



2015 CASE STUDY

Type: Commercial | Issue: NV201501

150 Ram Jack
Helical Piles
Integral Part
of Foundation
Design for
12,000 ft.²
Expansion
Project



RAM JACK LOCATION:

VersaGrade, Inc.
www.versagrade.com | 775-284-1964
Sparks, NV

STEP 2 | NEW CONSTRUCTION

Reno, Nevada

CASE STUDY 2015

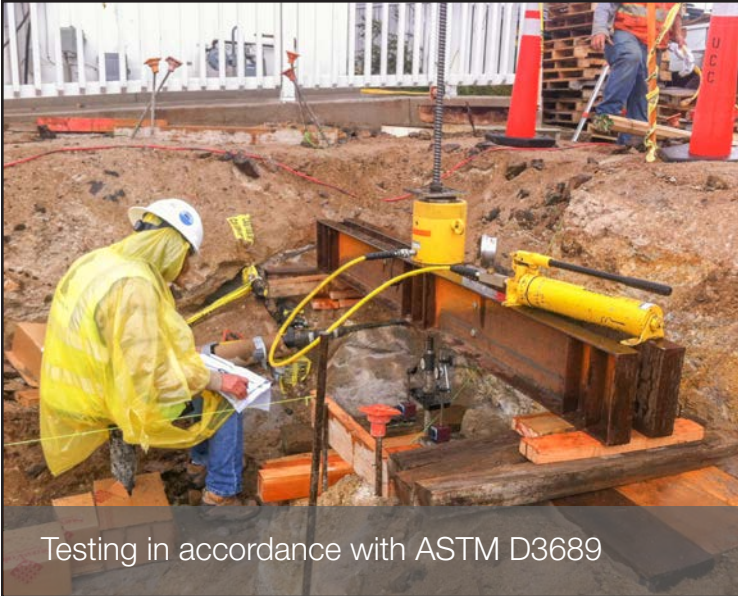
STEP 2 is a private non-profit organization that has been serving Northern Nevada since 1986. Its mission is to provide comprehensive, coordinated services related to the treatment and recovery of chemically dependent women and their families. The 12,000 ft.² expansion project adds a 20-bed residential housing component and storage facility to the already existing Mathewson Family Counseling Center and Transitional Cottages. The design vision of the project is to accommodate the everyday living needs of women and children in distress.

SITUATION

The project site is located north of Reno, Nevada on the foothills of Peavine Mountain. The area is predominately made up of Alta Formation soils components that contain hard rock volcanic flows (Andesite & Laharic Breccia), highly expansive clay minerals (PI's of 80+), and corrosive soil properties. The soils investigation confirmed the project site would not be conducive for conventional foundation construction. A deep foundation system was decided to be the best course of action; however, due to the soil properties and its inconsistent nature, no one foundation system type could be utilized. VersaGrade, Inc. was contacted early in the design process to help determine the best and most economical approach for this problem site.

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Testing in accordance with ASTM D3689

PROPOSED SOLUTION

Two adjacent project sites comprised the project: One site was “The Living Center” and the other was “The Storage Facility.” Both building foundations were similarly designed as pile and grade beam systems. Since the soils were highly expansive, the entire foundation system was designed with a 6-in. void space under it to allow the clay soils to expand and contract without contacting the foundation system. Sure Void (6 in. thick x 10 in. wide) was installed along the bottom of grade beam trenches to provide the separation between soil and grade beam. Lateral stability which is normally achieved by the skin friction of the buildings weight on the underlying soils, was alternately achieved by the use of battered piles installed at load points throughout the buildings footprint.

It was determined that a mix of deep foundation types that included Ram Jack Helical Piles and

Contech Systems Injection Bore (IBO) Micro Piles would be necessary to overcome these problem soils.

VersaGrade, Inc. was awarded the subcontract to install Ram Jack Helical Piles or Contech Micro Piles on two adjacent project sites. The Living Center foundation plan consisted of 95 vertical piles and 22 battered piles with working loads of 34 kips and 10 kips respectively.

