

[SPEC NOTE: This document is intended as a guide to develop specifications for products manufactured under ARTSPAN INC. and distributed by; WESTMAN STEEL, U-BUILD STEEL BUILDINGS & BEHLEN INDUSTRIES. It is not be viewed as a complete source of information about our product(s). Please refer to our product literature for additional recommendations. <http://artspaninc.com/>]

[SPEC NOTE: This section includes insulated metal standing seam roof panels utilizing a continuous foamed in-place closed cell insulating core with exterior and interior preformed and prefinished metal sheets. Offset tongue and groove side joints are designed to accept butyl sealant and hidden roof clips. Standing seam is mechanically folded with a 50mm seam height making it suitable for low slope roofs, providing a complete building envelope component. Interior and exterior metal facings are manufactured in a variety of profiles, thicknesses and finishes. Edit **Part 1 General** for specific project requirements. This section includes performance, proprietary, and descriptive type specifications; edit text to avoid conflicting requirements. Delete all **SPEC NOTES** and brackets at final edit.]

Part 1 General

1.1 SECTION INCLUDES

- .1 Preformed factory insulated metal standing seamed roof panel assembly, with related flashings, assembly devices, anchors and accessory components, to complete weathertight roofing system.

1.2 RELATED REQUIREMENTS

[SPEC NOTE: Only include those sections below that are actually included in the body of this section.]

- .1 Section 05 12 00 - Structural Steel: Structural steel building frame
- .2 Section 07 13 00 - Sheet Membrane Waterproofing
- .3 Section 07 26 00 - Vapour Retarders
- .4 Section 07 27 00 - Air Barriers
- .5 Section 07 62 00 - Sheet Metal Flashing and Trim
- .6 [Section 07 84 00 - Firestopping]
- .7 Section 07 92 00 - Joint Sealants
- .8 [Section 13 34 19 - Metal Building Systems]
- .9 [Section 13 34 23 - Fabricated Structures: Building framing system]

1.3 REFERENCE STANDARDS

[SPEC NOTE: Only include the reference standards below that are applicable to the project.]

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM A653/A653M-19a, 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 E84-19b, Standard Test Method for Surface Burning Characteristics of Building Materials



- .4 ASTM C518-17, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- .5 ASTM C1363-19, Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus
- .6 ASTM E72-15, Standard Test Methods of Conducting Strength Tests of Panels for Building Construction
- .7 ASTM E1680-11, Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems
- .8 ASTM E1646-95(2018), Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference
- .2 National Fire Protection Agency (NFPA)
 - .1 NFPA 286, Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth
- .3 Underwriters Laboratories Canada (ULC)
 - .1 CAN/ULC S101-14, Standard Methods of Fire Endurance Tests of Building Construction and Materials
 - .2 CAN/ULC S102-18, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
 - .3 CAN/ULC S126-14, Standard Method of Test for Fire Spread Under Roof-Deck Assemblies
 - .4 CAN/ULC S127-14, Standard Corner Wall Method of Test for Flammability Characteristics on Non-Melting Foam Plastic Building Materials
 - .5 CAN/ULC S138-06, Standard Method of Test for Fire Growth of Insulated Building Panels in Full-Scale Room Configuration
- .4 Canadian Standards Association (CSA)
 - .1 CSA-S16-19, Design of Steel Structures
 - .2 CSA-S136-16, North American Specification for the Design of Cold-formed Steel Structural Members
- .5 Canadian Sheet Steel Building Institute (CSSBI)
 - .1 CSSBI 30M-2017, Standard for Steel Building System
 - .2 CSSBI S8-2018, Quality and Performance Specification for Prefinished Sheet Steel Used for Building Products

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination: Coordinate work in accordance with Section 01 31 00, and as follows:
 - .1 Coordinate with other Work having a direct bearing on Work of this section.
 - .2 Coordinate the Work for installation of [vapour retarder] [air barrier system].
 - .3 Coordinate the Work with installation of [roof hatches] [vents] [equipment support] [fall protection equipment] [and other materials penetrating metal roof panel system].
- .2 Pre-Installation Meeting:

- .1 Convene [one (1) week] [[____] weeks] before starting work of this section.
- .2 Review construction schedule, material availability, personnel, equipment, facilities and other relevant issues to avoid unnecessary delays.
- .3 Review methods and procedures related to panel installation, including manufacturer's written instructions.

