SECTION 07241

EXTERIOR INSULATION AND FINISH SYSTEMS - CLASS PB

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Exterior soffits: Exterior finish system applied directly to Portland cement board.

B. Related Sections:
   1. Division 5 Section “Cold Formed Metal Framing”; metal framing and furring.
   2. Division 7 Section "Joint Sealers" for sealing joints in system with elastomeric joint sealants.

1.3 DESCRIPTION

A. The Exterior Finish System shall consist of the following:
   1. A weather resistive barrier installed over open framing.
   2. A cement panel substrate applied over the weather resistive barrier and attached to the framing.
   3. A glass fiber reinforcing fabric, embedded into a minimum 3/32" thick layer of a polymer modified Portland cement exterior basecoat material.
   4. A colored decorative polymeric finish coat.

B. Designations below for the class and type of exterior finish system specified in this section are based on those developed by the Exterior Insulation Manufacturers Association (EIMA).
   1. Class PB Type A designates a polymer-based protective finish coating (Class PB), externally reinforced (Type A).

1.4 PERFORMANCE REQUIREMENTS

A. General: Provide systems that comply with the following performance requirements:
   1. Bond Integrity: Free from bond failure within system components or between system and supporting wall construction, resulting from exposure to fire, wind loads, weather, or other in-service conditions.
   2. Weathertightness: Resistant to water penetration from exterior into system and assemblies behind it or through them into interior of building that results in deterioration of thermal-insulating effectiveness or other degradation of system and assemblies behind it, including substrates, supporting construction, and interior finish.

B. Physical Properties: Provide products whose physical properties and structural performance comply with the following when tested per methods referenced:
   1. Abrasion Resistance: No cracking, checking, or loss of film integrity after exposure to 528 quarts of sand when tested per ASTM D 968, Method A.
   2. Accelerated Weathering Characteristics: No cracking, checking, crazing, erosion, blistering, peeling, or delamination after testing for 2000 hours when viewed under five times magnification per ASTM G 23, Method 1.
   3. Absorption-Freeze Resistance: No visible deleterious effects and negligible weight loss after 60 cycles per EIMA 101.01.
   4. Mildew Resistance: No growth when tested per ASTM D 3273.
   5. Salt-Spray Resistance: No cracking, checking, crazing, erosion, blistering, peeling, or delamination after testing for 300 hours per ASTM B 117.

6. Tensile Adhesion: No failure in the adhesive, base coat, or finish coat. Minimum 5-psi tensile strength before and after freeze-thaw and accelerated weathering tests per EIMA 101.03.
7. Water Penetration: No water penetration into the plane of the base coat to board interface of the test specimen after 15 minutes at 6.24 lbf/sq. ft.of air pressure difference or 20 percent of positive design wind pressure, whichever is greater, across the specimen during a test period when tested per EIMA 101.02.
8. Water Resistance: No cracking, checking, crazing, erosion, blistering, peeling, or delamination after testing for 14 days per ASTM D 2247.
9. Impact Resistance: Tested per EIMA 101.86; and meeting or exceeding the following impact classification and range:
   a. Standard Impact Resistance: 25-49 inch-lb.
10. Positive and Negative Wind-Load Performance: Capability to withstand wind loads when tested per ASTM E 330, including Safety Factor of 1.5.

C. Structural Performance: Provide a system design capable of withstanding the effects of normal thermal movement, gravity loads, and loads and stresses within limits and under conditions indicated:
   1. Wind Loads: 40 psf acting inward and outward.
   2. Deflection: Limit deflection of framing members to less than L/240 of the member.

1.5 SUBMITTALS

A. Product Data: For each component of system specified.

B. Shop Drawings: Show fabrication and installation of system including plans, details of components, flashings, joint locations and configurations, and connections and attachments to other work.
   1. Submit engineering calculations for building connections.

C. Samples for Initial Selection: Manufacturer's color to match CM's samples showing the range of color, texture, and patterns.

D. Samples for Verification: 24-inch-square panels for finish, color, and texture specified. Prepare samples using same tools and techniques intended for actual work.
   1. Incorporate within each sample a typical control joint filled with sealant of color indicated or selected.

E. Installer Certificates: Signed by system manufacturer certifying that installers comply with specified requirements. On request, submit evidence of panel-fabricating experience.

F. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and address of architects and owners, and other information specified.

G. Material Certificates: Signed by manufacturers or a third-party agency approved by system manufacturer certifying that each of the following items complies with requirements:
   1. Joint sealants.

H. Compatibility and Adhesion Test Reports: From sealant manufacturer indicating that materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with joint sealants. Include joint sealant manufacturer's written interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed to obtain adhesion.

I. Product Test Reports: Indicate compliance of proposed system with physical property requirements specified in "Performance Requirements" Article based on comprehensive testing of current products by a qualified testing and inspecting agency.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who is certified in writing by system manufacturer as qualified to install manufacturer's system.

B. Source Limitations: Obtain materials for system from one source and by a single manufacturer or by manufacturers approved by manufacturer as compatible with other system components.

C. Fire-Test-Response Characteristics: Provide system assemblies and components with the following fire-test-response characteristics as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing and inspecting agency.
   1. Flame Spread of Finish Coats: 25 or less when tested individually per ASTM E 84.
   2. Smoke Developed of Finish Coats: 450 or less when tested individually per ASTM E 84.
   3. Full-Scale, Multistory Fire Test: Tested mockup, representative of completed multistory wall assembly of which system is a part, complies with U.B.C. Standard 26-4 for test method and required fire-test-response characteristics.
   4. Radiant Heat Exposure, Unrestricted Installation: Tolerable level of incident radiant heat energy of at least 12.5 kW/sq. m when tested according to the BOCA National Building Code.

D. Mockups: Before installing system, construct mockups for each form of construction and finish required to verify selections made under Sample submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for completed Work:
   1. Locate mockups in the location and of the size indicated, or if not indicated, as directed by CM.
   2. Notify Construction Manager seven days in advance of the dates and times when mockups will be constructed.
   3. Demonstrate the proposed range of aesthetic effects and workmanship.
   4. Obtain CM's acceptance of mockups before starting fabrication of work.
   5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
      a. Protect mockups from weather and from construction activities. Brace mockups to resist design wind loads and provide waterproof coverings for construction materials not intended to be permanently exposed to the weather.
      b. Accepted mockups in an undisturbed condition at the time of Substantial Completion may become part of the completed Work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original, unopened packages with manufacturer's labels intact and clearly identifying products.

B. Store materials inside and under cover; keep them dry and protected from the weather, direct sunlight, surface contamination, aging, corrosion, damaging temperatures, construction traffic, and other causes.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not install system when ambient outdoor air and substrate temperatures are 40 deg F (4.4 deg C) and falling unless temporary protection and heat are provided to maintain ambient temperatures above 40 deg F (4.4 deg C) during installation of wet materials and until they have dried thoroughly and become weather resistant, but for at least 24 hours after installation.

1.9 COORDINATION AND SCHEDULING

A. Coordinate panel fabrication schedule with construction progress to avoid delaying the Work.

B. Supply anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, templates, instructions, and directions, as required, for installation.

C. Coordinate installation of EIFS with related Work specified in other Sections to ensure that wall assemblies, including sheathing, flashing, trim, joint sealers, windows, and doors, are protected against damage from the effects of weather, age, corrosion, moisture, and other causes. Do not allow water to penetrate behind EIFS.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers and Systems: Subject to compliance with requirements, provide one of the following systems:
1. Dryvit Systems, Inc.
2. Senergy Div.; of Harris Specialty Chemicals, Inc.
3. United States Gypsum Co.

2.2 MATERIALS

A. Compatibility: Provide substrates, adhesive, reinforcing meshes, base- and finish-coat materials, sealants, and accessories that are compatible with one another and approved for use by system manufacturer for Project.

B. Colors, Textures, and Patterns of Finish Coat: Comply with the following requirements:
1. Provide color, texture, and pattern selected by CM.

C. Metal Framing: Comply with requirements in Division 5 Section "Cold-Formed Metal Framing."

D. Job-mixed formulation of portland cement complying with ASTM C 150, Type I, and polymer-based adhesive specified for base coat.

