



# INDIAN RIVER INLET BRIDGE REPLACEMENT PROJECT UNDERWAY

By: Tina Shockley

**I**n the second smallest state in the nation, near the resort community of Bethany Beach, a modern marvel is underway. Skanska USA Civil Southeast, a world renowned Sweden-based bridge building company is raising a new Indian River Inlet Bridge.

The existing bridge's piers are being eroded by severe scouring - the product of a manmade high velocity waterway and the corrosive nature of the salty Atlantic Ocean. Collectively, they have reduced the life expectancy of the existing bridge, requiring a new bridge to be built. The new bridge will have all of its piers outside of the water, on land. This means the bridge will be a larger and longer version with an overall total bridge length of 2600 feet, including 900 feet of clear span over the inlet.

The \$150 million design-build project was awarded in September 2008 to Skanska because it had the lowest price, highest technical score and most aggressive construction schedule. The bridge is expected to be open to traffic in April 2011, and the project completed by July 2011 - eight months earlier than required by DelDOT. In order to expedite the contract, a design-build contract was established which allows for the design of the bridge to occur simultaneously with the construction. Design plans are about 95% complete, and construction is well underway. The new bridge will have a minimum 100 year life span, and is being supported by 36 inch square precast concrete piles. Due to the dense sand and soft clay layers below ground, the installation of the piles was challenging. However, detailed

data collection, quality assurance and persistence paid off. The pile program was completed in the fall of 2009.

With the new bridge, boaters will have up to 45 feet of under clearance, which is 10 feet more than the existing bridge provides. The bridge will have two 12-foot wide travel lanes, a 10 foot wide outside shoulder and a 4-foot wide inside shoulder in each direction. A 12-foot wide protected sidewalk will also be featured on the east side of the bridge.

The bridge will consist of twin 249-foot high pylons on each side of the inlet supporting the two-planes of cable stays on each edge of the structure. The bridge has no support piers in the inlet. The main span of the bridge will be completely supported by the tension exerted on the cable stays.

The bridge, which is being built amidst a state park and recreational resort area, requires the bridge builder to be very cognizant of recreational and environmental impacts during construction. As part of the contract, Skanska must avoid placing any shoring or work platforms in the water crossing while building the structure. One unique aspect of the bridge's construction was that during the design phase of the project, the public provided input on some of the architectural and visual features of the bridge. These included the lighting fixtures for the walkways, the color of the cable stays and the design for the top of the pylons.

Another unique aspect of the bridge is that it is the first time a fiber optic monitoring system



has been used on a bridge of this type. DeIDOT and the University of Delaware's Department of Civil and Environmental Engineering are working to incorporate smart bridge technology in order to measure the long-term performance of the bridge.

During the early part of 2010 and into spring, the pile caps will be built at the main pylons. Additionally, concrete edge girders will be placed as construction of the bridge deck begins. Meanwhile, piers and bridge approaches to the main span will be also constructed.

Soon after, deck construction will begin, including the first major concrete pour for the bridge deck. Springtime will bring additional work on the bridge deck, pylon towers, and approaches to the main span, including cable stay erection.

The bridge project has also been a blessing during the recent economic downturn, as it has spurred economic growth for the State of Delaware by bringing construction jobs, increasing revenues for local businesses and benefitting the local tourism industry.

The State is also maximizing the bridge building experience by sharing it with students from



kindergarten to graduate school. Local students are learning about the math, science and technology that is required to build a bridge of this magnitude. Students are able to visit the construction site and learn firsthand from a bridge

engineer. By having students come to the site, they gain the "WOW" factor. They see the magnitude of the structure, they meet the bridge builders, and they learn about the math and science concepts being applied as Skanska builds the bridge.

In the end, this bridge will be a useful part of Delaware's transportation infrastructure, and will connect people for generations to come.

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