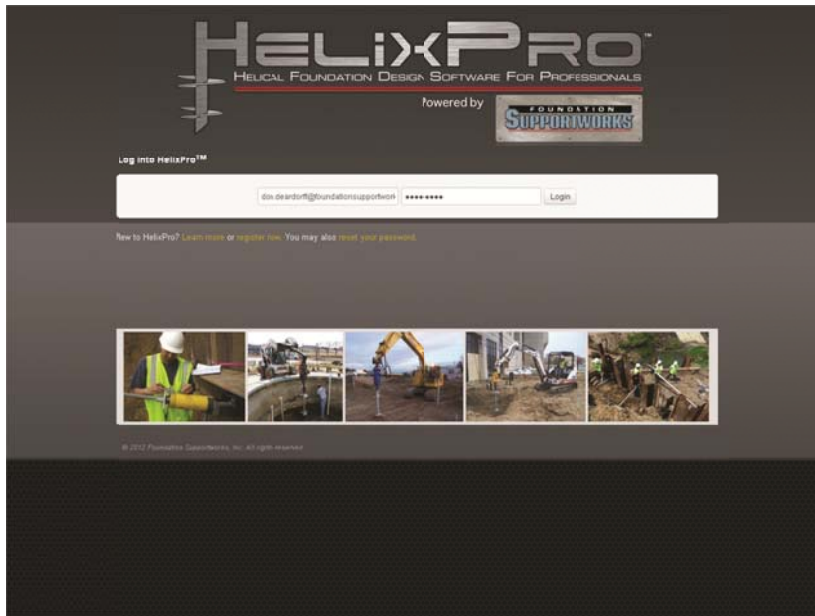


HelixPro™ Design Software Available Now from Foundation Supportworks®

HelixPro™ - “Helical Foundation Design Software for Professionals” was released in September of 2012 after nearly a year of design, development and programming efforts. Foundation Supportworks (FSI) engineers routinely travel throughout the United States and Canada to promote the use of [helical foundation systems](#) through engineering seminars and presentations. We heard loud and clear when you asked for an accurate, easy to use design tool for helical foundations.



What is HelixPro™?

HelixPro™ is a state-of-the-art, web-based software created by FSI. With the software being web-based, you never have to worry about having the current version. Updates are automatic. The program calculates bearing and uplift capacities of helical piles as well as tension capacities of helical tiebacks. HelixPro™ calculates pile and tieback capacities using the Individual Bearing Method. The program is ideal for analyzing both vertical and battered piles for deep foundations of new structures, seismic retrofitting applications, tension/uplift elements of guyed structures, tiedowns, and much more.

Why use HelixPro™?

HelixPro™ allows you to perform multiple trials with varying soil profiles and helix configurations, making it easy to select the most economical and practical solution for your project. HelixPro™ provides a step-by-step “wizard” approach, making it easy to use and navigate. There are help menus and buttons along the way to further assist the user through the design process. The second half of this article provides a design example to illustrate the software’s layout and functionality. The example utilizes real soil and project information for a guyed tower project completed in St. Louis, Missouri. The tower supports were retrofitted with helical piles and anchors to provide additional support and stability. The example is for the design of the southwest guy support where two Model 150 square shaft helical anchors were installed at a 40 degree batter.

Some of the many other features of the software include:

- Links to case studies, current and previous issues of FNDP, and technical content on the FSI website
- Ability to save and manage projects and sort these projects by date, application and project status
- Graphical representation of soil layers and helix plate depths

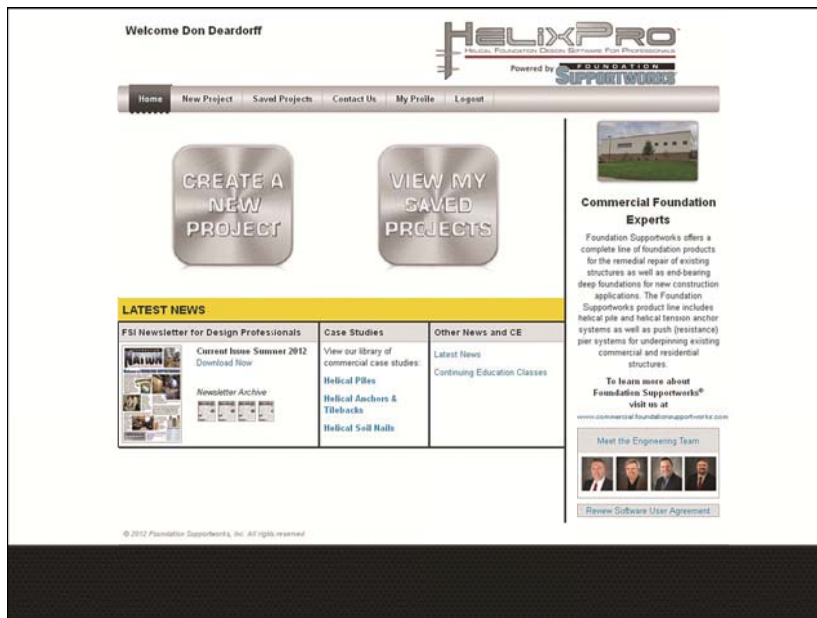
- Graphical representation of installation torque with depth along with boundary lines to represent the torsional rating of the shaft
- Pop-up warnings to alert the user when the torsional rating of the shaft is exceeded, when non-standard helix plate configurations are selected, when minimum depth or embedment criteria are violated, etc.
- Generation of a summary report with a graphical representation of the proposed installation
- **FREE** of charge to you

