

*This section includes composite, polyisocyanurate foam insulated steel panels for exterior building walls, interior partitions and suspended ceilings.*

## **Part 1      General**

### **1.1      SECTION INCLUDES**

- .1      Preformed, steel-faced, insulated architectural wall panels with polyisocyanurate foam core.
- .2      Prepainted steel trim, flexible flashings, prepainted metal flashings and sealing materials.

### **1.2      RELATED SECTIONS**

*In this article, include those sections that inter-rely on this section. The listing below is only partial and should be edited to include those sections specific to the project that describes subjects or products that affect this section directly.*

- .1      Section [05 12 00] [\_\_\_\_\_] - Structural Steel: Structural steel building frame.
- .2      Section [05 41 00] [\_\_\_\_\_] - Structural Metal Lightweight Framing: Stud wall framing system.
- .3      Section [071300] [\_\_\_\_\_] - Sheet Membrane Waterproofing: Waterproof membrane seal at [bottom] [\_\_\_\_\_] of panels.
- .4      Section [07 26 00] [\_\_\_\_\_] - Vapour Retarders: [\_\_\_\_\_].
- .5      Section [07 27 00] [\_\_\_\_\_] - Air Barriers: [\_\_\_\_\_].
- .6      Section [07 21 13] [\_\_\_\_\_] - Board Insulation: [\_\_\_\_\_].
- .7      Section [07 21 16] [\_\_\_\_\_] - Blanket Insulation: [\_\_\_\_\_].
- .8      Section [07 62 00] [\_\_\_\_\_] - Sheet Metal Flashing and Trim: [\_\_\_\_\_].
- .9      Section [07 84 00] [\_\_\_\_\_] – Fire stopping: [\_\_\_\_\_].
- .10     Section [07 92 00] [\_\_\_\_\_] - Joint Sealants: [\_\_\_\_\_].
- .11     Section [08 34 13] [Vertical Swing Cold Room Doors] [\_\_\_\_\_]
- .12     Section [08 34 15] [Sliding Cold room Doors] [\_\_\_\_\_]
- .13     Section [42 20 00] [\_\_\_\_\_] – Process Cooling Equipment: [\_\_\_\_\_].

### **1.3      REFERENCES**

*Edit this article after editing the rest of this section. Only list reference standards below, that are included within the text of this section, when edited for a project specification - delete references that do not apply.*

- .1      ASME B18.2.2 - Square and Hex Nuts (Inch Series).

- .2 ASTM A653/A653M-09a - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .3 ASTM E72 -05- Method for Conducting Strength Tests of Panels for Building Construction.
- .4 ASTM E84-10 - Test Method for Surface Burning Characteristics of Building Materials.
- .5 CAN/CGSB-19.13-M87 - Sealing Compound, One-component, Elastomeric, Chemical Curing.
- .6 CGSB-19-GP-14M (June 84) - Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.
- .7 CAN/ULC-S102-07 - Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .8 CAN/ULC-S710.1 - Thermal Insulation - Bead – Applied One Component Polyurethane Air Sealant Foam, Part 1: Material Specification.
- .9 CAN/ULC S-101-07 Standard methods of fire endurance test of building construction and materials.
- .10 CAN/ULC S-126-06 Standard method of test for fire spread under roof deck assemblies.
- .11 CAN/ULC S-127-07 Standard Corner wall method of testing for flammability characteristics of non-melting foam plastic building materials.
- .12 ULC/ORD-C376 – 1995 Fire growth of foamed insulation building panels in a full scale room configuration.
- .13 CFIA (Canadian Food Inspection Agency).
- .14 CSSBI (Canadian Sheet Steel Building Institute) - Light gauge Steel Roofing and Siding.

#### **1.4 SYSTEM DESCRIPTION**

- .1 Composite panel system consisting of interior and exterior preformed, interlocking steel panels with injected polyisocyanurate foam core.
  - .1 Panel decompression cavity and evacuation channel to drain water infiltration to exterior.
  - .2 Concealed anchorage system, designed to minimize thermal bridging.
  - .3 Pre-form steel panel lateral edges with [offset] [straight] joint system with butyl seal.
- .4 [Full height panels with no horizontal joints] [Horizontal joints with concealed fasteners].

#### **1.5 PERFORMANCE REQUIREMENTS**

- .1 Components: Design and size to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of panel as calculated.
  - .1 Structural Performance: Design loads and maximum deflections to ASTM E72.

