



BEJS

BRIDGE EXPANSION JOINT SYSTEMS



What is A.I.I.?

AASHTO Innovation Initiative (A.I.I.)

Dedicated to sharing...

- High payoff,
- Market-ready technologies

Accelerating adoption of innovation among...

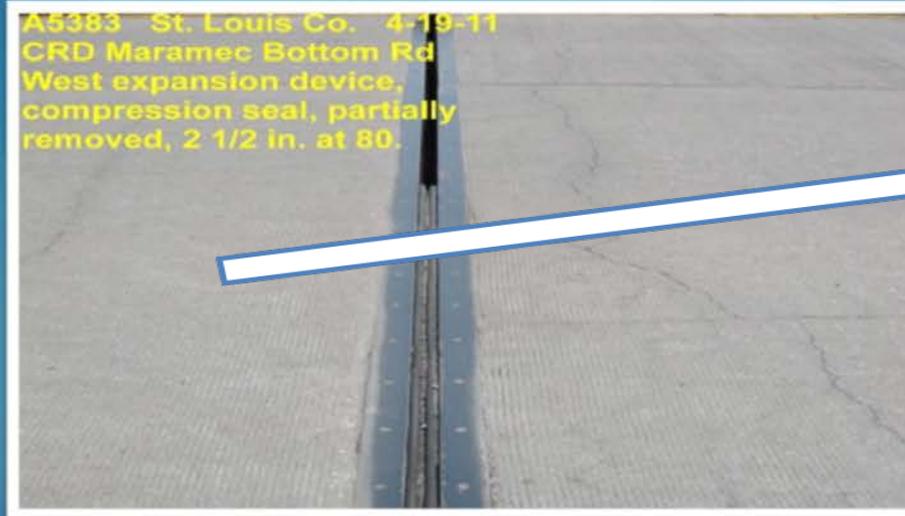
- Peers in U.S. transportation agencies

aai.transportation.org

Question and Comment Box

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.



GoToWebinar Control Panel

Attendees: 3 out of 101

Names - Alphabetically

- AASHTO Webinar 1 - Organizer, Presenter
- Mark Croarkin - Organizer
- Andrew Wimsatt - Me

Audio

Call in number: 1 (888) 585 9008
Conference room number: 259-475-869

Questions

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?

Type question here.

Send

AASHTO Innovation Initiative Presents a Webinar on Bridge Expansion Joints
Webinar ID# 136-098-387

