

Pensacola Bay Bridge

Challenge:

The U.S. 98 [Pensacola Bay Bridge](#) constructed in 1960 reached the end of its service life and underwent a replacement process starting in 2017. The previous bridge served approximately 55,000 daily traffic counts as an important east-west transportation corridor, and as a primary hurricane evacuation route; it was due to be widened to accommodate increasing traffic. The replacement bridge expanded from two to three lanes in each direction, providing an operationally safe transportation corridor for the traveling public.

The Florida Department of Transportation (FDOT) conducted a cost analysis and concluded that replacing the bridge was more cost-effective than attempting rehabilitation. [Eisman & Russo, Inc.](#) was awarded the construction management CEI services contract for the Design-Build project which involved constructing two, independent, three-mile-long bridge structures. The new structures have a 10' inside and outside shoulder and a 10' wide multi-use path for pedestrians and bicyclists. Eisman & Russo selected GRL Engineers, Inc. as the specialty deep foundations consultants for pile Verification Testing (VT) and related services. Bridge construction began in March 2017 and is near completion as of July 2023.

Method and Results:

The bridge replacement included 2,124 prestressed concrete piles which were 30-inch and 36-inch square, some of which were over 200 feet long in one piece. The work included piles static load testing, [PDA tested](#) Test Piles, and 100% PDA testing of production piles by the project Dynamic Testing Engineer (DTE) member of the design/build team. GRL performed occasional PDA Verification Testing (VT) and related [CAPWAP data analyses](#) on selected piles as a member of the Eisman & Russo project CEI team representing the FDOT. Examples of analyses results can be viewed in Figures 1 and 2.

In September of 2019, one of the new bridge structures was complete with both EB and WB traffic switch to it, with the demolition of the original bridge underway and the second new structure partially under construction. Hurricane Sally interrupted construction and caused damage to the structures resulting in closing the bridge to traffic. Many piles were damaged. [Low strain integrity testing](#) was performed on many piles for assessments in-place under the existing bridges. In cases where piles were found to have damage, 6 pile footings were utilized rather than the original 4 pile footings. In total, an additional 98 piles were utilized for the restoration work in the aftermath of the hurricane with a project delay of more than nine months.

The construction cost of the bridge was approximately \$444- million, making it the largest transportation infrastructure improvement project in Northwest Florida history. With the expanded lanes, the average daily traffic is estimated 60,000+ vehicles.

Project Details

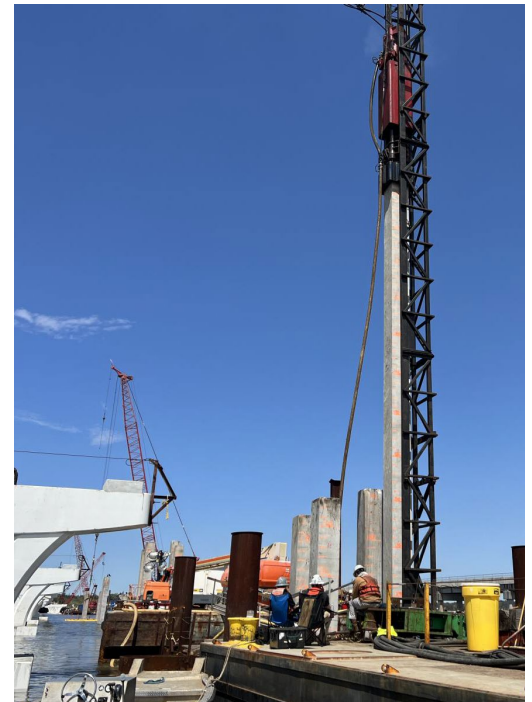
Client: Eisman & Russo, Inc. / FDOT

Location: Pensacola Bay, Florida

GRL Office: Florida

GRL Services

- Pile Driving Analyzer® Pile Testing
- CAPWAP® Data Analyses
- Low Strain Integrity Testing



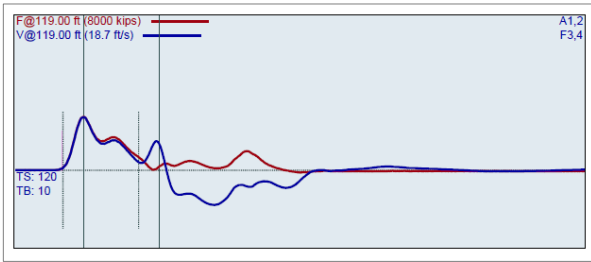


Figure 1: Typical end of driving PDA test record.

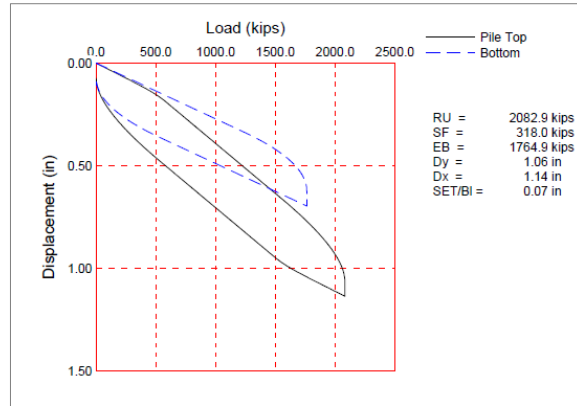


Figure 2: Typical CAPWAP® generated pile top and bottom static load versus displacement plots.

To learn more about GRL Engineers, visit www.grlengineers.com or email us at info@grlengineers.com.