

SECTION 072100

THERMAL INSULATION

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment, and services necessary to complete the thermal insulation as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Foundation wall insulation.
 - 2. Cavity wall insulation within masonry cavity.
 - 3. Spray foam insulation.
 - 4. Semi-rigid insulation.
 - 5. Miscellaneous blanket insulation.
 - 6. Attachment devices.
 - 6-7. Under slab polystyrene insulation.**

1.3 RELATED SECTIONS

- A. Unit Masonry - Section 042000.
- B. Roofing - Section 075419, for roof insulation.
- C. Firestops and Smoke seals - Section 078413.
- D. Glazed Aluminum Curtain Wall - Section 084413, for curtain wall insulation.
- E. Gypsum Board Insulation - Section 092116, for acoustical insulation.
- F. Earthwork - Division 31.

1.4 SUBMITTALS

- A. Submit product data for each type of product indicated.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for insulation products.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the site ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type and brand. Delivered materials shall be identical to approved samples.
- B. Store materials under cover in a dry and clean location, off the ground. Remove materials which are damaged or otherwise not suitable for installation and replace with acceptable materials.
- C. Take every precaution to prevent the insulation from becoming wet, cover with tarps or other weather/watertight sheet goods.

PART 2 PRODUCTS

2.1 FOUNDATION WALL INSULATION

- A. Provide extruded polystyrene board insulation equal to "Styrofoam" manufactured by Dow Chemical Co., or approved equal made by Owens Corning or PACTIV Building Products, conforming to ASTM C 578, Type IV, with a maximum flame spread and smoke developed indices of 75 and 450 respectively.
- B. Insulation shall have an aged R value of not less than 5/inch; shall be 2" thick unless otherwise noted on the drawings.

2.2 CAVITY WALL INSULATION WITHIN MASONRY CAVITY

- A. Provide extruded polystyrene board insulation equal to Styrofoam "Cavitymate Ultra" manufactured by Dow Chemical Co. or approved equal conforming to ASTM C 578, Type IV with a maximum flame spread and smoke developed indices of 15 and 165 respectively.
 - 1. Boards shall be 16" wide x 96" long; boards shall be 1" thick unless otherwise noted on the drawings.
 - 2. Insulation shall have an aged R value of not less than 5.6/inch.

2.3 SPRAY FOAM INSULATION

- A. Manufacturers
 - 1. Henry Permax RT 2045-2.0.
 - 2. Dow Chemical Co. Styrofoam Spray Polyurethane Foam.
 - 3. Demilec LLC Heatlok SOY 200.
 - 4. BASF Corp. Walltite.
 - 5. NCFI InsulStar.

B. Material

1. Insulation: ASTM C 1029, Type II polyurethane with zero ODP.
2. Density (ASTM D 1622): 2.1 lbs/cu. ft.

C. Accessories

1. Primer: As required by insulation manufacturer.
2. Overcoat: Aldocoat 747 Ignition Barrier Protective Coating, Aldo Products.

2.4 SEMI-RIGID INSULATION

- A. Provide semi-rigid mineral wool insulation equal to "RockBoard" made by Roxul Inc., or equal made by Fibrex or Thermafiber conforming to ASTM C 612, Type IVA, faced on one side with foil scrim vapor retarder, maximum flame spread and smoke developed indices of 5.
- B. Insulation shall have an R value of not less than 4/inch with a nominal density of 4 lbs./cu. ft.
- C. Insulation shall be 2" thick unless otherwise noted on the drawings.

2.5 BLANKET INSULATION

- A. Provide flexible glass fiber blankets/batts equal to "Fiberglass Flame Spread 25 Insulation" as manufactured by Owens Corning or equal made by Manville or Certainteed conforming to ASTM C 612, Type 1A or ASTM C 665, Type III, Class A, faced on one side with foil reinforced Kraft vapor retarder; maximum flame spread and smoke developed indices 25 and 50 respectively.
- B. Insulation shall have an R value of not less than 3.7/inch and shall be 3.5" thick unless otherwise noted on the drawings.

2.6 ACCESSORIES

- A. Clips for Securing Insulation to Encountered Surfaces: Spindle anchor and washer type consisting of perforated metal plates with spindle welded to center and snap on washers. Spindle and washers shall receive a corrosion-resistant electro-zinc plating. Adhesives for securing clips in place shall be recommended by the approved clip manufacturer.
 1. Acceptable Manufacturers
 - a. Miracle Adhesives Corp.
 - b. Stic-Klip Mfg. Co., Inc.
 - c. Midwest Fasteners
- B. Adhesive for Bonding Insulation: The type recommended by the insulation manufacturer, and complying with fire-resistance requirements.

1. For bonding rigid polystyrene insulation to masonry or concrete, provide adhesive equal to "Foamgrab PS" made by Dacor Products Co. or equal made by ChemRex Inc. or Miracle Adhesives.
- C. Protection Board: Premolded, semi-rigid asphalt/fiber composition board, 1/4" thick, formed under heat and pressure, standard sizes.

2.7 UNDER SLAB POLYSTYRENE BOARD INSULATION (FOR RIGID VOID FORMER AND RADIANT HEAT SLAB LOCATIONS)

- A. Provide extruded polystyrene board insulation equal to "Styrofoam Highload 60" manufactured by Dow Chemical Co., or approved equal made by Owens Corning or PACTIV Building Products, conforming to ASTM C 578, Type VII, with a maximum flame spread and smoke developed indices of 15 and 165 respectively.
- ~~B.~~ Insulation shall have an aged R value of not less than 5.0/inch; shall be 2" thick unless otherwise noted on the drawings.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where thermal insulation is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

A. General

1. Cooperate in the coordination and scheduling of the work of this section with the work of other sections so as not to delay job progress.
2. Install insulation in as large components as practical and to cover entire areas indicated on the drawings, closely butted together at sides and ends, and against walls, beams, etc. Neatly fit and cut insulation around all projections such as pipes, conduits, hangers and all other elements encountered in the field, which will result in complete coverage of the scheduled areas.
3. Discard, off the site, insulation which becomes damaged during the course of installation, or is no longer in a physical condition to function for use intended, and replace with new material.
4. Clean surfaces on which adhesives are used to secure the insulation in place of dirt, grime, grease, oil and other foreign materials, to assure that the surfaces are properly prepared to accept the bond of the approved adhesives.
5. Exercise extreme care to avoid damage and soiling of faces on insulation units which will be exposed to view. Align joints accurately, with adjoining surfaces set flush.

6. Set vapor barrier faced units with vapor barrier to inside of construction, except as otherwise shown. Do not obstruct ventilation spaces. All joints in vapor barriers shall be sealed with 4" wide, foil faced duct tape to prevent vapor and air migration.
7. Tape joints and ruptures in vapor barriers, using tape specified above, and seal each continuous area of insulation to surrounding construction so as to ensure vapor tight installation of the units.
8. Where insulation is impaled on stick clips, provide clips not less than 3" from corners or edges and not more than 12" o.c.
9. Comply with manufacturer's instructions for the particular conditions of installation in each case. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer's technical representative for specific recommendations before proceeding with the work.
10. 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.
11. Apply a single layer of insulation to the required thickness, unless a double layer is required, to make up the total thickness shown.
12. Furnish mason trades rigid insulation to be installed within masonry cavity.

3.3 INSTALLATION OF PERIMETER AND UNDER-SLAB INSULATION

- A. On vertical surfaces, set units in adhesive applied in accordance with manufacturer's instructions. Use type of adhesive as specified herein.
 1. Extend insulation 24" below grade unless otherwise noted on the drawings.
- B. Protect below-grade insulation on vertical surfaces (from damage during back-filling) by application of protection board. Set in adhesive in accordance with recommendations of manufacturer of insulation.
- C. Protect top surface of horizontal insulation (from damage during concrete work) by application of protection board.

3.4 INSTALLATION OF CAVITY-WALL INSULATION

- A. Install small pads of adhesive spaced approximately 1'-0" o.c. both ways on inside face, as recommended by manufacturer. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction.

3.5 INSTALLATION OF SPRAY FOAM INSULATION

- A. Apply self-supported, spray-applied insulation according to manufacturer's written instructions. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other

items not indicated to receive insulation are masked. After insulation is applied, make it flush with face of studs by using method recommended by insulation manufacturer.

- B. Apply to a minimum cured thickness of not less than 2.5", nor more than 3".
- C. Apply overcoat to a uniform minimum thickness shown on drawings.

3.6 INSTALLATION OF SEMI-RIGID MINERAL WOOL INSULATION

- A. Install wall insulation with edges closely butted, with joints square, straight and in alignment (no staggered), and with vapor barrier facing on warm side of building, and with exposed faces flush and in the same plane without warp or twist. Cut and fit insulation to closely fit intersecting or penetrating surfaces. Seal joints between insulation, between insulation and intersecting or penetrating surfaces and between insulation and perimeter surfaces with 4" wide vaporproof aluminum tape applied on the vapor barrier side. Insulation shall be friction fit between furring channels or studs.
- B. Where insulation is installed directly below structural deck, fasten to deck using stick clips as specified herein. Space clips 12" o.c. both direction and impale insulation on clips. Insulation shall be installed with vapor barrier facing down. Butt ends and edges of insulation together and tape joints using 4" wide vaporproof aluminum tape over vapor barrier.

3.7 INSTALLATION OF BLANKET OR BATT FIBERGLASS INSULATION

- A. Install blanket fiberglass insulation in largest pieces as practical with edges closely butted. Cut and fit insulation to closely fit intersecting or penetrating surfaces.
 - 1. Face vapor barrier towards warm side, tape joints with 4" wide vaporproof aluminum tape applied over vapor barrier.

3.8 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation will be subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION