Researchers at the University of South Florida have developed a new technology for enhancing the end bearing of drilled shafts tipped in cohesion-less soil and debris.

Drilled shafts are large diameter cast-in-place concrete structures that can develop enormous axial capacity to resist heavy loads from tall buildings and bridges. These structures develop capacity from a combination of side shear resistance and end bearing capacity. However, the base of the drilled shaft contributes very little to the overall load carrying capability because there is a large displacement required to develop the end bearing capacity. There is a need to utilize the entire end bearing capacity for these large diameter cast-in-place structures.

USF inventors have found a way to reduce the required displacement, which increases the usable overall capacity. The reduced required displacement is achieved by pre-compressing the soil resulting in a stronger foundation and improved overall usable capacity. Furthermore, this method also does not require the grout to be pressurized during the curing. This methodology varies from others as it not only enhances freely draining sand soils but also can be applied to poorly draining soils and rock. Improving the overall capacity by up to 10X, this technology has great potential to revolutionize large cast-in-place concrete structures.

**ADVANTAGES:**
- Increases the overall usable capacity by up to 10X
- Provides quality assurance to design engineers
- Applicable to all soil types

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**Increased Overall Capacity of Drill Shafts via Reducing the Required Displacement**

**A Comparison of Typical Drill Shaft Capacity to the Novel Drill Shaft with Increased Overall Capacity**