# EDITORIAL

## Sustainability and the Art of Concrete Bridge Design

John S. Dick, *Executive Editor*

*Photo: Ted Lacey Photography.*

With this issue, *ASPIRE*™ begins its third year of exploring sustainable solutions. We find the subject more pervasive—in a most positive way—with each passing year. Both Myint Lwin and Scott Snelling address the topic in their articles. Myint, who is director, Office of Bridge Technology at the Federal Highway Administration, provides transcribed comments made during a presentation last November at the American Segmental Bridge Institute's annual convention in Minneapolis. Scott is a senior engineer with Hardesty & Hanover in New York City and serves on the American Society of Civil Engineers' Task Committee for Sustainable Design. From his background, he suggests what a new national standard for sustainable bridge design could look like, based on existing sustainability standards for buildings.

*ASPIRE* has highlighted many arch bridge projects over the years including three in this issue, and there is yet another waiting in the wings for the Spring issue. The three projects in this issue are:

- Spencer Creek Bridge, Newport, Ore.,
- Humpback Bridge over the Boundary Channel on the George Washington Parkway near Washington, D.C. in Virginia.
- Galena Creek Bridge on the I-580 Freeway Extension, near Reno, Nev., and

The arch is structurally and aesthetically well-suited for creating highway bridges. Fred Gottemoeller, in his popular book titled, *Bridgescape: the Art of Designing Bridges,* says about evaluating bridge types, "…if it is desirable for the structure to frame an important view, than a structural type with a curved, arched soffit will be an effective choice...Arches continue to have strong visual appeal because of their shape…Arch bridges look best where the surroundings 'contain' the visual thrust of the arch."

Each highlighted project uses the arch in a unique way. Each draws on context sensitivity and uses concrete for interesting solutions. These projects also illustrate different techniques for building concrete arches. We believe you, too, will find these projects innovative and useful in the future consideration of such designs.

Janssen & Spaans Engineering (JSE) has played an important role in concrete bridge design for nearly 30 years. They have been involved in two record bridge spans in recent years. Since 1960, the two parallel Oneida Lake Bridges in Brewerton, N.Y., were the world's longest precast, prestressed concrete bridge spans at 320 ft. But, in 2000, a JSE design for the Moore Haven Bridge over the Okeechobee Waterway in Florida resulted in a three-span unit with a 320-ft-long main span, tying the record. The Kentucky Route 22 project, shown on the cover and mentioned in the FOCUS on JSE, when completed, will be the new world record holder, with a main span of 325 ft. Along the way, techniques pioneered by JSE and used in the design and construction of spliced girder bridges have become commonplace. We are proud to feature them in this issue.

The Jakway Park Bridge in Iowa not only uses ultra-high-performance concrete at a design compressive strength of 21,500 psi but employs a special new shape called the Pi girder (owing to its cross-section's resemblance to the Greek letter). Created by the Massachusetts Institute of Technology and the Federal Highway Administration, the shape takes advantage of the material's unique properties.

The Pennsylvania Department of Transportation is this issue's featured state. The concrete industry acknowledges Pennsylvania as home to the nation's first modern precast, prestressed concrete bridge; a cutting edge solution for the time. Today, PennDOT continues its state-of-the-art applications of concrete technology.

Each article serves as a testament to wise decisions by designers and good investments by owners on behalf of the traveling public. As always, we hope you enjoy and benefit from their presentation.



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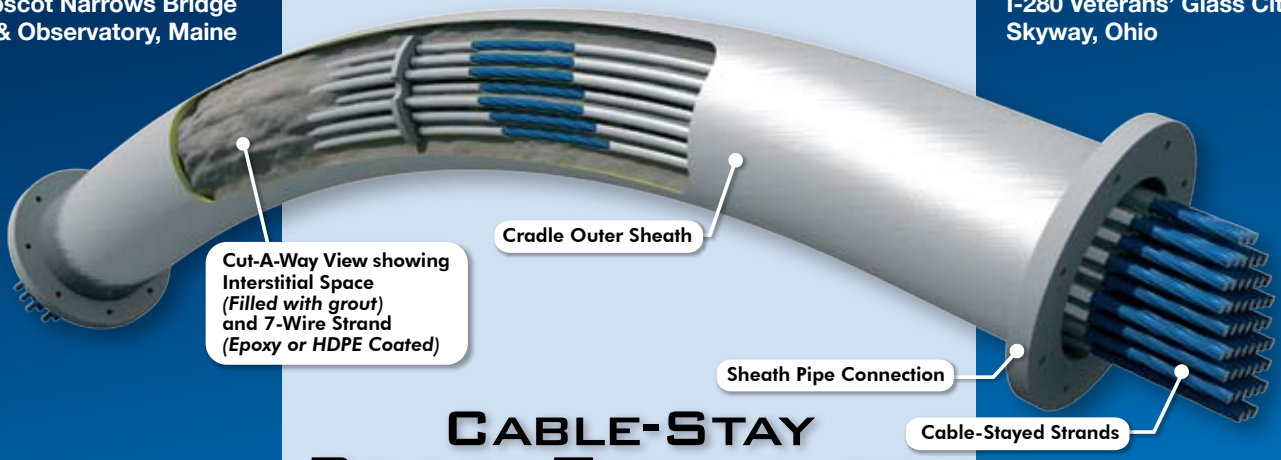
Photo: Prestress Services LLC.

**Penobscot Narrows Bridge & Observatory, Maine**

**I-280 Veterans' Glass City Skyway, Ohio**




# Cable-Stay Bridge Technology

The FIGG Cable-Stay Cradle System™ Invention – first used in the I-280 Veterans' Glass City Skyway, Ohio & Penobscot Narrows Bridge & Observatory, Maine – was designed to revolutionize cable-stay bridges. The cradle is one unit that goes through the pylon. Among the cradle's many benefits are that it allows for unlimited stay sizes and makes it possible to remove, inspect and replace individual stay strands. Awards include: the 2007 ASCE Charles Pankow Award for Innovation, the NOVA Award from the Construction Innovation Forum, the 2006 NSPE New Product Award and the 2006 Modern Marvels Invent Now Top 25 Inventions (selected from 4000 entries)

OWNER: **Maine Department of Transportation**
DESIGNER: **FIGG**
CONTRACTOR: **Cianbro/Reed & Reed, JV**

The world's tallest public bridge observatory at the top of the 420' western pylon provides 360 degree vistas of Maine for visitors from May through October. The cable-stay bridge features a 1,161' main span and was opened to traffic on December 30, 2006. Aesthetics selected by the community center around a bridge theme of "Granite, Simple and Elegant". This bridge has received numerous awards, including the George S. Richardson medal from the International Bridge Conference and the ASBI Bridge Award of Excellence.

OWNER: **Ohio Department Of Transportation**
DESIGNER: **FIGG**
CONTRACTOR: **Bilfinger Berger Civil Inc.**

Toledo's landmark cable-stay bridge features 612.5' spans on either side of a single pylon and incorporates stainless steel cable casings and a pylon with four sides of glass on the top 196'. The custom glass reflects the community's vision and honors their heritage in the glass industry. At night, LED lights behind the glass create dramatic lighting celebrating seasons and holidays. This bridge opened to traffic in June 2007 and has received numerous awards including the NCSEA Outstanding Project Award and the ASBI Bridge Award of Excellence.

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