

BRIDGE EXPANSION JOINT, MODULAR

\*\*From Alburgh-Rouses Point BHF MEMB(24)(Re-Ad)

- xx. DESCRIPTION. This work shall consist of furnishing and installing expansion devices.

The work under this Section shall be performed in accordance with these provisions, the Plans, and Section 516 of the Standard Specifications.

- xx. MATERIALS. The modular expansion joint system and its component parts, including stiffening plates and anchorages, shall be supplied by the manufacturer. The manufacturer shall certify that components meet the following requirements:

Connecting and Sliding Plates.....ASTM A588M  
 Hollow Beams, Steel Extrusions, and Milled  
 Steel Shapes.....ASTM A588M  
 Strip Seal.....ASTM D2628<sup>a</sup>  
 Adhesive (to bond the preformed compression  
 seal to steel surfaces).....Table 1

Notes:

<sup>a</sup> Recovery test not required.

TABLE 1  
 MOISTURE CURING URETHANE ADHESIVE<sup>1</sup> WITH HYDROCARBON SOLVENT

Average weight per liter (gal)	0.96 kg (8 lbs/gal)± 10%
Solids Content	72% - 74% by Weight
Adhesive to remain fluid from	-15°C to 50°C (5°F to 120°F)
Film Strength (ASTM D412)	8.5 MPa (1230 psi)
Elongation	350%

<sup>1</sup> The sealer shall be applied in one piece for the full length of each joint. Splices will not be permitted if the full length of joint is less than 15 meters (50 feet). If the full length of joint is more than 15 meters (50 feet), but less than 30 meters (100 feet), one fabrication splice in the sealer will be permitted. If the full length of joint is greater than 30 meters (100 feet), fabrication splices in the sealer will be permitted at approximately 15 meter (50 foot) intervals.

Stud shear connectors and threaded studs shall conform to the requirements of Subsection 714.10.

- xx. GENERAL REQUIREMENTS.

(a) Modular Expansion Joint Systems. Modular expansion joint systems are manufactured in various sizes, defined by their total movement capability. The correct movement capability required at any one location is indicated on the Plans.

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(b) Sealing Elements. On each individual structure, all the seals used in the modular joints shall be of the same configuration and shall be from the same manufacturer.

(c) Modular Expansion Joint System Manufacturers. The following manufacturers are capable of supplying a modular expansion joint system that meets these specifications:

Kinedyne Corporation  
3566 S. Benzing Road  
Orchard Park, NY 14127  
Phone: 716-667-6833  
Toll free: 888-358-5438  
Fax: 716-667-6837

The D. S. Brown Company  
300 East Cherry Street  
North Baltimore, OH 45872  
Phone: 419-257-3561  
Fax: 419-257-2200

Watson-Bowman Acme Company  
95 Pineview Drive  
Amherst, NY 14228  
Toll free: 800-677-4922  
Local direct: 716-691-7566  
Fax: 716-691-9239

Requests for substitutions for the above shall be submitted to the Agency's office of Contract Administration a minimum of 10 days in advance of the bid opening date. Substitutions for the above after award shall be approved by the Engineer.

xx. TERMINOLOGY. The following terminology will be used throughout this Section:

Joint System - This term is used to describe the installation with all of its component parts as installed in the structure slab, and if applicable, in sidewalks, barriers, and other bridge components.

Segment - A modular joint system manufactured at less than full roadway width. No segment shall be less than a single lane width long.

Joint - The separation between two elements of a bridge to allow for movement.

xx. FABRICATION DRAWINGS. The Modular Expansion Joint System manufacturer's instructions for the proper installation of the joint system shall be entered on the Fabrication Drawings. Manufacturer's instructions shall include the proper width settings for various ambient temperatures. Fabrication Drawings which lack manufacturer's installation instructions shall be returned without examination.

xx. FABRICATION.

- (a) General Requirements. All metal surfaces to come in contact with the neoprene sealer shall be blast-cleaned in accordance with the requirements of Steel Structures Painting Council Surface Preparation No. 6 (SSPC-SP6) - Commercial Blast Cleaning. After cleaning, all cleaned surfaces shall exhibit a clean quality of CSP6 or better, as defined by Steel Structures Painting Council Standard SSPC Vis 1.

The cleaned metal surfaces shall be protected from rusting until such a time as the sealer and lubricant adhesive are placed against the metal surface. Any cleaned metal surface upon which rusting appears shall be recleaned in accordance with the foregoing, at no additional cost to the Agency.

The curb and parapet sliding plates, if required, shall be shop-assembled to fit the modular expansion joint system. The plates may be disassembled from the joint system for shipment to the project site.

Unless otherwise noted, each modular expansion joint system shall be fabricated as a single entity. It shall fit the full width of the structure as indicated on the Plans. The system shall be preset by the manufacturer prior to shipment. Presetting shall be done in accordance with the joint opening at 20°C (68°F). The joint opening shall be as indicated on the Plans. Should the Plans indicate that segmental fabrication is permissible, or required, each segment shall be fabricated to exactly fit that portion of the superstructure under construction, including sidewalks. Segments shall be fitted with temporary seals. Temporary seals will not require lubricant adhesive.

Fabrication inspection shall be conducted at the discretion of the Agency.

