

## Model 288 Helical Piles

**Project:** Cardinal Stadium Expansion

**Location:** Louisville, KY

### Challenge:

Cardinal Stadium is an open-air football stadium which is home to the University of Louisville Cardinals. A \$63 million expansion project was approved for the north end of the stadium which included the addition of 10,000 seats, bringing the total seating capacity to 65,000. Improvements would also be made to the Howard Schnellenberger Football Complex. The project was required to be completed in time for the September 2018 season home opener.

Although drilled piers were planned for the new stadium seat foundations, another foundation solution was needed at four locations where access was restricted for the drilled pier equipment. Access was limited at these areas by underground utilities and close proximity to existing foundations.

The test borings indicated a general subsurface profile consisting of 5 to 7 feet of clay fill underlain by stiff to very stiff clay to a depth of 15 feet where a medium dense sand was observed to a depth of 30 feet. Layers of medium dense sand and stiff clay were encountered below 30 feet to the top of bedrock at 60 feet.

### Solution:

Helical piles were considered the ideal deep foundation option given the soil conditions, required pile capacities, and the need for smaller installation equipment. Helical piles could also be installed within these select areas around existing underground utilities. The helical pile design consisted of the Model 288 (2.875-inch OD by 0.276-inch wall) hollow round shaft with 8"-10"-12" triple-helix lead sections to support the design working compression load of 35 kips. Ten piles were installed to depths of 17 to 24 feet to bear within the medium dense sand and to meet or exceed the target installation torque of 7,800 ft-lb. Torque-correlated ultimate capacities were at least twice the design working load ( $FOS \geq 2$ ). The piles were fitted with new construction brackets to be cast into concrete pile caps. The pile leads, extensions and brackets were hot-dip galvanized for corrosion protection. The ten helical piles were installed in one day and the crew and equipment were off site prior to a mandatory stop work time of 4 pm to allow the football team to practice in private and without distractions.

## Project Summary

<b>Architect:</b>	Rosser International
<b>Structural Engineer:</b>	AEdifica Case Engineering
<b>Geotechnical Engineer:</b>	GEM Engineering
<b>General Contractor:</b>	F.A. Wilhelm Construction
<b>Pier Installer:</b>	Foundation Supportworks® by Woods
<b>Products Installed:</b>	(10) Supportworks® Model 288 Helical Piles, Installed Depths of 17 to 24 feet; Design Working Compression Load of 35 kips



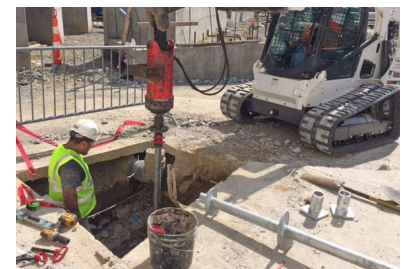
Cardinal Stadium with construction at north end



Installation of Model 288 piers near existing foundations



Installing around existing utilities



Skid steer used for installation



New construction brackets in place