

PART 1 - GENERALITIES

1.1 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM A 36/A 36M, Specification for Structural Steel.
 - .2 ASTM A 193/A 193M, Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service.
 - .3 ASTM B 209M, Specification for Aluminum and Aluminum-Alloy Sheet and Plate Metric.
 - .4 ASTM B 210M, Specification for Aluminum and Aluminum-Seamless Alloy Drawn Tubes.
 - .5 ASTM B 211M, Specification for Aluminum and Aluminum Alloy Bar, Rod and Wire.
 - .6 ASTM A 307, Specification for Carbon Steel Bolts and Studs, 60,000 Tensile Strength psi.
 - .7 ASTM A 325, Specification for Structural Bolts, Steel, Heat Treated, 120/105ksi Minimum Tensile Strength.
 - .8 ASTM A 325M, Specification for High-Strength Bolts for Structural Steel Joints.
 - .9 ASTM A 490, Specification for Heat Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength.
 - .10 ASTM A 490M, Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints.
 - .11 ASTM F 593, Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
 - .12 ASTM A 653/A 653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .13 ASTM A 792/A 792M, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
 - .14 ASTM A 792/A 792M, Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
 - .2 American Association for State Highway and Transportation Officials (AASHTO)
 - .1 AASHTO Standard Specifications for Highway Bridges
 - .3 General Standards Board of Canada (GSC)
 - .1 CAN/CGSB-1.40, Paint for primary anti-corrosion layer, alkyd resins, for construction steel.
 - .2 CAN/CGSB-1.105- Quick-drying primer paint.
 - .3 CAN/CGSB-1.181- Zinc-rich, organic and prepared coating.
 - .4 CAN/CGSB-85.10, Metal Protective Coatings.
 - .5 CAN/CGSB-85.100, Paint.
 - .4 Canadian Institute of Steel Construction (CICA)/Canadian Association of the Paint and Coating Industry.
 - .1 CISC/AFPC 1-73a, Paints a quick drying layer for frame steel.
 - .2 ICCA/AFPC 1-73b, Paint a quick drying layer for frame steel.
 - .3 ICCA/AFPC 2-75, Primary Layer Paint, Fast-Drying for Framing Steel.
 - .5 American Welding Society (AWS)
 - .1 A5.10/A5.10M, Specification for Bare Aluminum and Aluminum Alloy Welding Electrodes and Rods.
 - .6 Canadian Standards Association (CSA)/CSA
 - .1 CSA C22.2 No. 79, Cellular Metal and Cellular Concrete Floor Raceways and Fittings.
 - .2 CAN/CSA-G40.20/G40.21, General Requirements for Laminated or Welded Construction Steel/Construction Steels.
 - .3 CAN/CSA-G164, Hot Galvanization of irregularly shaped objects.
 - .4 CAN/CSA S6, Canadian Code for the Calculation of Road Bridges.
 - .5 CAN/CSA-S16, Limit States Design of Steel Structures.
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- .6 CAN/CSA-S16.1, Rules for Calculating the Boundary States of Steel Frames.
- .7 CAN/CSA-S136, Limit States Design of Steel Structures.
- .8 CSA-S136.1, Commentary on CSA Standard S136.
- .9 CAN3-S157, Calculation of the mechanical strength of aluminum elements.
- .10 CSA S269.1, Falsework for Construction Purposes.
- .11 CSA W47.1, Certification of steel welding companies.
- .12 CSA W47.1, Steel Smelting Company Certification.
- .13 CSA W47.2, Aluminium Smelting Welding Company Certification.
- .14 CSA W48, Input metals and associated materials for arc welding.
- .15 CSA W55.3, Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
- .16 CSA W55.3, Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
- .17 CSA W59, Welded Steel Construction.
- .18 CSA-W59S1, Supplement Number 1, Fixed Offshore Steel Structures, CSA W59, Welded Steel Construction (Arch Welding).
- .19 CSA W59.2, Welded Aluminium Construction.
- .7 Master Painters Institute
 - .1 MPI-INT 5.1, Structural Steel and Metal Manufacturing.
 - .2 MPI-EXT 5.1, Structural Steel and Metal Manufacturing.
 - .3 MPI - EXT 5.5D, Oil Paint.
 - .4 MPI - 18, Organic Zinc Rich Primer.
- .8 Canadian Sheet Steel Building Institute (CSSBI)
 - .1 CSSBI 10M, Standard for steel roof aprons.
 - .2 CSSBI 12M, Standard for steel composite aprons.
 - .3 CSSBI 50M, Manual of lightweight steel frame elements.
 - .4 CSSBI 52M, Lightweight Steel Framing Binder.
 - .5 CSSBI - A few words about steel 3, Maintenance of prefinished steel sheet products.
 - .6 CSSBI Technical Bulletin Vol. 7, No. 2, Changing Standard Thicknesses for Canadian Lightweight Steel Framing Applications.
 - .7 CSSBI S5, Guide Standard for wind-resistant steel half-timbers.

