

REINFORCING NEWS

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Unique bridge design for unique community

By Kevin Cornell

Tangier Island, Virginia is about one mile wide and three miles long located in the middle of Chesapeake Bay. The community of Tangier is the only settlement on the island, linked to the mainland by ferries and air service. Many of its residents claim lineage to the first settlers who arrived in 1620 from Cornwall England after Captain John Smith visited in 1608. The community's economy is largely based on fishing, crabbing and a small tourism industry. Even a community of this size requires modern infrastructure to keep its residents and visitors safe



Photo: John Liles, North Star Construction

Tangier Island community and bridge crossings

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and healthy. Tangier has its own water and wastewater treatment facilities, solid waste incinerator, school, retail shops, health clinic, police and fire service. Its main roadways are narrow and vehicles limited to golf carts, mopeds, bicycles and about a dozen motor vehicles. Its infrastructure serves its resident population of 700 and approximately 500 tourists during the summer.

The island can be characterized as low lying with three north-south ridges and an extensive marsh. Flooding and erosion are constant challenges to the islanders, along with seasonal tidal high water. As homes are repaired or replaced, they are elevated in accordance with a flood management program. Because of the maritime environment and flooding conditions, there is considerable rot of foundations and infrastructure made of wood.

Housing is located along the three ridges. Access between these three areas has been provided over wetland by narrow wooden bridges. Since the bridges are close to the water level of the wetlands, difficult to maintain, and exceeded the carrying capacity for fire service vehicles, they had to be repaired or replaced.

In February 2004, the Accomack County Board of Supervisors passed

a motion to replace the two Route 1302 bridges over Canton Creek.

The Federal Highway Administration (FHWA) awarded the Virginia Department of Transportation (VDOT) \$400,000 under FHWA's Innovative Bridge Research and Construction (IBRC) program to use innovative materials on one of the bridges. Since Tangier Island has no program for highway maintenance, using durable components would reduce the long-term costs of transporting crews, equipment and materials from the mainland.

Stainless steel reinforcing was specified to address construction in a marine environment and any issues related to corrosion. By using stainless steel reinforcing, the useful life of a bridge is dramatically increased. The integrity of the concrete is enhanced significantly, and maintenance costs are much lower or non-existent when stainless steel reinforcing is used.

North Star Construction Corp. was awarded the contract for replacement of the bridges. It contracted Bayshore Concrete Products to produce two abutments for one of the bridges. Located in Cape Charles, VA., Bayshore was established in 1961 to produce the precast

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Unique design

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components for the 17-mile-long Chesapeake Bay Bridge Tunnel. The company contacted Salit Specialty Rebar of Niagara Falls, New York to supply stainless steel reinforcing for precast bridge abutments. This was a VDOT special provision. All of the reinforcing was required to meet ASTM A955/955M. Stainless steel grade 2205 duplex material was used because of its high corrosion resistance, greater strength, and proven reliability. Salit's facility in Western New York is a principal source of stainless steel rebar, and fabricated reinforcing products for projects throughout North America.



Photo: Kevin Council, Salit Specialty Rebar

Stainless steel assembly wired into proper configuration at StelCrete.

Pre-assembled cages were preferred to reduce the labor costs in the remote Tangier location. The welding had to be accomplished in accordance with AWS D1.5 and D1.6. Salit worked with StelCrete of Niagara Falls, Ontario to provide the cages for several reasons. Foremost, Salit needed to be involved in the fabrication process. As a sister company in the Salit Steel Group the collaboration allowed the input and supervision necessary to undertake this complicated and intricate fabrication. Secondly, StelCrete has an excellent record of accomplishments and reputation for precision welding. The company has demonstrated this repeatedly, supplying large and project-critical pre-welded steel rein-

forcement products to the precast industry. In addition, StelCrete has the certified welders necessary to meet the VDOT requirements for certification.



Photo: StelCrete

Stainless steel assemblies welded at StelCrete.

Once StelCrete was approved for supplying the pre-welded cages, Salit cut and bent the rebar for the abutments and shipped the fabricated rebar to StelCrete. The order consisted of five tons of stainless steel reinforcing with 2 ½ tons of material in each abutment. Once the cages were assembled, welded and inspected, they were trucked to Bayshore where they were placed in a mold and covered with concrete.



Photo: StelCrete

Pre-welded assemblies shipped from StelCrete to Bayshore.

By precasting the abutments, the contractor was able to ship the bridge components by barge to Tangier Island and place them into position, without incurring the costs of on site cast-in-place construction. From beginning to end the entire prefabrication job took 14 days. A purchase order was received on April 11 and the welded cages were

on a truck and for delivery to Bayshore by April 25, 2006.



Photo: Chad Saunders, Bayshore

Precast abutments shipped from Bayshore facility to Tangier Island.

