

Preformed Silicone Expansion Joint Seals For Highway Bridges

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Background

- Preformed Silicone Joint Seals (a.k.a. “Inverted V” Joint Seals) have been installed on highway bridges for over **20 years**, since 1996.
- Designed to compete against:
 - Neoprene Compression Seals
 - Two-Component Poured in Place Silicone
 - Closed Cell Foam Expansion Joint Seals
 - Asphaltic Plug Joints
 - Strip Seals

Features

- **RESILIENT MATERIAL**
 - **Inorganic Silicone Material is U.V., Ozone Resistant.**
 - **Retains Material Properties from -60°F to 450°F.**

- **LOW STRESS DESIGN**

During normal cyclic movement, the seal is never in tension, due to its folded Inverted “V” shape. This shape reduces stress on both the seal, and the locking adhesive.





FIRST NIAGARA

7 DAY OUTLOOK

INLAND EMPIRE

TUE

101



74

WED

700



74

THU

102



75

FRI

96



71

SAT

93



70

SUN

90



68

MON

88



65

KTLA 5.COM



4:10 AM 68°

REMINDE ME TO STAY INSIDE ON WEDNESDAY

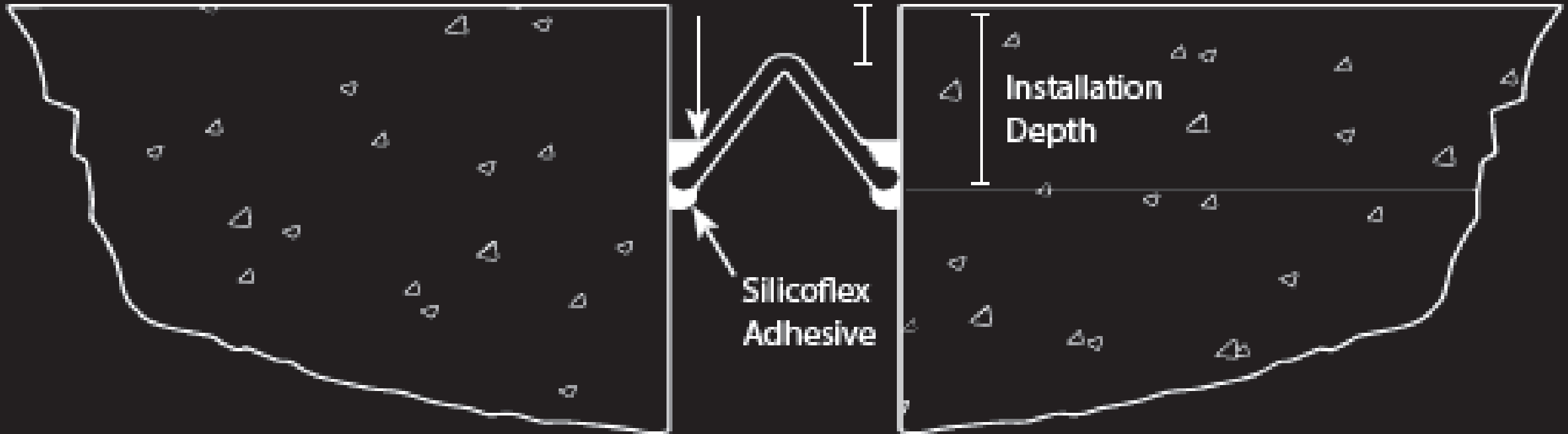
Features

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Silicoflex
Adhesive Recess



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PRACTICES WE CAN NOT AFFORD TO DEFER

