CONSTRUCTION STANDARD SPECIFICATION

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CONSTRUCTION STANDARD SPECIFICATION

SECTION 07240

EXTERIOR INSULATION AND FINISH SYSTEMS-CLASS PB

PART 1 - GENERAL

1.01 SUMMARY

Location and extent of exterior insulation finish system is indicated on Contract documents.

A. Section includes the following:

1. Applications over concrete surfaces.
2. Applications over masonry surfaces.
3. Applications over gypsum surfaces.

B. Related Sections: Refer to the following:

1. Section 03300, “Cast-In-Place Concrete” for concrete substrates behind system.
2. Section 04220, “Concrete Masonry Unit” for masonry substrates behind system.
3. Section 05400, “Cold-Formed Metal Framing” for steel stud framing behind system.
4. Section 07900, “Joint Sealants” for sealing joints in system with elastomeric joint sealants.
5. Section 09250, “Gypsum Drywall” for Glass-Mat Gypsum sheathing board.

1.02 REFERENCES

A. American Society of Testing and Materials (ASTM)

A653 Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

B117 Test Method of Salt Spray (Fog)

C67 Method of Sampling and Testing Brick and Structural Clay Tile

C150 Specification for Portland Cement

C297 Test Method for Tensile Strength of Flat Sandwich Constructions in Flatwise Plane

C578 Specification for Rigid, Cellular Polystyrene Thermal Insulation

D578 Specification for Glass Fiber Yarns

D968 Test Method for Abrasion Resistance of Organic Coatings by Falling Abrasive

D2247 Practice for Testing Water Resistance of Coatings in 100% Relative Humidity

D3273 Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber

E84 Test Method for Surface Burning Characteristics of Building Materials

E108 Method for Fire Tests of Roof Coverings

E119 Method for Fire Tests of Building Construction and Materials

E330 Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference

E331 Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference

G23 Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials

G53 Recommended Practice for Operating Light- and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials

B. Building Officials and Code Administrators International (BOCA)

1993 National Building Code Section 1406.0 Combustible Materials On The Exterior Side of Exterior Walls

C. Exterior Insulation Manufacturers Association (EIMA)

101.01 Test Method for Freeze-Thaw Resistance of Exterior Insulation and Finish Systems (EIFS), Class PB (Modified ASTM C67)

101.02 Test Method for Resistance to Water Penetration of Exterior Insulation and Finish Systems (EIFS), Class PB (Modified ASTM E331)

101.03 Test Method for Determining Tensile Adhesion Strength of an Exterior Insulation and Finish System (EIFS), Class PB, and Components (Modified ASTM C297)

101.86 Test Method for Resistance of Exterior Insulation and Finish Systems, Class PB, to the Effects of Rapid Deformation (Impact)

105.01 Test Method for Alkali Resistance of Glass Fiber Reinforcing Mesh for Use in Exterior Insulation and Finish Systems (EIFS), Class PB

Guideline Specification for Expanded Polystyrene (EPS) Insulation Board

D. International Building Code (IBC)

Method of Test for the Evaluation of Flammability Characteristics of Exterior Nonload-bearing Wall Panel Assemblies Using Foam Plastic Insulation

1.03 DEFINITIONS

A. Exterior Insulation and Finish Systems (EIFS): Exterior assemblies composed of inner layer of board insulation, outer layer composed of glass-fiber-mesh-reinforced base coat applied directly to board insulation, and protective finish coat.

B. Designation PB: Polymer-based (PB) class of exterior insulation and finish system based on classification developed by EIFS Industry Members Association (EIMA).

C. System: Refers to Class PB exterior insulation and finish systems.

D. Beneficial Occupancy: The point at which the Project Team determines the facility or area can be occupied from both a regulatory and work function standpoint.

E. Construction Complete: The point at which the Project Team determines the requirements of the Construction Phase including the construction contract are fulfilled. This includes the resolution of any open items.

F. Project Complete: The point at which the Project Team determines that all project activities are completed, closed, and/or approved for normal operations.

