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ADDENDUM #2

DATE:	**November 26, 2025**
PROJECT:	**Georgia War Veterans Nursing Home** **Classroom Addition** **1101 15th Street, Augusta, GA 30901**
PROJECT NUMBER:	**2KM #2022-05.08**

Part 1 – Specifications:

2.101 Reference Division 6, Wood Plastics and Composites:
- A. **ADD** the following items:
  - 1. ***Section 06 16 56 Air and Water Resistive Sheathing Board.***

2.102 Reference Division 7, Thermal and Moisture Protection:
- A. **ADD** the following items:
  - 1. ***Section 07 42 43 Composite Wall.***
- B. **ADD** the following as approved manufacturer in Section 07 54 19 Polyvinyl-Chloride Membrane Roofing, Item 2.2.A:
  - 1. ***"Duro-Last EV PVC KEE".***
- C. **ADD** the following items:
  - 1. ***Section 07 84 00 Firestopping.***

Part 2 – Drawings:

N/A

Part 3 – Project Clarifications:

2.301 Question #1: Structural Components – Purlins/Joists and Steel Decking
The Architectural drawings refer to "See Structural," while the Structural drawings note "Design by Others." See attached. Please confirm which party is responsible for providing the design and specifications for the purlins/joists and/or structural steel decking.

Response: **The phrase "Design by Others" indicates that the structural design of the cold-formed steel (CFS) purlins is a delegated design. In other words, it is the General Contractor's responsibility to retain a CFS engineer to design these elements in accordance with the project's specifications and submit a shop drawing for review.**

2.302 Question #2: Insulated Metal Cladding / Fiber Cement Specifications
We were unable to locate specifications for the insulated metal cladding and/or fiber cement products. Will a spec section be issued, or can you provide the required performance and product criteria?

Response: **See Section 07 42 43 Composite Wall Panels attached.**

2.303 Question #3: Roller Shades – Spec Section 12 49 40
This section is included in the specifications; however, roller shades do not appear to be identified on the drawings. Please confirm whether roller shades are to be included and, if so, where they are required.

Response: **Roller shades are to be installed on Storefront Type "B" in the Clinical Training Room #103A.**

2.304 Question #4: Furniture Schedule – Vendor Responsibility (A1.4)
The furniture schedule lists several items as FBVIBV – Furnished by Vendor, Installed by Vendor. Will the General Contractor be responsible for providing and coordinating with the vendor, or will the Owner provide the furniture vendor directly?

Response: **Furniture will be procured thru a separate contract with the Owner and Furniture vendor.**

2.305 Question #5: Certification Requirements – ASHE vs. ICRA
The documents reference ASHE certification requirements. Will ICRA certification be considered an acceptable alternative, or will the GC be required to obtain ASHE certification if awarded the project?

Response: **ICRA certification will be acceptable.**

2.306 Question #6: Please clarify the total number of calendar days allotted for the above referenced project. The specifications state that all work must be completed within 280 consecutive days starting the day after the Notice to Proceed, while Addendum 1 specifies a duration of 250 consecutive days.

Response: **The project is to be completed in 280 consecutive calendar days.**

2.307 Question #7: A2.1 shows the exterior wall clad with insulated metal panels. When you go to A2.2 on the cuts it shows a fiber cement cladding system. Which is correct? Also, I don't see a spec for either of them.

Response: **The exterior wall clad should be composite wall panels. See Section 07 42 43 Composite Wall Panels specification attached.**

2.308 Question #8: Please confirm that fireproofing of the structural steel will not be required.

Response: **Fireproofing of structural steel is required per details on A1.3 – Roof Plan and Details. See Section 07 84 00 Fireproofing specification attached.**

2.309 Question #9: Will we be able to get all the offices to do the finishes or will it need to be phased. If phased how many phases.

Response: **The three (3) offices and the administrative conference room can be done individually (one at a time) during normal business hours. The Owner would need several days advance notice to pack up the designated office. The central common area needs to be done after hours as they all use this space to access their respective offices. The administrative conference room would be used by whoever is displaced during the individual office work. Therefore, the work would need to be done in approximately (5) phases:**

- **Executive Director's Office #150**
- **Medical Director's Office #152**
- **Associate Director's Office #149**
- **Administrative Conference Room #157 and Conference Room #142**
- **Admin./File Area/Corridor #144 & #155**

2.310 Question #10: Can we do the exterior and interior work at the same time?

Response: **Yes.**

2.311 Question #11: Will there be any parking permit fees that will be required to not get a ticket from the AU parking police?

Response: **Contractors may use the gravel contractor lot to the North of the GWVNH parking lot.**

2.312 Question #12: We are wanting to confirm that the construction notes on page A1.1 are the extent of work needed on the interior of the building independent from the addition itself? We were told by Chris Townsend that existing chair railing in areas (103) lobby, (100E) corridor and (100A) lobby would all require re-staining. Can you confirm this to be an accurate statement? Additionally, we want to confirm that ALL grid is to remain per the plans and only ceiling tile is to be replaced with new?

Response: **All work within the area of construction barrier, if damaged, should be restored to current conditions/finishes. The only existing chair rail to be restained is in Conference Room #142 per plans. All grid is to remain per the plans noted. The ceiling grid in Dining/Multi-purpose Room #107 is not anticipated to be heavily damaged with the addition tie in but if heavily damaged, it will need to be restored.**

2.313 Question #13: We are requesting Duro-Last's EV PVC Kee Membrane 60-mil as an approved equal in lieu of FiberTite and Tremco's products.

Response: **Duro-Last EV PVC KEE is approved as an equal manufacturer.**

2.314 Question #14: Drawing A1.1 (Detail 3) shows WT-1 on all elevations (North, South and East) the WT-1 cut section shows an exterior fiber cement cladding system. Drawing A2.2 details 1,2,3 show all elevations with an insulated metal panel cladding system. Which cladding system will be required on this project? Additionally, can you include a division in the spec manual for the required product?

Response: **The exterior wall clad should be composite wall panels. See Section 07 42 43 Composite Wall Panels specification attached.**

2.315 Question #15: Is there a specific brand/type of 1" sheathing required for the substrate? Also can this be 5/8" sheathing?

