

# PART 1 – GENERAL

## DESCRIPTION

### General Requirements

Division 1, General Requirements, is part of this specification and shall apply as if repeated here

### Work furnished and included:

Structural liner.

Thermal barrier.

Air/vapour barrier.

Rigid insulation.

Roof panel and support system.

Accessories including associated flashings, closures, sealants.

### Related work not included:

Structural framing members including purlins, eave and ridge elements, and other elements required to support the cladding system.

Mechanical equipment and/or ductwork as well as their supporting framing.

Flashings associated with other trades.

## STANDARDS

Design of cladding system in accordance to the latest edition of:

CSA-S136 for the design of Cold Formed Steel Structural Members

Canadian Sheet Steel Building Institute Standards 10M, 20M, B11.

National Building Code of Canada

## QUALITY ASSURANCE

Manufacturer of roof system, and installer shall demonstrate at least five years experience in projects similar in scope.

This section establishes the standard of quality required for the complete metal roof system. Proposed substitutions must meet this standard, and will be considered as follows:

A written request for approval of a substitution is received at least ten (10) days prior to tender closing.

The request includes a complete item-by-item description comparing the proposed substitution to the specified system, together with manufacturer's literature, samples, test data, engineering standards and performance evaluation indicating comparable standards to those specified.

## DESIGN REQUIREMENTS

Design roof system to resist

{Snow loads and snow build-up and rain load, expected in this geographical region NBCC climatic data, 50 year probability} {### kPa}

{Wind loads, positive and negative, expected in this geographical region NBCC climatic

data, 50 year probability} {### kPa}

Dead load of roof system.

If the roof system is to be designed as a shear diaphragm, then the factored shear design loads “Q” and the flexibility factors “F” must be shown on the structural drawings.

Deflection of the roof system is not to exceed  $\{1/240^{\text{th}}\}$   $\{1/180^{\text{th}}\}$  of the span for the specified live loading.

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 nighttime sky heat loss.

Temperature Change (Range): 20 deg C, ambient; 40 deg C, material surfaces

### **SAMPLES**

Submit samples of standard coloured metal roof sheet for review by the consultant, prior to fabrication.

### **SHOP DRAWINGS**

Submit shop drawings in accordance with Section [01 33 23].

Indicate arrangement of pre-finished Roof Sheet, including joints, types and locations of supports, fasteners, flashing, gutters, mitres, and all metal components related to the roof installation. Include for {Structural Liner}, {Thermal Barrier}, {Membrane Air/Vapour Barrier}, {Insulation}, as part of the roof system.

Drawings shall be signed and sealed by a Professional Engineer, attesting to the ability of the metal panels assembly to withstand the specified loads.

### **MAINTENANCE DATA**

Provide maintenance data for cleaning and maintenance of panel finishes for incorporation into manual specified in Section [## ## ##].

### **PRODUCT DELIVERY, HANDLING AND STORAGE**

Store components and materials in accordance with panel manufacturer's recommendations and protect from elements.

Protect prefinished steel during fabrication, transportation, site storage and erection, in accordance with CSSBI Standards.

### **GUARANTEE**

For work in this section, warranty by installer against defects or deficiencies in materials or workmanship shall be for a period of one year from date of substantial completion.

## WARRANTY

Provide a manufacturer's written warranty: Furnish panel manufacturer's written warranty covering failure of factory-applied exterior finish within the warranty period. Warranty period for finish: {20 years} {35 years} {40 years} after the date of Substantial Completion. The values below are based on normal environments and exclude any aggressive atmospheric conditions.

{Barrier Series (Polyvinyl Chloride – PVC) will not change colour more than ten (10.0) Hunter ΔE units as determined by ASTM method D-2244-02 at any time for twenty (20) years from date of installation (20.5 yrs from application).}

{10000 Series (Polyvinylidene Fluoride - PVDF) will not visibly (within 10 metres to the unaided naked eye) crack, chip, or peel (lose adhesion) for thirty-five (35) years from date of application. This does not include minute fracturing that may occur during the normal fabrication process. 10000 Series (Polyvinylidene Fluoride - PVDF) will not chalk in excess of a number eight (8) rating, in accordance with ASTM D-4214-98 method D659 at any time for thirty-five (35) years from date of installation (35.5 yrs from application); will not change colour more than five (5.0) Hunter ΔE units as determined by ASTM method D-2244-02.}

{WeatherX™ (Siliconized Polyester - SMP) will not crack, chip, or peel (lose adhesion) for forty (40) years from date of installation (40.5 yrs from application). This does not include minute fracturing that may occur during the normal fabrication process. WeatherX™ (Siliconized Polyester - SMP) will not chalk in excess of a number six (6) rating, in accordance with ASTM D-4214-98 method D659 at any time for thirty (30) years from date of installation (30.5 yrs from application); will not change colour more than eight (8.0) Hunter ΔE units as determined by ASTM method D-2244-02.}

## PART 2 – PRODUCTS

### ROOF SYSTEM COMPONENTS:

Roof System: Marquis 450: System 3000 by Vicwest.