1.04 SYSTEM DESCRIPTION

System shall meet or exceed the following requirements:

TEST	METHOD	ACCEPTANCE CRITERIA
Abrasion Resistance	ASTM D968	No cracking, checking or loss of film integrity at 528-quarts (500 liters) of sand.
Accelerated Weathering	ASTM G23 or G53	No deleterious effects* after 2,000-hours when viewed under 5x magnification.

Freeze/Thaw Resistance	EIMA 101.01 (Modified ASTM C67)	60 cycles. No deleterious effects.*
Mildew Resistance	ASTM D3273	No growth supported during 28-day exposure period.
Salt Spray Resistance	ASTM B117	No deleterious effects* at 300-hour exposure.
Tensile Adhesion	EIMA 101.03 (Modified ASTM C297)	No failure in the adhesive, base coat or finish coat. Minimum 5 psi (34.5 kPa) tensile strength before and after freeze/thaw and accelerated weathering tests.
Water Penetration	EIMA 101.02 (Modified ASTM E331)	No water penetration beyond the plane of the base coat/EPS board interface after 15-minutes at 6.24 psf (299 Pa), or 20% of positive design wind pressure, whichever is greater.
Water Resistance	ASTM D2247	No deleterious effects* at 14-day exposure.
Impact Resistance	EIMA 101.86	Standard: 25-49 in-lb (2.83-5.54 J)
Wind Load	ASTM E330	Withstand negative and positive wind loads required by applicable building code.

* No deleterious effects: No cracking, checking, crazing, erosion, rusting, blistering, peeling, or delamination.

1.05 SUBMITTALS

A. General: Submit the following in accordance with conditions of Contract and Section 01300, “Descriptive Submittals.”

B. Product Data: Submit manufacturer’s catalog product data for each component required, including manufacturer’s installation instructions.

C. Shop drawings showing fabrication and installation of system including plans, elevations, sections, details of components, joint locations, configurations, and attachments to other units of work.

D. Samples for initial selection in the form of manufacturer’s color charts and small-scale samples consisting of actual units or sections of units showing full range of colors, textures, and patterns available for each type of textural choices indicated.

E. Samples for verification in the form of 24 inch (610 mm) square panels for each finish, color, texture, and pattern specified. Prepare samples using same tools and techniques intended for actual work. Maintain samples at job site until substantial completion.

F. Product test reports from qualified independent testing agency evidencing compliance of EIFS with requirements based on comprehensive testing of current products.

G. Certificate of Compliance: System manufacturer's certificate of compliance with EIMA standards.

H. Installer Certification: Submit certificates signed by system manufacturer certifying that Installers are qualified to install manufacturers system.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Engage experienced installer who has completed systems similar in material, design, and extent to that indicated for Project and with record of successful in-service performance.

B. Manufacturer's Qualifications: Firm experienced in manufacturing systems similar to those indicated for Project, and that has record of successful in-service performance for minimum of three (3) years.

C. Fire-Test-Response Characteristics: Provide materials and construction that are identical to those tested with the following fire-test-response characteristics, as determined by testing per ASTM test method indicated below, by UL or other testing and inspecting agencies acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing and inspecting agency.

1. Flame Spread of Insulation Board and Finish Coats: 25 or less when tested individually per ASTM E84.

2. Smoke Developed of Insulation Board and Finish Coats: 450 or less when tested individually per ASTM E84.

3. Full-Scale Multistory Fire Test: Tested mockup, representative of completed multistory wall assembly of which system is a part, complies with UBC Standard 26-4 for test method and required fire-test-response characteristics of exterior nonload-bearing wall panel assemblies containing foam plastic insulation.

4. Full-Scale Fire Test: Tested mockup that represents completed wall assembly of which system is a part, shows no tendency to propagate flame over surface or through finish to core, or to cause delamination of finish when vertically mounted exterior face is exposed 15 minutes to fire source using spread of flame test per ASTM E108 modified for testing vertical walls.

