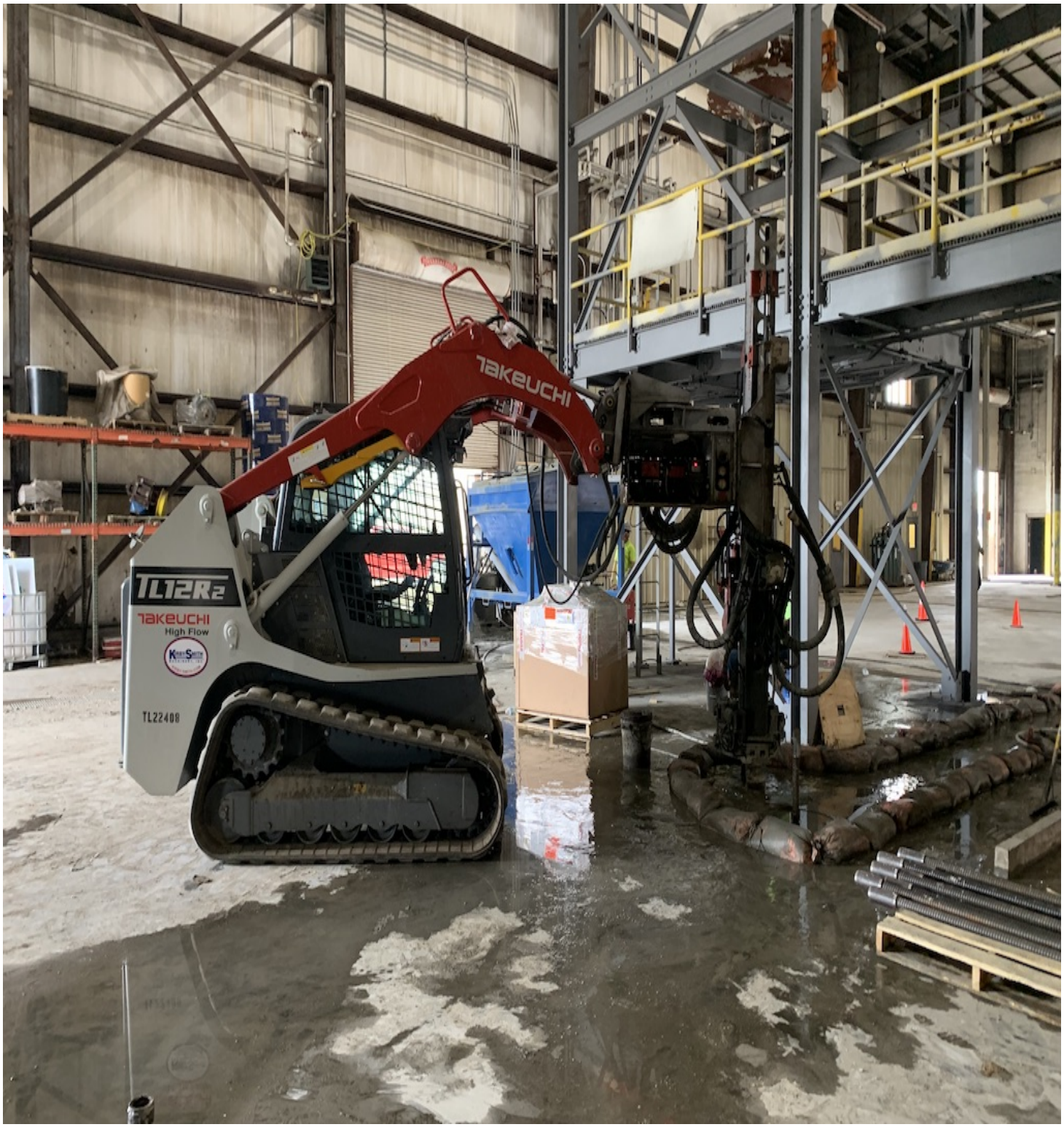
Subsurface Constructors

Ground Improvement

Hollow Bar Micropile for Plan Expansion



Subsurface Constructors

Design Experience & Flexibility Bring Value to Industrial Plant Expansion with Hollow Bar Micropiles

A large fertilizer production facility in North St. Louis recently underwent a significant plant expansion that required new large, heavily loaded footings both inside and outside of the existing plant. Subsurface Constructors had experience on this site having designed and installed close to 3,000 aggregate piers in 2005 for a large storage building on the site. For the new addition, Subsurface was again contacted to help design a solution. This time, aggregate piers were not feasible due to the extreme loads.

The soil profile on the site generally consists of very soft to medium stiff lean to fat clay down to about 40 feet, then loose to dense silty sand down to limestone bedrock at about 66 to 70 feet. It was originally assumed that deep foundations would need to go down to bedrock; however, Subsurface engineered a solution of drilled displacement piles terminating in the dense sands at about 55 feet for the exterior addition. Subsurface installed a total of 72 piles that were 16-in. diameter and capable of carrying a maximum allowable service load of 188 kips in compression and 60 kips tension.

For the new footings inside the existing building, the solution required low-overhead equipment. Here, Subsurface designed and installed roughly 35 hollow bar, uncased micropiles to maximum loads of 94 kips compression and 30 kips tension. These piles were also terminated in the dense sand, thus preventing any rock coring and the added expense that comes with it. Successful load tests were completed on sacrificial piles for both pile types.

Project details:

Year: 2022
Location: St. Louis, Missouri