GoToWebinar

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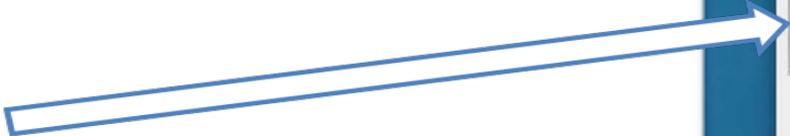
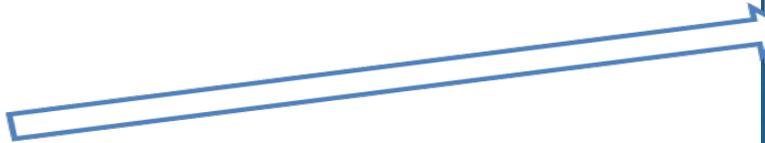
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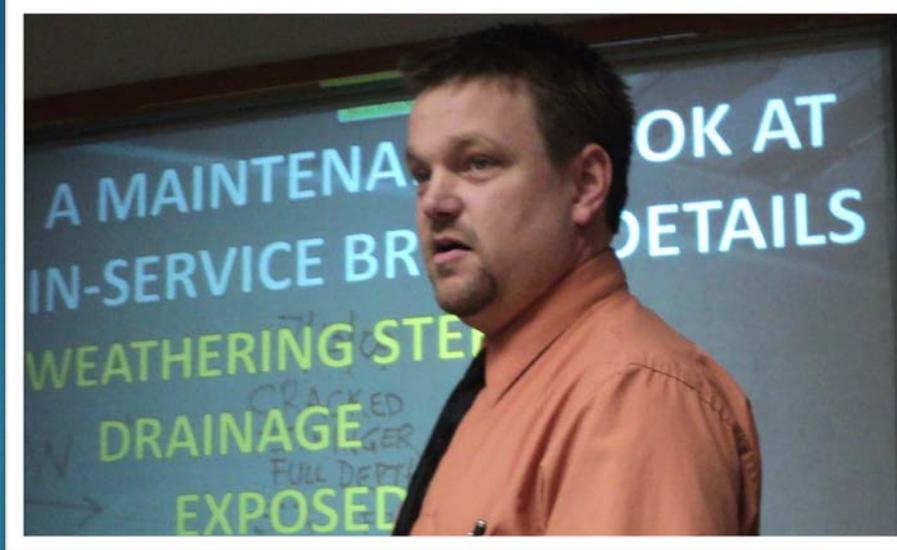
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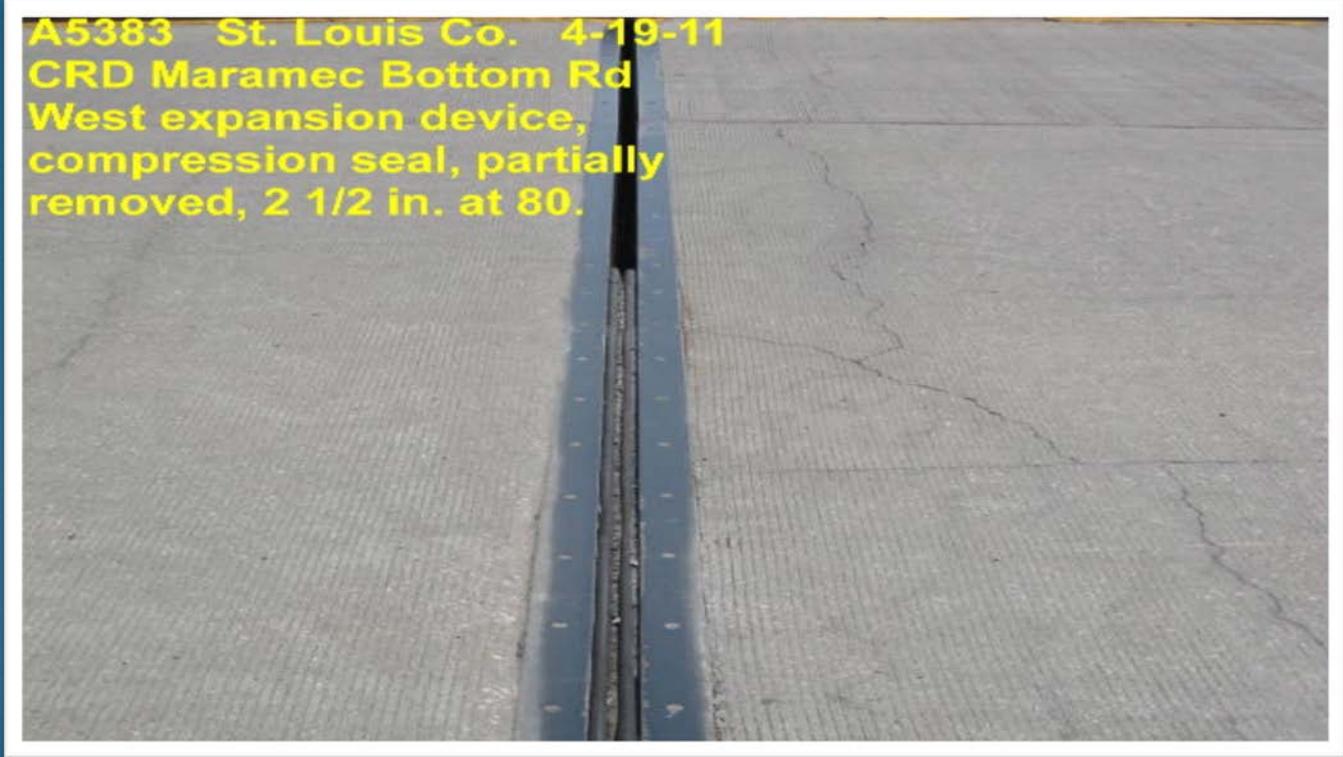


