AASHTO Innovation Initiative (A.I.I.)

Dedicated to sharing...
- High payoff,
- Market-ready technologies

Accelerating adoption of innovation among...
- Peers in U.S. transportation agencies

aii.transportation.org
JOINT MAINTENANCE
WATERPROOF WITHOUT REPLACEMENT

A5483  St. Louis Co.  4-19-11
CRD Marmec Bottom Rd
West expansion device, compression seal, partially
removed, 2 1/2 in. at 80.
Welcome to the AASHTO Innovation Initiative Webinar on Bridge Expansion Joint Systems. Please mute the speakers on your computer to minimize feedback. We will start the webinar shortly.

Q: Hello, this is a question. What are bridge expansion joints?
Presenter – Mark Croarkin, MoDOT
JOINT MAINTENANCE
WATERPROOF WITHOUT REPLACEMENT

A5383  St. Louis Co.  4-19-11
CRD Maramec Bottom Rd
West expansion device
compression seal, partially
removed, 2 1/2 in. at 80.
A2163
Aug 23 2011
Typical Bearing
Clean / paint / lube

A2164
Aug 23, 2011
Typical Girder 1 EB Structure Only
Paint Lower Web and Bottom Flange (Pic East End)

A2163
Aug 23 2011
Girder 4 Hole at bearing behind stiffner
Clean and Paint All Girder Ends
VERTICAL STIFFNER SECTION LOSS

HOLE IN WEB OVER BEARING
REBAR EXPOSED

A3616 10-16-12
SPAN 4 BT 4 CAPFACE
LARGE SPALLS W/REBAR EXP
PAY NOW

OR PAY MORE LATER
Expansion Jt Hydroblast Removal
Kilian Corporation
Illinois Bridge (I-255 @ I-64)
Intermediate Bent
A2895 12-11-14
Rte W over Big River
Bt 6 Expansion Joint Failing
Broken Armor Splice Weld @ W Side
Spalled Nosing/Exposed Anchorage W Side
LET'S ROLL THE VIDEO TAPE........

JOINT MATERIAL SAMPLES
REVIEW OF:

- XJS - SILSPEC WITH SILICONE SEALANT
- SILICOFLEX GLAND
- EVAZOTE GLAND
- EMSEAL GLAND
WHAT IS THE XJS SYSTEM

GRANOR XJS® EXPANSION JOINT SYSTEM

XJS® STANDARD DRAWING FOR NEW WORK INTO CONCRETE DECK

SilSpec® 900 PNS
Polymer Nosing System

100mm (Typ.) Varies 100mm (Typ.)

Dow Corning® 902 RCS
Recess 12mm below surface

40mm (Typ.)

Backing Rod

Bevel Edge

FIG 1
NO SING
SANDBLAST FOAM PRIMER
BACKER ROD

SILICONE
A3101  Jefferson Co.  MO 21  4-21-11
Seal looks good - east joint
(2 3/8 inches at 50).

A2943  Jefferson Co.  MO 21  4-21-11
East joint - 1 1/8 inches at 45 - good.
<table>
<thead>
<tr>
<th>Model</th>
<th>Inst. Width</th>
<th>Max Closure</th>
<th>Max Opening</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF150</td>
<td>1” - 2” (25.4mm-50.8mm)</td>
<td>½” (12.7mm)</td>
<td>2” (50.8mm)</td>
</tr>
<tr>
<td>SF225</td>
<td>1 ¼” - 3” (31.75mm – 76.2mm)</td>
<td>¾” (19mm)</td>
<td>3” (76.2mm)</td>
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<tr>
<td>SF400</td>
<td>2 ½” - 4” (63.5mm – 101.6mm)</td>
<td>1” (25.4mm)</td>
<td>5” (127mm)</td>
</tr>
</tbody>
</table>
IT STILL LOOKS GOOD
EXCESSIVE GLUE

CANNOT TRIM

GLAND FAILURE
Nov 3, 2014
North Approach Slab to Approach Pavement
Now up to 6" at 60+ degrees
TECHNICAL DATA:

Design Information

The design of the seal shall be capable of accommodating movement and variations in joint widths through compression and tension of its shape. Grooved sidewalls shall be 1/8" (3mm) wide by 1/8" deep (3mm) and spaced between ¼" (6mm) to ½" (13mm) apart and run along the entire length of the bond surfaces of the seal to ensure an effective and quality surface for adhesion.
A 4840  ST LOUIS  7/3/12  
CRD JJ KELLEY MEM DR @ IS 270 
ABUT 1 EVAZOTE EXP. JOINT 
FACING NORTH
BEJS SYSTEM -- Bridge Expansion Joint System

Features
- Water-tight, tensionless silicone bellows
- Traffic durable
- Weathertight
- Primary seal
- Rapid installation—new or retrofit
- Non-invasive anchoring
- Integral expansion preserves traffic flow
- Joint-face adhered
- Continuity of seal through curbs, sidewalks, parapets
- 100% free of wax or asphalt compounds

Uses
- Replaces old or failed bridge expansion joint systems
- Ideal for concrete-to-concrete substrates
- For repair of deficient joints provides definition and removal of existing anchored metal angles or is not feasible or affordable
- As a replacement for failed strip seal inserts
- To seal the joint under asphalt-in-place joints
- To seal control joints under continuous asphalt roadway surfaces

Standard Sizes
- 1/2" (12mm) to 4" (100mm)

Movement Capability
- ±30% and ±30% (total ±60%) of nominal material size (see Performance Data)
EPOXY
INSERT GLAND
SILICONE ADHESIVE
Universal-90 Upturn Transition

Universal-90 Flipped-Over as Downturn Transition

UNIVERSAL 90
SUCCESSFUL TRIAL

SOME MINOR DEBONDING – BUT NO LEAKS

INJECT SILICONE ADHESIVE MORE
IOWA

TRIAL PHOTOS – LOOKS LIKE GOOD SILICONE INJECTION
“It has held up well and remains water tight” - Rick Rodda
100% Acrylic Impregnation versus Wax-Saturated Foam

Expansion joint was installed in spring of 2011.

During the first hot spell of the summer the joint closed down and wax oozed onto the walkway as well as dripped below.

Bridge Connecting the new waterfront restoration of the Seaport Hotel to the Boston World Trade Center
Results are dripping wax which contaminated the brick and was tracked into interior of the Seaport Hotel.
Isobutylene-and-wax base saturated products will bleed...

Examples of the melted wax on the top of the bridge-walkway during summer
Once the wax has been expelled from the foam during warm weather, the product fails to expand as the joint opens during cold weather.

Gap forms and joint leaks below.

Photos were taken on 50 degree day (same location as previous).

Require all products to be certified in writing to be free of wax, according to independent testing using FTIR and DSC.
ALL THESE SYSTEMS HAVE SIZING AND INSTALLATION INSTRUCTIONS ON THE INTERNET
QUESTIONS, COMMENTS, OTHER PRODUCT EXPERIENCES

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