1.2 COMPUTATIONAL CRITERIA

- .1 The work details and assemblies must be calculated in accordance with CSA-S16, CSA-S136 and CSA-S136.1 standards, in order to withstand the indicated shear forces, times and stresses, and to allow for the expected thermal movements.
- .2 Shear-stressed assemblies
 - .1 Prescribe shear-resistant triangulated frame assemblies (standard assemblies) in accordance with industry-recognized publications such as the Handbook of the Canadian Institute of Steel Construction.
 - .2 If shear stresses are not mentioned, prescribe or calculate the assemblies so that they can withstand the stresses of the uniformly distributed maximum load that the bending beams can safely withstand, provided they are not subjected to any concentrated load.
- .3 For non-standard assemblies, submit sketches and calculation notes bearing the bucket and the signature of a competent Engineer in good standing of the Order of Engineers of Quebec.

1.3 WORKSHOP DRAWINGS

- .1 Submit required workshop drawings, including shaping and assembly documents, design and assembly details, shaping details, diagrams and assembly instructions, and lists of materials and materials.
 - .2 Assembly drawings: must gather all the details and information needed to assemble and assemble the elements, including:
 - .1 Working methods;
 - .2 The order of assembly of the elements;
 - .3 The type of equipment to be used for assembly;
 - .4 Temporary bracing devices of the structural elements.
 - .3 Each drawing submitted must bear the seal and signature of a member engineer in good standing of the Order of Engineers of Quebec.
 - .4 Check that the drawings submitted for the assemblies, the building blocks and the components designed by a shaper bear the bucket and the signature of a member engineer of the Order of Engineers of Quebec.
 - .5 Workshop drawings must include all shaping and fitting details, including workshop seals, cuts, notches, assemblies, drills, support plates, threaded anchors, rivets and welds. Welds must be indicated using symbols defined in CSA W59.
 - .6 Documents setting out the proposed welding methods must be approved by the Canadian Welding Bureau and must bear the seal of the canadian welding bureau.
 - .7 Submit a description of the working methods, bracing and temporary reinforcements, the order of assembly and the type of equipment proposed for the assembly of the construction steel elements.
 - .8 Drawings of the temporary sneezing works submitted must bear the seal and signature of a member engineer of the Order of Engineers of Quebec.
 - .9 The drawings submitted must bear the seal and signature of a member engineer in good standing of the Order of Engineers of Quebec.
 - .10 Submitted designs must indicate cuts, chaperones, assemblies, drillings, threaded fastening devices, rivets, welds and other required elements. Welds must be represented using symbols shown in Appendix A of CSA W59.2.
 - .11 Submit documents describing working methods, order of assembly of frame elements and type of equipment that will be used.
 - .12 Submit the required shaping details and mounting drawings.
 - .13 Mounting drawings should indicate relevant details, such as marks, depth and spacing of the truss, braces, supports and anchors.
 - .14 Include, on the workshop drawings, the characteristics relating to the geometry of the truss, the frames, the supports, the joints and the anchors, as well as the dimensions and properties of the elements, the stresses and constraints, specified and weighted, taking into account various loads, as well as the arrow and arch.
 - .15 Submit the workshop drawings as well as the required sneezing and assembly drawings.
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- .16 In the case of concrete-covered decks, workshop drawings must indicate, show or understand relevant details regarding the temporary supply of steel decks, including the location of the slabs, the timing of their installation and removal, and the expected duration of each of these operations.
- .17 Workshop drawings should indicate the calculation loads, the dimensions of the frame elements, the materials used, the nominal thicknesses before the coatings were implemented, the details of the coatings, assembly and bracing, the dimensions and spacing of the screws, and the details of the anchors.
- .18 Workshop drawings must indicate the location, dimensions and openings of related works, as well as the requirements for them.
- .19 Use symbols recommended in CSA W59 to represent welds.
- .20 Before starting work, submit two (2) certified copies of the manufacturing workshop reports outlining the properties of the materials provided.

1.4 TRANSPORTATION, STORAGE AND HANDLING

- .1 Ensure the transportation, storage and handling of the items.
- .2 Provide and place protective holds for transport, lifting and storage of items.
 - .1 During shaping, transporting and mounting, necessary precautions must be taken to ensure that the beams and beams are not damaged.
 - .2 Do not nick the edges of the elements.
 - .3 Do not subject the elements to undue hardship.
- .3 Mark the mass on items that weigh more than 3 metric tons.
- .4 Protect unpainted patinated steel elements before assembly with a waterproof tarpaulin.
- .5 Ensure that no part of the steel elements comes into contact with the ground.
- .6 At least 7 days before the items are shipped, give the Engineer the delivery schedule.
- .7 Protect steel poles during transportation, on-site storage and implementation.

