

**Part 1            General**

**1.1                REFERENCES**

- .1    ASTM International Inc.
  - .1    ASTM A36/A36M-08, Standard Specification for Carbon Structural Steel.
  - .2    ASTM A193/A193M-08, Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature or High-Pressure Service and Other Special Purpose Applications.
  - .3    ASTM A307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
  - .4    ASTM A325-07a, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
  - .5    ASTM A325M-08, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength[Metric].
  - .6    ASTM A490M-04ae, Standard Specification for High-Strength Steel Structural Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints [Metric].
- .2    Canadian General Standards Board (CGSB)
  - .1    CAN/CGSB-85.10-99, Protective Coatings for Metals.
- .3    Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturers Association (CPMA).
  - .1    Handbook of the Canadian Institute of Steel Construction.
  - .2    CISC/CPMA Standard 2-75, Quick-Drying Primer for use on Structural Steel.
- .4    Canadian Standards Association (CSA International)
  - .1    CSA G40.20/G40.21-04, 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    CAN/CSA-S16-01(R2007), Limit States Design of Steel Structures.
  - .4    CAN/CSA-S136-07, North American Specifications for the Design of Cold Formed Steel Structural Members.
  - .5    CSA W47.1-03, Certification of Companies for Fusion Welding of Steel.
  - .6    CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding.
  - .7    CSA W55.3-1965(R2003), Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
  - .8    CSA W59-03, Welded Steel Construction (Metal Arc Welding).
- .5    Master Painters Institute
  - .1    MPI-INT 5.1-08, Structural Steel and Metal Fabrications.
  - .2    MPI-EXT 5.1-08, Structural Steel and Metal Fabrications.

- .6 The Society for Protective Coatings (SSPC) and National Association of Corrosion Engineers (NACE) International
  - .1 NACE No. 3/SSPC SP-6-06, Commercial Blast Cleaning.

## **1.2 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
  - .1 Provide drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.
- .3 Erection drawings:
  - .1 Submit erection drawings indicating details and information necessary for assembly and erection purposes including:
    - .1 Description of methods.
    - .2 Sequence of erection.
    - .3 Type of equipment used in erection.
    - .4 Temporary bracings.
- .4 Fabrication drawings:
  - .1 Submit fabrication drawings showing designed assemblies, components and connections are stamped and signed by qualified professional engineer licensed in the Province of Manitoba, Canada.
- .5 Source Quality Control Submittals:
  - .1 Submit one electronic copy of mill test reports 4 weeks prior to fabrication of structural steel.
    - .1 Mill test reports to show chemical and physical properties and other details of steel to be incorporated in project.
- .6 Fabricator Reports:
  - .1 Provide structural steel fabricator's affidavit stating that materials and products used in fabrication conform to applicable material and products standards specified and indicated.

## **1.3 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver materials in manufacturer's original, undamaged containers with identification labels intact.
- .3 Packaging Waste Management: remove for reuse in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **Part 2            Products**

### **2.1                DESIGN REQUIREMENTS**

- .1      Design details and connections in accordance with requirements of CAN/CSA-S16 to resist forces, moments, shears and allow for movements indicated.
- .2      Shear connections:
  - .1          Select framed beam shear connections from an industry accepted publication such as "Handbook of the Canadian Institute of Steel Construction" when connection for shear only (standard connection) is required.
  - .2          Select or design connections to support reaction from maximum uniformly distributed load that can be safely supported by beam in bending, provided no point loads act on beam, when shears are not indicated.
- .3      For composite construction select or design minimum end connection to resist reaction resulting from factored movement resistance as tabulated in the "Handbook of the Canadian Institute of Steel Construction" assuming 100% shear connection with depth of steel deck and/or slab shown on drawings.
- .4      Submit sketches and design calculations stamped and signed by qualified professional engineer licensed in Province of Manitoba, Canada for non standard connections.

