

ITEM 03576.2202 M - BRIDGE DOWNSPOUT SYSTEM (FIBERGLASS)

DESCRIPTION: This work will consist of furnishing and placing fiberglass downspout systems for bridge drainage as shown on the plans and in accordance with the specifications.

MATERIALS: Fiberglass pipe and fittings shall be reinforced thermosetting resin pipe (RTRP) systems meeting the requirements of ASTM Specification D2996. They shall qualify for a 207 Mpa minimum short time rupture strength hoops tensile stress.

The final color of the reinforced pipe and fittings shall be pigmented sage green. Paint will not be accepted.

A. **Downspouts:**

1. **Pipe:** Pipe shall be reinforced thermosetting resin fiberglass pipe meeting the requirements of ASTM Specification D2996, D3982, D3840 and NBS PS 15-69.
2. **Pipe Fittings:** Pipe fittings (e.g. elbows, tees, couplings, etc.) shall be reinforced thermosetting resin fiberglass pipe meeting the requirements of ASTM Specification D2996, D3982, D3840 and NBS PS 15-69.
3. **Adhesive:** The adhesive used for joining the fiberglass pipes and pipe fittings shall meet the requirements of ASTM-D-5686 and 5677.

B. **Pipe Brackets and Supports:** Pipe brackets and supports shall conform to the requirements of ASTM A-575, Grade 1015 and 1020.

Anchors shall meet or exceed the requirement of U.S. Government, G.S.A. Specifications No. FS-S-325 Group I, Type I, Class I.

Nuts and bolts shall conform to the requirements of F568 Class 4.6. Nuts and bolts shall be galvanized in accordance with Subsection 719-01, Type II.

Bolts and cap screws shall conform to the requirements of ASTM F568, Class 4.6.

C. **Neoprene Coupler:** Neoprene couplers shall conform to the requirements of ASTM Specification C-564 or equal.

CONSTRUCTION DETAILS:

A. **Shop Drawings:** Shop drawings will not be required.

B. **Basis of Acceptance:** Downspouts shall be accepted at the work site by the Engineer-in-Charge upon certification of the manufacturer that the materials used and fabrication procedure employed conform to the requirements of this specification. The Engineer may reject any downspout system which, in his opinion, exhibits poor quality or workmanship.

C. **Erection of Downspout Systems:** All connections of pipes and fittings shown on the plans

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to facilitate future removal for maintenance cleanout or flushing shall be made with a threaded, gasketed coupler or a bolted gasketed flange system. All cleanouts shall be made with a female - male threaded plug. Adhesive bonded joints will be permitted for runs of pipe between such connections.

A socket joint made for joining two pieces of pipe or fittings together requires the following steps:

1. The plain end of the BDP, "Bridge Drainage Pipe," shall be sanded as to remove the resin glaze from the end of the BDP to be bonded. This can be accomplished with a power disc grinder or belt sander. Grind off enough area to exceed slightly the length of insertion into the socket itself. The strength and adhesion of the joint will be adversely affected by any grease, oil, dirt, moisture, solvents, etc., remaining on the BDP or in the interior of the socket to be bonded. After sanding the BDP, dust off the end and socket with a clean, dry cloth since grinding dust will severely weaken the bonding properties. If a sanded joint must be left for an extended period of time, the joint shall be re-sanded just prior to the joining procedure.
2. Check for ease of insertion before mixing the adhesive. If necessary, sand additional material from the plain end to allow for an easy insertion.
3. Mix the adhesive per the instructions supplied by the manufacturer.
4. Apply a thick adhesive mix on the plain end and inside the socket. Be sure the adhesive is totally covering the plain end and the socket surfaces.
5. Insert the plain end into the socket.
6. In the larger diameter BDP it may be necessary to use extra force such as a come-a-long or other device to insert the BDP into the socket. The joint shall remain supported and motionless to the satisfaction of the Engineer, until the adhesive has cured. The curing process can be both accelerated and strengthened by applying heat to the joint once the adhesive has reached gelatin. Wipe any excess adhesive off the joint and clean for a good appearance.

Runs of pipe shall be supported at spacing not greater than the lesser of those recommended by the manufacturer of the pipe or as shown on the bridge plans. Supports that have point contact or narrow supporting areas shall be avoided. Standard sling, clamp and clevis hangers for use with steel pipe can be used. Straps shall have 120 Degrees of contact with the pipe. Hanger thickness shall be 5 mm.

Nominal ID (mm)	Min. Strap Width (mm)
163	38
213	38
267	38
303	51

All reinforced fiberglass pipe, fittings and expansion joints shall be handled and installed in accordance with guidelines and procedures recommended by the manufacturer of the material.

1. Pipe Installation: The pipe shall be laid true to line and grade as shown on the plans or as directed by the Engineer, with joints close and even, so that a true and even surface of invert will be made over the joints throughout its entire length. Horizontal pipe shall

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be installed so that the minimum slope shall not be less than 8%. Pipe shall be placed in accordance with the requirements of this specification unless special methods are called for on the plans or in the itemized proposal.

2. Field Testing: Prior to the acceptance of the structure by the Department, the downspout system shall be flushed out and tested by the Contractor, to insure that it is flowing at full capacity. Any obstruction in the downspout system preventing the free flow of drainage or its operation at full capacity shall be removed to the complete satisfaction of the Engineer.

METHOD OF MEASUREMENT:

Downspout System: The downspouts will be measured as the number of meters measured along the centerline of pipe between the extreme outer limits of downspouts, including hoppers, furnished and placed as shown on the plans and in accordance with the specifications.

BASIS OF PAYMENT:

- A. General: The unit price bid per meter shall include the cost of furnishing all labor, materials and equipment necessary to erect the pipe and pipe fittings, pipe supports, nuts, bolts, washers, to provide clean outs if indicated on the plans, straps to cap and plug the pipe, if necessary, and to replace cracked or otherwise defective material necessary to complete the work. The unit price bid for meter shall also include the cost of furnishing and placing pipe hangers and brackets, couplings, paint if required, and the cost of furnishing and placing all adaptor fittings required at the juncture of fiberglass pipe and ductile iron pipe.

PAYMENT WILL BE MADE UNDER:

ITEM NO.	ITEM	PAY UNIT
03576.2202M	Bridge Downspout System (Fiberglass)	Meter