5. Radiant Heat Exposure, Unrestricted Installation: Tolerable level of incident radiant heat energy of at least 12.5 kW/sq. m. when tested according to BOCA National Building Code Section 1406.0.

6. Fire Resistance Characteristics: Provide materials and construction identical to those of assemblies whose fire resistance has been determined per ASTM E119 by testing and inspecting agency acceptable to authorities having jurisdiction.

D. Single-Source Responsibility: Obtain materials for system from one source and by single manufacturer, or by manufacturers approved by system manufacturer as compatible with other system components.

E. Compatibility Requirements: System manufacturer shall certify that system is suitable for use with substrates indicated herein and in Contract documents.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original unopened packages, containers, or bundles with manufacturer's labels intact and legible.

B. Store materials inside, under cover and in manner to keep them dry, protected from freezing and inclement weather, direct sunlight, surface contamination, aging, corrosion, and damage from construction traffic and other causes.

Stack insulation board flat and off the ground.

C. Remove wet, frozen, or deteriorated materials from site.

1.08 PROJECT CONDITIONS

A. Environmental Conditions: Do not install system when ambient outdoor air and substrate temperatures are 40°F (4°C) and falling, unless temporary protection and heat are provided to maintain ambient temperatures above 40°F (4°C) during installation of wet materials and until they have dried thoroughly and become weather resistant, but for not less than 24 hours after installation.

B. Hot-Weather Limits: As recommended by system manufacturer and depending upon air temperature, relative humidity, wind speed, and exposure to sun.

C. Do not install coatings when conditions are outside of specified limits.

D. Partially completed work or work not fully cured that is exposed to the elements in excess of manufacturer's recommendations may be rejected.

1.09 WARRANTY

Provide system manufacturer's standard labor and material warranty, but in no case less than five (5) years from date of substantial completion. Warranty shall be in addition to, and not a limitation of other rights Owner may have under Contract documents.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Manufacturers: Subject to compliance with requirements, products by the following manufacturers are acceptable. However, it is Contractor's responsibility to provide only products compatible with adjacent materials in assembly.

Dryvit Systems, Inc.
El Rey
Pleko Products, Inc.
Senergy, Inc.
Sto Industries

2.02 MATERIALS

A. Compatibility: Provide adhesive, board insulation, reinforcing fabrics, base and finish coat materials, sealants, and accessories that are compatible with one another and approved for use by system manufacturer.

B. Primer: Manufacturer's recommended primer.

C. Adhesive: Manufacturer's recommended adhesive.

D. Portland Cement: ASTM C150 Type I or Type II.

E. Expanded Polystyrene Foam Plastic Board Insulation: ASTM C578 Type I; Rigid cellular thermal insulation formed by expansion of polystyrene resin beads or granules in closed mold, approved by system manufacturer for material qualities including corner squareness, other dimensional tolerances, and the following:

Provide insulation in boards not more than 24 inches x 48 inches (610 mm x 1219 mm) and in thickness indicated, but not less than that allowed by system manufacturer, nor more than 4 inches (102 mm).

F. Reinforcing Fabric: ASTM D578, alkali-resistant glass-fiber fabric manufactured especially for use in EIFS.

1. Standard Reinforcing Fabric: Minimum 4.0 oz/sq. yd. (136 g/sq. m).

2. Strip Reinforcing Fabric: Minimum 3.75 oz/sq. yd. (127g/sq. m).

G. Base Coat: Manufacturer's recommended one component base coat.

H. Surface Conditioner: Manufacturer's recommended surface conditioner, tinted to match finish coat color.

I. Finish Coat: Manufacturer's recommended factory-mixed, textured, integrally colored finish coating.

1. Color: Selected at time of submittals from manufacturer's standard color chart.

2. Finish Texture: Selected at time of submittals from manufacturer's full range of standard textures.

J. Clear Sealer Topcoating: Clear acrylic coating.

K. Trim Accessories: As required by system manufacturer.

Galvanized Steel: ASTM A653, G60 coating minimum.

