of acoustical insulation and adjoining framing members.
      d. Stuff loose-fill acoustical insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40 percent of normal maximum volume.
   2. Ceiling Insulation:
      a. Install blanket acoustical insulation above ceilings where indicated.
      b. Maintain 3-inch clearance of acoustical insulation around recessed lighting fixtures.
   3. Acoustical Sealant Installation:
      a. At sound-rated assemblies and elsewhere indicated, seal construction with a continuous bead of acoustical sealant at perimeter, behind control joints, and at openings and penetrations.
      b. Install acoustical sealant to both faces of partitions at perimeters and through penetrations.

C. Acoustical Installation Requirements:
   1. Application: Apply acoustical sealant where shown on drawings and the following.
      a. Both sides and perimeter of door and window frames.
      b. Penetrations of partitions, floors, and ceilings by piping, ventilation ducts, conduits, cables, and cable trays.
      c. Perimeter and between joints of all sound isolating partitions, floors, and ceilings.
   2. Acoustical Sealant:

a. Use continuous beads of acoustical sealant along gypsum board face layer to seal assemblies at head, sill, perimeter, and penetrations, and joints between layers of sound isolating gypsum board construction and around the perimeter of resilient ceilings.
b. Comply with ASTM C 919 requirements for use of joint sealants in acoustical applications as applicable to materials and conditions indicated.

3. Sheet Sealant:
   a. In fall full height, sound rated, and sound sensitive walls, over back and sides of all electrical, telephone, and communication boxes with specified acoustical pads.
   b. Verify unused knockouts are plugged before installing the pads. Mold pads tightly to the boxes and to the adjacent surfaces.
4. Installation:
   a. To seal gaps 3/8-inch in dimension and larger, pack with glass/mineral fiber batt prior to installing sealant materials.
   b. Use compressible closed-cell foam backer rod as required. Uncompressed backer rod width should be 30 to 50 percent greater than joint width.

D. Correction and Repair:
   1. Correct deficiencies that do not conform to the Contract Documents.
   2. Repair non-conforming, damaged and defective work.

E. Protection:
   1. Protect installed acoustical insulation in place from deterioration and damage until covered.
   2. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

SECTION 09 81 43 – HIGH-PERFORMANCE ACOUSTICAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. High-performance soundproofing acoustical blanket insulation indicated on the Drawings as temporary and removed after construction.
   2. Plenum barrier acoustical blanket insulation indicated on the Drawings as temporary and removed after construction.
   3. Acoustical baffle blanket insulation indicated on the Drawings as temporary and removed after construction.
   4. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

A. Qualifications:
   1. Installer: Company or individuals must have at least 5 years' experience installing insulation for at least 30 previous projects similar to this project in size, material, design, and complexity.
   2. Supervisors: Individuals must have at least 7 years' experience installing insulation for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading insulation installers.

B. Submittals: Submit product data, samples, and written descriptions of specified qualifications.

PART 2 - PRODUCTS

2.1 FOIL-BACKED EXPOSED ACOUSTICAL INSULATION

A. Description: Fiberglass blanket insulation wrapped in a nonporous scrim on one side and a foil backing on the other.

B. Product: "Studio-Quilt IQF-F" manufactured by Insul-Quilts, Inc., or equal.

C. Requisite Properties:
   1. Nominal Thickness: 2.0 inches thick.
   2. Standard Nominal Width: 48 inches wide.

3. Standard Length: 16 feet long. (custom sizes available)
4. Weight: 0.44 pounds per square foot.
5. Color: Black or white, as selected by the Architect.
6. Flammability: Class A Fire Rated in conformance with ASTM E84.

D. Performance Requirements:
1. Minimum Sound Transmission Class (STC): At least STC 16, when tested in conformance with ASTM E 90 and ASTM E 413.
2. Minimum Noise Reduction Coefficient (NRC): At least NRC 0.90, when tested in conformance with ASTM E 492 and ASTM E 989.

E. Sound Absorption Coefficients: The installed product must conform to the following octave-band sound absorption coefficients when tested in conformance with ASTM C 423 in mounting conditions representative of the project design, subject to final review and approval of the acoustic consultant.

SOUND ABSORPTION DATA							
OCTAVE BAND FREQUENCIES (Hz)							
125	250	500	1000	2000	4000	5000	NRC
.15	.90	1.03	.99	.71	.48	.43	.90

2.2 CLOTH-BACKED EXPOSED ACOUSTICAL INSULATION

A. Description: Fiberglass blanket insulation wrapped in a nonporous scrim on one side and a cloth backing on the other.

B. Product: “Studio-Quilt IQF-S” manufactured by Insul-Quilts, Inc., or equal.

C. Requisite Properties:
1. Nominal Thickness: 2.0 inches thick.
2. Standard Nominal Width: 48 inches wide.
3. Standard Length: 16 feet long. (custom sizes available)
4. Weight: 0.40 pounds per square foot.
5. Color: Black or white, as selected by the Architect.
6. Flammability: Class A Fire Rated in conformance with ASTM E84.

