

**SECTION 07 24 00**  
**EXTERIOR INSULATION AND FINISH SYSTEMS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Exterior insulation and finish systems (EIFS).
  - 2. Unit finishes as DEFS.

**1.2 RELATED REQUIREMENTS**

- A. Gypsum Board Sheathing 09 29 00, GYPSUM SHEATHING.

**1.3 APPLICABLE PUBLICATIONS**

- A. Comply with references to extent specified in this section.
- B. American National Standards Institute (ANSI):
  - 1. A108/A118/A136-14 - Installation of Ceramic Tile.
  - 2. A137.1-12 - Ceramic Tile - Version 1.
- C. ASTM International (ASTM):
  - 1. B117-11 - Operating Salt Spray (Fog) Apparatus.
  - 2. C67-14 - Sampling and Testing Brick and Structural Clay Tile.
  - 3. C177-13 - Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
  - 4. C297/C297M-15 - Flatwise Tensile Strength of Sandwich Constructions.
  - 5. C578-15 - Rigid, Cellular Polystyrene Thermal Insulation.
  - 6. C666/C666M-15 - Resistance of Concrete to Rapid Freezing and Thawing.
  - 7. C920-14a - Elastomeric Joint Sealants.
  - 8. D968-15 - Abrasion Resistance of Organic Coatings by Falling Abrasive.
  - 9. D2794-93(2010) - Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
  - 10. E84-15a - Surface Burning Characteristics of Building Materials.
  - 11. E96/E96M-15 - Water Vapor Transmission of Materials.
  - 12. E119-15 - Fire Tests of Building Construction and Materials.
  - 13. E330/E330M-14 - Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
  - 14. E331-00(2009) - Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Wall by Uniform Static Air Pressure Differences.

15. E2486/E2486M-13 - Impact Resistance of Class PB and PI Exterior Insulation and Finish Systems (EIFS).
16. G90-10 - Performing Accelerated Outdoor Weathering of Nonmetallic Materials Using Concentrated Natural Sunlight.

#### **1.4 PREINSTALLATION MEETINGS**

- A. Conduct preinstallation meeting at project site minimum 30 days before beginning Work of this section.
  1. Required Participants:
    - a. Contracting Officer's Representative.
    - b. Architect/Engineer.
    - c. Contractor.
    - d. Installer.
    - e. Manufacturer's field representative.
    - f. Other installers responsible for adjacent and intersecting work, including air barriers and sealants.
  2. Meeting Agenda: Distribute agenda to participants minimum 3 days before meeting.
    - a. Installation schedule.
    - b. Installation sequence.
    - c. Preparatory work.
    - d. Protection before, during, and after installation.
    - e. Installation.
    - f. Terminations.
    - g. Transitions and connections to other work.
    - h. Inspecting and testing.
    - i. Other items affecting successful completion.
  3. Document and distribute meeting minutes to participants to record decisions affecting installation.

#### **1.5 SUBMITTALS**

- A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Submittal Drawings:
  1. Show size, configuration, and fabrication and installation details.
  2. Show details for corner treatment, sills, soffits, quoins, lintels, openings, penetrations, flashing, and other special applications.
- C. Manufacturer's Literature and Data:
  1. Description of each product.

- 2. Installation instructions.
- 3. Warranty.
- D. Samples:
  - 1. Two 300 mm (1 foot) square samples of EIFS simulated synthetic stucco finishes over cement board identical to proposed installation in thickness, color, texture insulation and workmanship.
- E. Test reports: Certify each product and complete system complies with specifications.
- F. Qualifications: Substantiate qualifications comply with specifications.
  - 1. Installer with project experience list.

#### **1.6 QUALITY ASSURANCE**

- A. Installer Qualifications:
  - 1. Regularly installs specified products.
  - 2. Installed specified products with satisfactory service on five similar installations for minimum five years.
    - a. Project Experience List: Provide contact names and addresses for completed projects.

#### **1.7 DELIVERY**

- A. Deliver products in manufacturer's original sealed packaging.
- B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, production run number, and manufacture date.
- C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

#### **1.8 STORAGE AND HANDLING**

- A. Store products indoors in dry, weathertight conditioned facility.
- B. Protect products from damage during handling and construction operations.

#### **1.9 FIELD CONDITIONS**

- A. Environment:
  - 1. Unless greater temperature is required by system manufacturer, install products only when ambient air temperature is minimum 7 degrees C (45 degrees F) and rising and predicted to persist for 24 hours after installation.

