

StelCrete

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REINFORCING NEWS

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Concrete Precasters Association of Ontario members tour StelCrete's modern assembly facility in Welland

By Robert Nichols



Included in the education component of this year's Concrete Precasters Association of Ontario conference was a tour of StelCrete's Welland facility. The 165,000 square-foot facility located on 44 acres houses three divisions of Salit Steel, including StelCrete, with the capacity to load 12 trailers at once. Approximately 80 people involved in the precast industry took the tour. It was arranged to showcase the technology that goes into every reinforcing product delivered to a project.

StelCrete staff escorted small groups through the various work stations to see the fabrication of pre-assembled products before returning to a lunch and welcome speeches by their hosts.

The facility is operating two shifts with a team of about 60. The shipping department services customers 24 hours a day, 7 days a week.

The rebar fabrication facility is one of four operated by StelCrete. The largest rebar fabricated is

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55mm. There are two CNC-controlled shear lines with a capacity of 20 tonnes each, along with 5 programmable bending machines. StelCrete operates eleven 10-tonne overhead cranes in addition to an outside runway 85-feet by 550 feet with a 10,000 tonne capacity.

One of the focal points of the tour was the Panasonic Tawers™ welding robot with expansion capabilities. The robot can weld both carbon and stainless steel rods and wire. The robot plant has a floor space of about 5 metres in length, 3 metres wide and 2 metres in height. The robot is fully enclosed to prevent accidental welding flash, and guarded by infrared beams to prevent accidental entry while operating. If the beams are interrupted, the robot shuts down automatically.

Among the many products produced by the rebar facility are manhole cages, stair assemblies, and girder assemblies. The operation's pre-assembled inventory yard is approximately 60,000 square feet.



Reinforcing News

Innovative product for small bridge

By Bob Hansen



21 precast units with pre-assembled reinforcement used for 19.840-meter deck

Reconstruction of a small bridge over Young's Creek in the Town of Port Ryerse on the shore of Lake Erie is an example where modified standard products were used to construct a unique structure over a federally regulated creek. The pre-assembled reinforcement of the precast units was supplied by StelCrete.

Hanson Pipe & Precast, Cambridge Ontario shipped product for the first phase of the 19.840-meter (65 foot-long) deck on September 22 and the second phase on November 10. The structure was fully functional by the end of November 2008.

To accommodate site conditions, Hanson Pipe & Precast used modified standard products for modular construction. Precast units included seven flat slabs for construction of the center section of the deck and 14 L-shaped modified QuickSpan sections to complete the deck at the north and south ends of the bridge. Six of the 4.573 meter-long center slabs were 1.829 meters wide and one was 1.524 me-

ters. Twelve modified 4.573 meter-long QuickSpan units were 1.829 meters wide and two were 1.525 meters. All precast units were skewed on a six-degree angle, and the center slabs were produced from a special form built for the project. A divider with a six-degree skew was placed in the QuickSpan form to produce the specially designed L-shaped sections with equal lengths needed for the deck. With Hanson's Cambridge and Whitby plants producing simultaneously, one set of bridge crossing components were manufactured per day (2-L sections and one flat slab). The flat slabs were produced in Hanson's Cambridge plant using self-compacting concrete to significantly reduce freight costs. The combined use of slabs and beams with modified QuickSpan units made possible the precast modular construction of the bridge. To complete the construction of the deck, a 150 mm concrete distribution slab was poured over the assembled units.



SSR supplies stainless steel reinforcement for modular deck bridges



Stainless steel reinforcement with reduced cover used for precast deck slabs on Allegany Bridge 20

The decks of two small bridges in Cattaraugus County, in Upper New York State were constructed with stainless steel reinforced precast concrete modules, instead of a traditional cast-in-place construction methodology. The decision taken by Cattaraugus County Department of Public Works, Engineering Division to design and construct the decks using precast panels, allowed the County to construct the bridges with its own forces.

Speed of construction was a factor in determining the bridge type. Between the sheet pile abutments, which took four weeks to construct, and production and assembly of the precast deck (4 weeks), the County estimated a time savings of at least 8 weeks per bridge. Without these time savings, the County would not have been able to complete the two bridges with in-house forces.

The Machias 17 bridge was a town bridge that was closed to traffic due to its deteriorated condition. Upon completion of the new structure, the County took over ownership of the structure. The Allegany 20 bridge was in poor condition with a reduced load posted for 22 tons. The County was looking to further reduce the load, due to both superstructure and substructure deterioration. The reduced load of the bridge had a negative impact on the travelling residential population and the local logging contractor who needed to cross the structure regularly. County engineers also determined that the hydraulic openings for both structures was insufficient.

County engineers were concerned about the dead load of the decks, so the concrete cover over the rein-

forcement had to be reduced to lighten the weight of the concrete. To achieve this, the engineers considered corrosion inhibitors and epoxy coated rebar. For the inhibitors to be effective, however, the panels needed at least 2 to 2-1/2 inches of concrete cover over the rebar. This was not an option. The county has had less than favorable experience with epoxy coated reinforcing on the heavily salted county roads of the snow-belt region, and with the reduced cover, this wasn't the ideal solution either. Stainless steel reinforcement with reduced cover became the most viable option. Although not used for the precast concrete panels, a corrosion inhibitor was used for concrete pours of other elements of the structures. The abutment walls and wing walls are all sheet pile, and the substructure or girders are galvanized steel beams. The span of the Machias 17 bridge is 31.67 feet, while the span of the Allegany 20 bridge is 38.4 feet and the Ellicottville 49 bridge 31.67 feet. All are 28.67 feet wide.



The Machias 17 bridge had been previously closed to traffic. Reconstruction began on June 23 and the bridge reopened to traffic on September 2. Allegany bridge 20 was closed to traffic on September 11 and reopened on November 12.

StelCrete closing the technology gap through innovation

StelCrete is an innovator for heavy construction reinforcing applications, as well as precast concrete products. The company is developing innovative products to bridge technology gaps created by traditional methods of reinforcement and the demands for new concrete products and construction techniques .

A greater focus is now being placed on the supply of engineered products produced in controlled workplace and assembly environments. The demand for pre-assembled reinforcement is growing.

StelCrete's Welland facility is a model for plant layout designed for efficiency and worker safety, so that assemblies can be produced quickly for immediate delivery or stockpiled throughout the year. Following are a few of the many situations where pre-assembled reinforcing can add value to a project.

- Just-in-time delivery to construction sites with limited or no room for storage of construction materials.
- Speed of installation.
- Delivery of partially assembled construction components.

- Reduced manpower requirements in an industry plagued by shortages of skilled labour.
 - Reduced chance of personal injury due to fewer people on the construction site.
 - Material handled by equipment instead of people transporting material into position, and limited use of potentially dangerous equipment requiring training like welding equipment.
 - Safe job sites due to reduced traffic, people and construction activity.
- Cost savings related to construction time, reduced job related injury, limited storage of materials and others to be determined.

Because of StelCrete's capabilities and interaction with the construction and precast concrete industry, it is well positioned to supply innovative products to close technology gaps.

Bob Hansen Operations Manager StelCrete



Bob Hansen joined StelCrete in May 2008 as Operations Manager, after 15 years in the steel manufacturing industry. He started work as a welder when he was 15. He paid for his studies in computer sciences at Brock University and civil engineering at McMaster University by working as a welder/fitter. After university, he was employed with John Deere, Toyota and Etmeco. At Etmeco, he worked in sales and management before joining StelCrete.



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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