1.5 SUBMITTALS

- .1 Submit information in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Action Submittals:
 - .1 Shop Drawings:
 - .1 Indicate arrangement of metal panels. Including panel dimensions, profiles of [inner and outer] panels, location and types of; sealants, supports, fasteners, flashing, closures and all metal components related to metal roof panel installation.
 - .2 Provide Shop Drawings stamped and signed by a Professional Engineer, registered or licenced in [Province] [Territory], Canada.
 - .2 Samples:
 - .1 [Samples for Initial Selection: Submit manufacturer's [colour chart] [prefinished metal samples] showing manufacturer's full range of standard colours for selection.]
 - .2 [Samples for Verification:
 - .1 Submit [duplicate] colour samples approximately [100mm x 100mm] in [each] selected colour, finish and texture.
 - .2 Submit sample, 300mm long [x panel width,] [for each specified profile].
 - .3 Informational Submittals:

[SPEC NOTE: When manufacturer's written instructions for specific installation requirements are referenced in **Part 3 Execution**, include the following request for submittal of those instructions. Edit the Part 3 statements to avoid conflict with manufacturer's written instructions.]

- .1 Product Data: Submit manufacturer's product data sheet indicating; dimension, exterior and interior steel gauge, tests and thermal values.
- .2 Installation Data: Submit manufacturer's installation requirements, special handling criteria, installation sequence, and cleaning procedures.
- .4 Design Submittals:
 - .1 Submit [documentation] [certification] indicating compliance to performance/design criteria, signed and sealed by the professional responsible for their preparation.
 - .1 Design Data: Include material data, calculations and details.
 - .2 Letters of Assurance: Submit the following documents as required by authorities having jurisdiction or as specified in Section [____].
 - .1 [Letter] [Schedule] of [Assurance] [Compliance] [Commitment]: Submit [concurrently with Shop Drawings] [before start of Work].

- .2 [Letter] [Schedule] of [Assurance] [Compliance] [Commitment]:
Submit after completion of Work of this Section.
- .5 Closeout Submittals:
 - .1 Section 01 78 00: Submission procedures.
 - .2 Maintenance Data: Submit maintenance data for cleaning and maintenance of panel finishes for incorporation into O & M manual specified in Section [_____].

1.6 QUALITY ASSURANCE

- .1 Structural design in accordance with CSA-S136.
- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum [five (5)] years [documented] experience.
- .3 Installer Qualifications: Company specializing in performing the work of this section with minimum [five (5)] years documented experience [and approved by the manufacturer].
- .4 Design Professional Qualifications: Professional [Structural] Engineer experienced in design of this Work and licensed in the [province] [place] where the project is located.

1.7 MOCK-UPS

[SPEC NOTE: Only include the following if Mock-Ups are applicable to the project. Mock-Ups impact project cost and project schedule. Insulated Metal Panel Mock-Ups tend to remain as part of the work.]

- .1 Section [01 43 00] [01 45 00]: General requirements for mock-ups
- .2 Provide [_____] m long x [_____] m wide mock-up of roof [and wall panels] [including gutter system], attachments to structural framing, associated vapour retarder and air barriers, drainage system, sealants, and related insulation.
- .3 Locate [where directed by Consultant].
- .4 Approved mock-up [will] [will not] remain as part of the Work.

1.8 DELIVERY, STORAGE ON SITE, AND PROTECTION

- .1 Section 01 61 00: Transport, handle, store, and protect products from damage.
- .2 Follow manufacturer's guidelines for transportation, storage, stacking, loading and unloading.
- .3 Deliver and store materials in manufacturer's original, unopened packaging, with identification labels intact.
- .4 Store material off ground, protect from weather, impacts, abrasion and provide ventilation. Slope to ensure drainage. Protect from direct sunlight exposure until installed.

1.9 WARRANTY

- .1 Section [01 78 00]: Warranties.

[SPEC NOTE: CCDC contracts use Substantial Performance. Revise term below to suit the definition in the Project's contract.]

- .2 Provide manufacturer's two-year warranty against manufacturer's defects and deficiencies from the date of Substantial Performance of the Work.

[SPEC NOTE: CSSBI S8-2018 - Quality and Performance Specification for Prefinished Sheet Steel Used for Building Products, provides paint qualification tests and weathering per ASTM standards, including 40-year film integrity and 30 years for chalk and colour change.]

- .3 Provide manufacturers panel finish warranty including degradation of paint finish under normal atmospheric conditions including colour fading caused by exposure to weather.
 - .1 [40-year film integrity and 30-year chalk and colour change in accordance with CSSBI S8-2018.]

