

733 – BRIDGE DRAINAGE SYSTEMS & DECK DRAIN EXTENSIONS

SECTION 733

BRIDGE DRAINAGE SYSTEMS & DECK DRAIN EXTENSIONS

733.1 DESCRIPTION

Provide and install the bridge drainage system as shown in the Contract Documents.

Submit to the Engineer for approval shop drawings of the bridge drainage systems showing methods for accommodating thermal expansion, if necessary. Use 15 x 10<sup>-6</sup> in/in / °F as the coefficient of thermal expansion for fiberglass systems.

Include in the shop drawings the methods to be used to properly position the bridge drainage system for the temperature at the time of installation. Show the amount of adjustment required for temperature changes (in 10° increments). The mean temperature shall be assumed 60°F.

Provide material for and install bridge deck drain extensions as shown in the Contract Documents.

**BID ITEMS**

Bridge Drainage System (\*)

Bridge Deck Drain Extension

\*Steel or Fiberglass

\*\*Unit of Measure Shown in the Contract Documents

**UNITS**

\*\*

Each

733.2 MATERIALS

Provide materials that comply with the applicable requirements.

Structural Steel Fabrication and Painting .....	<b>DIVISION 700</b>
Structural Steel .....	<b>DIVISION 1600</b>
Castings .....	<b>DIVISION 1600</b>
Steel Fasteners .....	<b>DIVISION 1600</b>
Anchor Bolts for Structural Uses .....	<b>DIVISION 1600</b>
Steel Fasteners .....	<b>DIVISION 1600</b>
PVC Pipe .....	<b>DIVISION 1900</b>
Fiberglass Pipes and Fittings.....	<b>DIVISION 1900</b>

**Joint Adhesive.** Bond adhesive joint will be a vinyl ester resin based product with silica filler, polyester pigment, and methyl ethyl ketone peroxide catalyst. The adhesive formulation will be certified proven suitable for the intended application. Certify the resin to have no additives that leach out, catalysts which remain active or other ingredients that could lead to deterioration.

733.3 CONSTRUCTION REQUIREMENTS

**a. Bridge Drainage System (Steel).** Install the steel bridge drainage system according to SECTION 712 and the Contract Documents.

**b. Bridge Drainage System (Fiberglass).** Use "bell and spigot" type adhesive bonded joints.

Use a standard sling, clamp or clevis hanger as used in steel pipe applications.

Use a split fiberglass pipe protective sleeve bonded in place at all support locations of a length no less than the pipe diameter being supported.

Install according to the approved shop drawing, Contract Documents, and guidelines and procedures recommended by the manufacturer.

Install the fiberglass bridge drainage systems that will not restrict movements between the substructure and superstructure or causes damage to the drainage system during expected thermal movements.

The strap thickness will be 3/16 inch for all hangers, a minimum width of 1 ½-inch for 8-inch and 10-inch pipe and 2 inches for greater than 10 inches. The sling, clamp for clevis will be sized to accommodate the pipe protective sleeve. Use a double nut on all connectors to prevent over tightening and to lock the nuts against each other.

Use bonded rigid couplers. Insert pipes so that the ends are centered.

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Sand spigot ends to remove glossy finish and expose fibers. Insert pipe so it bottoms out within the bell fitting to create a fully fitted joint. Mix and apply 2 layers of adhesive according to the manufactures recommendations. Secure the joint so it cannot move, do not twist the joint. Do not disturb the joint until it has gelled according to the manufactures recommendations. An electric heat gun or heating collar may be used to accelerate gelation of the joint.

**c. Bridge Deck Drain Extensions.** Install angles equally spaced around the perimeter of PVC pipe using two 1 3/4-inch long by 1/2 -inch diameter bolts with a flat washer and lock nut. Place the bolt head on the inside of the PVC pipe.

Anchor the steel angles to the bottom of the deck using a concrete hex nut sleeve anchor. Use a 5/8-inch diameter sleeve anchor with an effective anchor length of 2 1/2 inches and a bolt with a 1/2-inch diameter. Embed all anchors a minimum of 2 inches into the bottom of the concrete. Drill and place the anchors in accordance with the anchor manufacturer's recommendations.

Plumb the completed drain extension and place the PVC pipe flush against the bottom of the concrete.

Use PVC pipe lengths that extend a minimum of 12 inches below the bottom of the beam, girder, chord or slab. If the beam, girder, chord or slab is not of uniform depth, vary the length of each extension to provide the 12-inch minimum.

### 733.4 MEASUREMENT AND PAYMENT

The Engineer will measure bridge drainage system by the units shown in the Contract Documents.

The Engineer will measure each bridge deck drain extension.

Payment for "Bridge Drainage System" and "Bridge Deck Drain Extension" at the contract unit prices is full compensation for the specified work.