SECTION 072413 - POLYMER-BASED EXTERIOR INSULATION AND FINISH SYSTEM (EIFS)

Spec Note: Verify and retain required measurement unit required for project.

1. GENERAL
   * + 1. RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

* + - 1. SUMMARY

EIFS-clad barrier-wall assemblies that are field applied over substrate.

Prefabricated panels consisting of EIFS-clad barrier-wall assemblies that are shop applied over sheathing on metal framing.

Retain paragraph below if cast-in-place or embedded attachment devices for prefabricated panels are required for Project.

* + - * 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
        2. Section Includes:
        3. Products furnished, but not installed, under this Section include connections and other attachment devices for prefabricated panels to be **[cast in concrete] [embedded in masonry assemblies]**.
        4. Definitions in ASTM E2110 apply to Work of this Section.
        5. Company Field Advisor: An employee of the Company which lists and markets the primary components of the system under their name who is certified in writing by the Company to be technically qualified in design, installation and servicing of the required products or an employee of an organization certified by the foregoing Company to be technically qualified in design, installation and servicing of the required products.
        6. EIFS: Exterior insulation and finish system(s).
        7. 2020 Building Code of New York State (BCNYS)
        8. Polymer-Based Exterior Insulation and Finish System: Class PB EIFS, as defined in ASTM E2568.
      1. DEFINITIONS
      2. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" paragraph below if Work of this Section is extensive or complex enough to justify a conference.

* + - * 1. Preinstallation Conference: Conduct conference at Project site.
      1. SUBMITTALS
         1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
         2. Manufacturer’s installation instructions shall be provided along with product data.
         3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
         4. Product Data: For each EIFS component, trim, and accessory.
         5. Sustainable Design Submittals:

Retain "Shop Drawings" and "Panel Schedule" paragraphs below for prefabricated panels.

* + - * 1. Shop Drawings: For prefabricated EIFS panels.

Include plans, elevations, sections, details of components including build-outs, details of penetrations and terminations, flashing details, joint locations and configurations, lifting points, fastening and anchorage details including mechanical fasteners, and connections and attachments to other work.

* + - * 1. Panel Schedule: For prefabricated panel fabrication.
        2. Samples: For each exposed product and for each color and texture specified, 12 inches square in size.

Retain "Delegated-Design Submittal" paragraph below if design services have been delegated to Contractor. Retain below with "Product Test Reports" paragraph in "Informational Submittals" Article for the EIFS assembly.

* + - * 1. Delegated-Design Submittal: For prefabricated EIFS panels.
        2. Manufacturer Certificates: Signed by EIFS manufacturer, certifying the following:

EIFS substrate is acceptable to EIFS manufacturer.

Accessory products installed with EIFS, including **[joint sealants,] [flashing,] [water-resistant barriers,] [trim,] <Insert accessory>** whether or not furnished by EIFS manufacturer and whether or not specified in this Section, are acceptable to EIFS manufacturer.

Retain "Product Certificates" paragraph below to require submittal of product certificates from manufacturers. Delete option if adhesive/base coats and finish coats are factory-mixed formulations and require only added water or are usable straight from container.

* + - * 1. Product Certificates: For**[ cementitious materials and aggregates and for]** insulation, from manufacturer.
        2. Product Test Reports: For each EIFS assembly and component, for tests performed by a qualified testing agency.

Retain "Field quality-control reports" paragraph below if Contractor is responsible for field quality-control testing. Testing may be required in addition to Special Inspections, to suit Project.

* + - * 1. Field quality-control reports.
        2. Sample Warranty: For manufacturer's special warranty.
      1. CLOSEOUT SUBMITTALS
         1. Maintenance Data: For EIFS to include in maintenance manuals.
      2. QUALITY ASSURANCE

Retain "Fabricator/Erector Qualifications" paragraph below only after verifying existence and availability of certifying program with EIFS manufacturers. Revise if fabricator is not erector.

* + - * 1. Fabricator/Erector Qualifications: Certified in writing by EIFS manufacturer as qualified to fabricate and erect manufacturer's prefabricated panel system using skilled and trained workers.
        2. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, to set quality standards for materials and execution, and to set quality standards for fabrication and installation.

Indicate portion of wall represented by mockup on Drawings or draw mockup as separate element.

Build mockup of typical wall area as shown on Drawings.

Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

Retain subparagraph below if the intention is to make an exception to the default requirement for demolishing and removing mockups.

Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

* + - 1. DELIVERY, STORAGE, AND HANDLING
         1. Deliver materials in original, unopened packages with manufacturers' labels intact and clearly identifying products.
         2. Store materials inside and under cover; keep them dry and protected from weather, direct sunlight, surface contamination, aging, corrosion, damaging temperatures, construction traffic, and other causes.