E. Reinforcing Mesh: Balanced, alkali-resistant, open-weave glass-fiber mesh treated for compatibility with other system materials, made from continuous multiend strands with retained mesh tensile strength of not less than 120 lbf/in. per EIMA 105.01, complying with ASTM D 578 and the following requirements for minimum weight:
1. Standard Reinforcing Mesh: Not less than 4 oz./sq. yd.
2. Corner Reinforcing Mesh: Not less than 7.2 oz./sq. yd.
3. Base-Coat Materials: System manufacturer's standard mixture complying with the following requirements for material composition and method of combining materials: Provide one of the following formulations as is standard with the system manufacturer.
   a. Factory-mixed formulation of polymer-emulsion adhesive and inert fillers that is ready to use without adding other materials.
   b. Job-combined formulation of manufacturer's standard polymer-emulsion adhesive and manufacturer's standard dry mix containing portland cement.
   c. Job-mixed formulation of portland cement complying with ASTM C 150, Type I, white or natural color; and manufacturer's standard polymer-emulsion adhesive designed for use indicated.

F. Finish-Coat Materials: System manufacturer's standard mixture complying with the following requirements for material composition and method of combining materials:
1. Factory-mixed formulation of polymer-emulsion binder, colorfast mineral pigments, sound stone particles, and fillers.

G. Water: Potable.

H. Mechanical Fasteners: System manufacturer's standard corrosion-resistant fasteners consisting of thermal cap, standard washer and shaft attachments, and fastener indicated below; selected for properties of pullout, tensile, and shear strength required to resist design loads of application indicated; capable of pulling fastener head below surface of insulation board; and of the following description:
   1. For attachment to steel from 0.033 to 0.112 inch in thickness, provide steel drill screws complying with ASTM C 954.

I. Trim Accessories: Type as designated or required to suit conditions indicated and to comply with system manufacturer's written requirements, manufactured from vinyl plastic and complying with ASTM C 1063.
   1. Casing Bead: Prefabricated one-piece type for attachment behind insulation, of depth required to suit thickness of coating and insulation, with face leg perforated for bonding to coating.

J. Materials: One of the following systems installed over the cold-formed metal framing, as standard with the manufacturer:
   1. Exterior Cement Board With Water/Air Barrier:
      a. Cement Board: 1/2-inch-thick, fiber cement board complying with ASTM C 1186, Type A, recommended by board manufacturer for exterior applications.
      b. Fasteners for Exterior Cement Board: 1-5/8 inches, No. 8 wafer-head steel drill screws complying with ASTM C 954, with an organic-polymer coating or other corrosion-protective coating having a salt-spray resistance of more than 500 hours per ASTM B 117.
      c. Water/Air Barrier: Provide one of the following as applicable to the system selected:
         1) Spunbonded Olefin Sheet: Meeting the following physical properties:
            a) Air Penetration >300 sec/100cc (Gurley Hill-TAPPI T-460);
            b) Water Vapor Transmission 50 perms (ASTM E-96 Method B);
            c) Water Penetration Resistance >210 cm (AATCC-127);
            d) Basic Weight 2.1 oz/sq yd (TAPPI T-410);
            e) Breaking Strength 30/30 MD/CD lbs/in (ASTM D-882, Method A);
            f) Tear Resistance - Trapezoid 7/9 MD/CD (ASTM D1117);
            g) Surface Burning Characteristics, Flame Spread Index Class A,
            h) Smoke Developed Value, Class A (ASTM E-84-97a).
            i) Product: Tyvek StuccoWrap; DuPont Company, Fibers Department.
         2) Polypropylene sheet, 0.0095 inch thick, consisting of spun-bonded polypropylene substrate with a polypropylene coating attached directly to 1 side; with a water-vapor transmission rate equaling 117 g in 24 hours through 1 sq. m of surface per ASTM E 96 procedure B and flame-spread and smoke-developed ratings of 0 and 15, respectively, per ASTM E 84.
            a) Product: Typar HouseWrap; Reemay, Inc.

2.3 ELASTOMERIC SEALANTS

A. Elastomeric Sealant Products: Provide system manufacturer's listed and recommended chemically curing, elastomeric sealant that is compatible with joint fillers, joint substrates, and other related materials, and complies with requirements for products and testing indicated in "EIMA Guide for Use of Sealants with Exterior Insulation and Finish Systems, and with requirements in Section 07900, "Joint Sealants" for products corresponding to description indicated below:
   1. Low-modulus silicone sealant.

B. Sealant Color: Provide CM's selections from manufacturer's full range of standard colors for type of sealant indicated.