Testing

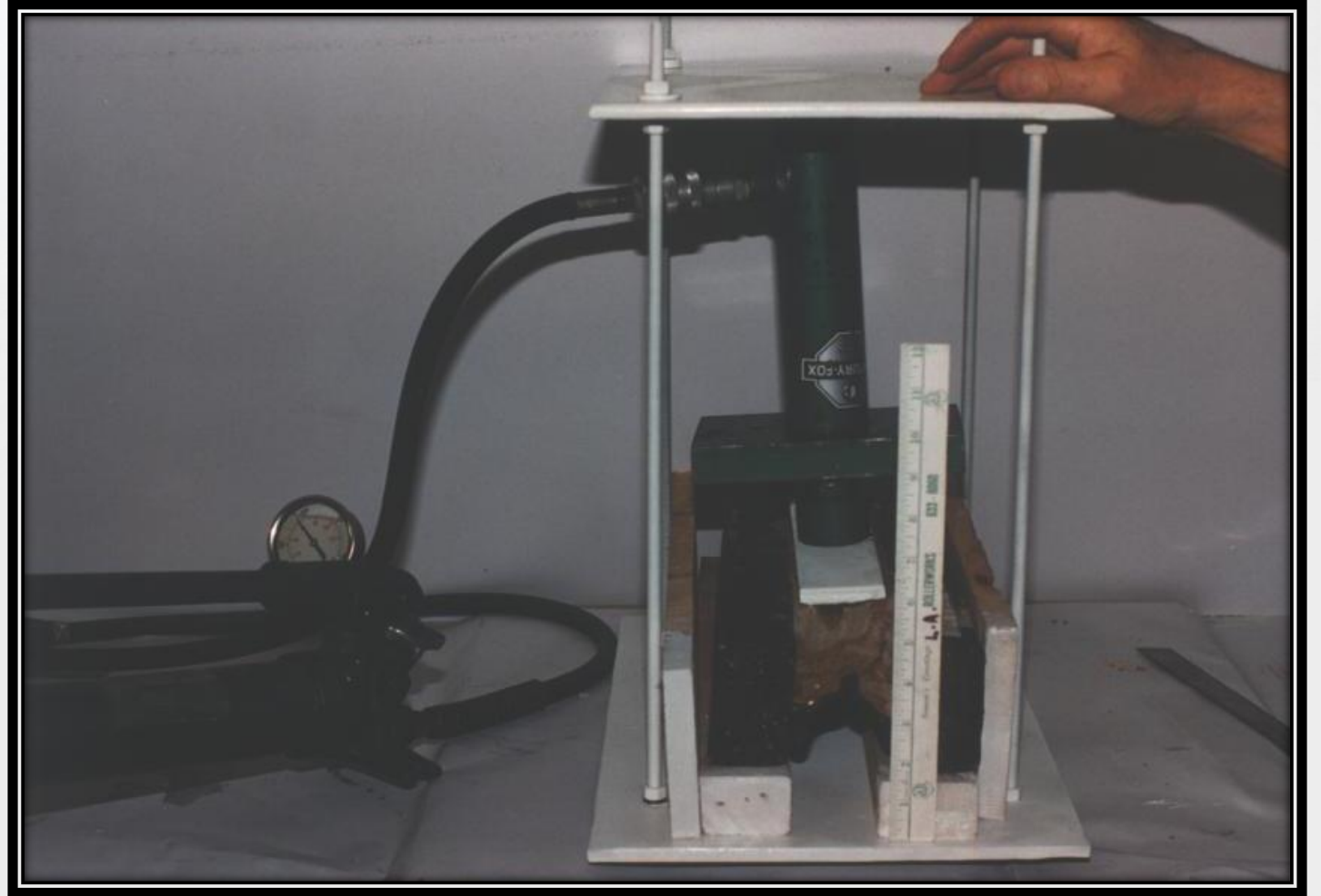
45° Skew Testing
- New York DOT
Materials Lab (Albany, NY)



