Part 1 General

1.1 GENERAL CONDITIONS

.1 The General Conditions of the Contract, Supplementary General Conditions and General Requirements are hereby made part of this Section.

1.2 WORK INCLUDED

.1 Structural steel framing members, structural steel support members, struts, complete with required bracing, welds, washers, nuts, shims, anchor plates and bolts.

.2 Baseplates, connectors and bearing plates.

.3 Erection.

1.3 RELATED WORK

.1	Cast-in-Place Concrete	Section 03 30 00
.2	Steel Decking	Section 05 31 00

1.4 QUALITY ASSURANCE

.1 Structural steel fabricator to be certified as minimum Division 2 Company under CSA W47.1-09 - "Certification of Companies for Fusion Welding of Steel Structures" or CSA Standard W55.3-08 "Resistance Welding Qualification Code for Fabricators of Structural Members" or both, as applicable.

.2 Design to strictly adhere to all codes and standards as enumerated under Section 1.5 Reference Standards.

.3 In the event of conflict between pertinent codes, standards and/or regulations, most stringent shall govern.

1.5 REFERENCE STANDARDS

.1 CSA Standard CAN/CSA-S16-01 - "Limit States Design of Structural Steel Buildings".

.2 CSA G40.21-04 (R2009) - "Structural Quality Steel".

.3 ASTM Standard A325M - "High Strength Bolts for Structural Steel Joints including Suitable Nuts and Plane Hardened Washers".

.4 CSA Standard W59-03 (R2008) - 'Welded Steel Construction".

.5 CSA Standard W47.1-09 - "Certification of Companies for Fusion Welding of Steel Structures".

.6 ASTM Standard A53 - "Welded and Seamless Steel Pipe".

1.6 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Submittal Procedures Section 01 33 00.

.2 Clearly indicate sizes, spacing and locations of structural members, connections, attachments, anchorages, framed openings and size and type of fasteners and welds.

.3 Indicate all shop and erection details including cuts, copes, connections, holes, threaded fasteners and welds.

.4 Show all welds, both shop and field, by the currently recommended symbols of the Canadian Welding Bureau.

.5 Prepare shop drawings under direction of a qualified Professional Engineer registered in the Province of Saskatchewan.

.6 Review of shop drawings for size and arrangement of principal and auxiliary members only. Such review will not relieve the Contractor of responsibility for general and detail dimension and fit, or any errors or omissions.

1.7 INSPECTION AND TESTING

.1 Materials and workmanship subject to inspection on behalf of Owner.

.2 Report failure of material to fit together properly to Consultant. No corrective measures permitted unless approved by Consultant in writing.

Part 2 Products

2.1 MATERIALS/COMPONENTS

.1 *Standard Rolled Sections:* new material conforming to CSA G40.21-04 (R2009), Grade 350W.

.2 *Hollow Structural Sections:* new material conforming to CSA G40.21-04 (R2009), Grade 350W, Class C.

.3 *Steel Pipe Sections:* new material conforming to ASTM Standard A53, Grade 241.

.4 *Base and Cap Plates:* new material conforming to CSA G40.21-04 (R2009), Grade 300W.

.5 *Beam End Plates, Ledger Angles and Miscellaneous Steel:* new material conforming to CSA G40.21-04 (R2009), Grade 300W.

.6 *Anchor Bolts:* new material conforming to CSA G40.21-04 (R2009), Grade 260W.

.7 *Bolts, Nuts and Washers:* high strength type recommended for structural steel joints, conforming to requirements of ASTM A325M-83c.

.8 *Paint for Primer:* shall be grey (unless approved otherwise) and meet requirements of one of the following:

.1 CGSB 1-GP-40d, Primer, Structural Steel, oil alkyd type.
.2 CISC/CPMA Standard 1-73a, quick drying one-coat paint for use on structural steel.

.9 *Shop and Field Studs:* shall be Nelson headed anchors to ASTM A108 - 58T or approved equivalent. Sizes as detailed on drawings.

2.2 FABRICATION

.1 Fabricate structural steel members in accordance with building design drawings and all requirements of CAN/CSA S16-01. Welding to conform to CSA W59-03 (R2008) "Welded Steel Construction". Verify all dimensions prior to fabrication.