Response: **See Section 06 16 56 Air and Water Resistive Sheathing Board specification attached. Sheathing should be 5/8" thick for Wall Type WT-1.**

END OF ADDENDUM #2

SIGNED BY _____

Robert L. Mauldin, NCARB, AIA
Principal Architect, GA-RA-005958

Enclosed:

Spec:	Section 06 16 56	Air and Water Resistive Sheathing
	Section 07 42 43	Composite Wall Panels
	Section 07 84 00	Firestopping

DIVISION 6 – WOOD & PLASTICS
SECTION 06 16 56 - AIR- AND WATER-RESISTIVE SHEATHING BOARD

PART 1 - GENERAL

1.1 RELATED SECTIONS

A. Section 06 10 00 “Rough Carpentry”.

B. Section 07 42 34 “Composite Wall Panels”.

C. Section 07 26 00 “Spray Applied Vapor Retarders”.

1.2 SUMMARY

A. Section Includes:
1. Vapor-permeable, air- and water-resistive wall sheathing.
2. Site-fluid-applied, vapor-permeable air barrier flashing.
3. Accessories.

1.3 DEFINITIONS

A. Air Barrier Accessory: A transitional component of the air barrier that provides continuity.

B. Air Barrier Assembly: The collection of ABs and accessories applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

C. Air Barrier Material (AB): Airtight barrier made of material that is air impermeable but moisture vapor permeable, with sealed joints and penetrations, and with terminations sealed to adjacent surfaces.

D. Material Transitions: Areas where the WRB/AB fiberglass-mat gypsum sheathing connects to beams, columns, slabs, parapets, foundation walls, roofing systems, and at the interface of dissimilar materials.

E. Rough Openings: Openings in the wall to accommodate windows and doors.

F. Weather-Resistant Barrier (WRB): Water-shedding barrier made of moisture-resistant material, and installed to shed water, with sealed joints and penetrations, and with terminations sealed to adjacent surfaces.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
1. Coordinate installation of board product air barriers with framing installation and subsequent operations that impact finished envelope air barrier work.
2. Coordinate installation of joint sealants with cleaning of joint sealant substrates and other operations that may impact installation or finished joint sealant work.

B. Preinstallation Conference: Conduct conference at 909 E. Robert Toombs Ave., Washington, GA.
1. Review board product air barrier accessory materials installation, including joints between sheathing boards and transitions to abutting construction including air barrier work of other Sections. Review requirements for forming and sealing penetrations of air barrier by other trades.
2. Review requirements for each type of air barrier product and installation, Project and manufacturer's details, mockups, testing and inspection requirements, and coordination and sequencing of air barrier work with work of other Sections.
3. Review manufacturer's written instructions for meeting Project requirements for substrates specified, including three-dimensional video model demonstrating proper application of components at wall openings.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of air barrier product assembly and accessory. Indicate assembly component materials and dimensions and include construction and application details. Include the following:
   1. Framing preparation instructions and recommendations.
   2. Substrate preparation instructions and recommendations.
   3. Air- and water-resistive sheathing board assembly.
   4. Standard drawings illustrating manufacturer's written instructions for installation and finishing applicable to Project, including details for joints, counterflashings, penetrations, terminations, and tie-ins to adjacent construction.

B. Shop Drawings: For locations and extent of WRB/AB system.
   1. Include details of typical conditions, special joint conditions, and intersections with other building envelope systems and materials.
   2. Include counter flashings and details showing bridging of envelope at substrate changes.
   3. Detail sealing penetrations and flashing around windows and doors.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and manufacturer.

B. Manufacturer Product Certificates: Indicate compliance with requirements of specified products in "Performance Requirements" Article or as indicated on Drawings.

C. Fire-Propagation Characteristics Certificate: From a qualified testing agency, documentation that air barrier system as a component of a wall assembly has been tested or engineered to pass NFPA 285. Include system classification number of testing agency on Shop Drawings.

D. Product Certificates: Indicate compliance with requirements of specified products in "Performance Requirements" Article or as indicated on Drawings.

E. Product Test Reports: For each air barrier product, and air- and water-resistive sheathing board assembly, for tests performed by a qualified testing agency.

F. Sample Warranties: For manufacturer's warranties.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified air barrier manufacturer experienced in manufacture of air barrier as one of its principal products.

B. Installer Qualifications: An experienced entity that employs applicators trained in application of specified products.

C. Testing Agency Qualifications: Qualified independent agency experienced in installing specified waterproofing system, and qualified to perform observation and inspection specified in "Field Quality Control" Article to determine Installer's compliance with requirements of this Project. Testing agency to be acceptable to Architect and retained by Contractor.

D. Mockups: Provide air barrier mockup application within mockups required in other Sections, or if not specified, in an area of not less than 64 sq. ft. (5.9 sq. m) of wall surface where directed by Architect for each type of backup wall construction. Include examples of surface preparation, crack and joint treatment, air barrier application, flashing, transition, and termination conditions. Build mockups to set quality standards for materials and execution.
   1. Include air barrier system tie-in details between walls and roof, and with wall and foundation wall. Include penetrations and openings.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original, unopened packaging and store in an enclosed shelter providing protection from damage and exposure to the elements.
   1. Store within temperature limits required by manufacturer.
   2. Store air- and water-resistive sheathing board supported on risers on a flat platform.
   3. Comply with manufacturer's written instructions for safety and handling.

B. Discard liquid materials that cannot be applied within their stated shelf life.

C. Store accessory materials in a location with constant ambient temperatures of 40 to 80 deg F (4 to 27 deg C).

1.9 FIELD CONDITIONS

A. Cold-Weather Conditions:
   1. Site Fluid-Applied, Vapor-Permeable Joint Flashing: Comply with manufacturer's cold-weather application written instructions when atmospheric temperatures or substrate surface temperatures are less than 40 deg F (4 deg C).
   2. Accessories and Sealants: Comply with manufacturer's cold-weather application written instructions when atmospheric temperatures or substrate surface temperatures are less than 40 deg F (4 deg C).

B. Exposure: Comply with manufacturer's limitations on exposure of applied product.
   1. Do not apply air barrier joint flashing to sheathing surface that is frozen or has frost.

C. Protect adjacent substrates from environmental conditions that affect air barrier performance.

D. Coordinate installation of air barrier with completion of roofing, below grade, factory applied air barrier portion to site fluid-applied membrane portion and other work requiring interface with air barrier.

E. Schedule work for inspection of air barrier applications prior to concealment.

F. Ensure ABs are cured before covering with other materials.

1.10 WARRANTY

A. Manufacturer's Warranty for Air- and Water-Resistive Barrier System: See manufacturer's published limited warranty.
   1. Defects: the system installed or to be installed in such structure was, at the time of shipment from manufacturer, free from manufacturing defects that make it unsuitable for its intended use as a water-resistive and air barrier (WRB-AB) system which limited warranty shall have a duration of ten (10) years from the date of purchase of the product or, when the system is used as a substrate in architecturally specified drainable EIFS, twelve (12) years from the date of purchase of the product for installation; and
   2. Exposure: the system, when properly installed in such structure, will not deteriorate or delaminate as a result of normal use conditions or as a result of exposure to normal weather conditions, or excessive humidity, for a period of twelve (12) months commencing on the date of installation of the system in such structure.