Structural Liner: Vicwest Steel Roof Deck, as specified in Section [05 31 00] - Steel Deck, profile number {RD938} {RD308} {RD306}, fabricated from ASTM A653M structural quality Grade 230 galvanized steel, with zinc coating of {ZF75 Galvaneal}, {Z275 galvanized}, as designated by ASTM A653M having a nominal core thickness [ ] mm ( "). {Use acoustic deck, where indicated on drawings}.

Thermal Barrier: Exterior grade gypsum sheathing to CSA A82.27, 12 mm thick.

Air/Vapour Barrier: Membrane shall be Sopraseal Stick 1100T by Soprema Inc. or {Ice and Water Shield} {Bituthene 3000} by W. R. Grace or an approved type to meet performance specified in Section [07 13 00]

Insulation: Rigid type {Owens Corning {703} {704} {705}} {Fibrex {1240} {1260} {1210 CR}} of sufficient thickness to provide RSI value of [ ], and designed to transfer gravity loads through the system to the structural liner.

| <b>Maximum Load</b> | <b>Insulation</b>                   |
|---------------------|-------------------------------------|
| 35 psf (1.7 kPa)    | Owens Corning AF530/703             |
|                     | Fibrex Industrial Board FBX 1240    |
| 60 psf (2.9 kPa)    | Owens Corning AF545/704             |
|                     | Fibrex Industrial Board FBX 1260    |
| 200 psf (9.6 kPa)   | Owens Corning 705                   |
|                     | Fibrex Industrial Board FBX 1210 CR |

#### Clip and Subgirt System:

Thermally responsive flush mount clip system, designed to allow for full thermal expansion and contraction of the exterior roof sheet. Clips to be fabricated from a minimum of 1.22 mm (0.048") steel, with minimum Z275 galvanized coating.

Continuous hat bar and zee clips made from galvanized material, thickness to suit design parameters, to accommodate depth of insulation.

Roof Fasteners: As specified by manufacturer, to resist wind uplift and sliding snow forces.

#### Prefinished Roof Sheet, exposed to exterior.

Profile: Marquis 450 Roofing profile, with interlocking Batten Ribs at 450 mm spacing.

Panel: Z275 galvanized (zinc coated) sheet steel conforming to ASTM A653M structural quality Grade 230 or AZ150 Galvalume, sheet steel conforming to ASTM A792M Grade 230, having a nominal core thickness 0.76mm (0.030").

#### Snap Cap Batten

Provide {50} {75} mm high SNAP-CAP Batten for full length of the roof panel, fabricated from Z275 galvanized (zinc coated) sheet steel conforming to ASTM A653M structural quality Grade 230. having a nominal core thickness 0.76mm (0.030"). Finish and colour to match roof sheet.

#### PANEL FINISHES:

{Structural Deck coating: {Plain galvanized finish on interior face} {Prepainted with Polyester on interior face} {Prepainted with WeatherX™ on interior face} {Prepainted with 10,000 Series on interior face} {Prepainted with Barrier Series}}

Prefinished Roof Sheet coating: {Prepainted with WeatherX™ on interior face} {Prepainted with 10,000 Series on interior face} {Prepainted with Barrier Series}

#### COLOUR

{Structural Deck colour to be QC \_\_\_\_\_ {Barrier coating thickness shall be {4} {6} {8} mils on exterior exposed surface of the finished profile and {4} {6} {8} mils on the reverse.}

selected from the manufacturer's standard colour range.}

Prefinished Roof sheet colour to be QC \_\_\_\_\_ {Barrier coating thickness shall be {4} {6} {8} mils on exterior exposed surface of the finished profile and {4} {6} {8} mils on the reverse.} selected from the manufacturer's standard colour range.

Specifier Note: Colour selection can affect cost and delivery largely due to supplier stock patterns.

## **ACCESSORIES**

Flashing: In accordance with Section [07 62 00]. Formed from same materials as the roof sheet. Custom fabricated to suit architectural details, as required.

Closures: Foam and metal closures to suit profiles selected, to manufacturer's recommendations.

Sealants: In accordance with manufacturer's recommendation and Section [07 92 00].

## **FABRICATION**

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.

