Rotator/Oscillator

I-15 Widening
500 North to I-215
EXPRESSLink
Salt Lake City, UT

MALCOLM
Deep Foundations

CONSTRUCTION PERIOD
February to June 2009
January to April 2010

CLIENT
Owner: Utah Department of Transportation
General Contractor: Kiewit/Clyde, JV

SERVICES
Drilled Shafts

31 EA 9 ft Dia up to 130 ft in depth
3 EA 6.5 ft Dia up to 97 ft in depth

Project Overview

EXPRESSLink will increase capacity to Interstate 15 by adding express lanes in each direction from 500 North to the north interchange in Davis County. Construction began in November 2008 and is expected to complete in Fall, 2010. Bridges at U.S. 89, Beck Street, 1000 North and 800 North will be replaced. The bridges at 800 North and 1000 North will be replaced by one bridge at 1000 North. UDOT is using a Design-Build Construction method that overlaps the two processes typically done in sequence. Design-Build saves money and cuts overall construction time nearly in half.

Benefits of Rotator Oscillator System

- Very loose and unstable soil can be stabilized to great depth.
- Vibration-free installation of temporary or permanent casing vital due to close nature of railroad tracks and proximity of underground utilities.
- Proven track record for better quality product (less shaft integrity problems).

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

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Construction Details

The Beck Street Bridge consisted of 24 each 9 ft diameter shafts with depths up to 135 feet. The project was unique in that the shafts were tip grouted upon completion. The designers were able to account for less settlement in their design and were able to shorten the lengths of the shafts which gave the Joint Venture a competitive advantage at bid time. Drilled shafts were constructed using the Oscillator/Rotator method by placing casing in advance of the excavation to shaft tip, then extracting during concrete placement.

One of the bent lines of shafts had several utilities that were of concern. A Chevron line was within 4 foot 10 inches, a water line 3 foot 10 inches, and a high pressured hydrogen line within 2 foot 10 inches. Our crews exercised extreme caution to ensure that the utilities were not compromised and the low vibration of the oscillator method added another level of precaution thus eliminating damage to the utilities.

Ground Conditions

The formations which the shafts were installed varied between sandy silts to lean and silty clays both with low blow counts. There were various seams of sand that were of concern to the owner, however it is this type of formation which magnifies the full intrinsic value of the fully cased oscillator method. As a result of our experience with this method we had no concern over the hole caving and bottom heave due to sand lenses. Our shafts tipped into a very hard bearing stratum of sandy silty clay with density values of up to 95 blow per 5 inches.

Quality Control

To ensure the integrity of the shaft construction, each shaft was tested for sand content, water density, and sounded for a flat bottom. Additionally, Cross-hole Sonic Logging (CSL), was performed in order to verify the continuity of the concrete placement. One benefit of tip grouting gave us the opportunity to “proof” test each shaft by pre-loading the side friction after the shaft had been completed.

Look to the Blue at Malcolmdrilling.com