Presenter – Mark Croarkin, MoDOT



JOINT MAINTENANCE

WATERPROOF WITHOUT REPLACEMENT



A2163
Aug 23 2011
Typical Bearing
Clean / paint / lube

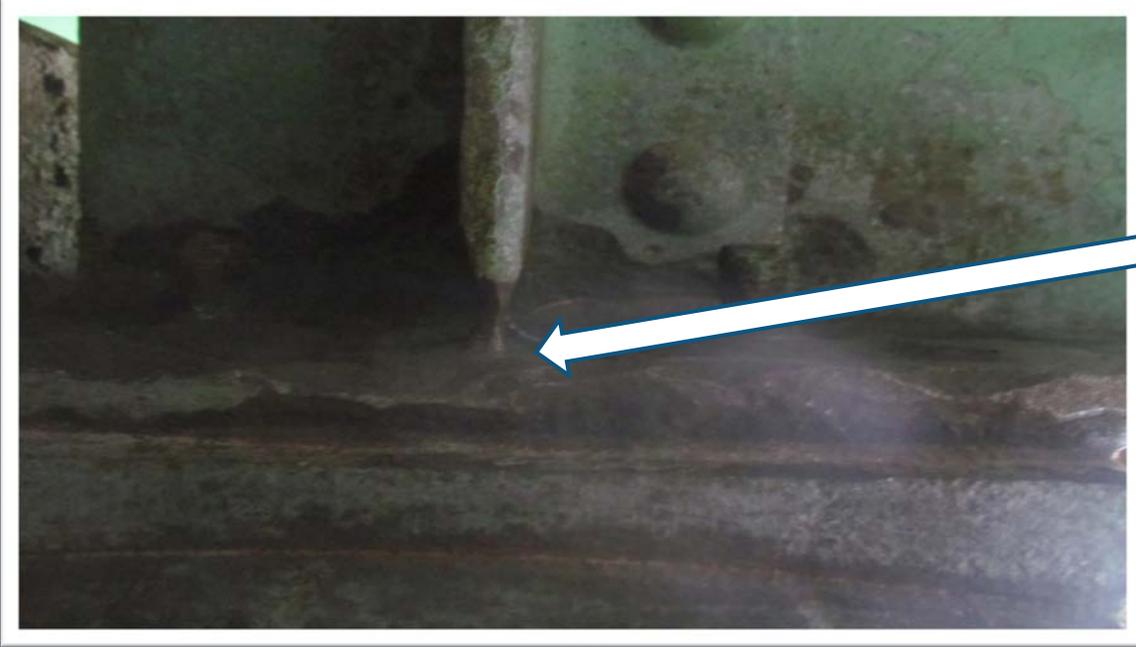


A2164
Aug 23, 2011
Typical Girder 1 EB Structure Only
Paint Lower Web and Bottom Flange (Pic East End)



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





VERTICAL STIFFENER
SECTION LOSS



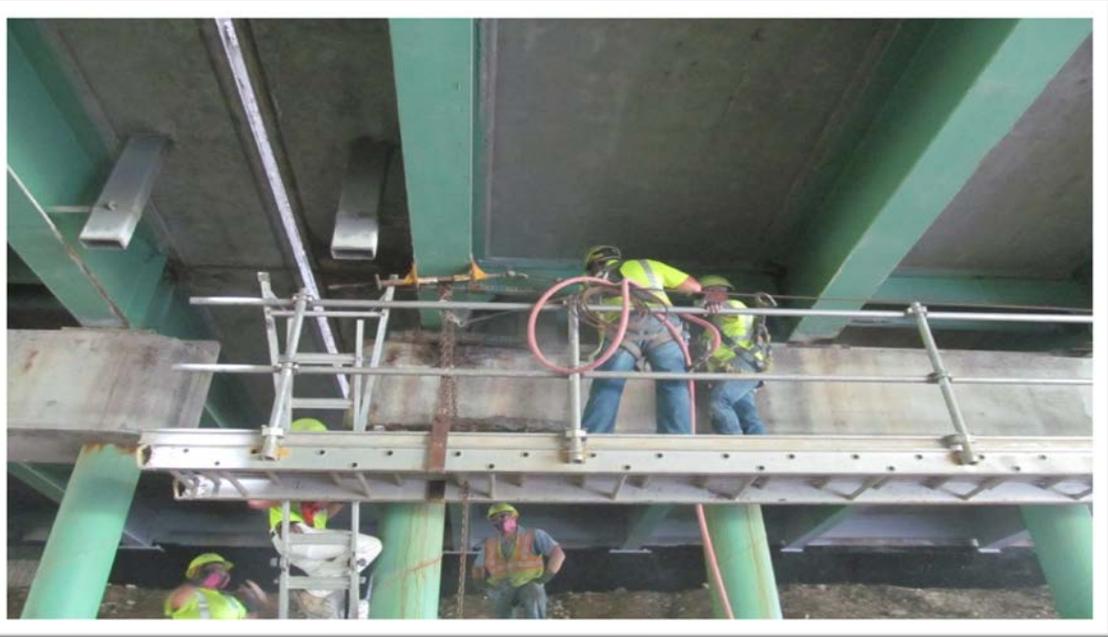
HOLE IN WEB
OVER BEARING



REBAR EXPOSED



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



PAY NOW

10

OR PAY
MORE LATER







SINUSOIDAL REINFORCEMENT



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 VIDEOTAPE.....

13

JOINT MATERIAL SAMPLES



A5383
Dec 14, 2010
Typical Compression Seal



A2941 01-11-12
Rte 21 S/Old Hwy 21
N. Exp Jt Breaking Free @ Lane 1/2 line



A3097 Jefferson Co 1/11/12
MO 21 S @ OR-21
Bent 1 Expansion
Replace with XJS



WATERPROOF WITHOUT REPLACEMENT

REVIEW OF:

- ▶ XJS – SILSPEC WITH SILICONE SELANT
- ▶ 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

