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## North Carolina, New York ports play role in \$3.9 billion Tappan Zee project

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[Joseph Bonney, Senior Editor](#) | Jan 18, 2016 10:08AM EST



Thirty miles of steel girders for a new highway bridge rising over the Hudson River near New York City are being delivered on a roundabout route using trucks, barges and ports with the space to handle the big cargo.

Eight hundred girders, ranging from 65 to 120 feet long and weighing up to 90 tons, are being delivered to the site of the new Tappan Zee Bridge by truck and barge from steel fabrication plants in North Carolina, Virginia and Pennsylvania.

The girders produced in North Carolina and Virginia are being trucked to the Port of Morehead City, North Carolina. From there they are loaded onto flat-deck seagoing barges for shipment to the Port of Coeymans, New York, about 95 miles upriver from the bridge construction site. The Pennsylvania-made girders are being trucked to Coeymans.

The 125-acre port, owned by Carver Cos., is being used as a staging and assembly area for the girders. The steel pieces are assembled into huge sections that are barged downriver for assembly into the three-mile-long bridge, which will have eight traffic lanes and four emergency pull-over lanes.

Tappan Zee Constructors, a joint venture of Fluor, American Bridge, Granite, Traylor Bros. and HDR Engineering, is building the bridge under a \$3.9 billion contract with the New York State Thruway Authority. The work is being carried out under a design-build contract in which construction begins while engineering details are still being tweaked.

The bridge will replace a 61-year-old span that crosses one of the Hudson's widest points. The location was chosen decades ago because it was the closest point to New York City where toll revenue could be collected by the state instead of by the Port Authority of New York and New Jersey.

Because of the new bridge's curving design, the girders are uniquely shaped. They must be delivered in precise sequence on a choreographed schedule. Shipments began in late 2014 and will continue into 2017. About half of the pieces have been delivered.

The girders moving through Morehead City are being produced by Hirschfeld Industries and trucked 225 miles from Greensboro, North Carolina, or about 400 miles from Abingdon, Virginia. **Seahawk Logitech arranged the road transportation, using specialized wheeled dollies. The girders were transported during daytime hours under special permits.**

The Pennsylvania-produced pieces are being supplied by High Steel Structure Inc. They are being trucked directly to Coeymans from plants in Williamsport, in north-central Pennsylvania, and in Lancaster County, west of Philadelphia.

When the girder sections arrive at Coeymans, they are assembled into segments up to 425 feet long and 40 feet wide. At the port, workers also install a variety of utility conduits — water for firefighting, compressed air for tools, fiber-optic wires for communications, electrical lines for bridge lighting and components, and security and communications lines. It's easier and safer to do the work on the ground than in the air at the bridge construction site.

Customized hydraulic rail carts move the girders onto a track to barges that carry the pieces from Coeymans to the construction site. Three barges make the circuit — one always en route, another dropping off at the construction site, and another being loaded in Coeymans.

At the construction site, the girder sections are lifted by a floating crane that has lifting capacity of 1,873 short tons. The crane, originally the Left Coast Lifter, was used by American Bridge and Fluor for reconstruction of the San Francisco Bay Bridge, then acquired by Tappan Zee Constructors and renamed I Lift NY.

Delivery of the crane was a logistical feat in itself. The crane was towed 6,000 miles from the U.S. West Coast through the Panama Canal to the bridge construction site. To squeeze under the 138-foot vertical clearance of the existing Tappan Zee span, the crane's barge had to be ballasted with 2 million gallons of water and moved at low tide.

Coeymans, located on a former brick-manufacturing plant about 25 miles south of Albany, New York, has developed something of a specialty in logistical work for bridges. This is the biggest project the port has handled, but Coeymans has served as staging area for two other New York-area bridge projects in recent years.

The port has about 400 acres of flat ground, including 125 acres adjacent to the river, which provides the space needed for delivery, inspection and other work.

The bridge's construction supply chain also has played to Morehead City's ability to handle oversize project cargo. The state-operated port specializes in breakbulk and bulk cargo, and has nearly 40 acres of open storage space that's being used to stage the long girders.

"We had the space and storage to offer them a flexible solution," said Lance Kenworthy, director of bulk and breakbulk business development at the North Carolina State Ports Authority.

Incoming girders are arranged in sequence for loading. Two rail-mounted gantry cranes, each with lift capacities of 115 tons, are used in tandem to lift the girders onto the flat-deck barges, using a stow plan developed by stevedore Metro Ports.

It's a delicate process. The girders arrive at the port with six coats of pale blue paint to prepare them for exposure to harsh weather conditions the bridge will have to withstand. "They don't want any scratches or nicks," Kenworthy said. "There's not a lot of room for error."

Contact Joseph Bonney at [joseph.bonney@ihs.com](mailto:joseph.bonney@ihs.com) and follow him on Twitter: [@JosephBonney](https://twitter.com/JosephBonney).

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