

SECTION 11300 OVERSHOT GATES



GENERAL

SUMMARY

- A. The Contractor shall provide all labor, materials, equipment, and incidentals required to furnish and install overshot gates, complete and operational with all necessary accessories as shown on the Contract Drawings, as specified herein, or as required for complete operation.
- B. Overshot gates shall be provided at the following locations: (Insert Structure Number or Building Number)
- C. The Contractor shall obtain all equipment specified in this Section from one manufacturer to ensure proper coordination and functionality. The manufacturer shall have responsibility for performance and compatibility of the entire system. This does in no way relieve the Contractor for ultimate responsibility under this Contract for equipment, coordination, installation, operation and guarantee.
- D. The Contract Drawings are for purpose of guidance and to show functional features and required external connections. They do not necessarily show all components necessary to accomplish the desired results nor do they necessarily show all components required to interface with the equipment. The Contractor shall provide all parts, equipment, and devices necessary to meet the functional requirements of the system.

REFERENCES

Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified:

- 1. American National Standards Institute (ANSI)
- 2. American Society for Testing and Materials (ASTM)
- 3. American Welding Society (AWS):
 - i. D1.1 Structural Welding Code Steel
 - ii. D1.2 Aluminum
 - iii. D1.6 Stainless steel

SYSTEM DESCRIPTION

Design Requirements:

- 1. Liberal safety factors will be used in the design of all equipment. Working stresses will not exceed the lower value of, one half of the yield strength, or one fifth of the ultimate strength of the material per ASD design approach. The Overshot gates and appurtenances shall be designed for installation in the structures as shown on the plans.
- 2. The overshot gate shall be at a 60 degree angle upward from the horizontal channel bottom when in the fully closed position.

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- 3. When the overshot gate is in the fully opened position, it shall lay flush with the concrete channel bottom and allow for full flow.
- 4. Overshot gates shall be provided in accordance with the Schedule to be provided as outlined below:

Location	Tag	Gate Invert Elevation	Elevation of top of Gate at closed position (60 degrees)	Maximum Water Elevation (Upstream)	Electric or Manual Operation

SUBMITTALS

- A. Submit the following for approval:
 - 1. Manufacturer’s information, specifications, and data showing dimensions, materials of construction, and weight of all major items of equipment.
 - 2. Installation diagrams showing location, arrangement, and size of all fasteners required for the equipment.
 - 3. Setting drawings, templates, and instructions for installation of guides, etc.
 - 4. Calculations justifying that all components were designed based upon the maximum heads described herein.
- B. Upon completion of installation, submit a digital copy of the Operation and Maintenance Manual for this equipment. A final copy of this manual shall be approved by the Engineer prior to distribution and as a minimum shall contain the following:
 - 1. Operational and maintenance manuals shall include all approved shop drawings associated with this Section, complete instructions for installation, and parts list for all components.
 - 2. Include a list and frequency of specific maintenance activities.

PRODUCTS

MANUFACTURERS

- A. Provide overshot gates as manufactured by the following:
 - 1. Henry Pratt Company (Hydro Gate brand).
 - 2. Prior-approved equal.
- B. Overshot Gate manufacturer shall have a minimum of 10 years’ experience in the design and manufacture of this type of equipment.

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EQUIPMENT MATERIALS

- A. All overshot gates shown on the plans and listed in the gate schedule shall conform in all respects to the project specifications and manufacturer's design standards. Materials used in construction of overshot gates and appurtenances will be best suited for the application and will conform to the following specifications:
1. Hot-Rolled Steel (Flats, Structural Shapes, Plates): ASTM A36, A283, Grade C or D; or ASTM A306, Grade 60.
 2. Stainless Steel (Structural, Plates, Flats): ASTM A167, ASTM A240 or ASTM A276, all Type 304L or 316L.
 3. Aluminum (Structural, Plates, Flats): ASTM B209 Alloy 6061, or ASTM B308 Alloy 6061.
 4. Fasteners: Stainless Steel, ASTM F593/F594, Alloy Group 1 or 2 (304 or 316).
 5. Side Seals: EPDM or Neoprene ASTM D2000, 60 Durometer, Type 304 or 316 retainer bar.
 6. Hinge Seal: EPDM or Neoprene, ASTM D2000, 60 Durometer, Type 304 or 316 retainer bar.
 7. Hoist shaft and tube: Cold rolled steel, ASTM A108, Grade 1045.
- B. Leaf: The leaf shall be (steel, stainless steel or aluminum) of horizontal and vertical structural reinforcing members and a smooth faceplate, and shall be assembled and securely welded to provide a flat, box-shaped gate leaf. The structural members shall be of the proper size, dimension, and placement to safely withstand the maximum upstream head designated in the "Gate Schedule". The faceplate shall be of sufficient thickness to safely withstand the maximum unbalanced head and shall be attached to structural members by welding. The leaf shall be designed to limit deflection to $L/360$. The gate slide shall be fabricated in one piece unless shipping limitations require multiple sections. When multiple sections required, joints shall include a rubber gasket to minimize leakage.
- C. Hinge: Shop-fabricated hinge assembly shall be provided for attaching the gate to the concrete curb as shown on the contract drawings. Hinge plates shall be stainless steel. The hinge pin shall be stainless steel in accordance with ASTM A-276.
- D. Side Seal Rubbing Plates: Provide stainless steel rubbing plates for a smooth and true contact surface for the seals throughout the full range of gate movement. Side seal rubbing plates shall be designed to attach to the structure channel walls. The plates shall be adjustable on the anchor bolts to provide proper alignment.
- E. Seals: J-seals shall be provided as specified. Seals shall be securely fastened to the leaf with formed stainless steel retainers and shall be replaceable and adjustable. The bottom seal shall be a flat rubber solid shape. Seals and retainer flats shall be provided with holes to match those on the slide.

