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. Foundation wall insulation (supporting backfill).
   2. Cavity wall insulation.
   3. Concealed building insulation for thermal resistance purposes.
   4. Fire Safing Insulation
   5. Sill Sealer.
   6. Vapor retarders.
   7. Wind Barrier

B. Related Sections include the following:
   1. Division 7 Section “EPDM Membrane Roofing” for insulation and application to receive fully-adhered EPDM membrane.
   1. Division 9 Section “Gypsum Board and Related Metal Framing” for material and installation in metal-framed assemblies of non-thermal insulation on building interior.
   2. Division 15 Sections "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, indicating compliance with performance standards and ratings.

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. Polyisocyanurate Board Insulation:
   a. Atlas Roofing Corporation
   b. Celotex Corporation.
   b. Dow Chemical Company.
   c. Hunter Panels
2. Extruded-Polystyrene Board Insulation:
   a. DiversiFoam Products.
   b. Dow Chemical Company.
   c. Owens Corning.
   d. Tenneco Building Products.

3. Blanket and Fiberous Insulation:
   a. CertainTeed Corporation.
   b. Johns Manville Corporation.
   c. Knauf Fiber Glass.
   d. Owens Corning.

4. Glass-Fiber Loose-Fill Insulation:
   a. CertainTeed Corporation.
   b. Johns Manville Corporation.
   c. Owens Corning.

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. Polyisocyanurate Board Insulation:

1. Exterior, Masonry Cavity Insulation: For applications and thickness as indicated and over exterior gypsum sheathing in masonry wall air space, as uninterrupted exterior envelope insulation system; ASTM C1289-02, Type I, Class 2. Rigid, glass fiber reinforced urethane foam insulation board core laminated between pinhole-free aluminum foil facers.
   a. Panel Edge: Shiplap edge profile.
   b. Thickness: Boards shall be 1 ½” inches thick in cavity or as indicated on the drawings.
   c. R-value: Per ASTM C518, shall be not less than R-10.8 for 1 ½” thick.
   d. Density: Compressive strength of core foam shall be 25 psi.

C. Extruded-Polystyrene Board Insulation: For below-grade applications and elsewhere as specifically indicated; 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.

D. Unfaced and Faced Mineral Fiber Blanket/Batt Insulation: Thermal insulation produced by combining mineral fibers of type described below with formaldehyde-free thermosetting resins to comply with ASTM C 665 for Type III and as follows:
   a. Mineral Fiber Type: Fibers manufactured from glass or slag.
   b. Surface Burning Characteristics: Maximum flame spread value of 10 and smoke developed value of 10.
   c. R-value: 3.17 per inch minimum.

E. Un-faced Mineral Fiber Sound Attenuation Insulation: Sound attenuation insulation produced by combining mineral fibers with formaldehyde-free thermosetting resins to comply with ASTM C 665 for Type I and as follows:
   a. Mineral Fiber Type: Fibers manufactured from glass or slag.
   b. Surface Burning Characteristics: Maximum flame spread value of 25 and smoke developed value of 50.
   c. Density: 0.75 to 3.0 pounds per cubic foot.
   d. Thickness: 3 5/8 inches unless otherwise indicated in Drawings.

D. Glass-Fiber Loose-Fill Insulation: ASTM C 764 for type (method of application) indicated below; maximum flame-spread and smoke-developed indices of 5, and as follows:
   2. Type 1 for pneumatic application.

F. Safing Insulation: USG Thermafiber mineral fireproofing insulation.

G. Sill Sealer: Amoco Amofoam or Dow polyethylene foam sill sealer, full width of sill plate.

2.4 VAPOR RETARDERS

A. Polyethylene Vapor Retarder: ASTM D4397, 6 mils thick, with a maximum permeance rating of 0.13 perm. Provide reinforced sheeting where necessary for integrity and durability during installation.

2.5 WIND BARRIER

A. Building Wrap: High density polyethylene fiber sheet. Tyvek Housewrap by DuPont, Wilmington, Delaware, or approved equal.

2.6 AUXILIARY INSULATING MATERIALS

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

B. Vapor-retarder Joint Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

C. Board Insulation Joint Tape: Pressure-sensitive tape of type recommended by rigid foam insulation board manufacturer for sealing joints and penetrations, equal to one of the following:
   1. Carlisle Coatings and Waterproofing, Inc.; CCW-705
   2. Polyguard Products, Inc.; Polyguard Tape
   3. Protecto-wrap Company; Protecto Wrap BT20.

2.7 INSULATION FASTENERS

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. Adhesively Attached, Spindle-Type Anchors:
      a. AGM Industries, Inc.; Series T TACTOO Insul-Hangers.
      b. Eckel Industries of Canada Limited; Stic-Klip Type N Fasteners.
      c. Gemco; Spindle Type.

B. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of thickness indicated securely in position indicated with self-locking washer in place; and complying with the following requirements:
   1. Plate: Perforated galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
   2. Spindle: Copper-coated, low carbon steel, fully annealed, 0.105 inch in diameter, length to suit depth of insulation indicated.

C. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, 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. 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 INSULATION

A. On vertical surfaces, set units in adhesive applied according to manufacturer's written instructions. Use adhesive recommended by insulation manufacturer.
   1. If not indicated, extend insulation a minimum of 24 inches below ground floor line.

B. Protect below-grade insulation on vertical surfaces from damage during backfilling by applying protection board. Set in adhesive according to insulation manufacturer's written instructions.

C. Protect top surface of horizontal insulation from damage during concrete work by applying protection board.

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. Set vapor-retarder-faced units with vapor retarder to warm side of construction, unless 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 airtight installation.

D. Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:
   1. Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application indicated.

E. Install board insulation in cavity-wall construction throughout Project where masonry cavity-wall construction is indicated on Drawings. Adhere boards to exterior Wind Barrier according to insulation manufacturer's written instructions. Stagger joints of insulation from those of the sheathing substrate where feasible.
   1. Retain insulation in place by full surface adhesive application, or spindle-type anchors spaced at intervals recommended in writing by insulation manufacturer to hold insulation securely in place without damaging sheathing. Maintain cavity width (airspace) dimension indicated between insulation and masonry veneer.
   2. Seal all butt joints and penetrations of rigid board insulation with specified joint tape according to insulation and tape manufacturer's instructions. Seal fastener penetrations with tape where possible.

G. 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 VAPOR RETARDERS

A. General: Extend vapor retarder to extremities of areas only where indicated to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.

B. Seal vertical joints in vapor retarders over framing by lapping not less than two wall studs. Fasten vapor retarders to framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners 16 inches o.c.

C. Seal overlapping joints in vapor retarders with adhesives or vapor-retarder tape according to vapor-retarder manufacturer's instructions. Seal butt joints and fastener penetrations with vapor-retarder tape. Locate all joints over framing members or other solid substrates.

D. Firmly attach vapor retarders to substrates with mechanical fasteners or adhesives as recommended by vapor-retarder manufacturer.

E. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarder.

F. Repair any tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarder.

END OF SECTION 07210