

## PART 1 - GENERAL

### 1.1 REFERENCES

- .1 ASTM International
    - .1 ASTM A 53/A 53M-07, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
    - .2 ASTM A 269-08, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
    - .3 ASTM A 307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
  - .2 Canada Green Building Council (CaGBC)
    - .1 LEED Canada-NC-2009, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations.
  - .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 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.
  - .4 Environmental Choice Program
    - .1 CCD-047-98 (R2005), Architectural Surface Coatings.
    - .2 CCD-048-98 (R2006), Surface Coatings - Recycled Water-borne.
  - .5 Green Seal Environmental Standards (GS)
    - .1 GS-11-2008, 2nd Edition, Paints and Coatings.
  - .6 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
    - .1 Material Safety Data Sheets (MSDS).
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1.1 REFERENCES (Cont'd)	.7	The Master Painters Institute (MPI) .1 Architectural Painting Specification Manual - current edition.
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 metal fabrications and include product characteristics, performance criteria, physical size, finish and limitations. .2 Submit electronic 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	Sustainable Design Submittals: .1 LEED Canada-NC Version 1.0 Submittals: in accordance with Section 01 35 21 - LEED Requirements.
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 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.

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| 1.4 DELIVERY,<br>STORAGE AND<br>HANDLING<br>(Cont'd) | .3 | Develop Construction Waste Management Plan related to Work of this Section and in accordance with Section 01 35 21 - LEED Requirements.   |
|  | .4 | Packaging Waste Management: remove for reuse and return of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and Section 01 35 21 - LEED Requirements. |

## PART 2 - PRODUCTS

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| 2.1 MATERIALS   | .1 | Steel sections and plates: to CSA G40.20/G40.21, Grade 300W.  |
|                 | .2 | Steel pipe: to ASTM A 53/A 53M standard weight black or galvanized finish, as indicated.                              |
|                 | .3 | Welding materials: to CSA W59.  |
|                 | .4 | Welding electrodes: to CSA W48 Series.  |
|                 | .5 | Bolts and anchor bolts: to ASTM A 307.  |
|                 | .6 | Stainless steel tubing: to ASTM A 269, Type 316 seamless welded with AISI No. 4 finish.                               |
|                 | .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 | Where possible, fit and shop assemble work, ready for erection.   |
|                 | .3 | Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.           |
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- 2.3 FINISHES
- .1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m<sup>2</sup> to CAN/CSA-G164.
  - .2 Stainless steel to ASTM A27.6.S316.
  - .3 High build epoxy coating: to CAN/CGSB-1.153.
- 2.4 SHOP PAINTING
- .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, stainless steel 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 PIPE RAILINGS
- .1 Steel pipe, exterior: hot dipped galvanized steel construction, formed to shapes and sizes as indicated.
  - .2 Steel pipe interior: standard black pipe construction formed to shapes and sizes as indicated.
  - .3 Galvanized exterior railings after fabrication.
  - .4 Shop coat prime interior railings after fabrication.
- 2.6 BENT PLATE DOOR FRAMES
- .1 Fabricate frames from steel plate, sizes and shapes as indicated.
  - .2 Weld frames together to form continuous frame for jambs and head of openings, sizes as indicated.
  - .3 Finish: galvanized.
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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 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 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.
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- 3.2 ERECTION  
(Cont'd)
- .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 PIPE RAILINGS .1 Install pipe railings as indicated.
- 3.4 BENT PLATE  
FRAMES .1 Install steel bent plate frames to openings as indicated.
- 3.5 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.
- 3.6 PROTECTION .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by metal fabrications installation.