URETEK

Foundation Repair and Stabilization

Increasing Foundation Footer Capacity for Convention Center in Kentucky

Problem

The Kentucky International Convention Center was constructed in 1977 and needed an upgrade. As part of the new design, a five-acre exhibit hall was proposed on the second floor. This and other design elements required that the building be demolished and rebuilt. A study was conducted to see if full demolition (building and foundations) or partial demolition (building only, with retrofitted foundations) would be more economical. Partial demolition was found to be both faster and more economical. URETEK Deep Injection® (UDI) was seen as a clear choice for the job, so the project team called URETEK.

Analysis

Because the new structure loads were significantly greater than the original, 55 footings needed a 50% increase in bearing capacity. Most of the 55 footings were large column pads (12'x12'x3'). Soil borings were used to evaluate relative density of sand layers across the site. Large variances were encountered between sand layers, requiring injections to be extended deeper in some areas. Based on the soil analysis and the project specifications, an injection plan was designed to enhance foundation soil strengths while increasing the bearing capacity of each footing.

Solution

URETEK crews drilled through the existing footings at predetermined locations according to the injection plan. After drilling to specified depths, polymer grout was injected to densify and strengthen the surrounding soils. This process is key in increasing foundation soil capacities. The project also involved soil stabilization at locations where foundation footings did not currently exist. For these locations, UDI was conducted to support new footing installations by injecting below the designed depth of these new footings.

Result

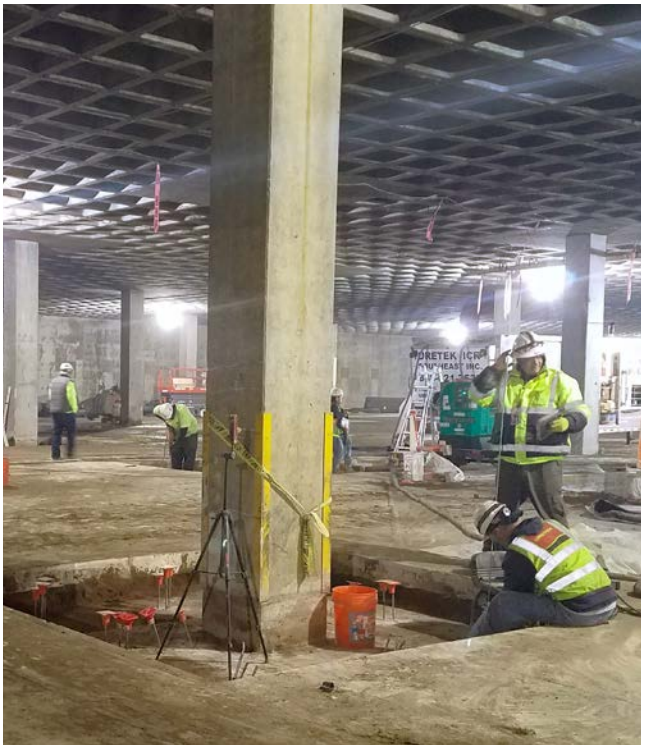
This $212 million project presented a complex work environment, but despite the presence of five other trades working simultaneously within the basement, all footings were stabilized ahead of schedule. UDI successfully raised the capacity requirements of the subject footings, stabilized the soils beneath the structure, and prepared the sites of new footings. URETEK saved time and reduced the cost of the project by completing foundation improvements in place without excavation and the removal of footings.

URETEK Deep Injection® (UDI)

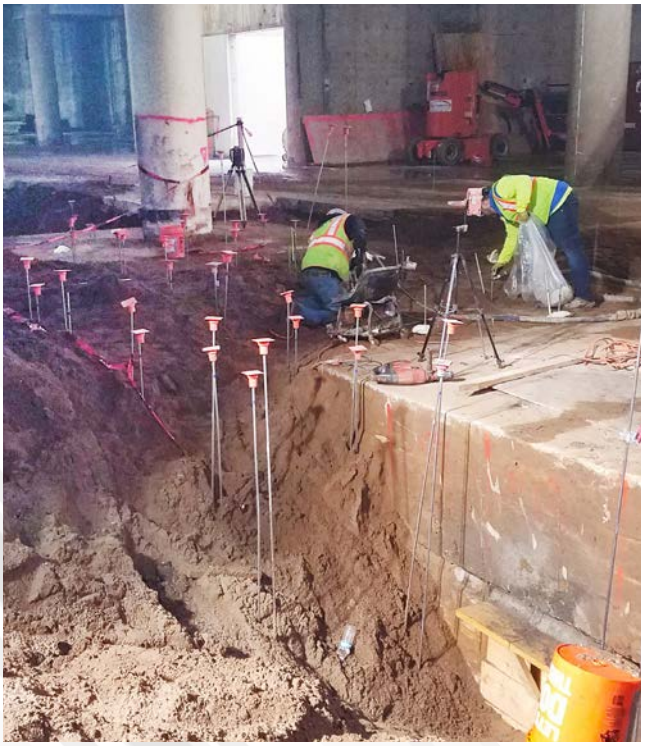
Widely referenced throughout our industry, UDI involves the injection of structural polymer into base and subgrade soils to increase the load bearing capacity. This is achieved by injecting the polymer through small holes drilled directly through the pavement structure to depths determined by site-specific analysis. Our URETEK 486 Star® material flows easily into voids and weak zones within the soil mass below. Through a controlled chemical reaction, the expanding polymer compacts surrounding soils and applies a controlled pressure on targeted areas of the affected pavement above. If needed, a multi-injection design plan is utilized to gently return the pavement to its original grade. The composite material quickly cures into a strong, dimensionally stable, and water-resistant geo-material, providing years of reliable service.

URETEK 486 Star®

URETEK 486 Star® polymer is a two-component, high-density, expanding thermoset polyurethane system. It was developed to be the ideal solution for under-sealing, void filling, lifting of settled pavement, stabilization and stiffening of weak soils, and for encapsulating and sealing buried infrastructure. URETEK 486 Star® is environmentally inert, non-toxic, and resists underground water erosion or weakening due to its industry-leading hydrophobic properties.



UDI was used to support 55 foundation footings from the original 1970s construction



URETEK crew installing tubes to perform UDI