- .2 Design anchors to transmit minimum load of 410 kg (905 lbs) to structural support elements without achieving its rupture limit or damaging panels.
  - .3 Maximum Allowable Deflection of Wall Panels: 1/180 of span or 15 mm (5/8 inch), under maximum design loads.
  - .4 Maximum Allowable Deflection of Roof or Ceiling Panels: 1/240 of span under maximum design loads.
  - .5 Maximum Allowable Deflection of Wall Panels Covered by Brick Facing: 1/360 of span under maximum design loads.
- .2 Performance of Panel System:
- .1 Flame Spread/Smoke Developed Performance: To CAN/ULC-S102, [20/80] [20/95] [\_\_\_\_\_].
  - .2 CAN/ULC – [S-101] [S102] [S-126] [S-134] and [S-138, formerly ULC/ORD-C376].
  - .3 Thermal Resistance of System: [RSI: 1.29/25.4 mm or R 7.5/ in.] [\_\_\_\_\_].
  - .4 Dimensions @ 25°C
    - Panel width: Norex-S: 1118 mm ± 2 mm  
Norex-L: 1080 mm ± 2 mm
    - Panel thickness: 2 to 4 inches: ± 2 mm  
5 inches: ± 2.5 mm  
6 inches: ± 3 mm
- Add 2% for dimensional stability as per ASTM-D2126

*Delete the following paragraph if not required.*

- .5 Comply with CFIA.
- .3 Movement: Accommodate movement within system without damage to system, components, or deterioration of seals; movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; deflection of structural support framing, shortening of building concrete structural columns, and creep of concrete structural members.
- .4 Tolerances: Accommodate tolerances of building structural framing.
- .5 Products: Provide continuity of thermal barrier at building enclosure elements [in conjunction with thermal insulating materials in Section [\_\_\_\_\_]].
- .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 seal at building enclosure elements in conjunction with air seal materials specified in Section [07 27 00] [\_\_\_\_\_].

## 1.6 ADMINISTRATIVE REQUIREMENTS

- .1 Section [01 31 00] [\_\_\_\_\_]: Project management and coordination procedures.
- .2 Coordination:

- .1 Coordinate with other work having a direct bearing on work of this section.
  - .2 Coordinate the Work with placement of anchors [\_\_\_\_\_].
  - .3 Coordinate the Work for installation of vapour retarder and air barrier seals.
  - .4 Coordinate the Work with installation of [windows] [louvres] [\_\_\_\_\_] components or materials.
- .3 Pre-installation Meetings: Convene [one (1) week] [[\_\_\_\_\_] weeks] before starting work of this section.

### **1.7 SUBMITTALS FOR REVIEW**

- .1 Section [01 33 00] [\_\_\_\_\_]: Submission procedures.
- .2 Product Data: Provide [two (2)] copies of product data indicating material physical properties.
- .3 Shop Drawings:
  - .1 Indicate dimensions, panel profile and layout, spans, joints, construction details, methods of anchorage, method [and sequence] of installation, flashing and [\_\_\_\_\_].
  - .2 Indicate details and special conditions at half scale.
  - .3 Indicate loads and calculations of maximum deflection at supports.
  - .4 Prepare Shop Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.
- .1 Samples: Submit [two (2)] [\_\_\_\_\_] 300 x 2400 mm (12 x 48 inch) panel samples showing jointing system, flashings, sheet facings with specified finish illustrating finish colour, sheen, and texture, flexible flashings, anchors and fasteners.

### **1.8 SUBMITTALS FOR INFORMATION**

- .1 Section [01 33 00] [\_\_\_\_\_]: Submission procedures.
- .2 Design and Performance Data: Indicate panel profile characteristics and dimensions, and structural properties of assembled panels.
- .3 Laboratory Testing: Upon request, submit laboratory tests and methods used.
- .4 Installation Data: Manufacturer's special installation requirements, including special handling criteria, installation sequence, and cleaning procedures.

### **1.9 QUALITY ASSURANCE**

- .1 Installer Qualifications: Company specializing in performing the work of this section with minimum five (5) years documented experience and approved by the manufacturer.

### **1.10 MOCK-UP**

*Use this article if there is a requirement for assessing full sized erected assemblies for review of construction, coordination of work of several sections, testing, or observation of operation.*

- .1 Section [01 43 00] [\_\_\_\_\_]: Requirements for mock-up.

