

PART 1 - GENERAL

1.1 GENERAL CLAUSES

- .1 General Clauses and Complementary General Clauses apply to works described in this section.

1.2 RELATED WORKS

- .1 Grouting – Section 03 30 00
- .2 Steel joists – Section 05 21 00
- .3 Steel deck – Section 05 31 00

1.3 REFERENCE STANDARDS

- .1 Do structural steel work in accordance with CAN3-S16.1, except where specified otherwise.
- .2 Do welding in accordance with CSA W59, except where specified otherwise.
- .3 Welder certification: in accordance with ACNOR W47.1.
- .4 Steel Sub-Contractor to be a certified member of CWB (section 2.1) as per CSA W47.1 standard.

1.4 SOURCE QUALITY CONTROL

- .1 If required by Engineer, submit two (2) certified copies of mill reports covering chemical and physical properties of steel used in this work.

1.5 DESIGN OF DETAILS AND CONNECTIONS

- .1 Design details and connections in accordance with requirements of ACNOR S16.1 to resist loads indicated.
- .2 Engineer may require welding procedures for examination.

1.6 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00.
 - .2 Each shop drawing submitted shall bear the signature and stamp of a qualified professional engineer registered in the Province of Quebec.
 - .3 Indicate shop and erection details including cuts, notches, connections, holes, bolts and welds. Indicate welds by welding symbols defined in CSA W59, appendix D.
 - .4 Sub-contractor in structural steel shall submit to the Engineer complete erection drawings showing the dimensions and locations necessary to the installation of anchor bolts, the elevations of column base plates, floors and roof. Do not start any erection before these drawings have been examined by Engineer.
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The Engineer's examination of these erection drawings is done in the sole purpose of insuring the conformity with the general concept. This examination does not imply that the submitted erection drawings are approved by the Engineer.

Although there has been examination and application of the "examined" seal, the Contractor remains solely responsible for errors or omissions in these drawings or for derogations in regards to the structural drawings and/or specifications. The Contractor is responsible for the verification of all dimensions on site, the fabrication procedures, construction and installation techniques and also the co-ordination of work with Sub-contractor.

- .5 Do not submit shop drawings by fax or by e-mail.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Structural steel: to CAN/CSA-G40.21, grade as indicated on structural drawings. HSS to be as per ASTM A500 grade C.
- .2 Anchor bolts: to CAN/CSA-G40.21.
- .3 Bolts, nuts and washers: to ASTM A325M.
- .4 Welding materials: to ACNOR W59.
- .5 Shop paint primer: to 1-73a.
- .6 Hot dip galvanizing: where indicated, galvanize steel to ACNOR G164, minimum zinc coating of 600 g/m².

PART 3 - EXECUTION

3.1 FABRICATION

- .1 Fabricate structural steel, as indicated, in accordance with CAN3-S16.1 and in accordance with shop drawings.
- .2 Provide punched holes from 11 to 27 mm in diameter for attachment of other work. Refer to drawings for details and locations.
- .3 Reinforce openings to maintain required design strength.

3.2 CONNECTION TO EXISTING WORK

- .1 Verify dimensions of existing work before commencing fabrication.

3.3 SHOP PAINTING

- .1 Clean, prepare surfaces and shop prime structural steel in accordance with CAN3-S16.1, except where members are to be encased in concrete.
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3.4 MARKING

- .1 Mark materials in accordance with CAN/CSA-G40.20. Do not use die stamping. The use of a punch is permitted only for material with a thickness over 20 mm. 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 joints for fit and match.

3.5 ERECTION

- .1 No structural steel element is to be installed before Engineer has examined the signed and sealed shop drawings and erection drawings (see 1.6).
- .2 Erect structural steel as indicated in accordance with CAN3-S16.1 and in accordance with shop drawings. Steel framework shall be erected straight and plumb within specified tolerances. Temporary bracing shall be installed and be kept in place so long as required by the safety of the work. Erection tolerances shall not exceed those specified in the CAN3-S16.1.
- .3 If indicated on drawings, seal members by continuous welds. Grind smooth.
- .4 No welding is to be done when ambient temperature is below -18o C without Engineer's approval.
- .5 Obtain written permission of Engineer prior to field cutting or altering of structural members not shown on drawings.
- .6 Touch-up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.
- .7 Anchor bolts to be furnished by the structural steel Sub-contractor and set in place by the General Contractor. The dry pack under the column bases shall be placed by General Contractor immediately after the steel erection has been completed.
- .8 Unless otherwise indicated, tighten high strength bolts to obtain a firm contact between all layers in contact ("snug tight"). Bolts indicated on drawings to be pre-tensioned or that the connexion is indicated to be "friction type" are to be tightened with a direct tension indicator or according to the turn-of-nut method to obtain tensions in bolts as specified in clause 23.4 of S16.1 standard. Refer to clauses 23.5 and 23.6 of S16.1 standard for tightening methods.

