

Section 07200

BUILDING INSULATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Extent of insulation work is shown on drawings and indicated by provisions of this section.
- B. Applications of insulation specified in this section include the following:
 - 1. Blanket-type building insulation.

1.3 QUALITY ASSURANCE

- A. Thermal Resistivity: Where thermal resistivity properties of insulation materials are designated by R-values they represent the rate of heat flow through a homogenous material exactly 1" thick, measured by test method included in referenced material standard or otherwise indicated. They are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one square foot per hour at mean temperatures indicated.
- B. Fire Performance Characteristics: Provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Surface Burning Characteristics: ASTM E 84.
 - 2. Fire Resistance Ratings: ASTM E 119.
 - 3. Combustion Characteristics: ASTM E 136.
- C. Maximum Allowable Asbestos Content of Inorganic Insulations: Provide insulations

composed of mineral fibers or mineral ores which contain less than 0.25% by weight of asbestos of any type or mixture of types occurring naturally as impurities as determined by polarized light microscopy test per Appendix A of 40 CFR 763.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product literature and installation instructions for each type of insulation and vapor retarder material required.
- B. Certified Test Reports: With product data, submit copies of certified test reports showing compliance with specified performance values, including r-values (aged values for plastic insulations), densities, compression strengths, fire performance characteristics, perm ratings, water absorption ratings and similar properties.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. General Protection: Protect insulations from physical damage and from becoming wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.
- B. Protection for Plastic Insulation
 - 1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
 - 2. Protect against ignition at all times. Do not deliver plastic insulating materials to project site ahead of installation time. Complete installation and concealment of plastic materials as rapidly as possible in each area of work.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products of one of the following:
 - 1. Manufacturers of Glass Fiber Insulation:
 - a. CertainTeed Corp.
 - b. Knauf Fiber Glass GmbH.

- c. Schuller International, Inc.
- d. Owens-Corning Fiberglas Corp.

2.2 INSULATING MATERIALS

- A. General: Provide insulating materials which comply with requirements indicated for materials, compliance with referenced standards, and other characteristics.
 - 1. Performed Units: Sizes to fit applications indicated, selected from manufacturer's standard thicknesses, widths and lengths.
- B. Unfaced Mineral Fiber Blanket/Batt Insulation: Thermal insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing); and as follows:
 - 1. Mineral Fiber Type: Fibers manufactured from glass.
 - 2. Combustion Characteristics: Passes ASTM E 136 test.
 - 3. Surface Burning Characteristics: Maximum flame spread and smoke developed values of 25 and 50, respectively.
 - 4. Thermal Resistance: R13 @ perimeter walls

2.3 AUXILIARY INSULATING MATERIALS

Mechanical Anchors: Type and size indicated or, if not indicated, as recommended by insulation manufacturer for type of application and condition of substrate.

PART 3 EXECUTION

3.1 INSPECTION AND PREPARATION

- A. Require Installer to examine substrates and conditions under which insulation work is to be performed. A satisfactory substrate is one that complies with requirements of the section in which substrate and related work is specified. Obtain Installer's written report listing conditions detrimental to performance of work in this section. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.

- B. Clean substrates of substances harmful to insulations or vapor retarders, including removal of projections which might puncture vapor retarders.
- C. Close off openings in cavities to receive poured-in-place insulation, sufficiently to prevent escape of insulation. Provide bronze or stainless steel screen (inside) where openings must be maintained for drainage or ventilation.

3.2 INSTALLATION, GENERAL

- A. Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work.
- B. Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.
- C. Apply a single layer of insulation of required thickness, unless otherwise shown or required to make up total thickness.

3.3 INSTALLATION OF GENERAL BUILDING INSULATION:

- A. Apply insulation units to substrate by method indicated, complying with manufacturer's recommendations. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Seal joints between closed-cell (non-breathing) insulation units by applying mastic or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with mastic or sealant.
- C. Set vapor retarder faced units with vapor retarder to warm side of construction, except as otherwise indicated. Do not obstruct ventilation spaces, except for firestopping.
 - 1. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure air-tight installation.

- D. Stuff loose glass fiber insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40% of normal maximum volume (to a density of approximately 2.5 lbs. per cu. ft.).