D. Performance Requirements:
1. Minimum Sound Transmission Class (STC): At least STC 12, when tested in conformance with ASTM E 90 and ASTM E 413.
2. Minimum Noise Reduction Coefficient (NRC): At least NRC 1.05, when tested in conformance with ASTM E 492 and ASTM E 989.

E. Sound Absorption Coefficients: The installed product must conform to the following octave-band sound absorption coefficients when tested in conformance with

ASTM C 423 in mounting conditions representative of the project design, subject to final review and approval of the acoustic consultant.

SOUND ABSORPTION DATA						
OCTAVE BAND FREQUENCIES (Hz)						
125	250	500	1000	2000	4000	NRC
.25	.79	1.09	1.20	1.09	1.06	1.05

2.3 PLENUM BARRIER ACOUSTICAL INSULATION

A. Description: Fiberglass blanket insulation wrapped in one layer of fiberglass on one side and a nonporous scrim on the other.

B. Application: Installed at partial-height non-rated partitions, between structure above and top or side of the partition below, especially where mechanical ducts or other obstructions exist.

C. Product: “Studio-Quilt IQF-F” manufactured by Insul-Quilts, Inc., or equal.

D. Requisite Properties:
   1. Nominal Thickness: 2.0 inches thick.
   2. Standard Nominal Width: 48 inches wide.
   3. Standard Length: 16 feet long. (custom sizes available)
   4. Weight: 0.44 pounds per square foot.
   5. Color: Black or white, as selected by the Architect.
   6. Flammability: Class A Fire Rated in conformance with ASTM E84.

E. Performance Requirements:
   1. Minimum Sound Transmission Class (STC): At least STC 16, when tested in conformance with ASTM E 90 and ASTM E 413.
   2. Minimum Noise Reduction Coefficient (NRC): At least NRC 0.90, when tested in conformance with ASTM E 492 and ASTM E 989.

F. Sound Absorption Coefficients: The installed product must conform to the following octave-band sound absorption coefficients when tested in conformance with ASTM C 423 in mounting conditions representative of the project design, subject to final review and approval of the acoustic consultant.

OCTAVE BAND FREQUENCIES (Hz)							
125	250	500	1000	2000	4000	5000	NRC
.15	.90	1.03	.99	.71	.48	.43	.90

2.4 ACOUSTICAL BAFFLE INSULATION

A. Description: Fiberglass blanket insulation wrapped in one layer of fiberglass on one side and a nonporous scrim on the other.

B. Application: Used for higher ceilings, larger open areas, and in spaces with non-linear ceilings.

C. Product: "IQF-S BAFFLE BLANKET" manufactured by Insul-Quilts, Inc., or equal.

D. Requisite Properties:
   1. Nominal Thickness: 2.0 inches thick.
   2. Standard Nominal Width: 48 inches wide.
   3. Standard Length: 16 feet long. (custom sizes available)
   4. Weight: 0.44 pounds per square foot.
   5. Color: Black or white, as selected by the Architect.
   6. Flammability: Class A Fire Rated in conformance with ASTM E84.

E. Performance Requirements:
   1. Minimum Sound Transmission Class (STC): At least STC 12, when tested in conformance with ASTM E 90 and ASTM E 413.
   2. Minimum Noise Reduction Coefficient (NRC): At least NRC 1.05, when tested in conformance with ASTM E 492 and ASTM E 989.

F. Sound Absorption Coefficients: The installed product must conform to the following octave-band sound absorption coefficients when tested in conformance with ASTM C 423 in mounting conditions representative of the project design, subject to final review and approval of the acoustic consultant.

SOUND ABSORPTION DATA							
OCTAVE BAND FREQUENCIES (Hz)							
125	250	500	1000	2000	4000	5000	NRC
.25	.79	1.09	1.20	1.09	1.06	1.06	1.05

2.5 ACCESSORIES

A. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
   1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
   2. Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations, and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed insulation and adjacent items.
   3. Install insulation using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
   4. Extend insulation to envelop entire area insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
   5. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.
   6. Installed insulation must be warrantable. Do not install, correct, or replace insulation in a manner that results in any warranty or guarantee becoming void.

B. Correction and Repair:
   1. Correct deficiencies that do not conform to the Contract Documents.
   2. Repair non-conforming, damaged and defective work.

C. Protection:
   1. Protect installed insulation in place from damage.
   2. Remove insulation before Substantial Completion.

