Innovation in Expansion Joints

presented by EMSEAL JOINT SYSTEMS
Insanity: doing the same thing over and over again and expecting different results.

Attributed to Albert Einstein

Why doesn’t it work?
What should an expansion joint do?

**Seal** and span the gap between structurally moving elements on a bridge

Provide **watertightness** to protect vulnerable working mechanisms and concrete below

Rebuilt header  Retrofit into metal angles  Retrofit into a Parapet wall
Performance requirements:

Handle the extreme **movement** of thermal cycling

Withstand **temperature variations** – not become too soft in summer or too brittle in winter

Be easy to **install**

Be easy to **repair**

Handle many types of **imperfect substrate conditions**

Provide **continuity** of seal

Provide **solutions** for bridge preservation problems

**BE COST EFFECTIVE!**
Composition of the material is critical as it must remain flexible throughout extremes of temperature ranges:

- not suffer compression set
- not fail at the bondline in cold temps
- not release impregnation chemicals in warm temps

Wax emulsion bleeding during hot weather
Movement

Expansion joint systems must demonstrate ability to expand when the temperature changes. Systems are typically installed during warmer weather.

This system has the ability to expand through the bellows to avoid failure at the bond line during cold temps and will not suffer compression set when compressed during warm weather.

It can be customized compressed in the factory to fit joint gaps for summer installs and still handle full extension in winter temps.
Remove Tension on the Bondline

The concept of inverting a preformed silicone seal and applying it to foam provides a resilient backing resulting in a system capable of resisting reasonable transient point loads.

Tensionless bellows handle movement and eliminates adhesive failure with a large expanded bondline area.

Foam exerts 2.5 psi backpressure
Be adaptable to various substrates

- Metal angles
- Spalled or irregular concrete
- Header material
Handle **Imperfect Substrates**

Bends to adapt to **angled curbs** and fills irregular gap edges and **small spalls** reducing costs of substrate repair.
Provide Continuity of Seal

Factory-Fabricated Terminations and Transitions ensure continuity of seal through changes in plane and direction at curbs and parapet wall and is an essential performance differentiator.

Universal 90’s

Silicone coated in the factory on both sides
Before - No continuity of seal

After - Using Universal 90 degree transition pieces
Custom factory fabricated transitions provide continuity

Costomemade manufactured in one drop in piece.
Easy to Install and Repair

Inserting a U-90

Inserting Stick

Pushing ends together
Sizing Tools to ensure proper selection

bridge by bridge size selection sheet

day of install size selection sheet
Provide **Solutions** for Bridge Preservation

Replacement of failed seals in **strip seal** configurations

**Parapet walls** that have gaps too large to caulk fitted with water “kickout” feature

Field applied non sag epoxy fills void
Failed elastomeric seals in modular joints

Some manufacturers are no longer making replacement seals.
Replacement for failed seals in a modular joint

Before

After
Provide **continuity** at the curbs and **watertightness** in an asphaltic plug joint.
Provide flexible solutions and be **cost effective** for small joint gaps in transverse and longitudinal joints.

Manufactured in 12 foot reels for lane by lane staged install.
Innovation results in achieved goal!!

*Before* and Leaking

*After* and Watertight

Use of an innovative system

failed caulk