Testing

Vertical Load Testing

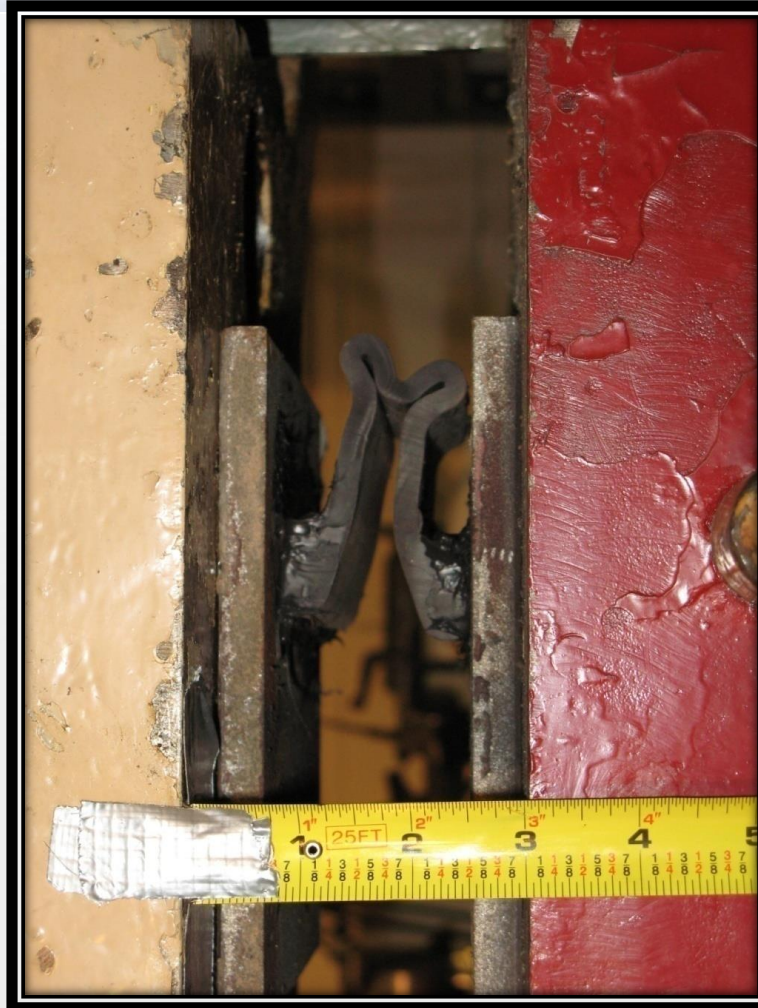
- R. J. Watson Lab
 - Sand/Dirt @ -20°F
 - 2,200 lb. vertical load
- Without failure of bond.



Testing

Bond Strength Test

- R. J. Watson Lab
 - SF400
 - Max. Opening 5"
 - 13" of displacement
- Without failure.



Testing

Bond Strength Test

- R. J. Watson Lab
- Spliced SF400
- 750 lbs. of Force, i.e. 250psi.



Materials

- Two Component Epoxy Primer

Brushed on Joint Interface.
Allowed to dry for up to 30 minutes
(depending on temperature).