Fabricate all components of the system in the factory, ready for field installation.

Provide roof sheet and all accessories in longest practicable length to minimize field lapping of joints.

## **PART 3 — EXECUTION**

### **EXAMINATION**

Examine work of other Sections upon which work of this Section depends.

Report all discrepancies to consultant before beginning work on the roof system.

### **INSTALLATION**

Thermal & Moisture Protection:

Structural Liner: Install Structural Liner in accordance with Section [05 31 00] Steel Deck. Ensure installation is complete before starting roof work.

Thermal Barrier: Install exterior grade gypsum board Thermal Barrier perpendicular to flutes of Structural Liner. Fasten using manufacturer's recommended fasteners, with spacing to suit wind loading conditions.

{Clip Support: Install 125 mm wide galvanized support plate at clip locations if required. Thickness to suit design parameters.}

Air/Vapour Barrier: Install membrane Air/Vapour Barrier in accordance with Section [07 13 00] and to manufacturer's recommendations. Ensure all joints are properly lapped, sealed

and tied in with wall air/vapour barriers to ensure airtight construction. Provide a continuous seal at all openings in the roof system.

Clip and Subgirts: Attach Marquis clips, hat bar, and zee clips using fasteners as recommended by the manufacturer, to suit the substrate.

Insulation: Install rigid Insulation in {one} {two} layers, as shown on the drawings. Tightly butt against support clips. Insulation should be continuous.

#### Roof Panel Installation

Install exterior prefinished roof panels on panel support clips, using manufacturer's proper construction procedure. Ensure metal roofing sheet side-lap is positively retained by clips, and proper sheet coverage is maintained.

Install the optional SNAP-CAP Batten, (if specified), using Snap-Cap Batten clips as shown on the approved shop drawings. Mitre Snap-Cap Batten as required.

Where indicated on approved shop drawings, secure the end-lap of metal roofing sheets in accordance with the manufacturers specifications and details to provide a weather-tight seal. Exposed fasteners to match colour of the roof sheet.

Provide notched and formed closures, sealed against weather penetration, at changes in pitch, and at ridges and eaves, where required.

Install all companion flashing {gutters}, {ventilators} as shown on the shop drawings. Use concealed fasteners when possible. Exposed fasteners to match colour of roof sheet.

#### **CLEAN-UP**

Clean exposed panel surfaces in accordance with manufacturer's instructions.

Repair and touch up with colour matching high grade enamel minor surface damage, only where permitted by the Architect and only where appearance after touch-up is acceptable to Architect.

Replace damaged panels and components that, in opinion of the Architect, cannot be satisfactorily repaired.

|                         |                             |
|-------------------------|-----------------------------|
| <b>[Project Name]</b>   | <b>Metal Roofing System</b> |
| <b>Section 07 42 13</b> |                             |
| <b>Project No: [ ]</b>  | <b>Section 07 61 13</b>     |

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|--|--|---------------------------|
|  | This specification was created by Vicwest to assist designers. It should be reviewed and modified as required to suit individual project conditions. | Page PAGE 1 of NUMPAGES 6 |
|--|--|---------------------------|

Deflection is a serviceability issue. It is not a structural issue. 1/240 is quite standard for roof systems, but can be reduced to 1/180  
 20 year warranty is typically associated with Barrier Series, 35 year warranty is typically associated 10,000 Series, whereas 40 year warranty is associated with WeatherX™  
 Structural capacity for load transfer through the insulation is dependent on the type and density of the insulation. Acceptable fibrous insulations (subject to revision) are listed below  
 #14AB x 3/4" or 1/4-14 x 3/4", #3PT is typically recommend by Vicwest when attaching to structural steel. Other types of fasteners can also be used.

Optional. If slope is less than 2:12, it is recommended to provide a better watertight system. WeatherX™ is a Silicone Modified Polyester (SMP) paint system

10,000 Series is a polyvinylidene fluoride (PVDF) paint system. Kynar® or Hynar® are other tradenames typically associated with this paint system. Not standard stock. Minimum quantities required.

Barrier Series is a thick-film PVC plastisol system. The thickness of the film can vary. Not standard stock. Minimum quantities required.

WeatherX™ is a Silicone Modified Polyester (SMP) paint system

10,000 Series is a polyvinylidene fluoride (PVDF) paint system. Kynar® or Hynar® are other tradenames typically associated with this paint system. Not standard stock. Minimum quantities required.

Barrier Series is a thick-film PVC plastisol system. The thickness of the film can vary. Not standard stock. Minimum quantities required.

Colour should be selected before issuing project for tender  
 Plate required when the subgirt system does not align with the flute of the deck.