B. Drainage Plane: the system, when properly installed in such structure and when cladding systems are properly designed and installed to promote drainage, is suitable for use as a drainage plane, which limited warranty shall have a duration of ten (10) years from the date of purchase of the product or, when the system is used as a substrate in architecturally specified drainable EIFS, twelve (12) years from the date of purchase of the product for installation. The foregoing warranties apply only when the system has been subjected to normal weather and use conditions and has been accorded treatment which is considered good practice in the building industry regarding storage, handling, joint and opening treatment, and maintenance of such products. In addition to this limitation, any damage to the system resulting in whole or in part from the following conditions is NOT the manufacturer’s responsibility and is NOT covered by the

foregoing warranties:

1. Failure to store, handle or install the system in accordance with manufacturer's storage, handling and installation instructions, applicable building practices and all applicable building codes;
2. Improper design or installation of the system, or assembly, or any portion or component of the structure, or failure or distortion of the walls, foundation or any other portion or component of the structure, including settling of the building or movement of framing members, or failure to establish adequate drainage;
3. Suitability or performance, including failure to establish adequate drainage, of any cladding, coating, finishes, coverings or materials (other than the manufacturer's approved tape or liquid flashing for the treatment of the joints, fasteners, openings, transitions and penetrations of the system) applied or attached to the system;
4. Causes other than normal weather and use conditions, such as: impact with objects; high force winds, earthquake, flood, fire or other acts of God or nature; sustained cascading or pooling of water, or immersion in water; or any other cause beyond GP's control;
5. Mold, mildew, fungi, bacteria or other similar conditions;
6. Failure to purchase and install the system within twelve (12) months from its date of manufacture;
7. Use of the system other than for its intended use
8. A third-party's actions, omissions or negligence

PART 2 - PRODUCTS

2.1 MATERIALS

A. Source Limitations: Obtain fluid-applied flashing materials and air barrier accessories from single source from single manufacturer.

B. VOC Content: 100 g/L or less.

C. Low-Emitting Materials: Fluid-applied flashing and accessories shall comply with testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.2 PERFORMANCE REQUIREMENTS

A. Air- and Water-Resistive Performance: Air- and water-resistive board assembly and seals with adjacent construction shall be capable of performing as a continuous air barrier system and as a water-resistive barrier flashed to direct incidental water to wall exterior, and interface with adjacent building air barrier system components.

1. Air- and Water-Resistive Board Assemblies: Capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations and transitions at perimeter conditions without deterioration, and air-leakage exceeding specified limits.

B. Air Permeance of Sheathing: Maximum 0.004 cfm/sq. ft. (0.02 L/s/sq. m) of surface area at 1.57 lbf/sq. ft. (75 Pa), when tested in accordance with ASTM E2178.

C. Air- and Water-Resistive Board Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. (0.2 L/s x sq. m) of surface area at 1.57 lbf/sq. ft. (75 Pa), when tested in accordance with ASTM E2357.

D. Water Penetration under Static Pressure: Test in accordance with ASTM E331, as follows:

1. No evidence of water penetration through air barrier board assembly when tested in accordance with a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 2.86 lbf/sq. ft. (137 Pa).

E. Water Vapor Permeance; Panel Assembly: 25 perms (1436 ng/Pa x s x sq. m) or more as tested in accordance with ASTM E96/E96M, Procedure B.

F. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated in accordance with ASTM E119 by a qualified testing agency.

G. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 450 or less.

H. Fire Propagation Characteristics: Provide air- and water-resistive board assembly qualified as a component of a comparable wall assembly that has been tested or engineered to pass NFPA 285.

2.3 WALL SHEATHING

A. Air- and Water-Resistive Sheathing Board: ASTM C1177/C1177M, glass-mat-faced gypsum sheathing board.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Georgia-Pacific Gypsum LLC; DensElement Barrier System or comparable product by one of the following:
a. StoGuard Waterproof Air Barrier.
b. Alternative Manufacturers will be accepted at Architects discretion.
2. Board Thickness: 5/8 inch (15.9 mm) thick.
3. Board Type: Type X.
4. Board Size: 48 by 96 inches (1219 by 2438 mm) for vertical and horizontal installations.
5. Air- and Water-Resistive Flashing Thickness: Minimum 16 mil (0.41 mm) wet film thickness.
6. Physical and Performance Properties:
a. Air Permeance; ASTM E2178: Maximum 0.004 cfm/sq. ft. (0.02 L/s x sq. m) of surface area at 1.57 lbf/sq. ft. (75 Pa) pressure difference.
b. Water Vapor Permeance: 25 perms (1436 ng/Pa x s x sq. m) or more when tested in accordance with ASTM E96/E96M, Procedure B.
c. Combustion Characteristics; ASTM E84: Class A.
d. Board Product Antifungal Properties; ASTM D3273: 10; zero defacement.
e. VOC Content - Fluid-Applied Flashing: 50 g/L or less.
f. UV and Weathering Resistance: Maximum 12-month exposure.

2.4 AIR BARRIER ACCESSORY MATERIALS

A. General: Provide compatible air barrier accessory materials furnished or in accordance with air barrier manufacturer's written instructions as required by Project conditions to produce a complete air barrier assembly identical to tested assemblies meeting performance requirements.

B. Joint Backing: See Section 07 92 00 "Joint Sealants & Gasketing" for backing materials.

C. Primer: Liquid primer in accordance with air barrier manufacturer's written instructions for exposed gypsum core edges.
1. Basis-of-Design Product: Subject to compliance with requirements, provide PROSOCO, Inc.; PorousPrep Sealer.
2. Color: Blue.

D. Fluid-Applied Air Barrier Flashing: Site-applied for application to joints, fasteners, penetrations, openings, and material transitions.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Georgia-Pacific Gypsum LLC; DensDefy Liquid Flashing.
2. Color: Gold.

E. Flashing and Transition Strip: self-adhered membrane, 25 mils (0.64 mm) thick.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Georgia-Pacific Gypsum LLC; DensDefy Transition Membrane.

2.5 FASTENERS

A. Screws for Fastening Board Product Air Barriers to Wood Framing: Wood screws, ASTM C1002, in length in accordance with sheathing manufacturer's written instructions for sheathing thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing to determine if work is ready to receive board product air barriers.
   1. Verify that surface flatness tolerances and framing spacing comply with Project requirements.
   2. Verify that adequate support is provided for sheathing board edges.
   3. Proceed with work once conditions comply with manufacturer's written instructions.

