SECTION 07 21 00

THERMAL INSULATION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Batt insulation and vapor retarder in exterior wall construction.
   2. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

B. Related Sections:
   1. Section 07 84 00 - Firestopping.
   2. Section 09 22 00 - Supports for Plaster and Gypsum Board, for supporting construction for batt insulation.
   3. Section 09 29 00 - Gypsum Board, for acoustic insulation.

1.02 REFERENCE STANDARDS

A. ASTM International:
   1. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
   2. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.03 ADMINISTRATIVE REQUIREMENTS

A. [Coordination:]
   1. [Coordinate Work of this section with construction of vapor retarder specified in Section [_____].]
   2. [Coordinate Work of this section with construction of air barrier specified in Section [_____].]

B. [Preinstallation Meeting:]

C. Sequencing:
   1. Do not install insulation until construction has progressed to point that inclement weather will not damage or wet insulation.
   2. Sequence work to ensure fireproofing and firestop materials are in place before beginning work of this section

D. [Scheduling:]

1.04 [SUSTAINABLE CHARACTERISTICS]

A. Section 01 35 63 - Sustainability Project Requirements: Requirements for sustainable design compliance.

B. Materials and Resources Characteristics:
   1. [Recycled Content Materials: Furnish materials with maximum available recycled content including:

SPEC NOTE ***List materials specified in this section required to have recycled content.***

a. [_____.]

2. [Regional Materials: Furnish materials extracted, processed, and manufactured within 500 miles of Project site.]

SPEC NOTE ***List materials specified in this section required to be regional materials.***

a. [_____.]

1.05 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

C. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Samples: Only as requested.

1.06 [SUSTAINABLE DESIGN SUBMITTALS]

A. Section 01 35 63 - Sustainability Project Requirements: Requirements for sustainable design submittals.

B. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.

1. Materials Resources Certificates:
   a. Certify recycled material content for recycled content products.
   b. Certify source for regional materials and distance from Project site.
2. Indoor Air Quality Certificates:
   a. Certify volatile organic compound content for each interior [adhesive][and][sealant] and related primer.

C. Product Cost Data: Submit cost of products to verify compliance with Project sustainable design requirements. Exclude cost of labor and equipment to install products.

1. Provide cost data for the following products:
   a. Products with recycled material content.
   b. Regional products.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver and store packaged materials in original containers bearing identification of manufacturer's name, thermal resistance rating, and fiber materials. Maintain seals unbroken and labels intact until time of use.

B. Protect insulation from physical damage and from becoming wet or soiled.

C. Comply with manufacturer's recommendations for handling, storage and protection during installation.

PART 2 PRODUCTS

2.01 THERMAL INSULATION

A. [Unfaced Mineral Fiber Batt:]
   1. Description:
      a. Unfaced, friction-fit, flexible batt of formaldehyde free fiberglass meeting requirements of ASTM C665, Type I.
      b. Insulation shall have a flame spread rating of 25 or less and a smoke development of 450 when tested in accordance with ASTM E84.
      c. Thermal Resistance Rating / Thickness:
         1) [Typical: R11 with nominal thickness of 3-5/8 inches.]
         2) [Typical: R19 with nominal thickness of 6-1/2 inches.]
         3) [Where Indicated: R19 with nominal thickness of 6-1/2 inches.]
         4) [Where Indicated: R11 with nominal thickness of 3-5/8 inches.]
         5) [Exterior Walls: R19 with nominal thickness of 6-1/2 inches.]
         6) [Underside of Sloped Roof Decks: R30 with nominal thickness of 10-1/4 inches.]
   2. Product: Johns Manville's "JM Formaldehyde Free Unfaced Batts"; Knauf Insulation's "EcoBatt Insulation"; or equal.

B. [Unfaced Mineral Fiber Batt:]
   1. Description:
      a. Unfaced, friction-fit, flexible batt of fiberglass meeting requirements of ASTM C665, Type I.
      b. Insulation shall have a flame spread rating of 25 or less and a smoke development of 450 when tested in accordance with ASTM E84.
      c. Thermal Resistance Rating / Thickness:
         1) [Typical: R11 with nominal thickness of 3-5/8 inches.]
         2) [Typical: R19 with nominal thickness of 6-1/2 inches.]
         3) [Where Indicated: R19 with nominal thickness of 6-1/2 inches.]
         4) [Where Indicated: R11 with nominal thickness of 3-5/8 inches.]
         5) [Exterior Walls: R19 with nominal thickness of 6-1/2 inches.]
         6) [Underside of Sloped Roof Decks: R30 with nominal thickness of 10-1/4 inches.]
   2. Product: Johns Manville's "JM Unfaced Fiber Glass Thermal Insulation"; Owens-Corning Fiberglas Corp.'s "Unfaced Thermal Batt Insulation"; or equal.

C. [Foil Faced Mineral Fiber Batt:]
   1. Description:
      a. Friction-fit flexible batt of formaldehyde free fiberglass with foil/kraft laminate vapor barrier facing on one side, width for use in metal framing and meeting requirements of ASTM C665, Type III, Class A.
      b. Insulation shall have a flame spread rating of 25 or less and a smoke development of 50 when tested in accordance with ASTM E84.
      c. Thermal Resistance Rating / Thickness:
         1) [Typical: R11 with nominal thickness of 3-5/8 inches.]
         2) [Typical: R19 with nominal thickness of 6-1/2 inches.]
         3) [Where Indicated: R19 with nominal thickness of 6-1/2 inches.]
         4) [Where Indicated: R11 with nominal thickness of 3-5/8 inches.]
         5) [Exterior Walls: R19 with nominal thickness of 6-1/2 inches.]
         6) [Underside of Sloped Roof Decks: R30 with nominal thickness of 10-1/4 inches.]
   2. Product: Johns Manville's "JM Formaldehyde Free Thermal-Shield FSK-25 Faced Batts"; Knauf Insulation's "EcoBatt Insulation FSK-25 Foil Faced Thermal Insulation"; or equal.

D. [Foil Faced Mineral Fiber Batt:]
   1. Description:
      a. Friction-fit flexible batt of fiberglass with foil/kraft laminate vapor barrier facing on one side, width for use in metal framing and meeting requirements of ASTM C665, Type III, Class A.
      b. Insulation shall have a flame spread rating of 25 or less and a smoke development of 50 when tested in accordance with ASTM E84.

c. Thermal Resistance Rating / Thickness:
   1) [Typical: R11 with nominal thickness of 3-5/8 inches.]
   2) [Typical: R19 with nominal thickness of 6-1/2 inches.]
   3) [Where Indicated: R19 with nominal thickness of 6-1/2 inches.]
   4) [Where Indicated: R11 with nominal thickness of 3-5/8 inches.]
   5) [Exterior Walls: R19 with nominal thickness of 6-1/2 inches.]
   6) [Underside of Sloped Roof Decks: R30 with nominal thickness of 10-1/4 inches.]

2. Product: Johns Manville's "JM Thermal-Shield FSK-25 Thermal Insulation"; Owens-Corning Fiberglas Corp.'s "Flame Spread 25 (FS-25) Fiberglas Insulation FRK-Faced"; or equal.

2.02 ACCESSORIES

A. [Insulation Support: String wire, staples, and nails as required.]

B. [Tape: Bright aluminum self-adhering type, mesh reinforced, 2 inches wide.]

PART 3 EXECUTION

3.01 EXAMINATION

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

B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 THERMAL BATT INSULATION

A. Install insulation and vapor retarder in accordance with manufacturer's instructions.

B. Install in exterior wall spaces without gaps or voids. Do not compress insulation.

C. Install batt insulation to fit snugly between framing members and around pipes, conduits, and outlet boxes as necessary to maintain integrity of insulation.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

E. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

F. Provide means to prevent displacement where required.

G. Size batt insulation 1/2 inch wider than stud opening.

H. Vapor Barrier Faced Insulation:
   1. Maintain continuous; avoid damaging and patch tears.
   2. Install with membrane facing warm side of building spaces. Lap ends and side flanges of membrane [over] [between] framing members.
   3. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.
   4. [Extend vapor retarder tight to full perimeter of adjacent window and door frames and other items interrupting plane of membrane. Tape seal in place.]

3.03 PROTECTION OF FINISHED WORK

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

3.04 DEFECTIVE WORK

A. Remove insulation in areas deemed defective and replace with new material conforming to requirements.

B. Restore to original condition work of other sections damaged in repair or replacement of defective work.

C. Remove or replace work damaged by weather.

END OF SECTION