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**Part 1            General**

**1.1            DESCRIPTION**

- .1    The work consists of furnishing, fabrication, and erecting of metal work, including the metal fasteners of the composite structures.
- .2    The work includes the cleaning metal surfaces and parts.
- .3    The work includes abrasive blasting of all parts that are to receive a protective coating.
- .4    The work includes the applying paints and protective coatings.

**1.2            RELATED REQUIREMENTS**

- .1    Section 01 11 00 – Summary of Work.
- .2    Section 01 29 00 – Payment Procedures.
- .3    Section 01 33 00 – Submittal Procedures.
- .4    Section 02 41 13 – Site Work, Demolition and Removals.
- .5    Section 03 30 10 – Concrete Cleaning and Repair.

**1.3            REFERENCES**

- .1    SSPC – Steel Structures Painting Council
- .2    AASHTO – American Association of State Highway and Transportation Officials
- .3    ASTM – American Society for Testing and Materials
- .4    CAN/CSA G40.20-04/G40.21-04 (R2009 or latest edition), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .5    CAN/CSA W59-03 (R2008 or latest edition), Welded Steel Construction Metal Arc Welding.
- .6    CAN/CSA-G164-M92 (R2003 or latest edition) - Hot Dip Galvanizing of Irregularly Shaped Articles.
- .7    CAN/CGSB-1.181-99 (or latest edition), Ready-Mixed Organic Zinc-Rich Coating.
- .8    CAN/CSA-S16-01 (R2007 or latest edition), Limit States Design of Steel Structures.

**1.4            ACTION AND INFORMATIONAL SUBMITTALS**

- .1    Submit shop drawings in accordance with Section 01 33 00.
- .2    Submit Certification of welder specified in this section.
- .3    Submit before commencing the manufacturer's data sheets on the coating system describing the following:
  - .1    Recommended maximum and minimum dry film thickness for each coating layer.

- .2 Mixing and thinning directions.
- .3 Acceptable humidity level and temperature range for application.
- .4 Minimum acceptable recoat time period for temperature ranges.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Water:
  - .1 Water used for high pressure water wash shall be fresh and clean and free from oil, acid, alkali organic matter or other deleterious substance.
- .2 Abrasive Material:
  - .1 Blast abrasive material shall fresh water and be clean and free of corrosion producing contaminants and oil. The type of blast abrasive material, hardness and grit size shall be such so as to achieve a surface profile, which is compatible with the requirements of the paint system to be used.
- .3 Metal:
  - .1 Steel Sections: to CAN3-G40.21, Grade 350W.
  - .2 Steel plate and angles: to CAN3-G40.21, Grade 350W.
  - .3 Welding materials: to CSA W59.
  - .4 Bolts and anchor bolts: to ASTM A307.
  - .5 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m<sup>2</sup> to CSA G164.
- .4 Coating and Paint:
  - .1 Technical Specifications:
    - .1 Polyamine cured epoxy system.
    - .2 One coat application.
    - .3 Curable while continuously submerged.
    - .4 Performance temperature range: -10 °C to 80 °C.
    - .5 The minimum and maximum dry film thickness to be within the manufacturer's recommendation.
    - .6 Minimum adhesion criterion of 8 MPa (1160 psi).
    - .7 The colour of the finish coat shall be grey.
    - .8 The contractor shall deliver a dry colour sample of all proposed coating systems to the Departmental Representative for approval three weeks prior to commencing the work.
- .5 Coating for Steel within Splash Zone
  - .1 The following applies for application of corrosion protective coating for the following:

- .1 Gate frames above high water mark and below the galvanized walkway framework.
- .2 Strut Arms.
- .2 Technical Specifications:
  - .1 High performance, aluminum-filled epoxy with the capability to resist salt water exposures.
  - .2 Low temperature cure.
  - .3 Application temperature: minimum -5 °C.
  - .4 The minimum and maximum dry film thickness to be within the manufacturer's recommendation.
  - .5 Apply strictly in accordance with manufacturer's recommendations.
  - .6 Contractor shall submit technical specifications of product to the Departmental Representative for approval three weeks prior to commencing the work.
- .6 Incidental Materials:
  - .1 Incidental materials needed to complete the surface preparation and coating works shall be strictly in accordance with the manufacture's guidelines and recommendations.
  - .2 This shall include paint additives, thinners, mineral spirits solvent mixtures associated with cleaning operations and all other incidental materials required to complete the work.