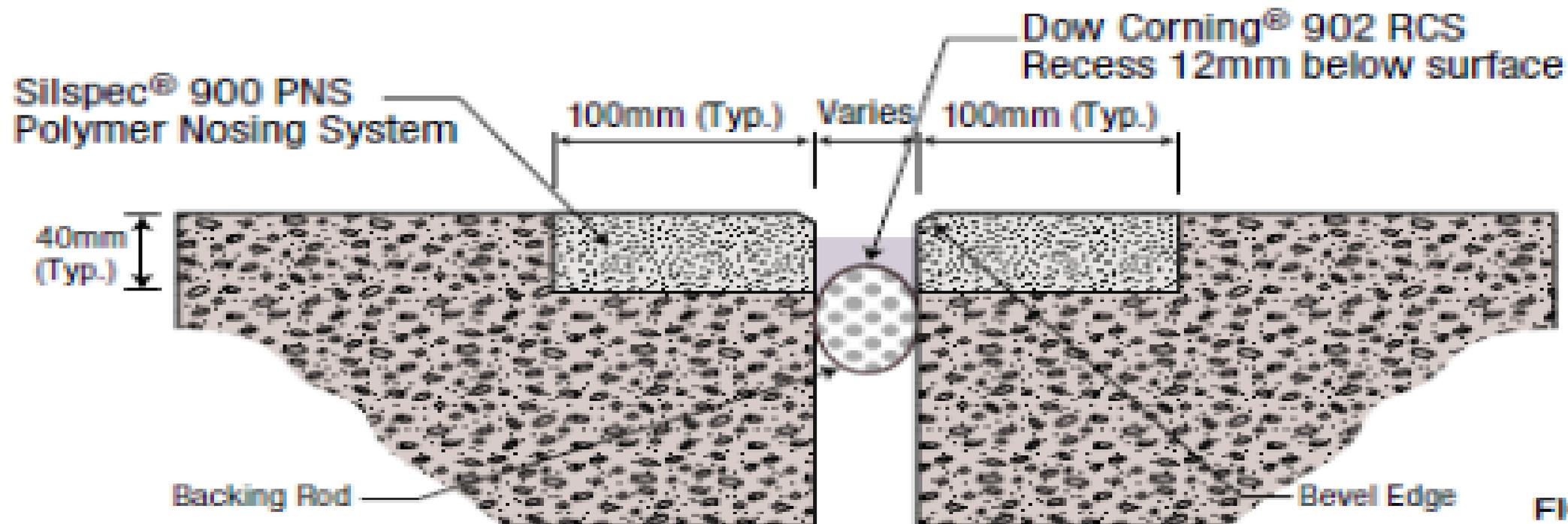


FIG 1



REMOVAL



SANDBLAST PREP



NOSING
SANDBLAST FOAM
PRIMER



BACKER ROD



SILICONE



A4640 St. Louis Co. I-270 4-21-11
Silicon debonded in east joint.



A3638 St. Louis Co. I-44 4-21-11
South expansion device - south bound
lanes (1 3/8 inches at 45).

A3638 St. Louis Co. I-44 4-21-11
South expansion device - south bound
lanes - silicon to narrow.



A4629 Jefferson Co 1/18/12
MO 30 E @ BIG RVR
Bent 4 Exp. joint failing
Repair expansion joint

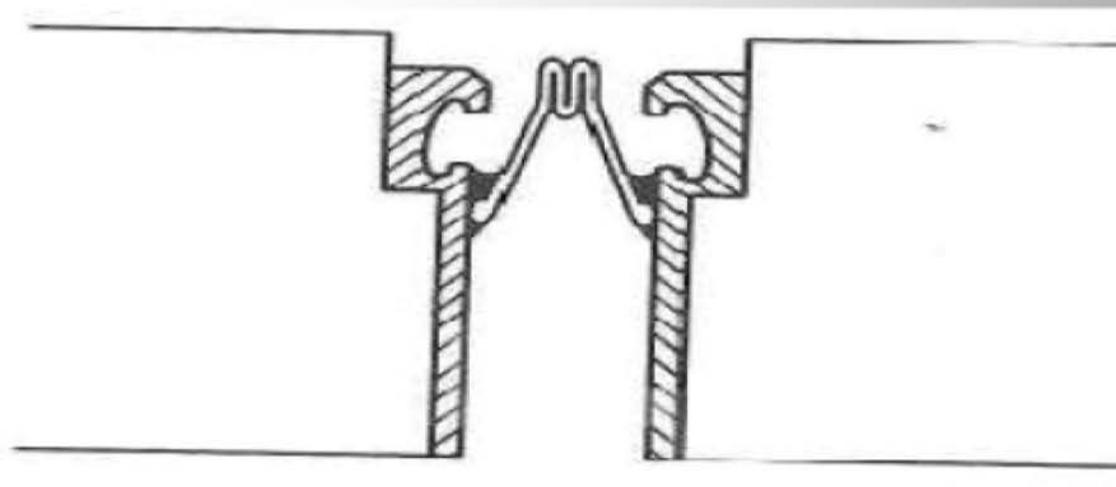






SILICOFLEX

Bridge Deck Joint Sealing System



Model	Inst. Width	Max Closure	Max Opening
 SF150	1" - 2" (25.4mm-50.8mm)	$\frac{1}{2}$ " (12.7mm)	2" (50.8mm)
 SF225	1 1/4" - 3" (31.75mm - 76.2mm)	$\frac{3}{4}$ " (19mm)	3" (76.2mm)
 SF400	2 1/2" - 4" (63.5mm - 101.6mm)	1" (25.4mm)	5" (127mm)





IT STILL LOOKS GOOD

EXCESSIVE GLUE



CANNOT TRIM



GLAND FAILURE



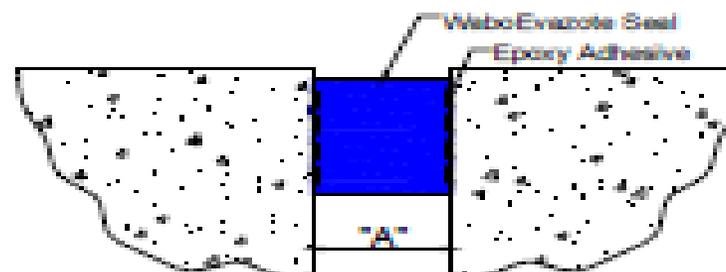




TECHNICAL DATA:

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 1/4" (6mm) to 3/4" (13mm) apart and run along the entire length of the bond surfaces of the seal to ensure an effective and quality surface for adhesion.







