FOUNDATION DEFLECTED SHAPE UNDER LATERAL LOADS

The primary objective of static load tests is to measure soil response to load. For resistance to lateral loads, soil response that is characterized for a single, free-head deep foundation element can be used to model the response of a group of fixed-head foundation elements. The soil response during a lateral static load test can best be characterized by determining the full-length deflected shape of the deep foundation element through a string of in-place inclinometers or a ShapeAccelArray. Components for a string of in-place inclinometers are illustrated in Figure 1.

Figure 1. In-Place Inclinometer String Components Consisting of Connecting Rods, Wheel Assemblies, and Inclinometers.

In-place inclinometers, wheel assemblies, and connecting rods are assembled to make a string of IPIs, and lowered into casing before the lateral test begins. Alternatively, a ShapeAccelArray can be inserted into a PVC pipe that is concreted into a deep foundation element. Inclinometer casing installation in a closed-end pipe pile prior to concreting is illustrated in Figure 2.

Figure 2. Inclinometer Casing Installed in Closed-End Pipe Pile Prior to Concreting.

The in-place inclinometer string or ShapeAccelArray instrumentation is left in place and read during the test. Full-length deflected shapes are plotted for the range of lateral loads applied during the test as illustrated in Figure 3. Correlating deflected shapes determined during a static load test with the deflected shape predicted by analytical software aids in refining lateral soil properties (p-y relationships). Such correlations can also be used to establish the section properties of composite-section deep-foundation elements such as drilled shafts, pre-stressed concrete piles, concrete-filled pipe piles, and continuous flight augered piles.

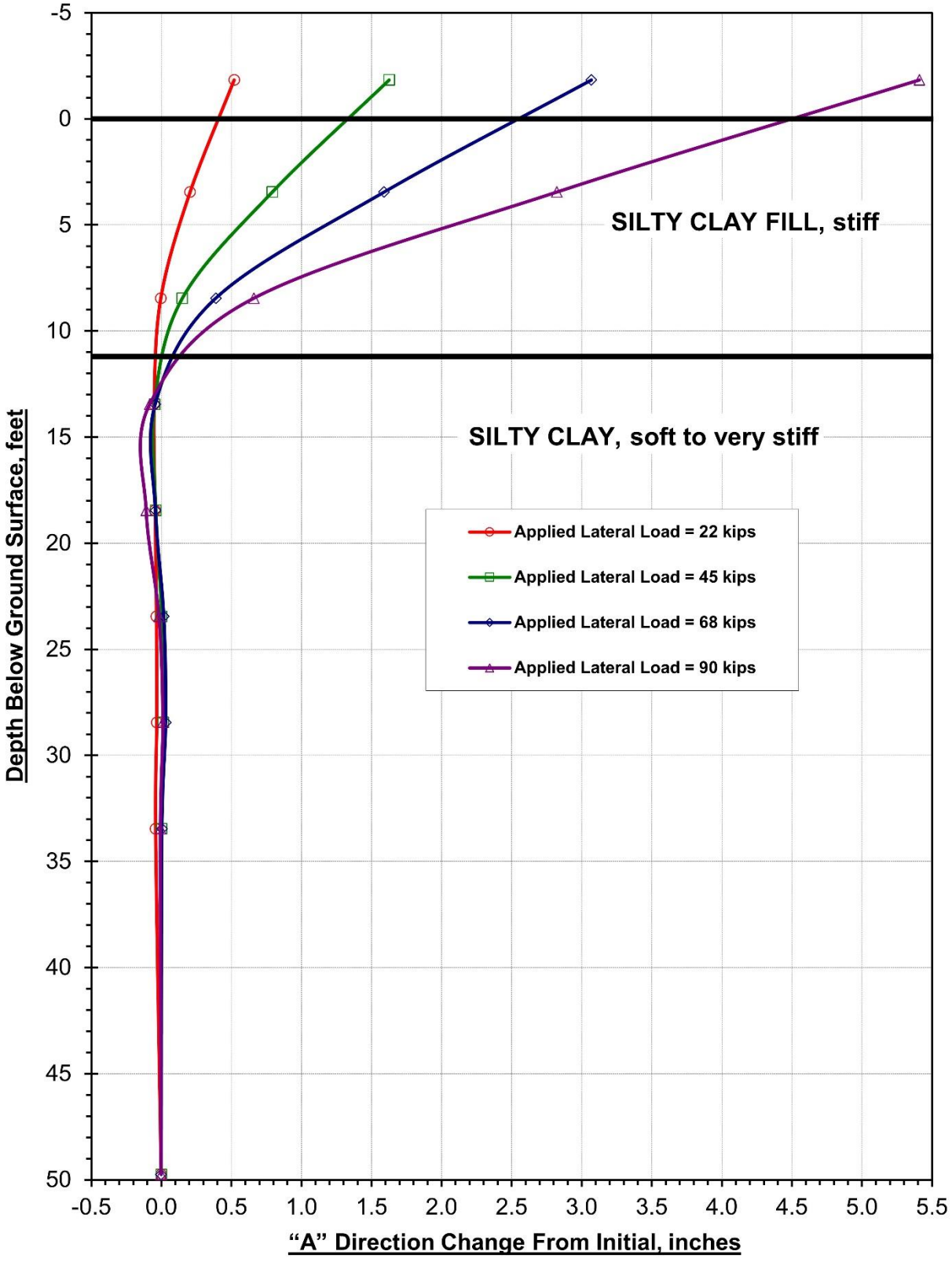

Figure 3. Deflected Foundation Shape from In-Place Inclinometers During A Lateral Load Test.