

## PART 1 - GENERAL

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| <u>1.1 REFERENCES</u>                          | .1 | ASTM International   |
|  | .1 | ASTM A 123/A 123M-15, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.  |
|  | .2 | ASTM E 935-13e1, Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings.   |
|  | .2 | Canada Green Building Council (CaGBC)  |
|  | .1 | LEED Canada 2009 for Design and Construction-2010, LEED Canada 2009 for Design and Construction Leadership in Energy and Environmental Design Green Building Rating System Reference Guide.    |
|  | .3 | CSA International  |
|  | .1 | CSA W59-13, Welded Steel Construction, (Metal Arc Welding).  |
| <u>1.2 ACTION AND INFORMATIONAL SUBMITTALS</u> | .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 handrails 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 the Province of Newfoundland and Labrador, Canada.   |
|  | .1 | Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.  |
|  | .4 | Samples:   |
|  | .1 | Submit for review and acceptance of each unit.   |
|  | .2 | Samples will be returned for inclusion into work.  |

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| 1.2 ACTION AND<br>INFORMATIONAL<br>SUBMITTALS<br>(Cont'd) | .5 | Sustainable Design Submittals:<br>.1 LEED Canada- Submittals: in accordance<br>with Section 01 35 21 - LEED Requirements.   |
| 1.3 QUALITY<br>ASSURANCE                                  | .1 | Perform welding to CSA W59.   |
| 1.4 DELIVERY,<br>STORAGE AND<br>HANDLING                  | .1 | Deliver, store and handle materials in<br>accordance with Section 01 61 00 - Common<br>Product Requirements and with manufacturer's<br>written instructions.  |
|   | .2 | Delivery and Acceptance Requirements: deliver<br>materials to site in original factory<br>packaging, labelled with manufacturer's name<br>and address.  |
|   | .3 | Storage and Handling Requirements:<br>.1 Store materials off ground, indoors, in<br>dry location and in accordance with<br>manufacturer's recommendations in clean, dry,<br>well-ventilated area.<br>.2 Store and protect railings from nicks,<br>scratches, and blemishes.<br>.3 Replace defective or damaged materials<br>with new. |
|   | .4 | Develop Construction Waste Management Plan<br>related to Work of this Section and in<br>accordance with Section 01 35 21 - LEED<br>Requirements.  |
|   | .5 | Packaging Waste Management: remove for reuse<br>or return of pallets, crates, padding,<br>banding, and packaging materials as specified<br>in Construction Waste Management Plan in<br>accordance with Section 01 74 21 -<br>Construction/Demolition Waste Management and<br>Disposal and Section 01 35 21 - LEED<br>Requirements.    |
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## PART 2 - PRODUCTS

- 2.1 DESIGN CRITERIA .1 Installed hand rail assembly and attachments to resist loads on guards and handrails as required by the National Building Code of Canada (current edition) without damage or permanent set. Test in accordance with ASTM A 935.
- 2.2 STEEL RAILING .1 Rails and Posts: pipe with welded joints. Sizes as indicated on drawings.
- .2 Fittings: elbows, T-shapes, wall brackets, escutcheons; machined steel.
- .3 Mounting: brackets and flanges. Prepare backing plate for mounting in wall construction.
- .4 Exposed Fasteners: as indicated.
- .5 Splice Connectors: steel welding collars.
- .6 Galvanizing: to ASTM A 123, provide minimum 600 g/sq m galvanized coating.
- .1 Touch-Up Primer for Galvanized Surfaces: SPCC 20 Type II Organic zinc rich.
- 2.3 FABRICATION .1 Fit and shop assemble components in largest practical sizes for delivery to site.
- .2 Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
- .3 Provide anchors, plates and angles required for connecting railings to structure.
- .4 Exposed Mechanical Fastenings: as indicated; consistent with design of component, except where specifically noted otherwise.
- .1 Supply components required for anchorage of fabrications. Fabricate anchors and related

- 2.3 FABRICATION      .4    Exposed Mechanical Fastenings: (Cont'd)  
    (Cont'd)
- .1    (Cont'd)  
         components of same material and finish as  
         fabrication, except where specifically noted  
         otherwise.
- .2    Continuously seal joined pieces by  
         continuous welds. Drill condensate drainage  
         holes at bottom of members at locations that  
         will not encourage water intrusion.
- .3    Grind exposed joints flush and smooth  
         with adjacent finish surface. Make exposed  
         joints butt tight, flush, and hairline. Ease  
         exposed edges to small uniform radius.
- .4    Accurately assemble components to each  
         other and to building structure.
- .5    Accommodate for expansion and  
         contraction of members and building movement  
         without damage to connections or members.

PART 3 - EXECUTION

- 3.1 EXAMINATION      .1    Verification of Conditions: verify conditions  
         of substrates previously installed under other  
         Sections or Contracts are acceptable for  
         handrail 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 INSTALLATION      .1    Install handrails in accordance with  
         manufacturer's instructions.
- .2    Coordinate with other roofing work to produce  
         a weathertight assembly. Cooperate with roof  
         installers to maintain weathertight temporary  
         covering and final roof assembly.
- .3    Install components plumb and level.

- 3.2 INSTALLATION (Cont'd)
- .4 Anchor railings to structure as indicated.
  - .5 Provide anchors as indicate:
    - .1 Grind welds smooth.
    - .2 Touch-up welds with primer.
  - .6 Conceal bolts and screws whenever possible.
  - .7 Assemble with spigots and sleeves to accommodate tight inconspicuous joints and secure installation.
- 3.3 ERECTION TOLERANCES
- .1 Maximum Variation From Plumb: 6 mm.
  - .2 Maximum Out-of-Position: 6 mm.
- 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 reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and Section 01 35 21 - LEED Requirements.
    - .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 hand rail installation.