How can you get started using HelixPro™?

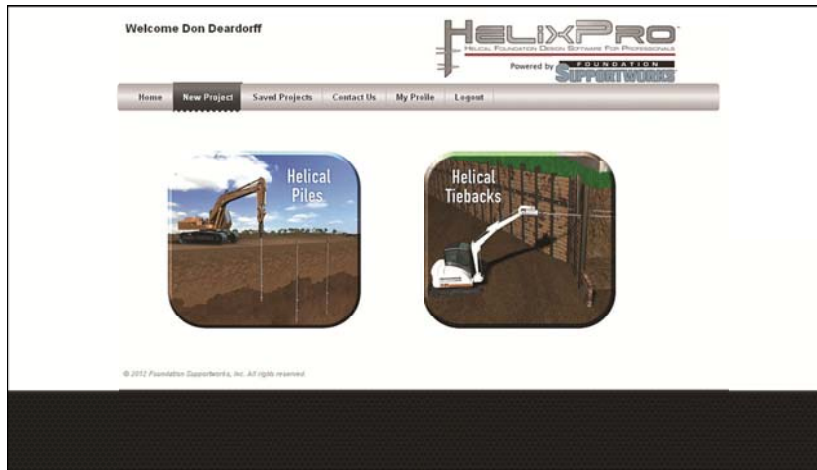
It's easy! Type the following URL into your web browser: helixpro.foundationssupportworks.com and click on the "Register Now" link. The software will walk you through some simple registration steps. Within two working days, you should receive an email stating that your account has been activated. FSI engineers utilize HelixPro™ every day to prepare preliminary designs for our contractor network. We are confident that you will also find HelixPro™ to be a valuable tool for your design of helical foundations.

A design example using HelixPro™

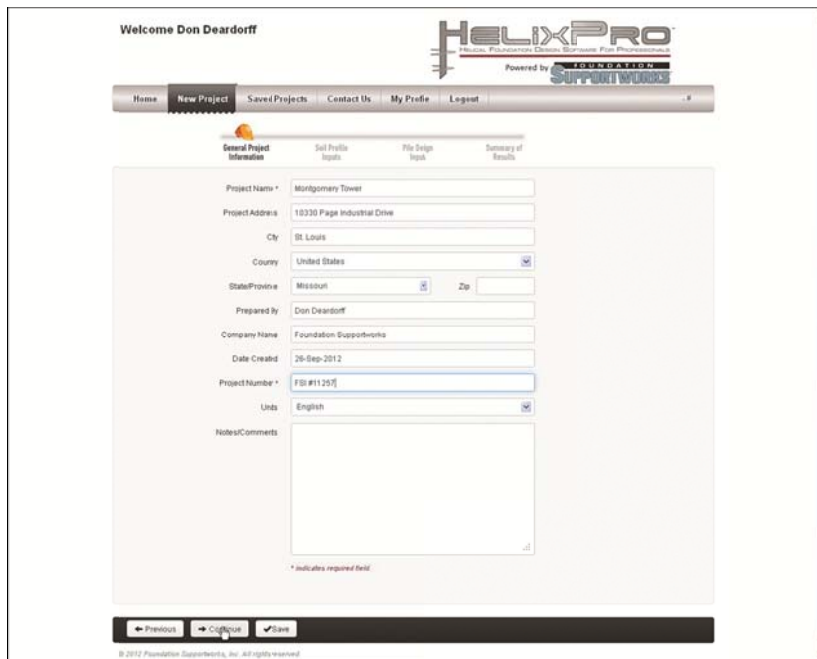
Following log-in, the program opens to the **Home** page where the user can create a new project or view saved projects. The top menu bar also allows access to **My Profile** where user information is input. User name and company name are automatically incorporated into the final report. The **Home** page also has links to FSI case studies, newsletters and other technical information. For this example the "Create A New Project" button is selected.