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GATE

- F. Vent Piping: The side seal rubbing plates shall have holes to mount PVC vent piping through the concrete structure.
- G. Nape Breakers: Nape breakers shall be provided on the leaf to minimize air pockets below the gate during flow.
- H. Wire Rope Hoist: The hoisting system shall consist of hoist base frame, cable drums, drum shaft, wire rope cables, bearing bracket and anchor bolts. The hoist shall be operated by either a manual or electric operator. The hoist shall be suitable for modulation service and for fully raising and lowering the gate. The root diameter of the drum shall be a minimum of 12 times the cable diameter.
1. Wire Rope Cable: Wire rope cable and attachment hardware shall be stainless steel. Cable and attachment hardware shall be designed to withstand all loads to the gate. Wire rope shall be standard IWRC type.
 2. Bearings: Hoist shall include a shaft support pillow block and bearing combination to prevent friction.
 3. Shaft: The shaft and tube material shall be cold rolled steel as shown in the materials.
 4. Manual Operator (Enclosed Gear): The manual hoist operator shall consist of a self-locking worm gear, with reduction spur gears as required, enclosed in a ductile iron housing. A handwheel, located approximately 36 inches above the operating surface, shall be provided to produce the necessary output torque to raise and lower the gate when a maximum 40 lb pull is exerted on the handwheel rim.
 5. Electric Operator: The electric actuator shall be of sufficient rating to raise or lower the gate under all head conditions. The power supplied to the actuator shall be 480 Volt, 3-Phase, 60 Hz. The motor duty rating shall be sufficient for one complete and continuous open or close cycle.

FINISHES

- A. Carbon or structural steel: The gate manufacturer shall be responsible for shop prime and finish painting of all gates and appurtenances supplied under this contract. All coatings shall conform to VOC Emission Regulations in effect at the manufacturing location and at the project site to allow touch up or recoating to be performed with the same products. All surfaces shall receive a primer and finished coat with a high solids epoxy coat or approved equal for potable water use. Primer and finished coats shall be applied in the manufacturer's shop. Where required by application, the coating shall be approved for contact with drinking water by the NSF, EPA, or other appropriate governing agencies. Number of coats, mil thickness, and surface preparation shall be in accordance with the paint manufacturer's recommendations for that application. Coating shall be Ameron Amerlock 400, medium gray color.

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- B. Submerged surfaces shall be cleaned to SSPC SP10, dry, and grease-free prior to painting in conformance with the paint manufacturer's instructions. Non-submerged surfaces shall be cleaned to SSPC SP6.
- C. All surfaces shall receive a primer and finished coat with a high solids epoxy coat or approved equal for potable water use. Primer and finished coats shall be applied in the manufacturer's shop.
- D. Where required by application, the coating shall be approved for contact with drinking water by the NSF, EPA, or other appropriate governing agencies. Number of coats, mil thickness, and surface preparation shall be in accordance with the paint manufacturer's recommendations for that application.
- E. Coating shall be Ameron Amerlock 400, medium gray color.
- F. Aluminum: Surfaces embedded in concrete shall receive one (1) coat of bitumastic coating.
- G. Stainless Steel: Stainless steel components shall not be coated.

SHOP TESTING

The complete gate assembly will be shop inspected for proper tolerances as shown on the manufacturer's drawings.

EXECUTION

SHIPPING & INSTALLATION

- A. Manufacturer shall provide temporary bracing to maintain tolerances during shipping and installation.
- B. The overshot gate equipment and appurtenances shall be installed by the contractor in a workmanlike manner in accordance with the Installation Manual furnished by the gate manufacturer. Extreme care should be used in handling, storage, and installation of this equipment to prevent damage or distortion of the equipment and to insure proper performance.

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FIELD QUALITY CONTROL

Field testing shall be performed after installation of the equipment. Testing shall demonstrate the following:

- A. The equipment has been properly installed in accordance with manufacturer's instructions and recommendations.
- B. The equipment has been installed in the specified location and orientation or as shown on the Contract Drawings.
- C. The equipment has been aligned.
- D. There are no mechanical defects in any of the parts.



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