

## **ICC - Acceptance Criteria for Helical Foundation Systems (AC358)**

By Darin Willis, P.E.

As many of you may know, Ram Jack has been working with the International Code Council's Evaluation Service (ICC-ES) as a member of the Ad Hoc Committee of Helical Foundation Manufacturers (CHFM) for the last two years to develop a comprehensive acceptance criterion for helical foundation systems. The acceptance criterion (AC358) was finally accepted at the ICC-ES hearing on June 5, 2007. The importance of this criterion is that there is now an industry standard for which all helical foundation systems must be measured. This standard was greatly needed as the demand for helical foundation systems are on the rise in residential, industrial and especially commercial applications. Engineers and inspection agencies now have a standard and guide to use in evaluating systems.

Ram Jack is currently using a 'legacy' evaluation report (PFC-5996) for engineers and building officials to use in evaluating our helical system per ICC requirements. Legacy reports were published and approved by ICC-ES based on old code agencies like IES and BOCA during its formation. Only a few helical manufacturers have legacy reports which are being phased out due to the inconsistencies in capacity and quality control measurements between manufacturers. Most of the legacy reports also didn't address connections to structures, soil interaction, buckling or corrosion.

The AC358 includes evaluating applications for new construction, remedial underpinning, slab support and tension anchors. The criterion provides capacity and testing requirements for all helical system elements both individually and as a system. These elements include brackets, shafts, helical blades and soil interaction. All of the components for each of these elements will be tested which include their connection to the structure, tension, compression, shear, torsion, lateral load resistance and flexure of couplings. Another key feature of the testing will be the establishment of a well documented capacity-to-torque relationship. This will allow engineers and building officials to verify the capacity of a helical product during installation. This will also eliminate the need for soil tests on every project to determine the bearing capacity of the soil which is a requirement contained in most of the current legacy reports.

All helical foundation elements will be tested by an independent International Accreditation Service (IAS) accredited laboratory conforming to the AC358 criterion. Since all helical foundation systems are not the same and will be tested and measured using the same standard, the inferior products hitting the market from foreign entities and fly by night manufacturers using weak and/or used material with no quality control will be weeded out through the process.

Ram Jack is currently having four (4) shaft diameters tested, 2 3/8", 2 7/8", 3 1/2" and 4 1/2", as well as four (4) helical blade diameters, 8", 10", 12" and 14". The ultimate capacities for these pilings will range from 5 to 170 k. The testing will take nine to twelve months to complete. Once this is done, we will submit an application to ICC-ES for an Evaluation Service Report (ESR). The ESR will offer an independent resource for accepting a helical foundation system. It will also be used by engineers as a guideline for preparing a foundation design. It should also prove to be a stepping stone in including a dedicated helical foundation section in the International Building Code (IBC). Currently helical foundations are considered specialty piles and are governed under Chapter 18 of the IBC.

The adoption of AC358 is a major milestone not only for Ram Jack but for the helical industry as a whole. Having evaluation reports will make it easier to specify and design helical foundation systems. Engineers and inspection agencies can expect a higher quality and reliability from helical foundation systems by insisting on ICC-ES evaluation reports.