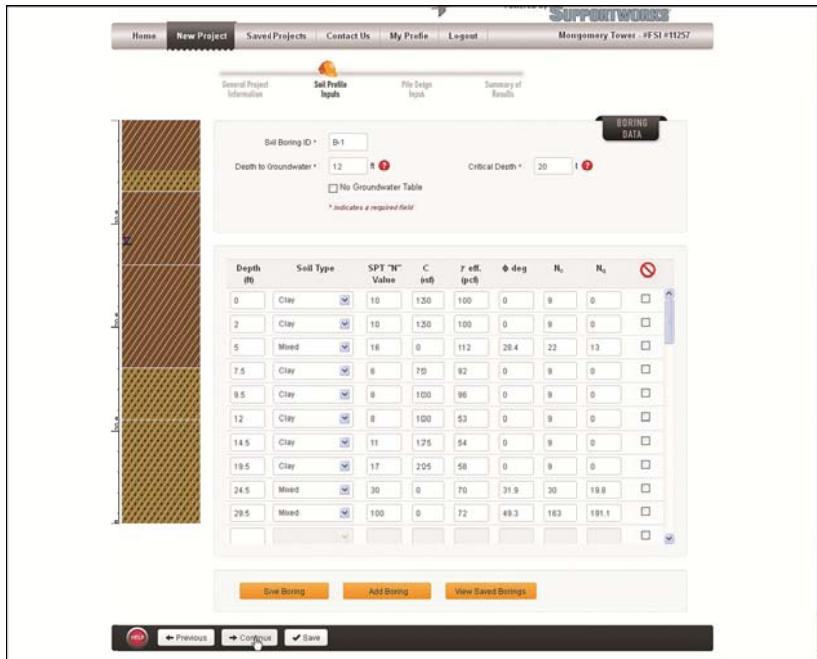
The **New Project** page allows the user to choose between the "Helical Piles" or "Helical Tiebacks" modules. The [helical piles](#) module is selected to determine capacities of vertical and battered piles in both tension and compression. The helical tiebacks module allows the user to create multiple wall configurations, define the active zone (failure plane) for each wall and determine capacities for multiple rows of tiebacks. The "Helical Piles" button is selected.



The **General Project Information** page allows the user to enter project information and select either English or Metric units. The project name and project number are required fields for this page. The buttons at the bottom allow the user to save the information on this page, go back to the previous page or continue to the next page. Information has been entered for the Montgomery Tower project located in St. Louis, MO. For more information on the project, [see the case study on our website](#). Select “Continue” to navigate to the next screen of data entry.

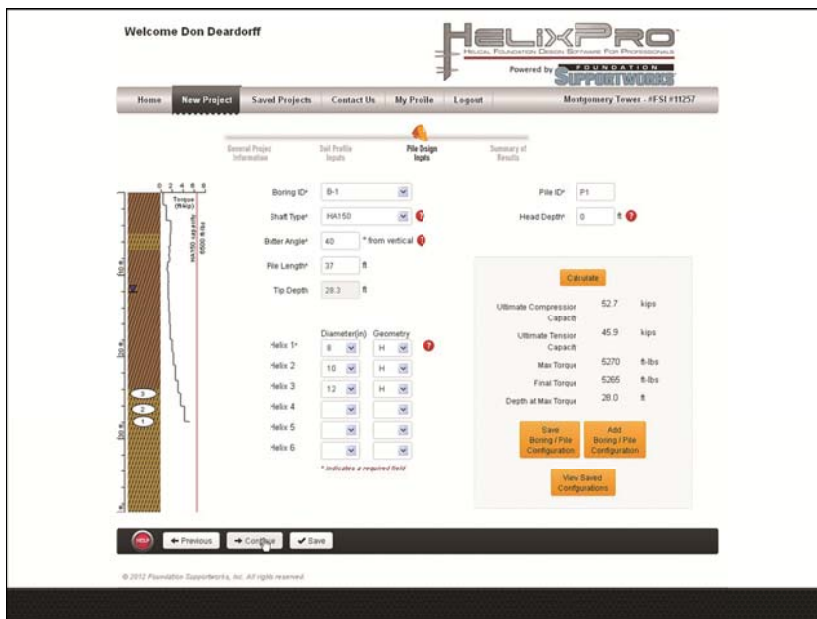


Required fields on the **Soil Profile Inputs** page include soil boring ID, depth to groundwater, critical depth and at least one soil layer. Seven soil types are available including sand, clay, mixed, organics, sand fill, clay fill and mixed fill. Soil strength parameter fields for clay, sand, clay fill and sand fill are populated automatically by correlation to SPT N-values; however, the user can manually override these values by entering new data. Selection of organic or mixed soils requires manual entry of the soil strength parameters. The soil profile is graphically displayed as the data is entered. Multiple borings can be entered and saved. The help menu is accessed by clicking on the question mark icons next to various entry fields. In this example, the user has entered and saved the information from Boring B-1 and is ready to continue to the next page.



