

## SECTION 07210 - BUILDING INSULATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes the following:

1. Insulation under slabs-on-grade.
2. Foundation wall insulation (supporting backfill).
3. Concealed building insulation.
4. Perimeter fire-containment systems (fire safing).
5. Wall insulation (part of masonry veneer system).
6. Vapor barriers.

- B. Related Sections include the following:

1. Division 3 Section "Cast-in-Place Concrete." For vapor barriers under slabs.
2. Division 4 Section "Unit Masonry Assemblies" for insulation installation in cavity walls.
3. Division 7 Section "Metal Roof Panels" for insulation specified as part of these systems.
4. Division 7 Section "EPDM Membrane Roofing" for insulation specified as part of roofing construction.
5. Division 7 Section "Self-Adhering Sheet Waterproofing" for insulation installed with waterproofing.
6. Division 9 Sections "Gypsum Board Assemblies" and "Gypsum Board Shaft-Wall Assemblies" for installation in metal-framed assemblies of insulation specified by reference to this Section.
7. Division 15 Section for Duct Insulation, Equipment Insulation, and Pipe Insulation.

#### 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: Full-size units for each type of exposed insulation indicated.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for insulation products.

- D. Research/Evaluation Reports: For foam-plastic insulation.

#### 1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of building insulation through one source.
- B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
  - 1. Surface-Burning Characteristics: ASTM E 84.
  - 2. Fire-Resistance Ratings: ASTM E 119.
  - 3. Combustion Characteristics: ASTM E 136.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect plastic insulation as follows:
  - 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 before installation time.
  - 3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Extruded-Polystyrene Board Insulation:
    - a. DiversiFoam Products.
    - b. Dow Chemical Company.
    - c. Owens Corning.
    - d. Tenneco Building Products.

2. Glass-Fiber Insulation:
  - a. Basis of Design Product: Formaldehyde-free Unfaced Batts as manufactured by Johns Manville Corporation or as approved
3. Perimeter Fire-Containment Systems:
  - a. United States Gypsum Co.

## 2.2 INSULATING MATERIALS

- A. General: Provide insulating materials that comply with requirements and with referenced standards.
  1. Preformed Units: Sizes to fit applications indicated; selected from manufacturer's standard thicknesses, widths, and lengths.
- B. Extruded-Polystyrene Board Insulation: ASTM C 578, of type and density indicated below, with maximum flame-spread and smoke-developed indices of 75 and 450, respectively:
  1. Type IV, 1.60 lb/cu. ft., unless otherwise indicated.
- C. Unfaced Mineral-Fiber Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of formaldehyde-free fibers manufactured from glass; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

## 2.3 PERIMETER FIRE-CONTAINMENT SYSTEMS

- A. Where indicated for gaps between the perimeter edge of fire-resistance-rated floor assemblies and non-fire-resistance-rated exterior curtain walls, provide a perimeter fire-containment system with the fire-test-response characteristics indicated, as determined by testing identical systems per UBC Standard 26-9 and UL 2079 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

## 2.4 VAPOR BARRIERS (FOR WALLS)

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
  1. Fire-Retardant, Reinforced-Polyethylene Vapor barriers:
    - a. Raven Industries, Inc.; DURA-SKRIM 2FR.

b. Reef Industries, Inc.; Griffolyn T-55 FR.

- B. Fire-Retardant, Reinforced-Polyethylene Vapor Barriers: 2 outer layers of polyethylene film laminated to an inner reinforcing layer consisting of either a nonwoven grid of nylon cord or polyester scrim and weighing not less than 22 lb/1000 sq. ft., with maximum permeance rating of 0.1317 perm, and flame-spread and smoke-developed indices of not more than 5 and 60, respectively.
- C. Vapor-Barrier Tape: Pressure-sensitive tape of type recommended by vapor-barrier manufacturer for sealing joints and penetrations in vapor barrier.

## 2.5 AUXILIARY INSULATING MATERIALS

- A. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for Sections in which substrates and related work are specified and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean substrates of substances harmful to insulations or vapor retarders, including removing projections capable of puncturing vapor retarders or of interfering with insulation attachment.
- B. Close off openings in cavities receiving poured-in-place insulation to prevent escape of insulation. Provide bronze or stainless-steel screens (inside) where openings must be maintained for drainage or ventilation.

### 3.3 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice and snow.

- C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Water-Piping Coordination: If water piping is located on inside of insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.
- E. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.

#### 3.4 INSTALLATION OF PERIMETER AND UNDER-SLAB INSULATION

- A. On vertical surfaces, set units in adhesive applied according to manufacturer's written instructions. Use adhesive recommended by insulation manufacturer.
- B. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.

#### 3.5 INSTALLATION OF GENERAL BUILDING INSULATION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. 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 (nonbreathing) insulation units by applying adhesive, 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 adhesive, mastic, or sealant as recommended by insulation manufacturer.
- C. Install mineral-fiber blankets in cavities formed by framing members according to the following requirements:
  - 1. Use blanket widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
  - 2. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
  - 3. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping stapling flanges to flanges of metal studs.
- D. Install board insulation on concrete substrates by adhesive:
  - 1. Fasten insulation anchors to concrete substrates with adhesive according to anchor manufacturer's written instructions.

- E. Stuff glass-fiber, loose-fill insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.

### 3.6 INSTALLATION OF PERIMETER FIRE-CONTAINMENT SYSTEMS

- A. Install perimeter fire-containment systems to fill gap between edge of concrete floor slab and back of spandrel panels of exterior curtain-wall systems and in other areas indicated to comply with fire-containment system manufacturer's written instructions to produce installations with ratings matching those established during fire-test-response testing.

### 3.7 INSTALLATION OF INSULATION IN MASONRY VENEER SYSTEM

- A. On units of foam-plastic board insulation, install pads of adhesive spaced approximately 12 inches O.C. both ways on inside face, and as recommended by manufacturer. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates indicated.

### 3.8 INSTALLATION OF VAPOR BARRIERS

- A. General: Extend vapor barrier to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor barrier to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
- B. Seal overlapping joints in vapor barriers with adhesives or vapor-barrier tape according to vapor-barrier manufacturer's instructions. Seal butt joints and fastener penetrations with vapor-barrier tape. Locate all joints over framing members or other solid substrates.
- C. Firmly attach vapor barriers to substrates with mechanical fasteners or adhesives as recommended by vapor-barrier manufacturer.
- D. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor barriers with vapor-barrier tape to create an airtight seal between penetrating objects and vapor barrier.
- E. Repair any tears or punctures in vapor barriers immediately before concealment by other work. Cover with vapor-barrier tape or another layer of vapor barrier.

### 3.9 PROTECTION

- A. Protect installed insulation and vapor barriers from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation

is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

### 3.10 INSULATION SCHEDULE

- A. Insulation Type 1: 1-inch extruded-polystyrene board, R=5.0.
- B. Insulation Type 2: 2-inch extruded-polystyrene board, R=10.0
- C. Insulation Type 3: 5-1/2 inch unfaced, glass-fiber blanket insulation, R=19.
- D. Insulation Type 4: 2-1/2 inch unfaced glass-fiber blanket insulation, R=8.

END OF SECTION 07210