### **2.2                MATERIALS**

- .1      Structural steel: to CSA-G40.20/G40.21 Grade 350W.
- .2      Anchor bolts: to CSA-G40.20/G40.21, Grade 300W.
- .3      High strength anchor bolts: to ASTM A193/A193M.
- .4      Bolts, nuts and washers: to ASTM A307.
- .5      Welding materials: to CSA W48 Series, CSA W59 and certified by Canadian Welding Bureau.
- .6      Shop paint primer: to CISC/CPMA2-75 solvent reducible alkyd (grey).
- .7      Hot dip galvanizing: galvanize steel, where indicated, to CAN/CSA-G164, minimum zinc coating of 600 g/m<sup>2</sup>.

### **2.3                FABRICATION**

- .1      Fabricate structural steel in accordance with CAN/CSA-S16 and in accordance with approved shop drawings.
- .2      Continuously seal members by continuous welds where indicated. Grind smooth.
- .3      Provide holes in steel members for attachment of wood connections as indicated on the drawings.

### **2.4                SHOP PAINTING**

- .1      Clean, prepare surfaces and shop prime structural steel in accordance with CAN/CSA-S16 and Section 09 97 19.

- .2 Clean members, remove loose mill scale, rust, oil, dirt and foreign matter. Prepare surface according to NACE No.3/SSPC-SP-6.
- .3 Apply one coat of primer in shop to steel surfaces, except:
  - .1 Surfaces to be encased in concrete.
  - .2 Surfaces to receive field installed stud shear connections.
  - .3 Surfaces and edges to be field welded.
  - .4 Faying surfaces of slip-critical connections.
  - .5 Below grade surfaces in contact with soil.
- .4 Apply paint under cover, on dry surfaces when surface and air temperatures are above 5 degrees C.
- .5 Maintain dry condition and 5 degrees C minimum temperature until paint is thoroughly dry.
- .6 Strip paint from bolts, nuts, sharp edges and corners before prime coat is dry.
- .7 Paint in accordance with Section 09 97 19.

### **Part 3 Execution**

#### **3.1 APPLICATION**

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

#### **3.2 GENERAL**

- .1 Structural steel work: in accordance with CAN/CSA-S16.
- .2 Welding: in accordance with CSA W59.
- .3 Companies to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel structures and/or CSA W55.3 for resistance welding of structural components.

#### **3.3 CONNECTION TO EXISTING WORK**

- .1 Verify dimensions and condition of existing work, report discrepancies and potential problem areas to Departmental Representative for direction before commencing fabrication.

#### **3.4 MARKING**

- .1 Mark materials in accordance with CSA G40.20/G40.21. Do not use die stamping. When steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.
- .2 Match marking: shop mark for fit and match.

**3.5 ERECTION**

- .1 Erect structural steel, as indicated and in accordance with CAN/CSA-S16 and in accordance with approved erection drawings.
- .2 Field cutting or altering structural members: to approval of Departmental Representative.
- .3 Clean with mechanical brush and touch up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.
- .4 Continuously seal members by continuous welds where indicated. Grind smooth.

**3.6 FIELD QUALITY CONTROL**

- .1 Inspection and testing of materials and workmanship will be carried out by testing laboratory approved by Departmental Representative.
- .2 Provide safe access and working areas for testing on site, as required by testing agency and as authorized by Departmental Representative.
- .3 Submit test reports to Departmental Representative within 2 weeks of completion of inspection.

**3.7 FIELD PAINTING**

- .1 Paint in accordance with Section 09 97 19.

**3.8 CLEANING**

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 45 00 - Quality Control.
- .3 Section 01 61 00 - Common Product Requirements
- .4 Section 01 78 00 - Closeout Submittals.
- .5 Section 06 20 00 – Finish Carpentry.
- .6 Section 06 40 00 – Architectural Woodwork
- .7 Section 09 91 23.01 – Interior Re-Painting.
- .8 Section 09 97 19 – Painting Exterior Metal Surfaces

**1.2 REFERENCES**

- .1 ASTM International
  - .1 ASTM A269, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
  - .2 ASTM A307-14, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .2 CSA International
  - .1 CSA S16-09, Design of Steel Structures.
  - .2 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
  - .3 CSA W59-13(R2013), Welded Steel Construction (Metal Arc Welding) Metric.
- .3 Environmental Choice Program
  - .1 CCD-047-98(R2005), Architectural Surface Coatings.
  - .2 CCD-048-98(R2006), Surface Coatings - Recycled Water-borne.
- .4 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .5 The Master Painters Institute (MPI)
  - .1 Architectural Painting Specification Manual - current edition.

