

## **PART 1 - GENERAL**

### **1.1 RELATED REQUIREMENTS**

1. Section 01 33 00 - Submittal Procedures.
2. Section 01 74 11 - Cleaning.
3. Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

### **1.2 REFERENCES**

1. ASTM International Inc.
    1. ASTM A 36/A 36M-12, Standard Specification for Carbon Structural Steel.
    2. ASTM A 193/A 193M-12b, Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature or High-Pressure Service and Other Special Purpose Applications.
    3. ASTM A 307-12, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
    4. ASTM A 325-10e1, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
    5. ASTM A 325M-13, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength.
    6. ASTM A 490M-12, Standard Specification for High-Strength Steel Structural Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints.
    7. ASTM A 780M-09, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
  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.
    3. Steel Structures Painting Manual, volume 1 – Good Painting Practice.
  4. Canadian Standards Association (CSA International)
    1. CSA G40.20/G40.21-13. General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
    2. CAN/CSA-G164-FM92(C2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
    3. CAN/CSA-S16-14, Limit States Design of Steel Structures.
    4. CAN/CSA-S136-12, North American Specifications for the Design of Cold Formed Steel Structural Members.
-

5. CSA W47.1-F09, Certification of Companies for Fusion Welding of Steel.
  6. CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding.
  7. CSA W55.3-F08(C2013), Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
  8. CSA W59-F13, 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.

### 1.3 SCOPE OF WORK

1. Provide the labour, equipment and materials required for fabrication and mounting of the steel piles.

### 1.4 CONTRACTOR QUALIFICATIONS

1. The General Contractor must qualify based on the provisions of the W47.1 standard "**Certification of companies for fusion welding of steel**". The Contractor, as well as all his staff assigned to the execution of welding work, must be certified with regard to divisions 1 or 2 of the Canadian Welding Bureau.

### 1.5 INSPECTION CERTIFICATE

1. Upon request from the Departmental Representative, submit two (2) certified copies of steel inspection reports pertaining to the chemical and physical characteristics of the steel to be used in the execution of the project.
2. Also provide an affidavit from the steel shaping company confirming that the material used for this project complies with the relevant standards pertaining to products and materials specified.

### 1.6 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 the Province of Quebec of Canada.
    2. On each detailed drawing for a given element, specify the location of the item and identify the plan number, as well as the reference axis adjacent to the item.
    3. Shop drawings must include all of the details pertaining to shaping and assembly, including cross-sections, notches, assemblies, perforations, threaded anchors and welds. Use the symbols of the Canadian Welding Bureau to show welds.
-

4. The control procedure for shop drawings merely aims to allow the Departmental Representative to familiarize himself with the general conformity of the structure *versus* the contractual provisions. The comments and/or corrections made to the drawings do not relieve the Contractor from his obligation to comply with all of the contractual requirements, nor do they constitute a commitment or approval should there be a deviation to the requirements.
5. Submit the welding procedures in the following cases:
  - a. Continuous weld;
  - b. Track welding.
3. Installation drawings :
  1. Submitted fabrication drawings must include the details and information required for the fabrication and assembly of the elements, specifically:
    - a. Working methods;
    - b. The assembly sequence;
    - c. The type of material to use for assembly;
    - d. The temporary bracing devices.
  2. At all times, the Contractor remains solely responsible for the construction methods, equipment and work execution mode.
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 Quebec of Canada.

## **1.7 DESIGN REQUIREMENTS AND ASSEMBLY DESIGN**

1. N/A.

## **1.8 DELIVERY, STORAGE AND HANDLING**

1. N/A.

# **PART 2 - PRODUCTS**

## **2.1 MATERIALS**

1. Structural steel: Unless otherwise indicated on the plans, comply with the G40.21 standard, nuance 350W for regular "I" shaped sections, 300W for C-shaped reinforcements, angles and plates, 350W class C or ASTM A500 class C for tubular sections and ASTM A-307 for anchor bolts.
2. High strength anchor bolts: to ASTM A 193/A 193M.
3. Bolts, nuts and washers: to ASTM A 325.
4. Welding material : Shall comply with CSA W59 and certified by the Canadian Welding Office.

## **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-S16-09.
2. Welding: in accordance with CSA W59.

### **3.3 SHAPING**

1. Shape the steel elements in compliance with the S16-09 standard.
2. Punch holes 11 to 27 mm in diameter to connect with other elements. Refer to the drawings for execution details and locations.
3. Reinforce the openings in order to ensure the original strength, if applicable.
4. Cut edges of plates and steel members must be smooth and free of crack or signs of breakage.
5. Joints must be sealed using a continuous weld where indicated. The welds must then be smoothed through grinding.

### **3.4 CONNECTION TO EXISTING WORK**

1. N/A

### **3.5 SHOP-APPLIED PAINT**

1. N/A.

### **3.6 MARKING**

1. N/A.

### **3.7 ERECTION**

1. Erect structural steel, as indicated and in accordance with CAN/CSA-S16-09 and in accordance with reviewed 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, or scratched or missing, in compliance with Item 3.3. The Contractor must remove grease from the structure's bolts prior to the application of the paint finish.
-

4. If indicated on the drawings, seal continuously all of the steel members by section, with a continuous weld bead and grind the welds.
5. Holes that have not been shop-perforated but are still required for assembly must be drilled mechanically. Holes must not be made with a torch.

### 3.8 FIELD QUALITY CONTROL

1. Inspection and testing of materials and workmanship will be carried out by testing laboratory designated by Departmental Representative.
2. Allow and facilitate access to the plant and to the construction site for the Departmental Representative to verify, examine and supervise the quality of the material and execution and to take samples for testing and analysis purposes. If necessary, provide all of the assistance (labour, equipment and materials) required by the Departmental Representative, free of charge.
3. The laboratory may subject all of the welds to non-destructive tests.
4. Destructive tests may be required by the Departmental Representative with regard to **welder certification** and tension or flexion tests.
5. If requested by the Departmental Representative, any part specified will be kept at the plant until the Departmental Representative authorizes its shipment to the construction site.
6. Before making a new weld, chisel, melt and grind all of the welds deemed defective until all traces of imperfection are removed.
7. The Departmental Representative and/or laboratory may make the verification required in the previous paragraphs again. If the bolt tightening tests have not been conducted as required, the expenses associated with the laboratory's verification will be paid by the General Contractor.
8. In the case of **hot dipped galvanized elements**, the interfaces of the elements in contact must be previously sealed with a continuous weld. In addition, the Contractor must notify the Departmental Representative five (5) days prior to the beginning of galvanization activities.
9. Welds on a galvanized element are prohibited unless expressly authorized by the Departmental Representative.

### 3.9 FIELD PAINTING

1. N/A.

### 3.10 CLEANING

1. N/A.

### 3.11 OVERLOADS ON THE STRUCTURE

1. N/A.
-

**PART 4 - ARCHITECTURALLY EXPOSED STRUCTURAL STEEL (AESS)**

1. N/A.

**END OF SECTION**