

RENEWWRAP®

Carbon Fiber Strengthening System



STRUCTURAL STRENGTHENING

CASE STUDY:

Reedsport, OR Umpqua River Bridge

OVERVIEW

The Umpqua River Bridge along the Oregon Coast Highway (US 101) is a swing-span bridge flanked by two tied reinforced concrete arches on each side. The bridge was opened in 1936 and was added to the National Register of Historic Places in 2005. Due to the age and deterioration of the bridge, along with increased loading, the structure required strengthening in several locations. The goal of the Oregon DOT was not only to strengthen the deck and beams to support today's truck loadings, but to keep the bridge in service during construction.

A detailed analysis of the existing bridge structure revealed the several deficiencies that required attention. The Oregon DOT designed and specified an FRP solution for the flexural deficiencies in the decks of the tied arch spans and interior concrete girders of the approach spans.

PROJECT DETAILS

ODOT required the positive moment regions of the decks spanning between floor beams to be strengthened using a near surface mounted (NSM) technique and provide a strength equivalent to #4 steel rebar @ 15" o.c. To provide the specified strength RenewWrap™ CF bars were bonded into shallow slots cut into the deck soffit. Pioneer Waterproofing, the FRP installation contractor worked from scaffolding suspended from the bridge over the river to provide full access to the underside of the bridge. Pioneer developed an innovative method for quickly and accurately cutting the slots which was one of the most challenging aspects of the project.

For the positive moment regions of the interior girders of the approach spans ODOT required additional strength equivalent to one #11 steel rebar. Pioneer installed the RenewWrap CF600 carbon fiber strengthening system to the bottom of the girder to meet ODOT's requirement. The CFRP was coated to provide UV-protection and an aesthetic finish.

PROJECT DETAILS

Location: Reedsport, OR

Application: Umpqua River Bridge

Client: Oregon DOT

Product Used: RenewWrap® FRP

Installation: 2017

Installer: Pioneer Waterproofing

Specialty Engineer: KL Structures



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CASE STUDY:

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Filling slots with RenewWrap® Epoxy Paste



Placing RenewWrap® CF carbon fiber bars in slots



Tooling surface of epoxy



Suspended scaffolding used as work platform



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