

1 General

1.1 RELATED REQUIREMENTS

- .1 Section 07 21 13 - Board Insulation.
- .2 Section 07 62 00 - Sheet Metal Flashing and Trim.
- .3 Section 07 92 00 - Joint Sealants.

1.2 REFERENCES

- .1 American National Standards Institute (ANSI).
 - .1 ANSI B18.6.4, Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws.
 - .2 ANSI B18.6.4, Screws, Tapping and Metallic Drive, Inch Series, Thread forming and Cutting.
- .2 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-51.32, Sheathing, Membrane, Breather Type.
 - .2 CAN/CGSB-93.4, Galvanized and Aluminum-Zinc Alloy Coated Steel Siding Soffits and Fascia, Prefinished, Residential.
- .3 Canadian Standards Association (CSA International).
 - .1 CSA B111, Wire Nails, Spikes and Staples.
 - .2 CAN/CSA S16.1, Limit States Design of Steel Structures.
 - .3 CSA S136, Cold Formed Steel Structural Members.
 - .4 CSA S136.1, Cold Formed Steel Structural Members.
- .4 Environmental Choice Program (ECP).
 - .1 CCD-045, Sealants and Caulking Compounds.
- .5 Underwriters' Laboratories of Canada (ULC).
 - .1 CAN/ULC-S706, Wood Fiber Thermal Insulation for Buildings.
- .6 CSSBI: 20M, Sheet Steel Cladding for Architectural and Industrial Applications.
- .7 NBCC, National Building Code of Canada - latest edition.

1.3 DESIGN CRITERIA

- .1 Design metal panels in accordance with the requirements of CSA S136, NBCC and CSSBI standards.
- .2 Design metal wall cladding system to provide for thermal movement of component materials caused by ambient temperature range of 60°C without causing buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.
- .3 Provide minimum thermal resistance of 0.56 RSI calculated with design wind loads in accordance with ASHRAE procedures.
- .4 Provide an effective air barrier, to prevent infiltration and/or exfiltration of air through wall assembly.
- .5 Design system to include expansion joints to accommodate movement in wall system and between wall system and building structure, caused by structural movements, (wind and snow loads) without permanent distortion, damage to filling materials, racking of joints, breakage of seals, or water penetration.
- .6 Design members to withstand dead load and wind loads, and, where applicable, live loads, calculated in accordance with NBC and applicable local regulations, to maximum allowable deflection of 1/180th of span.
 - .1 Sheet steel base thickness to be as specified with girt spacing determined by design criteria, but NOT to exceed 1800mm o.c.
 - .2 Design sheets according to the specified tolerances for the erection of the structural support.
- .7 Design system to attain water impermeable wall screen assembly for protection against

driving wind forces and water capillary action. Incorporate in assembly, system of gaskets, seals and closures to achieve intended design. Provide for positive drainage of condensation occurring within wall construction.

- .8 Maintain following installation tolerances:
 - .1 Maximum variation from plane or location shown on approved shop drawings: 20mm/10m of length.
 - .2 Maximum offset from true alignment between two adjacent members abutting end to end, in line: 1.00 mm.
- .9 Permanence through wall system shall not exceed 30 ng/Pa.s.m²
- .10 Design wall system to allow for movement of air between exterior and interior side of metal cladding.

1.4 SUBMITTALS

- .1 General:
 - .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit product data including manufacturer product sheet, for specified products.
- .3 Shop Drawings:
 - .1 Submit shop drawings showing layout, profiles and product components, including anchorage, accessories, finish colors and textures.
 - .2 Include details showing thickness and dimensions of the various system parts, fastening and anchoring methods, locations of joints and gaskets and location and configuration of joints necessary to accommodate thermal movement.
 - .3 Indicate dimensions, profiles, attachment methods, schedule of wall elevations, trim and closure pieces, soffits, fascia, metal furring, and related work.
 - .4 Indicate elevations of all walls showing wall openings and all pertinent dimensions, materials, and finishes, details at head, jamb and sills at all wall openings and at top, bottom, corners and other intersections including where siding abuts existing work. Include details of girt system including anchoring details, panel fastening details and compliance with design criteria and requirements of other work.
- .4 Test Reports:
 - .1 Certified test reports showing compliance with specified performance characteristics and physical properties.
- .5 Certificates:
 - .1 Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical requirements.
- .6 Manufacturer's Instructions:
 - .1 Manufacturer's Installation Instructions
- .7 Closeout Submittals. Submit the following:
 - .1 Warranty documents specified herein.