.2 No cutting of openings in structural members except as shown on structural drawings. Reinforce openings to maintain required design strength.

.3 Accurately cut and mill column ends to assure full contact of bearing surfaces.

.4 Camber horizontal members as specified on drawings. Mill camber up where not specifically detailed.

.5 All bolted connections to be "bearing" type connections except where subject to stress reversal which are to be "slip resistant" type connections.

.6 All connections showing combined axial load (tension or compression) across the joint to be designed for loads shown. Such connection to be bolted through columns only.

.7 All beams to be connected for the greater of the following conditions.

.1 Loads shown on drawings.
.2 50% of the total uniformly distributed load resistance of the member.
.3 Half depth of the connected member using M20 bolts (minimum two bolts) in double shear.

.8 Tolerances

.1 Tolerances of structural steel shall be maintained strictly in accordance with CAN/CSA S16-01.

2.3 PAINTING

.1 All steel in contact with concrete and all faying surfaces of high strength bolted slip-resistant connections shall <u>not</u> be primed.

.2 All structural steel shall be prepared in accordance with SSPC Standard SP2 "Hand Tool Cleaning" and have one coat of specified shop applied primer.

Part 3 Execution

3.1 ERECTION

.1 Erect structural steel in accordance with building design drawings and all requirements on CAN/CSA S16-01.

.2 Make adequate provision for all erection loads and for sufficient temporary bracing to maintain structure safe, plumb and in true alignment until completion of erection. Leave such bracing in place as long as required for safety and integrity of the structure.

.3 As erection progresses, securely bolt work to take care of full design loads and to provide structural integrity as required.

.4 Use high tensile bolts for field connections unless otherwise noted on building design drawings.

.5 Set all baseplates which are shop welded to columns to proper elevation on steel shims. Maximum tolerance from stated elevations to be ± 2mm.

.6 Tolerances

.1 Tolerance of structural steel shall be maintained strictly in accordance with CAN/CSA S16-01.

.7 After erection, prime all welds, abrasions, bolted connections and all other surfaces not shop primed, except surfaces to be in contact with concrete.

.8 Obtain written permission of Consultant prior to altering or field welding of structural members.

END OF SECTION

Part 1 General

1.1 GENERAL CONDITIONS

.1 The General Conditions of the Contract, Supplementary General Conditions and General Requirements are hereby made part of this Section.

1.2 WORK INCLUDED

.1 Steel roof deck, complete with cover plates, cell closures and flashings.

.2 All closure angles, channels, plates, as well as supplementary deck support or anchorage where required to provide continuous deck membrane.

.3 Contractor to study Contract Drawings and Specifications with regard to the work shown and required under this Section to ensure its completeness. Supplementary items necessary to complete the work although not specifically shown or specified shall be supplied and installed.

.4 Steel roof deck designed as a structural diaphragm. Contractor to ensure all side lap fastening and welding is as per the Drawings and Specifications.

1.3 RELATED WORK

.1 Structural Steel for Buildings Section 05 12 23

1.4 REFERENCE STANDARDS

.1 Canadian Sheet Steel Building Institute (CSSBI) - "Standard Steel Roof Deck" and "Steel Roof Deck".

.2 CAN/CSA S136-07 - "Cold Formed Steel Structural Members".

.3 ASTM A446 - "Steel Sheet, Zinc Coated (Galvanized) by the Hot Dip Process, Physical (Structural Quality)".

.4 Welding to CSA W59-03 (R2008) except where specified elsewhere.

1.5 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Submittal Procedures Section 01 33 00.

.2 Clearly indicate decking plan, deck profile, dimensions, anchorage, supports, projects, openings and reinforcement, applicable details and accessories.

.3 Clearly indicate position of temporary shoring of decking if required by design criteria.

.4 Review of shop drawings will not relieve Contractor of responsibility for general and detail dimensions and fit, or any errors or omissions.

.5 Prepare shop drawings under the direction of a professional engineer registered in the Province of Saskatchewan, Canada.

.6 Submit shop drawings stamped and signed by qualified professional engineer registered in Province of Saskatchewan, Canada.

