

Challenge:

The \$77-million expansion projects underway at Ports of Indiana-Burns Harbor in 2024 included the construction of a highway bridge leading into the port, three new ship berths, a new bulk warehouse, two new railyards, industrial site development, and comprehensive dock and rail rehabilitation. GRL Engineers provided pile dynamic load testing services during construction of the new ship berths: Berth 16/17 and Berth 5. The berths were supported on three different pile types and were to be oriented both vertically and at a 12H:4V batter. The pile sizes and required capacities for each location is detailed in the following table:

| Location | Pile Type | Ultimate Tension and Compression Capacities |
|-------------------------|--------------------------|---|
| Berth 16 and 17 | HP 14x73 | 300 kips |
| Berth 5 Mooring Pier | 16 x 0.5" Open-End Pipe | 550 kips |
| Berth 5 Mooring Dolphin | 36 x 0.75" Open-End Pipe | 700 kips |

Method and Results:

The project specifications required dynamic load test to be performed at each location during initial driving and restrike. Before pile installation began, GRL performed [GRLWEAP Wave Equation analysis](#) for the project. The purpose of the wave equation analysis was to determine the suitability for the selected driving system to install the piles to the required capacities within generally accepted limits for driving stresses and blow count. During pile installation, GRL performed [Pile Driving Analyzer \(PDA\) tests](#) and [CAPWAP analyses](#) were conducted to monitor pile installation and assess the nominal driving resistance during initial driving and restrike. The waiting times for restrikes varied, with as short of restrike interval necessary in order to achieve the tension capacities. Based on PDA testing and CAPWAP analysis, GRL confirmed the required compression and tension capacities and issued the driving criteria for the production piles.

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

Project Details

Client: ICC Group, Inc.

Location: Ports of Indiana-Burns Harbor, Portage, Indiana

GRL Office: Illinois

GRL Services

- GRLWEAP Analysis
- CAPWAP® Analysis
- Pile Driving Monitoring (PDA)