### **Part 3 Execution**

#### **3.1 CONSTRUCTION METHODS**

- .1 Cleaning:
  - .1 The contractor shall undertake measures to ensure that all debris, spent water from high pressure washing, spent sand blasting abrasives and removed paint from surface preparation and over spray from new coatings will not be deposited in the waterway or on surrounding ground surface areas.
  - .2 The contractor shall conduct their operations within all current Federal, Provincial and Municipal laws, regulations and requirements with respect to environment protection.
  - .3 During high pressure washing the contractor shall ensure that wash water is kept to a minimum by efficient use of equipment and workforce. The contractor is to contain all spent water to ensure it is not deposited into the waterway or onto the underlying ground surfaces or adjacent areas.
  - .4 All existing structural steel to be surface prepared and painted shall be high pressure water washed with a water nozzle located not more than 300 mm from the surface. The water pressure shall be a minimum of 5000 psi
  - .5 All oil and grease shall be removed with a solvent cleaning as specified in SSPC-SP 1, Solvent Cleaning. The solvent shall be a water based biodegradable

dispersant formulated to remove hydrocarbon contaminants from painted and unpainted surfaces. The solvent be compatible with the coating system and as recommended by the coating system manufacturer.

.2 Abrasive Cleaning:

- .1 During abrasive blasting the contractor shall ensure that debris products and spent abrasives are kept to a minimum by efficient use equipment and workforce. Full or partial enclosures shall be used on site to contain and collect surface debris products.
- .2 Where practical all cleaning, abrasive and coating applications shall be done off site at the Contractor's work shop.
- .3 Surfaces adjacent to the areas to be abrasive blasted cleaned shall be protected from damage during surface preparation.
- .4 Structural steel shall be abrasive cleaned to the requirements of SSPC-SP 10/NACE No.2, Near White Blast Cleaning, providing a surface profile ranging between 25 um and um or better as required by the coating systems manufacturers.
- .5 No rust scale shall remain within the area of coating application. Any areas shielded or unreachable by the blast cleaning shall be prepared manually to the satisfaction of the Departmental Representative.
- .6 Prepared surfaces shall be coated as quickly as possible, however, if the freshly prepared steel flash rusts, the steel shall be re-blasted to the requirements of SSPC-SP 7/NACE No.4, Brush-off Blast Cleaning.
- .7 After blast cleaning, all surfaces shall be blown off with compressed air so all residuals are removed from the surface and corners.

.3 Steel Fabrication:

- .1 Fabricate structural steel in strict accordance with reviewed shop drawings and referenced standards.
- .2 Fabricate and assemble structural material in shop to greatest extent possible.
- .3 Build work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .4 Fabricate items from steel unless otherwise noted.
- .5 Where possible, fit and shop assemble work, ready for installation.
- .6 Ensure exposed welds are continuous for length.
- .7 Hot dip galvanize items after fabrication if required.
- .8 Miscellaneous anchors, bolts and inserts:
  - .1 Where size, spacing and the like are not indicated, provide as necessary for the purpose.
  - .2 Galvanize all miscellaneous anchors, bolts and inserts.
  - .3 Provide miscellaneous steel as required for guide units and the like to the shape, size and details required.