Stack insulation board flat and off the ground.

Protect plastic insulation against ignition at all times. Do not deliver plastic insulating materials to Project site before installation time.

Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

* + - 1. FIELD CONDITIONS

Weather and ambient conditions may affect drying and curing time and appearance.

* + - * 1. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions and ambient outdoor air, humidity, and substrate temperatures permit EIFS to be applied, dried, and cured according to manufacturers' written instructions and warranty requirements.

Proceed with installation of adhesives or coatings only when ambient temperatures have remained, or are forecast to remain, above 40 deg F for a minimum of 24 hours before, during, and after application. Do not apply EIFS adhesives or coatings during rainfall.

* + - 1. WARRANTY

When warranties are required, verify with Director’s Representative's counsel that warranties stated in this article are not less than remedies available to Director’s Representative under prevailing local laws.

EIFS manufacturers' standard warranties vary tremendously in what they include and exclude, in some cases claiming to limit coverage to only the products they manufacture. Although none of the manufacturers produce joint sealants or sheathing, some indicate that they will include the sealants and sheathing in their warranties, provided they are preapproved.

Some standard warranties are for materials only, whereas others include labor to repair or replace defective materials. Durations vary, and some are measured from completion of EIFS installation rather than Substantial Completion of Project. Contact manufacturers to verify the warranty terms they accept.

* + - * 1. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace components of EIFS that fail in materials or workmanship within specified warranty period.

Failures include, but are not limited to, the following:

Bond integrity and weathertightness.

Deterioration of EIFS finishes and other EIFS materials beyond normal weathering.

Warranty coverage includes the following EIFS components:

EIFS finish, including base coats, finish coats, and reinforcing mesh.

Insulation installed as part of EIFS**[, including buildouts]**.

Insulation adhesive**[ and mechanical fasteners]**.

EIFS accessories, including trim components and flashing.

Verify available warranties and warranty periods for EIFS.

Warranty Period: **[Five] [10] <Insert number>** years from date of Substantial Completion.

1. PRODUCTS
   * + 1. MANUFACTURERS
          1. Source Limitations: Obtain EIFS from single source from single EIFS manufacturer and from sources approved by EIFS manufacturer as tested and compatible with EIFS components.
       2. PERFORMANCE REQUIREMENTS

Compliance with ASTM E2568 is required by the IBC.

* + - * 1. EIFS Performance: Comply with ASTM E2568 and with the following:

Weathertightness: Resistant to water penetration from exterior.

Retain "System Fire Performance" subparagraph below only where fire-resistance-rated wall construction is required and testing has demonstrated that adding EIFS does not reduce fire resistance.

System Fire Performance: **[Fire-resistance rating of wall assembly] [Full-scale multistory fire test]**.

ASTM E2568 requires only that EIFS be tested according to ASTM E330 for structural performance and that results of these tests be reported. Because no minimum performance is included in either ASTM International (ASTM) standard, design pressure values may be needed to ensure that EIFS have been tested by manufacturer to withstand Project requirements.

Structural Performance of Assembly and Components:

Retain one of two "Wind Loads" subparagraphs below.

Wind Loads: Uniform pressure of **<Insert lbf/sq. ft. >**, acting inward or outward.

If retaining "Wind Loads" subparagraph below, indicate pressures on appropriate Drawings. The IBC requires loads to be indicated on structural drawings.

Wind Loads: Uniform pressure as indicated on Drawings.

Retain one of first four options in "Impact Performance" subparagraph below for impact-resistance levels recognized by ASTM E2568. If more than one impact-resistance level is required, identify the default level and retain fifth option. Identify exceptions to the default level on Drawings, or insert subparagraphs below identifying specific areas and impact levels required for each area.

Impact Performance: ASTM E2568, [Standard] [Medium] [High] [Ultra High] impact resistance[ unless otherwise indicated].

"Abrasion Resistance of Finish Coat" and "Mildew Resistance of Finish Coat" subparagraphs below are examples only and are not included in ASTM E2568. Before retaining, verify that EIFS manufacturers can comply with requirements.

Abrasion Resistance of Finish Coat: Sample consisting of 1-inch-thick EIFS mounted on 1/2-inch-thick gypsum board; cured for a minimum of 28 days and shows no cracking, checking, or loss of film integrity after exposure to 528 quarts of sand when tested according to ASTM D968, Method A.

Mildew Resistance of Finish Coat: Sample applied to 2-by-2-inch clean glass substrate; cured for 28 days and shows no growth when tested according to ASTM D3273 and evaluated according to ASTM D3274.

Retain "Performance of Prefabricated Panels" paragraph below if retaining "EIFS Performance" paragraph above and if Contractor is required to assume responsibility for design.

