Historical example:

Guideline Specification for EIFS - Class PB

Division 7 Section 07240

Adopted by EIMA June 5,1984

Revised April, 1997

INTRODUCTION

The EIFS Industry Members Association, Inc. (EIMA) has prepared these generic specifications for use as guidelines when specifying Exterior Insulation and Finish Systems (hereinafter referred to as EIFS or System). Specific installation instructions and procedures for each particular system must be obtained from the manufacturer supplying the materials and integrated into the project specifications and contract documents. EIMA does not endorse any particular system or make any recommendations in regard to a specific manufacturer's products or application procedure. It is the sole responsibility of the manufacturer to provide all parties with specific recommendations regarding its product application and limitations.

NOTE: This specification is only a guide for experienced specifications writers and should not be used as an actual specification without appropriate modifications for the specific use intended. It must be integrated into and coordinated with the procedures of each architectural firm, product manufacturer, and the requirements of the specific project. It is intended solely to cover the EIFS portion of the building and assumes that the EIFS is being applied to a sound substrate. Specific requirements, installation instructions and procedures published in the product manufacturer's literature supersede this guideline specification.

PART 1 - GENERAL

1 .01 Description and Scope

A. Provide all labor, material, and equipment necessary to install the EIFS. The system consists of adhesive and/or mechanical attachment, insulation board, base coat, reinforcing mesh, and finish coat as specified by the EIFS manufacturer.

B. Related work specified elsewhere:

1. Light Gauge Metals Section 05400

2. Sheathing Section 06100 [Note: Refer to EIMA Tech Notes WC- 101 for selection of sheathing.]

3. Unit Masonry Section 04200

4. Concrete Section 03300

5. Sealants Section 07900 [Note: Refer to EIMA Guide for Use of Sealants With Exterior Insulation and Finish Systems (EIFS), Class PB, and include EIMA Standard 300.01, with minimum requirement for 50% elongation after conditioning, in performance requirement for sealants.]

C. Referenced Documents

1. ASTM Standards

- A 526 Specification for Sheet Steel, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality
- B 69 Specification for Rolled Zinc
- B 117 Test Method for Salt Spray (Fog) Testing
- C 67 Method of Sampling and Testing Brick and Structural Clay Tile
- C150 Specification for Portland Cement
- C 297 Test Method for Tensile Strength of Flat Sandwich Constructions in Flatwise Plane
- C 578 Specification for Preformed, Cellular Polystyrene Thermal Insulation
- Cl 135 Test Method for Determining Tensile Adhesion Properties of Structural Sealants
- D 968 Test Method for Abrasion Resistance of Organic Coatings by Falling Abrasive
- D1784 Specification for Rigid Poly Vinyl Chloride (PVC) Compounds and Chlorinated Poly Vinyl Chloride (CPVC) Compounds
- D2247 Practice for Testing Water Resistance of Coatings in 100% Relative Humidity
- D 3273 Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
- E 84 Test Method for Surface Burning Characteristics of Building Materials
- El 08 Method for Fire Tests of Roof Coverings
- El 19 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 2
- E331 Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
- E 695 Method for Measuring Relative Resistance of Wall, Floor, and Roof Constructions to Impact Loading

- G23 Practice for Operating Light- and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Nonmetallic Materials
- G53 Recommended Practice for Operating Light- and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials

2. Building Code Standards

Section 1406.0,1996 National Building Code, Building Officials and Code Administrators International (BOCA)

Section 717.4 and 717.5,1994 Standard Building Code, Southern Building Code Congress International (SBCCI)

UBC Standard 26-4 (formerly UBC 17-6), 1994 Uniform Building Code, International Conference of Building Officials (ICBO)

3. EIMA Standards

101 .01 Standard Test Method for Freeze-Thaw Resistance of Exterior Insulation and Finish Systems (EIFS), Class PB (Modified ASTM C 67) (Revised August, 1995)

101.02 Standard Test Method for Resistance to Water Penetration of Exterior Insulation and Finish Systems (EIFS), Class PB (Modified ASTM E 331) (Revised August, 1995)