B. Adjacent Substrate Examination: Prior to installation of accessory materials, examine adjacent substrates to receive transition treatment.
   1. Verify that substrates are sound and free of contaminants, adequately cured or aged, compatible with proposed transition materials, and free of obstructions or impediments that would result in failure of transition adhesion and failure of air barrier assembly to perform in accordance with Project requirements.
   2. Verify that concrete and masonry surfaces are visibly dry, cured, and free from release agents, curing agents, and other contaminates.
      a. Test for capillary moisture by plastic sheet method in accordance with ASTM D4263.
   3. Verify that masonry joints are filled with mortar and struck flush.

C. Proceed with installation once conditions comply with manufacturer's written instructions and only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean, prepare, and treat portions of work not requiring sheathing board substrate in accordance with air barrier manufacturer's written instructions.
   1. Mask adjacent finished surfaces.
   2. Remove contaminants and film-forming coatings from substrates.
   3. Remove projections and excess materials; fill voids with substrate patching material.
   4. Prepare and treat joints and cracks in substrate in accordance with air barrier manufacturer's written instructions.

B. Joints: Seal all sheathing joints with fluid-applied flashing approved by sheathing manufacturer. Fill gaps 1/4 inch (6.4 mm) or greater with backer rod prior to applying fluid-applied flashing.

3.3 INSTALLATION OF AIR- AND WATER-RESISTIVE SHEATHING BOARDS

A. Discard each air- and water-resistive sheathing board with damage that compromises continuity or impairs performance as an air barrier, and is unable to be repaired in accordance with manufacturer's written repair instructions.
   1. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

B. Comply with ASTM C1280, GA-253, and manufacturer's written instructions.
   1. Fasten sheathing boards to wood framing with specified screws in pattern indicated.
   2. Install sheathing boards with a 1/4-inch (6.4-mm) gap where they abut masonry or similar materials that might retain and transmit moisture to them.

C. Cut sheathing boards at penetrations, edges, and other obstructions of work to allow for application of air barrier accessory materials. Fit sheathing boards closely against abutting construction.

D. Install sheathing boards with long dimension perpendicular or parallel to framing. Abut ends and edges of sheathing boards centered over face of framing members. Offset sheathing boards joints by not less than one stud spacing.
   1. Apply sheathing boards in pieces sized to provide minimum number of joints and optimum sheathing board arrangement. Arrange joints so that pieces do not span between fewer than three support members.
   2. Do not bridge building expansion joints; cut and space edges of sheathing boards to match spacing of structural support elements.

E. Space fasteners maximum 8 inches (203 mm) o.c. and set back a minimum of 3/8 inch (9.5 mm) from edges and ends of sheathing boards and as required in indicated fire-resistance-rated designs.
   1. Apply fasteners with heads flush to board product air barrier membrane surface without breaking or punching through the surface.
      a. Treat all sheathing fasteners specified fluid-applied flashing used for sealing joints, a minimum of 16 mils thick.
   2. Securely attach sheathing boards to substrate by fastening as indicated, complying with the following:
      a. Table 2304.9.1, "Fastening Schedule," in the IBC.
      b. ICC-ES evaluation report for fastener.
   3. Use common galvanized wire nails. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.
   4. Use corrosion-resistant sheet metal screw fasteners. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections.

F. Coordinate wall sheathing boards installation with flashing and air barrier accessory material installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

3.4 INSTALLATION OF SITE FLUID-APPLIED AIR BARRIER FLASHING

A. General: Apply site fluid-applied AB at joints, fasteners, penetrations, openings, and material transitions to achieve a continuous air barrier in accordance with air barrier manufacturer's written instructions. Apply site fluid-applied AB in accordance with manufacturer's written instructions for application temperature ranges.

B. Apply self-adhered flashing material in full contact with substrate to produce a continuous seal in accordance with air barrier manufacturer's written instructions.
   1. Vapor-Permeable Air Barrier: Total wet film thickness in accordance with manufacturer's written instructions to meet performance requirements, but not less than 16 mil (0.41 mm) wet film thickness, applied in one or more equal coats by roller, spray, trowel, or knife.

C. Do not cover air barrier until it has been tested and inspected by Owner's testing agency.

D. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air barrier components.

3.5 INSTALLATION OF AIR BARRIER ACCESSORY MATERIALS

A. General: Install accessory materials in accordance with air barrier manufacturer's written instructions and AAMA 714. Install AB to adjacent components of building air barrier system, including, but not limited to, roofing system air barrier, exterior fenestration systems, door framing, and other openings.

B. Apply primer in accordance with manufacturer's written installation instructions.

C. Seal punctures, voids, and seams. Patch with fluid-applied flashing extending 1 inch (25.4 mm)

beyond repaired areas.

D. Seal wall penetrations in accordance with manufacturer's written instructions.

E. Connect and seal exterior wall air barrier continuously to subsequently installed roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.

F. Wall Openings Transition Assembly Installation: Apply opening transition assembly so that a minimum of 2 inches (51 mm) of coverage is achieved over adjacent sheathing board substrate.
1. Apply in accordance with window manufacturer's written instructions for silicone joint sealant bedding bead to aluminum frame and mechanically attach transition assembly aluminum race to aluminum frame.
2. Embed transition assembly in continuous application of fluid-applied flashing on sheathing board surface.

G. Rough Openings: Apply bead of fluid-applied flashing to inside corners first, followed by application to jambs, header, sill, and adjacent sheathing.

H. Flashings: Seal top of through-wall flashings to air barrier with fluid-applied flashing.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Owner may engage a qualified testing agency to perform tests and inspections.
1. Inspections: ABs, accessories, and installation are subject to inspection for compliance with requirements and photograph documentation of conditions to be concealed by subsequent Work.

B. Tests: As determined by Owner's testing agency from among the following tests:
1. Qualitative Air-Leakage Testing: Test air barrier assemblies for air leakage in accordance with ASTM E1186, smoke pencil with pressurization or depressurization or ASTM E1186, chamber pressurization or depressurization with smoke tracers.
2. Quantitative Air-Leakage Testing: Test air barrier assemblies for air leakage in accordance with ASTM E783.

C. Air- and water-resistive barrier will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.7 CLEANING AND PROTECTING

A. Clean spills, stains, and overspray resulting application using cleaning agents recommended by manufacturers of affected construction. Remove masking materials.

B. Protect air barrier from damage from subsequent work. Protect materials from exposure to UV light for period in excess of that acceptable to air barrier manufacturer; replace overexposed materials and retest.

END OF SECTION

DIVISION 7 – THERMAL AND MOISTURE PROTECTION
SECTION 07 42 43 – COMPOSITE WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Exterior panelized fiber-cement rainscreen cladding system and accessories.

