Bridge Preservation

achieved through low cost watertight joint solutions

14 May 2019
Western Bridge Preservation Partnership
Reno, NV

Nathan Peters
EMSEAL Joint Systems, Ltd.
What is BEJS & Foam Supported Silicone?

- Open Cell Foam
- 100% Acrylic Impregnation
- Infused Acrylic Microspheres offer increased resiliency and longevity
- Coated with factory applied and cured traffic-grade, UV resistant silicone coating

- Silicone-Foam Composite Joint
- Designed for 120% Total Movement (+/- 60%)
- Watertight By Design
**BEJS: Bridge Expansion Joint System**

**How & Why it Works?**

- Resilient backing system to Primary Seal
- Tensionless Bellows (Eliminates Adhesive Failures)
- Multiple Points of Adhesion
  - Expanded Bond-Line & Injected Sealant at Bond-line
  - 2 Part Epoxy Adhesive
  - 2.5 psi backpressure
- Stages as multiple units, cures as one monolithic joint seal
- Fully Customizable: Foam Density, Foam Depth, Silicone Thickness, Pre-Fabricated Transitions, Compressed to Fit for ease of installation

**BEJS** is installed with 3/4” recess - limits debris buildup, unnecessary traffic loading & direct point loads.
BEJS: Bridge Expansion Joint System

- Can be installed against various substrate types and profiles:
  - Concrete
  - Metal
  - Elastomeric Concrete (Polyurethane)
  - PPC (Polyester Concrete)
  - Epoxy Joint Nosing Materials
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- metal angles
- header material
- spalled or irregular concrete
**BEJS: Bridge Expansion Joint System**

**BEJS in Concrete**

- **CSP-2 (Concrete Surface Profile 2 per ICRI)**

- **Can be achieved through grinding w/ demo saw & diamond tip blade, or sandblasting**
BEJS: Bridge Expansion Joint System

**BEJS in Metal**

- Sandblast or grind metal to near white condition prior to seal installation

- Use of elastomeric nosing material to preserve metal bond to concrete
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**BEJS: Bridge Expansion Joint System**

**BEJS in Elastomeric Concrete (EMCRETE)**

- **3:1 Blockout Ratio**
- **Prime, Mix, & Pour!**
  No rebar required!
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BEJS: Bridge Expansion Joint System

Universal Transitions

- Factory Fabricated & Warranted transition

- Efficient watertight solution for changes in plane

- Standard 90 Degree but can be customized to any angle
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Typical Problems with Expansion Joints

• Not Watertight
• Hypersensitive to proper installation
• Does not stage well
• Joint material suffers from compression set
• Unable to adapt to irregular substrates
• Unable to seamlessly adapt to changes in plane
• Difficult to install
• Difficult to Repair
Non-sag poorly tooled

Adhesive Failure
- Adhesive Failure
- Compression Set
- Gland failures not easily repairable
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- Limited Bondline
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Foam Supported Silicone

- Impregnated Foam (Memory Foam)
- Uniform Solid Foam Block Construction
- Coated with UV Resistant & Waterproof Material
- Adhered to substrate with multiple adhesive components

Benefits

- High Range of Movement (5”+ with 120% Total Movement)
- Conforms to irregular substrates
- Factory Transitions Available
- Most for Staged Construction
- Easily Repairable
✔ Joins every 5 to 6 Feet
✔ Ideal for Staging & Quick Repair
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Expansion Joint Solutions

✔ Sealant Band
✔ Foam
✔ Watertight Joint
✔ Watertight Joint

√ Watertight Joint
√ Foam
√ Sealant Band
✓ Seals Wide Vertical Joints
✓ Parapets, Backwalls, etc
BEJS ON-A-REEL

✔ 15 Year Life
✔ Factory Cured Silicone
✔ Resilient Foam Backer
✔ 100% Movement
BEJS-On-A Reel

- Ideal for Joint Gaps of .5” – 1.25”
- Most economical for small movement joints
- 100% Watertight
- 120% Total Movement
Asphaltic Plug Joints

- Curbs are a Critical Leak Point
- Poured Sealants do not handle changes in plane well
- Silicone Geometry is difficult to Achieve as a secondary seal

Foam Supported Silicone System

- Factory Fabricated Transitions
- Deliver Watertight Changes in Plane
- Single Unit That Is Easy to Install
- Factory Fabricated Transitions are Warranted
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√ Critical Leak Point
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Low Cost Watertight Expansion Joint Solutions

*Fully Customizable*

*Factory Fabricated Transitions*

- Watertight Solutions from Out-to-Out
- Purposefully designed to shed water away from critical substructure components

![Diagram showing Watertight Transitions](image)
Irregular Joint Conditions

- Skew
- Joint Tapers
- Joint Jogs
- Longitudinal Joints
- Jersey Barriers/Parapets
Irregular Joint Conditions

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Irregular Joint Conditions

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### 4-STEP BRIDGE CHECKLIST
**COMPLETE (1) BRIDGE CHECKLIST PER JOINT**

<table>
<thead>
<tr>
<th>1.) GENERAL INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
</tr>
<tr>
<td>Phone:</td>
</tr>
<tr>
<td>Email:</td>
</tr>
<tr>
<td>Bridge Location:</td>
</tr>
<tr>
<td>Lane Direction:</td>
</tr>
<tr>
<td>Bridge Size (e.g., Main St over Rte. 66):</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.) BRIDGE MEASUREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.) Abutment</td>
</tr>
<tr>
<td>Span &quot;A&quot;: ___________</td>
</tr>
<tr>
<td>Span &quot;B&quot;: ___________</td>
</tr>
<tr>
<td>B.) Pier</td>
</tr>
<tr>
<td>C.) Joint Length:</td>
</tr>
<tr>
<td>D.) Ambient</td>
</tr>
<tr>
<td>Temp:</td>
</tr>
<tr>
<td>Deck Temp:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3.) JOINT GAP MEASUREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.) Joint Dimensions</td>
</tr>
<tr>
<td>Joint Gap Width &quot;A&quot;: ___________</td>
</tr>
<tr>
<td>B.) Joint On A Skew?</td>
</tr>
<tr>
<td>C.) Does Joint Width</td>
</tr>
<tr>
<td>Joint Yes:</td>
</tr>
<tr>
<td>D.) Is Joint Subject to</td>
</tr>
</tbody>
</table>
| **The Right Fit**

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**BE3S receives 2 national transportation industry awards!**

BE3S, selected for 2014 AASHTO Innovation Initiative

**AASHTO Innovation Initiative**

The purpose of the AASHTO (American Assoc. of State Highway Transportation Officials) Innovation Initiative is to identify and champion the implementation or deployment of a select few proven technologies, products or processes that are:
- Ready for implementation
- Stand out above the rest
- Proven in use
- Will be of significant benefit to other agencies

**BE3S, selected for 2014 ARTBA TransOvation Award**

**The Transportation Development Foundation of ARTBA established this award in order to recognize and honor innovative transportation infrastructure-related products...that:**
- Quantitatively improve transportation safety
- Save transportation users and taxpayer’s time and money and/or
- Make our transportation infrastructure more environmentally sustainable

**BE3S certified 3 times**

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**EMSEAL Field Card**

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**Order: 2.00 Inch Material - Compress to fit**

**EMSEAL**

Fax: (508)336-0281 / Email: bridgevw@emseal.com / Phone: (508)336-0280

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*Additionally Selected Technologies (ASTs)*

The AST program allows for the nominated technologies that are ready for implementation and stand out above the rest. Because of this, the AST has several unique designations. Based on a technology's potential benefits, each has been sorted into one or more categories. BEJS is listed in the Construction, Maintenance, and Design categories.

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BEJS certified 3 times to

AASHTO's Product Evaluation Listing
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✔ The Right Fit

✔ Material Recommendations can come direct from the manufacturer
✔ Each joint seal accurately sized and made to order
✔ Measure twice cut once!

✔ Benefits

✔ Assurance knowing you have the appropriately sized material
✔ Lower margin for error on material sizing
✔ Assist with the Specification Process
✔ Each Joint seal tailored and custom fit
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✔ www.EMSEAL.com

✔ EMSEAL BEJS Installation Video

✔ Resources
  ✔ CAD Library
  ✔ Guide Spec
  ✔ Bridge Checklists
  ✔ Tech Data
  ✔ Info Guide Requests
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Innovation in Bridge Expansion Joints

- BEJS - Bridge Expansion Joint System
  - Long-lasting watertight solution
  - Handles extreme thermal movement
  - Simple to install
  - Fills imperfect substrate conditions
  - Easy to repair
  - Continuity of seal at curbs and parapets
  - Cost effective

QUESTIONS?