

ITEM 567.40010825 - MODULAR EXPANSION JOINT SYSTEM – 3 CELL (MODIFIED)

1. DESCRIPTION:

- 1.01 The work shall consist of fabricating, furnishing, and installing a modular expansion joint system designed to accommodate multi-directional accelerated movements as generated by seismic events at the locations indicated on the Contract Plans.
- 1.02 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 Contract Plans.
- 1.03 The modular joint systems supplied for this work shall be one of the following:

A. Wabo-Seismic Modular – As Furnished By:

Watson-Bowman Associates
95 Pineview Drive
Amherst, NY 14228

B. Maurer System Swivel Expansion Joint Assembly – As Furnished By:

D. S. Brown Company
P.O. Box 158
North Baltimore, OH 45872

- 1.04 Only a modular joint system supplied by one of the foregoing suppliers will be acceptable. No other supplier will be considered. Only one manufacturer's joint system will be permitted to be installed on this project.
- 1.05 **Fatigue Design:** The expansion joint device shall be designed and tested to a fatigue life of 100,000,000 truckload cycles. The manufacturer shall be required to submit a detailed report substantiating the testing performed on its joint design and showing the resistance line generated from testing.

The fatigue design will be acceptable where the following criterion is shown to be satisfied:

- A. 50% of the maximum hot spot stress is less than the tested fatigue resistance at 100,000,000 truck cycles.

The above criterion must apply for each of the following steel elements: center beam, connection, and support bar.

- 1.06 **Alternate to Tested Fatigue Design:** In lieu of demonstrating an acceptable fatigue design under Item 1.05 above, an acceptable fatigue design will exist where the following requirements are present:
 - A. The spacing between support bars does not exceed 3' – 0" at any point on the center beam.
 - B. The connection is a fully penetrated weld in accordance with the details on the Contract Documents, and
 - C. The weld procedures used for the connection are in accordance with the New York State Steel Construction Manual.

ITEM 567.40010825 - MODULAR EXPANSION JOINT SYSTEM – 3 CELL (MODIFIED)

2. MATERIALS:

2.01 Materials used for this work shall conform to the following requirements:

- A. The modular joint system and all its component parts, including stiffening plates and anchorages, shall be supplied by the manufacturer. The manufacturer shall certify in writing that the following components meet the listed requirements:

Hollow Beams & Steel Extrusions	ASTM A588
Seal	705-09*
Lubricant Adhesive	567-2.0
Headed Studs	709-05

* Shape approval by the Director of Materials is not required. Hardness, Type A Durometer shall be 60+5; ASTM Method D2240. This shall be certified by the manufacturer.

- 2.02 Immediately prior to installation, the joint system shall be inspected by the Engineer for proper alignment and complete bond between neoprene sealer and the steel as well as proper stud replacement. No bends or kinks in the joint system steel shall be allowed (except as necessary to exactly follow the roadway profiles and grades), nor shall the straightening of such bends 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 the expense of the Contractor. 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 one inch (1”), in any direction, shall be carefully removed and a new stud placed in the proper location. All stud replacements shall be at the expense of the Contractor.
- 2.03 The modular expansion joint system shall be set to the proper width for the ambient temperature at the time of setting. This information is indicated on the Contract Plans.
- 2.04 Any 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.
- 2.05 In order to perform the work of installing the joint systems in a proper manner, some portions of the curb cannot be constructed until after the siding plates of the joint system are installed. At such times that the necessary concrete is placed (after joint system plate installation), existing surfaces shall receive coating of epoxy polysulfide grout (721-03). The grout shall be placed no sooner than two (2) hours prior to concrete placement. The cost of the grout shall be included in the unit price bid for the concrete.
- 2.06 After the joint system is permanently installed, including sliding plates and all concrete placements, a watertight integrity test shall be performed. The test shall be done in accordance with requirements of Subsection 567-3.01D.
- 2.07 Structural steel used to fabricate the connecting sliding plates, shall meet the requirements of ASTM A588 or A242. The steel shall be 3/8” thickness.
- 2.08 Shop drawings shall be required. They shall meet the requirements of Subsection 567-2.04. They shall be submitted to the Authority within ninety (90) days after the award of the Contract.

ITEM 567.40010825 - MODULAR EXPANSION JOINT SYSTEM – 3 CELL (MODIFIED)

2. MATERIALS: (cont'd)

- 2.09 The modular joint system manufacturer's instruction for the proper method of installing the joint system including field splicing methods, if required, shall be entered on the shop drawings. Shop drawings which lack manufacturer's installation instructions may be returned without examination.
- 2.10 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 Csa2, or better, as defined by Steel Structures Painting Council Standard SSPC Vis. 1.
- 2.11 All 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 expense to the Authority.
- 2.12 The curb and parapet sliding plates, if required, shall be shop assembled to fit the modular joint system. The plates may be disassembled from the joint system for shipment to the project site.
- 2.13 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 Contract Plans. The system shall be preset by the manufacturer prior to shipment. Presetting shall be done in accordance with the joint opening at 68°F which is indicated on the Contract Plans.
- 2.14 All welding permanently incorporated in the expansion joint shall meet the requirements of A. W. S. Code Section D-1.5. The fabrication of the joint shall be performed by a shop certified to Category III qualifications by A.I.S.C.

3. CONSTRUCTION DETAILS:

- 3.01 The modular expansion joint system shall be installed in strict accordance with the manufacturer's instructions, and the advice of their official representative. Two (2) weeks prior to the intended installation the Engineer will be supplied with two (2) copies of the written instructions. The manufacturer's official representative shall be present for the installation of the first joint system and afterward, be available in the field as necessary for consultation on the proper installation of all modular joint systems. The permanently installed joint system shall match exactly the finished roadway profile and grades. After the joint system has been permanently installed, a water tight integrity test shall be done in accordance with the requirements of Subsection 567-3.01D and the following modifications:
 - A. The words "permanently installed" as used above 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 done. This will apply even if the other work is to be paid for under other items of the Contract.
 - B. All certifications from the joint manufacturer's representative to the Engineer shall be in writing.

ITEM 567.40010825 - MODULAR EXPANSION JOINT SYSTEM – 3 CELL (MODIFIED)

3. CONSTRUCTION DETAILS: (cont'd)

3.02 After the modular joint system has been set to its final line and grade, the bridge deck concrete can be placed. Prior to concrete placement, all existing concrete surfaces shall be primed with epoxy polysulfide grout (721-03). The grout shall be applied no sooner than two (2) hours previous to the concrete placement. The uppermost surface of the concrete placement shall be finished in accordance with the requirements of Subsection 555-3.07, Finishing. The cost of this work including the group placement shall be included in the unit price bid for the bridge deck concrete.

3.03 **Shop Drawings:** The Contractor shall submit five (5) copies to the Engineer for approval.

4. METHOD OF MEASUREMENT:

4.01 The work will be measured as the number of feet of modular expansion joint system, completely installed, measured along the horizontal projection of the centerline of the joint system between the outer limits indicated on the Contract Plans.

4.02 The words “completely installed” shall be interpreted to mean the joint system in place with the following operations completed:

- A. Concrete placed and finished.
- B. Watertight integrity test performed.

5. BASIS OF PAYMENT:

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

5.02 No payment will be made for any work noted to be done at the expense of the Contractor, or any work noted to be paid for under other items of the Contract.