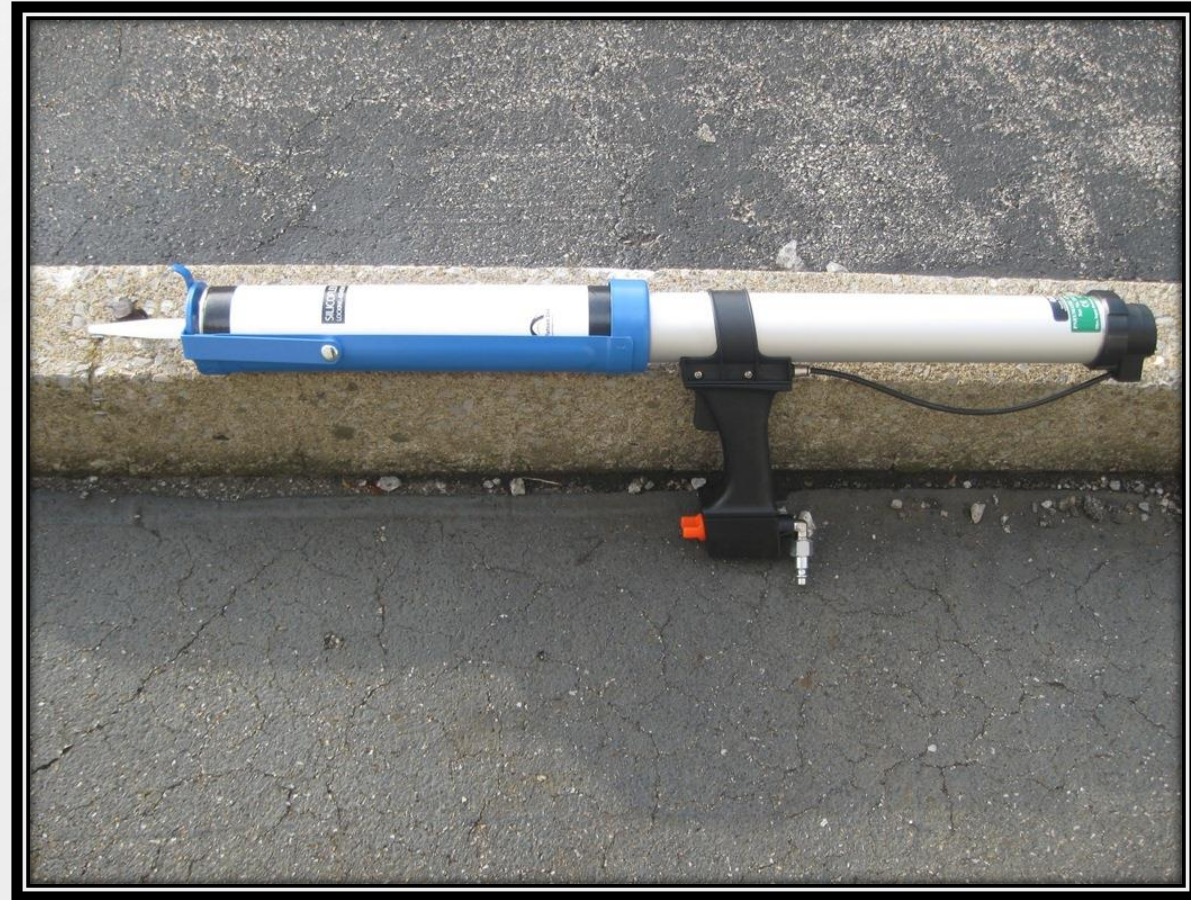
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PRACTICES WE CAN NOT AFFORD TO DEFER

Materials

- Single Component
Silicone Locking
Adhesive

(Optional Pneumatic
Caulking Gun)



Materials

- Extruded Silicone Gland

SF150

1.5" of movement

Closes to .5"

Opens to 2"

Recommended for joint openings
Between 1" – 2" at installation.



Materials

- Extruded Silicone Gland

SF225

2.5" of movement

Closes to .75"

Opens to 3"

Recommended for joint openings
Between 1 1/4" – 3" at installation.