**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 in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit two copies of WHMIS MSDS in accordance with Section 01 33 00 For finishes, coatings, primers, and paints applied on site: indicate VOC concentration in g/L.
- .3 Shop Drawings:
  - .1 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.
  - .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

#### **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 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.
- .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.

### **Part 2 Products**

#### **2.1 MATERIALS - STEEL**

- .1 Steel Sections and Plates: CAN/CSA-G40.20/G40.21, Grade 300W. 350W for wide flange and HSS Sections.
- .2 Steel Pipe: ASTM A53/A53M, Standard weight, galvanized finish
- .3 Stainless steel: to ASTM A269, Type 304 Commercial grade seamless welded with AISI No. 4 finish.
- .4 Bolts, Nuts, and Washers: ASTM A307.
- .5 Wire: cold drawn steel.
- .6 Sheet steel: to ASTM A526, commercial quality, thicknesses indicated, ZF075 zinc coating to ASTM A525 M.

- .7 Exposed fastenings: same material, colour, finish as fastened metal, as indicated.
- .8 Isolation coating: to CGSB 1 GP 108c, alkali resistant, bituminous paint.
- .9 Welding Materials: Type required for materials being welded.
- .10 Welding Filler Material: CSA-W48.
- .11 Shop and Touch-Up Primer: CAN/CGSB-1.40, colour grey.
- .12 Galvanizing: to CSA G164 M92, hot dipped galvanizing, minimum zinc coating 600g/m<sup>2</sup> (2 oz/sq.ft).
- .13 Aluminum extrusion: Aluminum Association Alloy AA 6063 T6.
- .14 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

## **2.2 FABRICATION**

- .1 Fit and shop assemble items in largest practical sections, for delivery to Site.
- .2 Fabricate items with joints tightly fitted and secured.
- .3 Continuously seal joined members by continuous welds.
- .4 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.
- .5 Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- .6 Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- .7 Use self-tapping shake-proof screws on items required to be assembled by screws or as indicated. Use screws for interior metal work, except where noted otherwise. Use welded connections for exterior metal work, unless otherwise approved by Contract Administrator.
- .8 Where possible, work to be fitted and shop assembled, ready for erection.
- .9 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
- .10 All exposed fastenings shall be of the same material, colour, and finish as the metal to which applied unless specifically shown or listed otherwise.
- .11 All items supplied by this section shall be complete with all fastenings.
- .12 Drill for countersunk screws and anchor bolts. Prime paint.
- .13 Galvanize all exterior work except for materials scheduled for painting.



- .14 All metal fabrications accessible to the public shall have burrs, sharp filings, or dangerous protrusions removed and ground smooth. Contractor shall correct any dangerous installation as directed by the Contract Administrator.
- .15 Site confirm field dimensions prior to fabrication.

## **2.3 FABRICATION TOLERANCES**

- .1 Squareness: 3 mm (1/8 inch) maximum difference in diagonal measurements.
- .2 Maximum Offset Between Faces: 1.6 mm (1/16 inch).
- .3 Maximum Misalignment of Adjacent Members: 1.6 mm (1/16 inch).
- .4 Maximum Bow: 3 mm in 1.2 m (1/8 inch in 4 ft).
- .5 Maximum Deviation From Plane: 1.6 mm in 1.2 m (1/16 inch in 4 ft).

## **2.4 FINISHES - STEEL**

- .1 Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- .2 Do not prime surfaces in direct contact with concrete or where field welding is required.
- .3 Prime paint items with two (2) coats.
- .4 Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M. Provide minimum 600 g/sq m (2.0 oz/sq ft) galvanized coating.
- .5 Non-structural Items: Galvanized after fabrication to ASTM A123/A123M. Provide minimum 380 g/sq m (1.25 oz/sq ft) galvanized coating.
- .6 Shop Painting:
  - .1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items. Apply two coats of primer to areas inaccessible after final installation.
  - .2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, and grease. Do not paint when temperature is lower than 7°C.
  - .3 Clean surfaces to be field welded. Do not paint.
  - .4 Non-ferrous metals shall be finished as specified by item.
- .7 Refer to Section 09 97 19 for painting of exterior metal surfaces.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that field conditions are acceptable and are ready to receive work.

