

3 EXECUTIVE SUMMARY

The 38-span dual bridges supporting I-495 over the Christina River in Wilmington, DE were closed to traffic on June 2, 2014 due to serious substructure settlement and lateral displacement of the existing pile foundations of four piers that resulted in gross deformation of the superstructure and insufficient load carrying capacity for live load. The bridge closure affected over 90,000 daily motorists and impacted the flow of goods to and from the nearby Port of Wilmington.

The project team, composed of Delaware Department of Transportation, Federal Highway Administration, AECOM and J.D. Eckman, began the design and construction of intermediate and permanent repairs within hours of the bridge closure. New drilled shaft foundations were installed at Piers 11, 12, 13 and 14. Although tilted, Piers 11 and 14 were deemed repairable and, as such, underpinning was designed to support the existing hammerhead pier columns.

Evaluation of Piers 12 and 13 indicated that they must be replaced in their entirety. Concrete grade beams, supported by the new drilled shafts, were constructed at both piers. The grade beams served the dual purpose of providing support for the temporary shoring towers and the future replacement piers.

Once the new foundations and grade beams were installed, the dual bridges were independently jacked to restore the proper superstructure geometry. As a result of around the clock design and construction efforts, traffic was restored to the southbound structure in 59 days and full traffic service was returned in 83 days, more than a month ahead of the projected schedule.