

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 04 21 13 – Brick Masonry
- .2 Section 09 21 16 – Gypsum Board Assemblies
- .3 Section 09 91 23 – Interior painting

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM A53/A53M-12, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A123/A123M-15, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - .3 ASTM A194 / A194M-15a, Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.
 - .4 ASTM A307-14, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .5 ASTM A325-14, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric).
 - .6 ASTM A269/A269M-15a, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
 - .7 ASTM F436M-11, Standard Specification for Hardened Steel Washers (Metric).
- .2 CSA International
 - .1 CAN/CSA G164-92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .2 CSA G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .3 CSA S16-14, Design of Steel Structures.
 - .4 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
 - .5 CSA W59-13, Welded Steel Construction (Metal Arc Welding)(Metric).
- .3 The National Association of Architectural Metal Manufacturer:
 - .1 EMMA 557-99, Standards for Expanded Metal.
- .4 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.
- .5 Steel structures painting council (SSPC)
 - .1 SSPC Painting manual.
 - .2
- .6 National Ornamental & Miscellaneous Metals Association (NOMMA)

METAL FABRICATIONS

- .1 Joint finish guideline – 1994.

1.3 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 pipe tubing bolts 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 Province Territory of QUEBEC, Canada.
 - .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
 - .3 Shop drawings shall illustrate following construction details: specialties, general arrangements, typical and special conditions of installations, materials, connections, accompanying items, anchors, location of fasteners and of exposed interfaces with adjacent materials.

1.4 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.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements with 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 off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Exposed surfaces of stainless steel items to be covered with thick self-adhesive paper or peelable plastic film before shipment of these items to site.
 - .3 Surfaces must not be cleared of protecting coating until final cleaning of building. Provide necessary instructions for removal of these protections.
 - .4 Replace defective or damaged materials with new.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse recycling in accordance with Section 01 74 21 - Construction/renovation/demolition waste management and disposal (CRD).
- .2 Remove all packaging materials from site and send to appropriate recycling facilities.

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1.7 RECYCLED CONTENT

- .1 Materials and products described in this section shall contain overall minimum average by weight of 20% post-domestic consumption recycled materials OR 40% post-industrial consumption recycled materials.

Part 2 Products**2.1 MATERIALS**

- .1 Steel sections and plates: Grade 300W, to CSA G40.20/G40.21, thickness as indicated in drawings.
- .2 Steel pipes: to ASTM A53/A53M, standard series, galvanized finish.
- .3 Stainless steel tubes and plates: to ASTM A269, Grade 304, commercial grade, for welding, without longitudinal seam, AISI number 4 finish.
- .4 Welding materials: to CSA W59.
- .5 Welding electrodes: to CSA W48 Series.
- .6 Bolts and anchor bolts: to ASTM A325, Type 1 medium carbon steel bolts, galvanized finish; ASTM A194/194M, Grade 2H nuts, galvanized finish; ASTM F436M, Type 1 washers.
- .7 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 round oval 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 Galvanization: hot dip with zinc coating, 600 g/m², ASTM A123/A123M. Typical for all exterior assemblies.
- .2 Primer applied in shop: in accordance with product MPI-EXT 5.1B and standard GS-11 for chemical composition and SCAQMD Rule 1168 for VOC level.
- .3 Zinc-rich primer: ready for use, in accordance with product MPI-INT 5.2C and standard GS-11, for chemical composition and SCAQMD Rule 1168 for VOC level.
- .4 Painting systems for non-galvanized interior metals: refer to Section 09 91 23 – Painting.

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.

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- .2 Concrete, mortar and masonry.
- .3 Wood.

2.5 SHOP PAINTING

- .1 Primer: VOC limit 250 g/L maximum to GS-11 CCD-047a CCD-048.
- .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 Surfaces to be welded on site must be cleaned and must not be coated with paint.
- .5 Surfaces must be cleaned according to instructions in Volume 2 of Steel Structures Painting Council manual.
- .6 All surfaces must be covered with one (1) coat of primer applied in shop, except interior surfaces of crib steps.
- .7 Surfaces inaccessible after assembly must be covered with two (2) coats of primer of a different colour.

2.6 ANGLE LINTELS

- .1 Steel angles: galvanized prime painted, sizes indicated for openings. Provide 150 mm minimum bearing at ends.
- .2 Weld or bolt back-to-back angles to profiles as indicated.
- .3 Finish: shop painted.
 - .1 Primer: VOC limit 250 g/L maximum to GS-11 when applied onsite.
- .4 Frames made of steel profiles, in dimensions indicated for profiles and apertures.
- .5 Profiles assembled by welding to form single-piece post-and-beam frame, in dimensions indicated.
- .6 Flat steel anchors, 38 mm x 38 mm x 6 mm thick, welded to post of frame in 600 mm centre-to-centre profiles.
- .7 Finish: Galvanized.

2.7 CHANNEL FRAMES

- .1 Fabricate frames from steel, sizes of channel and opening as indicated.
- .2 Weld channels together to form continuous frame for jambs and head of openings, sizes as indicated.
- .3 Weld 50 mm x 50 mm x 6 mm thick steel strap anchors to channel jamb frame at 600 mm on centre.
- .4 Finish: galvanised for exterior components, prime coat painted for interior components.

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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 Ministerial Representative.
 - .2 Inform Ministerial 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 Ministerial 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 Ministerial 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 with bolts to CSA S16 Weld field connection.
- .7 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.
- .8 Once assembly is completed, use primer to touch up rivets, welds done on site, bolts and burned or scratched surfaces.
- .9 Using zinc-rich primer, touch up galvanized surfaces in places burned during on-site welding.
- .10 Hand over, to appropriate trades, templates and items to be immersed in concrete or embedded in masonry.

3.3 CHANNEL FRAMES

- .1 Install steel channel frames to openings as indicated.

3.4 CLEANING

- .1 Clean metalwork as soon as possible after installation to rid it of dust generated by construction work or by surroundings.
- .2 Removal all protective labels just before final acceptance, and clean products using cleaners recommended by manufacturer.
- .3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

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- .1 Leave Work area clean at end of each day.

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