BMDO | Bridge Material Design Options

FAST FACTS:

Rigified FRP

Project Location:	Bradley, ME
Project Name:	Jenkins Bridge
Bridge Material Design Option:	Rigified FRP
Unique Feature:	Approximately 30 strain gages were installed on three arches. The bridge also employed a composite headwall design with steel columns and waler.
Project Description:	The Jenkins Bridge spans the Great Works Stream in Bradley and is located on Cram Street, a local road. Project design included an innovative composite headwall design that allowed the voided composite headwall to be installed rapidly and provided a corrosion-resistant means of soil retention.

Purpose and Need: Existing twin steel structural pipe arches for this bridge were constructed in 1970 by the town of Bradley. Extensive deterioration and damage to the pipes led to a recommendation to replace the structure.

Contract Amount: N/A

Engineer's Estimate: $1,150,000

Bid Amount: $814,919

Final Contract Value: $941,500 including direct purchase of FRP arches by MaineDOT

Traditional Approach: Replace the existing structure with two concrete box culverts.

New Approach: Use Rigified FRP arches on concrete footings on steel H-piles. Employ a composite headwall system with T-walls on all four corners.

Bridge Details:

Span:	38'-6"
Rise:	6'
Width:	34'
Skew:	19 degrees
Arch:	12 carbon filter tubes, 12" in diam., spaced @ 2'-11"
Headwall:	composite panels with through ties

Benefits Realized/Expected: The first year in service an ice floe completely dammed up this bridge opening. However, the bridge withstood the extreme hydraulic forces with no negative results. Though this had been a concern with FRP technology, the bridge withstood the forces with no observed damage and handled the ice and water flow in a manner similar to conventional bridge structures.

Duration of Activity: 2010

Owner: MaineDOT

Team/Affiliations: MaineDOT; University of Maine AEWC Advanced Structures and Composites Center; Advanced Infrastructure Technologies; Kleinfelder • SEA; Wyman & Simpson, Inc.

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