BEJS SYSTEM -- Bridge Expansion Joint System

- [Tech Data](#)
- [Install Data](#)
- [Guide Spec](#)
- [CAD](#)
- [Sample](#)
- [Projects](#)
- [Checklist](#)
- [en español](#)
- [BEJS Resources](#) ▾



- Features**
- Watertight, tensionless silicone bellows
 - Traffic durable
 - Pre-compressed
 - Primary seal
 - Rapid installation--new or retrofit
 - Non-invasive anchoring
 - Staged installation preserves traffic flow
 - Joint-face adhered
 - Continuity of seal through curbs, sidewalks, parapets
 - 100% free of wax or asphalt compounds ([Why Does it Matter?](#))

- Uses**
- Replaces old or failed bridge expansion joint systems
 - Ideal for concrete-to-concrete substrates
 - For [Nosing Material](#)-repaired substrates
 - Metal reinforced edges where demolition and removal of existing embedded metal angles is not feasible or affordable.
 - As a replacement for failed strip-seal inserts
 - To seal the joint under asphaltic-plug joints
 - To seal control joints under continuous asphalt roadway surfaces

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

- Movement Capability**
- +50% and -50% (Total 100%) of nominal material size (see [Performance](#))

NEW!

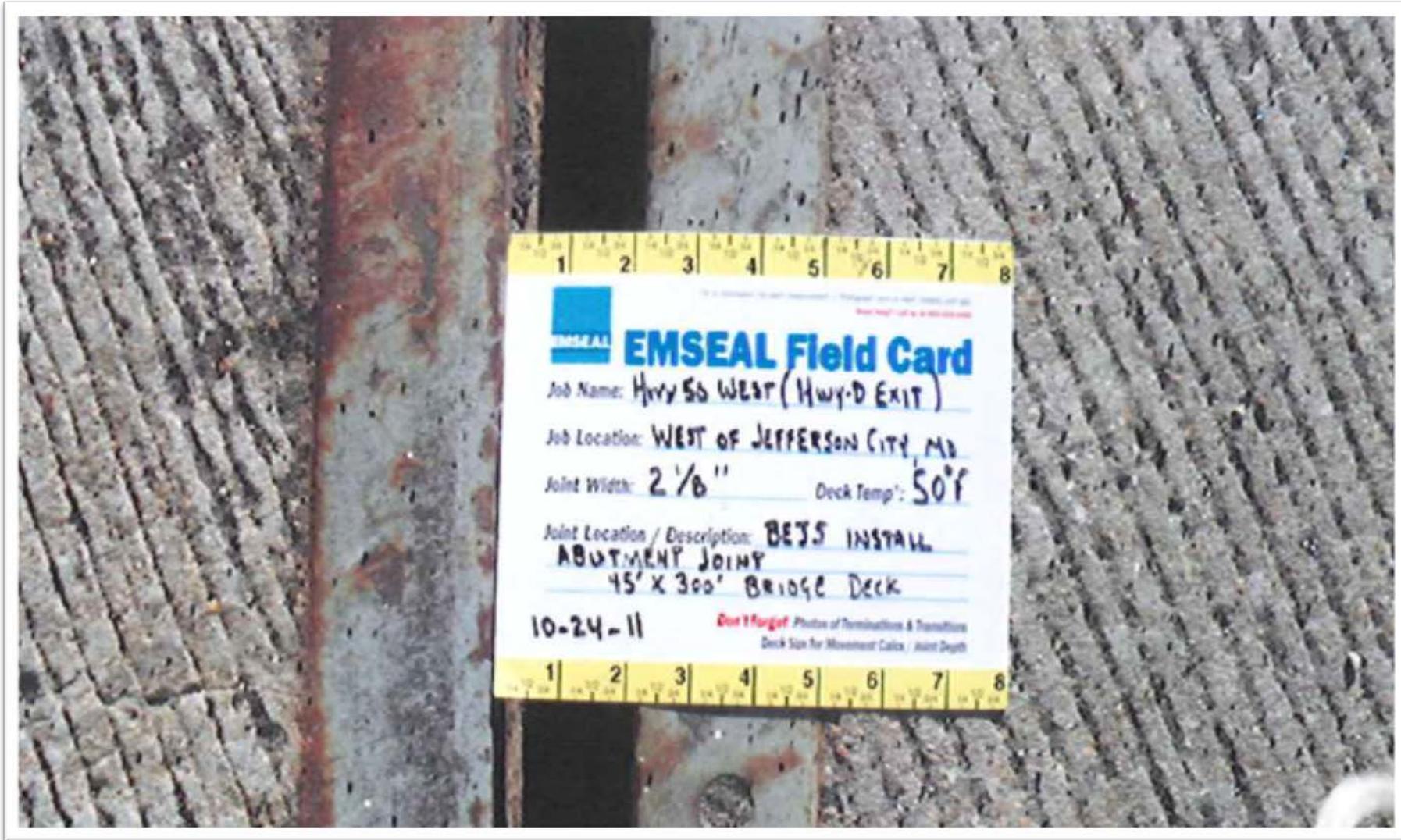


NEW!