101.03 Standard Test Method for Determining Tensile Adhesion Strength of an Exterior Insulation and Finish System (EIFS), Class PB, and Components (Modified ASTM C 297) (Revised August, 1995)

101.86 Standard Test Method for Resistance of Exterior Insulation and Finish Systems, Class PB, to the Effects of Rapid Deformation (Impact) (Revised August, 1995)

105.01 Standard Test Method for Alkali Resistance of Glass Fiber Reinforcing Mesh for Use in Exterior Insulation and Finish Systems (EIFS), Class PB (Adopted August, 1995)

300.01 Standard Test Method for Determining Tensile Adhesion Properties of Sealants When Used with Exterior Insulation and Finish Systems (EIFS), Class PB (Revised August, 1995

Guideline Specification for Expanded Polystyrene (EPS) Insulation Board (Revised August, 1995)

Tech Notes, WC-1 01, Selection of Sheathing for Class PB Exterior Insulation and Finish Systems (EIFS) (Revised September, 1994)

D. Terms/Definitions

1. Class PB System A class of EIFS where the base coat varies in thickness depending upon the number of layers, or thickness, of reinforcing mesh. The reinforcing material is glass fiber mesh which is embedded into the base coat per EIFS manufacturer recommendations and with no mesh color visible. Protective finish coats, of various thickness, in a variety of textures and colors, are applied over the base coat.

2. Insulation Board A preformed insulating material of a specific type and density that functions to reduce heat flow through the wall and provides the surface to receive the base coat.

3. Adhesive A material used to attach the insulation board to the substrate.

4. Base Coat A material applied to the face of the insulation board that functions as the weather barrier.

5. Reinforcing Mesh Balanced, open weave glass fiber fabric, treated for compatibility with other materials of the system, which functions to strengthen the system.

6. Finish Coat A decorative and protective textured coating applied to the base coat.

7. Accessory Products, such as corner beads and casing beads, that may be utilized in conjunction with the system.

8. Primer A material that may be used to prepare surfaces prior to application of another system component.

9. Mechanical Fastener A device used to attach the insulation board to the substrate.

1 .02 Design Limitations

A. The maximum allowable system deflection, normal to plane of wall, is L/240 (L = Height in inches).

B. Design wind-load shall not exceed the systems allowable wind-load as stated in the manufacturer's applicable code reports.

C. Details shall conform with system manufacturer's recommendations and shall be consistent with the project requirements. [Note: Consult EIMA publication on Class PB details for general information and guidance.]

D. Expansion joints are required in the system where they exist in the substrate, where the system adjoins dissimilar construction, and at floor lines in multilevel wood frame construction. System shall terminate at expansion joint; sealant joint shall be detailed and installed.

E. All areas requiring an impact resistance classification higher than "standard," as defined by EIMA Test Method and Standard 101 .86, shall be detailed in the drawings and specifically described in the contract documents.

F. The use of dark colors must be considered in relation to wall surface temperature as a function of local climate conditions.

1 .03 Quality Assurance

A. EIFS Manufacturer Requirements

1. Shall be a system manufacturer for a minimum of three years.

2. System shall be recognized for the intended use by the applicable building code(s).

B. Insulation Board Manufacturer

1. Insulation board manufacturer shall be recognized by EIFS manufacturer as capable of producing insulation board to meet system requirements.

2. Insulation board shall be listed by an approved agency.

3. Insulation board and/or packaging shall be labeled with pertinent information required by the EIFS manufacturer, the approved listing agency, and the applicable building code.

C. Contractor Requirements

1. Contractor shall be knowledgeable in the proper installation of Class PB Systems.

2. Contractor shall have demonstrated the ability to install the system on projects of similar size and complexity. Contractor shall provide a list of completed projects.

3. Contractor shall provide the proper equipment, manpower and supervision on the job site to install the system in compliance with the project plans and specifications.

1 .04 Submittals Prior to Commencement of Work

A. A list of completed project references.

B. System manufacturer's literature, including specifications, application instructions and details.

C. System manufacturer's self-certification of compliance with EIMA standards.

D. EPS board manufacturer's self-certification of compliance with the current edition of EIMA Guideline Specification for Expanded Polystyrene (EPS) Insulation Board.

