SECTION 07.24.00
EXTERIOR INSULATION AND FINISH SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Composite wall and soffit cladding of rigid insulation and reinforced finish coating ("Class PB").
B. Drainage and water-resistant barriers behind insulation board.
C. Incidental uses of same finish coating applied directly to concrete and masonry.

1.02 RELATED REQUIREMENTS
A. Section 05.40.00 - Cold-Formed Metal Framing: Sheathing on metal studs.
B. Section 06.10.00 - Rough Carpentry: Sheathing on wood framing.
C. Section 07.62.00 - Sheet Metal Flashing and Trim: Perimeter flashings.
D. Section 07 90 00- Joint Sealers: Perimeter and penetration sealants.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01.30.00 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate wall and soffit joint patterns, joint details, and molding profiles.
C. Product Data: Provide data on system materials, product characteristics, performance criteria, and system limitations.
D. Selection Samples: Submit manufacturer's standard range of samples illustrating available coating colors and textures.
E. Verification Samples: Submit actual samples of selected coating on specified substrate, minimum 12 inches square, illustrating project colors and textures.
F. Manufacturer's Installation Instructions: Indicate preparation required, installation techniques, and jointing requirements.

1.05 QUALITY ASSURANCE
A. Maintain copy of specified installation standard and manufacturer's installation instructions at project site at all times during installation.
B. EIFS Manufacturer Qualifications: Provide EIFS products other than insulation from the same manufacturer with qualifications as follows:
1. Member in good standing of EIMA (EIFS Industry Members Association).
2. Manufacturer of EIFS products for not less than 5 years.
C. Insulation Manufacturer Qualifications: Approved by manufacturer of EIFS and approved and labeled under third party quality program as required by applicable building code.
D. Installer Qualifications: Company specializing in EIFS work, with minimum three years of documented experience, and approved by manufacturer.

1.06 MOCK-UP
A. Construct mock-up of typical EIFS application on specified substrate, size as indicated on drawings, and including flashings, joints, and edge conditions.
B. Locate mock-up as indicated on drawings.
C. Mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Delivery: Deliver materials to project site in manufacturer's original, unopened containers with labels intact. Inspect materials and notify manufacturer of any discrepancies.
B. Storage: Store materials as directed by manufacturer's written instructions.
1. Protect adhesives and finish materials from freezing, temperatures below 40 degrees F and temperatures in excess of 90 degrees F.
2. Protect Portland cement based materials from moisture and humidity. Store under cover off the ground in a dry location.
3. Protect insulation materials from exposure to sunlight.
1.08 FIELD CONDITIONS
A. Do not prepare materials or apply EIFS under conditions other than those described in the manufacturer's written instructions.
B. Do not prepare materials or apply EIFS during inclement weather unless areas of installation are protected. Protect installed EIFS areas from inclement weather until dry.
C. Do not install coatings or sealants when ambient temperature is below 40 degrees F.
D. Do not leave installed insulation board exposed to sunlight for extended periods of time.

1.09 WARRANTY
A. See Section 01.77.70 - Closeout Procedures, for additional warranty requirements.
B. Provide manufacturer's standard material warranty, covering a period of not less than 5 years.

PART 2 PRODUCTS
2.01 EXTERIOR INSULATION AND FINISH SYSTEM
A. Exterior Insulation and Finish System: DRAINAGE type; reinforced finish coating on mechanically-fastened insulation board over sheet-type combination drainage layer/water-resistive barrier over substrate; provide a complete system that has been tested to show compliance with the following characteristics; include all components of specified system and substrate(s) in tested samples.
B. Fire Characteristics:
   1. Flammability: Pass, when tested in accordance with NFPA 285.
   2. Ignitibility: No sustained flaming when tested in accordance with NFPA 268.
   3. Potential Heat of Foam Plastic Insulation Tested Independently of Assembly: No portion of the assembly having potential heat that exceeds that of the insulation sample tested for flammability (above), when tested in accordance with NFPA 259 with results expressed in Btu per square foot.
C. Water Penetration Resistance: No water penetration beyond the plane of the base coat/insulation board interface after 15 minutes, when tested in accordance with ASTM E331 at 6.24 psf differential pressure with tracer dye in the water spray; include in tested sample at least two vertical joints and one horizontal joint of same type to be used in construction; disassemble sample if necessary to determine extent of water penetration.
D. Drainage Efficiency: Average minimum efficiency of 90 percent, when tested in accordance with ASTM E2273 for 75 minutes.
E. Salt Spray Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating after 300 hours exposure in accordance with ASTM B117, using at least three samples matching intended assembly, at least 4 by 6 inches in size.
F. Freeze-Thaw Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating when viewed under 5x magnification after 10 cycles, when tested in accordance with ICC-ES AC219 or AC235.
G. Weathering Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating when viewed under 5x magnification after 2000 hours of accelerated weathering conducted in accordance with ASTM G153 Cycle 1 or ASTM G155 Cycle 1, 5, or 9.
H. Water Degradation Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating after 14 days exposure, when tested in accordance with ASTM D2247.
I. Mildew Resistance: No growth supported on finish coating during 28 day exposure period, when tested in accordance with ASTM D3273.
J. Abrasion Resistance Of Finish: No cracking, checking or loss of film integrity when tested in accordance
with ASTM D968 with 500 liters of sand.

2.02 MATERIALS

A. Finish Coating Top Coat: Water-based, air curing, acrylic or polymer-based finish with integral color and
texture.

B. Base Coat: Acrylic- or polymer-modified, fiber reinforced Portland cement coating.
   1. Portland Cement: ASTM C150, Type I or II.
   2. Base Coat Thickness: 1/4 inch, minimum.