- .3 Verify dimensions, tolerances, and method of attachment with other work.

### **3.2 PREPARATION**

- .1 Clean and strip primed steel items to bare metal where Site welding is required.
- .2 Supply steel items required to be cast into concrete or embedded in masonry with setting templates to appropriate sections.

### **3.3 INSTALLATION**

- .1 Install items plumb and level, accurately fitted, free from distortion or defects.
- .2 Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- .3 Field weld components indicated on Drawings.
- .4 Perform field welding to CSA requirements.
- .5 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.
- .6 Touch-up rivets, field welds, bolts, and burnt or scratched surfaces after completion of erection with primer.
- .7 Obtain approval prior to Site cutting or making adjustments not scheduled.

### **3.4 ERECTION TOLERANCES**

- .1 Section 01 73 00: Tolerances.
- .2 Maximum Variation From Plumb: 6 mm (1/4 inch), non-cumulative.
- .3 Maximum Offset From True Alignment: 6 mm (1/4 inch).
- .4 Maximum Out-of-Position: 6 mm (1/4 inch).

### **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.

### **3.6 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by metal fabrications installation.

### **3.7 SCHEDULES**

- .1 The following Schedule is a list of principal items only. Refer to Drawing details for items not specifically scheduled.
- .2 Stainless Steel W/C Vanity countertop:
  - .1 14 ga stainless steel countertop and edge faces fully adhered to 2 layers 19mm plywood
  - .2 Seamless welded seams ground and finished smooth with AISI No. 4 finish
  - .3 Custom Support Structure and Brackets as indicated on drawings.
- .3 Stainless Steel Mirrors
  - .1 12 gauge (2.5mm) 304 grade Stainless Steel with #8 mirror finish
  - .2 provide ss channel divider strip with #8 mirror finish
  - .3 refer to drawings for sizes and locations
- .4 Stainless Steel Exterior Building Signage
  - .1 Supply stainless steel plate materials for Exterior Washroom Signage as noted in Section 10 14 00.

**END OF SECTION**

**Part 1            General**

**1.1            RELATED SECTIONS**

- .1        Section 01 33 00 - Submittal Procedures.
- .2        Section 01 74 19 - Construction/Demolition Waste Management And Disposal.

**1.2            REFERENCES**

- .1        American Society for Testing and Materials International, (ASTM)
  - .1        ASTM A36/A36M-[14] Standard Specification for Carbon Structural Steel
  - .2        ASTM A53/A53M-[02], Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
  - .3        ASTM A269-[02], Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
  - .4        ASTM A307-[02], Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
  - .5        ASTM A240/A240M-[15b], Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
  - .6        ASTM A1008/A1008M-[15], Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable
  - .7        ASTM B584-[14] Standard Specification for Copper Alloy Sand Castings for General Applications
  - .8        ASTM B505/505M-[14] Standard Specification for Copper Alloy Continuous Castings
- .2        Canadian General Standards Board (CGSB)
  - .1        CAN/CGSB-1.40-[97], Anti-corrosive Structural Steel Alkyd Primer.
  - .2        CAN/CGSB-1.181-[92], Ready-Mixed, Organic Zinc-Rich Coating.
- .3        Canadian Standards Association (CSA International)
  - .1        CAN/CSA-G40.20/G40.21-[98], General Requirements for Rolled or Welded Structural Quality Steel.
  - .2        CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .3        CAN/CSA-S16.1-[01], Limit States Design of Steel Structures.
  - .4        CSA W48-[01], Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
  - .5        CSA W59-[1989(R2001)], Welded Steel Construction (Metal Arc Welding) (Imperial Version).
- .4        The Environmental Choice Program
  - .1        CCD-047a-[98], Paints, Surface Coatings.

