Techno Metal Post Pikes Peak Region Installs (24) Helical Piles for (3) Bridge Abutments in Sedalia, CO

August, 2018

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Project Name & Location:	Big Bear Bridge - Sedalia, CO
Project Date:	August 2018
Project Type:	Helical Pile Deep Foundations to Support (3) Concrete Bridge Abutments
Helical Pile Installation Contractor: **Engineering Company:** **General Contractor:**	Techno Metal Post Pikes Peak Region Big R Bridges with Input from JAC Engineering Ivy Custom Homes
Helical Piles Specifications:	P3 3.50" O.D. Leads with 10" and 8"-10"-12" Helix Plates; 30 KIP Capacity; 7018 Welding Rod, (2) 18" #5 Rebar x 1/2" Plate Caps Welded to Piles
Soils & Embedment Depth:	Sandy - Saturated Soil Just Below Surface; Average Pile Embedment 49 ft.
Project Timeline:	Helical Pile Installation - 4 Days
Helical Pile Manufacturer:	Techno Metal Post - Thetford Mines, QC Canada

Project Overview

The landowner wanted a bridge installed for crossing over a drainage area that infrequently/seasonally carries water and is classified as a 500 year flood corridor. To safeguard against a potential catastrophic flood event, the (3) concrete bridge abutments had to be supported and very well anchored. Additionally, private bridges like this one are very difficult if not impossible to insure. The bridge itself and the abutments were designed to be self supporting, but the owner wanted a "fail-safe" solution and he elected to have Techno Metal Post helical piles installed to provide additional protection.

Project Objectives:

To anchor the (3) concrete bridge abutments to the ground to further secure the bridge in case of a catastrophic flood. The bridge, being privately owned, was un-insurable and the owner wanted a "fail safe" attachment to the ground if floodwaters came. The bridge itself and the abutments were designed to be self supporting, but the owner elected to use Techno Metal Post helical piles to anchor and support the abutments.

Engineer's Specific Requirements:

There were (3) concrete bridge abutments, and the installer was instructed to install (8) piles per abutment – install them to maximum torque or 30+ KIPS. The bridge itself weighed 200,000 lbs and the cast-in-place concrete weighed approximately 400,000 lbs. Crews were instructed to weld a ½" horizontal rebar plate cap with (2) #5 rebars to the top of each pile. The form setters would then tie that to the double layer rebar mat of the abutment.

Specific Challenges:

The hot, dry weather necessitated the use of several fire safety precautions when grinding and welding work was being done. All piles and pile extensions had to be staged in each abutment excavation.

Advantages Over Other Methods:

Helical piles can be installed far faster than drilled piers, and the ground water on the site would have necessitated the drilled piers would have to be cased before concrete could be placed, which would have made them even more expensive. Also, more than likely a drill rig would not have been able to access the excavation area and may have gotten stuck in the soft sandy soil.

Specific Details of the Structure on Piles:

The bridge abutments were constructed immediately after the (24) helical piles were installed. The concrete was allowed to cure for (28) days, and then the steel girder bridge superstructure was delivered and installed.

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