

**SECTION 07 22 00
ROOF AND DECK INSULATION**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Roof and deck insulation and vapor barrier on new construction ready to receive roofing.

1.2 RELATED WORK

- A. Wood cants, blocking, and edge strips: Section 06 10 00, ROUGH CARPENTRY.
 B. Perimeter, rigid, and batt or blanket insulation not part of roofing system: Section 07 21 13, THERMAL INSULATION.
 C. Roof copings: Section 07 40 00 SIDING PANELS.
 D. Counterflashing: Section 07 54 23 THERMOPLASTIC POLYOLEFIN (TPO) Roofing

1.3 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only. Editions of applicable publications current on date of issue of bidding documents apply unless otherwise indicated.
- B. American Society of Heating, Refrigeration and Air Conditioning (ASHRAE):
 90.1-07.....Energy Standard for Buildings Except Low-Rise
 Residential Buildings
- C. ASTM International (ASTM):
 C1289-10.....Faced Rigid Cellular Polyisocyanurate Thermal
 Insulation Board
 D1970-09.....Standard Specification for Self-Adhering Polymer
 Modified Bituminous Sheet Materials Used as Steep
 Roofing Underlayment for Ice Dam Protection
 E84-09.....Standard Test Method for Surface Burning
 Characteristics of Building Material
 F1667-05.....Driven Fasteners: Nails, Spikes, and Staples
- D. National Roofing Contractors Association: Roofing and Waterproofing
 Manual
- F. Underwriters Laboratories, Inc. (UL): Fire Resistance Directory (2009)

1.4 PERFORMANCE REQUIREMENTS

- A. Thermal Performance: Provide roof insulation meeting minimum overall average R-value of 33 over conditioned spaces, with minimum R-value at any location of 18.

1.5 QUALITY CONTROL

- A. Requirements of Division 07 roofing section for qualifications of roofing system insulation Installer; Work of this Section shall be performed by same Installer.
- B. Requirements of Division 07 roofing section for inspection of Work of this Section and qualifications of Inspector.
- C. Unless specified otherwise, comply with the recommendations of the NRCA "Roofing and Waterproofing Manual" applicable to insulation for storage, handling, and application.
- D. Requirements of roofing system uplift pressure design for specified roofing system.

1.6 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Product Data:
 - 1. Vapor Barrier.
 - 2. Roofing primer.
 - 3. Roof insulation, each type.
 - 4. Roof Adhesive.
- C. Federal Sustainable Design Submittals:
 - 1. Product Data for Credit IEQ 4.1: For adhesives and sealants used documentation including printed statement of VOC content.
- D. Shop Drawings: Include plans, sections, details, and attachments.
 - 1. Nailers, cants, and terminations.
 - 2. Layout of insulation showing slopes, tapers, penetration, and edge conditions.
- E. Samples:
 - 1. Roof insulation, each type.
 - 2. Nails and fasteners, each type.
- F. Certificates:
 - 1. Indicating type, thermal conductance, and minimum and average thickness of insulation.
- G. Laboratory Test Reports: Thermal values of insulation products.
- H. Layout of tapered roof system showing units required.
- I. Documentation of supervisors' and inspectors' qualifications.

1.7 DELIVERY, STORAGE AND MARKING

- A. Comply with the recommendations of the NRCA "Roofing and Waterproofing Manual" applicable to built-up roofing for storage, handling and installation requirements.

1.8 QUALITY ASSURANCE:

- A. Roof insulation on combustible or steel decks shall have a flame spread rating not greater than 75 and a smoke developed rating not greater than 150, exclusive of covering, when tested in accordance with ASTM E84.
 - 1. Insulation bearing the UL label and listed in the UL Building Materials Directory as meeting the flame spread and smoke developed ratings will be accepted in-lieu-of copies of test reports.
 - 2. Compliance with flame spread and smoke developed ratings will not be required when insulation has been tested as part of a roof construction assembly of the particular type used for this project and the construction is listed as fire-classified in the UL Building Materials Directory.
 - 3. Insulation tested as part of a roof construction assembly shall bear UL labels attesting to the ratings specified herein.

PART 2 - PRODUCTS**2.1 ADHESIVE MATERIALS**

- A. Adhesive Materials, General: Adhesive and sealant materials recommended by roofing system manufacturer for intended use, identical to materials utilized in approved listed roofing system, and compatible with roofing membrane.
 - 1. Liquid-type adhesive materials shall comply with VOC limits of authorities having jurisdiction.
 - 2. Two-component polyurethane adhesive.
- B. Primer: Manufacture's recommended primer.

2.2 ROOF AND DECK INSULATION

- A. Roof and Deck Insulation, General: Preformed roof insulation boards approved by roofing manufacturer.
- B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces. R= 6.00 per 25mm (1 inch).
- C. Tapered Roof Insulation System:

1. Fabricate of polyisocyanurate. Use only one insulation material for tapered sections. Use only factory-tapered insulation.
 2. Cut to provide high and low points with crickets and slopes as shown.
 3. Minimum thickness of tapered sections; 38 mm (1-1/2 inch).
 4. Minimum slope 1:48 (1/4 inch per 12 inches) unless otherwise noted.
- D. Vapor Barrier: 40 mil air and vapor barrier consisting of 35 mils of self-adhering rubberized asphalt laminated to a 5 mil polyolefin film.

2.3 INSULATION ACCESSORIES

- A. Cants and Tapered Edge Strips:
1. Wood Cant Strips: Refer to Division 06 Section "Rough Carpentry."
 2. Insulation Cant Strips: Same material as insulation.

2.4 FASTENERS

- A. Fasteners: Factory-coated steel fasteners and metal or plastic plates, designed for fastening substrate board to roof deck.
- B. Staples and Nails: ASTM F1667. Type as designated for item anchored and for substrate.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Comply with requirements of Division 07 roofing section.

3.2 PREPARATION

- A. Comply with requirements of Division 07 roofing section. Install vapor barrier over concrete decks.

3.3 VAPOR BARRIER INSTALLATION:

- A. Apply primer per manufactures; instructions. Apply only to areas to be waterproofed the same day. Allow 1 hour minimum cure time before installing vapor barrier.
- B. Install vapor barrier per manufacturer's instructions. Apply from low points to high points so that laps will shed water. Overlap edges by at least 2 1/2".

3.4 RIGID INSULATION INSTALLATION

- A. Insulation Installation, General:
1. Install roof insulation in accordance with roofing system manufacturer's written instructions.
 3. Cant Strips: Install preformed insulation cant strips at junctures of roofing system with vertical construction.
- B. Insulation Thickness:

1. Thickness of roof insulation shown on drawings is nominal. Actual thickness shall provide the average thermal resistance "R" value of not less than that specified in Performance Requirements Article.
 2. Insulation on Metal Decks: Provide minimum thickness of insulation for metal decks recommended by the insulation manufacturer to span rib opening (flute size) of metal deck used. Support edges of insulation on metal deck ribs.
 3. When thickness of insulation to be used is more or less than that shown on the drawings, make adjustments in the alignment and location of roof drains, flashing, gravel stops, fascias and similar items at no additional cost to the Government.
 4. Where tapered insulation is used, the slope of the insulation shall be as shown on the drawings; the thickness at the low point (drains) shall be not less than 76 mm (3 inches), except over areas that are not conditioned, where minimum shall be not less than 38mm (1 ½ inch).
 5. Use not less than two layers of insulation when insulation is 68 mm (2.7 inch) or more in thickness unless specified otherwise. Stagger joints minimum 150 mm (6 inches).
- C. Lay insulating units with close joints, in regular courses and with cross joints broken. When laid in more than one layer, break joints of succeeding layers of roof insulation with those in preceding layer.
- D. Lay units with long dimension perpendicular to the rolled (longitudinal) direction of the roofing felt.
- E. Seal all cut edges at penetrations and at edges against blocking with bitumen or roof cement.
- F. Cut to fit tight against blocking or penetrations.
- G. Cover all insulation installed on the same day; comply with temporary protection requirements of Division 07 roofing section.
- H. Installation Method:
1. Adhered Insulation: Concrete roof slabs.
 - a. Prime substrate as required.
 - b. Set each layer of insulation firmly in ribbons of bead-applied insulation adhesive. Apply beads at minimum 6" spacing
 2. Mechanically Fastened Insulation: Metal Roof Decks.
 - a. Fasten insulation to resist uplift pressures specified in Division 07 roofing section.

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