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## 1.0 GENERAL

### 1.1 REFERENCES

- .1 Provide medium duty slide gates in accordance with the following standards (latest revision) except where specified otherwise.
- .2 American Society for Testing and Materials (ASTM)
  - .1 ASTM A36/A36M Specification for Carbon Structural Steel.
  - .2 ASTM A48/A48M Specification for Grey Iron Castings.
  - .3 ASTM A123/A123M Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - .4 ASTM A126 Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
  - .5 ASTM A307 Specification for Carbon Steel Bolts and Studs, Threaded Rod 60000 psi Tensile Strength..
  - .6 ASTM A325M Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric).
  - .7 ASTM A582 Specification for Free-Machining Stainless Steel Bars.
  - .8 ASTM B36/B36M Specification for Brass Plate, Sheet, Strip, and Rolled Bar.
  - .9 ASTM B584 Specification for Copper Alloy Sand Castings for General Applications.
  - .10 ASTM F594 Specification for Stainless Steel Nuts.
- .3 American Water Works Association (AWWA)
  - .1 AWWA C560 Cast Metal Slide Gates
  - .2 AWWA C561 Fabricated Stainless Steel Slide Gates
- .4 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB 31-GP-3 Corrosion Preventive Compound, Cold Application, Hard Film.
  - .2 CAN/CGSB-1.181 Ready-Mixed Organic Zinc-Rich Coating.
- .5 Canadian Standards Association (CSA)
  - .1 CSA-G40.21 Structural Quality Steel.
  - .2 CAN/CSA-G164 Hot-Dip Galvanizing of Irregularly Shaped Articles.

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- .6 Structural Steel Painting Council (SSPC)
  - .1 SSPC-SP10 Near White Metal Blast Cleaning.

## **1.2 SUBMITTALS**

- .1 Provide the following submittals.
- .2 Shop drawings and product data at least 30 days prior to fabrication of the products. Indicate on the shop drawings; dimensions and elevations; materials including specifications; details required to fabricate, locate, and install the slide gates including all related fittings and embedded parts; and coatings including specifications.
- .3 Manufacturer's supplied documentation for operation and maintenance.
- .4 Manufacturer's written instructions for unloading, handling, storing, and installing gates and for repairing damaged coatings prior to performing the Work.
- .5 The gate manufacturer's certificate prior to commencing the testing of the slide gates certifying that the installation has been performed according to its recommendations.

## **1.3 QUALITY CONTROL**

- .1 Provide the services of the slide gate manufacturer's representative to supervise the installation, testing, and commissioning of the slide gates.

## **1.4 DELIVERY, STORAGE, AND HANDLING**

- .1 Inspect each shipment and timely replace any damaged materials.
- .2 Unload, handle, and store materials in accordance with the manufacturer's written instructions. Do not damage the gate or shop-applied coating. Do not store slide gate components in direct contact with the ground.

## **2.0 PRODUCTS**

### **2.1 MATERIALS**

- .1 Provide slide gates material in accordance with the following.
- .2 Medium duty slide gates:

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- .1 Medium duty slide gates with rising gate stems in accordance with [AWWA C560] [AWWA C561] and having components fabricated from the following materials:

Component	Material	Specification
[Seat and slide, cross bar, and wedge blocks	Cast iron	ASTM A48/A48M, Class 30 ASTM A126, Class B
Seating face	Aluminum bronze	ASTM B36, C26000
Frame	Galvanized steel	CSA-G40.21, CAN/CSA-G164 ASTM A36/A36M, A123/A123M
Stem	Stainless steel	ASTM A276, Type 304 ASTM A582, Type 303
Fasteners: • bolts • nuts and washers	<ul style="list-style-type: none"> <li>• Galvanized steel</li> <li>• Stainless steel</li> </ul>	<ul style="list-style-type: none"> <li>• ASTM A307, A325M, A123/A123M</li> <li>• ASTM F594</li> </ul>
Lift and stop nuts	Cast zinc aluminum or bronze	Zinc Aluminum ZA-12 or ASTM B584 Alloy 838 or 865 Bronze
Adjustable stem guides, with stem collar and bronze bushing, and wall brackets	Cast iron	ASTM A48/A48M, Class 30 ASTM A126, Class B
Pedestals	Galvanized steel	CSA-G40.21, CAN/CSA-G164 ASTM A36/A36M, A123/A123M]

