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## **PART 1 GENERAL**

### **1.1 REFERENCES**

- .1 American Society for Testing and Materials International, (ASTM).
  - .1 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .2 ASTM A792/A792M-10(2015), Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot Dip Process.
  - .3 ASTM D523-14, Standard Test Method for Specular Gloss.
- .2 Department of Justice Canada (Jus).
  - .1 Canadian Environmental Protection Act (CEPA), 1999.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
  - .1 Material Safety Data Sheets (MSDS).

### **1.2 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for sheet metal roofing and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .3 Shop Drawings:
  - .1 Indicate dimensions, materials and finish, anchor details, penetration details, compliance with design requirements and requirements of related work.
  - .2 Drawings shall be signed and sealed by a professional engineer licensed to practice in the Province of Newfoundland and Labrador, attesting to the ability of the metal panels assembly to withstand the specified loads.

### **1.3 QUALITY ASSURANCE**

- .1 Submit mock-ups in accordance with Section 01 45 00 - Quality Control.
- .2 Fabricate 3000 x 3000 mm sample roofing panel using identical project materials and methods to include typical seam.
- .3 Mock-up will be used:
  - .1 To judge workmanship, substrate preparation, operation of equipment and material application.
- .4 Locate where directed.

- .5 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with sheet metal flashing work.
- .6 When accepted, mock-up will demonstrate minimum standard of quality required for this Work. Approved mock-up may remain as part of finished Work.

#### **1.4 DESIGN REQUIREMENTS**

- .1 Design roof system to resist
  - .1 Snow loads and snow build-up and rain load, expected in this geographical region NBCC climatic data, 50 year probability.
  - .2 Wind loads, positive and negative, expected in the geographical region NBCC climatic data, 50 year probability.
  - .3 Dead load of roof system.
- .2 Deflection of the roof system is not to exceed 1/240<sup>th</sup> of the span for the specified live loading.
- .3 Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, overstressing of components, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and night time sky heat loss.
  - .1 Temperature Change (range): 20°C, ambient; 40°C, material surfaces.
- .4 Roof system shall be weathertight.

#### **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect sheet metal roofing from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

### **PART 2 PRODUCTS**

#### **2.1 SHEET METAL MATERIALS**

- .1 Zinc coated steel sheet: to ASTM A653/A653M, structural quality grade 230 or 240, with Z275 coating, 0.61 mm minimum base metal thickness.

#### **2.2 PREFINISHED STEEL SHEET**

- .1 Prefinished steel with factory applied silicone modified polyester.

- .1 Class F1S.
- .2 Colour: linear white.
- .3 Specular gloss: 30 units +/-5 to ASTM D523.
- .4 Coating thickness: not less than 25 micrometres.
- .5 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20% to ASTM D822 as follows:
  - .1 Outdoor exposure period 1000 hours.
  - .2 Humidity resistance exposure period 1000 hours.
- .2 Sheet Steel: linear sheet, structural quality grade 230 to ASTM A653, with Z275 zinc coating:
  - .1 Siliconized polyester (SMP)
  - .2 Dry film thickness: 0.025 mm
  - .3 Gloss: 25 to 35 of matt finish <10\
  - .4 Colour: linear white
- .3 For copings and flashing provide prefinished, formed material to match cladding.
- .4 Insulation: semi-rigid glass fibre insulation to ASTM C612, Types 1A, 1B.
  - .1 Thickness: as indicated on drawings.
- .5 Insulation adhesive: Compatible with insulation type and zinc coated steel sheet, in combustible after curing.
- .6 Screws: Stainless steel, head colour same as exterior sheet, dished stainless steel/neoprene.
- .7 Sealants: See Section 07 92 00 – Joint Sealants.
- .8 Gaskets: Soft pliable arctic grade vinyl, extruded profile or closed cell polyurethane foam, adhesive on two sides, release paper protected.
- .9 Touch-up paint: as recommended by roof system manufacturer.
- .10 Isolation coating: bituminous paint.