* + - * 1. Performance of Prefabricated Panels: EIFS shall be designed as follows and withstand the structural performance indicated for Class PB EIFS and thermal movement limits indicated below without failure due to defective manufacture, fabrication, installation, or other defects in construction.

Structural Performance: EIFS shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to **[ASCE/SEI 7] <Insert requirement>.**

Retain one of two "Wind Loads" subparagraphs below.

Wind Loads: Uniform pressure of **<Insert lbf/sq. ft. >**, acting inward or outward.

If retaining "Wind Loads" subparagraph below, indicate pressures on appropriate elevation Drawings.

Wind Loads: Uniform pressure as indicated on Drawings.

Deflection Limits: Design prefabricated panels to withstand design loads without deflections greater than **[1/240] <Insert deflection limits>**.

Thermal Movements: Allow for thermal movements from ambient and surface temperature changes. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

Temperature Change: **[100 deg F] <Insert temperature change>**.

* + - 1. EIFS MATERIALS

Retain "Prefabricated Panels" paragraph below if prefabricated panels are required.

* + - * 1. Prefabricated Panels: Comply with requirements in Section 054000 "Cold-Formed Metal Framing" for metal framing supporting sheathing beneath EIFS and Section 061600 "Sheathing" for sheathing and sheathing joint treatment.

Retain "Flexible-Membrane Flashing" paragraph below if required; delete if flexible-membrane flashing is specified in another Section. A typical use for membrane flashing is flashing and sealing at openings for windows, doors, and other penetrations. Some manufacturers offer a fluid-applied flashing material for use in lieu of the flexible sheet flashing product. Revise paragraph below for fluid-applied flashing if desired.

* + - * 1. Flexible-Membrane Flashing: Cold-applied, self-adhering, self-healing, rubberized-asphalt and polyethylene-film composite sheet or tape and primer; EIFS manufacturer's standard or product recommended in writing by EIFS manufacturer.
        2. Insulation Adhesive: EIFS manufacturer's standard formulation designed for indicated use; compatible with substrate and complying with**[ one of]** the following:

Retain option in "Insulation Adhesive" paragraph above if retaining more than one subparagraph below for Contractor's option. Type of formulation used is typically Contractor preference. If retaining only one subparagraph below, consult with manufacturer on which formulation is best suited to the application. Cementitious adhesives are typically used for the attachment of EPS to gypsum, cement board, or unpainted masonry surfaces. Noncementitious adhesives are typically used for the attachment of EPS to wood substrates.

Job-mixed formulation of portland cement, complying with ASTM C150, Type I, and polymer-based adhesive specified for base coat.

Factory-blended dry formulation of portland cement, dry polymer admixture, and fillers specified for base coat.

Factory-mixed noncementitious formulation designed for adhesive attachment of insulation to substrates of type indicated, as recommended by EIFS manufacturer.

* + - * 1. Molded, (Expanded) Rigid Cellular Polystyrene Board Insulation: Comply with ASTM E2430, unless otherwise noted, and the following:

Flame-Spread and Smoke-Developed Indexes: 25 and 450 or less, respectively, according to ASTM E84.

Dimensions: Provide insulation boards of not more than 24 by 48 inches, with thickness indicated on Drawings.

Foam Buildouts: Provide with profiles and dimensions indicated on Drawings.

* + - * 1. Reinforcing Mesh: Balanced, alkali-resistant, open-weave, glass-fiber mesh treated for compatibility with other EIFS materials, made from continuous multi-end strands with retained mesh tensile strength of not less than 120 lbf/in. according to ASTM E2098 and the following:

Reinforcing Mesh for EIFS, General: Not less than weight required to comply with impact-performance level specified in "Performance Requirements" Article.

"Strip-Reinforcing Mesh," "Detail-Reinforcing Mesh," and "Corner-Reinforcing Mesh" subparagraphs below are examples only. Unlike the reinforcing mesh required in the "field" areas of EIFS, impact resistance for these secondary reinforcing applications is not addressed in the referenced standards. See manufacturers' product data and revise to suit EIFS selected, or delete if not required.

Strip-Reinforcing Mesh: Not less than **[3.75 oz./sq. yd.] [As recommended by EIFS manufacturer] <Insert weight>**.

Detail-Reinforcing Mesh: Not less than **[4.0 oz./sq. yd.] [As recommended by EIFS manufacturer] <Insert weight>**.

Corner-Reinforcing Mesh: Not less than **[7.2 oz./sq. yd.] [As recommended by EIFS manufacturer] <Insert weight>**.