- .3 Gate stems: Minimum diameter of [XX.X] mm. Stem guides and bronze bushings spaced to limit the slenderness ratio ( $l/r$ ) of the stem to less than 200.
- .4 Manual operator: [Square operating nut with T-wrench.] [Handwheel (cast aluminum), lift housing (cast iron), and pedestal] [Geared operator enclosed in a weatherproof cast iron housing equipped with lubrication fittings and mechanical seals, crank, and pedestal. Incorporate an output shaft extension to permit gate operation using a portable drill unit.]. Design the operator to permit gate operation with a maximum pull force of [111 N] [177 N].
- .5 Stem covers for rising stem operators: Galvanized steel or aluminum covers fitted with clear, acrylic window with measuring scales in metric and imperial graduations
- .6 Wall thimbles: Type [F or E] cast-iron thimbles in accordance with ASTM A48/A48M, Class 30 or ASTM A126, Class B.
- .7 Hardware: Screws, bolts, and nuts with threads in accordance with the ANSI Unified Thread Standard.

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- .8 Shop coatings consisting of the following:
  - .1 Machine finished surfaces: Corrosion preventive compound conforming to CAN/CGSB 31-GP-3.
  - .2 Exposed cast-iron surfaces except for the gear operator housing, prepared, primed, and painted as follows:
    - .1 Surface preparation: [Near white metal in accordance with SSPC-SP10].
    - .2 Coating: [3 coats, Amerlock 400 high solids epoxy paint as manufactured by PPG Protective & Marine Coating. Dry film thickness of 150 to 200 µm per coat. Colour: black.]
  - .3 Manual gear operator housing: 2 finish coats of blue machine exterior enamel paint.
  - .4 Galvanizing: Minimum zinc coating of 610 g/m<sup>2</sup>.

### **3.0 EXECUTION**

#### **3.1 INSTALLATION AND ASSEMBLY OF SLIDE GATES**

- .1 Assemble and install the slide gate components in accordance with the manufacturer's written instructions, at the locations, of the sizes, and at the elevations specified. [Provide the services of the manufacturer's representative to supervise the installation, testing, and commissioning of the slide gates.]
- .2 Locate and install the wall thimbles and gate frames including anchor bolts in their correct orientation, alignment, and plumb position.
- .3 Support the gate thimble, anchor bolts, and other parts so that they are not displaced during concrete placement.
- .4 Provide a watertight joint between the gate frame and the wall thimble in accordance with the manufacturer's written instructions.
- .5 Align the stem and operator with the gate, and install in a plumb position.
- .6 After installation, clean, lubricate, and otherwise service the slide gate components in accordance with the manufacturer's written instructions.

#### **3.2 TESTING OF SLIDE GATES**

- .1 Dry test each slide gate by raising and lowering it with the lift at least 3 cycles throughout its full range of operation after each change or adjustment. Make any required changes or adjustments until the operation of the slide gate, lifts and all appurtenant components are satisfactory to the Minister.
- .2 [Wet test each slide gate by ]. [Measure actual leakage and compare with the allowable limits defined in [AWWA C560] [AWWA C561]. Adjust gates as required until the actual leakage rate is below the allowable limits.]

#### **3.3 REPAIR OF DAMAGED COATINGS**

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- .1 Prepare damaged paint surfaces and re-coat with paint in accordance with the paint manufacturer's written instructions.
- .2 Repair damaged galvanized surfaces with a zinc-rich paint that is in accordance with CAN/CGSB-1.181.

Galvanized surfaces to be repaired shall be cleaned using a power-tool to a bright metal finish. Apply multiple coats of zinc-rich paint in accordance with the manufacturer's written instructions.

**END OF SECTION**