1.5 QUALITY ASSURANCE

- .1 Installer Qualifications:
 - .1 Installer experienced in performing work of this section who has specialized in the installation of work similar to that required for this project.

1.6 QUALITY ASSURANCE MOCK-UP

- .1 Fabricate a mock-up that will demonstrate the various aspects of the cladding installation and detailing.
- .2 The installation is to reflect the intent to have a full tie in of the air barrier to the entire

- perimeter of all wall openings, including doors, providing a tight air and water seal and the relationship of the cladding installation to the openings.
- .3 The mock-up is to be reviewed by the Contractor and Departmental Representative prior to the Contractor moving forward with the installation of all other windows.
- .4 Mock-up to be approved prior to fabrication of additional openings.
- .5 The approved mock-up shall remain on site as part of the work and it will form the standard of acceptance for the remainder of the work.

1.7 DELIVERY, STORAGE & HANDLING

- .1 General:
 - .1 Comply with Section 01 61 00 - Common Product Requirements.
- .2 Ordering:
 - .1 Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- .3 Delivery:
 - .1 Deliver materials in manufacturer's original, unopened, undamaged, containers with identification labels intact.
 - .2 Package wall panels for protection against transportation damage. Provide markings to identify components consistently with drawings.
- .4 Storage and Protection:
 - .1 Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
 - .2 Exercise care in unloading, storing and installing panels to prevent bending, warping, twisting and surface damage.
 - .3 Protect panels from moisture and condensation with tarpaulins or other suitable weathertight covering installed to provide ventilation.
 - .4 Slope panels to ensure positive drainage of any accumulated water.
 - .5 Do not store panels in any enclosed space where ambient temperature can exceed 49 degrees C.
 - .6 Protect finish of panels by applying heavy duty removable plastic film, during production.
 - .7 Avoid contact with any other materials that might cause staining, denting, or other surface damage.

1.8 PROTECT CONDITIONS

- .1 Field Measurements:
 - .1 Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

1.9 WARRANTY

- .1 Manufacturer's Warranty:
 - .1 Submit, for Departmental Representative's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to and not a limitation of other rights Owner may have under the Contract Documents.
 - .2 Warranty Period: 2 years commencing on Date of Substantial Completion.

1.10 WASTE MANAGEMENT AND DISPOSAL

- .1 Collect and separate for disposal waste material generated by this Section.
 - .2 Place in appropriate on-site bins in accordance with Waste Management Plan.
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- .3 A clean worksite is mandatory at all times. Failure to maintain the site in a clean, safe condition shall result in the Departmental Representative initiating a clean-up and related costs being deducted from progress claims.

2 Products

2.1 SHEET METAL WALL CLADDING SYSTEM

- .1 Exterior sheet metal panels:
 - .1 Fabricate in accordance with ASTM A653/A653M. The core shall be formed from Grade 230 (33) steel having a minimum yield strength of 230 MPa and a maximum allowable stress resistance of 144 MPa to thickness specified, zinc-coated by the hot-dip process, on both sides, to ASTM A924/A924M, Z-275 (G-90) designation.
 - .2 Base metal thickness: 26ga.
- .2 Profiles:
 - .1 Type 1:
 - .1 Ribbed panels: 70 mm ribbed panel, 178 mm wide ribs at 283 mm o/c.
 - .2 Finish and colours: all panels pre-painted on exterior side, color selected from manufacturer's standard colors.
- .3 Sub-Girts:
 - .1 Designed by wall cladding manufacturer to suit design loading criteria, spans and requirements of specific application.
 - .2 Fabricate from Grade 230 (33) steel, hot-dip galvanized to ASTM A924/A924M, Z-275 (G-90) designation, one-piece formed to shape shown on drawings.
 - .3 Thickness of base metal to be determined by structural calculations, in accordance with Par. 1.3 above, with minimum thickness of 1.2 mm.
 - .4 If alignment of structural framing or substrate is greater than acceptable tolerance for cladding system provide adjustable two-piece sub-girts, for screw stitching in field at maximum 600 mm o.c.
- .4 Wall Cladding Flashings:
 - .1 Visible moldings: corner flashings, cap and drip flashings, ridge caps, starter strips, trim at openings to be of same material, gauge and finish as the adjoining cladding, brake-formed to required profile.
 - .2 Concealed moldings: all hidden components and clips shall be fabricated from hot-dipped galvanized steel, designation Z-275 (G-90) with minimum base metal thickness of 0.80 mm.
- .5 Accessories:
 - .1 Metal closures: same thickness and finish as adjoining panels.
 - .2 Foam closures: extruded, closed-cell, flexible PVC, same shape as cladding, arctic climate type.
 - .3 Thermal breaks: 1.5 mm thick x minimum 38 mm wide foam rubber, for application to face of sub-girts.
 - .4 Butyl tape: 100% solid butyl-polyisobutylene tape 3 mm thick x 13 mm wide.
 - .5 Insulation adhesive: quick drying, synthetic elastomeric base, to ASTM C916-79, Type IV.
 - .6 Sealing compound: thermoplastic rubber base.
- .6 Fasteners:
 - .1 Screws: to ANSI B18.6 and cladding manufacturer's recommendations.
 - .2 Exposed screws: type AB #14, hexagonal head, cadmium-plated carbon steel, self tapping screws, pre-painted same color as the cladding with integrated EPDM washer. Use 19 mm long screws for joining panels and 25 mm long screw for attaching panels to structural support.

- .3 Stitching screws: #14, hexagonal head, cadmium-plated, carbon steel, self tapping screw, 19 mm long.
- .4 Screws for structural steel: #14 hexagonal head cadmium-plated carbon steel, self-tapping screws of length to penetrate minimum 13 mm into steel structural support.
- .7 Touch-up Materials:
 - .1 Color matched alkylid paint as supplied by cladding manufacturer.

3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 PREPARATION

- .1 Protect metal surfaces in contact with concrete, masonry, mortar, plaster or other cementitious surfaces with isolation coating.

3.3 INSTALLATION OF SHEET METAL WALL CLADDING

- .1 Install cladding to the requirements of CSSBI standards, manufacturer's written instructions and reviewed shop drawings.
 - .1 Installation shall be performed by a company certified by the manufacturer of the metal cladding as an approved installer.
 - .2 Install components to allow for thermal expansion and contraction.
 - .3 Provide alignment bars, brackets, clips, inserts, shims, as required to securely and permanently fasten wall cladding system to building structure.
- .2 Install thermal breaks continuous over length of sub-girts and secure sub-girts through liner panels to the structural girts. Screw fasten in accordance with design loading requirements.
- .3 Install insulation in strict accordance with the requirements of Section 07 21 13 - Board Insulation.
- .4 Install exterior panels c/w all required flashings and trim. Ensure that all fasteners at flashings and trim are concealed. Make sure all laps are perfectly aligned and joined. Use sufficient pressure when installing screws to ensure that the EPDM washers are fully seated, but without buckling the panels.
- .5 Stitch the side laps of exterior sheets with screws between sub-girts at maximum 600 mm o.c.
- .6 End laps at exterior panels to be minimum 100 mm, located over sub-girts and sealed with tape sealant.
- .7 Make all necessary openings in the panels for mechanical and electrical purposes. Cut to fit tight around pipes and other accessories and seal with sealant.
- .8 Install notched, shaped and waterproof closures to protect the cladding components against the effects of the weather.

3.4 PANELS

- .1 Wall cladding: shop cut to required sizes and to provide openings for doors, windows, grilles and other penetrations. Cuts to be square and clean.
- .2 Accessories: brake or bend to shape, of material and finish to match cladding, comprising of cap and ridge flashing, drip flashings, corner flashings, closure flashings at head, jamb and sills at door and window openings, roof edge and gable flashings.

3.5 CAULKING AND SEALING

- .1 Caulk and seal internally as specified in this Section and recommended by system manufacturer.
- .2 Caulk and seal between metal siding and adjacent or abutting surfaces in accordance with Section 07 92 00 - Joint Sealants.

3.6 CLEANING

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.
- .2 Wash down exposed surfaces using solution of mild domestic detergent in warm water, applied with soft clean wiping cloths.
- .3 Remove excess sealant with recommended solvent.

END OF SECTION