E. Samples

1. The contractor shall, before the project commences, provide the owner/architect with samples for approval. Samples shall be of the EIFS to be applied, and of suitable size as required to accurately represent each color and texture to be utilized on the project.

2. Each sample shall be prepared using the same tools, equipment and techniques required for the actual applications.

3. An approved sample shall be available and maintained at the job site.

F. When required by contract documents, prepare and submit project specific details.

1.05 Product Delivery, Storage, and Handling

A. Deliver all materials supplied by the system manufacturer in original, unopened and undamaged packaging with legible manufacturer's identification and labels intact.

B. Store all products supplied by the system manufacturer in a cool, dry place protected from direct sunlight, weather and other damage. Store all wet materials at a temperature of not less than 40 degrees F (4.40C) at all times.

C. Material Safety Data Sheets (MSDS) shall be supplied for the components of the EIFS and be available at the job site.

1 .06 Job Conditions

A. Weather and Environmental Conditions

1. Application of wet materials shall not take place during inclement weather unless appropriate protection is provided. Protect materials from inclement weather until they are dry.

2. Installation of wet materials shall be at an ambient temperature of 40 degrees F (4.40C) and rising and shall be maintained above 40 degrees F (4.40C) for a minimum of 24 hours after application.

3. Supplemental heat shall be furnished for applications when the temperature is less than 40 degrees F (4.40C). Sufficient ventilation and time shall be provided to ensure that materials have sufficiently dried prior to removing supplemental heat.

B. Protect surrounding areas and surfaces during the application of the wall system.

1.07 Coordination/Scheduling I

A. The work in this section requires close coordination with related sections and trades.

B. The tops of all walls shall immediately be covered with the final trim, or temporarily protected, to prevent water infiltration behind the system. The cap flashing shall be installed as soon as possible after the finish coat has been installed.

C. All sealants shall be installed in a timely manner. Protect open joints from water intrusion during construction with backer rod, or temporary covering, until permanently sealed.

PART 2 - PRODUCTS

2.01 Manufacturers

A. The following manufacturer(s) are approved for the project:

1. _____

2. _____

3. _____

B. All components of the EIFS shall be obtained from the selected system manufacturer or its recognized supplier.

2.02 Materials

A. Adhesive -- shall be compatible with the insulation board, substrate, and reinforcing mesh.

B. Portland Cement--shall conform to ASTM C 150, Type I or Type I & II.

C. Insulation Board -- Expanded Polystyrene (EPS) shall conform to the requirements of (1) ASTM C578, (2) current edition of EIMA Guideline Specification for Expanded Polystyrene (EPS) Insulation Board and (3) system manufacturers' current published specifications. Thickness shall be noted on drawings.

D. Reinforcing Mesh -- shall be balanced, open weave glass fiber fabric treated for compatibility with other materials of the system.

E. Base Coat -- shall be compatible with the insulation board and reinforcing mesh.

F. Primers -- shall be as required by the system manufacturer.

G. Finish Coat -- shall be the type, color, and texture as selected by the architect/owner.

H. Mechanical Fasteners -- shall be as required by the system manufacturer.

I. Accessories -- if required by system manufacturer, shall be of proper size and configuration for their intended purpose, and shall be fabricated from zinc-coated (galvanized) steel, zinc alloy, or rigid PVC plastic (virgin material).

1. Galvanized steel -- as specified in ASTM A 526 and shall have a minimum G60 coating.

2. PVC plastic --as specified in ASTM D 1784, Cell Classification 13244C.

3. Zinc alloy -- as specified in ASTM B 69. J.
Water -- shall be clean and potable. K.

4. Sealants -- shall be recommended by the sealant manufacturer for use with the selected EIFS, I and shall be listed by the system manufacturer.

2.03 Performance Characteristics

The system and its components shall meet or exceed the following performance standards.