Part 2 Products

2.1 MATERIALS/COMPONENTS

.1 *Sheet Steel:* Grade A or Grade B structural quality, conforming to ASTM A446.

2.2 DECKING/RELATED ACCESSORIES

.1 *Roof Decking:* RD38 Roof Deck - 38 mm deep by 914 mm wide sheets by 0.76 mm core thickness, as manufactured by VicWest or approved equivalent. Galvanized to Z275 (G90) standard or ZF075 (A25) wiped coat.

.2 Any substitution of specified material to be approved in writing by the Consultant.

.3 *Closure Strips, Flashings, Cover Plates and Related Accessories:* minimum 1.6 mm (16 gauge) sheet steel.

.4 *Primer:* Zinc rich, ready mix to CGSB-1-GP-181M.

.5 *Closures to external walls:* neoprene as recommended by manufacturer.

2.3 FABRICATION

.1 Fabricate metal decking in accordance with Drawings and as recommended by the Canadian Sheet Steel Building Institute (CSSBI) Standards. Fabricate to accommodate maximum deflections of 1/360 span.

.2 Supply steel fillers between decking and supporting members where required.

.3 Deck units to be 3 span continuous where possible; under no circumstances should deck be less than 2 span continuous except where detailed.

Part 3 Execution

3.1 INSTALLATION

.1 Erect metal decking in accordance with drawings and as recommended by the CSSBI. Properly align and level on structural supports.

.2 Allow minimum 40 mm bearing when supported by structural steel and minimum 100 mm bearing when supported by masonry or concrete.

.3 Mechanical fasten male/female side laps at maximum 300 mm.

.4 Fasten deck to ALL supporting steel with 20 mm fusion welds at maximum 300 mm on centre. Secure "V" rib pans to structure with plug welds through 19 mm diameter steel washers at 300 mm on centre.

.5 Reinforce openings 150 mm to 450 mm in size with L51 x 51 x 4.8 steel angles or as indicated on the Drawings. Place angles perpendicular to flutes, extended minimum two flutes each side of openings and weld to deck.

.6 Reinforce openings over 450 mm in accordance with details indicated on Drawings.

.7 Install minimum 150 mm cover plates where deck changes direction. Spot weld in place at maximum 300 mm on centre.

.8 Immediately after installation, touch up welds, burned areas and damaged spots with prime paint. Use type of primer recommended for galvanized surfaces.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Section Includes:

.1 Materials and application of Wind-Load bearing steel stud systems.

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM C475/C475M-12, Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

.3 ASTM C1002-07, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

.4 ASTM C1177/C1177M-08, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

.3 Canadian Standards Association (CSA International)

.1 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

.2 CSA W47.1-09, Certification of Companies for Fusion Welding of Steel.

.3 CSA W55.3-08, Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.

.4 CSA W59-03(R2008), Welded Steel Construction (Metal Arc Welding) (Metric Version).

.5 CAN/CSA S136-07(R2012), North American Specification for the Design of Cold-Formed Steel Structural Members.

.4 Canadian Sheet Steel Building Institute (CSSBI)

.1 CSSBI Fact Sheet #3 June 1994, Care and Maintenance of Prefinished Sheet Steel Building Products.

.2 CSSBI Technical Bulletin Vol. 7, No. 2, September 2011, Standard Thicknesses for Canadian Lightweight Steel Framing Applications.

.3 CSSBI S5-11, Guide Specification for Wind Bearing Steel Studs.

1.3 SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Shop Drawings:

.1 Indicate design loads, member sizes, materials, design thickness exclusive of coatings, coating specifications, connection and bracing details, screw sizes and spacing, and anchors.

.2 Indicate locations, dimensions, openings and requirements of related work.

.3 Indicate welds by welding symbols as defined in CSA W59.

.3 Submit samples of framing components and fasteners to Departmental Representative.

.4 Prior to beginning Work, submit: two certified copies of mill reports covering material properties.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Protect steel studs during transportation, site storage and installation in accordance with CSSBI Sheet Steel Facts #3.

.2 Handle and protect galvanized materials from damage to zinc coating.

.3 Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 MATERIALS

.1 Steel: to CSA S136, fabricated from ASTM A653/A653M, Grade 340 steel.