END OF SECTION

SECTION 09 91 00 – PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Field-applied finish paint.
   2. Surface preparation.
   3. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

A. Submittals: Submit product data, samples, and written descriptions of specified qualifications.

B. Field Samples: Include *in-situ* mockups as part of the work of this specification section.
   1. The Architect reviews field samples for conformance to the Contract Documents and approves or rejects them as the standard by which subsequent work is evaluated.
   2. Revise field samples and repeat reviews, including arranging all revisions and paying all revision costs, until accepted in writing by the Architect. Final acceptance of tile is made from field samples.
   3. After acceptance, promptly identify and protect field samples for reference until Substantial Completion.
   4. Approved field samples may remain part of the work after being identified for future reference.

C. Maintenance Material Submittals:
   1. Before Final Completion, deliver to the Owner extra stock materials to replace those worn or damaged as a result of normal occupancy.
   2. Furnish at least one unopened gallon or container for each paint type, color, composition, grade, finish, and variety.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers:
   1. Basis of Design Manufacturer: Design is based on products manufactured by the following.

a. Kelly-Moore Paints.

2. Acceptable Manufacturers: Other acceptable sources of comparable products include the following and are subject to the approval of the Owner, or equal.
   a. Dunn Edwards.
   b. Sherwin Williams.

2.2 PAINT

A. Description: 100-percent premium grade (best grade) low- and no-VOC paints, unless otherwise indicated.

B. Products: Provide the following products manufactured by Kelly-Moore Paints, or equal.
   1. 1st Coat: “971 Acry-Plex PVA Primer”.
   2. 2nd Coat: “1520 Enviro-Coat Semi-Gloss”.
   3. 3rd Coat: “1520 Enviro-Coat Semi-Gloss”.

C. Requisite Properties:
   1. Colors:
      a. P-1: Match Kelly-Moore Paints color OW254-1 “Buff Bluff”.
      b. P-2: Match Kelly-Moore Paints color OW256-1 “Arizona Heat”.
      c. P-3: Match Kelly-Moore Paints color KM4037-2 “Earthy Tan”.
      d. P-4: Match Kelly-Moore Paints color KM4104-5 “Red Ochre”.
   2. Sheens: Provide the following, unless otherwise indicated.
      a. Ceilings: Not more than Gloss Level 3. (Eggshell)
      b. Trim: At least Gloss Level 6. (Gloss)
      c. Other Walls: At least Gloss Level 3. (Eggshell)

2.3 ACCESSORIES

A. Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

2.4 MIXING

A. Factory-mix paint to match approved samples and mockups accepted by the Architect.

B. Box paint at the project site or factory-batch to ensure uniform and consistent color. This requirement includes specified maintenance materials.

C. Open paint containers only as required for use and mix only in designated areas.

D. Thoroughly agitate and stir materials to a uniform and smooth consistency suitable for proper installation.

E. Do not reduce, alter, or introduce foreign materials into paint, except in conformance with manufacturer's instructions and other requirements and recommendations.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
   1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
   2. Verify in-place construction, project conditions, and the work of other specification sections conform to the manufacturer's instructions and other requirements and recommendations.
   3. Protect work areas from dust and other airborne contaminants during surface preparation and paint installation. Protect adjacent surfaces against soiling and damage. Close and protect drains and other openings and penetrations to prevent paint intrusion or migration of liquids.
   4. Prepare substrates as required, recommended, or accepted by the manufacturer without limitation; and in a manner that does not result in any warranty or guarantee becoming void.
   5. Install paint using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
   6. Only install paint under conditions that ensure finishes are free from blemishes and defects.
   7. Provide smooth surfaces of uniform finish, color, appearance, and coverage. Paint surfaces with cloudiness, spotting, holidays, runs, or other imperfections are prohibited and are rejected as non-conforming work.
   8. Do not exceed the application rates recommended by the manufacturer.
   9. Completed work must match approved samples and mockups, as accepted by the Architect.
   10. Installed paint must be warrantable. Do not install, correct, or replace paint in a manner that results in any warranty or guarantee becoming void.

B. Correction and Repair:
   1. Correct deficiencies that do not conform to the Contract Documents.
   2. Repair non-conforming, damaged and defective work.Replace soiled paintthat cannot be cleaned to the same condition as new.

C. Protection:
   1. Protect installed equipment in place from soiling, deterioration, and damage until Substantial Completion.
   2. Remove protection when it's no longer needed and before Substantial Completion.

