Part 1 General

1.1 DESCRIPTION OF WORK

.1 The work described herein shall consist of the construction of a pre-engineered prefabricated steel building, complete with a sign, including the provision of all material, equipment, tools, labour and services required.

1.2 STANDARDS

The following organizations publish standards which have been referred to in this Section:

1. CSA International
78 Rexdale Boulevard,
Toronto, Ontario M9W 3R1

2. ASTM – American Society for Testing and Materials
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959 USA

3. CGSB – Canadian General Standards Board
Lac Du Portage 111, 6B1
11 Laurier Street
Gatineau, QC K1A 1G6

4. CSSBI – Canadian Sheet Steel Building Institute
652 Bishop Street N, Unit 2A
Cambridge, Ontario N3H 4V6

The Standards referred to shall be the most recent edition.

1.3 STRUCTURAL DESIGN REQUIREMENTS

The following standards shall be applicable to the construction of pre-engineered steel buildings:

1. Manitoba Building Code.
2. National Building Code of Canada – including all applicable supplements.

3. ASTM A307-076, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
4. ASTM A325M-08, Standard Specification for structural bolts, steel, heat treated 830MPa minimum tensile strength [metric]
5. ASTM A542M-08, Standard Specification for steel sheet, zinc-coated (galvanized) or zinc-iron alloy-coated (galvannealed) by the hot-dip process.
6. ASTM 490M-04AE1, Specification for High-Strength Steel Bolts, Clauses 10.9 and 10.9.3, for Structural Steel Joints (Metric).
7. CSSBI 30M-06, Standard for Steel Building Systems.
8. CSSBI Sheet Steel Facts No. 3 (SSF3), Care and Maintenance of Prefinished Sheet Steel Building Products.
9. CAN/CSA-G164-M, Hot Dip Galvanizing of Irregularly Shaped Articles.
10. CAN/CSA-S16.1, Limit States Design of Steel Structures.
11. CGSB-1.40-97, Anticorrosive structural steel alkyd primer.
12. CGSB 41-GP-6M, Sheets, Thermosetting Polyester Plastics, Glass Fibre Reinforced.
13. CGSB-93.3, Prefinished Galvanized and Aluminium-Zinc Alloy Steel Sheet for Residential Use.
14. CSA G40.20, General Requirements for Rolled or Welded Structural Quality Steel.
15. CSA G40.21, Structural Quality Steels.
16. CSA S136-07, Design of Cold Formed Steel Structural Members.
17. CSA W47.1-03, Certification of Companies for Fusion Welding of Steel Structures.
18. CSA W55.3, Certification of Companies for Resistance Welding of Steel and Aluminium.
19. CSA W59-03, Welded Steel Construction (Metal Arc Welding).
20. CSA W59S1-M, Supplement No. 1 to W59-M Welded Steel Construction (Metal Arc Welding).

1.4 BUILDING SYSTEM DESCRIPTION

.1 The Contractor shall provide the building structure from rigid frame or beam and column construction. The wall system shall consist of single skin panels and the roof system shall be standing seam. The building occupancy shall be as defined by National Building Code of Manitoba in Group F, Division 2.

1.5 DESIGN REQUIREMENTS

.1 The Contractor shall provide the building structure to the physical dimensions shown on the plans. The building shall be watertight and allow for thermal movement of component materials caused by ambient temperature range of 80° Celsius without causing buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.

.2 The building shall provide positive drainage of condensation occurring within wall construction, and of water entering at joints, to the exterior face of the wall in accordance with NRC “Rain Screen Principles”. The building enclosure shall be vapour sealed. Properly designed expansion joints shall be provided to accommodate all movement without permanent distortion damage to infill’s, racking of joints, breakage of seals, water penetration or glass breakage. The connections of building elements to the building frame shall be designed to ensure stress in sealants and seals are within the sealant manufacturer’s recommended maximum.