The **Pile Design Inputs** page requires input for boring ID, pile ID, pile shaft type, helix plate configuration and geometry, pile length, batter angle and pile head depth. After required fields have been filled, pile capacity is determined by the program by clicking the “Calculate” button. The ultimate tension and compression capacity, maximum installation torque, final installation torque and depth to maximum installation torque are calculated and displayed. Installation torque versus depth is displayed graphically next to the soil profile. Multiple pile types can be entered and saved.

An ultimate tension capacity of 45.9 kips is determined for the HA150 (1.5-inch round corner square bar) with an 8”- 10”-12” helix plate configuration, a 40 degree batter, 37 feet of installed length and the soil conditions represented by Boring B-1.



Continuing to the **Summary of Results** page allows the user to select the boring/pile combinations to include in the final report, and also the order in which to present the results. Output reports are generated in PDF format for each boring/pile (pile module) or each boring/wall/tieback row (tieback module). The reports are formatted to include all of the input data, the calculated results and other design information needed for project submittals. A graphical representation of the soil profile, helical pile batter and depth, and installation torque with depth is created. For the tieback module, the graphical representation also includes the wall and failure plane geometry.

If you have any questions regarding the software, please feel free to contact FSI through the **Contact Us** page of the software.

Prepared By: Don Deardorff
Company Name: Foundation Supportworks

Project Name: Montgomery Tower **Date:** September 26, 2012
Project Number: FSI #11257

Application: Helical Piles **Ultimate Compression Capacity:** 52.7 kips
Boring ID/Pile ID: B-1/P1 **Ultimate Tension Capacity:** 45.9 kips
shaft Type: HA150 **Final Installation Torque:** 5,265 ft-lbs
Head Depth: 0 ft **Maximum Installation Torque:** 5,270 ft-lbs
Batter Angle: 40° **Depth at Max Torque:** 28.0 ft
Pile Length: 37 ft
Tip Depth: 28.3 ft

	Diameter (in)	Geometry	Depth (ft)
Helix 1	8	H	27.9
Helix 2	10	H	26.4
Helix 3	12	H	24.5

Groundwater Depth: 12 ft
Critical Depth: 20 ft

Depth	Soil Type	SPT 'N' Value	C (psf)	γ	eff. (pcf)	ϕ deg	Nc	Nq
0	Clay	10	1250	100	0	9	0	0
2	Clay	10	1250	100	0	9	0	0
5	Mixed	16	0	112	28.4	22	13	0
7.5	Clay	6	750	92	0	9	0	0
9.5	Clay	8	1000	96	0	9	0	0
12	Clay	8	1000	53	0	9	0	0
14.5	Clay	11	1375	54	0	9	0	0
19.5	Clay	17	2125	58	0	9	0	0
24.5	Mixed	30	0	70	31.9	30	19.8	0
29.5	Mixed	100	0	72	49.3	163	191.1	0

Refer to the latest version of the FSI Technical Manual for appropriate termination devices including threaded rod adapters, retrofit brackets and new construction brackets. The application and design of termination devices should be confirmed by the design professional of record.

FSI helical pile and tieback lead sections are manufactured in true lengths of 5, 7 and 10 feet. FSI helical extension sections have nominal lengths of 3, 5, 7 and 10 feet. These nominal lengths are the true measured lengths for HP287, HP288 and HP450 shafts, and are the net lengths (total length minus coupler overlap) for HA150 and HA175 shafts. The net lengths for HP287 and HP288 extension shafts are 6 inches less than the nominal lengths. Helical leads and extensions are available in other non-standard lengths upon request.

FSI helical piles feature helix plates manufactured with a helix shape conforming to the geometry criteria of ICC-ES AC308. A helix plate thickness of 3/8-inch is standard for plate diameters of 8 to 14 inches. A helix plate thickness of 1/2-inch is standard for a plate diameter of 16 inches. A plate steel yield strength of at least 36 ksi (A36) is standard for the HA150 shaft, while a plate steel yield strength of at least 50 ksi (Grade 50) is standard for HA175, HP287, HP288, HP346, HP350 and HP450 shafts.

FSI offers helical piles and tiebacks as either black (uncoated) steel or as hot-dip galvanized in accordance with ASTM A123. Hardware is provided as hot-dip galvanized (ASTM A153), mechanically-galvanized (ASTM B695) or zinc-plated (ASTM B633).