Materials

- Extruded Silicone Gland

SF400

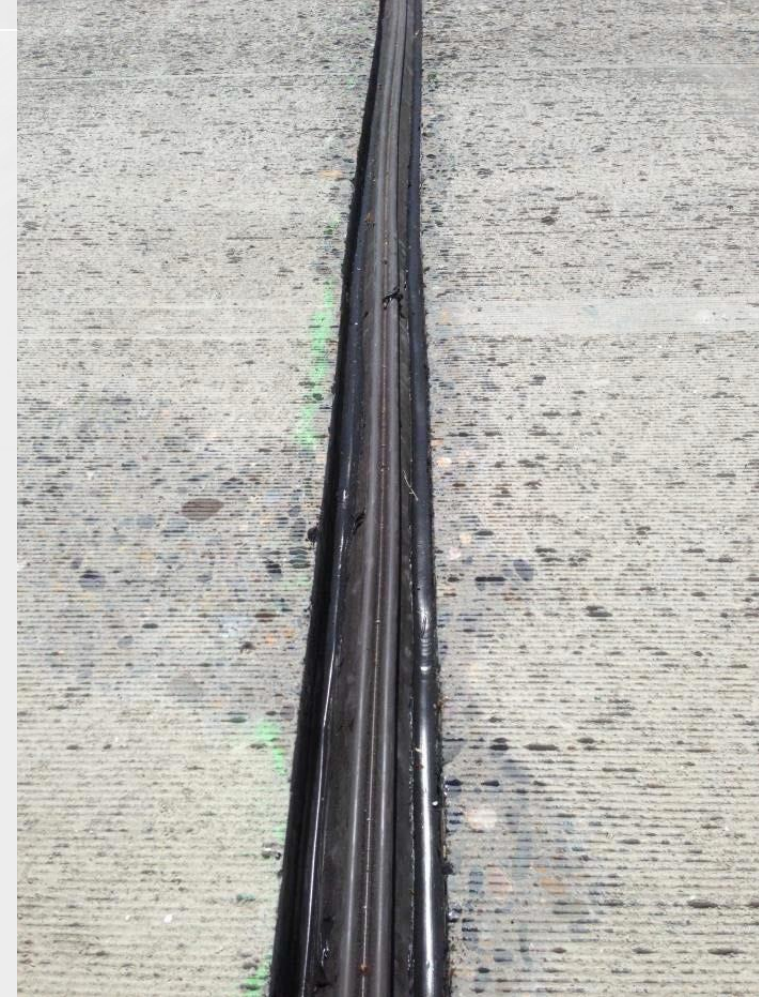
4" of movement

Closes to 1"

Opens to 5"

Recommended for joint openings

Between 2.5" – 4.5" at installation.



Materials

- Extruded Silicone Gland

SF500

5" of movement

Closes to 1.5"

Opens to 6.5"

Recommended for joint openings

Between 2.75" – 5.5" at installation.