.3 The steel building shall be designed to withstand all dead loads and live loads including snow, wind, ceilings, sprinklers, mechanical and electrical systems, cranes, hoists, material handling equipment and impact loads.

1.6 SUBMITTALS

.1 Within fourteen (14) days of the date on which the contract is awarded, the Contractor shall submit to the Engineer detailed plans and shop drawings for the building which the Contractor proposes to supply and erect. The approval of the Engineer shall be required prior to the commencement of construction.

.2 The shop drawings shall show the foundation requirements of the building, including loading factors, location and design of column anchors, and other data required for the Engineer to review designs for the construction of the foundation. The shop drawings shall be stamped by a professional engineer registered to practice in the Province of Manitoba.

.3 The Engineer will return the shop drawings to the Contractor within fourteen (14) days of receipt. The shop drawings will be marked reviewed if they meet with the approval of the Engineer. If changes or corrections are required, the Contractor shall re-submit the shop drawings within fourteen (14) days from the date of review.

1.7 JOB CONDITIONS

.1 The Contractor shall co-ordinate his work schedule with the Engineer to expedite progress on the total project, of which the pre-engineered building forms a part, and which may involve a number of other sub trade contractors.

Part 2 Products

2.1 MATERIALS

.1 The building structural steel shall be in accordance with CSA G40.21 and shall be shop primed. Bolts shall be in accordance with ASTM A325 M complete with nuts and washers. Welding materials shall meet current CSA W59 and steel sheet, zinc coated to current ASTM A542M, structural quality grade A with Z 275 coating passivated for unpainted finish and unpassivated for paint finish. Plastic sealants and adhesives shall be as recommended by the sealant manufacturer. The insulation and tape shall be as recommended by the steel systems manufacturer. The vapour barrier and sealing tape shall also be as recommended by the building systems manufacturer. All prefinished flashings over windows, doors and other openings, and where shown on the plans, shall be provided by the building manufacturer.

2.2 FABRICATION

.1 Structural members shall be fabricated in accordance with the shop drawings and to CAN/CSA S16.1 with tolerances not to exceed those specified in CSSB1 30M. Holes shall be provided for attachment of other work, as indicated. All openings shall be reinforced to maintain design strength.

2.3 WALLS AND ROOF

.1 Exterior sheet walls shall be pre-formed of steel sheet, prefinished from the manufacturer's standard profiles complete with closures, gaskets, caulking, flashing and fasteners to effect weather tight installation. Exterior wall panels shall consist of a minimum 0.53 mm (26 ga.) thick galvanized metal prefinished to the colour specified.

.2 Exterior wall corners shall be of material to match the finish and profile of the adjacent cladding material and shall be shop-cut and brake formed to correct angle.

.3 All accessories to exterior wall cladding, breaks or bend to shape, shall be of material and finish to match the wall cladding, comprising cap flashings, drip flashings, internal corner flashings, copings and closures.

.4 Interior liner sheet walls shall consist of factory pre-formed steel sheet prefinished to the manufacturer's standard profile, with interlocking side lap. Sealant material shall be installed in the interlocking lap. All ends of sheets shall be cut square and clean.

.5 The exterior sheet roof shall consist of 0.53 mm (26 ga.) factory pre-formed standing seam steel sheet, prefinished to the manufacturer's standard profiles, including closures, gaskets, caulking, flashing and fasteners to effect weather tight installation. All ends shall be cut square and clean.

.6 Accessories to roof cladding shall be bent to shape and of material and finish to match the roof cladding or wall cladding where applicable, comprising cap flashings, drip flashings, coping and closures for corners, fascia and soffit.

.7 All sub-purlins and clips shall be pre-formed steel sheet zinc coated.

2.4 MANSARD

.1 If a mansard is shown on the plans, it shall be fabricated in accordance with Clause 2.3 in this Section. The mansard shall be factory painted in the colour specified in Section 01001, Special Provisions.

