Part 1 General

1.1 SECTION INCLUDES

1. Structural steel framing members, support members.
2. Base plates, bearing plates.
3. Grouting under base plates.

1.2 RELATED REQUIREMENTS

1. Section 05 50 00 - Metal Fabrications.
2. Section 04 05 19 - Masonry Anchorage and Reinforcement: Supply of anchors for casting into concrete and anchoring into masonry

1.3 REFERENCE STANDARDS

1. STD G40.20/G40.21-13 General requirements for rolled or welded structural quality steel/structural quality steel
2. CSA S16:19 Design of steel structures
3. Handbook of steel construction
4. CSA W47.1:19 Certification of companies for fusion welding of steel
5. STD W59-18 Welded steel construction

1.4 ACTION SUBMITTALS

1. Section 01 33 00: Submission procedures.
2. Shop Drawings:
    1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments and fastening.
    2. Connections.
    3. Design loads.
    4. Indicate welded connections with AWS A2.1-DC welding symbols. Indicate net weld lengths.
    5. Provide structural steel shop drawings / erection drawings stamped by a professional engineer licensed in Ontario. Stamp for connections only.
        1. Connections shall be concentric and shall not introduce eccentricity into any elements.
        2. Design of steel connections to the maximum UDL loads in steel handbook beam tables, provided no point loads act on the beam and when shears are not indicated

1.5 INFORMATIONAL SUBMITTALS

1. Section 01 33 00: Submission procedures.
2. If requested, Manufacturer's Mill Certificate: Certify that Products meet or exceed specified requirements.

3. If requested, Mill Test Reports: Submit indicating structural strength, destructive and non-destructive test analysis.
4. Delegated Design Submittals:
    1. Submit documentation indicating compliance to design criteria, signed and sealed by the delegated design professional responsible for their preparation.
        1. Design Data: Include material data, calculations and details.

1.6 CLOSEOUT SUBMITTALS

1. Section 01 77 00: Project Close-out.

1.7 QUALITY ASSURANCE

1. Fabricate structural steel members to CISC Code of Standard Practice, and CSA-W59.
2. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five (5) years documented experience.
3. Installer Qualifications: Company specializing in performing the work of this section with minimum five (5) years documented experience and approved by the manufacturer.
4. Delegated Design Professional Qualifications: Professional Structural Engineer experienced in design of this Work and licensed in the province where the project is located.
5. Welders' Certificates: Submit to Section 01 33 00, certifying welders employed on the Work, verifying qualification within the previous twelve (12 months) to CSA-W59 and CSA-W47.1.

Part 2 Products

2.1 PERFORMANCE / DESIGN CRITERIA

1. Delegated Design: Design structural steel connections by a licensed design professional using performance and design criteria as indicated.

2.2 MATERIALS

1. Structural Steel Members: CSA-G40.20/G40.21, Grade 350W unless otherwise noted.
2. Structural Channels and Angles: CSA-G40.20/G40.21, Grade 300W unless otherwise noted.
3. H.S.S.: CSA-G40.20/G40.21, Grade 350W (Class C) unless otherwise noted.
4. Steel plate.: A36, Grade 250W minimum unless otherwise noted.
5. Bolts, Nuts, and Washers: ASTM A325 bolts, galvanized to A153/A153M for galvanized structural members.
6. Anchor Bolts: ASTM F1554 (formerly ASTM A307). Material shall be a minimum of Grade 36 (Fu = 414MPa) or CSA G40.21 300W (Fu=450MPa)..

7. Welding shall conform to CSA W47.1 and CSA W59, by the Canadian Welding Bureau. All welding shall be completed by CWB Certified Welders. Third party welding inspection shall be performed by firms certified to CSA W178.1 and W178.2.
8. Grout: Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing additives, with a compressive strength of 35 MPa (minimum). Grout shall be installed at a maximum of 38mm (1 1/2").
9. Primer: As specified in Section 09 91 00.

2.3 FABRICATION

1. Fabricate structural steel to CSA-S16 and in accordance with reviewed Shop Drawings.
2. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
3. Fabricate connections for bolt, nut, and washer connectors.
4. Where masonry bears on steel beams, weld 15M x 300mm (12") long weldable rebar dowels at 1200mm (48") o.c. to beams

2.4 FINISH

1. Clean, prepare surfaces, and shop prime structural members to CSA-S16, except as noted below.
2. Shop prime structural steel members. Do not prime surfaces that will be fireproofed.
3. Hot-dip galvanized to ASTM A123/A123M, zinc coating thickness appropriate grade for type and size of steel material indicated.
4. All structural steel shall receive a minimum of one coat of approved shop primer, touched up as required on site, except that steel which will receive spray-on fireproofing shall not be primed.
5. Galvanizing for metals shall conform with CSA-G164 unless noted. Touch-up on site by grinding the surface to bright metal and applying zinc rich paint conforming to CAN/CGSB-1.181 (or ASTM A780).
6. Exterior structural steel shall be protected from corrosion by hot dip galvanizing. Exterior HSS columns shall have drainage holes at the base (13mm (1/2") dia. max 2" from the base).

2.5 SOURCE QUALITY CONTROL AND TESTS

1. Provide shop testing of structural steel sections.

Part 3 Execution

3.1 ERECTION

1. Erect structural members to CSA-S16.
2. Perform welding: CSA-W59.

3. Allow for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.
4. Field weld components indicated on Drawings and Shop Drawings.
5. Do not field cut or alter structural members without approval of Consultant.
6. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.
7. Grout under base plates as specified on structural drawings. Trowel grouted surface smooth, splay neatly to 45 degrees.
8. Field Painting - Touch-Up:
    1. Paint to requirements of Section 09 91 00.
    2. Touch up all damaged surfaces and exposed surfaces without shop coat, with primer.
9. Structural steel shall be tested by an independent C.S.A. certified testing company for erection tolerances, plumbness, alignment, connections, elevation, materials and workmanship. Provide stamped structural steel inspection report to consultant team.

3.2 FIELD QUALITY CONTROL

1. Inspection and testing of materials and workmanship shall be carried out by testing
laboratory.
2. Provide safe access and working areas for testing on site, as required by testing agency
and as authorized by Consultant.
3. Testing company to submit test reports directly to Engineer within one (1) week of completion of inspection.
4. Owner will pay costs of test as specified under Cash Allowances.
    1. If there is no testing and inspection Cash Allowance, provide quote for testing, for approval and payment, by Owner.

End of Section