Rotator/Oscillator

Tilikum Crossing
Bridge of the People
Portland, OR

MALCOLM
Deep Foundations

CONSTRUCTION PERIOD

November 2011 to July 2013

CLIENT

Owner: TriMet
General Contractor: Kiewit Infrastructure Inc.

SERVICES

Drilled Shafts:
8 Ea. 8 Ft. Dia. Up to 120 Ft. in Depth

16 Ea. 10 Ft. Dia. with Permanent Casing
up to 165 Ft. in Depth

BENEFITS OF ROTATOR/OSCILLATOR SYSTEM

- **Vibration-free installation of temporary or permanent casing**
- **Enables shaft construction in very loose and unstable soil to great depths**
- **Fully cased construction enhances shaft quality and reduces risk of nonconformities**

CONTACT MALCOLM

This job was managed by our Northwest Division in Seattle, Washington

For a complete list of office locations and technologies visit **malcolmdrilling.com**

Project Overview

Tilikum Crossing adds capacity to the transportation system, with better access to important destinations such as Portland State University, Oregon Health & Science University, the Central Eastside, and the Oregon Museum of Science and Industry, while reducing traffic on other bridges.

Bus lines 9-Powell Blvd and 17-Holgate/Broadway use the new bridge, reducing their travel times and improving efficiency. Cyclists and pedestrians can access existing and planned greenways and bike routes on both sides of the river.

The bridge has two main towers, and the foundation system comprises a cluster of 10-foot diameter shafts connected into a pile cap. These towers handle the loads of the cable stay bridge.

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Construction Details

The bridge bents, numbering two on the east side and two on the west side of the river, are supported on two drilled shafts per bent. These shafts were constructed with standard oscillator methods excavated from grade to depths of 120 feet. The river had two tower foundations, which consist of eight drilled shafts per foundation 10 feet in diameter and up to 165 feet in depth. This work was performed from temporary platforms that the general contractor built to hold the oscillator and excavation crane while the rest of the equipment was provided by barge. There were two full-scale load tests performed, one on each tower to confirm shaft capacity and design criteria were met.

Ground Conditions

Subsurface soils were grouped into five general geologic units for the project: fill; Willamette River alluvium (soft clay silt with silty fine sand lenses); catastrophic flood deposits; reworked Troutdale (sand, sandy gravels with silt, and scattered cobbles) formation (sand, gravels, and cobbles); and Troutdale formation (cementitious sands, gravels, and cobbles). The unit nomenclature generally follows that established in the PE phase of the project. The characteristics of the units varied across the bridge alignment, and thus for presentation purposes further organized the project into the west bank, bridge towers, and east bank. High groundwater tables were found in all borings and during shaft drilling.

Quality Control

Two Osterberg Load Cell tests were performed to confirm installation techniques and design assumptions. The con crete mix design was developed with special emphasis on workability and retention of workability for the duration of the tremie concrete placement operation. The shaft integrity was tested using CSL test methods.

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