Part 2 Products

2.1 MANUFACTURERS

- .1 Artspan Inc; Product: SKYLINE Insulated Metal Roof Panel. [David Forsey Architectural Representative david.forsey@westmansteel.ca (800) 661-2823.]
- .2 Other acceptable manufacturers.
 - .1 [____]; Product: [____].
 - .2 [____]; Product: [____].
 - .3 [____]; Product: [____].
- .3 Substitutions: [Refer to Section 01 25 00] [Not permitted].

2.2 DESCRIPTION

- .1 System Description:
 - .1 Standing seam, continuous foamed in-place closed cell polyisocyanurate insulation with exterior and interior preformed and prefinished metal sheets; tongue and groove side joints; site installed and mechanically folded seams.

2.3 PERFORMANCE CRITERIA

- .1 Air Infiltration: Maximum 0.02 L/s/m² at a test differential of 75 Pa in accordance with ASTM E1680-11.
- .2 Water Penetration: No water penetration at a test differential of 300 Pa in accordance with ASTM E1646-95(2018).

[SPEC NOTE: Thermal Performance results are based on ASTM C518 and ASTM C1363. Panels are produced in various thicknesses; 50mm, 101mm, 127mm, 152mm.

Based on; ASTM C518-17, ASTM C1363-19, 75 °F and 40 °F mean temp with a temp differential of 39.6 °F and 58 °F respectively

Thermal Performance - Imperial [IP]				
75 °F		Thickness	40 °F	
BTU/hr·ft²·°F	hr·ft²·°F/BTU		BTU/hr·ft²·°F	hr·ft²·°F/BTU
U-Factor	R-Value		U-Factor	R-Value
0.065	15.16	2" (50mm)	0.060	16.67
0.033	30.38	4" (101mm)	0.030	33.33
0.026	37.87	5" (127mm)	0.024	41.67
0.022	45.43	6" (152mm)	0.020	50.00

Thermal Performance - Metric [SI]				
24 °C		Thickness	4.4 °C	
W/m²·K	m²·K/W		W/m²·K	m²·K/W
U SI Value	R SI Value		U SI Value	R SI Value
0.375	2.67	2" (50mm)	0.341	2.93
0.188	5.35	4" (101mm)	0.170	5.88
0.150	6.67	5" (127mm)	0.136	7.35
0.125	8.00	6" (152mm)	0.114	8.77

- .3 Thermal Resistance of System: RSI-1.33 per 25mm of core thickness; tested at 24°C in accordance with ASTM C518-17.

2.4 DESIGN CRITERIA

- .1 Design: Design [roof panels and connections] by a licensed design professional using performance and design criteria as indicated.
- .2 Loads: Design and size components to withstand, wind uplift, sliding force, dead and live loads as calculated in accordance with [applicable] building code [to a design pressure of [_____] kPa].

[SPEC NOTE: Deflection for exterior wall panels: L/180. Interior partition walls: L/120. Roofs and ceilings: L/240. Ensure deflection limits meet the project design.]

- .3 Maximum Allowable Deflection of Steel Roof Panel: L/240 of span.
- .4 Thermal Movement: Provide for expansion and contraction within system components caused by a cycling temperature range of [20 degrees C], ambient; [40 degrees C] over a [12-hour] hour period without overstressing components causing buckling, failure of connections, or other detrimental effects.
- .5 Thermal Barrier: Provide continuity of thermal barrier at building enclosure elements in conjunction with thermal insulating materials specified in Section [07 21 00].
- .6 Vapour Retarder: Provide continuity of vapour retarder at building enclosure elements in conjunction with vapour retarders specified in Section [07 26 00].
- .7 Air Seal: Provide continuity of air barrier at building enclosure elements in conjunction with air barrier materials specified in Section [07 27 00].

2.5 MATERIALS

- .1 Zinc-Coated (Galvanized) Steel Sheet: ASTM A653/A653M, commercial steel (CS), minimum Grade 230, with Z275 coating designation.
- .2 Core Material: Closed cell polyisocyanurate insulation with nominal density of 38 kg/m³.

2.6 PANELS

- .1 Profile: Skyline Mesa Smooth
- .2 Width: 1067mm

[SPEC NOTE: Standard exterior core steel thickness is 0.61mm. Other gauges are available with sufficient lead time.]