* + - * 1. Base Coat: EIFS manufacturer's standard mixture complying with**[ one of]** the following:

Retain option in "Base Coat" paragraph above if retaining more than one subparagraph below for Contractor's option. Some base coats also contain chopped glass fibers and pigments; add if required. Type of formulation used is typically Contractor preference. If retaining only one subparagraph below, consult with manufacturer on which formulation is best suited to the application. Cementitious adhesives are typically used for the attachment of EPS to gypsum board, cement board, or unpainted masonry surfaces. Noncementitious adhesives are typically used for the attachment of EPS to wood substrates.

Job-mixed formulation of portland cement complying with ASTM C150, Type I, white or natural color; and manufacturer's standard polymer-emulsion adhesive designed for use with portland cement.

Job-combined formulation of manufacturer's standard polymer-emulsion adhesive and manufacturer's standard dry mix containing portland cement.

Factory-blended dry formulation of portland cement, dry polymer admixture, and inert fillers to which only water is added at Project site.

Factory-mixed noncementitious formulation of polymer-emulsion adhesive and inert fillers that is ready to use without adding other materials.

Retain "Water-Resistant Base Coat" paragraph below in addition to or in lieu of "Base Coat" paragraph above if applicable. If retaining more than one coating, indicate extent of each type of coating on Drawings. Water-resistant base coats are offered by some EIFS manufacturers for areas of anticipated high moisture, such as sloped surfaces, windowsills, and certain parapet applications.

* + - * 1. Water-Resistant Base Coat: EIFS manufacturer's standard waterproof formulation complying with[ one of] the following:

Type of formulation used is typically Contractor preference. If retaining only one subparagraph below, consult with manufacturer on which formulation is best suited to the application, or revise formulation to match EIFS manufacturer's product.

Job-mixed formulation of portland cement complying with ASTM C150, Type I, white or natural color; and manufacturer's standard polymer-emulsion adhesive designed for use with portland cement.

Job-combined formulation of manufacturer's standard polymer-emulsion adhesive and manufacturer's standard dry mix containing portland cement.

Retain "Mechanical Fasteners" paragraph below in addition to or in lieu of adhesive based on Project conditions. Typically, EIFS insulation is secured with adhesive only.

* + - * 1. Mechanical Fasteners: EIFS manufacturer's standard corrosion-resistant fasteners, consisting of thermal cap, standard washer and shaft attachments, and fastener indicated below; designed to resist Project's design loads; capable of pulling fastener head below surface of insulation board; and complying with the following:

Retain examples of fastener types in subparagraphs below to suit Project and manufacturers' requirements, or insert another.

For attachment to steel studs from 0.033 to 0.112 inch in thickness, provide steel drill screws complying with ASTM C954.

For attachment to light-gage steel framing members not less than 0.0179 inch in thickness, provide steel drill screws complying with ASTM C1002.

For attachment to wood framing members and plywood sheathing, provide steel drill screws complying with ASTM C1002, Type W.

For attachment to masonry and concrete substrates, provide sheathing dowel in form of a plastic wing-tipped fastener with thermal cap, sized to fit insulation thickness indicated and to penetrate substrate to depth required to secure anchorage.

For attachment to **<Insert substrate>**, provide manufacturer's standard fasteners suitable for substrate.

Retain "Primer" paragraph below if applicable. Some manufacturers recommend using a primer for certain conditions; see "Primer coat" discussion in the Evaluations.

* + - * 1. Primer: EIFS manufacturer's standard factory-mixed, elastomeric-polymer primer for preparing base-coat surface for application of finish coat.

Verify availability of finish-coat formulations with manufacturers before retaining options in "Finish Coat" paragraph below. For exact finish, insert names of coating manufacturers and products.

* + - * 1. Finish Coat: EIFS manufacturer's **[standard acrylic-based coating] [standard acrylic-based coating with enhanced mildew resistance] [siliconized acrylic-based coating] [elastomeric coating] <Insert coating>** complying with the following:

Retain one of first two subparagraphs below. Second subparagraph is an example of an applied-aggregate finish available from some EIFS manufacturers. This finish has been discontinued by most EIFS manufacturers but may be available as a custom finish. Revise to suit products, or insert name of product.

Factory-mixed formulation of polymer-emulsion binder, colorfast mineral pigments, sound stone particles, and fillers.

Factory-mixed formulation of polymer-emulsion binder, colorfast mineral pigments, and fillers used with stone particles for embedding in finish coat to produce an applied-aggregate finish.

Material in "Aggregate" subparagraph below is an example only; revise to suit products. Aggregate size and composition may vary among EIFS manufacturers.

Aggregate: Marble chips of size and color **[as indicated by manufacturer's designations] [to match Director’s Representative sample] [as selected by Director’s Representative from manufacturer's full range of industry colors and color densities]**.

