



# **Vacuum Grouting Successfully Introduced as a New Standard**

## Case Study

During a routine inspection of the Mid Bay bridge in August of 2000, two external tendons were found with severe signs of distress. The corrosion had completely deteriorated the tendon section, causing the tendon failures. The Florida Department of Transportation called for an emergency plan to repair the structure.

## PRODUCTS

Grouting of PT Systems  
Multistrand tendons replacement

## LOCATION

USA

## TIMELINE

01-2001 - 05-2001

## SCOPE

Supply  
Rental of Equipment  
Technical support  
Vacuum grouting

## OWNER

Mid Bay Bridge Authority, Okaloosa Co., Florida, USA

## GENERAL CONTRACTOR

Granite Construction Co., Panama City, Florida, USA

# Context

The Mid Bay Bridge is a precast segmental bridge with a total length of 5,872 m and is composed of 140 spans of 41.5 m each plus a main span of 68.6 m. The bridge is about nine years old.

Granite Construction Co., the general contractor on the project, hired DYWIDAG for materials, equipment and technical advice for the de-tensioning and replacement of 11 external tendons. This work was completed from October to December 2000.

# Solution

The inspection performed by the Florida Department of Transportation found voids behind the bearing plates in a significant percentage of the external tendons of the bridge. Initially, the contractor plan was to regROUT the voids by using a tremie tube method. DYWIDAG, however, proposed the use of vacuum grouting for this repair. Mock-ups were built to demonstrate the adequacy of this method (see photos).

The mock-ups consisted of tendons partially grouted in order to artificially reproduce the actual field conditions. A darker grout was used for the first grouting phase, while a lighter colour was used for the vacuum grouting phase in order to visually inspect the performance of the grouting after the dissection of the mockup.

The results of the mock-up testing proved the higher quality of the vacuum grouting and this was the method selected for the grouting of the voids. More than 700 voids were vacuum grouted between January to May of 2001.

The problems experienced by the Mid Bay Bridge originated a nationwide bridge inspection activity that confirmed that the grouting practice in the USA until then (conventional grouting materials, conventional grout pump/mixers and non-qualified labor) had contributed to the problems of voids in post-tensioning tendons. The vacuum grouting method has now been adopted by many states as the solution for these problems.

DYWIDAG is now considered the actual leader in the vacuum grouting technique in the USA. Since the completion of the Mid Bay Bridge, we have vacuum grouted voids in post-tensioning tendons at the BQE Bridge (precast segmental bridge) in New York, at the Sydney Lanier Bridge (cable stayed bridge) in Georgia, at the Charles River Crossing Bridge in Massachusetts, at the C & D Canal Bridge in Delaware (cable stayed bridge) and are currently working at the Cochran Bridge in Alabama (cable stayed bridge).