C. Reinforcing Mesh: Balanced, open weave glass fiber fabric, treated for compatibility and improved bond
with coating, weight, strength, and number of layers as required to meet required system impact rating.

D. Insulation Board: Extruded polystyrene (XPS) board insulation with natural skin surfaces; ASTM C578,
   Type V, with the following characteristics:
   1. Board Size: 48 x 96 inch.
   2. Board Size Tolerance: 1/16 inch from square and dimension.
   3. Board Thickness: As indicated on drawings.
   4. Dimensional Stability: 2 percent, maximum.
   6. Thermal Conductivity (k factor) at 25 degrees F: 0.18 as determined by ASTM C177.
   9. Water Absorption: 0.3 percent by volume, maximum.
   10. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/450, when tested in
       accordance with ASTM E84.

E. Water-Resistive Barrier Coating: Fluid-applied air and water barrier membrane; applied to sheathing;
furnished or approved by EIFS manufacturer.

2.03 ACCESSORY MATERIALS

A. Insulation Adhesive: Type required by EIFS manufacturer for project substrate.

B. Insulation Fasteners: Fastener and plate system appropriate for substrate and as recommended by EIFS
   manufacturer.

C. Trim: EIFS manufacturer's standard PVC or galvanized steel trim accessories, as required for a complete
   project and including starter track and drainage accessories.

D. Sealant Materials: Compatible with EIFS materials and as recommended by EIFS manufacturer.

PART 3 EXECUTION

3.01 GENERAL

A. Install in accordance with EIFS manufacturer's instructions and ASTM C1397.

B. Where different requirements appear in either document, comply with the most stringent.

C. Neither of these documents supercedes the provisions of the Contract Documents that define the
   contractual relationships between the parties or the scope of work.

3.02 EXAMINATION

A. Verify that substrate is sound and free of oil, dirt, other surface contaminants, efflorescence, loose
   materials, or protrusions that could interfere with EIFS installation and is of a type and construction that
is acceptable to EIFS manufacturer. Do not begin work until substrate and adjacent materials are complete and thoroughly dry.

B. Verify that substrate surface is flat, with no deviation greater than 1/4 in when tested with a 10 ft straightedge.

3.03 PREPARATION

A. Install self-furring metal lath over solid substrates that are deemed unacceptable to receive adhesively applied insulation. Install in accordance with ASTM C1063, except for butt-lapping instead of overlapping.

1. Attach to concrete and concrete masonry using corrosion-resistant power or powder actuated fasteners or hardened concrete stub nails not less than 3/4 inch long and with heads not less than 3/8 inch wide. Ensure that fasteners are securely attached to substrate and spaced at maximum 16 inches on center horizontally and 7 inches vertically.

B. Apply primer to substrate as recommended by EIFS manufacturer for project conditions.

3.04 INSTALLATION - WATER-RESISTIVE BARRIER

A. Apply barrier coating as recommended by coating manufacturer; prime substrate as required before application.

B. Mechanically attach sheet materials to substrate using fasteners and fastener spacing recommended by EIFS manufacturer.

C. Seal all substrate transitions and intersections with other materials to form continuous water-resistive barrier on exterior of sheathing, using method recommended by manufacturer.

D. At door and window rough openings and other wall penetrations, seal water-resistive barrier and flexible flashings to rough opening before installation of metal flashings, sills, or frames, using method recommended by manufacturer.

E. At moving expansion joints, apply flexible flashing or flashing tape across and recessed into joint with U-loop forming continuous barrier but allowing movement.

F. Lap flexible flashing or flashing tape at least 2 inches on each side of joint or transition.

G. Install drainage layer or spacers after flashing tape has been completed.

H. Exterior Soffit Vents: Install according to manufacturer's written instructions and in locations shown on the drawings. Provide vent area specified.

3.05 INSTALLATION - INSULATION

A. Install in accordance with manufacturer's instructions.

B. Prior to installation of boards, install starter track and other trim level and plumb and securely fastened. Install only in full lengths, to minimize moisture intrusion; cut horizontal trim tight to vertical trim.

C. Install back wrap reinforcing mesh at all openings and terminations that are not to be protected with trim.

D. On wall surfaces, install boards horizontally. On horizontal surfaces, install boards ________.

E. Place boards in a method to maximize tight joints. Stagger vertical joints and interlock at corners. Butt edges and ends tight to adjacent board and to protrusions. Achieve a continuous flush insulation surface, with no gaps in excess of 1/16 inch.

F. Fill gaps greater than 1/16 inch with strips or shims cut from the same insulation material.

G. Rasp irregularities off surface of installed insulation board.

H. Mechanical Fastening: Space fasteners as recommended by EIFS manufacturer.
I. Adhesive Attachment: Use method required by manufacturer to achieve drainage efficiency specified; do not close up drainage channels when placing insulation board.

3.06 INSTALLATION - FINISH

A. Base Coat: Apply in thickness as necessary to fully embed reinforcing mesh, wrinkle free, including back-wrap at all terminations of the EIFS. Install reinforcing fabric as recommended by EIFS manufacturer.
   1. Lap reinforcing mesh edges and ends a minimum of 2-1/2 inches.
   2. Allow base coat to dry a minimum of 24 hours before next coating application.

B. Apply finish coat after base coat has dried not less than 24 hours, embed finish aggregate, and finish to a uniform texture and color.

C. Finish Coat Thickness: 1/16 inch.

D. Seal control and expansion joints within the field of exterior finish and insulation system, using procedures recommended by sealant and finish system manufacturers.

E. Apply sealant at finish perimeter and expansion joints in accordance with sealant manufacturer's instructions.

3.07 CLEANING

A. Clean EIFS surfaces and work areas of foreign materials resulting from EIFS operations.

3.08 PROTECTION

A. Protect completed work from damage and soiling by subsequent work.

END OF SECTION