Concrete Bridge Joint Rehabilitation



directional changes, upturns, uneven joints



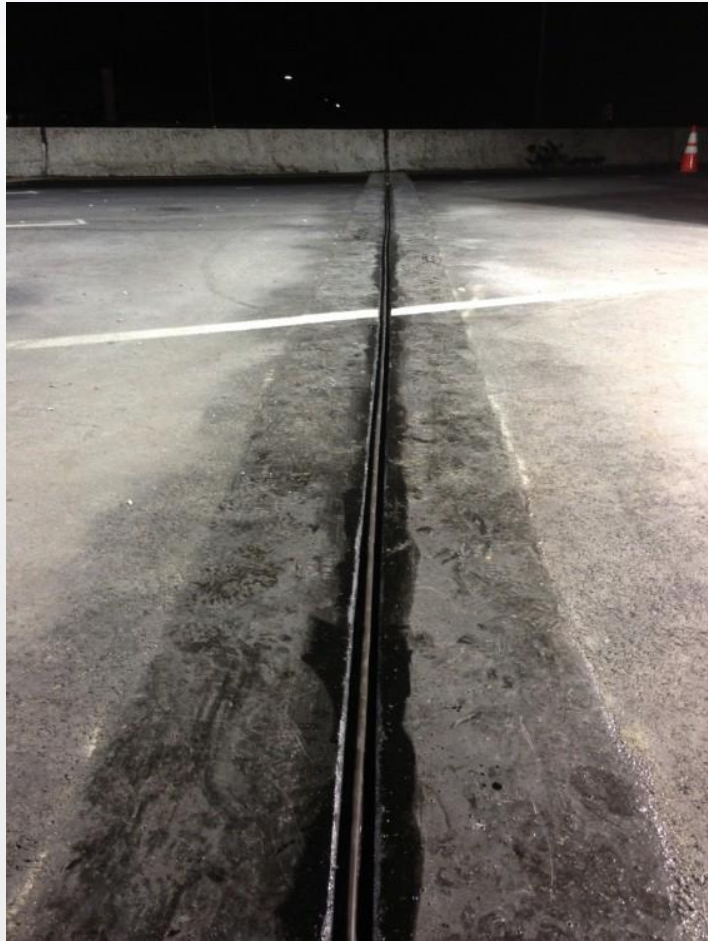
Steel Bridge Joint Rehabilitation



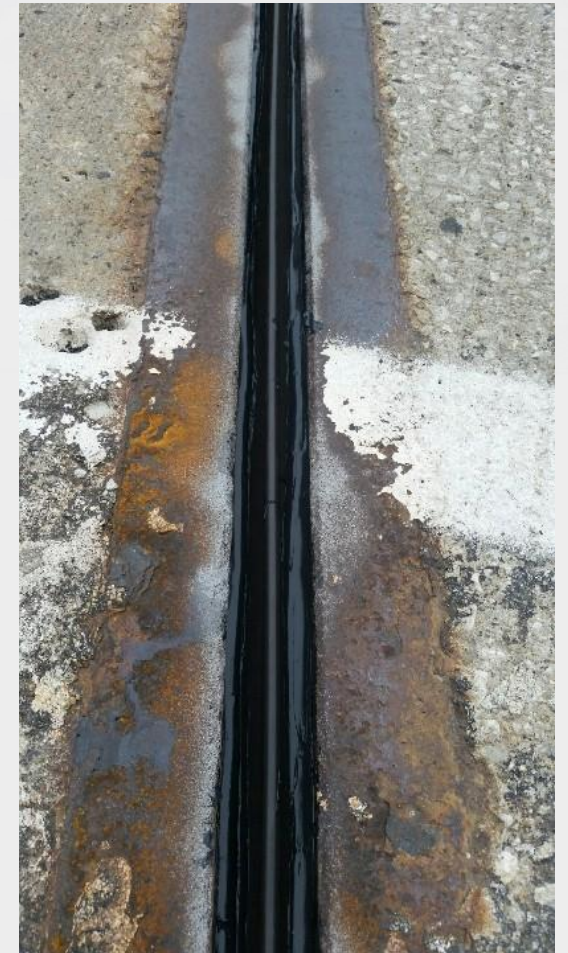
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PRACTICES WE CAN NOT AFFORD TO DEFER

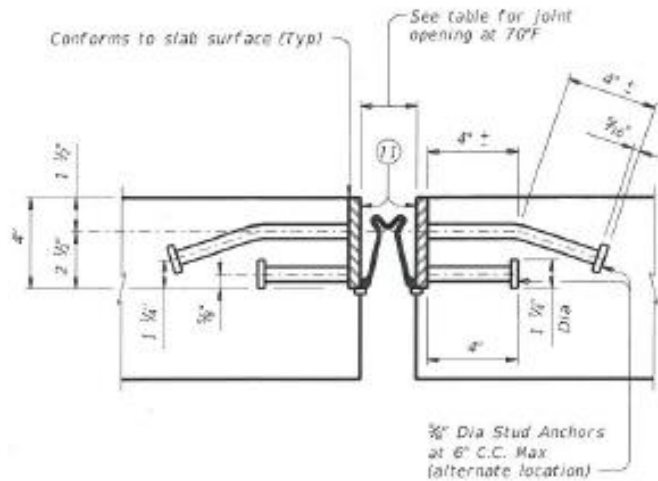
Elastomeric Concrete Bridge Joint Rehabilitation