NEW!





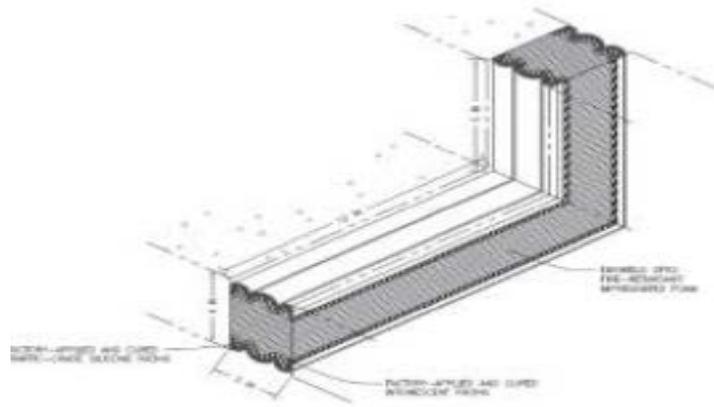


EPOXY
INSERT GLAND
SILICONE ADHESIVE

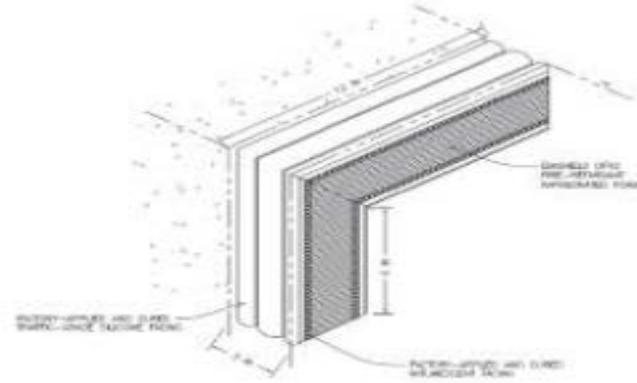


COMPLETED





Universal-90 Upturn Transition



Universal-90 Flipped-Over as Downturn Transition

UNIVERSAL 90



EMSEAL BEJS Watertight Joint System for Bridges Old Bath Road Bridge over US Route One in Brunswick, Maine First Interim Report October 16, 2013

October 11, 2012 MaineDOT's Bridge Maintenance Forces and representatives of EMSEAL installed a demonstration bridge joint seal on the Old Bath Road Bridge (#6033) over US Route 1 in Brunswick. The EMSEAL (BEJS) is a 'pre-compressed' 100% acrylic cellular foam compression-type seal with a silicone external facing. The pre-compressed seal is confined between wood slats and shrink-wrap.

MaineDOT's Transportation Research Division inspected the joint on October 16, 2013 with Don McKenna, Region 1 Bridge Maintenance TOM.

We found a considerable amount of debris accumulated within the joint after one year. According to NCHRP 319, debris accumulation can be detrimental to the performance of these types of compression seals (NCHRP 219, p.12).

No doubt, a contributing factor to the debris accumulation is that the seal was carried up the face of curb creating a dam, rather than running the seal straight through which would allow water and non-compressible materials to exit the road surface.



The joint seal splices (left photo) seem to be holding up well. The seal is supplied in 6.56 LF (2 m) lengths and is bonded end to end in the field with a silicone adhesive prior to insertion into the joint. The silicone sealant bead that runs the length of the seal and bonds to the steel is still holding up well for the most part.

It was noted that in some areas the bond has begun to weaken on the seal side of the bead and has caused some separation. It is unclear to what depth the debondment extends to. See photo below.

Overall, the joint seal is performing well. Bridge Maintenance noted that they have seen no evidence of leakage underneath the deck.



References:
Transportation Research Board, NCHRP
Synthesis 319 Bridge Deck Joint Performance
46 p.

EMSEAL Joint Systems Ltd, 25 Bridle Lane,
Westborough, MA 01581,
BEJSSYSTEM TECH DATA sheet

Submitted:
Dale Peabody & Doug Gayne
Maine Department of Transportation
Transportation Research Division
October 24, 2013



SUCCESSFUL TRIAL

SOME MINOR DEBONDING
- BUT NO LEAKS

INJECT SILICONE ADHESIVE
MORE

IOWA

TRIAL PHOTOS – LOOKS LIKE GOOD SILICONE INJECTION



WASHINGTON

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"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.

