KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, EDITION 2015

Delete SECTION 1510 and replace with the following:

SECTION 1510

STRIP SEAL ASSEMBLY

1510.1 DESCRIPTION

This specification covers materials for a bridge expansion joint system using a strip seal assembly as shown in the Contract Documents.

1510.2 REQUIREMENTS

a. Shop Fabrication.

Shop fabricate assemblies in accordance with the requirements of **SECTION 744**. Perform stud welding, including pre-production testing and post-production QC inspection, in accordance with the applicable clauses in AWS D1.1. Apply studs in the flat position (surface to which studs are applied being horizontal and facing up) except when stud application qualification tests permit welding to surfaces that are vertical. Perform post-production bend tests on no less than 20% of the device's total number of welded studs, including those that do not show a full 360 degrees of flash around the stud or those that have been repaired by fillet welding.

Apply studs that conform to the requirements of ASTM A 29, Grades 1010 through 1020.

b. Type I.

(1) Provide a Type I Strip Seal assembly that consists of a single continuous neoprene strip or diaphragm seal element inserted into two wedge grips of extruded or rolled steel that are anchored to the bridge. The Engineer will consider other configurations of locking devices or grips to retain the diaphragm in place if the Contractor provides detailed information on the alternate device.

(2) Unless shown otherwise in the Contract Documents, provide grips that comply with the requirements of ASTM A 36 or A 242. The anchoring system for the grips must comply with the details shown in the Contract Documents.

(3) Provide a Polychloroprene (Neoprene) diaphragm that complies with the requirements of ASTM D 2628 (except for recovery requirements), or alternately, ASTM D 2000 3BC 615 A14 B14 C12 F17 (250% minimum ultimate elongation). In the preceding "line call-out", the "15" in 615 refers to minimum tensile strength in hundreds of psi.

(4) Provide a sealant for bonding the neoprene diaphragm to the steel grips that complies with the recommendations of the manufacturer of the assembly.

c. Type II

(1) Provide a Type II assembly that consists of separate units of elastomer and metal or integrally molded components cast under heat and pressure, and anchored to the bridge by bolts or studs.

(2) The assembly must contain a flexible convolution or diaphragm, with or without fabric reinforcement, which links the pads and spans the expansion joint. The diaphragm must be a continuous strip, molded in an upstanding arch, which will retain its shape during the expansion cycle and must permit horizontal, vertical, and skewed movements while still maintaining a watertight seal.

(3) Provide an elastomer manufactured from neoprene that complies with **TABLE 1510-1.**

TABLE 1510-1: TYPE II ELASTOMER		
Property	**ASTM Test Method**	**Requirement**
Tensile Strength	D 412	1500 psi, minimum
Elongation at Break	D 412	200% minimum
Hardness	D 2240	45±10 points, Durometer A
Compression Set, 22 hrs @ 70°C	D 395, Method B	35% maximum
Low Temperature	D 746 or D 2137	Not Brittle @ -40°C
Ozone Resistance, exposure @ 100 PPHM ozone for 70 hrs. @ 40°C, sample under 20% strain	D 1149	No Cracks
Oil Deterioration, volume increase after immersion in IRM 903 Oil for 70 hrs. @ 100°C	D 471	120% maximum

PPHM = Parts Per Hundred Million

(4) Provide a sealant that complies with the recommendations of the manufacturer of the assembly.

(5) Fasten the assembly to the bridge with bolts or studs that complies with details in the Contract Documents and are of a length recommended by the assembly manufacturer.

(6) Provide internal reinforcement plates that comply with the requirements of ASTM A 1011 SS Grade 36, A 36 or similar structural steel.

d. Type III

(1) Provide a Type III assembly that consists of a continuous cellular or strip type neoprene seal, geometrically designed to fasten to or be clamped by the extruded aluminum frames anchored to the bridge by bolts or cast-in-place anchors.

(2) Provide aluminum frame components that comply with the requirements of ASTM B 221 (Alloy 6061-T6).

(3) Fasten the assembly to the bridge with bolts or studs that complies with details in the Contract Documents and are of a length recommended by the assembly manufacturer.

(4) Provide an elastomer manufactured from preformed neoprene that complies with **TABLE 1510-2.**

TABLE 1510-2: TYPE III ELASTOMER		
Property	**ASTM Test Method**	**Requirement ***
Tensile Strength	D 412	2000 psi, minimum
Elongation at Break	D 412	175% minimum
Hardness	D 2240	70±10 points, Durometer A
Compression Set, 22 hrs @ 70°C	D 395, Method B	25% maximum
Low Temperature	D 746	Not Brittle @ -40°C
Ozone Resistance, exposure @ 300 PPHM ozone for 70 hrs. @ 40°C, sample under 20% strain	D 1149	No Cracks
Oil Deterioration, volume increase after immersion in IRM 903 Oil for 70 hrs. @ 100°C	D 471	80% maximum

***** All test sections taken for the extruded section. PPHM = Parts Per Hundred Million

1510.3 TEST METHODS

Test the materials in accordance with the ASTM standards referenced above.

1510.4 PREQUALIFICATION

None required.

1510.5 BASIS OF ACCEPTANCE

Receipt and approval of a Type D Certification as specified in **DIVISION 2600**.

Visual inspection for condition and workmanship at the point of usage, including a verification that 20% of the device's welded studs were bent in the shop (see **subsection 1510.2a**) approximately 15 degrees from normal.

In addition, the Engineer may bend any number of additional (previously untested) studs on any delivered device by striking the head of the studs or placing a pipe over the studs and manually bending the studs approximately 15 degrees from each stud's original axis. Fully secure the device prior to testing to avoid damaging or bending it. At temperatures below 50 degrees F, the manual method of bending is preferred. The Engineer may reject any device having two or more failures during field testing.

Once a device is rejected due to failed bend tests, field weld repairs (as an option to replacement) will not be accepted unless the contractor performs the bend test on all remaining (untested) studs and only the stud welding (not manual welding) process is used.

Devices that have not been rejected due to one or more failed bend tests may use the manual welding process.

All field welding repairs (including surface prep) shall conform to AWS D1.1 (stud or manual welding) using new replacement studs. The work shall be performed by a KDOT prequalified field welder. Any repairs that damage or introduce undesirable deflections in a device may result in its rejection.

The Engineer may bend test any number of replacement studs.

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