1.2 DEFINITIONS

A. DBVR: Drained and back-ventilated rainscreen system; designed to drain and dry cavity entering water through drainage channels, weeps, and air ventilation.

1.3 PRE-INSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at Project site.
   1. Meet with Owner, Architect, Owner's insurer if applicable, composite panel Fabricator and Installer, composite panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects composite panels, including installers of doors, windows, and louvers.
   2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   3. Review methods and procedures related to composite panel installation, including manufacturer's written instructions.
   4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
   5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect composite panels.
   6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
   7. Review temporary protection requirements for composite panel assembly during and after installation.
   8. Review procedures for repair of panels damaged after installation.
   9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:
   1. Include details of panel dimensions, profiles, edge conditions, joints, corners, anchorages, attachment assembly, trim, flashings, closures, and accessories; and special details.
   2. Accessories: Include details of the flashing, trim, and anchorage, at a scale of not less than 1-1/2 inches per 12 inches (1:10).

C. Samples for Initial Selection: For each type of composite panel indicated with factory-applied color finishes.
   1. Include similar Samples of trim and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
   1. Composite Panels: 12 inches (305 mm) long by actual panel width. Include fasteners, closures, and other composite panel accessories. Submit custom color samples in paint manufacturer's standard size.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each product, tests performed by a qualified testing agency.
   1. Composite Manufacturer's Material Test Reports: Certified test reports showing compliance with specific performance or third-party listing documenting compliance to comparable code sections IBC 1404.16.1 and IBC 1703.5.
   2. Composite Panel System Fabricator's Certified System Tests Reports: Certified system test reports showing system compliance with specific performance or third-party listing documenting compliance code section. Base performance requirements on composite panel system type provided.
      a. DBVR System: Tested to AAMA 509.

C. Field quality-control reports.

D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For composite panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by composite panel fabricator.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for composite panel fabrication and installation.
   1. Build mockup of typical composite panel assembly [as indicated on Drawings] <Insert size>, including [corner,] [soffits,] supports, attachments, and accessories.
   2. Water-Spray Test: Conduct water-spray test of mockup of composite panel assembly, testing for water penetration in accordance with AAMA 501.2.
   3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, composite panels, and other manufactured items so as not to be damaged or deformed. Package composite panels for protection during transportation and handling.

B. Unload, store, handle, and erect composite panels in a manner to prevent bending, cracking, warping, twisting, and surface damage.

C. Stack composite panels on platforms or pallets no more than two pallets high, covered with suitable weathertight and ventilated covering.

D. Store composite panels to ensure dryness, with positive slope for drainage of water. Do not store composite panels in contact with other materials that might cause staining, denting, or other surface damage. Ensure panels are fully dry before installation.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of composite panels to be performed in accordance with manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

A. Coordinate composite panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

A. Warranty on Panel Material: Manufacturer agrees to replace fiber cement that fails within specified warranty period.
   1. Warranty Period: 15 years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer agrees to repair finish or replace composite panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Finish Warranty Period: 15 years from date of Substantial Completion.

PART 2 – PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Physical Performance: Provide composite panel system in accordance with ASTM C1186.
   1. Wet Flexural Strength: Result: 1418 psi (9777 kPa), Lower Limit: 1015 psi (6998 kPa).
   2. Water Tightness: No water droplets observed on any specimen.
   3. Freeze-Thaw: No damage or defects observed.
   4. Warm Water: No evidence of cracking, delamination, swelling, or other defects observed.
   5. Heat-Rain: No crazing, cracking, or other deleterious effects, or surface or joint changes observed in any specimen.

B. Structural Performance: Provide composite panel systems capable of withstanding the effects of the following loads, based on testing in accordance with ASTM E330/E330M:
   1. Design Wind Loads: Basic Wind Speed = 112mph, Exposure Category B.
   2. Deflection Limits: Maximum lateral deflection: L/180.

C. Thermal Expansion: Maximum 0.00000318 deg F to minus 1 (0.000005724 deg C to minus 1) when tested in accordance with ASTM E228.

D. Air Leakage: 1.53 cfm/sq. ft. (7.78 L/s/sq. m) or less in accordance with AAMA5094.

E. Water Penetration under Static Pressure: No water penetration to room side of assembly when tested for 15 minutes in accordance with ASTM E331 at the following test-pressure difference:
   1. Test-Pressure Difference: 6.24 lbf/sq. ft. (300 Pa).

F. Fire Propagation Characteristics: Composite panel wall assembly passes NFPA 285.

G. Surface-Burning Characteristics: Provide composite panels that meet the following values when tested in accordance with ASTM E84:
   1. Flame-Spread Index: Zero.
   2. Smoke-Developed Index: Zero.

H. Fire Resistance: Composite panel wall assembly passes ASTM E119.

I. Ignition Resistance: Composite panel passes NFPA 268.

2.2 COMPOSITE WALL PANELS

A. Composite Wall Panel Systems: Provide factory-formed and -assembled, composite wall panels fabricated from a pressed, stamped, and autoclaved mix of portland cement, fly ash, silica, recycled rejects, and wood fiber bundles; formed into profile for installation method indicated. Include attachment assembly components and accessories required for weathertight system.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Nichiha Architectural Wall Panels; Architectural Wall Panels or comparable product by one of the following:
   a. Swisspearl – Patina Rough.
   b. Equitone by Etex.

B. Sand Stone-Textured Composite Wall Panels:
1. Panel Dimensions: 17-7/8 by 71-9/16 inches (455 by 1818 mm).
2. Panel Thickness: 3/4 inch (18 mm).
3. Panel: Factory sealed on all six sides.
4. Profiles: Stone texture with 1/4-inch (6-mm) faux vertical joint at midpoint.
5. Color: As selected by Architect from manufacturer's full range.
6. Accessory Components: Manufactured corners with 3-1/2-inch (89-mm) returns.

C. Rough-Face, Brick-Textured Composite Wall Panels <Insert drawing designation>:
1. Panel Dimensions: 17-7/8 by 71-9/16 inches (455 by 1818 mm).
2. Panel Thickness: 5/8 inch (16 mm).
3. Panel: Factory sealed on all six sides.
4. Profiles: Rough-faced modular running brick texture with faux mortar joints.
5. Color: As selected by Architect from manufacturer's full range.
6. Accessory Components: Manufactured corners with 3-1/2-inch (89-mm) returns.

2.3 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet with ASTM A653/A653M, G90 (Z275) hot-dip galvanized coating designation or ASTM A792/A792M, Class AZ50 (Class AZM150) aluminum-zinc-alloy coating designation unless otherwise indicated. Provide Fabricator's standard sections as required for support and alignment of composite panel system.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Nichiha Architectural Wall Panels; Ultimate Horizontal and Vertical Starter Track or comparable product by one of the following:
   a. Swisspearl.
   b. Equitone.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of composite panels unless otherwise indicated.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Nichiha Architectural Wall Panels; Ultimate Clip System or comparable product by one of the following:
   a. Swisspearl.
   b. Equitone.