3.6 FIELD QUALITY CONTROL

- .1 Inspection and testing of materials and workmanship will be carried out by testing laboratory designated by Engineer.
- .2 Engineer may require inspections and/or testing of welds to be carried out by a specialist designated by Engineer.
- .3 Owner will pay cost of tests.

3.7 PREFABRICATED CONCRETE PANELS

- .1 If prefabricated concrete panels are to be supported by steel structure, prefabricated concrete sub-contractor to submit to Engineer signed and sealed shop and erection drawings for his examination. These drawings to clearly indicate the type of connection to the structure as well as the loads and their locations.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 03 45 00 – Precast architectural concrete..

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM A 53/A 53M-07, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A 269-[08], Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
- .2 CSA International
 - .1 CSA G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
 - .3 CSA W59-M03(R2008), Welded Steel Construction (Metal Arc Welding) [Metric.
- .3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for sections, plates, pipe, tubing, bolts and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
 - .1 For finishes, coatings, primers, and paints applied on site: indicate VOC concentration in g/L.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
 - .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.4 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
 - .2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
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1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements] [and] [with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse by manufacturer of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section[01 74 21 - Construction/Renovation/Demolition (CRD) Waste Management and Disposal.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Stainless steel sections and plates: to CSA G40.20/G40.21, Grade 316.
- .2 Welding materials: to CSA W59.
- .3 Welding electrodes: to CSA W48 Series.
- .4 Bolts and anchor bolts: to ASTM A 307.
- .5 Stainless steel tubing: to ASTM A 269, Type 316 commercial grade seamless welded with AISI No. 4 finish.
- .6 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 FABRICATION

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated.
- .3 Where possible, fit and shop assemble work, ready for erection.
- .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 FINISHES

- .1 Galvanizing: hot dipped galvanizing with zinc coating [600] g/m² to CAN/CSA-G164.
 - .2 Shop coat primer: in accordance with chemical component limits and restrictions requirements and VOC limits of GS-11.
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- .3 Zinc primer: zinc rich, ready mix to MPI-EXT 5.2C

2.4 SHOP PAINTING

- .1 Primer: VOC limit 250 g/L maximum to GS-11.
- .2 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.
- .3 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 degrees C.
- .4 Clean surfaces to be field welded; do not paint.

2.5 ANGLE LINTELS

- .1 Steel angles: [galvanized] [prime painted], sizes indicated for openings. Provide [150] mm minimum bearing at ends.
- .2 Weld or bolt back-to-back angles to profiles as indicated.

2.6 TUBULAR HANDRAILS AND RAILINGS

- .1 Stainless steel pipe: grade 316, formed to shapes and sizes as indicated on drawings.
- .2 Stainless steel plates: grade 316, formed to shapes and sizes as indicated on drawings.
- .3 Exterior tubular handrails to be made out of stainless steel of grade 316.
- .4 If one of the stainless steel elements was to show signs of rust within the first year of warranty, all stainless steel handrail and railings would need to be replaced (including anchors) at no cost.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for metal fabrications installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied [and after receipt of written approval to proceed from Departmental Representative.

3.2 ERECTION

- .1 Do welding work in accordance with CSA W59 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 Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
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- .4 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .5 Supply components for work by other trades in accordance with shop drawings and schedule.
- .6 Make field connections with bolts to CSA S16 or weld field connection.
- .7 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.
- .8 Touch-up rivets, field welds, bolts and burnt or scratched surfaces with primer after completion of:
 - .1 Primer: maximum VOC limit 250 g/L to GS-11.
- .9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.
 - .1 Primer: maximum VOC limit 250 g/L to GS-11.

3.3 TUBULAR HANDRAILS AND RAILINGS

- .1 Install pipe railings to stairs and ramps as indicated on plans.
- .2 Set railing on prefabricated concrete as indicated on plans, with anchors, plates bolts and non-shrinking grout.
- .3 Seal handrail anchors in prefabricates concrete panels with non-shrinking grout.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Renovation/Demolition (CRD) Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION
