SUPERSEDED BY EB 06-057 eau
EFFECTIVE 5/3/07

New York State Department of Transportation
ENGINEERING INSTRUCTION

EI 03-018

Title: **SPECIFICATION FOR ARMORLESS BRIDGE JOINTS**

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

Approved:
GEORGE A. CHRISTIAN
Acting Deputy Chief Engineer (Structures)
6/24/03
Date

ADMINISTRATIVE INFORMATION:

This Engineering Instruction (EI) is effective with projects submitted for the letting of January 15, 2004.

The revised specifications issued by this EI will be incorporated into the next revision of the Standard Specifications.

This EI does not supersede any EIs or EBs.

PURPOSE:

This EI issues new and revised Standard Specifications allowing the use of armorless bridge joint systems.

TECHNICAL INFORMATION:

These specifications introduce new bridge joint systems for structures. The new bridge joint systems employ an elastomeric concrete header with a structural joint sealant. These new systems are the preferred type of bridge joints to be used when superstructure movement is 64 mm or less. Bridge Detail (BD) sheets for the armorless bridge joint systems will be issued by EB 03-031.

In the interim period between the issuance and effective date of this EI, these systems may be used under special specification16567.5099 M.

IMPLEMENTATION:

The following specification is revised:

Section 567 - Armored Bridge Joint Systems

The following specification is new:

Section 705-04 Armorless Bridge Joint Systems

The following special specification is disapproved on the effective date of this EI:

16567.5099 M - Silicone Expansion Joint System

TRANSMITTED MATERIALS:

Revised Specifications 567 and new 705-04 are attached.

BACKGROUND:

It is anticipated that the introduction of armorless bridge joint systems into new construction will alleviate many problems associated with the armored joint and compression seal currently in use. These new systems have been used by NYSDOT Bridge Maintenance for many years with excellent results.

The reasons for the change are many. Persistent problems with armored joints have been routinely encountered by NYSDOT bridge maintenance forces. During initial construction, proper consolidation of the concrete under the horizontal leg of the armoring angle is difficult. The resulting voids lead to water collecting under the angle. When this water freezes it lifts up on the armoring angle and increases the likelihood of snow plow impact.

An additional problem is the corrosion of the steel angle. On the vertical face, the corrosion creates a gap at the seal to angle interface which causes water to leak onto the superstructure and substructure elements below. On the horizontal face, the corroding steel causes the concrete in contact with the angle to spall away, creating a larger gap for water to get under the angle. This causes leakage behind the angle in an armored joint in which the seal remains watertight.

Repair of damaged armored joint systems is time consuming and difficult. Damaged compression seals cannot be repaired and must be replaced. To remove and replace a concrete header with armoring angles requires jack-hammering, cutting out the steel angles, and placing new steel angles and concrete. The repaired section cannot be opened to traffic until the concrete has cured. This procedure requires long term lane closures.

In contrast, the poured liquid sealant or a closed cell cross-linked foam seals are easily spliced or cold joined in the field and are easily replaced in segments or in their entirety. They require very little time to place and/or cure and traffic can be restored in a matter of hours.

The elastomeric concrete used in the armorless joint systems offers a durable header material that cures much faster than traditional concrete. This minimizes lane closure times, reduces Maintenance and Protection of Traffic costs and shortens delays to the traveling public. Unlike traditional concrete, fresh elastomeric concrete bonds extremely well to previously placed fully cured material. It can also be installed in segments, making it adaptable to stage construction as well as staged repairs or replacements.

CONTACT:

Direct questions regarding this EI to the Structures Division Standards Unit at (518) 485-5748 or by email at plasalle@dot.state.ny.us

REVISIONS TO STANDARD SPECIFICATIONS

Make the following changes to Volume 2 of 3 of the Standard Specifications of January 2, 2002:

Page 5-112, Line 22, Delete "**ARMORED**"

Page 5-112, Line 23; Delete "armored"

Page 5-112, Line 25; Delete "armored"

Page 5-113, **Insert** the following new section after line 8:

"D. Armorless Bridge Joint System. The system shall consist of components shown on an Approved Materials Detail Sheet for a Manufacturer and System whose name appears on the Materials Bureau Approved List. The required method of installation will be shown on the Approved Materials Detail Sheet."