Test	Method	Acceptance Criteria

A. Durability

1. System Performance
    a. Abrasion Resistance; ASTM D968 No cracking, checking or loss of film integrity at 528 quarts (500 liters) of sand.
    b. Accelerated Weathering: ASTM G23 or G53 No deleterious effects*after 2000-hours when viewed under 5x magnification
    c. Freeze/Thaw Resistance EIMA 101.01 (Modified ASTM C 67) 60 cycles No deleterious effects.*
    d. Mildew Resistance ASTM D 3273 No growth supported during 28-day exposure period.
    e. Salt Spray Resistance ASTM B117 No deleterious effects* at 300-hours exposure.
    f. Tensile Adhesion EIMA 101.03 (Modified ASTM C927) No failure in adhesive, base coat or finish coat. Minimum Spsi (34.5 kPa) tensile strength before and after free/thaw and accelerated weathering tests.
    g. Water Penetration EIMA 101.2 (Modified ASTM E331) No water penetration beyond the plane of the base coat/EPS board interface after 15-minutes at 6.24 psf (200 Pa), or 20% positive design wind pressure, whichever is greater.
    h. Water Resistance ASTM D2247 No deleterious effect* at 14-day exposure.

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

2. Component Performance
    a. Alkali Resistance of Reinforcing Mesh EIMA 105.1 120 p11 (21nD/cm) retained tensile strength

b. Physical Properties and Requirements for EPS ASTM C578 Refer to current edition of EIMA Guideline Specification for Expanded Polystyrene (EPS) Insulation Board

B. Fire Performance

1. System Performance
    a. Fire Endurance ASTM E119 No effect on fire resistance of wall assembly.
    b. Full-Scale Diversified Fire Test ASTM E108 (Modified) No significant contribution to vertical or horizontal flame spread.
    c. Full-Scale Multi-Story Fire Test UBC Standard 26-4 (formerly UBS 17-5)
        i. Resistance to vertical spread of flame within the core of the panel from one story to the next.
        ii. Resistance to flame propagation over the exterior surface
        iii. Resistance to vertical spread of flame over the interior surface from one story to the next.
        iv. Resistance to significant lateral spread of flame from the compartment of fire origin to adjacent spaces.
    d. Radiant Heat Exposure Current National Building Code, Section 1406.0 Current standard Building Code Section 717.4 & 717.5
2. Component Performance
    a. Surface Burning ASTM E84 Adhesive, insulation board, reinforced base coat and finish coat shall each separately have a flame spread of 25 or less, and smoke developed of 450 or less.

C. Structural Performance

1. System Performance
    a. Impact Resistance EIMA 101.86 Standard: 25-49 in-lb. (2.83-5.54 J) Medium: 50-89 in-lb. (5.65-10.1 J) High: 90-150 in-lb. (10.2-17) Ultra-High: Over 150in-lb. (17.1J)
    b. Wind Load ASTM E330 Withstand negative and positive wind loads required by applicable building code.

PART 3 - EXECUTION

3.01 Installation

A. Installation shall be performed strictly in accordance with system manufacturer's current published instructions.

3.02 Substrate

A. The substrate shall be of a type approved by the system manufacturer.

B. The substrate shall be free of planar irregularities greater than 1/4-in. (6.4 mm) in 8 ft.-0-in. (2.4 m) and shall be sound and free of foreign substances.

C. Unsatisfactory conditions shall be reported to the General Contractor and corrected by the substrate installer before application of the system.

D. Refer to system manufacturer for recommendations on the use of primer.

3.03 Application

A. Mixing -- All materials requiring preparation in the field shall be labeled with complete mixing instructions. All instructions shall be followed by the contractor.

B. System Terminations -- At all system terminations, the insulation board shall be backwrapped with reinforcing mesh and base coat in accordance with paragraphs 3.03 B 1 and 3.03 B 2.

1. Reinforcing mesh of sufficient width shall be applied to the substrate so it will encapsulate the edge of the insulation board and extend a minimum of 2-1/2-in. (63 mm) onto the substrate behind the insulation board and a minimum of 2-1/2-in. (63 mm) onto the face of the insulation board.

2. The encapsulation of the edge of the insulation board with base coat and reinforcing mesh shall be completed after the installation of the insulation board, and prior to application of mesh to the field of the insulation board. *[Note: System terminations may also be detailed with accessories in accordance with the system manufacturer's recommendations.]*

C. Method of Attachment of Insulation Board --shall be in accordance with the applicable building code and approved by the system manufacturer.

