Bridge to the Future

Elevated Reversible Bridge features many firsts, and Tampa Fabricated Reinforcing Steel is a key supplier

It's new. It's bold. It's innovative. In fact, there might not be anything quite like it anywhere else in the world. Earlier this year, ground was broken on one of the most unique highway projects ever imagined. When completed in 2005, Tampa, Florida will be the site of a nine-mile elevated reversible bridge which, with the help of Gerdau Ameristeel's Tampa Fabricated Reinforcing Steel Division, will set new standards for highway safety, beauty and traffic flow well into the 21st century.

The new elevated reversible bridge is being erected in the median strip of Tampa's already-existing Lee Roy Selmon Crosstown Expressway (Lee Roy Selmon is a well-known local businessman and civic leader and former All-Pro defensive lineman for the National Football League Super Bowl Champion Tampa Bay Buccaneers, and a member of the NFL Hall of Fame).

Gerdau Ameristeel's Tampa Fabricated Reinforcing Steel Division is supplying more than 17,000 tons of fabricated reinforcing steel to PCL for the piers and roadway segments of the reversible bridge project.

When completed, the reversible span will carry three lanes of traffic high above the ground, one way, into downtown Tampa's central business district during the busy morning hours. Later in the day, a dramatic change will occur. At a pre-determined time, those same three lanes of traffic will be reversed, carrying the afternoon and evening traffic from downtown Tampa back to the eastern suburbs, connecting to Interstate 75. With all the traffic on the span always moving in the same direction, accidents are less likely to occur. Also, there will be only one exit at each end of the nine-mile elevated roadway. Traffic on the lower level will still allow motorists to enter and exit along the way.

Another innovative feature is that this is the first toll facility in the United States to operate without toll booths. Instead, tolls will be collected using Florida's electronic toll collection system or by direct billing. This system will help guarantee convenient, safe, non-stop travel to downtown Tampa. The lanes below will continue to provide uncongested travel to other local destinations along the way.

The reversible bridge will consist of more than 3,000 reinforced concrete segments, each resting on graceful piers, just six feet wide at the base. The bridge segments and piers are being constructed off-site by PCL Civil Contractors. PCL has set up a 25-acre casting yard at the nearby Port of Tampa, where a team of 90 PCL employees is forming the 70-ton segments by pouring concrete into enormous steel molds.

Traffic passes eastbound beneath several segments of the reversible bridge. The long beam in the foreground will be removed as more segments are put in place.

When called for, each segment is carefully trucked to the construction site with its corresponding segment for installation. These custom matches

help to ensure a smooth fit over the entire nine-mile course. Construction of the segments began in February with PCL employees casting one segment every two days. As production intensified, the schedule has picked up to its current pace of 45 segments per week.

At the construction site, a steel truss placed between the piers temporarily supports the segments while they are being assembled. That allows all of the work to be performed from above. The segments are lowered on to the truss by an overhead crane and pulled together with steel cables inside the bridge.

Open Air Testing Lab

In addition to providing daily service to Expressway customers, the bridge will serve as an open-air laboratory for highway safety and a prototype for 21st century transportation facilities and future technology. The weatherproof hollow core of the bridge will contain utilities, fiber optics, and specialized "intelligent transportation system" equipment that will automatically activate electronic motorist information services, the automatic toll collection system, and an automated emergency response system for disabled vehicles.

PCL employees standing in the hollow portion of a bridge segment form, prior to pouring the concrete, demonstrate the size of the core. The entire inside of the steel form is composed of various sizes and shapes of Gerdau Ameristeel reinforcing steel.

The bridge will provide state-of-the-art communication with motorists. Electronic variable message signs near the gateway entrances and on the ramps will provide important information to drivers about the operation of the reversible lanes. In addition, gates will block wrong-way access to the lanes. But that's just the beginning.

Borrowing technology from U.S. Navy aircraft carriers, the new bridge will be equipped with dragnet vehicle arresting barriers. When a jet aircraft lands on a carrier deck, a tail hook catches one of several wires stretched across the deck and stretches a short distance allowing the plane to come to a safe halt in a few feet. The bridge will have similarly designed safety nets, guaranteeing that a vehicle cannot enter the express lanes in the wrong direction. If a vehicle was to break through the gates, a safety net will stop the wrong-way vehicle without injuring its occupants. Traffic managers will continuously monitor video images of the expressway so assistance can be dispatched immediately in the event of an accident or breakdown.

On the environmental side, an ecological restoration will be created in Tampa Bay. To replace wetlands impacted by construction of the new project, 40 acres of fresh and salt water habitat will be restored and interconnected. This will recreate the natural conditions that nurture aquatic plants, fish, birds, and other marine life native to Tampa Bay.

At the Tampa Fabricated Reinforcing Steel Division, Rebar Bender Johnny Harold, left, and Shipper, Checker, Loader Jon Erdly bend circular T-3s for the Reversible bridge segments.

Gerdau Ameristeel's Tampa Fabricated Reinforcing Steel Division is supplying more than 17,000 tons of fabricated reinforcing steel to PCL for the piers and roadway segments of the reversible bridge project. Commenting on the project, John Floyd, Heavy Construction Sales, said "What makes segmental concrete construction really critical is the extremely close tolerances you have to establish and maintain with the fabricated rebar. These bars are fitting in a very confined space, and they have to be just right. Fortunately, Gerdau Ameristeel excels at that. We've got a great team, from our engineering department, to the employees in the shop, to our administrative staff."

The new technologies developed and tested on the elevated reversible bridge will one day be applied around the world, saving lives and enhancing the quality of life for future travelers.