Page 5-113 Line 14, delete "An armored" and **Replace** with "A"

Page 5-113 **Insert** the following as a new section after line 16:

"D. Materials Detail Sheet (MDS). A sheet approved by the D.C.E.S. and containing all material requirements and installation information for Armorless Bridge Joints which are included on the Materials Bureau Approved List."

Page 5-116, **Insert** the following as a new section after line 7:

567-2.04 Armorless Bridge Joint. The material requirements shall be as shown on the Approved Materials Detail Sheet corresponding to a Manufacturer and System listed on the Materials Bureau Approved List.

Page 5-116 Line 8; delete "**567-2.04**" and **Replace** with "**567-2.05**"

Page 5-119, **Insert** the following new section after line 1:

567-3.04 Armorless Bridge Joint System

A. Manufacturer's Representative. The joint system shall be installed in strict accordance with the manufacturer's instructions and the Approved Materials Detail Sheet. In the event of a conflict, the terms of the Approved Materials Detail Sheet shall rule. A representative of the bridge joint system manufacturer shall be present prior to placement to inspect the prepared surfaces and remain at the job during all phases of the installation. The representative shall be fully conversant in all respects with the correct installation methods. The representative shall be responsible to advise both the Engineer and the Contractor on properly installing the joint system. The representative may be excused from the project site at the discretion of the EIC.

B. Preparation. All surfaces shall be prepared as per the Approved MDS. At a minimum, the preformed recess which is to receive the joint system shall be air blown using air free of water and oil or vacuum-cleaned so that all loose or foreign matter is removed prior to installation of the system. The substrate shall be dry for a minimum of 24 hours prior to installation fo the joint system.

C. Storage Inspection and Handling. The joint system shall be stored, inspected and handled in accordance with the Approved Materials Detail Sheet.

D. Installation Inspection. All installation work shall be subject to the Engineer's inspection.

E. Watertight Integrity Test. At least five work days after the joint system has been fully installed the Contractor shall test the entire (full length) joint system for watertight integrity. The entire joint system shall be covered with water, either ponded or flowing, for a minimum duration of 15 minutes. The concrete surfaces under the joint shall be inspected during this 15 minute period, and also for a minimum of 45 minutes after the supply of water has stopped, for any evidence of dripping water or moisture. Water tightness shall be interpreted to be no free dripping water on any surface on the underside of the joint. Patches of moisture shall not be cause for non-acceptance.

Should the joint system exhibit evidence of water leakage at any place whatsoever, the Contractor shall locate the place(s) of leakage and take all measures necessary to seal the leak. A subsequent water integrity test shall be performed subject to the same conditions and consequences as the original test.

Page 5-119 Line 13; add the following after the end of the sentence:

No additional payment will be made for corrective actions.

Page 5-119 Delete line 14 through line 21.

Page 5-119 **Insert** the following after line 31:

567.60 M	Armorless Bridge Joint System	Meter

Make the following changes to the Volume 3 of 3 of the Standard Specifications of January 2, 2002:

705-04 Armorless Bridge Joints

Scope. This specification covers the material requirements for armorless bridge joint systems.

Material Requirements. The materials used to construct the armorless bridge joint system will appear as approved materials on the Department's Approved List for Materials and Equipment for use on NYSDOT Projects.

Basis of Acceptance. Acceptance of this material will be based on the manufacturer's name and system appearing on the Department's Approved List and a Manufacturer's certification of conformance of the system to the approved Materials Detail Sheet (MDS.) The supplier will provide two copies of the approved Materials Details through the Contractor to the Engineer as part of the evidence of acceptability for the material at least 10 days prior to shipment of the product to the job site.