

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM A53/A53M-[02], Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM B209-14, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
 - .3 ASTM B221-14, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
 - .4 ASTM A240/A240M-16, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
 - .5 ASTM A269-[02], Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
 - .6 ASTM A307-[02], Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .7 ASTM B632/B632-M-15, Standard Specification for Aluminum-Alloy Rolled Tread Plate
- .2 American National Standards Institute:
 - .1 ANSI 14.3-2000, Safety Requirements for Fixed Ladders
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.40-[97], Anti-corrosive Structural Steel Alkyd Primer.
 - .2 CAN/CGSB-1.181-[92], Ready-Mixed, Organic Zinc-Rich Coating.
- .4 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-G40.20/G40.21-[98], General Requirements for Rolled or Welded Structural Quality Steel.
 - .2 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CAN/CSA-S16.1-[01], Limit States Design of Steel Structures.
 - .4 CSA W48-[01], Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
 - .5 CSA W59-[1989(R2001)], Welded Steel Construction (Metal Arc Welding) (Imperial Version).
- .5 The Environmental Choice Program
 - .1 CCD-047a-[98], Paints, Surface Coatings.
 - .2 CCD-048-[98], Surface Coatings - Recycled Water-borne.

1.2 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets. Indicate VOC's:

- .1 For finishes, coatings, primers and paints.
- .2 Shop Drawings
 - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.3 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.
- .3 Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Packing, Shipping, Handling and Unloading:
 - .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Storage and Protection:
 - .1 Cover exposed stainless steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.
 - .2 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 00 – Cleaning and Waste Management.

Part 2 Products

2.1 MATERIALS

- .1 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 300 W.
- .2 Steel pipe: to ASTM A53/A53M, standard weight, schedule 40 seamless black.
- .3 Steel tubing: to CAN/CSA-G40.20/G40.21 Grade 300W, square, wall thickness, sizes and dimensions as indicated.
- .4 Floor plate: to CAN/CSA-G40.20/G40.21, Grade 260 W, thickness as indicated.
- .5 Welding materials: to CSA W59.
- .6 Welding electrodes: to CSA W48 Series.
- .7 Bolts and anchor bolts: to ASTM A307.

- .8 Aluminum sheet: plain, 14 gauge minimum thickness, powder coated finish, colour to be determined.
- .9 Aluminum finishing materials: 18 gauge unless noted otherwise, satin anodized, to ASTM B632 and ASTM B209.
- .10 Stainless steel finishing materials: 22 gauge unless noted otherwise, satin finish, ASTM A240.
- .11 Stainless steel tubing: to ASTM A269, Commercial grade.
- .12 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: to CAN/CGSB-1.40.
- .3 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

2.4 ISOLATION COATING

- .1 Isolate aluminum from following components, by means of bituminous paint:
 - .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
 - .2 Concrete, mortar and masonry.
 - .3 Wood.

2.5 SHOP PAINTING

- .1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.
- .2 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.
- .3 Clean surfaces to be field welded; do not paint.

2.6 COUNTER BRACKETS, BENCH BASE SUPPORTS

- .1 Fabricate brackets and supports from steel, sizes as indicated.

.2 Shop coat prime after fabrication and apply a high build epoxy coating finish to Section 09 91 23 – Interior Painting.

.3 Colour: Refer to drawings for paint colour schedule.

2.7 WALL PROTECTION RAILS

.1 Dimensions: 6" height, length as indicated.

.2 Rail: 1 1/2" diameter stainless steel tubing, 1/8" wall thickness, cap and weld exposed ends.

.3 Posts: 1/2" x 1 1/2" stainless steel bar stock.

.4 Base plates: 1/8" thick, 3" diameter round stainless steel plates c/w countersunk stainless steel hardware.

.5 All stainless steel to be satin finish.

2.8 CORNER GUARDS

.1 22 gauge stainless steel to ASTM A240.

.2 3'-0" high with 2" leg. Leg to incorporate bend to account for uneven substrates.

.3 Adhere or mechanically fasten into solid blocking. Fasteners to be stainless steel flat-head screws with countersunk holes installed flush or stainless steel oval head screws.

.4 Stainless steel to be satin finish.

