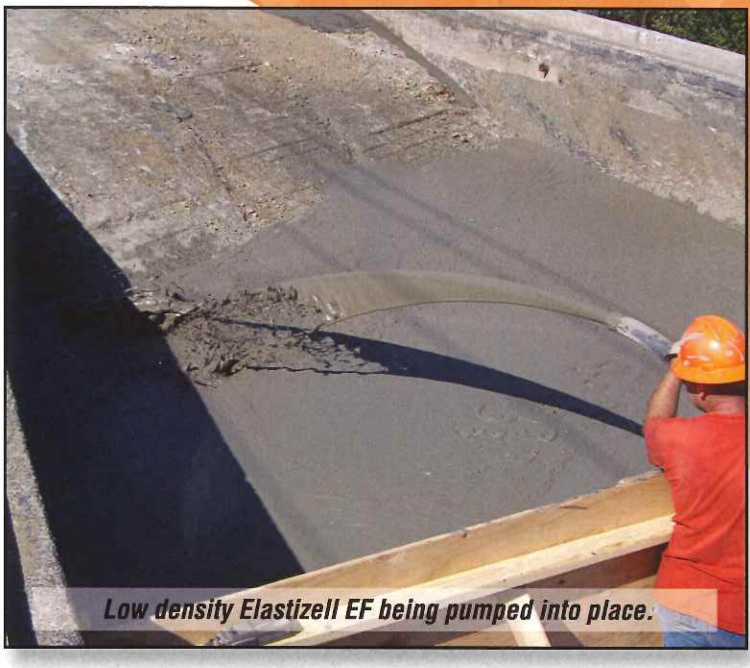
Elastizell EF Provides Load Balancing Solutions


Existing sand fill was removed to reduce load.


Low density Elastizell EF being pumped into place.

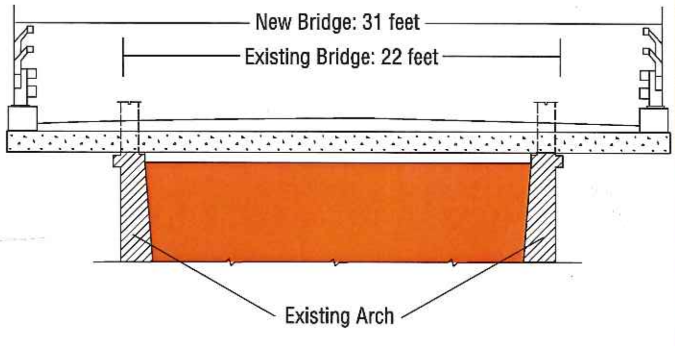
Problem

A 90 year old historic concrete arch bridge was too narrow and functionally obsolete. The load capacity of the existing foundation was unknown. How could this bridge be brought up to current standards with minimal cost and disruption to the community?

Discussion

In order to save the existing bridge, the added weight of the new wider roadway would need to be balanced by reducing weight. The current bridge contained soil fill that could be removed and replaced with lighter material.

The lighter fill material needs to contour to the shape of the existing arches in order to maintain even load distribution on the arches, keeping them in compression. The replacement material also needs to place minimal lateral load on the spandrel walls.



= ELASTIZELL EF

Solution

The bridge was renovated using Elastizell EF to replace the soil fill. An aggregate sub-base was placed over the Elastizell EF and finished with 9 foot wider precast concrete panels to support a new asphalt road surface. This solution allowed the existing arches and foundation to be used.

By keeping the bridge intact the project cost only $1 million and took only 17 months from design to completion of construction. Replacing the bridge would have cost $6 million and 6 years to complete. Construction was completed in only 55 days. This project was awarded the 2008 APWA National Project of the Year Transportation Category for Projects <$2 million.

Advantages

- *Quick installation of only 55 days of construction using 2 to 4 foot lifts of Elastizell EF.*
- *Saved $5 million by keeping a portion of the existing bridge.*
- *No additional load on foundation avoiding settlement concerns.*
- *Elastizell EF was able to form fit to arches.*
- *Elastizell EF is self-supporting and placed no additional load on spandrel walls.*

BASIC PHYSICAL PROPERTIES

Elastizell EF

*Greater values may be obtained if required per Elastizell Corporation design.

CLASS	MAXIMUM CAST DENSITY pcf (kg/m³)	MINIMUM COMPRESSIVE STRENGTH* psi (Mpa)	ULTIMATE BEARING CAPACITY Tons/sf (kN/m²)
I	24 (384)	10 (0.07)	0.7 (69)
II	30 (480)	40 (0.28)	2.9 (276)
III	36 (576)	80 (0.55)	5.8 (552)
IV	42 (672)	120 (0.83)	8.6 (827)
V	50 (800)	160 (1.10)	11.5 (1103)
VI	80 (1280)	300 (2.07)	21.6 (2068)

Comparison of Maximum Fill Material Densities

ELASTIZELL EF			
Class I	24 pcf (384 kg/m³)	Water	62.4 pcf (1000 kg/m³)
Class II	30 pcf (480 kg/m³)	Lightweight Aggregates	60-90 pcf (961-1442 kg/m³)
Class III	36 pcf (576 kg/m³)	Flowable Fills	90+ pcf (1442+ kg/m³)
Class IV	42 pcf (672 kg/m³)	Soils	120 pcf (1922 kg/m³)
Class V	50 pcf (800 kg/m³)	Aggregates, Asphalts	125 pcf (2002 kg/m³)
Class VI	80 pcf (1280 kg/m³)	Lean Concrete	145 pcf (2323 kg/m³)

For specific design values and more detailed specifications, as well as design assistance, please contact the ELASTIZELL CORPORATION OF AMERICA or our local applicator below.

Elastizell Cellular Concrete

ENGINEERED FILL

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