



Award Winning Emergency Repairs in Missouri City, Texas

Problem

Erosion control on the east bank of an effluent pond in Quail Valley had been an ongoing struggle and concern for Missouri City officials and the Public Works Department. The pond is part of the Quail Valley Waste Water Treatment Plant, and through wastewater reclamation, the pond is used to water nearby fairways at the city-owned Quail Valley Golf Course. Over time, the pond bank's minor erosion issues escalated to the extent that water was traveling through the bank's subsurface soil, entering Stafford Run Creek. As a countermeasure, a portion of the troublesome pond bank was mud-jacked with cementitious slurry in an attempt to stabilize bank soils and cutoff water migration. Unfortunately, the solution was only temporary and city officials needed to find a more reliable solution...fast. After fielding a variety of bids, some for well over \$1 million, the city awarded the contract to URETEK who proposed using its URETEK Deep Injection® (UDI) process to inject structural polymer deep into the bank. This economical and environmentally safe solution was proposed to stop water migration and stabilize bank soils with minimal site work.

Analysis

After analysis of the bank subsoils, URETEK technicians decided to pursue an "underground curtain" pattern of UDI to wrap beneath the east and south pond banks. Unlike mudjacking, UDI does not involve the use of cementitious slurry, and the material is placed deeper into the ground. UDI is perfectly suited for compromised-soil jobs like these because it utilizes the hydro-insensitive URETEK 486®. This material maintains its structural strength and integrity even in the wettest environments.

Solution

URETEK technicians mobilized to make the bank repairs. To create the underground curtain, a series of linear holes were drilled every five feet along the east and south pond banks. URETEK technicians began by injecting structural polymer starting at 20 feet below the surface, where it expanded and compressed loose soils, filled subsurface voids and fissures, and bonded with surrounding soils. Subsequently, technicians injected at 15, ten, and five feet below the surface. Technicians then moved to an adjacent hole and repeated the injection

process, creating a water-tight underground curtain one section at a time. At an especially weak section of the east bank where migrating water had heavily eroded the bank, three rows of underground curtains were created for extra reinforcement.

Result

URETEK injected structural polymer at more than 100 injection sites, successfully creating a 500-foot underground curtain along the east and south pond banks. All water migration ceased, and the effluent pond was contained. Pond bank repairs allowed the city to continue using its reservoir to water golf course fairways. URETEK saved Missouri City more than \$500,000 using UDI when compared to the projected costs of other solutions. City officials were thrilled, and the project went on to win the 2014 Project of the Year Award (less than \$2 million) at the annual conference of the Texas chapter of the American Public Works Association.



URETEK technician injects structural polymer to create an underground curtain.

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.



URETEK won the 2014 TPWA Project of the Year Award.

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