- .2 Construct [\_\_\_\_\_] m ([\_\_\_\_\_] feet) long by [\_\_\_\_\_] m ([\_\_\_\_\_] feet) wide mock-up, including panel system, attachments to building frame, associated vapour retarder and air seal materials, sealants and seals, related insulation, and [\_\_\_\_\_].
- .3 Demonstrate component assembly including panel [and glazing] materials, attachments, anchors, and perimeter sealant.
- .4 Locate [where directed by Consultant] [\_\_\_\_\_].
- .5 Approved mock-up [may] [may not] remain as part of the Work.

#### **1.11 DELIVERY, STORAGE, AND PROTECTION**

- .1 Section [01 61 00] [\_\_\_\_\_]: Transport, handle, store, and protect products.
- .2 Protect prefinished materials during transportation, site storage and assembly to CSSBI standards.
- .3 Deliver panels and accessories in original wrappings, bearing manufacturer and product names.
- .4 Inspect panels upon delivery at site and immediately inform manufacturer of defects.
- .5 Protect panels from accelerated weathering if stored beyond one (1) month by removing or venting sheet plastic shipping wrap; cover panels with woven fabric tarpaulins.
- .6 Store materials in well ventilated areas, off ground with weather protection. Slope metal sheets to ensure drainage.
- .7 Store materials away from contaminating sources, fertilizers, chemical products or corrosive substances.
- .8 Store adhesives and sealants at minimum temperature of 5 degrees C (41 degrees F) to ensure required malleability upon application.
- .9 Stack and store flashings and metal trim to prevent creasing, twisting, scratching and other damage.

#### **1.12 WARRANTY**

- .1 Section [01 78 10] [\_\_\_\_\_]: Warranties.
- .2 Provide a five (5) year manufacturer's warranty to include coverage for failure to meet specified requirements.
- .3 Performance specification from steel suppliers will cover degradation of panel finish including colour fading caused by exposure to weather, defect in design.

## Part 2 Products

### 2.1 MANUFACTURERS

- .1 Norbec Architectural; Product: Norex Architectural Panels.
- .2 Other acceptable manufacturers offering functionally [and aesthetically] equivalent products.
  - .1 [\_\_\_\_]; Product: [\_\_\_\_].
  - .2 [\_\_\_\_]; Product: [\_\_\_\_].
- .3 Substitutions: [Refer to Section 01 62 00] [Not permitted].

### 2.2 PANEL MATERIALS

- .1 Sheet Steel: ASTM A653/A653M, commercial grade galvanized steel.
  - .1 Panel width, vertical panel: [1080 mm (42-1/2 inches)] [914 mm (36 inches)] [762 mm (30 inches)] [610 mm (24 inches)] [\_\_\_\_].
  - .2 Panel width, horizontal panel: [1054 mm (41-1/2 inches)] [914 mm (36 inches)] [762 mm (30 inches)] [610 mm (24 inches)] [\_\_\_\_].
  - .3 Panel Length: [2.4 m (8 feet)] [14.6 m (48 feet)] [\_\_\_\_].
  - .4 Exterior Sheet Steel: Coating designation [Z275 (G90)] [\_\_\_\_]; factory precoated with [silicone modified polyester] [polyester] [polyurethane] [\_\_\_\_].
    - .1 Sheet Metal Thickness: [0.432 mm (0.0170 in)] [0.648 mm (0.0255 in)] base metal thickness [\_\_\_\_].

*The first option below can only be used if 0.648 mm (0.0255 in) thick steel sheet or embossing is specified.*

- .2 Surface Profile: [Without profile] [fluted] [striated] [Micro-ribbed].

*The standard surface texture is smooth. Add the following paragraph if the optional embossed texture is desired.*

- .3 Surface Texture: Embossed with stucco finish.
- .4 Colour: [\_\_\_\_] [To be selected from manufacturer's standard colour range].
- .5 Interior Sheet Steel: Coating designation [Z275 (G90)] [\_\_\_\_]; factory precoated with [silicone modified polyester] [polyester] [polyurethane] [\_\_\_\_] finish.
  - .1 Sheet Metal Thickness: 0.432 mm (0.0170 in) base metal thickness.
  - .2 Surface Profile: [fluted] [striated] [\_\_\_\_].

