

DFI Helical (Screw) Pile Seismic Research Study – Phase I Literature Review

ABSTRACT

Helical piles are being used in seismic regions of the U.S. and other countries, yet there remains much confusion regarding the state of practice and building codes for this pile type. Nonetheless, it is anticipated that piles with comparatively small cross-section and high anchoring capacity, such as helical piles, could be beneficial for seismic resistance due to their slenderness, higher damping ratios, ductility, and resistance to tip uplift. In addition, helical piles can be easily implemented as a retrofitting solution for foundations that are found to be deficient according to updated seismic codes. This paper is part of three phase investigation on the use of helical piles for earthquake mitigation. The results of an extensive literature and industry search for previous seismic tests performed on helical piles are highlighted as well as the current design standards used in seismic regions. Existing seismic testing results and current design standards are analyzed to make recommendations about how to fill the knowledge gaps and provide quantitative data on the behavior of helical piles under seismic conditions.