

# Smart Slings Monitor Lifts, Can Alert Crew to Overload

## Smart Sling Case Study: Leesport, Pennsylvania, State Route 1003 Pedestrian Bridge

**J**.D. Eckman Inc., Atglen, Pennsylvania, is a 70-year-old, family-owned, full-service construction company specializing in bridges and highways.

In one recent project, Eckman replaced a 100-year-old concrete arch bridge spanning the Schuylkill River in Leesport, Pennsylvania. The bridge carried State Route 1003 along with a pedestrian sidewalk, making it an important link between the two parts of town divided by the river.

A temporary pedestrian bridge erected at the beginning of the project let residents cross the river during the replacement bridge's two-year construction.

In addition to providing pedestrian access, the temporary bridge let a neighboring emergency medical services company stage rescue equipment on the river's far side so first responders could cross the bridge quickly on foot and still have the equipment it needed to respond to emergencies on the other side of the river.

### Challenge

As the new bridge neared completion, the temporary pedestrian bridge needed to be removed to allow final paving. The plan was to position cranes on both sides of the river, rig one crane to each end of the temporary bridge, then pick it up in a two-crane lift and set it on the road deck of the new bridge for disassembly.

A tandem crane lift presents several opportunities for complications.

One potential issue is that a tandem lift depends on both crane operators working in unison to lift both ends of the structure evenly. If one operator begins to swing the load before the other is fully clear of obstructions, the load could collide with an object, causing unknown dynamic forces in the rigging and crane.

Another potential issue can occur if the load has not been properly disconnected before lifting. The ends of the Leesport pedestrian bridge were bolted to concrete foundations on opposite river banks. If a bolt had been



Smart Sling lifting pedestrian bridge.

unintentionally left in place, or if the bridge had rusted at the connection, the load would not be free to move, and the rigging could be overloaded during the lift.

### Solution

To have greater insight into the status of the lift, J.D. Eckman incorporated Slingmax Smart Slings into the lift plan.

Battery-powered electronic sensors inside Smart Slings continually monitor for severe overload. During a within-capacity lift, the sensors transmit a "normal" signal to a computer base station every 30 seconds. That lets a designated person continuously watch the safety of the lift while coworkers concentrate on other tasks.

In the case of a severe overload, Smart Slings instantly transmit an "overload" signal to the base station, which then displays an alert on its screen and sends text messages and emails to everyone who's registered in the system.

The crane operator, riggers, and anyone else on the job site can then stop the lift, lower the load, and reevaluate.

### Method and Results

The Leesport bridge lift crew was trained how to properly rig and use Smart Slings. Since crew members were already familiar with Twin-Path synthetic round slings, the only added thing they needed to remember was not to rig on the orange "no-rig zone."

The Smart Sling base station set up at one end of the bridge automatically detected the Smart Slings and showed they were in "normal" condition. When the lift started, J.D. Eckman and Slingmax personnel monitored the slings, which stayed "normal" throughout the lift.

The base station's 500' transmitting range let supervisors monitor the lift on a battery-operated computer as they walked around the site to observe the crews and all phases of the procedure.

If anyone had observed an issue, the crane operator could have been alerted immediately.

In this case, the lift went perfectly, with the slings indicating "normal" from start to finish.

At the end of the operation, nothing had to be done except turn off the base station and stow the slings properly to await the next time.

Since the sling batteries have a two-year life, the riggers did not even have to worry about charging them or turning off the sensors.

In addition, the sensors are waterproof and shockproof, so normal synthetic sling care ensures that the sensors will be in good working order the next time the slings are needed.

From start to finish, the lift was smooth, within sling capacity, and easily monitored by Slingmax Smart Slings. ■



100-year-old bridge.

Photo by Jodi Christman.



The 500' range lets supervisors monitor and roam.