*The standard surface texture is smooth. Add the following paragraph if the optional embossed texture is desired.*

- .3 Surface Texture: Embossed with stucco finish.
- .4 Colour: [\_\_\_\_] [To be selected from manufacturer's standard colour range].
- .2 Insulation: Spray-in expanding polyisocyanurate foam.
  - .1 Thickness: [50 mm (2 inches)] [75 mm (3 inches)] [102 (4 inches)] [127 (5 inches)] [152 mm (6 inches)].

### 2.3 ACCESSORIES

- .1 Panel Supports and Anchorages: Steel sheet, hot-dip galvanized to ASTM A653/A653M,

- 1.58 mm (16 gauge), to dimensions and profiles indicated.
- .2 Metal Flashings, Closures: Steel sheet, hot-dip galvanized to ASTM A653/A653M, 0.053 mm (26 gauge), to dimensions and profiles indicated.
- .1 Colour: [\_\_\_\_\_] [As selected from manufacturer's standard color range].

*Select from the following two paragraphs below.*

- .3 Fasteners: Manufacturer's standard type to suit application; zinc coated.

**[OR]**

- .4 Fasteners:
- .1 Exterior Finishing Screws: Self-fastening/self-drilling, #9 x 25 mm (1 inch), zinc-coated steel screws with rubber washer and head color to match panels.
- .2 Interior Finishing Screws: Self-fastening/self-drilling steel #8 x 19 mm (3/4 inch) zinc-coated screws with head color to match panels.
- .3 Structural Screws: Self-fastening/self-drilling TEK #1/4-28 zinc-coated steel screws, length same as panel thickness.
- .4 Anchor Bolts and Nuts: ASME B18.2.2, SAE Gr. 5, minimum 6.6 mm (0.26 inch) diameter.
- .5 Flexible Flashing: Air-barrier type; modified bitumen sheet laminated to protective polyethylene film, self-adhering, 1 mm. (0.040 inch) thick; primer as recommended by manufacturer.
- .1 Manufactured by [Bakor] [\_\_\_\_]; Product: [Blueskin SA] [\_\_\_\_].
- .6 Panel Sealant (concealed joint): Synthetic butyl, elastomeric, solvent-free, non-skinning, and compatible with steel surfaces, to CGSB-19-GP-14 M.
- .1 Manufactured by [Sika] [\_\_\_\_]; Product: [511 Sika Lastomer] [\_\_\_\_].
- .7 Flashing Sealant: Exterior type, weather-resistant, compatible with surfaces to be sealed. Elastomeric with chemical polymerization, moisture curing, to CAN/CGSB-19.13, colour to match panels.
- .1 Manufactured by [Chemlink] [\_\_\_\_]; Product: [Duralink] [\_\_\_\_].
- .8 Interior Sealant: CAN/CGSB-19.13, silicone based mastic [approved by CFIA for use in buildings with food processing/handling facilities]; colour to match panels.
- .1 Manufactured by [Adchem] [\_\_\_\_]; Product: [Adsil 4800] [\_\_\_\_].
- .9 Joint Backup: Polyethylene, urethane, neoprene or vinyl compressible closed-cell foam, compatible with primers and sealants. Oversize 30% to 50% to suit joint width.
- .10 Air Sealant Foam: CAN/ULC-S710.1, Bead applied, gun foam, one-component polyurethane sealant.
- .1 Flame spread/smoke developed rating of 25/50 as tested to CAN/ULC-S102 or ASTM E84.
- .2 Manufactured by [Zerodraft] [\_\_\_\_]; Product: [Zerodraft Foam Sealant] [\_\_\_\_].
- .11 Field Touch-up Paint: As recommended by panel manufacturer.
- .12 Bituminous Paint: [Asphalt base] [\_\_\_\_].

## 2.4 FABRICATION

- .1 Fabricate panels utilizing pressurized-equalized rain screen fabrication (applicable to vertical panel only).
- .2 Factory fabricates panels with thickness tolerance of plus or minus 1.6 mm (1/16 inch), minimum.
- .3 Form sections true to shape, accurate in size, square, and free from distortion or defects.
- .4 Form pieces in longest practicable lengths.
- .5 Inject steel sheet cavities with polyisocyanurate foam.
- .6 Factory seal exposed foam with plastic film to eliminate water infiltration and prevent loss of insulating gas.
- .7 Apply butyl sealant to interior and exterior overlaps during production to provide a continuous and uniform bed of sealant to achieve air tightness.
- .8 Factory finish sheets to paint manufacturer's standards.
- .9 Panel Joints: fabricated for [offset] [straight] [horizontal] joint connections and secured using [concealed] [ ] fasteners.