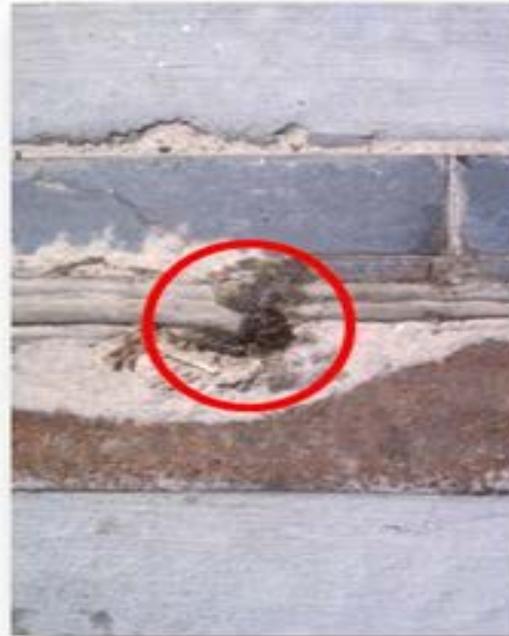
During the first hot spell of the summer the joint closed down and wax oozed onto the walkway as well as dripped below.

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.



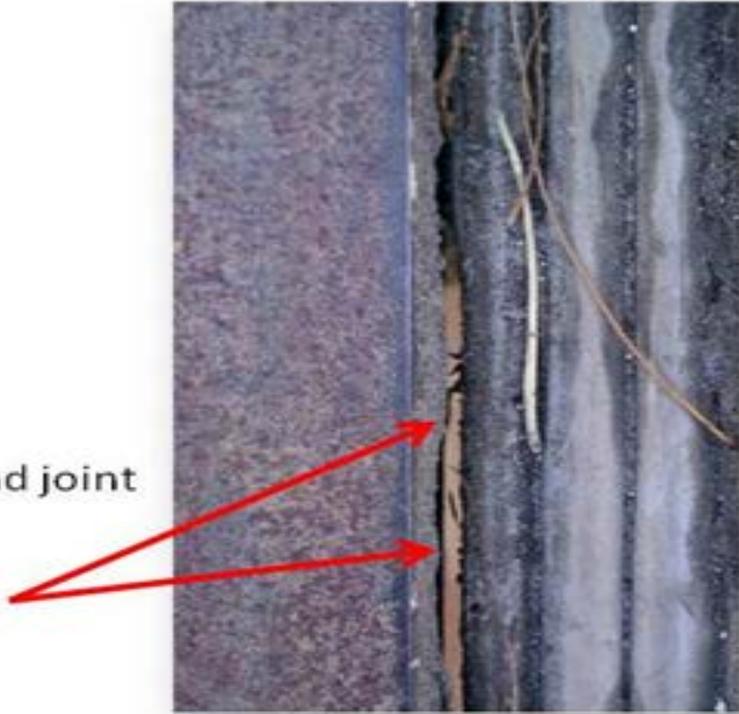
Isobutylene-and-wax base saturated products will bleed...



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)

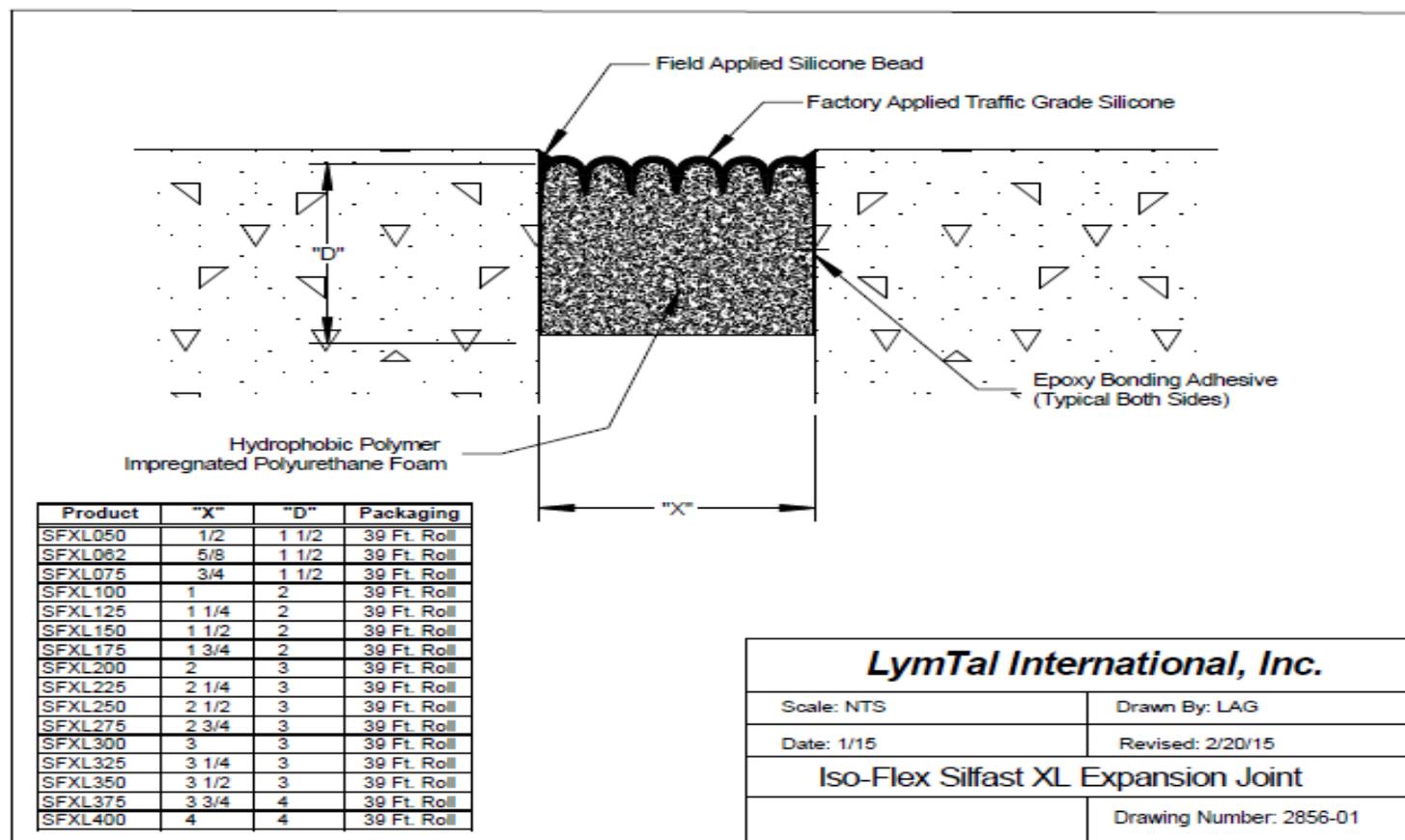
Require all products to **be certified in writing to be free of wax** according to independent testing using FTIR and DSC

