

**Part 1            General**

**1.1            RELATED REQUIREMENTS**

- .1      Section 01 51 00 - Temporary Utilities.
- .2      Section 01 52 00 - Construction Facilities.

**1.2            REFERENCES**

- .1      Association of Iron and Steel Engineers (AISE)
  - .1          Standard No. 7.
- .2      American Institute of Steel Construction (AISC)
  - .1          ASIC 360-05, Specification for Structural Steel Buildings – Allowable Stress Design.
- .3      American National Standards Institute (ANSI).
- .4      American Society for Testing and Materials (ASTM)
  - .1          ASTM A276-10, type 304L, Stainless Steel Bars and Shapes.
  - .2          ASTM A240/A240M -12a, type 304L, Stainless Steel Plate, Sheet and Strip.
  - .3          ASTM A325-10, Bolts.
  - .4          ASTM A449-10, Standard Specification for Hex Cap Screws, Bolts and Studs.
  - .5          ASTM B209-10, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
  - .6          ASTM B584-12a, Bronze Bearings.
  - .7          ASTM F593-02(2008)e1, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
  - .8          ASTM F594-09e1, Standard Specification for Stainless Steel Nuts.
- .5      Crane Manufacturers Association of America (CMAA)
  - .1          Specification 70-2010, Specification for Top Running Bridge & Gantry Type Multiple Girder Electric Overhead Traveling Cranes.
- .6      Canadian Standards Association (CSA)
  - .1          CSA A23.3-04, Standard for Design of Concrete Structures.
  - .2          CSA S16-09, Standard for Design of Steel Structures.
  - .3          CSA W47.1-09, Certification of Companies for Fusion Welding of Steel.
  - .4          CSA W47.2-11, Certification of Companies for Fusion Welding of Aluminum.
  - .5          CSA W55.3-08, Certification of Companies for Resistance Welding of Steel and Aluminum.
  - .6          CSA W59-03, Welded Steel Construction.
  - .7          CSA W59.2-M1991, Welded Aluminum Construction.
  - .8          CSA/CAN3-Z299.3, Quality Assurance Program.

- .9 CSA/CAN3 G40.20/G20.21, General Requirement for Rolled or Welded Structural Quality Steel/Structural Quality Steels.
- .7 Steel Structure Painting Council (SSPC)
  - .1 The Society for Protective Coatings (SP-1 and SP-10).
- .8 United States Army Corp of Engineers (USACE)
  - .1 EM 1110-2-2105, Design of Hydraulic Steel Structures.

### **1.3 INSTALLATION AND REMOVAL**

- .1 Provide temporary controls in order to execute Work expeditiously.
- .2 Remove from site all such work after use.

## **Part 2 Products**

### **2.1 STOP LOGS**

- .1 The stop logs will be vertical-lift type with downstream sealing skin plates and appropriate seals.
- .2 Design the stop logs to be lowered or raised under no flow conditions under balanced head conditions.
- .3 Provide a gravity-engaged and lanyard-release lifting beam suitable for inserting, retrieving and handling stop logs. Lifting beam will be complete with lifting eyes (lugs) suitable for lifting with a mobile crane.
- .4 Design the stop logs to withstand full hydrostatic force at maximum water level acting on the upstream side and no force (dewatered) acting on downstream side.
  - .1 Design Parameters: Listed in Section 35 20 16, Clause 2.2.
- .5 Design the stop logs to withstand seismic loading to NBCC 2010.
- .6 The stop logs will have suitable springs or bumpers to ensure adequate sealing performance.
- .7 Provide embedment type stop log pocket with no components projecting into the water passage.
- .8 The stop log sill surface will be flush with the water passage surface.
- .9 Design of all carbon steel components with a corrosion allowance of 1.6 mm minimum.
- .10 Proportion backing members of embedded parts such that the bearing stress transmitted to the concrete does not exceed 6894 kPa.
- .11 All bolted connections will use bolt, washers and nut. Tapped holes are not permitted.

### **2.2 MATERIALS AND FABRICATION**

- .1 Stop Logs and Lifting Beam:
  - .1 Fabricate the stop logs and lifting beam from plate and structural materials.

