TO:

MAIN OFFICE

REGIONAL OFFICES

# ENGINEERING INSTRUCTION

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

SUBJECT: SPECIAL SPECIFICATION
ITEM 15653.10

Subject Code: 7.27-1

Distribution: [G] Main Office [G] Regions [ ] Special

APPROVED: R. N. Kamp
Deputy Chief Engineer (Structures)

Code: EI 74-100

Date: 10/29/74

Modifies:
EI 74-058 DATE 6/20/74

EI 74-58, entitled Bridge Joints, stated that the details and specifications of the Elastomeric Armored Joint would be forwarded in the near future.

Attached is a copy of the Special Specification (New) Item 15653.10 (Old Item 227C), Armored Joint With Preformed Elastomeric Joint Sealer.

The new item number for this joint should be added to the Policy for Bridge Joints attached to EI 74-58.

SPECIAL SPECIFICATION

15653.10
ARMORED JOINT WITH PREFORMED ELASTOMERIC JOINT SEALER

DESCRIPTION:

This work shall consist of furnishing and placing an armored joint system of the type shown on the Contract Plans and described in this Specification.

DEFINITIONS:

A. Armored Joint System:

The system shall consist of armored joint segments, angles, anchor studs, threaded studs, bolts, nuts, lock washers, expansion bolt anchors, and sealant, all combined as noted in the Contract Documents so that a fully operational and waterproof system shall seal the joint in which it is installed. Armored joint system shall be referred to throughout this specification as the "joint system".

Armored Joint Segment:

A segment is the length molded in the shop and shipped to the job site. Armored joint segments shall be referred to through this specification as the "armored segment(s)".

C. Joint:

The opening provided between two portions of a structure to allow for expansion and contraction.

MATERIALS:

A. Material Requirements:

1. Angles:

The steel used shall conform to the requirements of Designation A242 and shall also meet the requirments of Material Specification 715.01 - Structural Steel.

2. Support Angles:

The steel used shall conform to the requirements of ASTM A36.

3. Internal Plates:

The metal plate which is internally bonded in the preformed elastomeric joint sealer shall be rolled mild steel.

4. Headed Concrete Anchor Studs and Threaded Studs:

The studs shall conform to the requirements of Material Specification Subsection 709.05 - Stud Shear Connectors. The studs shall be furnished in the dimensions shown on the Plans.

5. Bolts and Nuts:

The steel used in the bolts and nuts shall conform to the requirements of ASTM Designation A307.

6. Expansion Bolt Anchors:

The steel used in the expansion bolt anchors shall meet or exceed the requirements of U.S. Government G.S.A. Specifications No. FF-S-325, Group III, Type 1 or Group VIII, Type 1.

The Contractor will be required to furnish the Engineer two (2) certified copies of the records of the chemical analysis of the steel to be furnished in the joint system.

7. Preformed Elastomeric Joint Sealer:

The elastomer shall be of the compound polychloroprene which shall have the following physical properties in accordance with ASTM Method D15, Part B.

| Property | ASTM Test | Requirement |
|---|---|---|
| Tensile Strength | D-412 | 1800 psi minimum |
| Elongation at break | D-412 | 400 percent minimum |
| Hardness | D-2240 | 45 (±5) points, shore durometer A |
| Compression set (22 hrs at 158°F) | D-395 (Method B) | 20 percent maximum |
| Low Temperature | D-746 (Procedure B) | Not brittle at -40°F |
| Oil Deterioration (Volume increase after immersion in ASTM Oil No. 3 for 70 hrs. @ 212°F.) | D-471 | 120 percent maximum |

Armored segments shall be furnished in lengths not less than 6 feet, excluding length of tongues. Shorter lengths may be used at locations requiring special treatment or to provide the closing sections.

The tape used to bond end surfaces of the preformed elastomeric joint sealer to each other shall be polyisobutylene-based extrusion, with aggressive tack and shall conform to Federal Specification MILC 18969a, Type II, Class B.

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ARMORED JOINT WITH PREFORMED ELASTOMERIC JOINT SEALER (Continued)

B. Fabrication Requirements:

Shop Drawings:

Shop drawings are required. The provisions of Section I, Drawings, Subsection 102, Shop Drawings, of the New York State Steel Construction Manual shall apply.

1. The Contractor shall prepare, as soon as possible after the award of the Contract, complete and accurate shop drawings of the armored segments to be used on this Contract.

2. The Contractor shall submit two sets of prints to the Deputy Chief Engineer (Structures) who will indicate thereon such corrections as may be necessary to secure completion of the armored segments in accordance with the intent of the Contract Documents.

