

Part 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 04 22 00 – Concrete Unit Masonry.
- .2 Section 09 91 23 – Interior Painting.
- .3 Section 10 14 00 – Signage.
- .4 Section 10 14 53 – Traffic signage.

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM A123/A123M-15, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM A194/A194M-15a, Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.
 - .3 ASTM A307-14, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .4 ASTM A325-14, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric).
 - .5 ASTM F436M-11, Standard Specification for Hardened Steel Washers (Metric).
- .2 CSA Group
 - .1 CSA-G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA-S16-14, Design of Steel Structures.
 - .3 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding (prepared in collaboration with the Canadian Welding Bureau).
 - .4 CSA W59-13, Welded Steel Construction (Metal Arc Welding)(Imperial version).
- .3 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - 2014.
- .4 Steel structures painting council (SSPC)
 - .1 SSPC Painting manual.
- .5 National Ornamental & Miscellaneous Metals Association (NOMMA)
 - .1 Joint finish guideline – 1994.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
 - .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Submit drawings stamped and signed by professional engineer registered or licensed in Quebec, Canada.
 - .3 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
 - .4 Indicate specialties, general arrangements, standard and special installation conditions, materials, connections, associated components, anchors, location of fasteners and exposed interfaces of adjacent materials.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

- .2 Storage and protection:
 - .1 Cover exposed stainless steel surfaces with self-adhering heavy paper or peelable plastic film before shipping components to site.
 - .2 Do not remove protective covering until final cleaning of building. Provide instructions for removal.

1.5 CALCULATION CRITERIA

- .1 In addition to the other structural considerations, calculate the work under this section to withstand wind and seismic loads in accordance with the National Building Code of Canada.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .2 Remove packaging waste from work site and ship to appropriate recycling centres.
- .3 Divert unused metal materials from landfill to recycling facility as approved.

1.7 RECYCLED CONTENT

- .1 Product and materials under this section must contain minimum average recycled content of 20% post-consumer content OR 40% post-industrial content.

Part 2 PRODUCTS

2.1 MATERIALS

- .1 Steel sections and plates: to CSA G40.20/G40.21, Grade 350W, thickness as indicated in the drawings.
- .2 Bolts and anchor bolts: to ASTM A325, medium carbon Type 1 steel bolts, galvanized; ASTM A194/A194M, grade 2H nuts, galvanized; ASTM F436M, Type 1 washers; ASTM A 307, prison fabrication.
- .3 Welding electrodes: to CSA W48 Series.
- .4 Welding materials: to CSA W59.
- .5 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 Where possible, fit and shop assemble work, ready for erection.
- .3 Reinforce work to meet intended use to withstand loads.
- .4 Fabricate curved work smooth, uniform and consistent as detailed.
- .5 Cut and adjust joints accurately and closely fitted.
- .6 Brace during transportation and assembly to maintain alignment.
- .7 Ensure exposed welds are continuous for length of each joint:
 - .1 File or grind exposed welds smooth and flush.
 - .2 Grind, fill with welding material and file exposed welds smooth and flush prior to applying finish.
 - .3 File or grind exposed welds smooth and flush.
 - .4 Weld to avoid warping, discolouration and damage.
 - .5 Ensure exposed welds are continuous for length of each joint.
- .8 Round corners to uniform radius of approximately 0.5 mm.
- .9 Drill holes as required for fixed components or components penetrating exposed steel.
- .10 Conceal erection or identification marks.

- .11 Space all exposed caps, angle joints, butt joints minimum 3 mm thick for open joints and uniform, tight-fitting for joints with no spacing.
- .12 Conceal fasteners wherever possible.

2.3 FINISHES

- .1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m² to ASTM A123/A123M.
- .2 Zinc primer: zinc rich, ready mix compliant to MPI-INT 5.2C.
- .3 Shop coat primer: compliant to MPI-INT 5.1A.

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 - PREPARATION

- .1 Remove lamination marks, rust, oil, dirt and other foreign matter.
- .2 Clean interior metal : Solvent Cleaning, followed by SSPC SP.6: Commercial Blast Cleaning.
- .3 Remove sharp edges, rough spots, weld splashes and other defect prior to applying primers.