- (b) Acceptance. The fabricated joint system will be accepted at the work site by the Engineer after a visual inspection and upon receipt of the Manufacturer's Certification Report (MCR) that states that the materials and the fabricating procedures were in accordance with the approved Fabrication Drawings and these provisions. The manufacturer shall submit, with the MCR, a certified copy of the Mill Test Report (MTR) for all steel used to fabricate the joint system.
- (c) Caulking Compound for Structures. Caulking compound shall be applied with either a pneumatic or ratchet hand gun. Caulking compound shall be a material which complies with Federal Specification TT-S-230 Sealing Compound, Synthetic-Rubber Base, Single Component, Chemically Curing. The color of the compound shall be cement mortar grey when tested in the manner described in TT-S-230. A sample of the caulking compound shall be submitted to the Engineer

for color approval. Acceptance of this material will be based on the manufacturer's certification of compliance with these specification requirements and approval of the Engineer.

xx. CONSTRUCTION REQUIREMENTS.

- (a) Manufacturer's Representative. During the initial stages of the joint system installation, the Contractor shall have present at the installation site a representative of the joint system manufacturer. This person shall be competent in all respects regarding the proper installation procedures to be used. The Representative shall advise the Contractor of, and certify to the Engineer that, the proper procedures are being followed. All certifications to the Engineer shall be in writing. A manufacturer's representative is not required for One Cell Modular Joint Systems.
- (b) Field Inspection. Immediately prior to installation, the joint system shall be inspected by the Engineer for proper alignment and complete bond between the neoprene sealer and the steel, and proper stud placement and effectiveness. No bends or kinks in the joint system steel shall be allowed (except as necessary to follow the roadway grades) nor shall the straightening of such bend or kinks be allowed. Any joint system exhibiting bends or kinks shall be removed from the work site and replaced by a new joint system, at no additional cost to the Agency. Neoprene sealer not fully bonded to the steel shall be fully bonded at the expense of the Contractor. Studs shall be inspected visually, and shall be given a light blow with a hammer. Any 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 25 mm (1 inch), in any direction, from the location shown on the Fabrication Drawings, shall be carefully removed and a new stud placed in the proper location. All stud replacements shall be at no additional cost to the Agency.

xx. INSTALLATION.

- (a) Manufacturer's Instructions. The modular expansion joint system shall be installed in strict accordance with the manufacturer's instructions and the advice of their representative. Two weeks prior to the intended installation, the Engineer shall be supplied with two copies of the written instructions. The permanently installed joint system shall match exactly the finished roadway profile and grades. The words "permanently installed" shall be interpreted to mean that any work necessary to be done to any other part of the structure, in order to achieve a truly complete permanent installation, has been completed. This will apply even if the other work is to be paid for under other Contract items.

- (b) Joint System Width, Splices, and Installation Equipment. The modular expansion joint system shall be set to the proper width for the ambient temperature at the time of setting, as indicated on the Fabrication Drawings. If the joint system has been fabricated in segments, they shall be field-spliced to create a single unbroken system. All mechanical devices, supplied by the joint system manufacturer, used to set the joint system to the proper width, will remain the property of the manufacturer. When no longer required, the devices shall be returned to the manufacturer.
- (c) Sliding Plate. In order to perform the work of installing the joint systems in a proper manner, some portions of the curb and parapet cannot be constructed until after the sliding plates of the joint system are installed. This surface shall be scrubbed with wire brooms. After the surface preparation has been accepted, every effort should be made to thoroughly wet the concrete surface, and all porous surfaces to be in contact with new concrete, for 12 hours. If, in the opinion of the Engineer, conditions or the situation prohibits this, then the surfaces should be wetted for as long as possible. Construction joints must be wetted by continuous spraying with hoses using potable water. The Contractor shall remove any puddles of freestanding water with oil-free compressed air, and protect the surfaces from drying, so that the existing concrete remains in a clean, saturated surface dry condition until placement of the new concrete.
- (d) Permanent Seals. After the joint system has been completely installed over the full width of the structure, including sidewalks, the temporary seals shall be removed and replaced with permanent seals. After the temporary seals are removed, all metal surfaces that will be in contact with the permanent seals shall be commercially blast cleaned (SSPC-SP6) to visual standard CSP6 as defined.
- (e) Watertight Integrity Test. A minimum of five working days after the joint system has been fully installed, the Contractor shall test the entire (full length) joint system for watertight integrity employing 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.

Watertightness 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 location, the Contractor shall locate the place(s) of leakage and take all measures necessary to stop the

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leakage. This work shall be done at no additional cost to the Agency. A subsequent water integrity test shall be performed subject to the same conditions and consequences as the original test.

xx. METHOD OF MEASUREMENT. The quantity of Special Provision (Bridge Expansion Joint, Modular) of the type specified to be measured for payment will be the number of meters (linear feet) used in the complete and accepted work, measured along its centerline.

xx. BASIS OF PAYMENT. The accepted quantity of Special Provision (Bridge Expansion Joint, Modular) of the type specified will be paid for at the Contract unit price per meter (linear foot). Payment will be full compensation for detailing, furnishing, handling, transporting, and placing the material specified, including nondestructive testing of welds, surface preparation, protective coating, and epoxy bonding compound; for performing watertight integrity tests as specified; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment will be made when the joint system has been completely installed and the following operations completed, where applicable:

- (a) Nuts tightened, or retightened, as required.
- (b) Concrete placed and finished.
- (c) Watertight integrity tests performed and accepted.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
900.640 Special Provision (Bridge Expansion Joint, Modular)	Meter (Linear Foot)