EDITORIAL

Photo: Ted Lacey Photography.

Challenges, Engineers, and Solutions

John S. Dick, *Executive Editor*

As we review projects for potential use in *ASPIRE*,™ the editorial team can't help but be impressed with how engineers respond to the challenges of envisioning and designing their bridges. This extends to the contractors who execute the designs and the agencies that approve and ultimately accept them. The results are frequently awe-inspiring.

Size doesn't matter: miles of spans or just one, short-spans or long-spans, two lanes or six lanes. We see impressive solutions being used in most bridges around the country these days. The projects described in this issue are no exception.

The Mon-Fayette Expressway Bridge in Pennsylvania saved the owner $8.5 million with a value-engineering proposal. Sitting on piers up to 200 ft tall, the cast-in-place concrete box girder includes a span of 518 ft. Low-permeability concrete and other measures provide a life expectancy of 100 years. This article begins on page 14.

In Washington State, a unique lid over an expressway connects both parts of a major office complex. It not only provides a vehicular bridge but carries the adjacent landscaping over the freeway with pedestrian-friendly meandering walkways that blend seamlessly into the surrounding environment. Read the article beginning on page 18.

Big Bear Bridge in California comprises a 474-ft-long arch supporting two 237-ft-long equal spans of post-tensioned, cast-in-place concrete box girders. This striking bridge, located near the south branch of the San Andreas Fault, is designed to resist a significant seismic event in part with the use of two 6.5-ft-diameter friction pendulum isolation bearings at the crest of the arch. This feature begins on page 22.

The Dulles Metrorail Aerial Guideway project near the nation's capital is being constructed just feet away from some of the country's heaviest traffic. The first phase of the project is 11.6 miles long, includes 3 miles of aerial guideway, 3 aerial stations, and a 2400-ft-long tunnel. At its highest point, it is 55 ft over the eight-lane I-495 Capital Beltway. (See page 26)

The twin I-80 Bridges over Echo Dam Road in Echo, Utah, were not built where you will find them today. They were built off line, out of traffic, and then slid into place in a matter of hours each. This permitted the heavily-travelled interstate highway to remain in service except for a brief closure of two lanes. How they did it is explained beginning on page 30.

The Covered Bridge over the Kennebec River in Norridgewock, Me., hasn't been "covered" in many years. The story behind the challenge to create this beautiful structure, only the second major concrete tied arch bridge in the United States, is impressive. The arch spans 300 ft and rises 60 ft above the deck. With a total length of 570-ft, the bridge has no deck joints and incorporates measures that will provide a 100-year service life. The article starts on page 34.

So far, the articles alternate between the east and west coasts. The final featured project is in Texas. The Santa Ursula Connector in Laredo needed to be designed for the condition of being 25 ft below high water level of the Rio Grande River. That required a shallow superstructure and substantial resistance to overturning. The selection of the Texas standard 15-in.-deep, precast, prestressed concrete solid slabs seemed logical. It provided a 22-in.-deep superstructure with a smooth soffit that won't trap debris. But, it was on a sharp horizontal curve. How the designers handled all of the constraints begins on page 38.

Once again, we salute the innovative designers and constructors who have met their challenges head-on. They have provided bridges that not only satisfy the unique site demands but create interesting stories that we are pleased to share in *ASPIRE*. If you have a project that you would like to have considered, whether large or small, please contact us at www.aspirebridge.org and select "Contact Us." We look forward to hearing from you.

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