[1] Experience has shown that in most cases the footing and stem wall foundation system that will withstand a given long term working load will withstand a pier installation force of up to 1.5 times that long term working load. If footing damage occurs during installation, the free span between piers ($L_{P\ MAX}$) may be excessive.

[2] It is recommended that $\mathbf{R}_{h\ MAX}$ not exceed ($\mathbf{R}_{h\ ULT}$ / 2) x 1.65 during installation without engineering approval.

Additional Notes:

Current practice by CHANCE® Civil Construction is to limit the unsupported pier pipe exposure to a maximum of 2 feet at the published working loads for the standard pier systems. The soil must have a SPT "N" of greater than 4. The pier pipe must be sleeved for pier pipe exposures greater than 2 feet and up to 6 feet and/or through the depths where the SPT value "N" is 4 or less. Sleeve must extend at least 36" beyond the unsupported exposure and/or the area of weak soil. If the anticipated lift is to exceed 4", then the Atlas Resistance® Continuous Lift Pier System should be used.

Atlas Resistance® Piers can be located as close as 12" (305 mm) between adjacent piers to develop a "cluster" of load bearing elements.

CHANCE® HELICAL ANCHOR/PILE BEARING CAPACITY

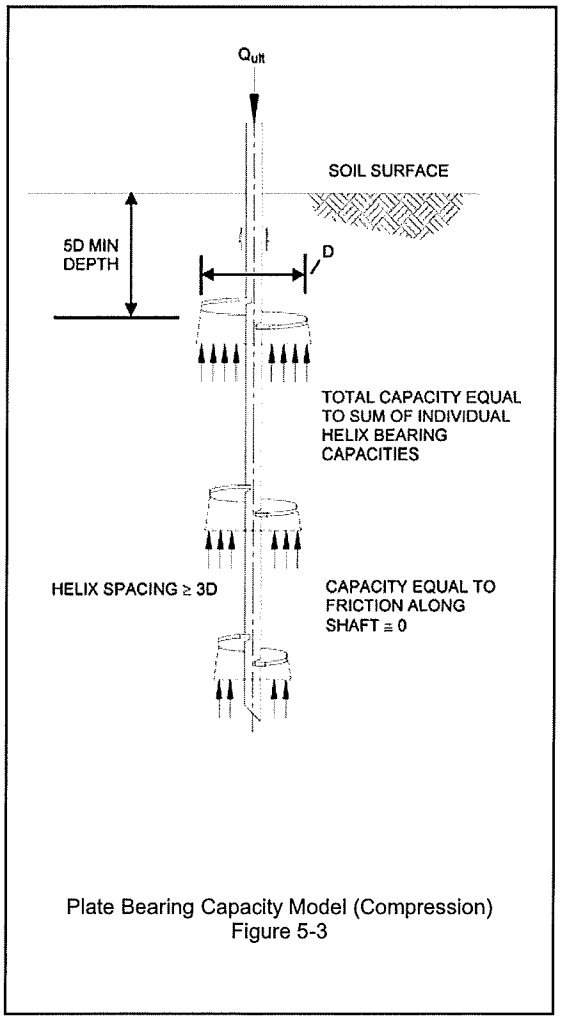

Plate Bearing Capacity Model (Compression)
Figure 5-3

The capacity of a helical anchor/pile is dependent on the strength of the soil, the projected area of the helix plate(s), and the depth of the helix plate(s) below grade. The soil strength can be evaluated by use of various techniques and theories (Clemence, 1985). The projected area is controlled by the size and number of helix plates. For helix depth, two modes of soil failure may occur: shallow and deep failure. The terms "shallow" and "deep" refer to the location of the bearing plate with respect to the earth's surface. By definition, "shallow" foundations in tension exhibit a brittle failure mode with general eruption of soil all the way to the surface and a sudden drop in load resistance to almost zero. With "deep" foundations in tension, the soil fails progressively, maintaining significant post-ultimate load resistance, and exhibits little or no surface deformation. The dividing line between shallow and deep foundations has been reported by various researchers to be between three and eight times the foundation diameter. CHANCE® Civil Construction uses five diameters (5D) as the break between shallow and deep helical anchors/piles. The 5D depth is the vertical distance from the surface to the top-most helix. Whenever a Chance® Helical Anchor/Pile is considered for a project, it should be applied as a deep foundation for the following reasons:

1. A deep bearing plate provides an increased ultimate capacity in uplift or compression.
2. The failure at ultimate capacity will be progressive with no sudden decrease in load resistance after the ultimate capacity has been achieved.