Geocomp
Technologies to manage risk for infrastructure

Project Brief

I-10 Twin Span Bridge over Lake Pontchartrain

Client:

Louisiana Department of Transportation and Development (LADOTD)

Location:

New Orleans, LA

Services Provided:

- Innovative approach to lateral load testing during construction
- 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 movement effects on bridge
- Coordination with pre-stressed components fabricator supported long-term structural health monitoring

Background & Project Challenges

The new Interstate 10 Twin Span Bridge over Lake Pontchartrain, was constructed to replace the previous bridge, which had been heavily damaged by Hurricane Katrina. This project was the largest public works project in the history of Louisiana.

The new bridge was built 300 feet to the east with an elevation of 30 feet (21 feet higher than the old bridge) and an 80-foot high-rise section for marine traffic. The main span consists of steel girders resting on concrete bents with pre-cast concrete pile foundations. The 60-foot width of each span includes three 12-foot lanes and two 12-foot shoulders on each side.

The LADOTD 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 worked 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 included:

- 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
- Weigh-in-Motion (WIM) system.

Special data loggers monitored sensors 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.

In addition, a load test was performed on the superstructure after the bridge opening to calibrate the WIM system and correlate other sensor data with vehicle loading.