SUPERSEDED BY EB 21-057 EFFECTIVE 11/24/21		New York State Department of Transportation ENGINEERING INSTRUCTION	EI 01-030

Title: **FIBERGLASS BRIDGE DOWNSPOUT SYSTEMS**

Distribution:

- ☐ Manufacturers (18)
- ☒ Main Office (30)
- ☐ Local Govt. (31)
- ☒ Regions/Agencies (32)
- ☐ Surveyors (33)
- ☒ Consultants (34)
- ☐ Contractors (39)
- ☐ _____( )

Approved:

JAMES M. O'CONNELL
Deputy Chief Engineer (Structures)

11/14/01
Date

ADMINISTRATIVE INFORMATION

This Engineering Instruction is effective with projects submitted for the letting of May 9, 2002. It does not supersede any previous issuances.

PURPOSE

This EI issues a specification for Fiberglass Bridge Downspout Systems.

DESIGN INFORMATION

Fiberglass Downspout Systems for bridge drainage are an alternative to PVC downspout systems when a corrosion resistant downspout system is needed. Fiberglass downspout systems offer superior durability to PVC, particularly in the area of impact resistance from vandalism. They also allow a longer support spacing than PVC systems. The support spacing is similar to that of steel pipe which will usually permit the reuse of the existing hangers and supports when replacing a Steel Downspout System. Fiberglass downspout systems can be expected to be approximately 20% to 25% more costly than PVC downspout systems.

IMPLEMENTATION

The Main Office Design Quality Assurance Bureau will insert the attached specification into projects that call for its use. Item 035756.2202 M - Bridge Downspout System (Fiberglass) should be disapproved as of the effective date of this EI.

TRANSMITTED MATERIAL

Special Specification for Fiberglass Bridge Downspout System.

Item 16576.22 M - Bridge Downspout System (Fiberglass) Meter

CONTRACT PERSON

All questions about this EI should be directed to the Structures Division Standards Unit at 518-485-5748.

Item 16576.22 M - Bridge Downspout System (Fiberglass)

Description: This work will consist of furnishing and installing 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 exterior of fiberglass pipe and fittings shall have a ultraviolet stabilized resin coating of the color noted in the Contract Documents. If no color is noted, use sage green. Paint will not be accepted.

A. **Downspouts:**

1. **Pipe:** Pipe shall be (reinforced thermosetting resin fiberglass pipe) meeting the requirements of ASTM Standard 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 Standard 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 - D5686 and D5677.

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

Anchors shall meet or exceed the requirement of U.S. Government, G.S.A. Specifications No. AA 1922A.

Nuts and bolts shall conform to the requirements of ASTM 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 C564 or equal.

D. **Basis of Acceptance:** Downspout materials will 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

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Engineer may reject any downspout system which, in the opinion of the Engineer, exhibits poor quality or workmanship.

Construction Details:

A. **Shop Drawings:** Shop drawings are not required.

B. **Erection of Downspout Systems:** Connections for runs of pipe noted on the plans as removable for maintenance shall be made with a bolted gasketed flange system or neoprene couplers. All clean outs 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 Bridge Drainage Pipe (BDP) 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 a electric heat collar to the joint once the adhesive has reached a gelatin

like consistency. Open flame shall not be used for curing. Wipe any excess adhesive from 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 may be used. Straps shall have 120 degrees of contact with the pipe. Hanger thickness shall be 5 mm. (min.)

NPS	Minimum Strap Width (mm)
6	38
8	38
10	38
12	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. Pipe shall 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 unobstructed and does not leak. Any obstruction in the downspout system preventing the free flow of drainage 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, to the nearest 0.1M, measured along the centerline of pipe between the extreme outer limits of downspouts, including hoppers, furnished and placed in accordance with the Contract Documents.

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Basis of Payment:

The unit price bid per meter shall include the cost of furnishing all labor, materials and equipment necessary to erect the pipe, fittings, pipe supports, 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 per meter shall also include the cost of furnishing and placing pipe hangers and brackets, couplings, and the cost of furnishing and placing all adaptor fittings required at the juncture of fiberglass pipe and other types of pipe.

Any necessary removal of lead based paint will be paid under a separate item(s).

Payment Will Be Made Under:

Item No.	Item	Pay Unit
16576.22 M	Bridge Downspout System (Fiberglass)	Meter