SECTION 07 21 00
THERMAL INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Board insulation and integral vapor retarder at cavity wall construction, perimeter foundation wall, and underside of floor slabs.

1.2 RELATED REQUIREMENTS

A. Section 07 21 29 - Sprayed Insulation: Sprayed-on, adhered closed cell polyurethane insulation.
B. Section 07 25 00 - Weather Barriers: Separate weather barrier and vapor retarder materials.
C. Section 09 21 16 - Gypsum Board Assemblies: Acoustic insulation inside walls and partitions.

1.3 REFERENCE STANDARDS

A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2015a.
B. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2014.

1.4 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

1.5 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Manufacturer - Thermal Insulation: Dow Chemical Company; www.dow.com or products meeting project requirements by one of the following:
   1. Hunter Panels: www.hunterpanels.com.
   2. Johns Manville: www.jm.com.
   3. Kingspan Insulation LLC: www.kingspan.com.
   4. Owens Corning Corporation: www.ocbuildingspec.com.

2.2 APPLICATIONS

A. Insulation Under Concrete Slabs: Extruded polystyrene (XPS) board.
B. Insulation at Perimeter of Foundation (Interior Face): Extruded polystyrene (XPS) board.
C. Insulation on Inside of Concrete and Masonry Exterior Walls: Polyisocyanurate foam core board laminated between two aluminum facers.

2.3 FOAM BOARD INSULATION MATERIALS

A. Extruded Polystyrene (XPS) Board Insulation - Under Slab: Complies with ASTM C578 with either natural skin or cut cell surfaces.
   1. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.
   2. Board Edges: Square.

3. Basis of Design: Dow Chemical Company; STYROFOAM Brand Square Edge Insulation; www.dow.com.

B. Extruded Polystyrene (XPS) Board Insulation - Under Slab: Complies with ASTM C578 with either natural skin or cut cell surfaces.
   1. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.
   2. Board Edges: Square.
   3. Basis of Design: Dow Chemical Company; STYROFOAM Brand Square Edge Insulation; www.dow.com or products meeting project requirements by one of the following:
   4. Manufacturers:
      a. Kingspan Insulation LLC; GreenGuard XPS Type IV, 25 psi: www.kingspan.com/#sle.
      b. Owens Corning Corporation; FOAMULAR Extruded Polystyrene (XPS) Insulation: www.ocbuildingspec.com/#sle.

C. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, complying with ASTM C1289.
   1. Classifications:
      a. Type I: Faced with aluminum foil on both major surfaces of the core foam.
         1) Class 2 - Glass fiber reinforced or non-reinforced core foam.
         2) Compressive Strength: 16 psi, minimum.
         3) Thermal Resistance, R-value: At 1-1/2 inch thick; 9.0 at 75 degrees F.
   2. Board Size: 48 inch by 96 inch.
   3. Board Thickness: 3.0 inch.
   4. Board Edges: Square.
   5. Basis of Design: Dow Chemical Company; THERMAXX XARMOR (ci); www.dow.com or comparable products meeting project requirements by one of the following:
   6. Manufacturers:
      a. Atlas Roofing Corporation: www.atlasroofing.com.
      b. Hunter Panels: www.hunterpanels.com.
      c. Johns Manville: www.jm.com.

2.4 ACCESSORIES

A. Tape: Reinforced polyethylene film with acrylic pressure sensitive adhesive.
   1. Application: Sealing of interior circular penetrations, such as pipes or cables.
   2. Width: As required for application.
   3. Temperature Resistance: Minus 40 degrees F to 212 degrees F

B. Tape joints of rigid insulation in accordance with insulation manufacturers' instructions.

C. Flashing and Sealant: Provide spray applied flashing and sealant component as recommended by board insulation manufacturer:
   1. Product: LiquidArmor -CM Flashing and Sealant by Dow.

D. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.2 BOARD INSTALLATION AT FOUNDATION PERIMETER

A. Adhere a 6 inches wide strip of polyethylene sheet over construction, control, and expansion joints with double beads of adhesive each side of joint.
B. Install boards horizontally on foundation perimeter.
C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.3 BOARD INSTALLATION AT CAVITY WALLS

A. Secure impale fasteners to substrate at following frequency:
   1. Six (6) per insulation board or as required by insulation board manufacturer.
B. Install boards to fit snugly between wall ties.
C. Install boards horizontally on walls.
D. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.4 BOARD INSTALLATION UNDER CONCRETE SLABS

A. Place insulation under slabs on grade after base for slab has been compacted.
B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
C. Prevent insulation from being displaced or damaged while placing vapor retarder and placing slab.

3.5 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION 07 21 00