

PART I – GENERAL**WORK SPECIFIED HEREIN**

All labor, materials, equipment and services necessary to fabricate and erect all structural steel as indicated or specified including, but not limited to:

- All structural steel including columns, beams, girders, column base and cap plates, joist and beam bearing plates, angles and channels.
- Framing for all openings in metal deck.
- Connection angles, bolts and electrodes for welding work.
- Framing and support for roof top units.
- Shop painting.
- Shop drawings.
- Furnishing of anchor bolts and anchor plates to be embedded in concrete or masonry.
- Connections for steel joist girders and steel joists to each other and to structural steel.
- All other items required to make the work of this section complete.

SUBSTITUTIONS

In accordance with Section 01600.

QUALITY ASSURANCE

- Provide Special Inspections for structural steel as shown on the drawings and as required by the Building Official. See Section 01400 for payment provisions for testing.
 - Welders shall be duly qualified (test passed in the preceding 12 months) in the position in which they are to weld and the qualifications and specifications for workmanship shall comply with the AWS requirements & Canadian Welding Bureau – CSA W47.1 &/or W55.3.
- Unless otherwise shown or specified, structural steel work shall conform to the following standards:
 - American Institute of Steel Construction
 1. Specifications for Structural Steel Buildings, 2005
 2. Code of Standard Practice, 2005
 - American Welding Society: Structural Welding Code – Steel, AWS D1.1-08 & Canadian Welding Bureau – CSA W47.1 &/or W 55.3.

SUBMITTALS

Submit shop drawings in accordance with Section 01300 and CAN/CSA S16-01 for all work under this Section. Include complete details and schedules for fabrication and assembly of structural steel members, procedures and diagrams. Include details of cuts, connections, camber, holes and other pertinent data. Indicate welds by standard AWS and CSA W59 symbols, and show size length and type of each weld. Furnish erection drawings referencing erection marks to shop detail drawing numbers. Provide setting drawings, templates and directions for installation of anchor bolts, embedded plates and other anchorages to be installed by others.

PRODUCT DELIVERY, STORAGE AND HANDLING

Exercise care during unloading, storage and erection to avoid damage. Dumping on the ground is not permitted. Material stored at the site shall be supported completely free of the ground and covered to avoid damage from the elements.

PART II – PRODUCTS**MATERIALS**

- Cold formed Steel Structural members CSA S136.
- Structural steel: Shall conform to CSA Standard G40.20/G40.21M, latest edition.
 - (a) Rolled shapes WF, WWF grade M350W.
 - (b) Channels angles, grade M300W.
 - (c) HSS shall have minimum yield of 350 MPa (class H).
- Hollow structural sections: CSA-G40.20/G40.21M
- Anchor bolts: CSA-G40.20/G40.21 M
- Leveling and bearing plates: CSA-G40.20/G40.21 M
- Bolts nuts and washers: ASTM A325.
- Welding materials and shear connectors: CSA W59.
- Shop primer:
 1. Interior steel to CISC/CPMA 1-73a.
 2. Exterior steel to CISC/CPMA 1-73a
 3. Color: gray
- Hot dip galvanizing: CAN/CSA G164-M, minimum zinc coating of 600g/m2 (2oz./sq.ft.)

PART III – EXECUTION**FABRICATION**

- Provide all structural steel components indicated on Drawings, in accordance with the requirements specified herein and meeting applicable requirements of CAN/CSA S16-01.
- Beam splices are acceptable only if approved by Consultants.
- Prepare steel work for attachments of other work.
- Provide structural work bearing on concrete or masonry with base or bearing plates and wall anchors unless noted otherwise on Drawings.
- Cut required holes in steel members and reinforce openings only as detailed on Drawings or as approved by Consultants.
- Attach retainers for adjustable masonry anchors required for tying masonry to structural steel.
- If indicated on Drawings, weld masonry strap anchors to structural steel.

- Supply steel Lintels installed by Section 04200. Provide 150mm (6") bearing at each end for angle lintels, 200mm (8") for beam or channel sections and with packing as may be required to ensure level seating. Fabricate multiple member lintels to suit masonry dimensions with spacers and weld or bolt them together. Provide lintels for all openings and as indicated on Drawings.
- Supply all necessary angles, channels and anchors for overhead door and other steel jambs, and framing, installed under Section 03300 and 04200.
- See approved overhead sectional door shop drawings for location of jamb extensions and spring pads.
- Connections:
 1. Shop and field connections shall be welded or bolted with high tensile bolts.
 2. Beam connections: Provide beam connections adequate to resist the reactions produced by the framing or load connections. Provide beam to column connections that apply vertical reaction with negligible eccentricity at the connecting face of the column, such as double angle beam web connections, end plate connections or unstiffened seats, unless otherwise shown on Drawings. Submit for review, in advance of the preparation of shop drawings, connections which do not meet these requirements. Provide connections complying with the requirements of CISC handbook of steel construction, except that the length of beam web angles shall not be less than half the depth of the beam and single angles shall not be used for beams deeper than 500 mm (1'-8"). Provide direct connections to flanges of spandrel beams to restrain twisting and torsion. Do not use fish plate or shear plate connections.
- Painting:
 1. All structural steel work except where specified otherwise herein, shall be one coat of shop primer or shop paint applied thoroughly and evenly to dry surfaces only;
 2. Surfaces scheduled to be top coated in the field shall receive shop primer prior to shipment; all other surfaces shall receive one coat of shop paint;
 3. Where shop coat of paint is applied, clean and prepare surfaces to meet requirements of CISC/CPMA Standard 1-73a.
 4. Paint steel members under cover and keep them under cover and protected until paint/primer has dried;
 5. Remove paint for at least 50 mm (2") beyond surfaces which are to be welded after painting;
 6. Do not paint surfaces to be field welded, that are in contact at bolted friction type connections or that are encased in or in contact with concrete;

7. Cleaning and preparation of special surfaces shall be in conformance to CAN/CSA-S16.1;
8. Structural steel exposed in finished areas and scheduled to receive finish coats of paint, must be smooth, even and free of shop paint drip marks.

- Marking:

1. Mark materials in accordance with CSA-G40.20/G40.21 M. 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.

SITE INSPECTION

Verify all anchor bolt locations, grouting and elevation of base and setting plates and other material set by other trades, etc., before commencing work. Notify the Professional of Record of any work set by others if out of tolerances specified, and do not erect any material upon such work until it has been corrected satisfactorily. Starting work implies acceptance of the work of other trades affecting erection of the structural frame. Final results are the entire responsibility of the Contractor.

ERECTION

- Erect the work of this Section in accordance with CAN/CSA-S16.1 and in accordance with reviewed shop drawings.
- Work shall include necessary erection equipment and temporary shoring and bracing as required for erection and in manner meeting safety regulations. Brace and support structure during erection to ensure that it is maintained in alignment under construction and other loading and until all other construction elements contributing to stability are in place.
- Obtain written permission from Consultant prior to field cutting or altering structural steel members.
- Set column base plates and loose bearing plates with steel leveling nuts, shims to proper elevation, true and level, ready for grouting in, as specified under the work of other Sections.
- Set beams cambered within allowable tolerances with cambers on top sides.
- Splice members only with Consultant's approval.
- Ensure that joints between exposed exterior members are provided with seal welds or that they are sealed with another method approved by Consultant.
- Provide structural framing at perimeter of holes through metal decking where required and in accordance with Section 05310 and as indicated on Drawings.
- Touch up with prime paint, field connections and burnt or scratched surfaces when erection is completed.

END OF SECTION