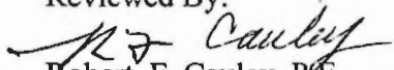
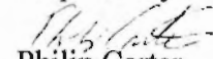


Reviewed By:


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Date: Sept. 17, 1997
Page 1 of 3

RESEARCH UPDATE U97-3

SILICOFLEX STRIP SEAL JOINT SYSTEM

Reference: Initial Report U95-10

Background:

In August, 1995 the Silicoflex Bridge Deck Expansion Joint System was installed on Bridge No. 1 on the Berlin State Highway. The new joint replaced an existing neoprene joint which failed from a compression set after 10 years of service. The failed joint allowed salt intrusion and caused a delamination of the steel girder ends. Rather than place another neoprene joint, it was decided that a silicone joint system would be installed as an experimental feature.

Product Description:

The Silicoflex System consists of a V-shaped, preformed, silicone strip seal which is bonded with a silicone adhesive directly to concrete, elastomeric concrete, or steel. The silicone bead is formed into serrations on the top of the seal and adheres to the vertical faces of the joint creating a waterproof bond. The seals may be placed on directional changes and curbs as well, and can be spliced as needed and connected with a splicing compound. The Silicoflex System is marketed by R.J. Watson, Inc., P.O. Box 85, East Amherst, NY 14051.

The joint seal was placed 1 inch below the riding surface and on the top and vertical faces of the upper curb. Prior to placing the joint, the steel angle plates were blast cleaned and wiped with Silicoflex cleaner/primer. Representatives from R.J. Watson, Inc. and Bridgesaver, Inc. assisted in the installation.

At the time the material was placed, the cost of the seal was \$40.00 per lineal foot. The sealant cost was \$10.00 per tube, which covers approximately 5 feet of joint. The overall cost of the materials was \$42.00 per lineal foot.

Performance Evaluation:

The Silicoflex System was inspected on May 22, 1997, after 1 year and 9 months of service. The joint was completely packed with sand from winter maintenance. The lower end of the joint at the downspout was blocked with debris which prevented drainage. Three sections were uncovered for inspection, one at each end and one near the center. At each location debonding was found. The worst area was near the upper end of the joint where the strip seal was found to be completely pulled away from the steel, leaving an opening approximately 3 inches long. (see photo). At two other locations the V-shaped seal was in contact with the steel but was not bonded. The seal itself appeared to be in good condition, but adhesion has not been retained.

The debonding could be the result of several factors. Most noticeable during the inspection was poor drainage and retention of sand and debris. The bond was further aggravated by considerable rust from the steel angle plates. It is possible that the steel was not thoroughly cleaned before the joint was installed, or that the normally occurring rust has spread underneath the adhesive and weakened the bond.

The Silicoflex joint is in contact with the steel throughout most of its length and is offering a fair degree of protection even though it has failed to remain tightly bonded to the steel. There doesn't appear to be an immediate need to replace the joint; although some chloride intrusion is certain.

