

1 GENERAL

1.01 RELATED SECTIONS

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

1.02 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A53/A53M-12, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - .2 ASTM A123/A123M-17, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .3 ASTM A307-14, Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 psi Tensile Strength.
 - .4 ASTM A325M-14, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength.
 - .5 ASTM A572/A572M-15, Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
 - .6 ASTM C881/C881M-15, Standard Specification for Structural Steel Shapes.
 - .7 ASTM A992/A992M-11 (2015), Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
 - .8 ASTM D2369-04, Standard Test Method for Volatile Content of Coatings.
- .2 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.
- .3 Canadian Standards Association (CSA)
 - .1 CSA G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA-S16-14, Design of Steel Structures.
 - .3 CSA S136-12, North American Specification for the Design of Cold-Formed Steel Structural Members.
 - .4 CSA S136.1-12, Commentary on 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 Metals 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).
- .4 Master Painters Institute (MPI)
 - .1 MPI Architectural Painting Specifications Manual, 2004.
- .5 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings) of the Environmental Protection Agency (EPA).

1.03 SOURCE QUALITY CONTROL

- .1 If requested by the Departmental Representative, submit copies of mill test reports showing chemical and physical properties and other details of steel to be incorporated into work at least 4 weeks prior to fabrication. Such mill test reports shall be certified by qualified metallurgists confirming that tests conform to requirements of CSA G40.20 and CSA G40.21.
- .2 Provide safe access and working areas for testing on site, as required by testing agency and as authorized by Departmental Representative.
- .3 The Contractor is to provide written documentation from the Canadian Welding Bureau certifying that the steel subcontractor is qualified to requirements of CSA W47.1, Division 1 or 2.1. This document is to be submitted in accordance with Section 01 n00 02 - Standard General Requirements.

1.04 DESIGN OF CONNECTIONS

- .1 Except where shown differently on the drawings, or as otherwise indicated, design details and connections in accordance with the requirements of CSA S16.

1.05 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 On erection drawings, indicate all details and information necessary for assembly and erection purposes such as, description of methods, sequence of erection, type of equipment proposed for use in erection, and temporary bracings.
- .3 It is the responsibility of the contractor to field confirm the exact locations and construction of the work to which work under this section connects to, or is supported on, or joins or butts up against.
- .4 Each drawing submission shall bear signature and stamp of qualified Professional Engineer registered or licensed to practice in the Province of Newfoundland and Labrador, for all assemblies, components, details and connections not shown on the drawings.
- .5 Review of shop details and erection diagrams will extend to general design concept only. This review does not relieve the Contractor of the responsibility for accuracy of the detail dimensions, general fit-up of parts to be assembled, adequacy of connection details, or for errors or defects contained in the details.

1.06 ALTERNATIVE MATERIALS

- .1 Acceptable materials: where materials are specified by trade name refer to the Instruction to Tenderers for procedure to be followed in applying for approval of alternatives.

1.07 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials in manufacturer's original, undamaged containers with

identification labels intact.

2 PRODUCTS

2.01 MATERIALS

- .1 Structural steel: to CSA G40.21, Grade 350W, Class C or ASTM 500, Grade C for HSS, and CSA G40.21, Grade 300W for plates.
- .2 Pipe: pipe for handrails and guards to be to ASTM A53, Grade 240, standard weight, (SCH. 40).
- .3 Anchor rods: to CSA G40.21, Grade 300W.
- .4 Bolts, nuts and washers: to ASTM F3125.
- .5 Adhesive anchors: acrylic adhesive for dowel and anchor rod anchorage: to ASTM C881, Type IV, Grade 3, Class A, B and C.
- .6 Welding materials: to CSA W59 and certified by Canadian Welding Bureau.
- .7 Substitutions for steel sections or materials shown on the drawings are not to be made unless specifically approved in writing by the Departmental Representative.
- .8 Hot dip galvanizing: galvanize steel, where indicated, to ASTM A123/A123M, minimum zinc coating of 610 g/m².
- .9 Galvanizing Touch-up/Repair:
 - .1 Touch-up galvanizing for repair to damaged galvanized surfaces shall be with a purpose-made cold-applied film galvanizing system consisting of zinc powder, aromatic hydrocarbon and binder. Coating system to meet the following minimum requirements.
 - .1 Dry film content 96% by weight with zinc purity of 99.995% to ISO 3549.
 - .2 Recognized for use as repair coating for hot-dip galvanizing.
 - .3 Dry film non-toxic to AS/NSZ 4020.
 - .4 UV resistant.
- .10 Galvanized post tie: purpose-made, galvanized steel upstand, retrofit post base complete with concealed connectors. Pre-finished, corrosion-protected base providing 25 mm stand-off. Minimum 3 - 12 mm diameter drift dowels, galvanized to ASTM, Class 55.

2.02 FABRICATION

- .1 Fabricate work square, tight, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Where possible, fit and shop assemble work, ready for erection.
- .3 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

2.03 METAL GUARDRAIL AND HANDRAIL

- .1 Design, detail and fabricate guardrails and handrails to the National Association of Architectural Metal Manufacturers, (NAAMM standards), Metal Stair Manual, Fourth Edition (1992). Size and weight to be as indicated on drawings. Joint quality to be to NOMMA - Type 2.
- .2 All guardrail and handrail components to be galvanized.
- .3 Provide adequate drainage at low points of all closed sections. Indicate drain hole and galvanizing vent locations on shop drawings for approval by Departmental Representative prior to fabrication.

3 EXECUTION

3.01 GENERAL

- .1 Do steel work in accordance with CAN/CSA S16.
- .2 Do 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.

3.02 INSPECTION

- .1 Examine the work of other sections upon which the work of this section depends and report any discrepancies to the Departmental Representative.
- .2 Verify that surfaces and conditions are ready to accept the work of this section.
- .3 Beginning of installation means acceptance of existing conditions.

3.03 PRODUCT DELIVERY, STORAGE AND HANDLING

- .1 Exercise care in storing, handling, and erecting material and support materials properly at all times so that no piece will be bent, twisted, or otherwise damaged structurally or visually.

3.04 ANCHOR RODS

- .1 Drilled-in adhesive anchors to be supplied and installed under this section.
- .2 Anchor sizes to be as indicated on the drawings and be complete with nuts and washers. Galvanize all anchors to be embedded in concrete.

3.05 INSTALLATION - GENERAL

- .1 Install steel components as indicated and in accordance with CAN/CSA S16, and reviewed erection drawings.
- .2 Specific welding procedures must be submitted for review by the Departmental Representative for all field welding.

3.06 TOUCH-UP OF GALVANIZED SURFACE

- .1 Touch-up all damaged, scratched or exposed steel at welds of galvanized components in field with cold-applied zinc galvanizing system.
- .2 Prepare all surfaces to be touched-up by de-greasing and cleaning to SSPC-SP12.
- .3 Refer to manufacturer's written instructions for additional cleaning, surface preparation and application requirements.

3.07 RETROFIT POST SUPPORTS

- .1 Retro-fit post supports at canopy columns:
 - .1 Install retro-fit post bases to ends of main entrance support column.
 - .2 Temporarily support canopy as required to properly reinstall column with new support bases.
 - .3 Contractor to confirm existing conditions and advise Departmental Representative prior to shop drawing submittal.
 - .4 Install post supports in accordance with post-tie manufacturer's written directions.

3.08 FIELD TOUCH-UP

- .1 Touch up all damaged surfaces with cold-applied galvanizing.

3.09 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.

END OF SECTION