Part 1 General

1.1 REFERENCES

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

.1 ASTM A 36/A 36M-14, standard Specification for Carbon Structural Steel.

.2 ASTM A 307-07b, Standard Specification for Carbon Steel Bolts and Studs 60,000 psi Tensile Strength.

.3 ASTM A 325-09 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-85.10-99, Protective Coatings for Metals.

.3 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturer's Association (CPMA).

.1 CISC/CPMA 2-75, Quick-Drying, Primer for use on Structural Steel.

.4 Canadian Standards Association (CSA International)

.1 CAN/CSA G40.20/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CAN/CSA-S16-09, Design of Steel Structures.

.3 CAN/CSA-S136-07, North American Specifications for the Design of Cold Formed Steel Structural Members.

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

.5 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding.

.6 CSA W55.3-08, Certification of Companies for Resistance Welding of Steel and Aluminum.

.7 CSA W59-03 (R2008), Welded Steel Construction (Metal Arc Welding).

1.2 DESIGN REQUIREMENTS

.1 Design details and connections in accordance with requirements of CAN/CSA S16 to resist forces, moments, shears and allow for movements indicated.

.2 Shear connections:

.1 Select framed beam shear connections from an industry accepted publication such as "Handbook of the Canadian Institute of Steel Construction" when connection for shear only (standard connection) is required.

.2 Select or design connections to support reaction from maximum uniformly distributed load that can be safely supported by beam in bending, provided no point loads act on beam, when shears are not indicated.

.3 Submit sketches and design calculations stamped and signed by qualified professional engineer licensed in Province of New Brunswick, Canada for non-standard connections.

1.3 SHOP DRAWINGS

.1 Submit shop drawings including fabrication and erection documents and materials list in accordance with Section 01 33 00 - Submittal Procedures.

.2 Erection drawings: indicate details and information necessary for assembly and erection purposes including:

.1 Description of methods.

.2 Sequence of erection.

.3 Type of equipment used in erection.

.4 Temporary bracings.

.3 Ensure Fabricator drawings showing designed assemblies, components and connections are stamped and signed by qualified professional engineer licensed in the province of New Brunswick, Canada.

Part 2 Products

2.1 MATERIALS

.1 Structural steel: to CAN/CSA-G40.20/G40.21 Grade 350W and ASTM A500 Grade C for HSS sections.

.2 Anchor bolts: to CAN/CSA-G40.20/G40.21, Grade 300W.

.3 Bolts, nuts and washers: to ASTM A325.

.4 Welding materials: to CSA W48 Series, CSA W59 and certified by Canadian Welding Bureau.

.5 Shop paint primer: to CISC/CPMA 2-75.

2.2 FABRICATION

.1 Fabricate structural steel in accordance with CAN/CSA-S16-09 and in accordance with reviewed shop drawings.

.2 Continuously seal members by intermittent welds and plastic filler where indicated. Grind smooth.

.3 Provide 13 mm drain hole in all HSS columns at low point. Hole shall be above concrete for columns with base embedded in concrete.

2.3 SHOP PAINTING

.1 All exterior steel exposed to the elements, including plates, connections, anchor bolts, lag screws, nuts and washers, spikes and screws to be hot dipped galvanized to CAN/CSA G164-M92.

Part 3 Execution

3.1 GENERAL

.1 Structural steel work: in accordance with CAN/CSA-S16.

.2 Welding: in accordance with CSA W59.

.3 Companies to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel structures and/or CSA W55.3 for resistance welding of structural components.

3.2 MARKING

.1 Mark materials in accordance with CAN/CSA G40.20/G40.21. Do not use die stamping. If steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.

.2 Match marking: shop mark bearing assemblies and splices for fit and match.

3.3 ERECTION

.1 Erect structural steel, as indicated and in accordance with CAN/CSA-S16 and in accordance with reviewed erection drawings.

.2 Field cutting or altering structural members: to approval of Consultant.

.3 Clean with mechanical brush and touch up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.

.4 Continuously seal members by continuous welds where indicated. Grind smooth.

3.4 FIELD QUALITY CONTROL

.1 Inspection and testing of materials and workmanship will be carried out by testing laboratory designated by Consultant.

.2 Provide safe access and working areas for testing on site, as required by testing agency and as authorized by Consultant.

.3 Submit test reports to Engineer within 2 weeks of completion of inspection.

.4 Contractor will pay costs of tests.

3.5 FIELD PAINTING

.1 Touch up welds and repair hot-dip galvanized steel in accordance with ASTM A780.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 03 30 00 - Cast-in-Place Concrete.

.2 Section 07 92 00 - Sealants

.3 Section 09 91 00 - Painting.

1.2 REFERENCES

.1 ASTM International

.1 ASTM A53/A53M -12, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

.2 ASTM A269, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

.3 ASTM A307-14, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.4 ASTM A325M-14, Specification for Structural Bolts, Steel, Heat Treated, 120/105 Ksi Minimum Tensile Strength.

.5 ASTM A500 / A500M -13, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

.6 ASTM A924/A924M-16ae1, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

.2 Standards Council of Canada

.1 CAN/CGSB-1.40-97, Anti- corrosive Structural Steel Alkyd Primer.

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

.3 CSA International

.1 CAN/CSA-G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel.

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

.3 CSA S16-14, Design of Steel Structures.

.4 CAN/CSA-S136-12, North American Specification for the Design of Cold-Formed Steel Structural Members.

.5 CSA W47.1-09 (R2014), Certification of Companies for Fusion Welding of Steel.

.6 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding.

