SECTION  – prefabricated buildings

1. General
   1. SUMMARY
      1. Section includes prefabricated buildings.
      2. Related Requirements:
         1. Section 03 30 00 – Cast-In-Place Concrete.
         2. Section 07 21 13 – Board Insulation.
         3. Section 07 21 16 – Blanket Insulation.
         4. Section 07 26 16 – Below Grade Vapour Retarders.
         5. Section 07 27 13 – Self-Adhered Air Membrane.
         6. Section 07 42 16 – Composite Aluminum Panels.
         7. Section 07 62 00 – Sheet Metal Flashing and Trim.
         8. Section 07 92 00 – Joint Sealants.
         9. Section 08 11 00 – Metal Doors and Frames.
   2. reference standards
      1. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE):
         1. ASHRAE 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings.
      2. Canadian Sheet Steel Building Institute (CSSBI):
         1. CSSBI 30M-06, Standard for Steel Building Systems.
   3. PREINSTALLATION MEETINGS
      1. Pre-installation Meetings:
         1. Convene pre-installation meeting 1 week prior to beginning Work of this Section, with Engineer of Record in accordance with Division 01 to:
            1. Verify project requirements.
            2. Review installation and substrate conditions.
            3. Co-ordination with other building construction subtrades.
            4. Review manufacturer's written installation instructions and warranty requirements.
      2. Hold project meetings every week.
      3. Ensure key personnel attend.
      4. Engineer of Record will submit written notification of change to meeting schedule established upon contract award 24 hours prior to scheduled meeting.
   4. SUBMITTALS
      1. Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.
      2. Product Data:
         1. Submit manufacturer's instructions, printed product literature and data sheets for sealants, insulation, and building materials and include product characteristics, performance criteria, physical size, finish and limitations.
         2. Submit two (2) copies of WHMIS MSDS for the following:
            1. Sealants.
            2. Tape.

Proprietary joints.

* + 1. Shop Drawings:
       1. Submit drawings stamped and signed by professional engineer registered or licensed in Ontario.
          1. Submit drawings for fabricator designed assemblies, components, and connections.
    2. Delegated Design Submittals:
       1. Indicate plans and grid lines, structural members, and connection details, bearing and anchorage details wall cladding, roof cladding, framed openings, accessories, schedule of materials and finishes, camber and loadings, fasteners, and welds.
       2. Indicate detailed description of mechanical, electrical, and other systems in Work.
       3. Describe requirements of other systems of components related to this Work but provided by others.
          1. Obtain necessary information required to detail this Work including methods of integration and securing.
       4. Submit erection drawings to Engineer of Record for approval before construction.
       5. Indicate erection dimensions and methods.
    3. Manufacturer's Instructions: submit application instructions for sealant.
    4. Manufacturer's Field Reports: submit to Engineer of Record manufacturer's written report, within three (3) days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.
    5. Sustainable Design Submittals:
       1. Construction Waste Management:
          1. Submit project highlighting recycling and salvage requirements.
          2. Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50% of construction wastes were recycled or salvaged.
       2. Low-Emitting Materials:
          1. Submit listing of adhesives and sealants used in building, showing compliance with VOC and chemical component limits or restriction requirements.
  1. DELIVERY, STORAGE AND HANDLING
     1. Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
     2. Storage and Handling Requirements:
        1. Store materials off ground, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
        2. Store and protect components and equipment from nicks, scratches, and blemishes.
        3. Replace defective or damaged materials with new.