#### **1.10 WARRANTY**

- A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

B. Manufacturer's Warranty: Warrant EIFS system materials against material and manufacturing defects.

1. Warranty Period: 10 years.

## **PART 2 - PRODUCTS**

### **2.1 PRODUCTS - GENERAL**

A. Basis of Design: SCHEDULE FOR FINISHES or equal.

#### **BRAND NAME OR EQUAL PRODUCTS**

In accordance with VAAR 811.104-71 (b), based on the inclusion of VAAR 811.104-71, Brand Name or Equal, bidders proposing to furnish an "equal product other than referenced in the solicitation, shall insert the following description for each equal product (See also VAAR 852.211-73 (c)(1) and (c)(2)).

Bidding on:

Manufacturer's Name: \_\_\_\_\_

Brand: \_\_\_\_\_

No.: \_\_\_\_\_

B. Provide system components from one manufacturer and from one production run.

### **2.2 EXTERIOR INSULATION AND FINISH SYSTEM (EIFS)**

A. Description: Polymer-Based (PB) system consists of Type I molded rigid polystyrene insulation adhered to sheathing and finished with glass-fiber-mesh reinforced based-coat and textured finish coat.

B. Performance Requirements:

1. Surface Burning Characteristics: When tested according to ASTM E84.

a. Flame Spread Rating: 25 maximum.

b. Smoke Developed Rating: 450 maximum.

2. Full Scale Wall Fire Test: No significant surface flaming or propagation of vertical or lateral flames when tested according to ASTM E119.

3. Impact Resistance (Sample to be cured. Finish, base coat and fabric over 25 mm (1 inch) insulation typical of project application), ASTM E2486/E2486M:

a. Standard Impact Resistance - 2.83 to 5.54 J (25-49 inch-lbs.).

4. Structural Performance: (Test panels 1200 mm x 1200 mm (4 feet by 4 feet) typical of project application): ASTM E330/E330M, no permanent deformation, delamination or deterioration for positive and negative pressures as required.
    - a. Wind Loads: Uniform pressure as indicated on Drawings.
  5. Water Penetration: ASTM E331, no water penetration minimum 720Pa (15psf) for windows and 300 Pa (6.24 psf) for curtain wall assembly.
  6. Abrasion Resistance: ASTM D968, 500 liters of sand with slight smoothing and no loss of film integrity.
  7. Accelerated Weathering: ASTM G90; 2000 hours with no deterioration.
  8. Salt Spray Resistance: ASTM B117; Withstand 300 hours with no deleterious effects.
  9. Water Vapor: ASTM E96/E96M; Maximum 12 g/h/sq. m (18 grains/hour/sf.).
  10. Absorption-Freeze-Thaw (Pre-weighed 100 mm x 200 mm (4 inch by 8 inch) specimens; 25 mm (1 inch) insulation, faced with finish coat cured and stored in air; tested with edges and back open), ASTM C67.
    - a. 50 Cycles: 20 hours at 9 degrees C (4 degrees F); 4-hour thaw in water.
    - b. After 50 cycles; total weight gain of maximum 6.2 grams. No checking splitting, or cracking.
- C. Adhesive: Manufacturers standard product including primer compatible with sheathing.
- D. Insulation:
1. Thermal Resistance: Thermal resistance (R-value), as indicated, measured by ASTM C177.
  2. Insulating Material: ASTM C578, as recommended by EIFS manufacturer and treated to be compatible with EIFS components. Age insulation minimum of 6 weeks before installation.
  3. Provide Type I Molded Expanded Polystyrene (MEPS) insulation board for Type PB systems, in sizes as required except maximum 600 mm X 1200 mm (24 X 48 inches) boards, and maximum 100 mm (4 inches) thick.
- E. Mechanical Anchors: As recommended by EIFS manufacturer.
- F. Accessories:

1. Trim, control joints, weep screed, edging, anchors, expansion joints, and other items required for proper installation as recommended by EIFS manufacturer.
2. Metal Items and Fasteners: Corrosion resistant.
- G. Reinforcing Fabric: Balanced, open weave, glass fiber fabric made from twisted multi-end strands specifically treated for compatibility with the other materials of system.
  1. Minimum weight 100 g/sq. m (4.3 oz./sq. yd.).
- H. Base Coat: Manufacturer's standard.
- I. Finish Coat: Manufacturer's standard. Minimum thickness 1.5 mm (1/16 inch), complying with performance requirements.
- J. Sealant: ASTM C920; Class 50 with 100 percent recovery. Type, grade and use as recommended by sealant manufacturer.
  1. When required, provide non-staining primer, bond breaker, and backer rods as recommended by sealant manufacturer.
  2. Do not use absorptive materials as backer rods.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Examine and verify substrate suitability for product installation.
- B. Protect existing construction and completed work from damage.
- C. Notify Contracting Officer's Representative in writing of conditions detrimental to proper completion of work.
- D. Do not proceed with work until unsatisfactory conditions are corrected.