The stainless steel reinforced abutments for the bridge over Canton Creek complements the materials comprising its deck and superstructure. The social infrastructure and economy of the unique community of Tangier is now supported by a reliable bridge designed to withstand the forces of the maritime environment with very low maintenance costs to the state.



Photo: John Line, North Star Construction

Specialty designed superstructure placed on precast abutments with pre-welded stainless steel reinforcement.

StelCrete

Reid's Precast introduces new product using pre-welded rebar cages

By W.J. Reid, Reid's Precast Cement Products Ltd.
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Reid's Precast has launched a new product line from its Langton, Ontario facility using pre-welded rebar cages. The 25-167 kVA single-phase transformer foundation product is being shipped to clients in various configurations. The product tends to be used in subdivisions by developers, electrical contractors and electrical utility groups.



Precast 25-167 kVA single-phase transformer Foundation.

A welded reinforcement cage prototype was designed and built by Stel-Crete to determine the economics of producing transformer foundations with pre-welded cages, and product quality. After a few alterations, the cages were approved for use and are now an element of the production process and final product. StelCrete provided AutoCad drawings of the reinforcement cage to facilitate production and acceptance by clients. StelCrete staff was onsite during production to make sure that the cages fit, as designed.

Once the formwork has been prepared, the cages are manually placed into the mold. Since the cages are not too large, or heavy, they can be handled by two people. Plastic wheel spacers, three inches in diameter, are installed on the cage prior to installa-

tion into the mold.



Pre-welded rebar cage.

A pre-welded cage reduces labor costs by saving fabrication time and the time required to set up the formwork. The cages can be placed into the form with minimal labour. In addition, a welded cage provides reinforcing that exceeds specifications. Stel-Crete has procedures set in place for speedy, on time delivery of products by drivers who understand the needs of clients.



Pre-welded cage placed in transformer formwork.

Reid's Precast was established in 1964 when the production facility was purchased from a previous pre-caster. At the time, a small number of tank sizes (550, 650 and 750 gallons) were produced, as well as catch basins and well tile. Gradually, the tank sizes increased. The smallest septic tank became 800 gallons, changing

from single to dual chambers, as other sizes were added (1,000, 1,500, 2,000, 3,000 gallons). Then, water cisterns became a product line. Throughout the 1970s, additional delivery trucks were added to Reid's fleet, and a new manufacturing building was erected.



Pre-welded transformer foundation cages offloaded for use.

Waterloo biofilter tanks were eventually added in 800, 1,500 and 2,000-gallon sizes, as well as standard 800-gallon oil/grit separators with 1,500 and 2,000-gallon versions available on an as-requested basis.

Throughout the years, Reid's has changed its methods of production and product design to meet market demand, improve quality, and to increase production efficiency by reducing the steps and labour needed to manufacture products.

Reid's Precast product lines include: septic and holding tanks; effluent pump tanks; bio-filter tanks; water cisterns; distribution boxes; oil interception tanks; catch basins; well tile; and the single-phase transformer foundation.

(Photos supplied by W.J. Reid)

StelCrete

Innovative jig presents new opportunity

An innovative jig system developed by StelCrete is providing clients with highly accurate pre-welded assemblies for small bridges and precast concrete boxes. The system is capable of producing assemblies for three different bridge designs at the same time over three shifts in a 24-hour period. Nine uniform or varying pre-assembled rebar cages can be ready for shipment in 24 hours. Complete production changeover to a new line of cages can be accomplished within three hours. The jig was created in response to demand for a greater number of cages of varying design and size in a short period.

The pre-welded assemblies can be produced for any precast concrete bridge unit currently on the market. The accuracy of the rebar placement is much higher than existing standards and codes that govern the fabrication of the assemblies. The rebar placement in a 38 foot bridge assembly has a tolerance of 5 mm. Deviation in the rebar placement is insignificant.

Since startup on August 15, five projects have been supplied by the jig located at StelCrete's facility in Fort Erie.



Salit's Bowmanville facility fully operational after one year

Barely one year has passed since Salit Steel opened a new facility in Bowmanville Ontario in August, 2005. The 25,000 square foot building and runway is located on a 20-acre site near Highway 401. The facility was established to provide better service to a growing number of clients in the GTA, east and north east of Toronto.

The operation is a stand-alone business centre with approximately 25 employees and its own fleet of shipping and receiving transports. Its administration is fully integrated with Salit's corporate office in Niagara Falls. It was set up as a full line structural steel service centre with its own rebar fabrication plant.

Clients benefit from the facility because it offers next day service. Open 24 hours Monday through Friday, Salit is able to provide clients with a product mix most often associated with a larger operation. Contact Bob Cameron at 1-866-623-5544





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StelCrete's core business is to supply precasters with fully pre-assembled, pre-welded reinforcing cages for all types of products