CCA Civil is building the Wittpenn Bridge north of the existing 1930 bridge.

Give a Lift

THE NEW WITTPENN VERTICAL LIFT BRIDGE WILL BE A SIZABLE IMPROVEMENT. BY RUSS GAGER

Relief is on the way for drivers delayed on Route 7 by the old Wittpenn vertical lift bridge that was built over the Hackensack River in Jersey City, N.J., in 1930. CCA Civil, a subsidiary of China Construction America (CCA), which focuses on the heavy construction market in the New York metropolitan area, is partnering with the New Jersey Department of Transportation (NJDOT) to build a new vertical lift bridge north of the existing bridge.

The new bridge will provide for a minimum vertical clearance of 70 feet above the water in the closed position compared with the 35-foot height for the existing bridge. As a result, fewer openings of the new bridge are promised by the New Jersey Department of Transportation.

The bridge also will have two lanes in each direction that are 2 feet wider than the current ones, 8- to 10-foot right shoulders in each direction, a 6-foot sidewalk along the eastbound roadway, and an 8-foot median with inside shoulders and a median barrier to separate opposing traffic flows.

The Route 7 Wittpenn Bridge connects the east side of the Hackensack River with Kearny, N.J., on the west side of the river in Hudson County. Route 7 allows traffic from the west to gain access to the Holland Tunnel and New York City. It also serves as a main trucking route between the New York metropolitan area and the greater area of Kearny and the Meadowlands. The project includes the realignment of Fish House Road on the west side of the river.

The new lift span will measure 325 feet

CCA Civil – Wittpenn Bridge

www.chinaconstruction.us

- Construction cost: $166 million
- Location: Kearny, N.J.
- Number of employees onsite: 50 to 75
- Scope: Bridge replacement

"While designing the bridge presented challenges, figuring out how to erect it was the more difficult part." – Jimmy Maldonado, project manager

long by 125 feet wide and be lifted straight up via towers on each side of the span. "It's like raising a football field – except that it's much larger than a football field," CCA Civil Project Manager Jimmy Maldonado declares. This phase of the project began in January 2015 and is scheduled for completion in January 2018. This will be accomplished through the coordinated cooperation of CCA Civil and of NJDOT.

Towering Above

CCA Civil is building three land piers for the bridge and erecting structural steel on those and three additional land piers already constructed. Then it is installing the concrete bridge deck of the approaches on the Kearny, N.J., side and erecting towers on two of the water piers.

Each of the two towers will have two gears 15 feet in diameter and weighing approximately 90 tons at the top to pull the steel wire ropes attached to the counterweight for the bridge span when it is raised.

"The big part of the project is fabrication and installation of the bridge towers," Maldonado asserts. The bridge towers and counterweights are being fabricated by Florida Structural Steel in Tampa. The lift span itself is being fabricated in Oregon.

"The fascinating thing about this lift span is it's an orthotropic deck," Maldonado marvels. "It's a lighter type of bridge deck structure. It has 15-foot-deep by15-foot-wide box girders attached to the underside. Nothing like this has ever been fabricated before."

How to Build It

The bridge was designed by Jacobs using computer-aided design and 3-D modeling. How to erect the bridge safely also was designed. "While designing the bridge presented challenges, figuring out how to erect it was the more difficult part," Maldonado maintains. "That's what makes the job complicated. There's a lot of risk involved."

McLaren Engineering is a third-party engineering consultant hired by CCA Civil to analyze the bridge design, how it's going to be erected and confirm that the bridge can sustain the type of loading it will experience during the erection process. BIM was used extensively by McLaren Engineering to determine those construction factors.

Safety has been a constant consideration during construction. "Everything we do has layers and layers of engineering and review," Maldonado emphasizes. "We've been planning on this for the past nine months, developing the erection of this bridge. An extreme amount of resources have been expended on the development of this engineering plan."

One of the challenging aspects of the project was finding a crane to lift the bridge components, some of which required a crane capacity of 1,000 tons. "There are plenty of cranes in the world that can hoist much more than 1,000 tons," Maldonado declares. "However, they don't fit in the footprint of the river. Some are bigger than the river and wider, and also the concern is that height-wise, you have to be able to clear the bridges when you're going upstream, and a lot of the existing bridges have low clearances. When all is said and done, the Chesapeake 1000 was selected because it is within a foot of the existing bridge when it is raised."

Extensive Coordination

Even though the new deck will be lighter due to its innovative construction, it still will weigh 5 million pounds. It will be shipped in thirds on a barge from Oregon through the Panama Canal to the jobsite on a journey that will take from 10 to 12 weeks.

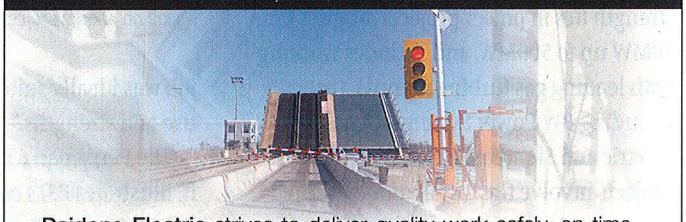
Coordinating the fabricator in Oregon and the one in Florida for the towers is one of the challenges of the project. The towers will be shipped by barge north to the bridge site. Mechanical and electrical installation also has to be carefully coordinated. The electricity has to be run across the bridge and to the top of each tower to run the motors for the gears.

Then the three 325-foot-long, 35-foot-wide sections will be erected onsite and bolted and welded together. "It's a pretty slender piece when we're hoisting it," Maldonado points out.

CCA Civil is the general contractor for Contract 3 of the project. According to Maldonado, more than a dozen subcontractors will work on construction of the towers. A control house for officials monitoring and operating the bridge 24/7 will be attached to the north side of one of the towers.

Madonado credits the teamwork of all the parties involved with the success of the project. Team members include especially NJDOT, the engineers, subcontractors and equipment providers. ◈

DAIDONE Electric INC. since 1929



Daidone Electric strives to deliver quality work safely, on time, and in accordance with the owner's specifications. Our goal is the continuation of our already established reputation. Since 1929, Daidone Electric has established itself as a premier contractor through our dedication to total customer satisfaction. As one of the NJ & Metropolitan area's top Electrical and Communications contractors, there is no job beyond the experience or capabilities of Daidone Electric.

SERVICES

- Mass Transit - Rail
- Power and Lighting
- Eletronic Toll Collection Systems
- Traffic Signal Intersections
- Civil & General Contracting
- Moveable Bridge/ Mechanical Rehab
- Intelligent Transportation Systems
- Technology Projects

Daidone Electric, Inc
200 Raymond Blvd., Newark, NJ 07105
Phone: 973-690-5216 • Fax: 973-690-5710
www.daidoneelectric.com