- .2 Major structural members and plate steel will be CSA G40.21 Grade 300 WT or 350 WT. Secondary structural shapes will be CSA G40.21 Grade 300W or ASTM A36.
- .2 Stop Log Seals:
  - .1 Permanently attach seals to sides and bottom of each stop log. Seal will be formed all around the waterway channel and between each stop log.
  - .2 Provide a seal with adequate impact, abrasion, scuff, weather, water, temperature and age-resistant properties which will provide suitable sealing properties.
  - .3 Protect stop log seals from damage during handling, transporting and testing of the stop logs.
- .3 Stop Log Sealing Surfaces:
  - .1 All sealing surfaces will be ASTM A276 Type 304L or 316L stainless steel. Finish will be mill finish.
- .4 Stop Log Embedded Parts:
  - .1 All embedded parts will be CSA G40.21 Grade 300W or ASTM A36.
  - .2 ASTM A276 Type 304L or 316L stainless steel may be proposed as an alternative.
- .5 Stop Log Bolting:
  - .1 All bolts for assembly of carbon steel structural joints and assemblies will be ASTM A325M-09 and all other bolts and studs will be ASTM A449-07b.
  - .2 ASTM F593 stainless steel bolts and ASTM F594 stainless steel nuts will be used for assembly of stainless steel joints.
  - .3 All materials will be new and conform to the applicable CSA and ASTM standards.

## **Part 3 Execution**

### **3.1 MATERIALS AND FABRICATION**

- .1 Shop Fabrication:
  - .1 Fabrication will comply with the requirements of the latest issue of CSA Standard S16, except where otherwise specified herein or shown on the drawings.
  - .2 Fabricate all plate and structural steel accurately, true to line and free from warp or rust. The edges to be joined will expose sound metal, free of visual laminations, cracks, and other injurious defects.
  - .3 Tolerances for fabrication will be within the limits specified in CSA Standard S16.
  - .4 The maximum permissible camber or sweep on any structural member will be 1/1000 of the length of the member.
  - .5 If more than one steel plate is used for the gate skin plate on a gate section or stop log, join the plates with full penetration welds. The location of such welded joints will be subject to acceptance by Departmental Representative.

- .6 Unless otherwise noted, the maximum variation from any detailed dimension or overall length of a member, as well as any variation from a true line, will not exceed:
  - .1 3.2 mm for dimensions over 0.30 m.
  - .2 1.6 mm for dimensions under 0.30 m.
  - .3 These dimensions are noncumulative.
- .7 Use more stringent tolerances where necessary to ensure proper guide installation and effective gate operation and sealing.
- .8 Skin plate edges at the sill will be straight within 1.016 mm. Finish edges must be clean and free of burrs, slag or sharp edges.
- .9 Provide welded on raised numbers minimum of 150 mm high constructed of 6-mm plate on each stop log, numbered consecutively. Seal weld around each and paint in a contrasting colour to the stop log itself for visibility.
- .2 Welding:
  - .1 All welding to be in accordance with CSA Standard W59-M and be performed by vendors qualified to CSA W47.1 and W55.3.
  - .2 Welding to be performed by shielded metal arc (SMAW), submerged arc (SAW), gas metal arc (GMAW), or flux cored arc (FCAW) welding processes. Gas tungsten arc (GTAW) welding may also be used where necessary.
  - .3 All welds to be continuous.
  - .4 Welding to be carried out according to qualified procedures and under qualified supervision.
  - .5 Welding will be subject to inspection by Departmental Representative. Identify all weldments with vendor's and welder's or welding operator's assigned symbol.
- .3 Protective Coatings:
  - .1 In accordance with Section 09 90 00 - Painting and Coating.
- .4 Spare Parts:
  - .1 Provide a price list for any spare parts considered necessary for maintenance of stop logs.
  - .2 Ensure all spare parts are interchangeable with and of the same material and workmanship as the original parts of the stop logs.
  - .3 Pack and treat for long-term storage at site all supplied spare parts, and clearly mark each part with its description and purpose on the outside of the packing.

**END OF SECTION**