2.5 TRIM FASTENING BOLTS

.1 Bolts used to fasten trim shall be ASTM A-307 steel, electro galvanized to ASTM B633-07; Standard spec for electrodeposited coatings of zinc on iron and steel. In addition, a chromate conversion treatment shall be applied over the protective zinc coating.

2.6 SCREWS

.1 All sheet metal screws and self-tapping screws shall consist of Class 410 stainless steel with metal backed neoprene washers.

2.7 WALL INSULATION

.1 The wall insulation shall have a rating factor (R value) of not less than 20 and shall be continuous around main columns (no cold spots) and shall consist of

layers of fibreglass installed with staggered joints, complete with a 0.1 mm (6mil) thick polyethylene vapour barrier. The layers shall be held in place with 50 mm x 50 mm strapping.

2.8 CEILING INSULATION

.1 The ceiling insulation shall have a rating factor (R value) of not less than 40 and shall be continuous around roof beams, purlins etc. (no cold spots) and shall consist of roll type metal building fibreglass insulation with integral cotton vinyl flame retardant backing.

2.9 INSULATION

.1 Insulation shall be placed at all locations below ground and under exterior building wall flashing, where shown on the Plans.

.2 Below ground insulation shall conform to CSGB-51-GP-20M or current CAN/ULC S701 Type 4 rigid extruded polystyrene foam HI-40 (blue in colour) with a compression strength of 275 kPa as manufactured by DOW Chemical or approved equal. Below ground insulation shall have a 50 mm thickness.

2.10 DOORS

.1 Doors shall be of reinforced metal insulated construction. Doors shall be fabricated of steel not less than 1.2 mm (18 ga.) thick, glazed and with weather stripping. Doors shall be provided with a raised metal threshold of no less than 12 mm (1/2 inch) in height and a latch cover plate (to protect lock). Frames shall be fabricated of steel not less than 1.25 mm (16 ga.) thick. Doors and frames shall be pre-finished by the manufacturer in sprayed grey enamel.

.2 Exterior doors shall be provided with vinyl CPS on top edge recesses of exterior doors.

.3 All voids in exterior doors shall be fully insulated. Insulated doors shall have a core of material, which will provide an R factor of 12. The core material shall be securely bonded to the inside face of both surface sheets.

2.11 DOOR HARDWARE

.1 LOCK

Each outside door shall be fitted with a Schlage Master Lock set, style P53PD and with one master key to open all lock sets in building.

.2 HINGES AND STRIKERS
Each door shall have three hinges (BB 179 LA or approved equal) with ASA strikers

.3 CLOSER AND STOP
Each door shall have a closer (LCN 401S or approved equal) and bracket. Each outside door shall have a door stop (GJ 81 MHD or approved equal).

2.12 OPERATING WINDOWS

.1 Operating windows shall be awning type, of PVC construction, complete with screen. Glass shall be triple glazed clear plate no less than 6.36 mm thick.

2.13 FIXED WINDOWS

.1 Fixed windows shall be fixed sash, hermetically sealed units, triple glazed with clear plate glass no less than 6.36 mm thick. The three panes shall be separated by a dehydrated air space of 4.75 mm to 12.75 mm wide. The fixed glass windows shall be Thermopane or Pan-O-Lite or approved equal and shall be warranted by the manufacturer for five years against film formation and dust collection between the interior glass surfaces.

2.14 PARTITIONS

.1 Interior partitions shall be of the height and layout as noted on the Plans. The partitions shall be compatible with and capable of being attached to the ceiling, wall and floor of the building, with adequate base and top support. The partition panels shall be capable of withstanding a uniform horizontal load of 80 kg per square metre of wall surface or if also vertically load bearing, not less than 55 kg per square metre horizontal plus an axial load of 1,350 kg per linear metre of partition wall. The partition covering panels shall be factory pre-fabricated of zinc coated steel no less than 0.53 mm (26 ga) thick and shall be painted in bone white enamel. Base channels, partition caps and slotted angles shall be fabricated of zinc coated steel no less than 1.60 mm (16 ga) thick and shall be compatible with the partition panel. The partitions shall basically consist of panels with 75 mm deep interlocking ribs. Both sides of all partition panels shall be finished with interior wall liner panels the same as those used to finish the building interior. Doors and door hardware shall be as specified in Clauses 2.10 and 2.11 of this Section.

