Kishwaukee River Bridge Repair for Greater Load Capacity

Case Study

The Kishwaukee Bridge, situated in Winnebago County, IL, is a post-tensioned precast segmental concrete box-girder bridge that first opened in 1980. In 2008, it underwent a successful strengthening process, employing DYWIDAG external multi-strand tendons within the box girders. This enhancement effectively extended the bridge's lifespan, while the diligent DYWIDAG team ensured the project was completed within a tight timeline.

PRODUCTS
External Multi-strand tendon addition

Location
USA - Winnebago County, IL

SCOPE
Supply
Installation
Technical Support
Post-Tensioning

OWNER
Illinois Department of Transportation

GENERAL CONTRACTOR
Kraemer North America

Context

During the late 1970s, the original construction team responsible for the Kishwaukee Bridge consisted of Edward Kraemer and Sons (EKS). They subcontracted with DYWIDAG Systems International (DSI) to serve as the Post Tensioning designer and supplier. At that time, DWIDAG redesigned the bridge's post-tensioning system using DYWIDAG THREADBAR® post-tensioning systems.
In the early 2000s, the Illinois Department of Transportation (IDOT), the bridge's owner, made the decision to implement a strengthening program to prolong the bridge's service life. The bridge required an increase in load capacity due to higher traffic volume and weight surpassing its original design.

In 2007, IDOT awarded the contract for the strengthening project through a competitive bidding process to the same team that worked on the bridge 28 years earlier: EKS, who once again subcontracted with DYWIDAG to supply and install the post-tensioning system.

Repairing the Kishwaukee River Bridge posed significant challenges due to the need to keep it open for through traffic. This created a unique set of conditions for the project, considering the nature of the work involved.

Solution

The strengthening design involved incorporating twenty-four 12-0.6"external post-tensioning tendons in each bridge. These tendons varied in length and were intended to strengthen the segmental box girder. To carry out this strengthening, the structural engineer chose to use external multi-strand tendons placed inside the box.

DYWIDAG was responsible for supplying the tendons and ensued their proper installation. In addition to the tendons, DYWIDAG post-tensioned 36 new deviators to ensure secure anchoring to the existing boxes.

Despite the challenging circumstances, the entire project was completed within a very short timeframe. Minimizing bridge closures was a top priority for the owner, especially considering that I-39 serves as a major commerce route servicing the Midwest.