3.2 SCHEDULE

A. Paint products schedule begins on the next page.

END OF SECTION

DIVISION 10

SPECIALTIES

SECTION 10 14 16 – INTERIOR SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Miscellaneous interior signage.
   2. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

A. Regulatory Requirements:
   1. Chemical Signs and Labels: Provide Proposition 65 signage in conformance with California Code of Regulations (CCR), Title 27.
   2. Raised Characters: Raised characters must conform to the requirements of California Building Code Section 11B-703.2:
   3. Depth: It must be 1/32-inch (0.8 mm) minimum above their background and must be sans serif uppercase and be duplicated in Braille.
   4. Height: It must be 5/8-inch (15.9 mm) minimum and 2 inches (51 mm) maximum based on the height of the uppercase letter "I". California Building Code Section 11B-703.2.5
   5. Finish and Contrast: Characters and their background must have a non-glare finish. Character must contrast with their background with either light characters on a dark background or dark characters on a light background. California Building Code Section 11B-703.5.1
   6. Proportions: It must be selected from fonts where the width of the uppercase letter "O" is 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I". Stroke thickness of the uppercase letter "I" must be 15 percent maximum of the height of the character. California Building Code Sections 11B-703.2.4 and 11B-703.2.6
   7. Character Spacing: Spacing between individual raised characters must conform to the requirements of California Building Code Section 11B-703.2.7 and 11B-703.2.8
   8. Format: Text must be in a horizontal format. California Building Code Section 11B-703.2.9
   9. Braille: It must be contracted (Grade 2) and must conform to the requirements of California Building Code Sections 11B-703.3 and 11B-703.4. Braille dots must have a domed or rounded shape and must conform to the requirements of California Building Code Table and Figure 11B-703.3.1.
   10. Mounting Height: Tactile characters on signs must be located 48 inches minimum to the baseline of the lowest Braille cells and 60 inches maximum to the baseline of the

highest line of raised characters above the finish floor or ground surface. California Building Code Section and Figure 11B-703.4.1

11. Mounting Location: A tactile sign must be located in conformance with California Building Code Section and Figure 11B -703.4.2 as follows:
    a. alongside a single door at the latch side.
    b. on the inactive leaf at double doors with one active leaf.
    c. to the right of the right hand door at double doors with two active leaves.
    d. on the nearest adjacent wall where there is no wall space at the latch side of a single door or at the right side of double doors with two active leaves.
    e. so that a clear floor space of 18 inches by 18 inches minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position.
12. Visual characters must conform to the requirements of California Building Code Section 11B-703.5 and must be 40 inches minimum above finish floor or ground.
13. Pictograms must conform to the requirements of California Building Code Section 11B-703.6.
14. Symbols of accessibility must conform to the requirements of California Building Code Section 11B-703.7.
15. Variable message signs must conform to the requirements of California Building Code Section 11B-703.8.

B. Submittals: Submit product data, shop drawings and samples.

PART 2 - PRODUCTS

2.1 PHOTOPOLYMER PANEL SIGNS

A. Description: Single-piece photopolymer panel permanent identification signs consisting of moisture resistant non-glare photopolymer bonded to sign base material.

B. Manufacturer: Provide photopolymer products manufactured by Nova Polymers, Inc., or equal.

C. Fabricators: Provide signs fabricated by one of the following, or equal.
    1. Neiman & Co.
    2. Signtech Inc.

D. Materials:
    1. Photopolymer Layer: 0.040-inch acrylic photopolymer.
    2. Base Material:
        a. Interior Locations: 0.120-inch phenolic base.
        b. Exterior Locations: Exterior grade photopolymer applied to a 0.120-inch phenolic base.

E. Requisite Properties:
   1. Overall Panel Thickness: Between 1/8- and 1/4-inch.
   2. Colors: Indicated on the Drawings or selected by the Architect.
   3. Finish: Furnish non-glare finish.
   4. Edge Condition: Square cut.
   5. Corner Condition: Square.
   6. Mounting: Indicated on the Drawings.
   7. Copy: Indicated on the Drawings.
      a. Letter spacing must conform to standards shown and kerned optically to the acceptance of the Architect.
      b. Lines of copy must be straight and parallel to the sign format, unless otherwise indicated.
      c. Edges of letters, numbers, and symbols must be smooth and continuous, with straight and curved portions reproducing the original forms exactly, with corners sharp and true.
      d. All forms must be free from ticks, line waiver, discontinuous curves, and other imperfections.
   8. Font: Indicated on the Drawings.

2.2 INSTALLATION MATERIALS

A. Fasteners: Non-removable mechanical fasteners and anchors suitable for secure attachment to substrate and placed through predrilled holes as recommended in writing by the sign manufacturer.
   1. Exposed Fasteners: Exposed fasteners are permitted only where specifically stated in the drawings and must be stainless steel painted or finished to match adjacent surfaces, unless otherwise indicated.
   2. Concealed Fasteners: Fabricate from metals that are not corrosive to the sign material and mounting surface.