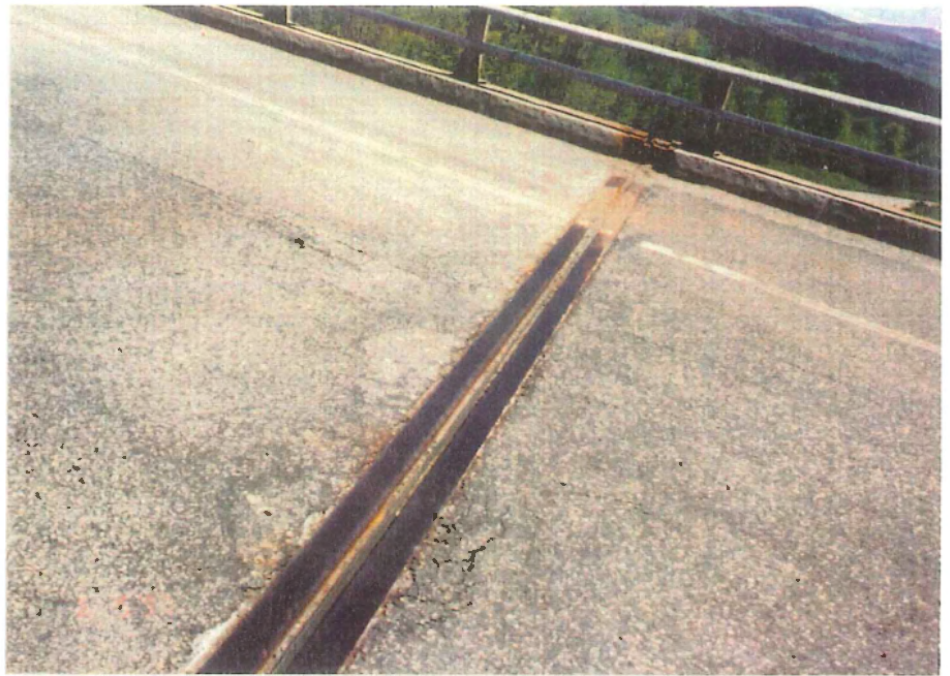
In spite of the breaks in the adhesive bond, the strip seal itself appears to have weathered well. It is possible that the silicone adhesive does not bond well to uncoated steel and would perform better when in contact with painted steel, concrete, or elastomeric material.

Follow Up:

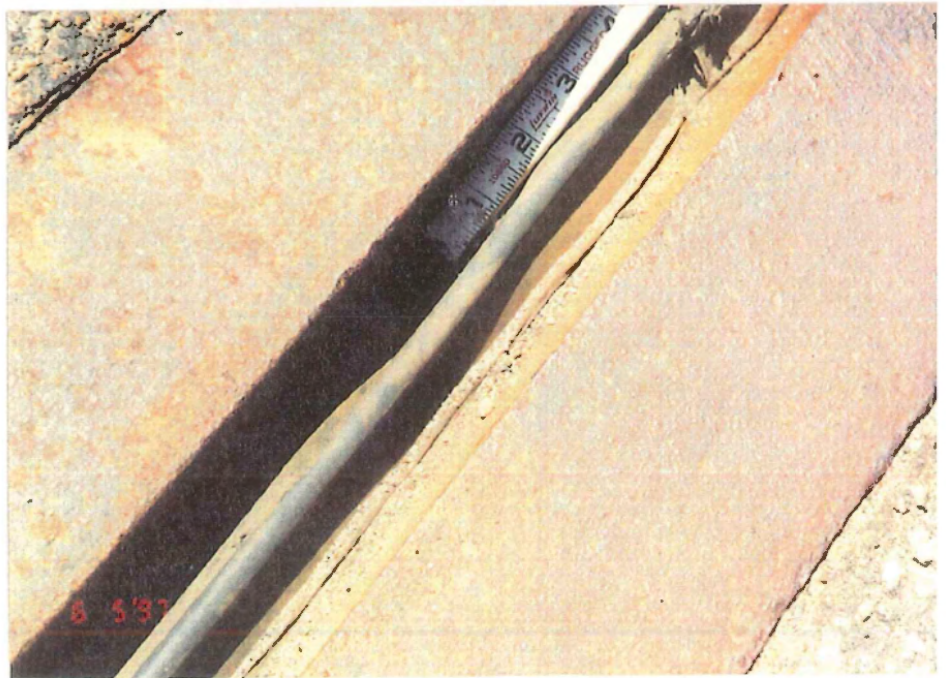
There are no immediate plans to replace the Silicoflex joint; therefore, it will be re-examined after another year to evaluate the rate of deterioration of the bond.

Photo Addendum

Silicoflex Strip Seal Joint
Bridge # 1
Berlin State Highway
View towards downspout



Bond failure
at upper end of joint



Clogged joint at
downspout end

