Geocomp
Technologies to manage risk for infrastructure

Project Brief

I-10 Twin Span Bridge over Lake Pontchartrain

Client:

Louisiana Department of Transportation and Development (LDOTD)

Location:

New Orleans, LA

Services Provided:

- Provided innovative approach to lateral load testing during construction
- Enabled cost-effective, long-term structural health monitoring

Value Provided:

- Sensors validated construction and design calculations
- Sensors provided real-time data of traffic loads and environmental factors
- Embedded sensor technology measured the effects of movement in bridge
- Coordination with pre-stressed components fabricator supported long-term structural health monitoring (SHM)

Background & Project Challenges

The new Interstate 10 Twin Span Bridge over Lake Pontchartrain, was constructed to replace the previous Twin Span Bridge, which was heavily damaged by Hurricane Katrina.

The new bridge was built 300 feet to the east of the current bridge, with an elevation of 30 feet, which is 21 feet higher than the old bridge. There is an 80-foot high-rise section to allow for marine traffic. The increased elevation allows the bridge to withstand a much higher storm surge. The new bridge also allows for a 50 percent increase in volume. The 60-foot width of each span includes three 12-foot lanes and two 12-foot shoulders on each side.

This project was the largest public works project in the history of Louisiana. The westbound portion of the new I-10 Twin Span bridge was operational in 2009 and the eastbound portion in 2011. The bridge main span consists of steel girders resting on concrete bents with pre-cast concrete pile foundations. LDOTD decided to install a long-term monitoring system to address several design questions raised during the design phase of the project.

Geocomp Role & Accomplishments

Geocomp's challenge was to work with Louisiana's Transportation Research Center, to design and install sensors, data loggers and data management systems to collect in-service performance data to help answer critical design questions.

The sensors installed include:

- Strain gages mounted on steel girders and cast inside concrete girders,
- Strain gages cast inside the foundation piles,
- Water pressure cells to measure wave forces,
- Inclinometers and accelerometers to measure lateral movements of piles,
- Corrosion meters, and
- A weigh-in-motion system.

Special data loggers monitored all sensors constantly in real-time at 20 times per second to detect and record all sudden events, in order to minimize the quantity of data that must be evaluated, without risking the loss of significant information on the performance of the bridge.