   One set of prints, with desired corrections indicated thereon in colored crayon, will be returned to the Contractor. When the revision has been completed to the satisfaction of the Deputy Chief Engineer (Structures), the tracings shall be forwarded to him for his written approval. Sepia reproducibles of the approved tracings shall be returned to the Contractor. The original tracings will be retained by the Deputy Chief Engineer (Structures). Fabrication shall be carried out in strict accordance with the approved sepias and the Contractor shall make no further changes to the sepias except upon written instructions from the Deputy Chief Engineer (Structures).

3. The Contractor shall distribute prints of the approved sepias as follows:

   One set to the Deputy Chief Engineer (Structures).

   Three sets to the Regional Director.

4. The details for the mechanical devices to set the joint to the ambient temperature shall be shown on the shop drawings.

Fabrication:

The metal surface of the armored joint segment to which the preformed elastomeric joint sealer is to be heat bonded shall be thoroughly cleaned of all dirt, oil, grease, scale and oxides by grinding or sandblasting immediately prior to the heat bonding process. The metal surface after cleaning, shall be defined by ASTM Designation D2200, Pictorial Standard, and shall meet the requirements of SSPC-SPC-6, Commercial Blast Cleaning, but shall not be of a quality less than CSa2.

Basis of Acceptance:

All materials used for this item, regardless of whether they are employed for fabrication or installation, shall be accepted at the work site upon certification, by the proper manufacturer, that all of the requirements of the Contract Documents have been met.

CONSTRUCTION DETAILS:

A representative from the joint manufacturer shall be present at the start of the installation. He shall be experienced with all phases of the joint system.

Immediately prior to installation, the armored segments shall be inspected by the Engineer for proper alignment and complete bond between the polychloroprene and the steel, and proper stud placement and weld effectiveness. No bends or kinks in the armoring steel shall be allowed, nor shall straightening of such bends or kinks be allowed. Armored segments exhibiting bends or kinks shall be removed from the work site, and replaced with new armored segments at the the Contractor's expense. Armored segments which exhibit any separation of the polychloroprene and the armoring steel shall be removed from the work site and replaced with new armored segments at the Contractor's expense. Studs shall be inspected visually and shall be given a light blow with a hammer. Any threaded stud which does not have a complete end weld shall be replaced. Any headed stud which does not have a complete end weld or does not emit a ringing sound when struck a light blow with a hammer shall be replaced. Studs located more than one inch from the location shown on the shop drawings shall be carefully removed and a new stud placed in the proper location.

In order for the armored segments to be installed properly, they must be set at a width which is directly dependent upon the ambient temperature at the start of installation, as shown on the shop drawings. The width setting shall be accomplished through the use of mechanical devices supplied by the armored segment fabricator. After the armored segment has been set to its proper line and grade and securely attached to its supports, the mechanical devices shall be removed and returned to the armored segment manufacturer.

Under no circumstances shall the internal plate be exposed either before, during or after the installation of any armored segment. Should any armored segment exhibit an exposed internal plate at any time prior to the final acceptance of the structure, that segment shall be removed and taken from the work site. A new armored segment shall be supplied and completely installed by the Contractor, at no expense to the State, to replace any armored segments removed by reason of an exposed internal plate.

The mating surfaces of the armored segments shall be scrubbed with wire brushes, or other means satisfactory to the Engineer, to remove any rust from the steel and roughen the polychloroprene. This operation shall immediately precede the application of tape.

ARMORED JOINT WITH PREFORMED ELASTOMERIC JOINT SEALER (Continued)

At least five working days, (but no sooner than 48 hours subsequent to any rainfall), after the joint system has been fully installed, the Contractor shall test the entire (full length) joint system for watertight integrity. He shall employ a method satisfactory to the Engineer. 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) or leakage and he shall take any and all measures necessary to stop the leakage. This work shall be done at the Contractor's expense.

Any water integrity test preformed subsequent to the Contractor's previously described corrective measures shall carry the same responsibility as the original test.

In the event that measures to eliminate leakage have to be taken, a subsequent water integrity test shall be preformed subject to the same conditions as the original test.

METHOD OF MEASUREMENT:

The quantity of joint system to be paid for under this item will be the number of linear feet of joint system completely installed measured horizontally along the center line of the joint between the outer limits of the joint system as shown on the Contract Plans. The words "completely installed" shall be interpreted to mean the joint system in place with all anchors encased in concrete, all necessary concrete finishing completed, and all necessary water-tight integrity tests completed. No measurement will be made for any vertical sections required at curbs.

BASIS OF PAYMENT:

The unit price bid per linear foot shall include the cost of furnishing all labor, materials and equipment necessary to complete the work.

Payment will not be made for any work done by the Contractor to stop water leakage evidenced by any water integrity test.

September 12, 1974
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