3.4 PROTECTION

- A. General: Protect installed insulation and vapor retarders from harmful weather exposures and from possible physical abuses, where possible by nondelayed installation of concealing work or, where that is not possible, by temporary covering or enclosure.

END OF SECTION

Section 072400

INSULATION AND FINISH SYSTEM (EIFS) - CLASS PB

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Manufacturer's requirements for the proper design, use, and installation of a drainage type, continuously insulated Exterior Insulation and Finish System (EIFS) Class PB (polymer-based) designed to provide drainage of incidental water entering the system.

1.2 RELATED SECTIONS

- A. Section 09 25 30 – Gypsum Sheathing

1.3 REFERENCES

- A. ASTM B117 Test Method for Salt Spray (Fog) Testing
- B. ASTM C203 Standard Test Method for Breaking Load and Flexural Properties of Block-Type Thermal Insulation
- C. ASTM C1135 Test Method for Determining Tensile Adhesion Properties of Structural Sealants
- D. ASTM D968 Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
- E. ASTM D1037 Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials
- F. ASTM D2247 Practice for Testing Water Resistance of Coatings in 100 Percent Relative Humidity
- G. ASTM D2294 Standard Test Method for Creep Properties of Adhesives in Shear by Tension Loading (Metal-to-Metal).
- H. ASTM D2794 Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
- I. ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
- J. ASTM E84 Test Method for Surface Burning Characteristics of Building Materials.
- K. ASTM E108 Standard Test Methods for Fire Tests of Roof Coverings
- L. ASTM E119 Standard Test Method for Fire Tests of Building Construction and Materials.
- M. ASTM E283 Standard Test Method for Determining rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Difference Across the Specimen
- N. ASTM E330 Test Method for Structural Performance by Uniform Static Air Pressure Difference.
- O. ASTM E331 Test Method for Water Penetration by Uniform Static Air Pressure Difference.

- P. ASTM E695 Method for Measuring Relative Resistance to Impact Loading.
- Q. ASTM E2134 Standard Test Method for Evaluating the Tensile-Adhesion Performance of an Exterior Insulation and Finish System (EIFS)
- R. ASTM E2178 Standard Test Method for Air Permeance of Building Materials
- S. ASTM E2273 Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies
- T. ASTM E2430 Standard Specification For Expanded Polystyrene (“EPS”) Thermal Insulation Boards For Use In Exterior Insulation and Finish Systems (“EIFS”)
- U. ASTM E2485 Standard Test Method for Freeze/Thaw Resistance of Exterior Insulation and Finish Systems (EIFS) and Water Resistive Barrier Coatings
- V. ASTM E2486 Standard Test Method for Impact Resistance of Class PB and PI Exterior Insulation and Finish Systems (EIFS)
- W. ASTM G155/
G153 Accelerated Weathering for Exposure of Nonmetallic Materials.
- X. Fed. Spec. Coating, Textured (For Interior and Exterior Masonry Surfaces)
TT-C-555B
- Y. MIL STD 810B Military Standard, Environmental Test Methods
- Z. N FPA 259 Test Method for Potential Heat of Building Materials.
- AA. N FPA 268 Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source.
- BB. N FPA 285 Standard Method of Test for the Evaluation of Flammability characteristics of Exterior Nonload-bearing Wall Assemblies Containing Combustible Components Using the Intermediate-scale, Multistory Test Apparatus.

1.4 ASSEMBLY DESCRIPTION

- A. An Exterior Insulation and Finish System (EIFS) consisting of an air/water barrier, adhesive, Expanded Polystyrene Insulation (EPS) Board, Base Coat with embedded Reinforcing Fabric Mesh, and Finish Top Coat. This system is installed over a roll on water-resistive barrier and flashing membrane applied over glass mat gypsum sheathing.
- B. Functional Criteria:
 - 1. General:
 - a. Insulation Board: At system termination, completely encapsulate insulation board edges by mesh reinforced base coat, substrate or drainage track (limited to terminations at foundation). The use of and maximum thickness of insulation board shall be in accordance with applicable building codes and EIFS manufacturer’s requirements.
 - b. Flashing: Flashing shall be continuous and watertight. Flashing shall be designed and installed to prevent water infiltration behind the cladding.
 - c. The configuration of the water resistive barrier, drainage plane and flashing, must allow for the egress of incidental moisture.
 - d. Design Pressures: Per Texas Department of Insurance (TDI) requirements for Coastal Areas based on ASCE 7-05, Wall Components and Cladding, computed as

follows: Zone 4 = +/- 58 psf (at interior areas of the building and away from building corners by more than 8 feet) and Zone 5 = +58 psf, -106 psf (within 8 feet from building corners).

