SECTION 07210

BUILDING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Unfaced thermal batt insulation in exterior and interior metal stud walls.
2. Perimeter safing insulation.
3. Foamed-in-place insulation.

B. Related Sections:

1. Section 05400 - Cold-Formed Metal Framing: Exterior wall, metal stud backup to receive batt insulation.
2. Section 07525 - Modified Bitumen Roofing: Roof insulation specified as part of roofing construction.
3. Section 07840 - Firestopping: Firestop sealant.
4. Section 08110 - Steel Doors and Frames: Exterior steel door frames to receive foamed-in-place insulation.
5. Section 09250 - Gypsum Board Assemblies: Sound attenuation batt insulation and acoustical sealant.

1.2 REFERENCES

A. Industry Standards: The Industry Standards listed below refer to the latest date of issue or edition, unless otherwise indicated.

1. ASTM C 272: Water Absorption of Core Materials for Structural Sandwich Constructions.
2. ASTM C 518: Steady-State Heat Flux Measurements and thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
3. ASTM C 578: Standard Specification for Rigid, Polystyrene Thermal Insulation.
4. ASTM C 612: Specification for Mineral Fiber Block and Board Thermal Insulation.
5. ASTM C 665: Specification for Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
6. ASTM E 84: Test Method for Surface Burning Characteristics of Building Materials
7. ASTM E 96: Test Method for Water Vapor Transmission of Materials
8. ASTM E 119: Method for Fire Tests of Building Construction and Materials
9. ASTM E 136: Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C
10. ASTM C423 – Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
11. ASTM C165 – Test for Measuring Compressive Properties of Thermal Insulations.
12. ASTM C553, Type I – Specification for Mineral Fiber Board Thermal Insulation for Commercial and Industrial Applications.
13. ASTM C1104 – Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation.
14. ASTM C1338 – Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings.

1.3 SUBMITTALS

A. Product Data: Submit product data for each type of insulation product specified.

B. Product Test Reports: Submit product test reports from tests performed by qualified independent testing laboratory evidencing compliance of insulation products with requirements including R-values, fire performance characteristics, perm ratings, water absorption ratings, and other properties, based on comprehensive testing of current products.

1.4 QUALITY ASSURANCE

A. Fire Performance Characteristics: Provide insulation materials identical to those whose indicated fire performance characteristics have been determined per the ASTM test method indicated below, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing and inspecting organization.

1. Surface Burning Characteristic: ASTM E 84.
2. Fire Resistance Ratings: ASTM E 119.
3. Combustion Characteristics: ASTM E 136.

B. Single-Source Responsibility for Insulation Products: Obtain each type of building insulation from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

C. Curtainwall and Safing Insulation: Curtainwall and safing insulation shall be 2 hour fire-tested under simulated field conditions using ASTM E119 guidelines.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Storage: 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 recommendations for handling, storage, and protection during installation.

B. Plastic Insulation: Do not expose to sunlight, except to extent necessary for period of installation and concealment.

1. Protect against ignition at all times. Do not deliver plastic insulating materials to project site ahead of installation time.
2. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide insulation products of one of the following:

1. Manufacturers of Slag-Wool-/Rock-Wool-Fiber Insulation:
   a. Fibrex Insulations Inc.
   b. Owens Corning.
   c. Thermafiber.
2. Manufacturers of Glass Fiber Insulation:
   a. CertainTeed Corp.

b. Manville, Inc.
c. Owens Corning Corporations.
d. Knauf Fiber Glass GmbH.

3. Manufacturers of Safing Insulation:
   a. Cafco Industries Ltd.
   b. Fibrex Inc.
   c. United States Gypsum Company/Thermafiber LLC.
4. Manufacturers of Foamed-In-Place Insulation:
   a. Polymaster, Inc.
   b. Taylor D Chemical Products, Inc.
   c. Thermco Foam Insulation

2.2 GLASS FIBER INSULATION

A. Unfaced Glass Fiber Thermal Insulation: ASTM C 665, Type I, and ASTM E 136.

1. Insulation Thickness: 3 ½"- R-11, 6¼"-R-19, 9¼"- R-30 or as otherwise indicated.
2. Surface Burning Characteristics:
   a. Maximum flame spread: 25 or less in accordance with ASTM E 84.
   b. Maximum smoke developed: 25or less in accordance with ASTM E 84.
3. Combustion Characteristics: Passes ASTM E 136 test.

2.3 SAFING INSULATION AND ACCESSORIES

A. Slag-Wool-Fiber Board Safing Insulation: Semi-rigid boards designed for use as a fire stop at openings between edge of slab and exterior wall panels, produced by combining slag-wool fibers with thermosetting resin binders to comply with ASTM C 612, Type IA and IB; nominal density of 4.0 pcf; passing ASTM E 136 for combustion characteristics; r-value of 4.0 at 75 deg F (23.9 deg C).

B. Sealing Compound: Material approved by safing insulation manufacturer for sealing joints between foil backing of safing insulation and edge of concrete floor slab against penetration of smoke.

C. Safing Clips: Galvanized steel safing clips approved by manufacturer of safing insulation for holding safing insulation in place.

2.4 FOAMED-IN-PLACE INSULATION

A. Foamed-In-Place Insulation (for filling voids in exterior steel door frames and other locations where indicated):

1. Product Density: Nominal 0.70 pcf in accordance with ASTM D 1622.
2. Thermal Resistance: Minimum R-value of 4.5 at one inch nominal thickness at 75 degrees F mean temperature in accordance with ASTM C 177.
3. Fire Characteristics:
   a. Flame Spread: Flame spread not to exceed 25 when tested in accordance with ASTM E 84 or UL 723.
   b. Smoke Developed: Not more than 450 when tested in accordance with ASTM E84 or UL 723.

PART 3 - EXECUTION

3.1 EXAMINATION

A. **Examine substrates and** conditions with Installer present, for compliance with requirements of the Sections in which substrates and related work are specified and to determine if other conditions affecting performance of insulation are satisfactory. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. **Clean substrates** of substances harmful to insulations or vapor retarders, including removal of projections that might puncture vapor retarders.

3.3 INSTALLATION, GENERAL

A. **Comply with insulation manufacturer's instructions** applicable to products and application indicated. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with installation of insulation.

B. **Extend insulation full thickness** as 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.

C. **Install insulation that is undamaged,** dry, and unsoiled and that has not been left exposed at any time to water, ice and snow.

D. **Water-Piping Coordination:** If water piping is located on inside of insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.

E. **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.

F. **Apply a single layer of insulation** of required thickness, unless otherwise shown or required to make up total thickness.

3.4 INSTALLATION OF GLASS AND/OR MINERAL FIBER INSULATION

A. **Apply insulation units** to substrate by method indicated, complying with manufacturer's recommendations. 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. **Set vapor retarder** faced units with vapor retarder to warm side (exterior side) of construction, except as 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.

C. **Stuff glass fiber loose fill insulation** into miscellaneous voids and cavity spaces where shown. Compact to approximately 40 percent of normal maximum volume (to a nominal density of 2.5 pcf).

D. Ventilation: Do not obstruct ventilation spaces, except for firestopping.

E. Install mineral-fiber blankets in cavities formed by framing members according to the following requirements:

1. Use blanket widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
2. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping stapling flanges to flanges of metal studs.

3.5 INSTALLATION OF CURTAIN WALL INSULATION

A. Install curtain wall insulation in accordance with manufacturer's instructions.

B. Attach curtain wall insulation with wire impaling clips secured with shields at 24' o. c. minimum.

3.6 INSTALLATION OF SAFING INSULATION

A. Install safing insulation to fill gap between edge of concrete floor slab and back of exterior spandrel panels on safing clips spaced as needed to support insulation but not further apart then 24 inches o. c. Cut safing insulation wider than gap to be filled to ensure compression fit and seal joint between insulation and edge of slab with caulking approved by safing insulation manufacturer for this purpose. Leave no voids in completed installation.

3.7 INSTALLATION OF FOAMED-IN-PLACE INSULATION

A. Install foamed-in-place insulation in accordance with manufacturer's instructions.

1. Completely fill voids in exterior steel door frames and other irregular voids where indicated on the Drawings.
2. The liquid ratios at the mixing gun shall be in accordance with the manufacturer’s specified range.

3.8 PROTECTION

A. General: 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