



SECTION 614

DRAINAGE FITTINGS

SECTION 614.10 GRATES AND BEARING PLATES.

614.10.1 Description. This work shall consist of furnishing and installing parallel bar grates and bearing plates, and curved vane grates and frames of the size and design shown on the plans.

614.10.2 Material.

614.10.2.1 Parallel bar grates and bearing plates, and curb inlets shall be constructed of structural steel meeting the requirements of ASTM A 36 and shall be fabricated as shown on the plans. Welds shall be of full section and sound throughout. Obvious dimensional defects and structural discontinuity of welds will be cause for rejection. All welding residue shall be removed. All tightly contacting surfaces shall be completely sealed by welding. Removal of welding beads will not be required except on bearing surfaces. Parallel bar grates and bearing plates, and curb inlets shall be hot-dip galvanized after fabrication in accordance with AASHTO M 111. Bolts, nuts and washers shall be galvanized in accordance with AASHTO M 232 or shall be mechanically galvanized. If mechanically galvanized, the coating thickness, adherence and quality requirements shall be in accordance with AASHTO M 232, Class C. Damaged spelter coating shall be repaired in accordance with [Sec 1081](#).

614.10.2.2 Curved vane grates and frames shall be constructed of cast gray iron, meeting the requirements of AASHTO M 306 and shall be fabricated as shown on the plans. Stainless bolts and washers shall be in accordance with [Sec 901.3](#).

614.10.3 Construction Requirements. Parallel bar grates and bearing plates, curb inlets, and curved vane grates and frames shall be installed as shown on the plans. Curved vane grates shall be properly oriented to the direction of water flow. Curved vane grates installed at low points shall be oriented as directed by the engineer.

614.10.4 Basis of Payment. The accepted quantity of parallel bar grates and bearing plates, and curved vane grates and frames will be paid for at the contract unit price for each of the items included in the contract.

SECTION 614.20 AUTOMATIC FLOODGATE.

614.20.1 Description. This work shall consist of furnishing and installing automatic floodgates of standard design to fit the opening shown on the plans. Type 1 floodgates shall be installed on concrete structures. Type 2 floodgates shall be installed on corrugated metal pipe. Gates shall be of the off-vertical type if shown on the plans.

614.20.2 Material.

614.20.2.1 Automatic floodgates shall have a frame and flap constructed of cast iron meeting the requirements of AASHTO M 105, minimum Class 30.

614.20.2.2 Each link shall be provided with commercial grade bronze bushings permanently lubricated and installed at the factory. For hydraulic heads greater than 10 feet, the bottom of the links shall be provided with an adjusting screw to align seating faces on the cover properly with respect to the seat. For hydraulic heads less than 10 feet, adjusting screws will not be required, however, the seating faces on the cover shall properly align with respect to the seat. The links shall be designed to prevent the cover from rotating far enough to become wedged in the open position.

614.20.2.3 The seat shall be one-piece cast iron with a raised section around the perimeter of the waterway opening to provide the seating face, and shaped to provide two pivot bosses extended above the top of the waterway opening.

614.20.2.4 All anchor bolts, assembly bolts, screws and nuts shall be of stainless steel having ample section to withstand safely the forces created by operation of the gate under a hydraulic head. Quantity and size of anchor bolts shall be as recommended by the manufacturer, except there shall be a minimum of four bolts. Each anchor bolt shall be furnished with two nuts to facilitate installation and alignment of the flat back gates when attached to concrete.

614.20.2.5 The contractor shall furnish a manufacturer's certification that the floodgate being supplied is in accordance with the specified material requirements and that the floodgate will operate properly under the specified hydraulic head. If the hydraulic head is not specified, the height of fill above the pipe will be considered the hydraulic head.

614.20.3 Construction Requirements. Automatic floodgates shall be carefully machined, watertight and automatic in operation. Floodgates shall react to any difference in water level, and shall be hinged to seat accurately. Floodgates shall be attached in accordance with the manufacturer's recommendations for corrugated metal pipes or concrete structures.

614.20.4 Basis of Payment. The accepted quantity of automatic floodgates, complete in place including connection to concrete structure or corrugated metal pipe, will be paid for at the contract unit price for each of the items included in the contract.

SECTION 614.30 MANHOLE FRAME AND COVER AND CURB INLET.

614.30.1 Description. This work shall consist of furnishing and installing manhole frames and covers, curb inlets or any items of similar nature. Manhole frames and covers, curb inlets or any items of similar nature shall be of the size and type necessary to fit appurtenant details shown on the plans, shall be of a standard design and shall meet the approval of the engineer.

614.30.2 Material. The manhole frames and covers, curb inlets or any items of similar nature shall be constructed of cast iron in accordance with AASHTO M 105. Specific classes, if required, will be shown on the plans.

614.30.3 Construction Requirements. Bearing surfaces of both the frame and cover shall be finished to a non-rocking fit. The fixture shall be set securely as shown on the plans to prevent displacement during the placing of concrete. All concrete placed adjacent to the fixture shall be thoroughly vibrated.

614.30.4 Basis of Payment. The accepted quantity of these items or items of similar nature, complete in place, will be paid for at the contract unit price for each of the pay items included in the contract.