.2 Zinc coated steel sheet: quality to ASTM A653/A653M, with Z275 designation coating.

.3 Welding materials: to CSAW59 and certified by Canadian Welding Bureau.

.4 Screws: pan head, self-drilling, self-tapping sheet metal screws, corrosion protected with minimum zinc coating thickness of 0.008 mm.

.5 Anchors: concrete expansion anchors or other suitable drilled type fasteners.

.6 Bolts, nuts, washers: hot dipped galvanized to CAN/CSA-G164, 380 g/m^2 zinc coating.

.7 Touch up primer: zinc rich, to CAN/CGSB 1-GP-181.

.8 Glass mat gypsum substrate sheathing (Exterior Water Resistant Fiber-Reinforced Gypsum Sheathing Panels): to ASTM C1177/C1177M. Panels 1200 mm wide x maximum practical length.

.9 Metal furring runners, hangers, tie wires, inserts, anchors required for installation.

.10 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.

.11 Steel drill screws: to ASTM C1002.

.12 Joint compound: to ASTM C475, asbestos-free.

2.2 STEEL STUD DESIGNATIONS

.1 Colour code: to CSSBI Technical Bulletin Vol.7, No. 2.

2.3 METAL FRAMING

.1 Steel studs: to CSA S136, fabricated from metallic coated steel, depth as indicated.

.1 Material thickness to be determined by supplier based on design wind loads and span heights, spacing of studs and attachment. Minimum steel thickness of 1.72 mm (14ga).

.2 Stud tracks: fabricated from same material and finish as steel studs, depth to suit.

.1 Bottom track: single piece.

.2 Top track: two piece telescoping.

.3 Bridging: fabricated from same material and finish as studs, 38 x 12 x 1.09 mm minimum thickness.

.4 Angle clips: fabricated from same material and finish as studs, 38 x 38 mm x depth of steel stud, 1.37 mm minimum thickness.

.5 Tension straps and accessories: as recommended by manufacturer.

2.4 SOURCE QUALITY CONTROL

.1 Ensure mill reports covering material properties are reviewed by Departmental Representative.

Part 3 Execution

3.1 GENERAL

.1 Do welding in accordance with CSA W59.

.2 Certification of companies: CSA W47.1 for fusion welding and CSA W55.3 for resistance welding.

.3 Do work to CSSBI S5.

3.2 ERECTION

.1 Erect components to requirements of reviewed shop drawings.

.2 Anchor tracks securely to structure at 800 mm on centre maximum, unless lesser spacing prescribed on shop drawings.

.3 Erect studs plumb, aligned and securely attached with two screws minimum, or welded in accordance with manufacturer's recommendations.

.4 Seat studs into bottom tracks and two piece telescoping top track.

.5 Install 50.0 mm minimum telescoping track at top of walls where required to accommodate vertical deflection.

.1 Nest top track into deflection channel minimum of 30.0 mm and maximum of 40.0 mm.

.2 Do not fasten tracks together.

.3 Stagger joints.

.6 Install studs at not more than 50.0 mm from abutting walls, openings, and each side of corners and terminations with dissimilar materials.

.7 Brace steel studs with horizontal internal bridging at 1200 mm maximum.

.1 Fasten bridging to steel clips fastened to steel studs with screws or by welding.

.8 Frame openings in stud walls to adequately carry loads by use of additional framing members and bracing as detailed on shop drawings.

.9 Touch up welds with coat of zinc rich primer.

3.3 ERECTION TOLERANCES

.1 Plumb: not to exceed 1/500th of member length.

.2 Camber: not to exceed 1/1000th of member length.

.3 Spacing: not more than +/- 3.0 mm from design spacing.

.4 Gap between end of stud and track web: not more than 4.0 mm.

3.4 CUTOUTS

.1 Maximum size of cutouts for services as follows:

Member Depth	Across Member Depth	Along Member Length	Centre to Centre Spacing (mm)
92	40 max.	105 max.	600 min.
102	40 max.	105 max.	600 min.
152	65 max.	115 max.	600 min.

.2 Limit distance from centerline of last unreinforced cutout to end of member to less than 300 mm.

END OF SECTION