#### **3.2 INSTALLATION - GENERAL**

- A. Install products according to manufacturer's instructions and approved submittal drawings.
  1. When manufacturer's instructions deviate from specifications, submit proposed resolution for Contracting Officer's Representative consideration.

#### **3.3 CONTROL JOINT INSTALLATION**

- A. See drawings for location of building control joints and surface control joints.
- B. Install surface control joints as follows:
  1. Direct Exterior Finish: Install at 6 meters (20 feet) maximum on center, both directions, erecting continuous vertical joints first at building expansion joints, intersection of dissimilar substrates

or finishing materials where concentrated stresses or movement is anticipated. Leave 13 mm (1/2inch) minimum continuous gap between board panels to receive control joint.

2. Unit Finish: Install at 5 meters (16 feet) maximum on center, both directions, or at lesser spacing as recommended by manufacturer, erecting continuous vertical joints first. Leave 13 mm (1/2 inch) minimum, continuous gap between board panels to receive control joint or sealant backer and sealant.
3. Exterior Insulation and Finish System. Install at 15 meters (50 feet) maximum in both directions and at building expansion joints, floor lines and where EIFS intersects other materials per manufacturer's recommendations.

#### **3.4 SEALANT INSTALLATION**

- A. Exterior Insulation and Finish System: Apply sealant according to EIFS manufacturer's recommendation.
- B. Do not apply sealant in locations intended for water drainage.

#### **3.5 SYNTHETIC STUCCO FINISH INSTALLATION**

- A. Joint Reinforcement: Pre-fill gypsum board joints and trim with synthetic stucco base coat mixed according to manufacturer's directions.
  1. Immediately embed reinforcing tape into wet base coat and tightly trowel to board surface to avoid crowning joints.
  2. Cure for four hours minimum before applying base coat.
- B. Base Coat: Uniformly apply base coat minimum 1.6 mm (1/16 inch) thick, smooth and flat over entire surface including joints and trim. Dampen board surface as necessary under rapid drying conditions.
  1. Embed reinforcing fabric in basecoat while wet and cover with basecoat material so fabric pattern is not visible.
- C. Finish: Trowel apply exterior finish to base coat texturing surface as specified to uniform thickness of 1.5 mm to 5 mm (1/16 inch to 3/16 inch).
  1. Dampen base coat as necessary under rapid drying conditions.
  2. Extend finish so breaks between batches occur at surface breaks such as corners, control joints, windows, and other interruptions.

### 3.6 EXTERIOR INSULATION AND FINISH SYSTEM INSTALLATION

- A. Insulation Board Layout: Place horizontally from level base line. Stagger vertical joints and interlock at corners. Butt joints tightly. Provide flush surfaces at joints. Offset insulation board joints from joints in sheathing minimum 200 mm (8 inches). Do not align joints with corners of doors, windows and other openings. Do not leave insulation board exposed longer than recommended by insulation manufacturer.
- B. Adhesive: Apply directly to entire back surface of the insulation board as recommended by the system manufacturer and immediately apply to gypsum board substrate. Apply firm pressure over entire board to ensure uniform contact and level surface. Allow adhesive to cure for 24 hours minimum before sanding.
- C. Create means of drainage between insulation board and gypsum board sheathing.
- D. Flash penetrations and terminations to discharge water to exterior.
- E. Mechanical Fasteners: Fasten with manufacturer's standard anchors, spaced as recommended by manufacturer, maximum 600 mm (24 inches) on center horizontally and vertically.
- F. Sanding: Sand entire surface of insulation before applying base coat, level high joints and remove dirt and weathering damage. Do not pre-fill low areas with basecoat.
- G. Base Coat: Trowel apply uniform thickness of base coat to insulation with minimum thickness of 1-1/2 times reinforcing fabric thickness and minimum 2.4 mm (3/32 inches) wet thickness.
- H. Install reinforcing fabric embedded in base coat. Provide diagonal reinforcement at opening corners, back wrapping, and other reinforcement recommended by EIFS manufacturer. Ensure fabric pattern is not visible beneath the surface of the basecoat after installation. Cure basecoat 24 hours minimum before applying finish coat.
- I. Finish Coat:
  - 1. Inspect basecoat for damage or defects and repair before applying finish coat.
  - 2. Trowel apply finish coat minimum 1.6 mm (1/16 inch) thick.
  - 3. Texture finish as required.
  - 4. Surface Tolerance: Maximum 1/500 (1/4 inch in 10 feet) deviation from plumb and plane.

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