Rotator/Oscillator

Huey P. Long Bridge
New Orleans, LA

MALCOLM
Deep Foundations

CONSTRUCTION PERIOD
March to October 2009

CLIENT
Owner: Louisiana
Department of Transportation
General Contractor: JV Kiewit Massman
Traylor Constructors

SERVICES
Drilled Shafts
10 EA 9.2 ft Dia Drilled Shafts
1 EA 9.2 ft Dia Drilled Shaft with 18,000 kips
Osterberg Load Test

Project Overview

The historic Huey P. Long Bridge is a through truss which will be widened with an additional truss on either side of the existing structure. The foundations at the Huey P. Long Bridge in New Orleans presented special challenges for construction due to the requirements for very deep drilled shafts in the Mississippi River beneath the existing bridge structure. Drilled shafts were constructed to depth of approximately 200ft in alluvial soils using a rotator system with full-length segmental casing, and base grouted to improve axial resistance.

Benefits of Rotator Oscillator System

Vibration-free installation of temporary or permanent casing

Enables shaft construction in very loose or unstable soil to depths exceeding 200 ft

Fully-cased construction enhances shaft quality and reduces risk on non-conformities

CONTACT MALCOLM
This job was managed by
our Northern California Division
located in Hayward, California.
For a complete list of office
locations and technologies,
visit **Malcolmdrilling.com**

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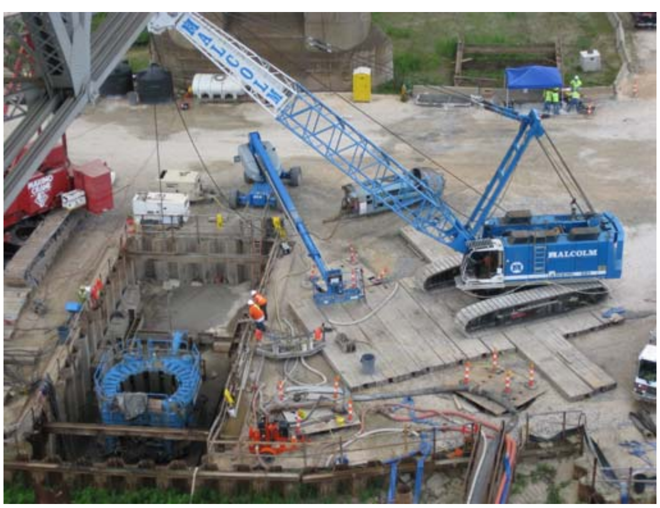
Construction Details

The Pier IVA foundation was constructed in the river in a restricted headroom environment beneath the existing bridge, on ten 9.2 ft diameter drilled shafts. All shafts were constructed using full length temporary segmental casing installed with a Leffer rotator to provide stability for the loose soils during the lengthy process of splicing and placement of reinforcement and concrete. This method was accepted as a value-engineered alternative approach to the original construction concept of open-hole drilling with mineral slurry support. Full casing support eliminated the risk of a borehole collapse and potential contamination of the sidewall thereby avoiding any adverse effects on side resistance. The drilling depth, the loose granular nature of the soils, buried willow mats and other obstructions presented a significant concern with the plan to use the rotator system. The concern was that casing could become stuck due to excessive friction build up during the time required to set the reinforcement and complete the splices necessitated by the restricted headroom. No such problems occurred during construction, as our experienced operators were careful to proceed at a slow and steady pace while maintaining a required soil plug and the fluid level inside the casing in excess of the groundwater head.



The reinforcement cage had several significant construction challenges. Because of both the base-grouting and rotator casing method, the cage was designed to be self standing. In addition, the cage had to be assembled and placed with as many as four splices during installation. The frame also included the tubes and a thin steel cover plate for the sleeve-port grouting system at the base of each shaft.

Ground Conditions

Shallow soils are very soft clays and silts, and were underlain at a depth of about 40ft by an old willow mat that had been placed as an erosion protection measure during the original bridge construction. Beneath the surficial soils to below the tip of the drilled shafts at elevation -195ft are loose to dense alluvial sand with occasional layers of soft clay.

Quality Control

The shaft integrity was tested using CSL testing. Visual inspection by the Mini SID camera ensured the clean and level shaft base. Base grouting using the steel CSL access tubes was performed to enhance shaft performance. The concrete mix had the characteristics of self-consolidating concrete with 35% of the Portland cement replaced by granulated blast furnace slag.