



RAM JACK[®]

2014 CASE STUDY

Type: Commercial | Issue: TX201401

HIGH DYNAMIC LATERAL LOAD? NO PROBLEM

Ram Jack's Helical Piles
With Rigid Threaded Connection
and Battered Installation
Provide Solutions

RAM JACK LOCATION:

Ram Jack Texas

www.ramjacksystems.com | 800-969-2255

Garland, TX

BAKER HUGHES | DEEP FOUNDATION SYSTEM SOLUTION

Houston, Texas

CASE STUDY 2014

PROBLEM

Baker Hughes contracted Carlos Gutierrez, P.E., with CSF Engineering to design a foundation for a “roll machine.” The roll machine, used to test oil field equipment, is the first of its kind in North America. The only other one in the world is in Saudi Arabia. Having the machine foundation placed in a fat clay soil and the dynamic loads of the machine generating up to 500 kips of lateral force caused concern about vibrations in the foundation. Due to the calibration requirements of the machine, any vibrations of the machine’s foundation would prove detrimental to its precision.

PROPOSED SOLUTION

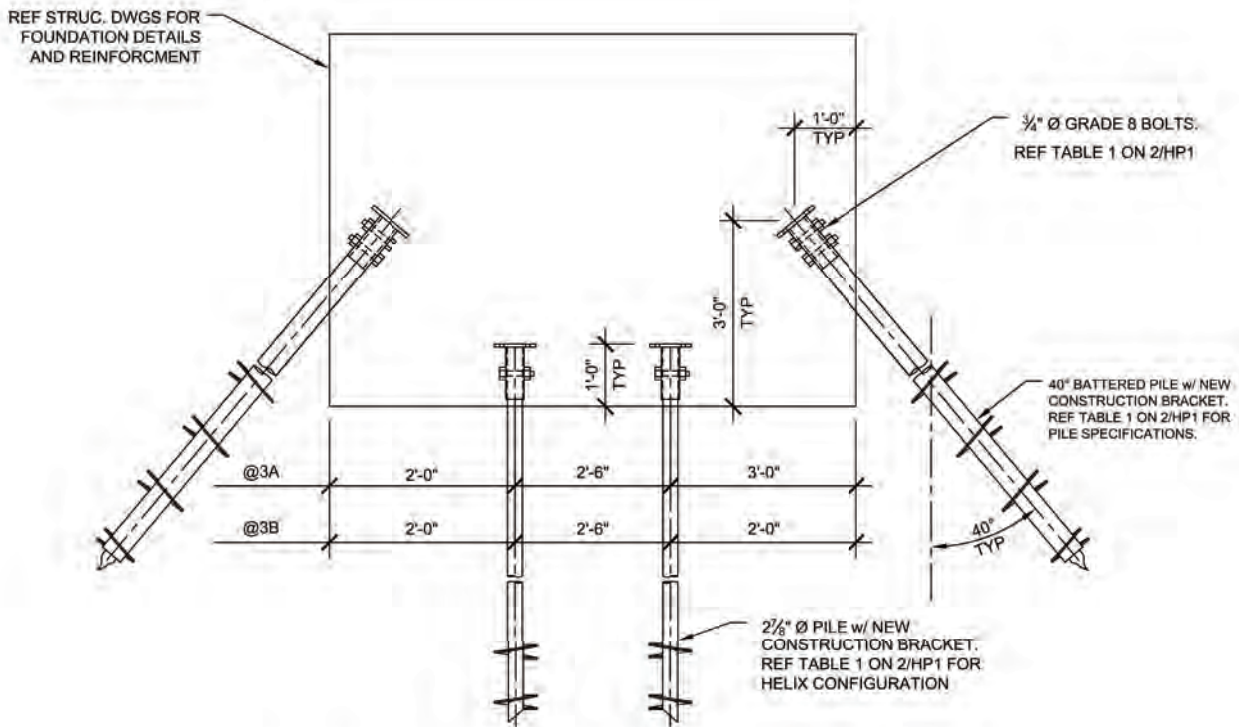
One of the top priorities of an engineer is to provide the most economical design to their client that will meet their needs and specifications. Mr. Gutierrez performed an extensive finite element analysis based on the machine manufacturer’s load specifications. From this analysis, he was able to determine the exact load requirements of the foundation in compression, tension, and shear. Mr. Gutierrez contacted Ram Jack’s engineering department to design a deep foundation system using helical piles to isolate the foundation from the fat clay soil the foundation was going to be placed in. With the accurate load information and soils report in-hand, Ram Jack began working on a deep foundation solution.



OUTCOME

Due to the size of the machine, the foundation was to be 64 ft. long by 8 ft. 6 in. wide by 6 ft. deep. With the high dynamic lateral loads, fifty (50) 3 ½ in. diameter helical piles were installed at a 35 degree batter. These piles had a triple 8”/10”/10” helix configuration and were installed with 12,700 ft-lbs of torque to an average depth of 30 ft. The vertical loads (compression and uplift) were resisted with twenty-five (25) 2 ¾ in. diameter helical piles which also had a triple 8”/10”/10” helix configuration and were installed with 5,200 ft-lbs of torque to an average depth of 15 ft.

When the roll machine began operations, the machine manufacturer’s engineers were on-site to measure the vibration levels in the foundation. The engineers were somewhat surprised when no measurable vibration could be detected. They stated that they had never witnessed a machine foundation that was so structurally sound which consisted of so little concrete. Many engineers see the slender shafts of helical piles and believe they have little lateral capacity. However, with Ram Jack’s rigid threaded connections and ability to install helical piles at virtually any angle, simple trigonometry can be utilized to maximize the lateral capacity of helical piles.



3A, 3B TYPICAL HELICAL PILE SECTION

NTS



RAMJACK®

- Engineered Foundation Solutions
- Products Manufactured in the USA
- 50+ Locations Nationwide



Recognized as
Code Compliant
to Meet International
Building Codes



HELICAL PILE DESIGN SOFTWARE: FOUNDATION SOLUTIONS™

Create Profiles

- Simulate soil profiles, including peat
- Anchors with varying diameter and helix configurations
- Vertical/battered/tie-back pile design
- Custom pile design

Mobile-friendly

- Web-based software
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