B. Tape: “VHB Tape” manufactured by 3M, or equal.

C. Adhesive: “732 Multi-Purpose Sealant Clear” manufactured by Dow Corning Corp., or equal.

2.3 ACCESSORIES

A. Plastic Cement: “WELD-ON 4” manufactured by IPC Corp., or equal.

B. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
   1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
   2. Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed signs and adjacent items.
   3. Install signs using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
   4. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
   5. Securely attach signs in place to supporting construction.
   6. Installed signs must be warrantable. Do not install, correct, or replace signs in a manner that results in any warranty or guarantee becoming void.

B. Installation Tolerances: Install signs to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch and from plumb, level, and alignment.

C. Correction and Repair:
   1. Correct deficiencies that do not conform to the Contract Documents.
   2. Repair non-conforming, damaged and defective work.
   3. Replace soiled items that cannot be cleaned to the same condition as new.

D. Protection:
   1. Protect installed signs in place from soiling, deterioration, and damage until Substantial Completion.
   2. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

SECTION 10 22 19 – MANUFACTURED PARTITION ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Demountable partitions.
   2. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

A. Delegated Design Requirements:
   1. Engineer, fabricate, assemble, and install sliding storefronts that conform to the profiles indicated and other Contract Document requirements; meet specified performance criteria; and result in structurally sound, non-corroding, and weathertight assemblies that accommodate, resist, distribute, or transfer in-service loads without incipient or catastrophic failure.
   2. Maintain visual design concept indicated, including sizes, profiles, and alignments. Deviation from visual design concept is non-conforming work and prohibited without prior written acceptance by the Architect.

B. Performance Requirements:
   1. Design Loads: Partitions must withstand the effects of earthquake motions determined in conformance with the seismic design provisions of American Society of Civil Engineers/ Structural Engineering Institute publication ASCE/SEI 7, "*Minimum Design Loads and Associated Criteria for Buildings and other Structures*".
   2. Uniformly Distributed Lateral Live Load: At least 10 pounds per square foot.
   3. Sound Transmission Class (STC): Provide complete assemblies (both frame and glazing) having a minimum laboratory-tested STC value of at least STC 36, as determined in conformance with ASTM E 413, based on testing in conformance with ASTM E 90.

C. Submittals: Submit product data, shop drawings, and samples.

D. Manufacturer Warranty: Furnish to the Owner a written manufacturer warranty for products, components, and accessories against all patent and latent defects, and incipient and catastrophic failure for 10 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: Provide products manufactured by the following, or equal.
   1. Krueger International, Inc.
   2. DIRTT Environmental Solutions, LTD.
   3. Haworth, Inc.
   4. Steelcase, Inc.

2.2 MANUFACTURERED PARTITIONS

A. Description: Pre-manufactured, modular, demountable partition system, components, accessories, and integrated utilities.

B. Products: “Genius Wall” (ICC-ES Report No. ESR-2673) manufactured by Krueger International, Inc.

C. Requisite Properties:
   1. Height: Indicated on the Drawings.
   2. Wall finishes: Acoustical wall fabric and writable surface as indicated on the Drawings.
   3. Swing Doors: Indicated on the Drawings.
   4. Glazing: 1/2-inch thick butt-glazed clear tempered glass.
   5. Door: Fully-glazed aluminum-framed stile and rail single-sliding door.
   6. Door Pulls: Indicated on the Drawings.
   7. Finishes: Clear anodized aluminum.
   8. Power and Data: Indicated on the Drawings.

2.3 ACCESSORIES

A. Floor Wireways: Provide one of the following, or equal.
   1. “Connectrac” manufactured by Connectrac.
   2. “Thread” manufactured by Steelcase.

B. Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
   1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
   2. Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed operable partitions and adjacent items.
   3. Install operable partitions using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
   4. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
   5. Securely attach operable partitions in place to supporting construction.
   6. Installed operable partitions must be warrantable. Do not install, correct, or replace operable partitions in a manner that results in any warranty or guarantee becoming void.

B. Installation Tolerances: Install partitions within the following tolerance variations.
   1. Maximum Variation from True Position: Not more than 1/8-inch in 12 feet nor more than 1/4-inch over any total length.
   2. Maximum Variation from Plane: Not more than 1/8-inch in 12 feet nor more than 1/4-inch over any total length.
   3. Maximum Out of Plumb: Not more than 1/8-inch in 10 feet.
   4. Maximum Out of Level: Not more than 1/8-inch in 20 feet nor more than 1/4-inch in any 40-foot run.
   5. Maximum Offset between Components at Joints:
      a. In-line Surfaces: Not more than 1/16-inch
      b. Corners: : Not more than 1/32-inch
   6. Squareness: Not more than 1/8-inch difference in diagonal measurements.