Retain one of three options in "Colors" subparagraph below. If retaining first, indicate colors in a separate schedule.

Colors: **[As indicated by manufacturer's designations] [Match Director’s Representative sample] [As selected by Director’s Representative from manufacturer's** **full range**].

Retain one of three options in "Textures" subparagraph below. If retaining first, indicate texture in a separate schedule.

Textures: **[As indicated by manufacturer's designations] [Match Director’s Representative sample] [As selected by Director’s Representative from manufacturer's full range]**.

Product in "Sealer" paragraph below is required by some EIFS manufacturers for use over decorative simulated-stone finishes.

* + - * 1. Sealer: Manufacturer's waterproof, clear acrylic-based sealer for protecting finish coat.
        2. Water: Potable.

Retain "Trim Accessories" paragraph below if applicable. Revise to galvanized steel or zinc alloy to suit Project. Use of galvanized steel may lead to rust stains. Verify acceptability with EIFS manufacturers for application indicated.

* + - * 1. Trim Accessories: Type as designated or required to suit conditions indicated and to comply with EIFS manufacturer's written instructions; manufactured from UV-stabilized PVC; and complying with ASTM D1784 and ASTM C1063.

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 and back leg.

Drip Screed/Track: Prefabricated, one-piece type for attachment behind insulation, with face leg extended to form a drip, of depth required to suit thickness of coating and insulation, with face leg perforated for bonding to coating and back leg.

Expansion Joint: Closed-cell polyethylene backer rod and elastomeric sealant, 3/4-inch minimum.

Windowsill Flashing: Prefabricated type for both flashing and sloping sill over framing beneath windows; with end and back dams; designed to direct water to exterior.

Parapet Cap Flashing: Type for both flashing and covering parapet top, with design complying with ASTM C1397**[ and ANSI/SPRI/FM 4435/ES-1]**.

* + - 1. MIXING
         1. Comply with EIFS manufacturer's requirements for combining and mixing materials. Do not introduce admixtures, water, or other materials, except as recommended by EIFS manufacturer. Mix materials in clean containers. Use materials within time period specified by EIFS manufacturer or discard.
      2. PANEL FABRICATION

Retain this article for prefabricated panels.

* + - * 1. Panel Framing: Fabricate panel framing to comply with requirements in Section 054000 "Cold-Formed Metal Framing."

Revise first subparagraph below if not welding panel framing.

Connect panel framing by welding unless otherwise indicated.

Connections: Provide connections capable of adjustment, complying with erection tolerance requirements, to anchor panels to structure.

* + - * 1. Sheathing: Install on metal framing to comply with requirements in Section 061600 "Sheathing."
        2. EIFS Application: Apply EIFS to sheathed metal-framed panels to comply with requirements in "Substrate Protection Application," "Trim Installation," "Insulation Installation," "Base-Coat Application," and "Finish-Coat Application" articles and as follows:

Wrap base coat and reinforcing mesh at edges of panels, and extend coverage not less than **[4 inches over backs of panels] [full thickness to cover edges of metal framing]** unless otherwise indicated.

Retain one of two subparagraphs below. Retain first where joint sealant is not applied over finish coat; retain second where joint sealant is applied over finish coat. See EIFS manufacturer's written instructions.

Continue finish coat around corners at edges of panels unless otherwise indicated, and extend to location indicated for sealant application. Do not extend finish coat over surfaces where sealant is applied.

Continue finish coat around corners at edges of panels, and extend over edges to cover base coat unless otherwise indicated.

* + - * 1. Panel Fabrication Tolerances: Comply with the following:

Overall Height and Width: Plus or minus **[1/8 inch] <Insert dimension>**.

Cumulative Height and Width over Length of Building: Not more than **[3/8 inch] <Insert dimension>**.

Openings within One Unit: Plus or minus **[1/8 inch] <Insert dimension>** for window and door frames.

Out of Square: Plus or minus **[1/8 inch] <Insert dimension>**.

Locations of Reveals and Architectural Features: Plus or minus **[1/8 inch] <Insert dimension>**.

Thickness: Plus or minus **[1/16 inch] <Insert dimension>**.

Flatness: Not more than **[1/8 inch in 8 feet] <Insert dimensions>** across face of panel.

Retain "Source Quality Control" Article below if prefabricated panels are specified and inspection of fabricators and testing of fabricated work are required by authorities having jurisdiction or by EIFS manufacturer.

* + - 1. SOURCE QUALITY CONTROL
         1. Testing Agency: **[The State will engage] [Engage]** a qualified testing agency to perform shop tests and inspections indicated below and to prepare test reports:

Shop welds are subject to testing and inspection.