2.15 SIGN

.1 The sign shall consist of 150 mm high 'kabel' style aluminium letters. The letters shall have a white baked enamel finish and shall be complete with mountings and spacers. The letters shall be mounted on a steel or aluminium plate. The sign shall read as depicted in Section 01001, Special Provisions and the Plans.

2.16 AIR INTAKE EXHAUST FAN AND VENTS

.1 The air intake(s), exhaust fan(s) and vents shall conform to the requirements of Section 01001, Special Provisions and the Plans.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 The building shall be erected in accordance with the instructions of the manufacturer and in a manner approved by the Engineer.

3.2 TRADESMEN

.1 The building shall be erected by tradesmen proficient in their respective trades.

3.3 ROOF

.1 The roof panels shall be adequately bolted at both the eave and the ridge. The roof shall be properly flashed and caulked at the eave, ridge and ribs and at all roof openings.

3.4 WALL

.1 Wall panels shall be fastened at the base girt and eave by a positive bolt and nut eliminating any through-wall fastening. All walls shall be properly flashed and caulked at the base, eave, rib, gable end-splice, windows, louvers, doors and all other openings.

3.5 LINER PANELS

.1 Wall and ceiling liner panels shall be installed subsequent to the installation of the insulation. The panels shall be fastened at the base and the eave by a positive bolt and nut complete with neoprene washers eliminating any through-wall fastening. The wall liner shall be caulked at the base, eaves, windows, doors and all other openings.

3.6 PARTITIONS

.1 Partitions shall be installed in accordance with Clauses 3.4 and 3.5 of this Section except that caulking will not be required. No insulation will be required within the partition walls.

3.7 SIGN

.1 The sign shall be bolted to the building wall at the location specified on the Plans, and without damaging the wall construction.

3.8 AIR INTAKE, EXHAUST FAN AND VENTS

.1 The air intake(s), exhaust fan(s) and vents shall be installed in accordance with the Plans complete with all weather exterior hoods and screens.

3.9 MISCELLANEOUS OPENINGS

.1 Miscellaneous openings shall be provided through the building walls and/or roof in accordance with the Plans.

3.10 CONCRETE CURB

.1 The Contractor shall construct a continuous 300 mm high (minimum above floor elevation) concrete curb under all supporting walls. The curb may be poured together with the floor slab. The building shall be constructed on the curb as per requirements of this Section. The interior liner panel shall stop at the top of curb and flashed to 25 mm down from top of curb.

3.11 SEALANT AND CAULKING

.1 Caulking shall be provided where required to prevent the entry of water into the structure.

.2 Caulking shall be provided between masonry, siding or stucco and the adjacent door and window frames or trim, including sills unless such locations are completely protected from the entry of rain.

.3 Caulking shall be provided at vertical joints between different cladding materials unless the joint is suitably lapped or flashed to prevent the entry of rain.

.4 Caulking shall be of a non-hardening type suitable for exterior use, selected for its ability to resist the effects of weathering and shall be compatible with and adhere to the substrate to which it is applied.

.5 All sealant and caulking shall be installed having a clean and tooled finish.

.6 Caulking shall conform to:

.1 CGSB 19-GP-5M, “Sealing Compound, One Component, Acrylic Base, Solvent Curing,”

.2 CAN/CGSB-19.13, “Sealing Compound, Once Component, Elastomeric, Chemical Curing,”

.3 CGSB 19-GP-14M, “Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing,” or

.4 CAN/CGSB-19.24, “Multi-Component, Chemical Curing Sealing Compound.”

3.12 CLEAN UP

.1 When the work is completed the contractor shall remove all surplus materials and debris of all trades and leave the works clean and in good order.