C. Correction and Repair:
   1. Correct deficiencies that do not conform to the Contract Documents.
   2. Repair non-conforming, damaged and defective work.
   3. Replace soiled items that cannot be cleaned to the same condition as new.

D. Protection:
   1. Protect installed operable partitions in place from soiling, deterioration, and damage until Substantial Completion.
   2. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

DIVISION 12

FURNISHINGS

SECTION 12 24 13 – ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Roller window shades.
   2. Shade operation.
   3. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

A. Submittals: Submit product data, shop drawings, wiring diagrams, and samples.

B. Manufacturer Warranty: Furnish to the Owner a written manufacturer warranty for products, components, and accessories against all patent and latent defects, and incipient and catastrophic failure for 5 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Provide products manufactured by one of the following, or equal.
   1. MechoShade Systems, Inc.
   2. Draper, Inc.
   3. Lutron Electronics Co., Inc

2.2 ROLLER WINDOW SHADES

A. Products: Provide products manufactured by MechoShade Systems, Inc., or equal.

B. Requisite Properties:
   1. Models:
      a. Manual Shade Operation: “Mecho/5 System”, or equal.
      b. Motorized Shade Operation: “WhisperShade IQ”, or equal.
   2. Sunscreen Shadecloth: “EcoVeil 1550 Series”, or equal.
      a. Size: Fabric width to match window mullion spacing.
      b. Minimum Thickness: At least 30 mils.

c. Total Weight: 17.6 ounces per square yard.
d. Color:
   1) WC-1: 1567 “Straw”.
   2) WC-2: 1566 “Eggshell”.
e. Pattern: Tightly-woven linear weave.
f. Bottom Hem: Straight.

3. Mounting: Ceiling mounting permitting easy removal and replacement without damaging roller shade or adjacent surfaces and finishes.
4. Direction of Roll: Regular roll.
5. Operation: Manual operation.

C. Performance Requirements:
1. Fire Resistance: Provide shade fabrics tested in conformance with NFPA 701, small scale Vertical Burn Test, and rated “PASS”.
2. Toxicity: Provide shade fabrics tested in accordance with University of Pittsburgh Toxicity Protocol including LC50 analysis and toxicity characteristics.
3. Anti-Microbial: ASTM G 21 results indicating “No Growth”; ASTM G 22 results indicating minimum 0.197-inch “No Growth Contact Area”.

2.3 COMPONENTS

A. Rollers: Either electro-galvanized or epoxy-primed steel, or extruded-aluminum tube of diameter and wall thickness required to support and fit internal components of operating system and the weight and width of shade band material without sagging; designed to be easily removable from support brackets; with removable spline fitting integral channel in tube for attaching shade material. Provide capacity for one roller shade band(s) per roller, unless otherwise indicated.

B. Mounting Brackets: Fascia end caps, fabricated from steel finished to match fascia or headbox.

C. Fascia: L-shaped, formed-steel sheet or extruded aluminum; long edges returned or rolled; continuous panel concealing front and bottom of shade roller, brackets, and operating hardware and operators; length as indicated; removable design for access.

D. Top/Back Cover: L-shaped; material and finish to match fascia; combining with fascia and end caps to form a six-sided headbox enclosure sized to fit shade roller and operating hardware inside.

E. Pocket-Style Headbox: U-shaped, formed-steel sheet or extruded aluminum; long edges returned or rolled; with a bottom cover consisting of slot opening of minimum dimension to allow lowering and raising of shade and a removable or an openable, continuous metal access panel concealing shade roller, brackets, and operating hardware and operators within.

F. Bottom Bar: Steel or extruded aluminum. Provide concealed, by pocket of shade material, internal-type bottom bar with concealed weight bar as required for smooth, properly balanced shade operation.

G. Hold-Down Brackets and Hooks or Pins: Manufacturer's standard for anchoring roller shade bottom in place and keeping shade band material taut.

2.4 SHADE OPERATION

A. Manual Shade Operation:
   1. Lift-Assist Mechanism: Manufacturer's standard spring assist for balancing roller shade weight and lifting heavy roller shades.
   2. Loop Length: Continuous-loop bead-chain with loop length equal to full length of roller shade.
   3. Bead Chain: Stainless steel.

2.5 ACCESSORIES

A. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

B. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
   1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
   2. Verify in-place supporting and adjacent construction conforms to the manufacturer’s requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed window shades and adjacent items.
   3. Install window shades using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
   4. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction

5. Securely attach window shades in place to supporting construction and safely connect facility services.
6. Installed window shades must be warrantable. Do not install, correct, or replace window shades in a manner that results in any warranty or guarantee becoming void.