2.4 MIXING

A. General: Comply with system manufacturer's requirements for combining and mixing materials. Do not introduce admixtures, water, or other materials except as recommended by system manufacturer. Mix materials in clean containers. Use materials within time period specified by system manufacturer or discard.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of system. Proceed with installation of system only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect contiguous work from moisture deterioration and soiling caused by application of systems. Provide temporary covering and other protection needed to prevent spattering of exterior finish coats on other work.

B. Protect system, substrates, and construction behind them from inclement weather during installation. Prevent infiltration of moisture behind system and deterioration of substrates.

C. Prepare and clean substrates to comply with system manufacturer's written requirements to obtain optimum bond between substrate and adhesive for insulation.

3.3 INSTALLATION

A. Comply with ASTM PS 49 and system manufacturer's written instructions for installation of system as applicable to each type of substrate indicated.

B. Installation Requirements:
   1. Exterior Cement Board Installation: Install on metal framing to comply with cement board manufacturer's written instructions. Install board with steel drill screws spaced no more than 8 inches o.c. along framing with perimeter fasteners at least 3/8 inch but less than 5/8 inch from edges of boards.

C. Form joints for sealant application with back-to-back casing beads for joints within system and with perimeter casing beads at dissimilar adjoining surfaces. Make gaps between casing beads and between perimeter casing beads and adjoining surfaces of width indicated.

D. Coordinate flashing installation with installation to produce a wall system that does not allow water to penetrate behind protective coating.

E. Apply trim accessories at perimeter of system, at expansion joints, and elsewhere, as indicated. Use casing beads at other locations. Install trim accessories at locations indicated according to system manufacturer's written instructions.

F. Install expansion joints at locations indicated, where required by system manufacturer, and as follows:
   1. Where expansion joints are indicated in substrates behind system.
   2. Where system adjoins dissimilar substrates, materials, and construction.

G. Embed reinforcing mesh of type indicated in wet base coat to produce wrinkle-free installation with mesh continuous at corners and overlapped not less than 2-1/2 inches or otherwise treated at joints to comply with ASTM PS 49 and system manufacturer's written requirements. Do not lap reinforcing mesh within 8 inches of corners. Completely embed mesh, applying additional base-coat material if necessary, so reinforcing-mesh color and pattern are not visible.

H. Additional Reinforcing Mesh: Apply strip reinforcing mesh around openings extending 4 inches beyond perimeter. Apply additional 9-by-12-inch strip reinforcing mesh diagonally at corners of

openings (re-entrant corners). Apply 8-inch-wide strip reinforcing mesh at both inside and outside corners, unless base layer of mesh is lapped not less than 4 inches on each side of corners.

1. Embed strip reinforcing mesh in base coat before applying first layer of reinforcing mesh.

I. Apply primer over dry base coat according to system manufacturer's written instruction.

J. Apply finish coat over dry base coat, maintaining a wet edge at all times for uniform appearance, in thickness required by system manufacturer to produce a uniform finish of color and texture matching accepted sample.

3.4 INSTALLATION OF JOINT SEALANTS

A. Prepare joints and apply sealants, of type and at locations indicated, to comply with applicable requirements in Division 7 "Joint Sealers" and in "EIMA Guide for Use of Sealants with Exterior Insulation and Finish Systems, Class PB."

1. Clean surfaces to receive sealants to comply with indicated requirements and system manufacturer's written instructions.
2. Apply primer recommended in writing by sealant manufacturer for surfaces to be sealed.
3. Install sealant backing to control depth and configuration of sealant joint and to prevent sealant from adhering to back of joint.
4. Apply masking tape to protect areas adjacent to sealant joints. Remove tape immediately after tooling joints, without disturbing joint seal.
5. Recess sealant sufficiently from surface of system so an additional sealant application, including backing rod, can be installed without protruding beyond system surface.
6. Apply joint sealants after base coat has cured but before applying finish coat.

3.5 CLEANING AND PROTECTING

A. Remove temporary covering and protection of other work. Promptly remove coating materials from surfaces outside areas indicated to receive system coatings.

B. Provide final protection and maintain conditions, in a manner acceptable to Installer and system manufacturer, that ensure system is without damage or deterioration at the time of Substantial Completion.

END OF SECTION 07241