Failed Strip Seal Rehabilitation



New Construction



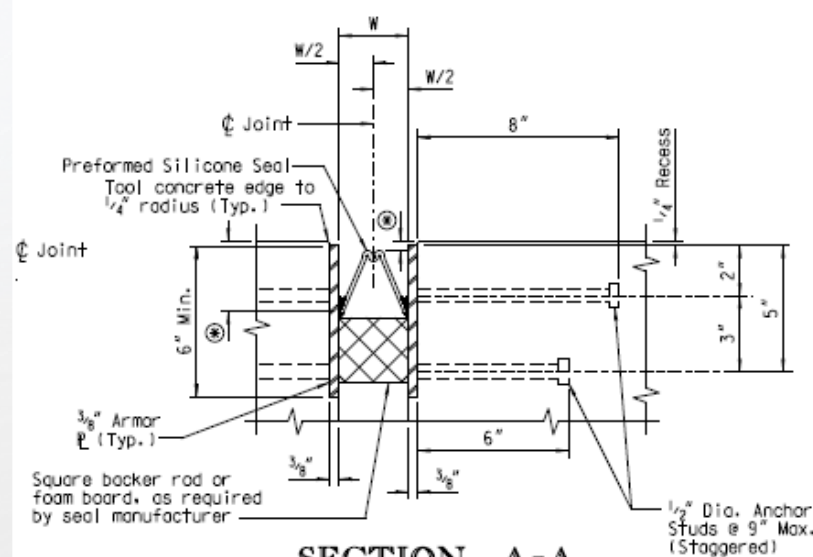
SHEET 2 OF 2



Bridge Division Standard

**SEALED EXPANSION JOINT
TYPE A
WITHOUT OVERLAY**

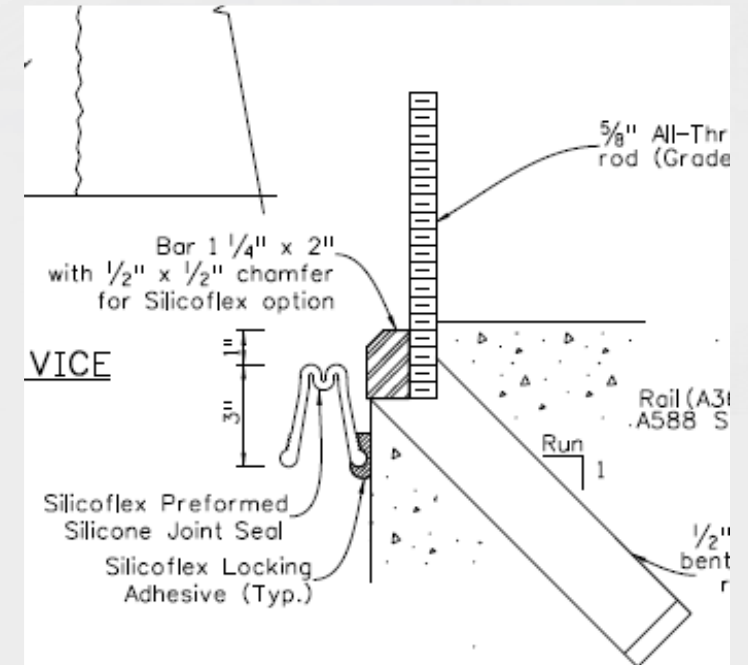
SEJ-A



SECTION A-A

⊙ - depth per manufacturer's instructions

REV.				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION			
REV.	JXY	SAN	3-14	PREFORMED SILICONE JOINT SYSTEM ALTERNATE			
				DEPARTMENT OF TRANSPORTATION			
REV.	JXY	BMH	12-13	DEPARTMENT OF TRANSPORTATION			
				DEPARTMENT OF TRANSPORTATION			
REV.	JXY	BMH	12-13	DEPARTMENT OF TRANSPORTATION			
				DEPARTMENT OF TRANSPORTATION			
QUAN.				DEPARTMENT OF TRANSPORTATION			
DR.	MRW	SAN	6-09	DEPARTMENT OF TRANSPORTATION			
DES.				DEPARTMENT OF TRANSPORTATION			
BY	CHE.	DATE		COUNTY	ROUTE		
				XXXXXXX	XXXXXX		



Colorado Department of Transportation
 4201 East Arkansas Avenue
 Room 107
 Denver, CO 80222
 Phone: 303-757-9309 FAX: 303-757-9197
 Staff Bridge Branch Initials



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PRACTICES WE CAN NOT AFFORD TO DEFER