## 2.5 SOURCE QUALITY CONTROL

- .1 Conduct periodic verification of assembly, panel pull-off tests, and check for uniform distribution of adhesion between insulation and steel sheets during lamination.

## Part 3 Execution

### 3.1 EXAMINATION

- .1 Section [01 70 00] [\_\_\_\_\_]: Verify existing conditions before starting work.
- .2 Verify that framing members and structural alignment are within recommended tolerances and ready to receive panel system. Advise [Consultant] [\_\_\_\_\_] if conditions are not acceptable; do not install panels.

### 3.2 INSTALLATION

- .1 Install composite metal panel system on walls [and soffits] to manufacturer's written instructions.
- .2 Protect panel surfaces in contact with [cementitious materials] [dissimilar metals] with bituminous paint. Allow to dry prior to installation.
- .3 Permanently fasten panel system to structural supports; aligned, level, and plumb, within specified tolerances.
- .4 Attach panels to structure without restricting movement caused by design loads and expansion and contraction of assembly.
- .5 Seal panels weather tight.



- .6 Attach flexible flashings to foundations [as indicated].
- .7 Provide [expansion] [control] joints where indicated.
- .8 Coordinate weather tight seal at roof, floor and at junctions with other wall construction. Maintain complete continuity of building envelope air barrier, vapour retarder, insulation and rain screen.
- .9 Trim panels with flashings; weep holes, transition sheets, flexible flashings and gap-filling insulation to attain specified system performance.
- .10 Provide weep holes and vents at each panel joint to drain water infiltrating system to exterior of building.
- .11 Provide exposed and concealed flashings with exterior minimum positive 1:12 slope; surfaces to remain free of stagnant water.
- .12 Minimize thermal bridging with insulation and backup to prevent direct conduction through envelope.
- .13 Do not leave metal sheet flanges unfolded or exposed. Minimize site cutting.
- .14 Protect exposed surfaces of cuts with paint to match panel colour. Ensure site cuts are same quality as shop cuts.

### 3.3 TOLERANCES

- .1 Section [01 73 00] [\_\_\_\_\_]: Tolerances.
- .2 ERECTION TOLERANCES FOR STRUCTURAL SUPPORT
  - .1 Unless otherwise specified, steel structural support must be erected in accordance with CAS-S16-14 standard.
  - .2 Tolerance on structural support flatness: 6 mm in 3 m (¼ inch in 10ft) in all directions.
  - .3 Tolerance on flatness for the structural support contact area with the panel: 1,5 mm in 150 mm (1/16 inch in 6 inches).
  - .4 A survey of the structural support flatness must be done prior to installation.
- .3 EDIFICATION TOLERANCES
  - .1 Width of interior reveal between panel: 5 mm ± 1,5 mm (3/16 in ± 1/16 in.).
  - .2 Tolerance on vertical alignment: 5mm in 6 m (3/16 inch in 20 ft)
  - .3 Tolerance on panel flatness: 6 mm in 3 m (¼ inch in 10 ft.) in all directions.
  - .4 Tolerance on oil canning and other surface aesthetic issues: 1 mm in 400 mm (5/128 inch. in 15¾ inches). Each panel must be individually inspected prior to installation.

### 3.4 CLEANING

*This article is intended to supplement cleaning requirements specified in Division 01 sections. Edit this article to supplement Division 01 statements.*

- .1 Section [01 74 00] [\_\_\_\_\_]: Cleaning installed work.
- .2 Remove excess sealant with solvent recommended by manufacturer.
- .3 Clean installation of residue and remove unused materials and products. Remove site cuttings from finish surfaces.

- .4 Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.

### **3.5 SCHEDULES**

*The following article will assist in preparing a schedule when panel design, colour, or dimensions vary for the project. The following schedule includes are EXAMPLES only. Edit the paragraphs below to create a schedule for the components specified in this section. Do not repeat statements that may exist on drawings.*

- .1 North, East and South Elevations: Striated profile, Red colour.

**END OF SECTION**