

VIBRATIONS DURING INSTALLATION OF HELICAL PILES

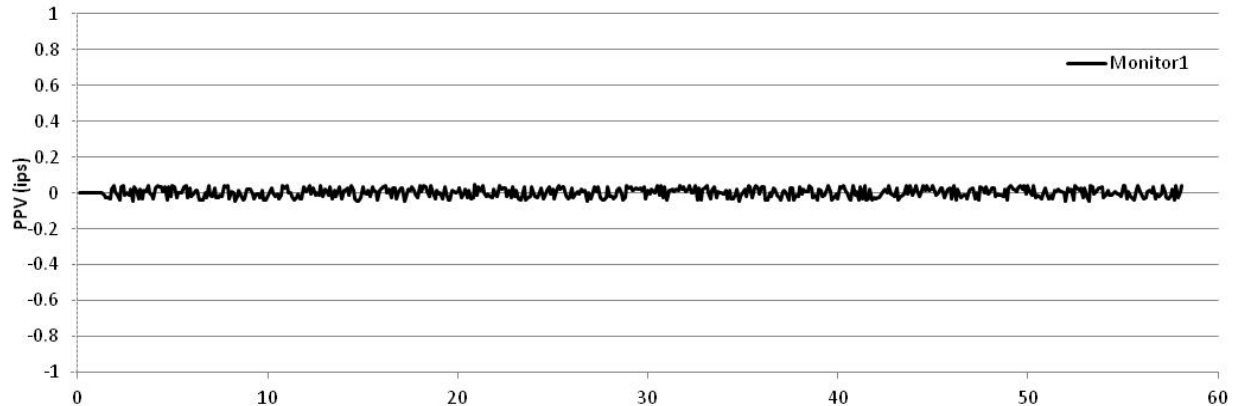


Fig. 1 Typical Vibration Monitor Data During Helical Pile Installation

One of the advantages of helical piles and helical anchors is that they produce minimal vibrations during installation. Magnum Piering, Inc. has designed, manufactured, and supplied helical pile products for projects where vibrations were of significant concern. Examples include work inside existing hospitals, retail centers, residential units, and numerous projects involving sensitive historic structures and neighboring structures. Owners, building officials, architects, and engineers are pleased with the extremely low and often negligible vibrations measured during installation of helical piles and helical anchors.

Typical vibrations located 25 feet from a helical pile installation are shown in Figure 1. Maximum peak particle velocity (ppv) is on the order of 0.08 ips, which is similar to vibrations produced during operation of track mounted earth moving equipment. If a large diameter helical pile encounters obstructions, peak particle velocity can exceed this common range. To date, there have been no reported instances of helical pile installation causing problematic vibrations.

Vibrations during helical pile installation (0.08 ips) compare favorably with common regulatory permissible limits which generally range from 0.20 for very sensitive structures to 0.50 ips for common conditions.

Vibrations during helical pile installation are nearly imperceptible. In fact, vibrations during helical pile installation are more in the range of common ambient vibrations in buildings as shown in Fig. 2.

Activity	Vibrations (ips)
Occupants walking/closing doors	0.02-0.05
Occupants running/jumping	0.05-0.20
Commuter-train traffic	0.03-0.07
Trash compactor	0.03-0.07
Moving furniture	0.10 - 0.15

Fig. 2 Common Values of Ambient Vibrations in Buildings (Hannen, 2015)

Works Cited

Hannen, A. P. (2015). *Vibration Limits for Historic Buildings and Art Collections*. APT Bulletin, Journal of Preservation Technology.