Case Studies – Tappan Zee Bridge Approaches



Case Studies – Honolulu Light Rail



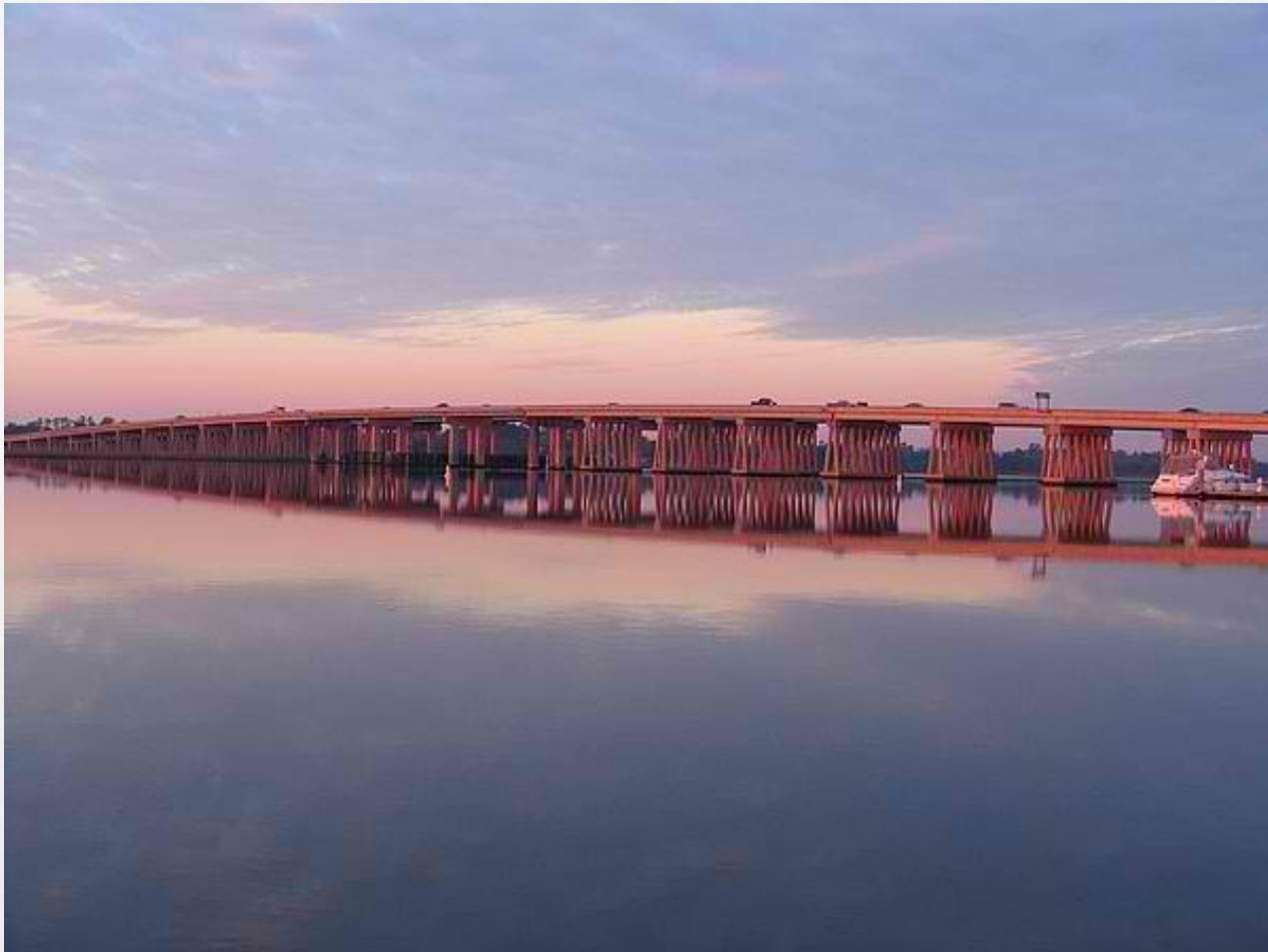
Case Studies – Castleton Bridge over Hudson River (South of Albany, NY)



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PRACTICES WE CAN NOT AFFORD TO DEFER

Case Studies – I-526 over Ashley River (Charleston, SC)



Always Follow Installation Instructions!

- This final bead shall be placed to the top of the ridges on the preformed silicone gland, and no higher.



Still going strong 20 Years +

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Thank you for your attention!

Please visit R. J. Watson at Booth #24 in the Oceans Ballroom, and outside tomorrow morning at Space #11!

