Reference Details

Owner Georgia Department of Transportation, GA, USA +++ **General Contractor** Scott Bridge, Inc., Opelika, AL, USA +++ **Engineer** Lichtenstein Consulting Engineers, Natick, MA, USA

DSI Unit DSI USA, BU Post-Tensioning, Arlington, VA, USA
DSI Scope 288 Retrofit Cable Dampeners

Precision Measuring Instrument for Precise Repair of Stay Cable Bridges, USA

Tallmadge Bridge, Savannah, GA, USA

The Eugene Tallmadge Memorial Bridge crosses the Savannah Harbor Navigation Channel approximately 15 miles (24km) from the mouth of the Savannah River.

With a vertical clearance of 136 feet (182m) at high tide and a horizontal clearance of approximately 600 feet (40m), the original Tallmadge Bridge, built from 1953 to 1954, soon proved to be too restricting. In order for Savannah's container harbor to grow, the bridge had to be adapted to allow bigger ships to pass through. Consequently, in 1981, the decision was made to replace the bridge. The new Tallmadge Bridge, a cable-stayed structure, has a vertical clearance of 185 feet (311m) at high tide and a horizontal clearance of 1,023 feet (56m), with both main piers located on land outside of the Savannah River allowing more navigable space. The new bridge was opened to traffic in 1991.

After 15 years of service and regular site investigations, the Tallmadge Memorial Bridge has now had to undergo repair of its cables and, in particular, their damper system.

As is usually the case with cable-stayed bridges of similar design, urethane dampeners are at the base and top of each cable. They are located between the cable-stay duct and the exit pipe that is part of the deck or pylon, where the cable stay enters the exit pipe. With this system, dampeners suffer from the continuous vibration in the bridge cables over time and eventually come loose, thus failing to provide the necessary dampening.

This retrofit poses a technical challenge because it requires the exact placement of the new urethane dampeners in the existing exit pipe geometry. This geometry is influenced by several constantly changing factors. For instance, the cable stays and the deck show differing changes in volume when reacting to variations in temperature. Consequently, in order for the new dampeners to achieve ideal results, the time span between measurements and installation has to be as short as possible.

State-of-the-art technology is used for achieving this goal. Precision instruments, up to date reverse engineering software and innovative production processes quickly and reliably deli ver the necessary precise measurement results and production parameters.

Stay cable specialist DSI USA makes use of these precision instruments and has developed the procedure to include this technology in a streamlined production and installation process. With the aid of a robotic arm, the DSI crew can take measurements down to one thousandth of an inch. Based on these measure - ments, a 3D model that serves as fabrication drawing is issued. Thus, innovative DSI techno logy contributed to the successful rehabilitation of Tallmadge Bridge. The new dampeners were ready for installation within the required aggressive time schedule of one week after measurements.

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