1.5 MEASURING FOR PAYMENT

- .1 The cost of all materials and work prescribed in this section must be included in the lump sum indicated in the bid for the Construction Steel lot. This lump sum must also include:
 - .1 X-ray control of optional workshop welded joints and additional welded joints on site.

1.6 QUALITY ASSURANCE

- .1 Submit two (2) copies of the workshop test reports 4 weeks before the construction steel works are assembled.
 - .1 Workshop test reports must indicate the chemical and physical properties of steel to be used in this work, as well as various other relevant details.
 - .2 These test reports must be certified by competent metallurgists qualified to practice in the province of Quebec.
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PART 2 - PRODUCTS

2.1 BUILDING STEEL

- .1 Equipements and materials
 - .1 Construction steel: CAN/CSA-G40.20/G40.21, nuanced according to the indications to the plans.
 - .2 Anchor bolts: CAN/CSA-G40.20/G40.21, 300W shade
 - .3 Bolts, nuts and washers: ASTM A 325 compliant
 - .4 Welding materials: CSA W48 and CSA W59 compliant and approved by the Canadian Welding Bureau.
 - .5 Primary layer paint applied in the workshop: SSPC SP-2 compliant.
 - .6 Shear studs: according to CSA W59, Appendix H
- .2 Shaping
 - .1 Construction steel components must be shaped in accordance with CAN/CSA-S16 and CAN/CSA-S136 standards and indicates of checked workshop designs.
 - .2 Shear studs must be installed in accordance with CSA W59.
- .3 In-workshop painting
 - .1 Construction steel elements must be cleaned, prepared and coated with a primary coat of paint in the workshop in accordance with CAN/CSA-S16
 - .2 Items must be cleaned and removed from rolling mill slag, rust, oil, dust and other foreign objects. Surfaces must be prepared using the SSPC-SP-2 method.
 - .3 A primary coat of paint should be applied in the workshop on all steel surfaces, with the exception of the following surfaces:
 - .1 Surfaces drowned in concrete;
 - .2 The surfaces to which shear studs will be attached on the site itself;
 - .3 The surfaces and shorelines that need to be welded on the site;
 - .4 The contact surfaces of friction assemblies;
 - .5 Surfaces below ground level that are directly in contact with the ground.
 - .4 Paint should be applied in a sheltered area on dry surfaces when the temperature of ambient air and treated surfaces is above 5 degrees Celsius.
 - .5 Painted elements should be kept dry and at a temperature of at least 5 degrees Celsius until the paint is completely dry.
 - .6 Paint on bolts, nuts, sharp edges and corners must be removed before being dry.

PART 3 – EXECUTION

3.1 BUILDING STEEL

- .1 Generalities
 - .1 Build steel structures in accordance with CAN/CSA-S16 and CAN/CSA-S136 requirements.
 - .2 Perform welding work in accordance with CSA W59.
 - .3 Welding companies must be certified under Division 1 of this estimate or section 2.1 of CSA W47.1 for smelting steel structures, and/or CSA W55.3 for the resistance welding of the frame elements.
- .2 Connection to an existing structure
 - .1 Before starting to shape the elements, check the dimensions and condition of the existing structure, and then notify the Engineer of any dimensional deviations or possible connection problems in order to obtain new guidelines.

- .3 Marking
 - .1 Mark items in accordance with CAN/CSA G40.20/G40.21 requirements. However, it is forbidden to mark them by stamping. In the case of steel elements not intended for painting, the marks must be placed in such a way as not to be visible once the assembly is complete.
 - .2 Inscription of assembly markers: mark the joints and supporting elements in the workshop in order to obtain well-fitting assemblies.
- .4 Mounting
 - .1 Mount the construction steel elements as directed and in accordance with CAN/CSA-S16 and CAN/CSA-S136 standards and the verified assembly designs.
 - .2 The modification or cutting of structural elements on the site must be approved by the Engineer.
 - .3 At the end of the assembly, clean with a mechanical brush and retouch bolts, rivets, welds and surfaces whose primary paint layer applied in the workshop is burned or scraped.
 - .4 Seal seals with continuous welding at the indicated locations. Then grind the welds by grinding.
- .5 On-site quality control
 - .1 The inspection and verification of the equipment, materials and quality of execution of the work will be carried out by the test laboratory designated by the Engineer.
 - .2 Provide safe work areas and access routes for on-site testing, as required by the testing agency and in accordance with the engineer's authorizations.
 - .3 Submit test reports to the Engineer within 2 weeks of the inspection.
 - .4 Submit shear studs to a test in accordance with CSA W59.
- .6 Painting on the job site
 - .1 Unless otherwise indicated, retouch all damaged surfaces and surfaces that have not been painted in the workshop with a primary coat paint compliant with SSPC-SP-6. Apply paint in accordance with CAN/CGSB 85.10 requirements.

END OF SECTION