.7 CSA W55.3-08 (R2013)Certification of companies for resistance welding of steel and aluminum.

.8 CSA W59-13, Welded Steel Construction (Metal Arc Welding).

1.3 QUALITY ASSURANCE

.1 Welded Steel Construction: CSA W59 -13.

1.4 SUBMITTALS

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

.2 Shop Drawings:

.1 Indicate construction details, sizes of steel sections and thickness of steel sheet.

.2 Indicate welded connections using standard welding symbols. Indicate net weld lengths.

.3 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

.4 Shop drawings shall bear the seal and signature of a registered Structural Engineer licensed to practice in the Province of New Brunswick.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle materials in accordance with contract requirements and in accordance with manufacturer's written instructions.

.2 Package and protect metal items to arrive undamaged at the job site.

.3 Store metal items under waterproof cover on pallets or plank platforms held off ground.

Part 2 Products

2.1 MATERIALS

.1 Minimum requirements as follows:

.1 Steel sections and plates: to CAN/CSA- G40.20/G40.21-13, Grade 350W.

.2 Steel pipe: to ASTM A53/A53M-12, Schedule 40, standard weight, finish as scheduled.

.3 Stainless steel tube; to ASTM A269, Type 316; Seamless welded with AISI No. 4 finish.

.4 Stainless steel plate: Type 316; Seamless welded with AISI No. 4 finish.

.5 Welding materials: to CSA W59-13.

.6 Bolts, nuts, washers and anchors: to ASTM A307-14, galvanized to CSA G164-M92(R2003), for galvanized components.

.7 Hot dipped galvanized steel for exterior work

.8 Grout: non-shrink, non-metallic, flowable, 24h, MPa 15, pull-out strength 7.9 MPa.

2.2 FABRICATION

.1 Field measure prior to fabrication.

.2 Fabricate Work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.3 Where possible, fit and shop assemble work, ready for erection.

.4 Exposed fasteners to be flush countersunk.

.5 Use self-tapping shake-proof counter-sunk flat headed screws on items requiring assembly by screws or as indicated.

.1 Use screws for interior metal work.

.2 Use welded connections for exterior metal work unless otherwise approved by Departmental Representative.

.6 Ensure exposed welds are continuous for length of each joint.

.1 File or grind exposed welds smooth and flush.

.2 Seal exterior steel fabrications to provide corrosion protection in accordance with CAN3-S16-14.

.7 In locations where stitch welding occurs, grind and sand stitches smooth and infill between stitches with epoxy sealant.

.8 Remove all splatter and slag, grind exposed welds smooth and sand flush and smooth.

.1 Do not over-grind or over-sand.

.2 Use epoxy based auto-body filler where required to provide a smooth uninterrupted finish.

.3 Prime paint.

2.3 FABRICATION TOLERANCES

.1 Squareness: 3 mm maximum difference in diagonal measurements.

.2 Maximum Offset Between Faces: 1.5 mm.

.3 Maximum Misalignment of Adjacent Members: 1.5 mm.

.4 Maximum Bow: 3 mm in 1200 mm.

.5 Maximum Deviation From Plane: 1.5 mm in 1200 mm.

2.4 FINISHES

.1 Galvanizing: hot dipped galvanizing with zinc coating 700 g/m2 to CAN/CSA-G164-M92(R2003).

.2 Shop coat primer: to CAN/CGSB-1.40-97

.1 Primer to be compatible with paint primer Section 09 91 00.

.1 Coordinate with painter.

.3 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181-99, in accordance with chemical component limits and restrictions requirements and VOC limits.

2.5 SHOP PAINTING

.1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items or items to receive fire proofing.

.2 Use primer unadulterated, as prepared by manufacturer.

.1 Paint on dry surfaces, free from rust, scale, grease.

.2 Do not paint when temperature is lower than 7 degrees C.

.3 Clean surfaces to be field welded; do not paint.

Part 3 Execution

3.1 ERECTION TOLERANCES

.1 Maximum Variation From Plumb: 6 mm per story, non-cumulative.

.2 Maximum Offset From True Alignment and or Out-of-Position: 6 mm.

3.2 ERECTION

.1 Do welding Work in accordance with CSA W59-13 unless specified otherwise.

.2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.3 Provide suitable means of anchorage acceptable to Consultant such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

.4 Exposed fastening devices to match finish and be compatible with material through which they pass.

.5 Provide components for building by other Sections in accordance with shop drawings and schedule.

.6 Make field connections with bolts to CAN/CSA S136-12, or weld.

.7 Ensure exposed welds are continuous for length of each joint.

.8 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

.9 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer.

.10 Touch-up galvanized surfaces with zinc rich primer including where burned by field welding.

.11 Remove all splatter and slag, grind exposed welds smooth and sand flush and smooth.

.1 Do not over-grind or over-sand.

.2 Use epoxy based auto-body filler where required to provide a smooth uninterrupted finish.

.3 Prime paint.

3.3 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.4 SCHEDULE

.1 This schedule is general in nature and does not include all miscellaneous items required on the project.

.1 Provide all misc metal items required for the project whether shown or identified or not.

.2 Review all Drawings and Details which show the majority but not all items.

.3 Finish:

.1 Hot dipped galvanized at wet locations, exterior and where noted.

.2 Prime painted and paint finish to Section 09 91 00

.2 Schedule

.1 Brackets: Sizes and shapes as indicated, complete with fixing anchors.

.2 Shop fabricated ferrous metal items.

.3 Metal and steel items as required

.4 Toilet back grab bar.

END OF SECTION