OUTCOME

Installation depths varied wildly with helical piles ranging from 10 ft. – 60 ft. to achieve adequate torque values. Where helical piles could not be installed due to solid and fractured rock obstructions, Injection Bore Micro Piles were installed to a depth of 20 ft. with a 4 ft. unbonded length. The Storage Facility foundation plan consisted of 62 vertical piles and 14 battered piles. The grade beam design on both buildings was only 10 in. wide, which made layout and installation techniques critical. Pile migration during installation of 1.5 in. was unacceptable.

Arbitrary piles were selected for testing in general accordance with ASTM D3689 to the design load. All tests performed splendidly with the maximum deflection at 34,000 lbs. being +0.137 in. and 90% rebound (+0.013 in.).

VersaGrade, Inc. used a Komatsu PC-160 Track-mounted hydraulic excavator with a Pro-Dig two stage 12K drive motor for the Helical installations and an Excavator Mount TEI 350 Rock Drill and ChemGrout CG600 Batching Plant for the Micro Pile installations.

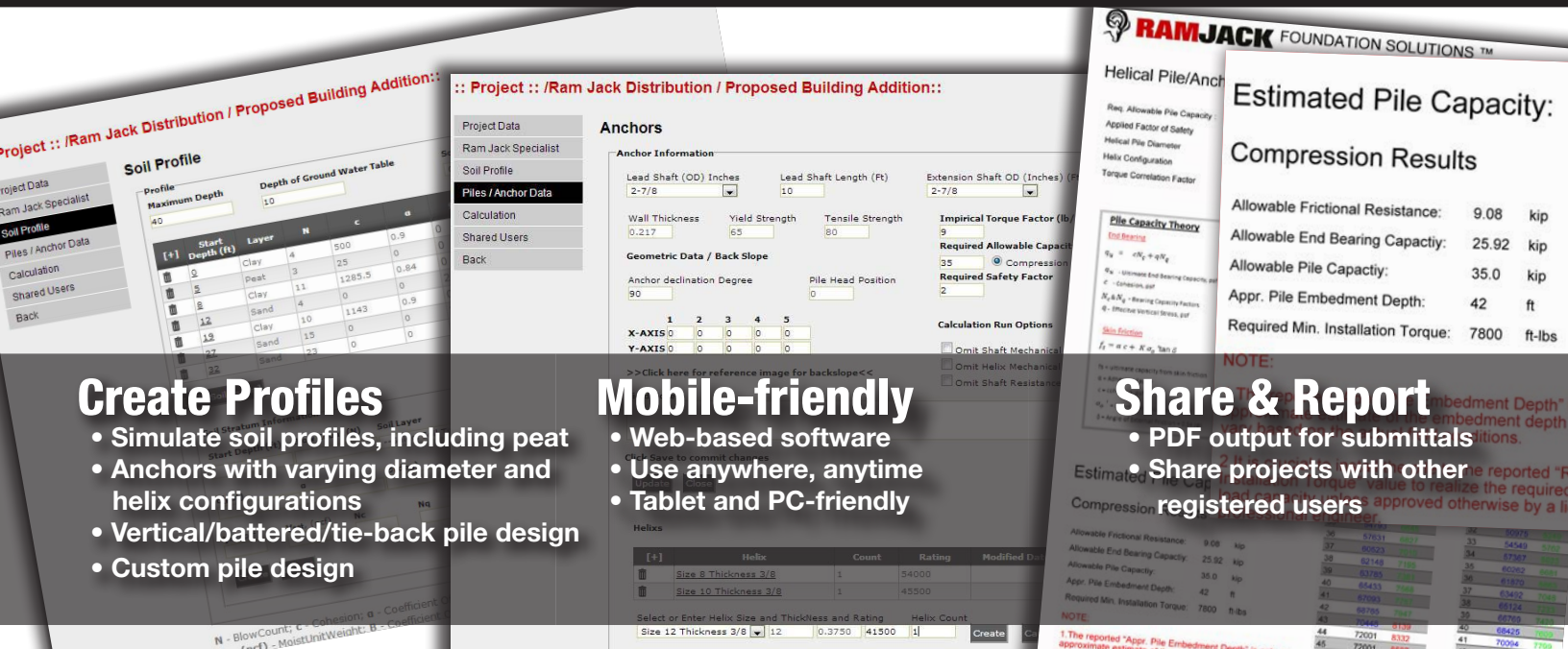
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HELICAL PILE DESIGN SOFTWARE: FOUNDATION SOLUTIONS™



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