REVIEW

- ▶ XJS
- ▶ SILICO FLEX
- ▶ EVAZOTE
- ▶ EMSEAL

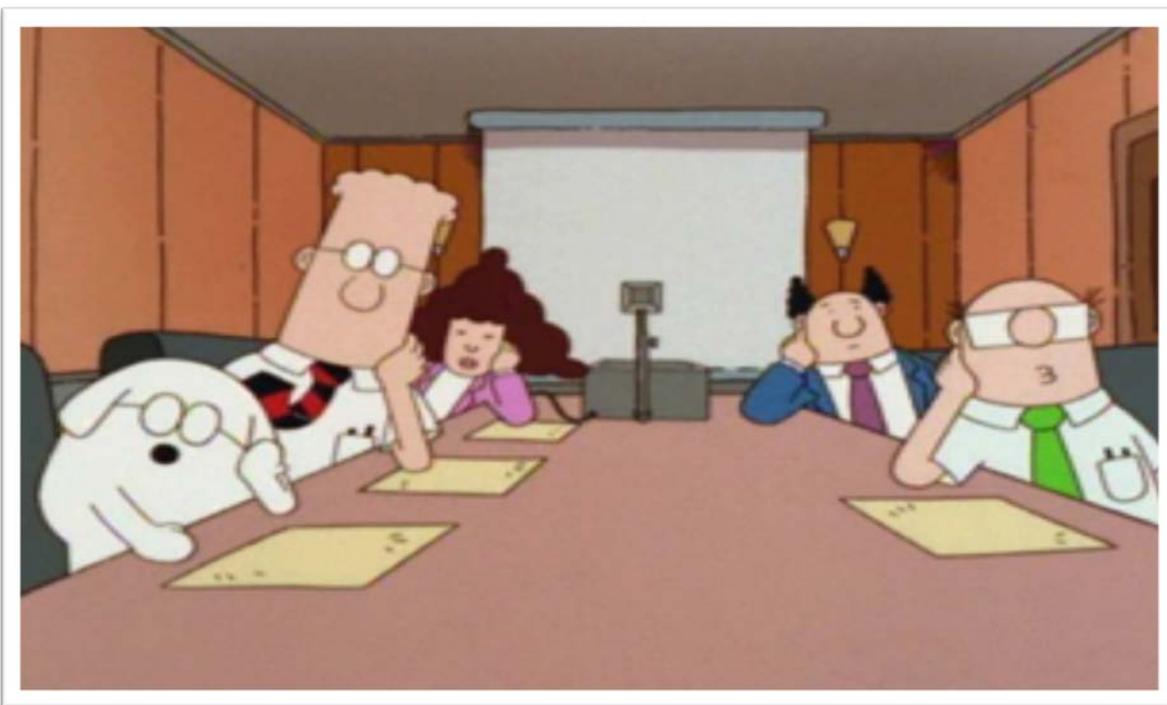
ALL THESE SYSTEMS HAVE SIZING AND INSTALLATION INSTRUCTIONS ON THE INTERNET

LYMTAL SILFAST XL



QUESTIONS, COMMENTS, OTHER PRODUCT EXPERIENCES

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