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- .4 Coating Application:
- .1 Applications of protective coatings are to be sprayed on all metal surfaces as identified on the drawings.
  - .2 Only coating systems contained in the original containers sealed by the manufacturer shall be used.
  - .3 All coatings system shall be stored, thinned, mixed and applied in accordance with SSPC-PA 1, Shop, Field and Maintenance Painting of Steel, and recommendations on the product data sheet from the manufacturer.
  - .4 Where practical all coatings to be done at contractor's shop.
  - .5 The recoat time period shall be as per manufacturer's product data sheet with regard to changing temperature.
  - .6 All nuts, bolts, washers and pitted areas shall be given a prime coat and finish coat by brush in addition to the spray application.
  - .7 All runs and sags shall be brushed as the application progresses.
  - .8 Application related failures in coatings described in the chapter "Coating Failures" of the SSPC Painting Manual Vol. 1 shall be corrected prior to application of a subsequent coat.
  - .9 The coating system shall consist of the minimum and maximum range of dry film thickness that is recommended by the coating system manufacturer.
  - .10 All coatings are to be inspected by a third party inspection agency after the application of coating system.

**END OF SECTION**

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**Part 1            General**

**1.1               RELATED REQUIREMENTS**

- .1       Section 01 11 00 – Summary of Work.
- .2       Section 01 29 00 – Payment Procedures.
- .3       Section 01 33 00 – Submittal Procedures.

**1.2               REFERENCES**

- .1       CAN/CSA G40.20-04/G40.21-04 (R2009 or latest edition), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .2       CAN/CSA W59-03 (R2008 or latest edition), Welded Steel Construction Metal Arc Welding.
- .3       ASTM A307-10 (or latest edition), Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .4       CAN/CSA-G164-M92 (R2003 or latest edition) - Hot Dip Galvanizing of Irregularly Shaped Articles.
- .5       CAN/CGSB-1.181-99 (or latest edition), Ready-Mixed Organic Zinc-Rich Coating.
- .6       CAN/CSA-S16-01 (R2007 or latest edition), Limit States Design of Steel Structures.

**1.3               ACTION AND INFORMATIONAL SUBMITTALS**

- .1       Submit shop drawings in accordance with Section 01 33 00.
- .2       Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details and accessories.
- .3       Submit Certification of welder specified in this section.

**Part 2           Products**

**2.1               MATERIALS**

- .1       Steel Sections: to CAN3-G40.21, Grade 350W.
- .2       Steel plate and angles: to CAN3-G40.21, Grade 350W.
- .3       Welding materials: to CSA W59.
- .4       Bolts and anchor bolts: to ASTM A307.
- .5       Galvanizing: hot dipped galvanizing with zinc coating 600 g/m<sup>2</sup> to CSA G164.
- .6       Zinc primer: Zinc rich, ready mix to CGSB 1-GP-181.

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**2.2 FABRICATION**

- .1 Fabricate structural steel in strict accordance with reviewed shop drawings and referenced standards.
- .2 Fabricate and assemble structural material in shop to greatest extent possible.
- .3 Build work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .4 Fabricate items from steel unless otherwise noted.
- .5 Where possible, fit and shop assemble work, ready for installation.
- .6 Ensure exposed welds are continuous for length.
- .7 Hot dip galvanize items after fabrication

**2.3 MISCELLANEOUS METAL WORK**

- .1 Miscellaneous anchors, bolts and inserts:
  - .1 Where size, spacing and the like are not indicated, provide as necessary for the purpose.
  - .2 Galvanize all miscellaneous anchors, bolts and inserts.
- .2 Miscellaneous Steel:
  - .1 Provide miscellaneous steel as required for guide units and the like to the shape, size and details required.
  - .2 Galvanize all miscellaneous steel items.

**Part 3 Execution**

**3.1 ERECTION**

- .1 Examine conditions under which work shall be erected. Do not proceed until all unsatisfactory conditions are corrected.
- .2 Install metalwork square, plumb, straight and true, accurately fitted, with tight joints and intersections.
- .3 Make field connections with bolts to CAN/CSA-S16.1, or weld.

**END OF SECTION**