2.9 RADIATOR SHROUDS

.1 Dimensions: To suit dimensions of existing radiator and as indicated.

.2 Mounting Angles: 3" x 1/8" stainless steel angle c/w stainless steel hardware to suit substrates. Edges deburred and smooth.

.3 Shroud: 11 gauge perforated stainless steel, 3/8" round, 1/2" staggered, min 50% open area. Edges deburred and smooth. To ASTM A240.

.4 Stainless steel to be satin finish.

2.10 ALUMINUM REVEAL STRIPS

.1 18 gauge satin anodized aluminum to ASTM B632 and ASTM B209.

.2 Dimensions: As indicated. Strips to be continuous for full height of wall.

.3 Adhere reveal strips to substrate.

2.11 ALUMINUM WALL BASE

.1 18 gauge satin anodized aluminum to ASTM B632 and ASTM B209.

.2 Dimensions: As indicated. Cove bend at base. Min 10' lengths.

- .3 Adhere wall base to substrate.

2.12 STAINLESS STEEL COLUMN COVERS

- .1 22 gauge stainless steel to ASTM A240.
- .2 Adhere or mechanically fasten into solid blocking. Fasteners to be stainless steel flat-head screws with countersunk holes installed flush or stainless steel oval head screws.
- .3 Stainless steel to be satin finish.

Part 3 Execution

3.1 ERECTION

- .1 Do welding work in accordance with CSA W59 unless specified otherwise.
- .2 Erect metal work square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3 Provide suitable means of anchorage acceptable to Contract Administrator such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .4 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .5 Provide components for building by other sections in accordance with shop drawings and schedule.
- .6 Make field connections with bolts to CAN/CSA-S16.1, or weld.
- .7 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.
- .8 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer.
- .9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.
- .10 Touch-up high build epoxy coated finishes.

3.2 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American National Standards Institute/National Association of Architectural Metal Manufacturers (ANSI/NAAMM)
 - .1 ANSI/NAAMM MBG531, Metal Bar Grating Manual.
- .2 American Society for Testing and Materials,(ASTM)
 - .1 ASTM A53/A53M, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A307, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .3 ASTM A325M, Specification for Structural Bolts, Steel, Heat Treated, 830 MPa Minimum Tensile Strength.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.40, Anti-corrosive Structural Steel Alkyd Primer.
 - .2 CAN/CGSB-1.181, Ready-Mixed Organic Zinc-Rich Coating.
- .4 Canadian Standards Association (CSA)
 - .1 CAN/CSA-G40.20/G40.21, General Requirements for Rolled or welded Structural Quality Steel.
 - .2 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA W59,Welded Steel Construction (Metal Arc Welding/Imperial Version).
- .5 National Association of Architectural Metal Manufactures (NAAMM)
 - .1 AMP 510, Metal Stair Manual.
- .6 Steel Structures Painting Council (SSPC)
 - .1 Systems and Specifications Manual, Volume 2.

1.2 SYSTEM REQUIREMENTS

- .1 Design metal stair, balustrade and landing construction and connections to NBC vertical and horizontal live load requirements.
- .2 Detail and fabricate stairs to NAAMM Metal Stairs Manual.

1.3 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets. Indicate VOC's:
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1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Packing, Shipping, Handling and Unloading:
 - .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Storage and Protection:
 - .1 Cover exposed stainless steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job Site.
 - .2 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 00 – Cleaning and Waste Management.

Part 2 Products

2.1 MATERIALS

- .1 Steel sections: to CAN/CSA-G40.20/G40.21 Grade 300 W.
- .2 Floor plate: to CAN/CSA-G40.20/G40.21, Grade 260 W.
 - .1 Thickness: 3 mm.
- .3 Steel pipe: to ASTM A53/A53M, standard weight, schedule 40 seamless black.
- .4 Steel tubing: to CAN/CSA-G40.20/G40.21, Grade 300W, square, wall thickness, sizes and dimensions as indicated.
- .5 Steel bars to CAN/CSA-G40.21, 20 mm diameter.
- .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 stairs in sections as large and complete as practicable.

2.3 STEEL PAN STAIRS

- .1 Fabricate stairs with closed riser steel pan construction.
- .2 Form treads and risers from 3 mm thick steel plate. Secure treads and risers to L 35 x 35 x 5 horizontal and vertical welded to stringers.
- .3 Form wall stringers from MC 310 x 15.8.
- .4 Form outer stringers from MC 310 x 15.8 with 5 mm thick plate fascia welded on.
- .5 Form landings from 3 mm thick steel plate, reinforced by L 55 x 55 x 6 mm spaced at 400 mm on centre.
- .6 Provide clip angles for fastening of furring channels, where applied finish is indicated for underside of stairs and landings.
- .7 Extend stringers around mid-landings to form steel base.
- .8 Close ends of stringers where exposed.
- .9 Shop coat prime after fabrication and apply a high build epoxy coating finish to Section 09 91 23 – Interior Painting.
- .10 Colour: Refer to drawings for paint colour schedule.

2.4 PIPE/TUBING BALUSTRADES

- .1 Construct balusters and handrails from steel pipe steel tubing or steel tubing.
- .2 Cap and weld exposed ends of balusters and handrails.
- .3 Terminate at abutting wall with end flange.
- .4 Shop coat prime after fabrication and apply a high build epoxy coating finish to Section 09 91 23 – Interior Painting.
- .5 Colour: Refer to drawings for paint colour schedule.

2.5 EXTERIOR GUARDS AND HANDRAILS

- .1 Construct exterior guards and handrails as follows:

- .1 Balusters: 38mm x 13mm solid steel section.
 - .2 Top rail: 38 mm diameter standard steel pipe.
 - .3 Mid rail: 38 mm diameter standard steel pipe.
 - .4 Bottom rail: 38 mm diameter standard steel pipe (where noted).
 - .5 Posts: same as balusters.
- .2 Weld balustrades to base plates as indicated.
 - .3 Shop coat prime after fabrication and apply a high build epoxy coating finish to Section 09 91 12 – Exterior Painting.
 - .4 Colour: Refer to drawings for paint colour schedule.

2.6 WOOD CLAD BALUSTRADES AND HANDRAILS

- .1 Construct steel reinforced wood handrails and balustrades from solid steel sections clad in wood with concealed fastenings.
- .2 Shop coat prime after fabrication and apply a high build epoxy coating finish to Section 09 91 23 – Interior Painting.
- .3 Colour: Refer to drawings for paint colour schedule.

2.7 ACCESS LADDERS INTERIOR/EXTERIOR

- .1 Stringers: 55 x 55 x 6 mm thick, steel angle.
- .2 Steel Rungs: 20 mm diameter, welded to stringers at 300 mm on centre.
- .3 Brackets: sizes and shapes as indicated, weld to stringers at 1200 mm c.c., complete with fixing anchors.
- .4 Cover Guard: metal plate guard cover, min 3mm thick c/w hinges @ 900 o.c. and hasp to accept Pad lock (lock NIC).
- .5 Shop coat prime interior ladders after fabrication. Shop coat prime exterior ladders after fabrication and apply a high build epoxy coating finish to Sections Section 09 91 12 – Exterior Painting and 09 91 23 – Interior Painting.

2.8 FINISHES

- .1 Shop coat primer: to CAN/CGSB-1.40.
- .2 Apply a high build epoxy coating finish to Section 09 91 23 – Interior Painting.

2.9 SHOP PAINTING

- .1 Clean surfaces in accordance with Steel Structures Painting Council Manual Volume 2.
- .2 Apply one coat of shop primer except interior surfaces of pans.
- .3 Apply two coats of primer of different colours to parts inaccessible after final assembly.
- .4 Use primer as prepared by manufacturer without thinning or adding admixtures. Paint on dry surfaces, free from rust, scale, grease, do not paint when temperature is below 7 degrees C.

- .5 Do not paint surfaces to be field welded.

Part 3 Execution

3.1 INSTALLATION OF STAIRS

- .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 stairs 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.

3.2 INSTALLATION OF ACCESS LADDERS

- .1 Install access ladders in locations as indicated.
- .2 Erect ladders 200mm clear of wall on bracket supports.

3.3 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.

3.4 PROTECTION

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

END OF SECTION