## **2.3 COMPONENTS**

- .1 Exterior sheet-roof: factory preformed steel sheet (standing seam) aluminum-zinc alloy coated, minimum 0.61 mm base metal thickness, factory painted, profiles to match existing building. Include closures, gaskets, caulking, flashing and fasteners to effect weathertight installation. Cut ends of sheets square and clean.
- .2 Accessories to roof cladding: brake or bend to shape, of material and finish to match roof cladding or wall cladding where applicable, comprising coping and closures for fascia and penetration jacks.
- .3 Sub-purlins and clips: factory preformed steel sheet, minimum 1.2 mm base metal thickness, aluminum-zinc alloy coated.

- .4 Diagonal web members: factory preformed steel sheet, aluminum-zinc alloy coated shop cut and formed to profile from manufacturer's standard.
- .5 Gussets, lateral spacers: factory preformed steel sheet, aluminum-zinc alloy coated shop cut and formed to profile from manufacturer's standard.
- .6 Semi-rigid glass fibre insulation, minimum RSI 3.5
- .7 Metal liner: factory preformed steel sheet, aluminum-zinc alloy coated, factory painted profile to match profiles in existing building, with interlocking side lap. Install sealant material in interlocking lap. Cut end of sheets square and clean.
- .8 Roof fasteners: as specified by manufacturer, to resist wind uplift and sliding snow forces.

## **2.4 ACCESSORIES**

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Flashing: in accordance with Section 07 62 00 formed from same materials as the roof sheet. Custom fabricated to suit details as required.
- .3 Closures: foam and metal closures to suit profiles selected, to manufacturer's recommendations..
- .4 Sealant: Caulking see Section 07 92 00 - Joint Sealing.

## **2.5 FABRICATION**

- .1 Fabricate roof components to comply with dimensions, profiles, gauges, and details as shown on the shop drawings, including fascia and soffit panels and all companion flashing.
- .2 Fabricate all components of the system in the factory, ready for field installation.
- .3 Provide roof sheet and all accessories in longest practicable length to minimize field lapping of joints.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for sheet metal roofing installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .2 Proceed with installation only after unacceptable conditions have been remedied.

### **3.2 INSTALLATION**

- .1 Thermal and Moisture Protection:
  - .1 Install liner in accordance with manufacturer's instructions.
  - .2 Support clips: attach clips, hat bar, and zee clips using fasteners as recommended by the manufacturer, to suit the substrate.
  - .3 Insulation: Install semi-rigid insulation in one layer. Tightly butt against support clips. Insulation shall be continuous.
- .2 Roof Panel Installation
  - .1 Install exterior prefinished roof panels on panel support clips, using manufacturer's proper construction procedure. Ensure batten is positively locked for full length of roof. Close interlocking side joints by using a purpose-made seaming machine, as supplied by the manufacturer.
  - .2 Where indicated on approved shop drawings, secure the end-lap of metal roofing sheets in accordance with the manufacturer's specifications and details to provide a weathertight seal. Exposed fasteners to match colour of the roof sheet.
  - .3 Provide notched and formed closures, sealed against weather penetration, at changes in pitch, and at ridges and eaves, where required.
  - .4 Install all companion flashings as shown on the shop drawings. Use concealed fasteners to match colour of roof sheet.

### **3.3 CLEAN-UP**

- .1 Remove protective film from panels
- .2 Clean exposed panel surfaces in accordance with manufacturer's instructions.
- .3 Repair and touch-up with colour matching high grade enamel minor surface damage, only where permitted by the Departmental Representative and only where appearance after touch-up is acceptable to Departmental Representative.
- .4 Replace damaged panels and components that, in opinion of the Departmental Representative, cannot be satisfactorily repaired.

### **3.4 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by sheet metal roofing installation.

**END OF SECTION**