C. Flashing and Trim: Provide galvanized aluminum flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Nichiha Architectural Wall Panels; Essential Flashing System or comparable product by one of the following:
   a. Swisspearl.
   b. Equitone.
2. Aluminum Trim: Formed with 0.040-inch (1.00-mm-) thick, coil-coated aluminum sheet facings.
3. Color: As selected by Architect from manufacturer's full range.

D. Panel Fasteners: Provide corrosion-resistant fasteners as required for construction method used.

E. Panel Sealants: ASTM C920, Class 35; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in composite panels and remain weathertight; and as recommended in writing by composite panel manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, composite panel supports, and other conditions affecting performance of the Work.
   1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by composite panel manufacturer.
   2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by composite panel manufacturer.
      a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and assemblies penetrating composite panels to verify actual locations of penetrations relative to seam locations of composite panels before installation.

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

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages in accordance with composite panel manufacturer's written instructions.

3.3 COMPOSITE PANEL INSTALLATION

A. General: Install composite panels in accordance with Fabricator's written instructions in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to supports unless otherwise indicated. Anchor composite panels and other components of the Work securely in place, with provisions for thermal and structural movement.
   1. Shim or otherwise plumb substrates receiving composite panels.
   2. Flash or seal composite panels at perimeter of all openings. Fasten flashing with manufacturer-approved fasteners. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by composite panels are installed.
   3. Install screw fasteners in predrilled holes.
   4. Locate and space fastenings in uniform vertical and horizontal alignment.
   5. Install flashing and trim as composite panel work proceeds.
   6. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:
   1. Composite Panels: Use hot-dip galvanized, ceramic-coated, or stainless steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.

C. Attachment Assembly, General: Install attachment assembly required to support composite wall panels and to provide a complete weathertight wall system, including subgirts, perimeter extrusions, tracks, drainage channels, panel clips, and anchor channels.
   1. Include attachment to supports, panel-to-panel joinery, panel-to-dissimilar-material joinery, and panel-system joint seals.

D. Panel Installation: Attach composite wall panels to supports at locations, at spacings, and with fasteners recommended in writing by Fabricator to achieve performance requirements specified.
   1. DBVR Rainscreen System: Install using Fabricator's standard assembly with horizontal channel that provides support and secondary drainage assembly, draining at base of wall.

Attach composite wall panels by placing panel clips to supports at locations, at spacings, and with fasteners recommended in writing by Fabricator.

a. Track-Support Installation: Install support assembly at locations, at spacings, and with fasteners recommended in writing by manufacturer. Use Fabricator's standard horizontal drain channels that provide support and secondary drainage assembly.

b. Panel Installation:

1) Attach composite wall panels by interlocking panel edges with Fabricator's standard clips.

c. Joint Sealing: Seal all joints in accordance with AAMA 509. Do not apply sealants to joints unless otherwise indicated.

E. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete composite panel assembly including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by composite panel Fabricator; or, if not indicated, provide types recommended in writing by composite system Fabricator.

F. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, or SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that is without buckling and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof performance.

2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 ft. (3 m) with no joints allowed within 24 inches (605 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

3.4 ERECTION TOLERANCES

A. Site Verifications of Conditions:

1. Verify that conditions of substrate previously installed under other Sections are acceptable for composite system installation. Provide documentation indicating detrimental conditions to composite system performance.

2. Once conditions are verified, composite system installation tolerances are as follows:

a. Shim and align composite wall panel units within installed tolerance of 1/4 inch in 20 ft. (6 mm in 6 m), non-accumulative, on level, plumb, and location lines as indicated, and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Water-Spray Test: After installation, test area of assembly as directed by Architect for water penetration in accordance with AAMA 501.2.

C. Fabricator's Field Service: Engage a factory-authorized service representative to test and inspect completed composite wall panel installation, including accessories.

D. Composite wall panels will be considered defective if they do not pass test and inspections.

E. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

F. Prepare test and inspection reports.

3.6 CLEANING AND PROTECTION

A. Remove temporary protective coverings, if any, as composite panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of composite panel installation, clean finished surfaces as recommended by composite panel manufacturer. Maintain in a clean condition during construction.

B. After composite panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace composite panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

DIVISION 7 - THERMAL & MOISTURE PROTECTION
SECTION 07 84 00 - FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes firestopping for the following:
   1. Penetrations through fire-resistance-rated walls and partitions including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.
   2. Penetrations through smoke barriers and construction enclosing compartmentalized areas involving both empty openings and openings containing penetrating items.
   3. Sealant joints in fire-resistance-rated and smoke-resistive construction.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Section 07 92 00 “Joint Sealants & Gasketing” for non-fire-resistive-rated joint sealants.
   2. Division 23 sections specifying ducts and piping penetrations.

1.2 SYSTEM PERFORMANCE REQUIREMENTS

A. General: Provide firestopping systems that are produced and installed to resist the spread of fire, according to requirements indicated, and the passage of smoke and other gases. Work shall be performed by a single subcontractor for all firestopping systems. Installer shall be “Certified” and “Trained” by the material manufacturer.

B. F-Rated Through-Penetration Firestop Systems: Provide through-penetration firestop systems with F ratings as determined per ASTM E 814, not less than that equaling or exceeding the fire-resistance rating of the constructions penetrated.

C. T-Rated Through-Penetration Firestop Systems: Provide through-penetration firestop systems with T ratings, in addition to F ratings, as determined per ASTM E 814, where indicated and where systems protect penetrating items exposed to contact with adjacent materials in occupied floor areas. T-rated assemblies are required where the following conditions exist:
   1. Where firestop systems protect penetrations located outside of wall cavities.
   2. Where firestop systems protect penetrations located outside fire-resistive shaft enclosures.
   3. Where firestop systems protect penetrations located in construction containing doors required to have a temperature-rise rating.
   4. Where firestop systems protect penetrating items larger than a 4-inch-diameter nominal pipe or 16 sq. in. in overall cross-sectional area.

D. Fire-Resistive Joint Sealants: Provide joint sealants with fire-resistance ratings indicated, as determined per ASTM E 119, but not less than that equaling or exceeding the fire-resistance rating of the construction in which the joint occurs.

E. For firestopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.
   1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
   2. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

F. For firestopping exposed to view, provide products with flame-spread values of less than 25 and smoke-developed values of less than 450, as determined per ASTM E 84.

1.3 SUBMITTALS

A. General: Submit the following according to Conditions of Contract and Division 1 Specification

Sections.

B. Product data for each type of product specified.
   1. Certification by firestopping manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs) and are nontoxic to building occupants.

C. Shop drawings detailing materials, installation methods, and relationships to adjoining construction for each through-penetration firestop system, and each kind of construction condition penetrated and kind of penetrating item. Include firestop design designation of qualified testing and inspecting agency evidencing compliance with requirements for each condition indicated.
   1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop configuration for construction and penetrating items.
   2. Where Project conditions require modification of qualified testing and inspecting agency's illustration to suit a particular through-penetration firestop condition, submit illustration approved by firestopping manufacturer's fire protection engineer with modifications marked.

D. Product certificates signed by manufacturers of firestopping products certifying that their products comply with specified requirements. Provide certificates of Installer’s training by the received from the firestopping material manufacturer.

E. Product test reports from, and based on tests performed by, a qualified testing and inspecting agency evidencing compliance of firestopping with requirements based on comprehensive testing of current products.

F. Qualification data for firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience.

1.4 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Provide firestopping that complies with the following requirements and those specified under the "System Performance Requirements" article:
   1. Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL, Warnock Hersey, or another agency performing testing and follow-up inspection services for firestop systems that is acceptable to authorities having jurisdiction.
   2. Through-penetration firestop systems are identical to those tested per ASTM E 814 under conditions where positive furnace pressure differential of at least 0.01 inch of water is maintained at a distance of 0.78 inch below the fill materials surrounding the penetrating items in the test assembly. Provide rated systems complying with the following requirements:
      a. Through-penetration firestop system products bear classification marking of qualified testing and inspecting agency.
      b. Through-penetration firestop systems correspond to those indicated by reference to through-penetration firestop system designations listed by UL in their "Fire Resistance Directory," by Warnock Hersey, or by another qualified testing and inspecting agency.
   3. Fire-resistive joint sealant systems are identical to those tested for fire-response characteristics per ASTM E 119 under conditions where the positive furnace pressure differential is at least 0.01 inch of water, as measured 0.78 inch from the face exposed to furnace fire. Provide systems complying with the following requirements:
      a. Fire-Resistance Ratings of Joint Sealants: As indicated by reference to design designations listed by UL in their "Fire Resistance Directory" or by another qualified testing and inspecting agency.
      b. Joint sealants, including backing materials, bear classification marking of qualified testing and inspection agency.

B. Installer Qualifications: Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having the necessary experience, staff, and training to install manufacturer's products per specified requirements.

C. Single-Source Responsibility: Obtain through-penetration firestop systems for each kind of penetration and construction condition indicated from a single manufacturer.

D. Provide firestopping products containing no detectable asbestos as determined by the method specified in 40 CFR Part 763, Subpart F, Appendix A, Section 1, "Polarized Light Microscopy."

E. Coordinating Work: Coordinate construction of openings and penetrating items to ensure that designated through-penetration firestop systems are installed per specified requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver firestopping products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer; date of manufacture; lot number; shelf life, if applicable; qualified testing and inspecting agency's classification marking applicable to Project; curing time; and mixing instructions for multi-component materials.

B. Store and handle firestopping materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.6 PROJECT CONDITIONS

A. Environmental Conditions: Do not install firestopping when ambient or substrate temperatures are outside limits permitted by firestopping manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

B. Ventilation: Ventilate firestopping per firestopping manufacturers' instructions by natural means or, where this is inadequate, forced air circulation.

1.7 SEQUENCING AND SCHEDULING

A. Do not cover up those firestopping installations that will become concealed behind other construction until Architect and authorities having jurisdiction have examined each installation.

PART 2 - PRODUCTS

2.1 FIRESTOPPING, GENERAL

A. Compatibility: Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by firestopping manufacturer based on testing and field experience.

B. Accessories: Provide components for each firestopping system that are needed to install fill materials and to comply with "System Performance Requirements" article in Part 1. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire-resistance-rated systems. Accessories include but are not limited to the following items:

1. Permanent forming/damming/backing materials including the following:
    a. Semi-refractory fiber (mineral wool) insulation.
    b. Ceramic fiber.
    c. Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.
    d. Joint fillers for joint sealants.

2. Temporary forming materials.
3. Substrate primers.
4. Collars.
5. Steel sleeves.

C. Applications: Provide firestopping systems composed of materials specified in this Section that comply with system performance and other requirements.

2.2 FILL MATERIALS FOR THROUGH-PENETRATION FIRESTOP SYSTEMS

A. Ceramic-Fiber and Mastic Coating: Ceramic fibers in bulk form formulated for use with mastic coating, and ceramic fiber manufacturer's mastic coating.

B. Ceramic-Fiber Sealant: Single-component formulation of ceramic fibers and inorganic binders.

C. Endothermic, Latex Compound Sealant: Single-component, endothermic, latex formulation.

D. Intumescent, Latex Sealant: Single-component, intumescent, latex formulation.

E. Intumescent Putty: Nonhardening, dielectric, water-resistant putty containing no solvents, inorganic fibers, or silicone compounds.

F. Intumescent Wrap Strips: Single-component, elastomeric sheet with aluminum foil on one side.

G. Job-Mixed Vinyl Compound: Prepackaged vinyl-based powder product for mixing with water at Project site to produce a paintable compound, passing ASTM E 136, with flame-spread and smoke-developed ratings of zero per ASTM E 84.

H. Mortar: Prepackaged dry mix composed of a blend of inorganic binders, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a non-shrinking, homogenous mortar.

I. Pillows/Bags: Re-usable, heat-expanding pillows/bags composed of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents and fire-retardant additives.

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

K. Silicone Sealant: Moisture-curing, single-component, silicone-based, neutral-curing elastomeric sealant of grade indicated below:
1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces and non-sag formulation for openings in vertical and other surfaces requiring a non-slumping/ gunnable sealant, unless indicated firestop system limits use to non-sag grade for both opening conditions.
2. Grade for Horizontal Surfaces: Pourable (self-leveling) grade for openings in floors and other horizontal surfaces.
3. Grade for Vertical Surfaces: Non-sag grade for openings in vertical and other surfaces.

L. Solvent-Release-Curing Intumescent Sealant: Solvent-release-curing, single-component, synthetic-polymer-based sealant of grade indicated below:
1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces and non-sag formulation for openings in vertical and other surfaces requiring a non-slumping/ gunnable sealant, unless indicated firestop system limits use to non-sag grade for both opening conditions.
2. Grade for Horizontal Surfaces: Pourable (self-leveling) grade for openings in floors and other horizontal surfaces.
3. Grade for Vertical Surfaces: Non-sag grade for openings in vertical and other surfaces.

