

Part 1 General

1.1 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM A307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .2 CSA International
 - .1 CSA G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA S16-09, Design of Steel Structures.
 - .4 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
 - .5 CSA W59-M03(R2008), Welded Steel Construction (Metal Arc Welding) Metric.
- .3 Green Seal Environmental Standards (GS)
 - .1 GS-11-2008, 2nd Edition, Paints and Coatings.
- .4 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.
- .5 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.2 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, and bolts and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 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 Saskatchewan, Canada.
 - .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: 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.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements and 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 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 of pallets, crates, padding, packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 MATERIALS

- .1 Steel sections and plates: to CSA G40.20/G40.21, Grade 350W.
- .2 Welding materials: to CSA W59.
- .3 Welding electrodes: to CSA W48 Series.
- .4 Bolts and anchor bolts: to ASTM A307.

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 (LINTELS)

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

2.4 SHOP PAINTING (BOLLARDS)

- .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, sizes indicated for openings. Provide 150 mm minimum bearing at ends.

2.6 BOLLARDS

- .1 Fabricate bollards complete with clip angles as indicated.
- .2 Concrete bases:
 - .1 Dimensions as indicated.
 - .2 Reinforcement as indicated.
 - .3 Use same concrete mix as concrete pad mix. Refer to structural drawings and Section 03 30 00 01 - Cast-in-Place Concrete Works for concrete and reinforcement specifications.

2.7 W-BEAM GUARDRAILS

- .1 Provide 311 mm wide galvanized W-Beam highway guardrail with flared end sections to length indicated. Bend to suit.

2.8 CORNER GUARDS

- .1 Refer to Section 10 26 00 – Corner Guards.

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.
- .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 as indicated.
- .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 SAFETY BARRIER

- .1 Set bollards in concrete and fill with concrete as indicated.
- .2 Assemble and install safety barrier complete with painted bollards and galvanized steel W-Beams as indicated.

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 recycling in accordance with Section 01 74 21- Construction/Demolition 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

Part 1 General

1.1 REFERENCE STANDARDS

- .1 American National Standards Institute/National Association of Architectural Metal Manufacturers (ANSI/NAAMM)
 - .1 ANSI/NAAMM MBG 531-00, Metal Bar Grating Manual.
- .2 ASTM International
 - .1 ASTM A53/A53M-07, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .3 ASTM A325M-09, Standard Specification for Structural Bolts, Steel, Heat Treated, 830 MPa Minimum Tensile Strength [Metric].
- .3 CSA International
 - .1 CSA G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA G164 M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA W59-03(R2008), Welded Steel Construction (Metal Arc Welding).
- .4 National Association of Architectural Metal Manufacturers (NAAMM)
 - .1 AMP 510-92, Metal Stair Manual.
- .5 National Research Council Canada (NRC)
 - .1 National Building Code of Canada 2015 NBC.

1.2 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 pre-manufactured products and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Saskatchewan, Canada.
 - .2 Indicate construction details, sizes of steel sections and thickness steel.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Storage and Handling Requirements:
 - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

- .2 Replace defective or damaged materials with new.

Part 2 Products

2.1 SYSTEM DESCRIPTION

- .1 Design Requirements:
- .2 Design metal stair, balustrade and landing construction and connections to National Building Code of Canada (NBC) vertical and horizontal live load requirements.
- .3 Detail and fabricate stairs to NAAMM Metal Stairs Manual.

2.2 MATERIALS

- .1 Steel sections: to CSA G40.20/G40.21 Grade 300W.
- .2 Steel plate: to CSA G40.20/G40.21, Grade 260 W.
- .3 Steel pipe: to ASTM A53/A53M, standard weight, schedule 40 seamless black.
- .4 Steel tubing: to CSA G40.20/G40.21, Grade 400, square.
- .5 Metal bar grating: to ANSI/NAAMM MBG 531, steel, Type W-19-4, serrated, with checkered plate nosings.
- .6 Welding materials: to CSA W59.
- .7 Bolts: to ASTM A307.

2.3 FABRICATION

- .1 Fabricate in accordance with 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:
 - .1 Make mitres and joints tight.
 - .2 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.

2.4 GRATING STAIRS

- .1 Form steel grating treads and landings from metal bar grating to profile indicated and secure to stringers and supports. Form landings of steel grating and reinforce as required.

2.5 HANDRAILS

- .1 Construct handrails from steel pipe and bar as indicated.
- .2 Cap and weld exposed ends of balusters and handrails.

2.6 BAR BALUSTRADES

- .1 Construct bar balustrades as follows:
 - .1 Balusters: 12 x 12mm bar.
- .2 Weld balustrades to rails as indicated.

2.7 FINISHES

- .1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m² to CAN/CSA-G164.

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 stairs installation in accordance with manufacturer's written instructions.
 - .1 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION OF STAIRS

- .1 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.
- .2 Do welding work in accordance with CSA W59 unless specified otherwise.
- .3 Touch up galvanized coating to welds, and burned or scratched surfaces at completion of erection.

3.3 CLEANING

- .1 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.

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