1. Adhesive Method--The adhesive shall be applied to the back of the insulation board by one of the following methods:

a. The adhesive shall be applied to the entire surface of the insulation board using a notched trowel as recommended by the system manufacturer.

b. The adhesive shall be applied to the entire perimeter of the insulation board in a ribbon fashion 2-in. (50 mm) wide by 3/8-in. (9.5 mm) thick. Dabs of approximately 4-in. (100 mm) in diameter, in the same thickness, are then applied 8-in. (200 mm) on center over the remainder of the board.

2. Adhesive and Mechanical Fastener Method

a. Adhesive shall be applied in accordance with Section 3.03 C 1a or 1b.

b. Mechanical fasteners shall be of a type and spacing in accordance with the system manufacturer's current published instructions.

D. Installation of insulation shall be in accordance with the system manufacturer's current published instructions.

1. The application of the insulation board shall commence at the base of the wall from a level line or support.

2. When the adhesive has been applied to the back of the insulation board, it shall be installed by sliding it into place until it abuts adjoining insulation board.

3. Pressure shall be applied over the entire surface of the insulation board to achieve uniform contact and high initial grab. The insulation board shall be checked occasionally for proper contact to the substrate. Proper contact has been achieved when a piece of insulation board is removed and a similar amount of adhesive is adhered to both the substrate and the insulation board.

4. The insulation boards shall be applied in a running bond pattern, with staggered vertical joints and interlocking insulation boards at the inside and outside corners. Insulation board joints shall be offset from sheathing joints and corners of openings.

5. All insulation boards shall be butted tightly. Any gaps greater than 1/16-in. (1.6 mm) between the insulation boards shall be filled with insulation. Gaps shall not be filled with adhesive or any other non-insulating material.

6. The adhered insulation board shall be allowed to remain undisturbed for 24 hours prior to proceeding with the installation of the base coat / reinforcing mesh, or longer if necessary for the adhesive to dry. Where mechanical fasteners are used, follow system manufacturer's current published instructions.

E. Applying Reinforcing Mesh and Base Coat

1. Prior to base coat / reinforcing mesh application, all insulation board irregularities greater than 1/16-in. (1.6 mm) shall be sanded flat. Insulation board surface shall be entirely free of deleterious material prior to base coat application.

[Note: EPS insulation board exposed to sunlight will develop a powdery film on the surface. This film must be entirely removed by sanding the surface.]

2. Complete the backwrapping at all system terminations (Section 3.03 B) by embedding the backwrap reinforcing mesh in the base coat.

3. Apply the base coat to the entire surface of the insulation board to the thickness specified by the system manufacturer.

4. Embed the field reinforcing mesh in the wet base coat, troweling from the center to the edge of the reinforcing mesh, to avoid wrinkles. The reinforcing mesh shall be continuous at all corners, and lapped over previously backwrapped mesh [2-1/2-in. (63mm)] or butted, in accordance with the system manufacturer's recommendations. The reinforcing mesh shall be embedded in the base coat per the system manufacturer's recommendation and with no mesh color visible.

5. EPS shapes installed over EIFS on noncombustible construction shall have reinforcing mesh embedded in the base coat.

6. Refer to system manufacturer for recommendations on use of primer.

F. Applying Finish

1. The base coat / reinforcing mesh application must be allowed to dry prior to the application of the finish coat.

2. Prior to application of the finish coat, surface irregularities in the base coat, such as trowel marks, board lines, reinforcing mesh laps, etc., shall be corrected.

3. Apply the finish coat to the dry base coat maintaining a wet edge at all times to obtain a uniform appearance. The thickness of the finish coat shall be in accordance with the system manufacturer's current published instructions.

4. The texture and color of the finish shall be as specified and in accordance with the approved sample. All mechanics applying and texturing the finish shall utilize the same tools, equipment and techniques to achieve uniformity.

3.04 Job Site Cleanup

A. All excess wall system materials shall be removed from the job site by the contractor in accordance with contract provisions.

B. All surrounding areas, where the EIFS has been applied, shall be left free of debris and foreign substances.