- e. Inclined surfaces shall follow the guidelines listed below:
 - (1) Minimum slope: 6 in (152 mm) of vertical rise in 12 in (305 mm) of horizontal run.
 - (2) For sloped surfaces, run of slope shall be a maximum of 12 in (305 mm).
 - (3) Usage not meeting above criteria shall be approved in writing prior to installation.
 - f. The building interior shall be separated from the insulation board by 1/2 in (12.7 mm) of gypsum board or equivalent 15 minute thermal barrier.
2. Performance Requirements
- a. System to meet the performance and testing requirements of the International Code Council Acceptance Criteria AC 212
 - b. Shall meet the testing requirements of the Product Performance Sheet.
3. Substrate Systems:
- a. Shall be engineered to withstand applicable design loads including required safety factor.
 - b. Maximum deflection of substrate system under positive or negative design loads shall not exceed L/240 of span.
 - c. Substrate dimensional tolerance: Flat within 1/4 in (6.4 mm) within a 10 ft (3.05 m) radius.
 - d. Surface irregularities: Sheathing not over 1/8 in (3 mm); masonry not over 3/16 in (4.8 mm).
4. Impact Resistance Classification:
- a. High Impact Resistance, 90-150 in-lbs (10.2–17.0 J) Impact Range
5. Expansion Joints: Continuous expansion joints shall be installed at the following locations in accordance with manufacturer's recommendations:
- a. At building expansion joints.
 - b. At substrate expansion joints.
 - c. At floor lines.
 - d. Where EIFS panels abut one another.
 - e. Where EIFS abuts other materials.
 - f. Where significant structural movement occurs, such as at
 - (1) Changes in roof line.
 - (2) Changes in building shape and/or structural system.
 - g. Where substrate changes
 - h. Substrate movement and expansion and contraction of EIFS and adjacent materials shall be taken into account in design of expansion joints, with proper consideration given to sealant properties, installation conditions, temperature range, coefficients of expansion of materials, joint width to depth ratios, and other material factors. Minimum width of expansion joints shall be as follows:
 - (1) 1/2 in (12.7 mm) where EIFS abuts other materials.

- (2) 3/4 in (19 mm) when EIFS abuts the EIFS.
- (3) Larger width where indicated on drawings.

6. Manufacturer's Detail:
 - a. EIFS latest published information shall be followed for standard detail treatments.
 - b. Non-standard detail treatments shall be as recommended by manufacturer, approved by Project Designer and be part of the Contract Documents.
7. Building Code Conformance: EIFS shall be acceptable for use on this project under building code having jurisdiction.

1.5 SUBMITTALS

- A. General: Submit Samples, Evaluation Reports, TDI Product Evaluation Reports, Manufacturer's installation requirements and specifications including flashing details and requirements, sealants, warranties and Certificates in accordance with Division 01 General Requirements Submittal Section. Manufacturer's installation requirements and details must be adhered to.

1.6 QUALITY ASSURANCE

- A. Products manufactured under ISO 9001:2000 Quality System.
- B. Qualifications:
 1. All EIFS assembly materials must be manufactured or sold by a single-source manufacturer and must be purchased direct from the manufacturer or its authorized distributor.
 2. Applicator:
 - a. Must be knowledgeable and competent in the proper installation of the EIFS system to be installed with at least 4-years of experience of comparable work.
 - b. Must possess a current manufacturer's certificate that has been issued by said manufacturer for the EIFS product to be installed.
- C. Regulatory Requirements:
 1. Insulation Board: Shall be produced and labeled under a third party quality program as required by applicable building code.
- D. Mock-up
 1. The Contractor shall, before the project commences, provide the OWNER/ENGINEER with a mock-up for acceptance.
 2. The mock-up shall be of suitable size as required (but not less than a 4-foot square) to accurately represent the products being installed, as well as each color and texture to be utilized on the project. The mock-up will show the various layers that will make up the EIFS assembly.
 3. The mock-up shall be prepared with the same products, tools, equipment and techniques required for the actual application. The finish used shall be from the same batch that is being used on the project.