B. Installation Tolerances: Install window shades to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch and from plumb, level, and alignment.

C. Correction and Repair:
1. Correct deficiencies that do not conform to the Contract Documents.
2. Repair non-conforming, damaged and defective work.
3. Replace soiled items that cannot be cleaned to the same condition as new.

D. Protection:
1. Protect installed window shades in place from soiling, deterioration, and damage until Substantial Completion.
2. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

DIVISION 27

COMMUNICATIONS

SECTION 27 51 19 – SOUND MASKING SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Sound masking system
   2. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

A. Submittals: Submit product data, shop drawings, and wiring diagrams.

B. Design Requirements: Engineer and install sound masking systems that meet specified performance criteria.
   1. Sound masking system must furnish uniform coverage throughout the masked space such that listeners moving through the space cannot localize individual loudspeakers nor detect changes in background noise levels.
   2. Sound masking system must be centrally controllable from a control panel and via the network.
   3. Sound masking system must be able to automatically assign an address to individual network components.

C. Performance Requirements:
   1. System must utilize digital signal processing technology for masking sound generation and adjustment of masking signals.
   2. Masking sound must be random and may not provide noticeable repetitive patterns.
   3. Each zone must provide a 1/3-octave band equalizer for the masking signal, capable of equalizing zones of up to 3 loudspeakers.
   4. Volume must be digitally adjustable in 0.5 decibel increments at each primary network device over a range of 35 decibel to 85 decibel measured at a distance of one meter.
   5. System must be capable of muting the masking volume at each zone.
   6. Listed sound levels are sound pressure levels measured at 5 feet above finish floor.
   7. After adjustment, system must provide a spatial uniformity of plus or minus 2 dB with furnishings in place.
   8. Nominal level of masking must be set at 42 dB(A) in open/circulation areas and 36 dB(A) in private offices. The upper and lower limit for 1/3 octave band sound pressure levels are listed in the tables below.

	Frequency (Hz)																				
42 dB(A)	125	160	200	250	315	400	500	630	800	1 k	1.25 k	1.6 k	2 k	2.5 k	3.15 k	4 k	5 k	6.3 k	8 k	10 k	dB(A)
Upper Limit (dB)	47	45	44	42	41	39	37	36	34	32	30	28	26	25	23	21	19	17	15	13	**44**
Lower Limit (dB)	39	39	38	38	37	35	34	32	31	29	27	24	22	19	17	14	12	9	7	4	**40**

	Frequency (Hz)																				
36 dB(A)	125	160	200	250	315	400	500	630	800	1 k	1.25 k	1.6 k	2 k	2.5 k	3.15 k	4 k	5 k	6.3 k	8 k	10 k	dB(A)
Upper Limit (dB)	41	39	38	36	35	33	31	30	28	26	24	22	20	19	17	15	13	11	9	7	**38**
Lower Limit (dB)	33	33	32	32	31	29	28	26	25	23	21	18	16	13	11	8	6	3	1	0	**34**

9. Installed loudspeaker coverage must be uniform in level and spectral character without regard to ceiling conditions such as penetrations and varying ceiling construction.
10. Masking in transitional zones will be provided so that persons entering a masked area do not walk into or out of a “wall of sound,” and that coverage level ramps up as the occupant walks into or out of an area with sound masking.

D. Timer Performance Requirements: Sound masking system must include the following.
1. A timer function allowing masking volume levels to be automatically adjusted according to a programmed schedule.
2. Calendar-based programmable timer function assigned to an individual or group of primary network devices.
3. Automatic daylight saving time adjustments.
4. Acclimatization process that automatically increases the masking volume over a period of time according to a programmed schedule. System must accommodate independent acclimatization schedules for each timer zone. System must be set to “ramp up” to the specified level over a period of 5 consecutive work days.
5. Up to 9 independent timer zones per control panel/programmable timer.
6. Independent timer schedules for each day of the week.
7. Variable rates of scheduled volume adjustments.
8. Exception timer schedules for calendar days requiring a different schedule from normal schedule.
9. Programmed system activation date.

PART 2 - PRODUCTS

2.1 SOUND MASKING SYSTEM

A. Product: “LogiSon Acoustic Network” manufactured by K.R. Moeller Associates Ltd., or equal.

B. Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
   1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
   2. Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.
   3. Install sound masking equipment using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
   4. Installed sound masking equipment must be warrantable. Do not install, correct, or replace sound masking equipment in a manner that results in any warranty or guarantee becoming void.

