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| Version | Date | Description of Revisions |
| 1 | August 30, 2006 | Approved final document. |
| 2 | November 13, 2009 | Modified ‘Related Section’ |
| 3 | March 15, 2011 | Minor changes from Legal |
| 4 | June 5, 2012 | Added References and Replacement Parts Section |
| 5 | July 3, 2012 | Reformatted to Remove White Space |
| 6 | April 22, 2015 | General formatting |
| 7 | April 11, 2016 | Phase 1 Update (AV) |
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NOTE:

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**The on-line copy is the current version of the document.**

# GEneral

## Related Sections

#### Section 01300 – Submittals

#### Section 05500 – Metal Fabrications – General

#### Section 05502 – Metal Fabrications – Structural

## References

### Comply with the latest edition of the following statutes, codes, and standards and all amendments thereto.

#### American Society for Testing and Materials (ASTM)

##### ASTM A123/A123M-15 Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel products

##### ASTM A307-14; Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength.

##### ASTM A325-14; Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.

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

#### Canadian Standards Association (CSA)

##### CAN/CSA S16-14, Design of Steel Structures.

##### CAN/CSA W59-13; Welded Steel Construction (Metal Arc Welding).

#### The Society for Protective Coatings (SSPC):

##### Systems and Specifications Manual, Volume 2.

##### SP 2; Hand Tool Cleaning

#### Canadian General Standards Board (CGSB)

##### CAN/CGSB-1.108-M89 Bituminous Solvent Type Paint.

#### Ontario Building Code 2012 ,including all subsequent amendment to-date

## Design Requirements

### Design and detail handrail components shall be in accordance with Ontario Building Code and all applicable codes.

## Submittals

### Submit shop drawings in accordance with Section 01300 - Submittals.

### Submit shop drawings indicating handrail profiles, connections, terminations, and accessories.

### Submit shop drawings indicating project specific scale plans, elevations and details of handrails.

### Submit shop drawings indicating design loads and shall bear the seal and signature of a qualified Professional Engineer.

### Submit minimum 400 mm long sample indicating connections and finishes.

# PRODUCTS

## Materials

### Steel sections: in conformance with CSA G40.21/G40.21M Grade 300W.

### Steel plate: in conformance with CSA G40.21/G40.21M Grade 260W, pattern checkered.

### Steel pipe: to ASTM A53/A53M-12, standard weight, schedule 40, seamless black.

### Steel tubing: to G40.21-13 (R2018) , Grade 350W, sizes and dimensions as indicated.

### Metal bar grating: to ANSI/NAAMM MBG 531, steel, Type W 19 4, with abrasive nosings.

### Welding materials: to CSA W59.

### Bolts: to ASTM A307.

### High strength bolts: to ASTM A325.

## Fabrication

### Fabricate posts and railings of 50 mm nominal size pipe, 48.26 mm o.d., 3.68 mm wall thickness with shop welded connections.

### Fabricate posts and railings to configuration indicated and to meet the requirement of the Ontario Building Code.

### Accurately form connections with exposed faces flush; mitres and joints tight. Make exposed connections of same material, colour and finish as base material on which they occur.

### Grind or file exposed welds smooth.

### Shop fabricate railings in sections as large and complete as practicable.

### Fabricate gates and hinged assemblies complete with all necessary hardware including but not limited to hinges, hasps, cane bolts and receivers.

### Fabricate safety chains of Type 304 stainless steel safety chain with links 34 mm long by 6 mm cross section, and stainless steel safety snap and eyebolt.

### Toe-board: 125 mm high, 6.0 mm thick plate.

# EXECUTION

## Installation

### Install fabrications plumb, level, structurally sound, securely fastened, and in correct locations and positions.

### Use welded connections wherever possible to provide rigid structure. Provide anchor rods, bolts and plates for connecting railings to structure.

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

### Perform welding work in accordance with CSA W59.2 unless specified otherwise.

### Use stainless steel anchors.

### Apply isolation coating to surfaces between dissimilar metals, and between metal and concrete, mortar, grout or masonry.

### Provide continuous toe-board at all handrails except at gates or where concrete curbs of 125mm or higher are installed.

**END OF SECTION**