1. Products
   1. materials
      1. Building Materials: Preformed aluminum panels, Minimum 1/8" thick AA3105-H14 alloy conforming to ASTM B 209-10, with special hardness for flat panels and anodizing quality.
         1. Exposed surfaces of aluminum shall be free of die marks, scratches, blisters, "leave-off" marks or other blemishes, whether left unfinished or finished.
      2. Glass and Glazing Materials - Insulating Glass Units: Provide sealed insulating glass units in accordance with CAN/CGSB-12.8, and the following unit composition:
         1. Exterior Lite: Clear float glass.
         2. Air Space: 1/2" Air Filled
         3. Interior Lite: Clear float having standard performance Low E coating on #3 surface.
         4. Use two stage seal method of manufacture, as follows:
            1. Primary Seal: polyisobutylene sealing compound between glass and metal spacer/separator.
            2. Secondary Seal: polyurethane, silicone or polysulphide base sealant, filling gap between the two lites of glass at the edge up to the spacer/separator and primary seal.
         5. Install stainless steel capillary breather tubes to equalize pressure differentials between insulating glass fabricating location and insulating glass installation location; crimp tube immediately prior to installation in accordance with glass fabricators written instructions.
         6. Sealants: In accordance with Section 07 92 00 "Joint Sealants."
         7. Sealants: VOC limit 250 g/L maximum to SCAQMD Rule 1168.
      3. Thermal Insulation:
         1. Cavity Wall Insulation Board: Plastic Wall Insulation: Polystyrene, extruded type, in accordance with CAN/ULC S701, Type 3, thermal resistance not less than RSI 0.87/1"; square edges, board size 16" x 8' x thickness required to achieve insulation value indicated on Drawings; minimum compressive strength 170 kPa at 10% deformation in accordance with ASTM D 1621-10, water absorption (% by volume) maximum 0.7% in conformation with ASTM D 2842-06.
         2. Glass Fibre Batt Insulation in Stud Cavity: Unfaced, preformed glass fibre batt insulation in accordance with CAN/ULC S702-09, Type 1; having a nominal RSI of 0.55/25 mm, thickness as required to meet design insulation values indicated on Drawings or as required to fill insulated spaces where not indicated; formaldehyde free, manufactured using recycled glass.
   2. SYSTEM DESCRIPTION
      1. Provide building structure and enclosure to physical dimensions as indicated.
      2. Prefabricated buildings are intended to enclose the following:
         1. Administration Offices.
         2. Operations Support Centre.
         3. North Kiosk.
         4. South Kiosk.
   3. DESIGN CRITERIA
      1. Design building to allow for thermal movement of component materials caused by ambient temperature range of 75 deg C.
      2. Ensure total absence of condensation on interior surfaces under following minimum condition.
         1. Interior: 22 deg C 30% RH, still air.
      3. Building: Watertight construction.
      4. Thermal resistance: Minimum 4.22 RSI for walls and minimum 5.27 RSI for roof.
      5. Provide for positive drainage of condensation occurring within wall construction and water entering at joints, to exterior face of wall in accordance with "Rain Screen Principles," as described by NRC.
      6. Vapour seal building enclosure to withstand, without failure, design RH at design ambient temperature condition, maintained against interior atmospheric pressure of 250 Pa.
      7. Design building enclosure elements to accommodate, by means of expansion joints, movement in wall and structural movements without permanent distortion, damage to infills, racking of joints, breakage of seals, water penetration or glass breakage.
      8. Design foundations in accordance with National Building Code of Canada requirements to permissible soil loads listed in soils report.
      9. Completed building: Exterior to interior sound attenuation not less than STC 30.
      10. Design, assemble and secure building elements to building frame to ensure stresses in sealants and seals are within sealant manufacturer's recommended maximum.
      11. Design building assembly to permit easy replacement and disassembly of components.
          1. Use non-welded construction.
      12. Allow for ceiling, piping, conduit, and other interior dead loads imposed on this structure.
      13. Building interior environment: heated and cooled to maintain temperature of 20 deg C minimum to 25 deg C maximum with relative humidity of 25% to 50%.
      14. Building lighting: maintain measured lighting level of 10 lx at 1500 mm above finished floor, after building finishes and painting complete.
      15. Access units, doors, and windows to sizes and locations indicated, weather-stripped, and insulated.
   4. PERFORMANCE CRITERIA
      1. Design building to withstand wind loads, snow loads, snow load build-up and temperature range expected in the geographical area for this project, under the National Building Code of Canada (NBCC) - latest edition climatic information for fifty (50) year probability without any detrimental effects on appearance and performance.
      2. Maximum deflection for roofing under full specified live load: 1/360 of clear span.
      3. Maximum deflection for exterior cladding under full specified exterior wind induced loads: 1/180 of clear span.
      4. Maintain following tolerances for building structure and enclosure elements.
         1. Maximum variation from plane or location shown on shop drawings: 1 mm/1 m of length and up to 1 mm/5 m maximum.
         2. Maximum offset from true alignment between two adjacent members abutting end to end, in line: 0.75 mm.
   5. FABRICATION
      1. Maintain air, vapour, and thermal barrier throughout building enclosure elements.
      2. Locate vapour barrier on warm side of thermal insulation.
      3. Locate air barrier as detailed.
      4. Complete enclosure assembly with exterior skin, glass units, doors, air barrier, thermal insulation, inner vapour seal membrane and interior finish.
      5. Accurately fit and rigidly frame together joints, corners, and mitres.
         1. Match components carefully to produce continuity of line and design.
         2. Make joints and connections toward exterior weathertight.
         3. Provide hairline joints for materials in contact.
         4. Co-ordinate location of visible joints.
2. Execution
   1. EXAMINATION
      1. Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for prefabricated building erection installation in accordance with manufacturer's written instructions.
         1. Visually inspect substrate in presence of Engineer of Record.
         2. Inform Engineer of Record of unacceptable conditions immediately upon discovery.
         3. Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Engineer of Record.
   2. ERECTION
      1. Do prefabricated metal building Work to CSSBI 30M.
      2. Erect building structure and enclosure elements.
   3. FIELD QUALITY CONTROL
      1. Manufacturer's Field Services:
         1. Obtain written report from manufacturer's verifying compliance of Work, in handling, installing, applying, protecting, and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
      2. Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
      3. Ensure manufacturer's representative is present before and during critical periods of installation testing.
      4. Schedule Site Visits:
         1. After delivery and storage of products, and when preparatory Work is complete but before installation begins.
         2. Twice during progress of Work at 25% and 60% complete.
         3. Upon completion of Work, after cleaning is carried out.
   4. CLEANING
      1. Progress Cleaning: clean in accordance with Division 01.
         1. Leave Work area clean at end of each day.
      2. Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Division 01.
         1. Remove excess sealant by moderate use of low VOC mineral spirits or other solvent as directed by sealant manufacturer.
         2. Clean surfaces.
   5. PROTECTION
      1. Protect finished surfaces with strippable coatings, strippable wrappers, plywood, or sheet materials as required before acceptance of Work.
      2. Protect installed products and components from damage during construction.
      3. Repair damage to adjacent materials caused by sealants, insulation, and building materials installation.

END OF SECTION