Testing and inspecting agency shall interpret tests and report whether tested Work complies with or deviates from requirements.

Correct deficiencies in or replace EIFS prefabricated panels that test reports and inspections indicate do not comply with requirements.

Additional testing and inspection, at Contractor's expense, shall be performed to determine compliance of corrected Work with requirements.

1. EXECUTION
   * + 1. EXAMINATION

Coordinate Work of this Section with requirements for erection tolerances, etc., that must be included in other related Sections.

* + - * 1. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
        2. Examine roof edges, wall framing, flashings, openings, substrates, and junctures at other construction for suitable conditions where EIFS will be installed.
        3. Proceed with installation only after unsatisfactory conditions have been corrected.

Begin coating application only after surfaces are dry.

Application of coating indicates acceptance of surfaces and conditions.

* + - 1. PREPARATION
         1. Protect contiguous work from moisture deterioration and soiling caused by application of EIFS. Provide temporary covering and other protection needed to prevent spattering of exterior finish coats on other work.
         2. Protect EIFS, substrates, and wall construction behind them from inclement weather during installation. Prevent penetration of moisture behind EIFS and deterioration of substrates.
         3. Prepare and clean substrates to comply with EIFS manufacturer's written instructions to obtain optimum bond between substrate and adhesive for insulation.

Retain "Concrete Substrates" subparagraph below if substrates are concrete.

Concrete Substrates: Provide clean, dry, neutral-pH substrate for insulation installation. Verify suitability of substrate by performing bond and moisture tests recommended by EIFS manufacturer.

* + - 1. EIFS INSTALLATION, GENERAL
         1. Comply with ASTM C1397, ASTM E2511, and EIFS manufacturer's written instructions for installation of EIFS as applicable to each type of substrate.
      2. SUBSTRATE PROTECTION APPLICATION

Delete "Flexible-Membrane Flashing" paragraph below if no flexible-membrane flashing or if flexible-membrane flashing is specified in another Section.

* + - * 1. Flexible-Membrane Flashing: Apply and lap to shed water; seal at openings, penetrations, and terminations. Prime substrates with flashing primer if required and install flashing.
      1. TRIM INSTALLATION

Retain this article if using trim. Trim may be adhesively or mechanically attached. See EIFS manufacturers' product data and details. Revise below to suit Project.

* + - * 1. Trim: Apply trim accessories at perimeter of EIFS, at expansion joints,**[ at windowsills,]** and elsewhere as indicated. Coordinate with installation of insulation.

Drip Screed/Track: Use at bottom edges of EIFS unless otherwise indicated.

Windowsill Flashing: Use at windows unless otherwise indicated.

Expansion Joint: Use where indicated on Drawings.

Casing Bead: Use at other locations.

Parapet Cap Flashing: Use where indicated on Drawings.

**<Insert trim and requirements>**.

* + - 1. INSULATION INSTALLATION

Retain one of three options in "Board Insulation" paragraph below that describe attachment method. Coordinate with products in Part 2.

* + - * 1. Board Insulation: **[Adhesively] [Mechanically] [Adhesively and mechanically]** attach insulation to substrate in compliance with ASTM C1397 and the following:

Retain "Sheathing" or "Concrete or Masonry" subparagraph below if insulation is adhesively applied. Revise if sealing of substrate is not required or if another method is required by EIFS manufacturer. Verify acceptability of alternative application methods with authorities having jurisdiction and in conformity with evaluation reports. Delete unacceptable methods.

Sheathing: Apply adhesive to insulation by notched-trowel method in a manner that results in coating the entire surface of sheathing with adhesive once insulation is adhered to substrate. Apply adhesive to a thickness of not less than 1/4 inch for factory mixed and not less than 3/8 inch for field mixed, measured from surface of insulation before placement.

Concrete or Masonry: Apply adhesive by ribbon-and-dab method.

Retain first two subparagraphs below only with adhesive or adhesive-and-mechanical attachment method.

Press and slide insulation into place. Apply pressure over entire surface of insulation to accomplish uniform contact, high initial grab, and overall level surface.

Allow adhered insulation to remain undisturbed for not less than 24 hours, before**[ installing mechanical fasteners,]** beginning rasping and sanding insulation or before applying base coat and reinforcing mesh.

Retain first subparagraph below only with mechanical or adhesive-and-mechanical attachment method.

Mechanically attach insulation to substrate. Install top surface of fastener heads flush with plane of insulation. Install fasteners into or through substrates with the following minimum penetration:

Retain applicable subparagraphs below. Values are from ASTM C1397. Verify values with EIFS manufacturer.

Steel Framing: 5/16 inch.

Wood Framing: 1 inch.

Concrete and Masonry: 1 inch.

Apply insulation over dry substrates in courses, with long edges of boards oriented horizontally.

Retain first subparagraph below if not using trim; retain second if using trim.

Begin first course of insulation from a level base line and work upward.

Begin first course of insulation from screed/track and work upward. Work from perimeter casing beads toward interior of panels if possible.

Stagger vertical joints of insulation boards in successive courses to produce running bond pattern. Locate joints, so no piece of insulation is less than 12 inches wide or 6 inches high. Offset joints not less than 6 inches from corners of window and door openings**[ and not less than 4 inches from aesthetic reveals]**.

Adhesive Attachment: Offset joints of insulation not less than 6 inches from horizontal and 4 inches from vertical joints in sheathing.

Mechanical Attachment: Offset joints of insulation from horizontal joints in sheathing.

Interlock ends at internal and external corners.

Abut insulation tightly at joints within and between each course to produce flush, continuously even surfaces without gaps or raised edges between boards. If gaps greater than 1/16 inch occur, fill with insulation cut to fit gaps exactly; insert insulation without using adhesive or other material.

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

First option in first subparagraph below is based on Dryvit's requirements. EIMA and other EIFS manufacturers allow 1/16-inch projections.

Rasp or sand flush entire surface of insulation to remove irregularities projecting more than **[1/32 inch] [1/16 inch]** from surface of insulation and to remove yellowed areas due to sun exposure; do not create depressions deeper than 1/16 inch. Prevent airborne dispersal and immediately collect insulation raspings or sandings.

Retain first subparagraph below if applicable.

Cut aesthetic reveals in outside face of insulation with high-speed router and bit configured to produce grooves, rabbets, and other features that comply with profiles and locations indicated. Do not reduce insulation thickness at aesthetic reveals to less than 3/4 inch.

Retain first subparagraph below if using foam buildouts on Project.

Install foam buildouts and attach to structural substrate by **[adhesive] [mechanical fastening] [adhesive and mechanical fastening]**.

Always retain first subparagraph below.

Interrupt insulation for expansion joints where indicated.

Retain first subparagraph below for joint-sealant application to base coat. Indicate joint widths on Drawings. Size to suit anticipated movement between adjoining materials and thermal expansion of assembly.

Form joints for sealant application by leaving gaps between adjoining insulation edges and between insulation edges and dissimilar adjoining surfaces. Make gaps wide enough to produce joint widths indicated after encapsulating joint substrates with base coat and reinforcing mesh.

Retain first subparagraph below if using trim.

Form joints for sealant application with back-to-back casing beads for joints within EIFS 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.

If manufacturer's details recommend extending mesh onto the substrate in lieu of onto back of board insulation, indicate on Drawings.

Before installing insulation and before applying field-applied reinforcing mesh, fully wrap board edges. Cover edges of board and extend encapsulating mesh not less than 2-1/2 inches over front and back face unless otherwise indicated on Drawings.

Treat exposed edges of insulation as follows:

Except for edges forming substrates of sealant joints, encapsulate with base coat, reinforcing mesh, and finish coat.

Encapsulate edges forming substrates of sealant joints within EIFS or between EIFS and other work with base coat and reinforcing mesh.

Retain first subparagraph below if using trim.

At edges trimmed by accessories, extend base coat, reinforcing mesh, and finish coat over face leg of accessories.

Coordinate installation of flashing and insulation to produce wall assembly that does not allow water to penetrate behind flashing and EIFS lamina.

* + - * 1. Expansion Joints: Install at locations indicated, where required by EIFS manufacturer, and as follows:

Retain and revise six subparagraphs below that reflect ASTM C1397 and ASTM C1481 requirements and EIMA recommendations. Class PB EIFS must be interrupted where true expansion joints occur in substrates but not necessarily at other joints. Verify requirements for joints with EIFS manufacturers, and adjust or add to list.

At expansion joints in substrates behind EIFS.

Where EIFS adjoin dissimilar substrates, materials, and construction, including other EIFS.

At floor lines in multilevel wood-framed construction.

Where wall height or building shape changes.

Where EIFS manufacturer requires joints in long continuous elevations.

Retain subparagraph below for prefabricated panels.

Where panels abut one another.

* + - 1. BASE-COAT APPLICATION

Retain "Water-Resistant Base Coat" paragraph below, in addition to, or in lieu of "Base Coat" paragraph below.

* + - * 1. Water-Resistant Base Coat: Apply full-thickness coverage **[to exposed insulation and]** to exposed surfaces of **[sloped shapes] [window sills] [parapets] [foam buildouts] <Insert location>** and to other surfaces indicated on Drawings.
        2. Base Coat: Apply full coverage to exposed insulation **[and foam buildouts ]with not less than [1/16-inch] <Insert dimension>** dry-coat thickness.
        3. Reinforcing Mesh: Embed reinforcing mesh in wet base coat to produce wrinkle-free installation with mesh continuous at corners, overlapped not less than 2-1/2 inches or otherwise treated at joints to comply with ASTM C1397. 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 invisible.

