## Part 1 General

### 1.1 RELATED SECTIONS

.1 Division 01 – General Requirements.

.2 Section 03 30 00.01 – Cast-in-Place Concrete-Short Form.

.3 Section 04 04 99 - Demolition for Minor Works.

.4 Section 05 50 00 - Metal Fabrications.

.5 Section 09 91 23 - Interior Painting.

### 1.2 REFERENCES

.1 American National Standards Institute/National Association of Architectural Metal Manufacturers (ANSI/NAAMM)

.1 ANSI/NAAMM MBG531-09, Metal Bar Grating Manual.

.2 NAAM AMP-510- Metal Stairs Manual

.2 American Society for Testing and Materials International, (ASTM)

.1 ASTM A53/A53M-10, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

.2 ASTM A307-10, Specification for Carbon Steel Bolts and Studs, 60,000PSI Tensile Strength.

.3 ASTM A325M-10, Specification for Structural Bolts, Steel, Heat Treated, 120/105ksi Minimum Tensile Strength.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.

.2 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

.4 Canadian Standards Association (CSA International)

.1 CSA W59-03(R2009), Welded Steel Construction (Metal Arc Welding/Imperial Version).

.2 CAN/CSA-G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel.

.3 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

.5 National Association of Architectural Metal Manufactures (NAAMM)

.1 AMP 510-92, Metal Stair Manual.

.6 Steel Structures Painting Council (SSPC), Systems and Specifications Manual, Volume 2.

**1.3 SYSTEM DESCRIPTION**

.1 Design Requirements:

.1 Design metal ladder, balustrade and landing construction and connections to NBC vertical and horizontal live load requirements. Provide shop drawings that have been prepared, be signed, and sealed by Structural Engineer, registered in the Province of Ontario.

.2 Detail and fabricate to NAAMM Metal Stairs Manual. The Ontario Ministry of Labour and Fixed Access Ladder Engineering Data Sheet 2-04.

**1.4 SUBMITTALS**

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Division 1.

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Division 1. Indicate VOC's:

.1 For finishes, coatings, primers and paints.

.2 Shop Drawings

.1 Submit shop drawings in accordance with Division 1.

.2 Indicate construction details, sizes of steel sections and thickness of steel sheet.

.3 Submit shop drawing bearing stamp of a qualified professional engineer registered in Province of Ontario.

.3 Submit the following documentation: Product Data, Spec Sheet, Product Label, distance from factory, post consumer and post industrial recycled content, weight, VOC compliance, Environmental Certification if available. (materials)

**1.5 QUALITY ASSURANCE**

.1 Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

**1.6 WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

**Part 2 Products**

**2.1 MATERIALS**

.1 Steel sections: to CAN/CSA-G40.20/G40.21 Grade 300 W.

.2 Steel plate: to CAN/CSA-G40.20/G40.21, Grade 260 W, pattern diamond.

.1 Floor plate: to CAN/CSA-G40.20/G40.21, as indicated.

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

.4 Steel tubing: to CAN/CSA-G40.20/G40.21,square, grade, sizes and dimensions as indicated.

.5 Metal bar grating: to ANSI/NAAMM MBG 531, steel, Type W-19-4.

.6 Welding materials: to CSA W59.

.7 Bolts: to ASTM A307.

.8 High strength bolts: to ASTM A325M.

**2.2 FABRICATION**

.1 Fabricate to NAAMM, Metal Stair Manual.

.2 Weld connections where possible, otherwise bolt connections. Countersink exposed fastenings, cut off bolts flush with nuts. Make exposed connections of same material, colour and finish as base material on which they occur.

.3 Accurately form connections with exposed faces flush; mitres and joints tight. Make risers of equal height.

.4 Grind or file exposed welds and steel sections smooth.

.5 Shop fabricate ladder, balustrade and landing in sections as large and complete as practicable.

**2.3 FINISHES**

.1 Galvanizing: hot dipped galvanizing with zinc coating 600g/$m^2$to CAN/CSA-G164. Exterior-Metal Ladders, landings and balustrade.

**2.4 ACCESS LADDERS**

.1 Stringers: 65 x 10mm thick steel.

.2 Steel Rungs: 25mm diameter, welded to stringers at 300mm on centre maximum.

.3 Brackets: sized and shaped as indicated, weld to stringer at 3000mm maximum on centre, complete with fixing anchors.

.4 Galvanize finish for exterior.

.5 Galvanize exterior ladders after fabrication.

**Part 3 Execution**

**3.1 INSTALLATION OF LADDER**

.1 Install in accordance with NAAMM, Metal Stair Manual.

.2 Install plumb and true in exact locations, using welded connections wherever possible to provide rigid structure. Provide anchor bolts, bolts and plates for connecting ladder to structure.

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

.4 Do welding work in accordance with CSA W59 unless specified otherwise.

.5 Touch up shop primer to bolts, welds, and burned or scratched surfaces at completion of erection.

.6 Touch up shop galvanizing to bolts, welds, and burned or scratched surfaces at completion of erection.

**3.2 CLEANING**

.1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.

.2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**3.3 ACCESS LADDERS**

.1 Install access ladders in locations as indicated.

.2 Erect ladders 150mm clear of wall on bracket supports.

**END OF SECTION**