2.6 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.
- .4 Primer not prepared as specified in SSPC will be rejected by Departmental Representative. Remove and reinstall as specified.

2.7 ANGLE LINTELS

- .1 Steel angles: galvanized, sizes indicated for openings. Provide 150 mm minimum bearing at ends.
- .2 Weld or bolt back-to-back angles to profiles as indicated.
- .3 Interior lintel finish: factory applied primer and finish applied after installation.
- .4 Exterior lintel finish: hot-dipped galvanization.

2.8 MISCELLANEOUS ITEMS

- .1 Refer to drawings for miscellaneous metal items to be fabricated, provided and installed under this section.

Part 3 EXECUTION

3.1 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 with bolts to CSA S16 or 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 Touch-up rivets, field welds, bolts and burnt or scratched surfaces with primer after completion.
- .9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

3.2 CLEANING

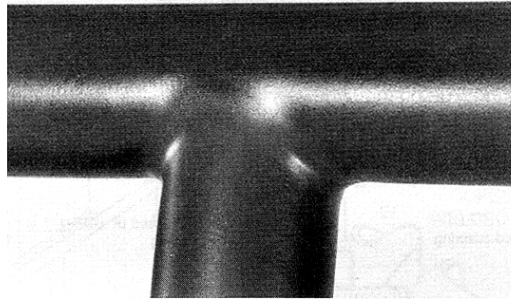
- .1 Upon completion, clean site to remove accumulated dirt and debris, attributable to construction work and environment.
- .2 Remove protective labels immediately prior to final acceptance and clean products using cleaners recommended by manufacturer.
- .3 Upon completion, remove surplus materials, rubbish, tools, equipment and security barriers.

Partie 4 - ILLUSTRATIONS

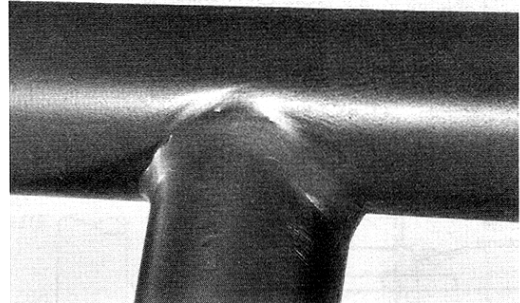
Railing System Joint Construction

Welded Steel Pipe or Tubing with Prime Coat of Paint Applied

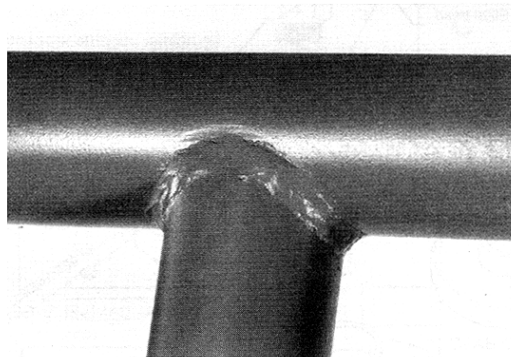
- Type 1 — Ornamental quality —
used where appearance is a critical factor
- Type 2 — Weld of good appearance used in areas of traffic —
where highly ornamental quality is not required
- Type 3 — Used in areas where it is not subject to view —
as in service stairs
- Type 4 — Acceptable when appearance is not a factor —
used in industrial and non-public areas



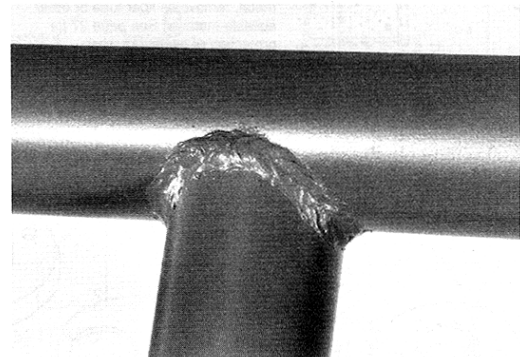
Type 1



Type 2



Type 3



Type 4

The above descriptions for Railing System Joint Construction are based on "Voluntary Joint Finish Standards" developed by the National Ornamental & Miscellaneous Metals Association (NOMMA). Photographs were provided through the courtesy of NOMMA.

END OF SECTION