L. Water: Potable, clean, fresh, and free from oil, acid, organic matter or other deleterious substances.

M. Mechanical Fastener Assemblies: System manufacturer's standard corrosion-resistant fastener assemblies, consisting of thermal cap, system manufacturer's standard washer and shaft attachments, and fasteners.

Select fasteners for pullout, tensile, and shear strength properties required to resist design loads of application indicated, capable of pulling fastener head below surface of insulation board.

N. Sealants: Provide system manufacturer's recommended chemically curing, elastomeric sealant that is compatible with joint fillers, joint substrates, and other related materials and complies with requirements of Section 07900, "Joint Sealants."

2.03 MIXING

Mix materials in accordance with manufacturer's instructions, using only manufacturer-approved materials in the instructed quantities. Use only freshly mixed materials. Apply materials within the time prescribed by the manufacturer and without retempering, unless specifically approved.

PART 3 - EXECUTION

3.01 EXAMINATION

A. General: Sandia National Laboratories (SNL) Construction Observer and Installer shall examine substrates, to determine if they are in satisfactory condition for installation of system. Do not proceed with installation of system until unsatisfactory conditions have been corrected.

B. New Concrete Substrates: Cured at least 28 days and free of form release agents or other contaminants that affect adhesion.

C. New Masonry Substrates: Cured at least 28 days and joints finished flush.

3.02 PREPARATION

A. Protection

1. Protect contiguous work from moisture deterioration and soiling resulting from application of systems. Provide temporary covering and other protection needed to prevent spattering of exterior finish coatings on other work.

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

B. Surface Preparation: Prepare and clean substrates to comply with system manufacturer's requirements to obtain optimum bond between substrate and adhesive for insulation.

1. Apply primer-sealer over substrates where required by system manufacturer for improving adhesion or for protecting substrates from premature degradation.

2. Clean substrates, removing contamination such as oil, form-release agents, waxes, paint, dust, and dirt. Use methods appropriate to type of substrate and contamination encountered, such as scrubbing with detergents, acid etching, scarification, and sandblasting.

3. Concrete Substrates; Remove fins and projections. Fill voids and even out irregularities with paste of neat cement grout or, if recommended by system manufacturer, with adhesive or base coat material.

4. Masonry Substrates: Where other than flush joints are encountered, apply leveling course to fill joints flush.

5. Existing Painted Substrates: Remove paint down to clean, sound, paint-free substrate over at least 90 percent or surface area. Use method that does not damage substrate.

6. Surface Leveling: Where required, or where specified, in order to produce uniform planar substrate for application of insulation board, apply adhesive mixture as leveling coat to true the surface.

3.03 INSTALLATION OF INSULATION

A. General: Comply with manufacturer's current published instructions for installation of system as applicable to each type of substrate.

B. Apply trim accessories at perimeter of system, at expansion joints, and elsewhere, as indicated on Contract documents. Use drip screed at bottom edge of system unless otherwise indicated. Use casing beads at other locations.

C. Attach insulation with adhesive unless mechanical attachment is recommended by manufacturer, to comply with the following requirements:

1. Apply adhesive to insulation by notched trowel method in manner that results in adhesive coating entire surface of gypsum sheathing once insulation is adhered to sheathing, unless system manufacturer's instructions specify use of primer-sealer in combination with ribbon and dab method.

2. Allow adhered insulation to remain undisturbed for period prescribed by system manufacturer, but not less than 24 hours, prior to beginning rasping and sanding insulation or application of base coat and reinforcing fabric.

3. Apply insulation boards over dry substrates in courses with long edges oriented horizontally. Begin first course from drip screed and work upward. Work from perimeter casing beads toward interior of panels when possible. Apply thin coat of adhesive to edges of insulation before inserting into trim accessories.

4. Stagger vertical joints in successive courses to produce running bond pattern. Locate joints so that no piece of insulation is less than 12 inches (305 mm) wide or 6 inches (152 mm) high. Offset joints at least 6 inches (152 mm) from corners of windows and door openings.

a. Offset joints of insulation at least 4 inches (102 mm) from joints in sheathing.

b. Offset joints of insulation at least 4 inches (102 mm) from decorative grooves (false joints).

5. Interlock ends at internal and external corners.

6. Abut boards tightly at joints within and between each course to produce flush, continuously even surfaces without gaps or raised edges between insulation boards. If gaps occur, fill with insulation cut to fit gaps exactly; insert without use of adhesive.

7. Cut insulation to fit openings, corners, and projections precisely and to produce edges and shapes conforming to details indicated.

8. Rasp or sand flush entire surface of insulation to remove irregularities projecting more than 1/16 inch (1.6 mm) from surface of insulation and to remove yellowed areas due to sun exposure; do not create depressions deeper than 1/16 inch (1.6 mm).

9. Cut grooves , rabbets, and other features in outside face of insulation with high-speed router and bit configured to produce grooves, rabbets, and other features that conform accurately to profiles and locations indicated. Do not reduce insulation thickness at features to less than 3/4 inches (19 mm).

10. Interrupt insulation where expansion joints are indicated in substrates behind EIFS.

11. 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.

12. Treat exposed edges of insulation board, including those forming substrates of sealed joints within system or between system and other work, by encapsulating with base coat, reinforcing fabric, and finish coat, unless otherwise indicated.

3.04 BASE COAT

A. General: Apply base coat to exposed surfaces of insulation in minimum overall thickness specified by system manufacturer, but no less than 1/16 inch (1.6 mm) when dry.

B. Embed standard reinforcing fabric in wet base coat to produce wrinkle-free installation with fabric continuous or lapped at corners and lapped or otherwise treated at joints to comply with system manufacturer’s requirements.

Completely embed fabric, applying additional base coat material if necessary, so that reinforcing fabric pattern is not visible.

C. Additional Strip Reinforcing Fabric: Apply strip reinforcing fabric around openings extending 4 inches (102 mm) beyond perimeter.

1. Apply additional 8 inch x 16 inch (203 mm x 406 mm) strip reinforcing fabric diagonally at corners of openings (re-entrant corners).

2. Apply 8 inch (203 mm) wide strip reinforcing at both inside and outside corners unless base layer of fabric is lapped at least 4 inches (102 mm) on each side of corners.

3. At decorative grooves (false joints), apply strip reinforcing at least 8 inches (203 mm) wide.

4. Embed strip reinforcing fabric in base coat before applying first layer of reinforcing fabric.

3.05 FINISH COAT

A. Apply manufacturers recommended surface conditioner to surfaces to receive finish coats when required.

B. Apply finish coat over dry base coat in thickness required by system manufacturer to produce uniform finish of texture and color matching approved samples.

3.06 INSTALLATION OF JOINT SEALANTS

A. General: Prepare joints and apply sealants, of type and at locations indicated, to comply with applicable requirements of Section 07900, "Joint Sealants."

B. Clean surfaces to receive sealants to comply with indicated requirements and system manufacturer's recommendations.

C. Apply primer recommended by sealant manufacturer for surfaces to be sealed.

D. Install sealant backing to control depth and configuration of sealant joint and to prevent sealant from adhering to back of joint.

E. Apply masking tape to protect areas adjacent to sealant joints. Remove tape immediately after tooling joints without disturbing joint seal.

3.07 CLEANING

A. Clean finished surfaces in a timely manner if required in order to prevent permanent discoloration.

B Remove accumulated dirt from finished surfaces prior to substantial completion but after completion of adjacent abutting horizontal surface construction (such as pavements) and after establishment of adjacent turf.

C. If discoloration or contamination occurs and cannot be removed, or if system suffers damage prior to substantial completion, then restore, or remove and replace, affected portions (reworking entire planar surfaces as necessary to conceal reworked area), using manufacturer's recommended restoration coatings or new materials meeting the requirements of this specification.

3.08 PROTECTION

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

B. Provide final protection and maintain conditions in manner acceptable to Installer and system manufacturer that ensures system's being without damage or deterioration at time of substantial completion.

END OF SECTION