4. The accepted mock-up shall be available and maintained at the job site.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials in original packaging with manufacturer's identification.
- B. Storage: Store materials in a cool, dry location, out of sunlight, protected from weather and other harmful environment, and at a temperature above 40°F (4°C) and below 110°F (43°C) in accordance with manufacturer's instructions.

1.8 PROJECT / SITE CONDITIONS

- A. Installation Ambient Air Temperature: Minimum of 40°F (4°C) and rising, and remain so for 24 hours thereafter.
- B. Substrate Temperature: Do not apply materials to substrates whose temperature are below 40°F (4°C) or contain frost or ice.
- C. Inclement Weather: Do not apply materials during inclement weather unless appropriate protection is employed.
- D. Sunlight Exposure: Avoid, when possible, installation of the materials in direct sunlight. Application of Acrylic Finishes in direct sunlight in hot weather may adversely affect aesthetics.
- E. Materials shall not be applied if ambient temperature exceeds 120°F (49°C) or falls below 40°F (4°C) within 24 hours of application. Protect materials from uneven and excessive evaporation during hot, dry weather.
- F. Prior to installation, the substrate shall be inspected for surface contamination, or other defects that may adversely affect the performance of the materials and shall be free of residual moisture.

1.9 COORDINATION AND SCHEDULING:

- A. Coordination: Coordinate water-resistive membrane and air barrier coating materials installation with other construction operations.

1.10 WARRANTY

- A. Warranty: Upon request, at completion of installation, provide manufacturer's Standard Labor and Material Limited Warranty, minimum 10 years.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: Master Wall, Inc., P.O. Box 397, Fortson, Georgia, 30058 Contact: 800.755.0825, www.masterwall.com. Technical Assistance, 800.760.2861. Local Assistance, 281.543.1237.
- B. EIFS Assembly: Master Wall Inc. Rollershield Drainage EIFS system, Class PB, Adhered to Steel Stud Wall Application.
- C. Components: Obtain components from authorized distributors. No substitutions or additions of other materials are permitted without prior written permission from the EIFS manufacturer for this project.

2.2 MATERIALS

- A. Per Manufacturer's specifications in compliance with TDI Product Evaluation Report EC-49, Assembly No. 3 and enhanced as follows:
 - 1. Wall Framing: Wall studs shall be C-shaped 3-5/8", 16 gauge steel metal studs spaced at 16 inches o.c. within Zone 4 areas, and 2"x6", 16 gauge steel metal studs at 16 inches o.c. within Zone 5 areas.
 - 2. Wall Sheathing: 5/8" thick Dens Glass Gold Gypsum Sheathing attached to steel studs with No. 8 x 1-5/8" long bugle heads screws, corrosion resistant, spaced at 4" o.c. around the perimeter and in the field.
 - 3. Base Coat: Master Wall Rollershield Air/Water Barrier.
 - 4. Reinforcing Mesh: Master Wall Ultra Mesh 21.0 oz/sy fiberglass reinforcing mesh.
 - 5. Top coat: Master Wall Superior Finish 100% acrylic based top coat.
 - 6. Insulation: 1 inch thick expanded polystyrene board.
- B. Adhesives
 - 1. 100% acrylic polymer based, requiring the addition of Portland cement; used as an adhesive to laminate EPS Insulation Board to the water-resistive barrier.
- C. Insulation Board: In compliance with manufacturer's requirements for Standard System EIFS.
 - 1. Produced and labeled under a third party quality program as required by applicable building code; and produced by a manufacturer approved by Manufacturer.
 - 2. Shall conform to ASTM C578 and ASTM E2430, Type I and the manufacturer's specification for Molded Expanded Polystyrene Insulation board.
 - 3. Maximum size shall be 2 ft x 4 ft (610 mm x 1219 mm).
 - 4. Thickness: 1 inch
- D. Finish
 - 1. 100% acrylic polymer based finish, enhanced DPR acrylic finish with hydrophobic and photocatalytic properties, repels water, reflects UV rays, and reduces smog particles near the finish surface. Finish type, texture and color as selected by OWNER.