M. Products: Subject to compliance with requirements, provide fire stopping systems from:
1. **Hilti Construction Chemicals, Inc.** (866) 445-8827
5400 South 122nd East Avenue
Tulsa, OK 74146

2.3 FIRE-RESISTIVE ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer indicated that complies with ASTM C 920 requirements, including those referenced for Type, Grade, Class, and Uses, and requirements specified in this Section applicable to fire-resistive joint sealants.

B. Sealant Colors: Provide color of exposed joint sealants to comply with the following:
1. Provide selections made by Architect from manufacturer's full range of standard colors for products of type indicated.

C. Single-Component, Neutral-Curing Silicone Sealant: Type S; Grade NS; Class 25; exposure-related Use NT, & joint-substrate-related Uses M, G, A, and (as applicable to joint substrates indicated) O.
1. Additional Movement Capability: Provide sealant with the capability to withstand the following percentage changes in joint width existing at time of installation, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, and remain in compliance with other requirements of ASTM C 920 for uses indicated:
a. 50% movement in both extension & compression for a total of 100% movement.

D. Multicomponent, Non-sag, Urethane Sealant: Type M; Grade NS; Class 25; exposure-related Use NT, and joint-substrate-related Uses M, A, and (as applicable to joint substrates indicated) O.
1. Additional Movement Capability: Provide sealant with the capability to withstand the following percentage change in joint width existing at time of installation, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, and remain in compliance with other requirements of ASTM C 920 for uses indicated:
a. 40% movement in extension & 25% in compression for a total of 65% movement.
b. 50% movement in both extension & compression for a total of 100% movement.

2.4 MIXING

A. Those products requiring mixing prior to application, comply w/firestopping manufacturer's directions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce firestopping products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning: Clean out openings and joints immediately prior to installing firestopping to comply with recommendations of firestopping manufacturer and the following requirements:
1. Remove all foreign materials from surfaces of opening and joint substrates and from penetrating items that could interfere with adhesion of firestopping.
2. Clean opening and joint substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping. Remove loose particles remaining from cleaning operation.

3. Remove laitance and form release agents from concrete.

B. Priming: Prime substrates where recommended by firestopping manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent firestopping from contacting adjoining surfaces that will remain exposed upon completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestopping materials. Remove tape as soon as it is possible to do so without disturbing firestop seal with substrates.

3.3 INSTALLING THROUGH-PENETRATION FIRESTOPS

A. General: Comply with the "System Performance Requirements" article in Part 1 and the through-penetration firestop manufacturer's installation instructions and drawings pertaining to products and applications indicated.

B. Install forming/damming materials and other accessories of types required to support fill materials during their application and in the position needed to produce the cross-sectional shapes and depths required to achieve fire ratings of designated through-penetration firestop systems. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

C. Install fill materials for through-penetration firestop systems by proven techniques to produce the following results:
1. Completely fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 INSTALLING FIRE-RESISTIVE JOINT SEALANTS

A. General: Comply with the "System Performance Requirements" article in Part 1, with ASTM C 1193, and with the sealant manufacturer's installation instructions and drawings pertaining to products and applications indicated.

B. Install joint fillers to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability and develop fire-resistance rating required.

C. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint width that optimum sealant movement capability. Install sealants at the same time joint fillers are installed.

D. Tool nonsag sealants immediately after sealant application and prior to the time skinning or curing begin. Form smooth, uniform beads of configuration indicated or required to produce fire-resistance rating, as well as to eliminate air pockets, and to ensure contact and adhesion of sealants with sides of joint. Remove excess sealant from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

3.5 LABELING

A. Label both sides of all fire rated walls above ceiling to identify fire “Time Rating” of wall assembly. Self-adhered lettering is not acceptable, conform to Section 09 91 00, “Painting”. Conform with

NFPA 101 L/S Code and IBC 2018 with Georgia Amendments. Reference paragraph 703.7 Marking and Identification: Where there is an accessible concealed floor, floor-ceiling or attic space, fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling in the concealed space.

B. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:
1. The words: "Warning: Through Penetration Firestop System – Do Not Disturb. Notify Building Management of Any Damage."
2. Contractor's name, address and phone number.
3. Through-penetration firestop system designation of applicable testing and inspecting agency.
4. Date of installation.
5. Through-penetration firestop system manufacturer's name.
6. Installer's name.

C. A firestop documentation manager software shall be used to document, track, and maintain the passive firestop systems throughout the construction and maintenance phase of the facility. The software solution shall be used to track and document every firestop system installed on the project and each subsequent addition, change, or removal of the firestop system. The firestop documentation shall be managed with a cloud-based software which allows the installer to use a standard smartphone or tablet device (either iOS, Android or Windows capable) to capture the relevant information for the installation. The following data shall be tracked for each penetration within the facility: product installed, system installed, date of installation, location of the penetration including a notation on the 2D plan image, F-rating, name of installer, photo (pre-installation and post-installation), and inspection status. The Owner and/ or Construction Manager may designate additional items to be tracked. The firestop documentation manager software must perform the following basic functions:
1. Create multiple projects/ facilities, add/create/ remove users for each project, upload documents including UL systems, 2D floor plans, product data, engineering judgments, etc.
2. Define data to track using pre-defined input fields or creating custom input fields as desired.
3. Capture multiple photos for each penetration, including a pre-installation and post-installation photo.
4. Scan QR Code on Hilti identification label to link the program data to a specific penetration location.
5. Annotate (mark) location of penetration on 2D floor plan.
6. Create reports by filtering data and utilizing report templates.
7. Online/ offline (for use in areas where data service is unavailable) synchronization of data between mobile device, online application and cloud-based system.
8. Ability to transfer ownership of projects from one customer to another from construction phase to facility maintenance.

D. Permanently attach Hilti identification labels to surfaces adjacent to and within 6 inches (150 mm) of firestopping edge so labels will be visible to anyone seeking to remove or change penetrating items or firestopping. Labels shall have a unique QR code for each penetration which can be scanned by the firestop documentation software to quickly identify the penetration attributes.
1. Acceptable Software: Hilti CFS-DM, from Hilti Inc., Plano, TX. Tel (800) 879-8000 website: www.us.hilti.com
2. Substitutions: Not permitted.
3. Single Source: Obtain firestop documentation manager software and firestop systems for each type of penetration and construction condition indicated only from a single manufacturer.

3.6 CLEANING

A. Clean off excess fill materials and sealants adjacent to openings and joints as work progresses by methods and with cleaning materials approved by manufacturers of firestopping products and of

products in which opening and joints occur.

B. Protect firestopping during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated firestopping immediately and install new materials to produce firestopping complying with specified requirements.

END OF SECTION