- .3 Thickness:
 - .1 Exterior Sheet: Minimum 0.61 mm core steel thickness, Mesa profile with a smooth, non-embossed steel surface texture.
 - .2 Interior Liner Sheet: Minimum [0.46] [0.61] mm core steel thickness, [Mesa profile with a smooth, non embossed steel surface texture] [Mesa profile with a light embossed surface texture].

[SPEC NOTE: Review ARTSPAN Colour Chart for standard stocked colour range. Custom colours available with sufficient lead time and approval of colour match sample. Specialty paint systems including Plastisol PVC Barrier available. Contact ARTSPAN for paint coating recommendations based on project application and location.]

- .4 Finish:
 - .1 Exterior: [PVDF 2-coat solid colour] [PVDF 3-coat metallic colour] QC# [_____] [As selected from manufacturer's standard range].
 - .2 Interior: PVDF 2-coat solid colour Regal White.

2.7 ACCESSORIES

- .1 Fasteners: Manufacturer's standard type to suit application for design loads. Colour matching panels where exposed to view.
- .2 Roof Panel Clip: Manufacturer's standard galvanized wall clip concealed within the panel joint.
- .3 Sealants: As specified in Section 07 92 00, and as follows:
 - .1 Concealed Sealant: Tape or compound, non-skinning, non-drying, butyl rubber.
 - .2 Exposed Sealant: [ASTM C920, silicone] [ASTM C834, acrylic co-polymer], single component, [colour matching cladding].
- .4 Flashings and Closures: As specified in Section 07 62 00, of same material, thickness and finish as exterior sheets; brake formed to required profiles.
- .5 Field Touch-up Paint: Air-dry paint finish specifically designed for repainting of sheet steel.

2.8 FABRICATION

- .1 Form sections true to shape, accurate in size, square, and free from distortion or defects.
- .2 Form pieces in longest practicable lengths.
- .3 Fabricate components to comply with dimensions, profiles, gauges and details as shown on the Shop Drawings, including all companion flashing.

Part 3 Execution

3.1 EXAMINATION

- .1 Verify existing conditions before starting work.
- .2 Verify dimensions, tolerances, and method of attachment with other work.
- .3 Verify structural support framing are aligned and within recommended tolerances to install panels.
- .4 Verify that site measurements [are as indicated on Drawings] [are as indicated on Shop Drawings] [meet manufacturer's minimum requirements].
- .5 Report unsatisfactory conditions to [Consultant] in writing; Do not start work of this section until unsatisfactory conditions are rectified.

3.2 INSTALLATION

- .1 Install panel system to manufacturer's written instructions [and approved shop drawings].
- .2 Install components required to complete the panel system including; continuous perimeter and panel joint sealant, roof clips, flashings and trims.
- .3 Permanently fasten panel system to structural supports; aligned within specified tolerances.
- .4 Locate panel joints over supports.
- .5 Seal and place gaskets to prevent weather penetration. Maintain neat appearance.

3.3 ERECTION TOLERANCES

- .1 [Section 01 73 00: Tolerances.]
- .2 Structural steel support must be erected in accordance with CSA-S16-19 standard.

[SPEC NOTE: Framing members out of alignment can cause issues in appearance with rippling or buckling of the panel faces and difficulty installing, engaging the panel joints and mechanical seaming.]

- .3 Tolerance on intermediate framing member alignment: 0mm to 6mm outward of the structural support line for members spaced greater than 2438mm.
- .4 Tolerance on intermediate framing member alignment: 0mm to 3mm outward of the structural support line for members spaced 1219mm to 2438mm.
- .5 Tolerance on intermediate framing member alignment: 0mm to 1.6mm outward of the structural support line for members spaced less than 1219mm.

3.4 CLEANING

- .1 Section 01 74 00: Cleaning installed work.

[SPEC NOTE: Manufacturer's installation instructions require the protective film to be removed within 60 days of panels arriving on site. Failure to remove film can result in adhesion break down making the film hard to remove and will leave a residue on the face of the panel. It is up to the contractor to ensure panels are received and installed in a timely manner. If panels are sitting longer than 60 days, protective film to be removed and panels restacked for installation.]

- .2 Remove protective film [immediately after each panel is installed] [at the end of the work day].
- .3 Remove site cuttings from finish surfaces, edges, trims and flashings.
- .4 [Clean and wash prefinished surfaces with mild soap and clean water; rinse with clean water.]
- .5 Repair and touch up very minor surface damage.
- .6 Replace damaged panels and components that cannot be repaired.

END OF SECTION