- .2 CCD-048-[98], Surface Coatings - Recycled Water-borne.

### **1.3 SUBMITTALS**

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings
  - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

### **1.4 QUALITY ASSURANCE**

- .1 Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.
- .4 All metal fabrication shall be performed by persons with a minimum five (5) years experience.

### **1.5 DELIVERY, STORAGE, AND HANDLING**

- .1 Packing, Shipping, Handling and Unloading:
  - .1 Deliver, store, handle and protect materials in a safe manner to prevent damage to product and injury.
- .2 Storage and Protection:
  - .1 Cover exposed stainless steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.
  - .2 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

### **1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material for recycling when available.
- .4 Divert unused metal materials from landfill to metal recycling facility when available.

**Part 2            Products**

**2.1                MATERIALS**

- .1        Bronze: ASTM B584-[14] and ASTM B505/505M-[14].
- .2        Steel plate to ASTM A36/A36M powder coated finish
- .3        Steel pipe: to ASTM A53/A53M powder coated finish.
- .4        Welding materials: to CSA W59.
- .5        Welding electrodes: to CSA W48 Series.
- .6        Bolts and anchor bolts: to ASTM A307.
- .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 headed screws on items requiring assembly by screws or as indicated. Tamper-proof. Epoxy Grout when fastening to stone for permanent bonding.
- .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        Shop coat primer: to CAN/CGSB-1.40.
- .2        Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

**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**

- .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.

## **2.6 PIPE RAILINGS**

- .1 Steel pipe: formed to shapes and sizes as indicated.
- .2 Galvanize interior pipe railings after fabrication. Power coat prime exterior railings after fabrication.

## **2.7 SIGN SUPPORTS**

- .1 Steel Rectangular Tubing: 6mm wall thickness. Powder-Coated – Black.
- .2 Steel Plate: Tapped holes for receiving signage screws and anchor bolts. Powder-Coated – Black.

## **2.8 BRONZE PLAQUES WITH LOGO DETAIL**

- .1 Fabricate from Navy M Bronze alloy CDA 922, (Copper Alloy No. C92200) (19mm) thick plate. Include welded threaded anchor dowels for embedding in limestone.
- .2 Finish: PBF-2Satin face, natural colored background and edges, semi-gloss polyurethane.
- .3 Lettering, logo component, border detail to be included in mould.

## **Part 3 Execution**

### **3.1 ERECTION**

- .1 Site Verification of Conditions: Verify installation conditions previously established under other sections are acceptable for product installation in accordance with manufacturer's instructions.
- .2 All welding work shall be in accordance with CSA W59 unless specified otherwise.
- .3 Grind all welds smooth prior to application of coatings.
- .4 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .5 Provide suitable means of anchorage acceptable to Consultant such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .6 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .7 Provide components for building by other sections in accordance with shop drawings and schedule.
- .8 Make field connections with bolts to CAN/CSA-S16.1, or weld.
- .9 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

- .10 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer.
- .11 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

### **3.2 PIPE RAILINGS**

- .1 Install pipe railings to stairs and walkway as per existing system.
- .2 Set railing standards in concrete. Grout to fill hole. Trowel surface smooth and flush with adjacent surfaces.

### **3.3 SIGNAGE SUPPORTS**

- .1 Anchor steel supports into concrete footing with M12 S.S. concrete lag bolt.
- .2 Set supports plumb and level.

### **3.4 BRONZE PLAQUES with LOGO DETAIL**

- .1 Bore holes in Limestone Boulder to match dowel anchors on back of plate. Do not drill holes within 75mm of any edge of stone. All holes to be measured before drilling.
- .2 Clean surfaces thoroughly prior to installation.
- .3 Anchor using an all weather resistant epoxy grout for permanent bonding.
- .4 Install plaque level, plumb, at heights and locations indicated.

### **3.5 CLEANING**

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.
- .3 Repair scratches and other damage which might have occurred during installation.
- .4 Clean the installed product in accordance with manufacturer's instructions. Remove construction debris from project site

**END OF SECTION**