B. Site Tests and Inspections:
   1. General: Include site tests and inspections as part of the work of this specification section.
      a. Schedule and arrange tests and inspections.
      b. Coordinate work and the final construction schedule with all tests and inspections.
      c. Furnish all work, equipment, tools, facilities, personnel, and controls necessary for each test and inspection.
      d. Arrange tests and inspections by notifying the Owner, the testing and inspection agency, the installer, the manufacturer's representative, and the Architect at least 5 business days before work is ready for testing or inspection.
      e. Witness all site tests and inspections.
      f. Receive test and inspection reports and distribute to the installer and the manufacturer's representative.
   2. Required Tests:
      a. Field Acoustical Testing: After installation and adjustment of sound masking system conduct acoustical tests to ensure conformance to specified performance requirements.

C. Correction and Repair:
   1. Correct deficiencies that do not conform to the Contract Documents.
   2. Repair non-conforming, damaged and defective work.

END OF SECTION

DIVISION 32

EXTERIOR IMPROVEMENTS

SECTION 32 17 20 – PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Pavement markings.
   2. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

A. Submittals: Submit product data, shop drawings, and samples.

PART 2 - PRODUCTS

2.1 PAVEMENT MARKINGS

A. Description: 100-percent water-based acrylic coating used for exterior zone and parking line marking without reflecting glass beads broadcast over the surface.

B. Products: “DURASHEEN Traffic paint” manufactured by Ennis Traffic Safety Solutions, or equal.

C. Requisite Properties:
   1. International Symbol of Accessibility Markings: Single 4-inch wide white lines with blue background. Match Federal Standard 595C color FS 15090 (blue).

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
   1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
   2. Verify in-place supporting and adjacent construction conforms to the manufacturer’s requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed paving specialties and adjacent items.

3. Install paving specialties using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
4. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
5. Securely attach paving specialties in place to supporting construction.
6. Installed paving specialties must be warrantable. Do not install, correct, or replace paving specialties in a manner that results in any warranty or guarantee becoming void.

B. Pavement Marking Special Techniques:
1. Paint the International Symbol of Accessibility on pavement at each accessible parking space, as indicated, in conformance with the requirements of section 11B-703.7.2.1 and 1129B.5, part 2, title 24 of CCR Accessibility Regulations. Paint white symbols on blue square backgrounds.

C. Installation Tolerances: Install paving specialties to an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch and from plumb, level, and alignment.

D. Correction and Repair:
1. Correct deficiencies that do not conform to the Contract Documents.
2. Repair non-conforming, damaged and defective work.
3. Replace soiled items that cannot be cleaned to the same condition as new.

E. Protection:
1. Protect installed paving specialties in place from soiling, deterioration, and damage until Substantial Completion.
2. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

SECTION 32 17 26 – TACTILE WARNING SURFACING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Detectable warning surfacing mat.
   2. Installation materials.
   3. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

1.2 SECTION REQUIREMENTS

A. Submittals: Submit product data, shop drawings, and samples.

B. Maintenance Material Submittals: Before Final Completion, deliver to the Owner tactile surfacing cleaning materials, equipment, accessories, and instructions; and extra stock materials to replace those worn or damaged as a result of normal occupancy.
   1. Furnish at least 2 percent of the total installed for each tile tactile surfacing color, composition, and variety.
   2. Furnish at least 2 percent of the total amount installed for each installation material type, color, and composition. but not less than one unopened container.

A. Manufacturer Warranty: Furnish to the Owner a written manufacturer warranty for products, components, and accessories against all patent and latent defects, and incipient and catastrophic failure for 10 years.

PART 2 - PRODUCTS

2.1 DETECTABLE WARNING SURFACING MAT

A. Description: Surface-applied, self-adhering, flexible, UV-protected, glass fiber reinforced polyurethane detectable warning tactile surfacing mat.

B. Products: “RediMat” manufactured by Detectable Warning Systems, Inc., or equal.

C. Requisite Properties:
   1. Sizes: Indicated on the Drawings.
   2. Color: Yellow.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General:
   1. Ensure proper supervision practices are followed at the project site before the installer begins work and at all times during installation.
   2. Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed tactile surfacing and adjacent items.
   3. Install tactile surfacing using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
   4. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
   5. Securely attach tactile surfacing in place to supporting construction.
   6. Installed tactile surfacing must be warrantable. Do not install, correct, or replace tactile surfacing in a manner that results in any warranty or guarantee becoming void.

B. Installation Tolerances: Install tactile surfacingto an allowable tolerance variation of not more than 1/4-inch from true position and not more than 1/8-inch and from plumb, level, and alignment.

C. Correction and Repair:
   1. Correct deficiencies that do not conform to the Contract Documents.
   2. Repair non-conforming, damaged and defective work.
   3. Replace soiled items that cannot be cleaned to the same condition as new.

D. Protection:
   1. Protect installed tactile surfacing in place from soiling, deterioration, and damage until Substantial Completion.
   2. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION