Part 1 General

1.1 REFERENCES

.1 American Society for Testing and Materials International, (ASTM).

- .1 ASTM C203 – Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation
- .2 ASTM C209 – Standard Test Methods for Cellulosic Fiber Insulating Board
- .3 ASTM C518 – Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- .4 ASTM C578 - 12b Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
- .5 ASTM D1621 – Standard Test Method for Compressive Properties of Rigid Cellular Plastics
- .6 ASTM D2126 – Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging
- .7 ASTM E 84-01, Standard Test Method for Surface Burning Characteristics of Building Materials.
- .8 ASTM E96 – Standard Test Method for Water Vapor Transmission of Materials
- .9 ASTM D1623 – Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics
- .10 ASTM C1289, Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.

.2 Canadian Gas Association (CGA)

- .1 CAN/CGA-B149.1, Natural Gas and Propane Installation Code Handbook.
- .2 CAN/CGA-B149.2, Propane Storage and Handling Code.

.3 Canadian General Standards Board (CGSB).

- .1 CGSB 71-GP-24M, Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.
- .2 CAN/CGSB 51.26-M86,

.4 Underwriters Laboratories of Canada (ULC).

- .1 CAN/ULC-S107, Fire Tests of Roof Coverings.
- .2 CAN/ULC-S701, Standard for Thermal Insulation, Polystrene, Boards and Pipe Coverings.
- .3 CAN/ULC-S702, Standard for Thermal Insulation, Mineral Fibre, for Buildings.
- .4 CAN/ULC-S704, Standard for Thermal Insulation Polyurethane and Polyisocyanurate, Boards, Faced.

.5 Canada Green Building Council (CaGBC)

- .1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets. Indicate VOC's insulation products and adhesives.

.2 Manufacturer's Instructions: Submit manufacturer's installation instructions.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away for public.

.4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.

.5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

Part 2 Products

2.1 BOARD INSULATION – EXTERIOR WALLS

.1 Wall Types EW1, EW1A: Polyisocyanurate Foam Sheathing (ISO).

.1 To CAN/ULC S704, Type 1, Class 1: Uniform closed-cell polyisocyanurate foam core bonded on one side with nominal 16.5 mil embossed white thermoset-coated aluminum sheet laminated and 1 mil aluminum on the other.

.2 Compressive strength: to ASTM D1621, minimum 16 Psi.

.3 Board size: 1220 mm x 2440 mm, thickness as indicated.

.4 Thermal resistance: R 6.5/inch [1.14 RSI/inch] @ 24 degrees C mean temperature.

.5 Manufacturer and Product

.1 John Manville AP Foil-Faced Polyisocyanurate Foam Sheathing (ISO) (or approved equal in accordance with B7).

.6 Thicknesses:

.1 As indicated.

.2 Wall Types EW2, EW2A: Extruded Polystyrene Rigid Insulation (XPS).

.1 To CAN/ULC S701, Type: 3, rigid closed cell type with high density skin.

.2 Compressive strength: to ASTM D1621, minimum 20 Psi.

.3 Board size: 610 mm x 2440 mm and 1220 x 2440mm, thickness as indicated, joints sealed.

.4 Thermal resistance: R 5.0/inch [0.88 RSI/inch] @ 24 degrees C mean temperature.

.5 Manufacturer and Product

.1 Owens Corning FOAMULAR® CodeBord® (or approved equal in accordance with B7)

.6 Thicknesses:

.1 As indicated.

2.2 BOARD INSULATION – FOUNDATION WALL

.1 Wall Type EW4, EW4A: Extruded Polystyrene Rigid Insulation (XPS).

.1 To CAN/ULC S701, Type: 4, rigid closed cell type with high density skin.

.2 Compressive strength: to ASTM D1621, minimum 30 Psi.

.3 Board size: 610 mm x 2440 mm and 1220 x 2440mm, thickness as indicated, joints sealed.

.4 Thermal resistance: R 5.0/inch [0.88 RSI/inch] @ 24 degrees C mean temperature.

.5 Manufacturer and Product

.1 Owens Corning FOAMULAR® C-300 (or approved equal in accordance with B7)

.6 Thicknesses:

.1 As indicated.

2.3 BOARD INSULATION – SURFACE APPLICATION

.1 Below grade on earth: Extruded Polystyrene Rigid Insulation (XPS).

.1 To CAN/ULC S701, Type: 4, rigid closed cell type with high density skin.

.2 Compressive strength: to ASTM D1621, minimum 30 Psi.

.3 Board size: 610 mm x 2440 mm and 1220 x 2440mm, thickness as indicated.

.4 Thermal resistance: R 5.0/inch [0.88 RSI/inch] @ 24 degrees C mean temperature.

.5 Manufacturer and Product

.1 Owens Corning FOAMULAR® C-300 (or approved equal in accordance with B7).

.6 Thicknesses:

.1 As indicated.

2.4 BOARD INSULATION – ROOF

.1 **Roof Type R1:** - Sloped Insulation to top side of roof deck: Expanded Polystyrene Rigid Insulation (EPS).

.1 To CAN/ULC S701, Type: 1, Expanded polystyrene insulation board.

.2 Compressive strength: to ASTM D1621, minimum 30 Psi.

.3 Board size: 610 mm x 2440 mm and 1220 x 2440mm, thickness as indicated, tapered to provide slope, joints sealed.

.4 Thermal resistance: R 3.75/inch [0.65 RSI/inch] @ 24 degrees C mean temperature.

.5 Manufacturer and Product

.1 Plasti-Fab PLASTISPAN Sloped Roof Insulation (or approved equal in accordance with B7)

.6 Thicknesses:

.1 As indicated, tapered to provide slope (see drawings for further info).

.2 **Roof Type R1:** Coverboard – Applied To Top of Sloped Roof Insulation:

.1 Soprema Sopra-Iso Plus Insulation (formerly Colgrip A).

.1 Type 2, Class 3, Grade 2: closed-cell polyisocyanurate foam insulation board laminated on both sides to heavy coated glass filament facer.

.2 Compressive strength: to ASTM D1621, minimum 20 Psi.

.3 Board size: As required, thickness as indicated.

.4 Thermal resistance: R 6.0/inch [1.06 RSI/inch] @ 24 degrees C mean temperature.

.5 Manufacturer and Product

.1 SOPREMA Sopra-ISO PLUS Insulation (or approved equal in accordance with B7)

.6 Thicknesses: 25.4 mm (1").

.3 Roof Type R1: Polyisocyanurate Foam Sheathing (ISO).

.1 To CAN/ULC S704, Type 1, Class 1: Uniform closed-cell polyisocyanurate foam core bonded on one side with nominal 16.5 mil embossed white thermoset-coated aluminum sheet laminated and 1 mil aluminum on the other.

.2 Compressive strength: to ASTM D1621, minimum 16 Psi.

.3 Board size: 1220 mm x 2440 mm, thickness as indicated.

.4 Thermal resistance: R 6.5/inch [1.14 RSI/inch] @ 24 degrees C mean temperature.

.5 Manufacturer and Product

.1 John Manville AP Foil-Faced Polyisocyanurate Foam Sheathing (ISO) (or approved equal in accordance with B7).

.6 Thicknesses:

.1 As indicated.

2.5 SUBSTITUTIONS

.1 Refer to Section B7 – Substitutes of Bid Opportunity 748-2013.

2.6 ADHESIVE

.1 Adhesive to manufacturer's written recommendations.

2.7 ACCESSORIES

.1 Insulation clips: impale type, perforated 50 x 50 mm cold rolled carbon steel 0.8 mm thick, adhesive back, spindle of 2.5 mm diameter annealed steel, length to suit insulation, 25 mm diameter washers of self-locking type.

.2 Joint sealing tape: air resistant pressure sensitive adhesive tape as recommended by insulation manufacturer.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 WORKMANSHIP

.1 Install insulation after building substrate materials are dry.

.2 Install insulation to maintain continuity of thermal protection to building elements and spaces.

.3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.

.4 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and CAN/CGA-B149.1 and CAN/CGA-B149.2 type B and L vents.

.5 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.

.6 Offset both vertical and horizontal joints in multiple layer applications.

.7 Do not enclose insulation until it has been inspected and approved by Contract Administrator.

3.3 EXAMINATION

.1 Examine substrates and immediately inform Contract Administrator in writing of defects.

.2 Prior to commencement of Work ensure:

.1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

3.4 RIGID INSULATION INSTALLATION

.1 Apply adhesive to insulation board in accordance with manufacturer's recommendations.

.2 Imbed insulation boards into vapour barrier type adhesive, applied as specified, prior to skinning of adhesive.

.3 In addition to adhesive install mineral fibre insulation boards with insulation clips and disk, 2 per 600 x 1200 mm board minimum, fit boards tight, cut off fastener spindle 3 mm beyond disk.

.4 Leave insulation board joints unbonded over line of expansion and control joints. Bond a continuous 150 mm wide 0.15 mm modified bituminous membrane over expansion and control joints using compatible adhesive and primer before application of insulation.

.5 Carefully inspect for continuity of air barrier prior to placement of insulation.

3.5 PERIMETER FOUNDATION INSULATION

.1 Exterior application: Install on exterior face of concrete with fastening clips and cap flashing in accordance with manufacturer's installation guidelines. Extend boards as indicated on earth.

3.6 TAPERED INSULATION INSTALLATION

.1 Co-ordinate installation of tapered insulation with specification requirements in Section 07 52 00 – Modified Bituminous Membrane Roofing.

.2 Install tapered insulation in accordance with shop drawings. Stagger joints between layers 152.4 mm (6") minimum.

.3 Taper insulation board at roof drains for minimum of 1219.2 mm (4') beyond opening.

.4 Provide 1% slope with tapered roof insulation.

3.7 COVERBOARD INSTALLATION:

.1 Install roofing board in accordance with manufacturer's written instructions, local code requirements and Underwriters Laboratories (UL) requirements for proper installation.

3.8 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION