

BMDO

Bridge Material Design Options



FAST FACTS:

Rigified FRP

PROJECT LOCATION:

Belfast, ME

PROJECT NAME:

Perkins Bridge

BRIDGE MATERIAL DESIGN OPTION:

Rigified FRP

UNIQUE FEATURE:

This was the first bridge constructed with 15" diameter tubes, which employ only 25% more carbon fiber than a 12" tube, yet have twice the bending strength.

PROJECT DESCRIPTION:

Perkins Bridge carries Herrick Road, a local road, over Little River.

PURPOSE AND NEED:

This project aimed to resolve numerous issues. The previous bridge, built in 1921, had a sufficiency rating of 51.2 and was a concrete T-beam on concrete abutments. The abutments were minimally-reinforced concrete jacket on an old stone abutment. Also, the 28' clear span bridge was located just downstream from a dam. Hydraulic analysis indicated that the bridge constricted the stream and water velocities were high. Reservoirs upstream and downstream from the bridge are public water supplies. In addition, horizontal and vertical alignments were poor. Finally, the project required 350' of approaches.

CONTRACT AMOUNT:

N/A

ENGINEER'S ESTIMATE:

\$1,500,000

BID AMOUNT:

\$873,167

FINAL CONTRACT VALUE:

\$1,309,159

TRADITIONAL APPROACH:

Construct a precast voided slab superstructure on tall reinforced concrete abutments.

NEW APPROACH:

Construct a 50' span using buried concrete-filled composite arches.

BRIDGE DETAILS:

Span: 47'-7"
Rise: 11"
Width: 45'
Skew: 0 degrees
Arch: 16 carbon filter tubes, 15" in diam., spaced @ 2'-11"
Headwall: cast-in-place concrete footing and precast modular gravity walls

BENEFITS REALIZED/EXPECTED:

Low maintenance. long lasting structure.

DURATION OF ACTIVITY:

June 2010 to June 2011

OWNER:

MaineDOT

TEAM/AFFILIATIONS:

MaineDOT; University of Maine AEWCA Advanced Structures and Composites Center; Advanced Infrastructure Technologies; Kleinfelder • SEA; Stetson & Watson

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