2. Sealer: 100% acrylic, transparent, permeable, dirt resistant sealer for use as a protective coating over acrylic finishes. Use 610 Matte Clear.
- E. Pre-punched strip of non-woven fabric to allow for drainage at the head of system penetrations.
- F. Water: Clean, cool, potable water
- G. Portland Cement: ASTM C150, Type I or Type I-II.
- H. Equivalent EIFS system may be substituted provided they meet all TDI windstorm requirements, specified wind pressures, and impact resistance. Documentation with testing data stating as such shall be submitted to Engineer for review.

2.3 RELATED MATERIALS AND ACCESSORIES

A. Substrate Materials:

1. Exterior grade glass mat gypsum sheathing conforming to ASTM C1177 having a water-resistant core gypsum board.
2. Not Used

B. Sealant System:

1. Sealant for expansion joints between panelized EIFS sections shall be ultra-low modulus designed for minimum 100% elongation and minimum 50% compression per manufacturer's requirements.
2. Sealant for perimeter seals around window and door frames and other wall penetrations shall be low modulus, designed for minimum 50% elongation and minimum 25% compression, per manufacturer's requirements.
3. Sealants shall conform to ASTM C 920, Grade NS.
4. Expansion joints between sections of EIFS shall have a minimum width of 3/4 in (19 mm).
5. Perimeter seal joints shall be a minimum width of 1/2 in (12.7 mm).
6. Sealant backer rod shall be closed-cell polyethylene foam.
7. Apply sealant to tracks or base coat of EIFS.
8. Refer to EIFS manufacturer's current bulletin for listing of sealants which have been tested and have been found to be compatible with EIFS materials.
9. Color shall be as selected by OWNER.
10. Joint design, surface preparation, and sealant primer shall be based on sealant manufacturer's recommendations and project conditions.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Compliance: Comply with manufacturer's instructions for installation. Manufacturer's representative shall make site visit during the EIFS installation and attend pre-installation

meeting.

- B. Substrate Examination: Examine prior to installation of EIFS assembly materials as follows:
 - 1. Substrate shall be of a type approved by manufacturer.
 - 2. Substrate shall be examined for soundness, and other harmful conditions.
 - 3. Substrate shall be free of dust, dirt, laitance, efflorescence, and other harmful contaminants. Substrate construction in accordance with substrate material manufacturer's specifications and applicable building codes.
 - 4. Maximum deflection of the substrate shall be limited to L/240.
- C. Sealants and Backer Rod: To be installed, where required, in accordance with the sealant manufacturer's specifications and published literature, and using the sealant manufacturer's recommended primers. Sealant must be one acceptable by Manufacturer.
- D. Advise Contractor of discrepancies preventing proper installation of the EIFS materials. Do not proceed with the work until unsatisfactory conditions are corrected.

3.2 PREPARATION

- A. Protection: Protect surrounding material surfaces and areas during installation of system.
- B. Clean surfaces thoroughly prior to installation.
- C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 MIXING

- A. Mix materials in accordance with manufacturer's instructions.

3.4 APPLICATION

- A. General: Installation shall conform to this specification and manufacturer's written instructions.
- B. Drainage Accessories, Water Resistive Barrier, and Insulation Board
 - 1. Install per Uniform Evaluation Standard (UES) Evaluation Reports No. 384 and No. 433.
- C. Apply base coat and fully embed mesh in base coat; include diagonal mesh patches at corners of openings and reinforcing mesh patches at joints of track sections. Apply multiple layers of base coat and mesh where required for specified impact resistance classification.
- D. Apply primer to base coat after drying. Primer may be omitted if it is not required by the manufacturer's product data sheets for the specified finish coat or otherwise specified for the project.

- E. Finish Coat: Apply finish coat to match specified finish type, texture, and color. Do not apply finish coat to surfaces to receive sealant. Keep finish out of sealant joint gaps.

3.5 CLEAN-UP

- A. Removal: Remove and legally dispose of EIFS materials from job site.
- B. Clean surfaces and work area of foreign materials resulting from material installation.

3.6 PROTECTION

- A. Provide protection of installed materials from water infiltration into or behind them.
- B. Provide protection of installed materials from dust, dirt, precipitation, and freezing during installation, and continuous high humidity until fully cured and dry.
- C. Clean exposed surfaces using materials and methods recommended by the manufacturer of the material or product being cleaned. Remove and replace work that cannot be cleaned to the satisfaction of the Project Designer/Owner.

END OF SECTION