Some high-impact applications may require a double layer of reinforcing mesh. Verify requirements with manufacturer.

* + - * 1. Double-Layer Reinforcing-Mesh Application: Where indicated or required, apply second base coat and second layer of reinforcing mesh, overlapped not less than 2-1/2 inches or otherwise treated at joints to comply with ASTM C1397 in same manner as first application. Do not apply until first base coat has cured.

Generally, retain "Additional Reinforcing Mesh" paragraph below to prevent stress cracking at corners of openings and inside corners and to give some additional impact resistance to outside corners.

* + - * 1. 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.

Retain first subparagraph below for aesthetic reveals.

At aesthetic reveals, apply strip-reinforcing mesh not less than 8 inches wide.

Generally, retain subparagraph below, so base mesh layer smooths transition at edges of strip-reinforcing mesh.

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

Retain "Foam Buildouts" paragraph below if applicable.

* + - * 1. Foam Buildouts: Fully embed reinforcing mesh in base coat.

Procedure in "Double Base-Coat Application" paragraph below helps ensure that mesh is fully protected from moisture and improves EIFS durability, weather resistance, and impact resistance.

* + - * 1. Double Base-Coat Application: Where indicated, apply second base coat in same manner and thickness as first application, except without reinforcing mesh. Do not apply until first base coat has cured.
      1. FINISH-COAT APPLICATION

Retain "Primer" paragraph below if applicable.

* + - * 1. Primer: Apply over dry base coat.

Retain option in "Finish Coat" paragraph below if retaining "Primer" paragraph above.

* + - * 1. Finish Coat: Apply full-thickness coverage over dry [primed ]base coat, maintaining a wet edge at all times for uniform appearance, to produce a uniform finish of color and texture matching approved sample and free of cold joints, shadow lines, and texture variations.

Retain subparagraph below for applied aggregate.

Embed aggregate in finish coat to produce a uniform applied-aggregate finish of color and texture matching approved sample.

Retain "Sealer Coat" paragraph below if applicable.

* + - * 1. Sealer Coat: Apply over dry finish coat, in number of coats and thickness required by EIFS manufacturer.
      1. INSTALLATION OF PREFABRICATED PANELS

Retain this article for prefabricated panels. Revise if fasteners and anchors are required in lieu of welded connections.

* + - * 1. General: Install panels according to Shop Drawings. Install **[by welding metal framing to structural-steel frame] [by welding to steel-weld plates anchored in concrete] <Insert requirements>** to comply with requirements in Section 054000 "Cold-Formed Metal Framing" unless otherwise indicated.

Lift panels only as indicated on Shop Drawings.

Do not warp or stress panels by forcing alignment.

Adjust connections to align panels and maintain correct and uniform joint widths.

Install bracing as panels are erected. Weld securely to panel framing and to structure.

* + - * 1. Erection Tolerances: Install panels level, plumb, and true to line with no variation in plane or alignment exceeding 1/16 inch and no variation in position exceeding 1/8 inch.

Maintain clearance between panels required for installing joint sealants.

* + - 1. FIELD QUALITY CONTROL

The BCNYS requires special inspections for all EIFS installations, except for EIFS-clad drainage-wall assemblies and EIFS installed over masonry or concrete walls. Verify requirements of applicable Uniform Code.

* + - * 1. Special Inspections: The State will engage a qualified special inspector to perform the following special inspections:

Retain applicable special inspections in subparagraphs below.

As stipulated in Ch. 17 of the IBC.

**<Insert special inspections>**.

Retain paragraphs below if testing of EIFS or EIFS attachment to substrates is required, in addition to "Special Inspections" paragraph above, to suit Project. Retain first option in "Testing Agency" paragraph below if Director’s Representative engages testing agency. If authorities having jurisdiction permit Contractor to engage testing agency, consider retaining second option.

* + - * 1. Testing Agency: **[The State will engage] [Engage]** a qualified testing agency to perform tests and inspections.
        2. EIFS Tests and Inspections: According to ASTM E2568 **<Insert tests and inspections>**.

Retain "Prefabricated Panels" paragraph below if applicable.

* + - * 1. Prefabricated Panels: Test and inspect field welds.
        2. EIFS will be considered defective if it does not pass tests and inspections.
        3. Prepare test and inspection reports.
      1. CLEANING AND PROTECTION
         1. 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 EIFS coatings.

END OF SECTION 072413