



Storm Water Culvert Repair in Florida

Problem

In Palm Coast, Florida, a 60-inch corrugated metal pipe (CMP) storm water culvert began leaking through multiple joints at two separate locations along Belle Terre Parkway. These leaks allowed fines to migrate into the storm water culvert resulting in weakened soil conditions and subsidence of the asphalt roadway above. With the extent of the weakened soils unknown, steel trench plates were placed over the areas of subsidence by city officials. An emergency repair contract was then issued to the city's on-call contractor, S.E. Cliene, and URETEK was brought in as a subcontractor to perform the emergency repairs.

Analysis

Prior to contacting URETEK, city employees repaired the joints of the CMP from within, utilizing traditional patching methods. While the joint patching was successful in leak sealing and mitigating further inflow and infiltration (I&I) issues, this did nothing to fill the voids created outside the pipe or to strengthen the sandy soils weakened by the loss of fines. When the roadway above the pipe began to settle, the city and its on-call contractor asked URETEK to develop a solution to stabilize the area. To ensure that any present voids were filled, a plan involving URETEK Deep Injection® (UDI) was developed to treat around the entire pipe, from grade level down to 12 feet, one foot below the bottom of the pipe.

Solution

The injection plan involved two locations, extending in a wedge pattern out past the footprint of visible settlement, with the aim of tying stable soils to the area of weakened soils in proximity to the now-repaired storm water culvert. The first location involved three rows of injections: two rows on either side of the buried culvert to depths of four feet, eight feet, and 12 feet, and a final row of injections directly above the culvert to a uniform depth of four feet. At the second location, five rows of injections were required, with two rows on either side of the culvert – to

four, eight, and 12 feet – and a single row of injections above the culvert to a depth of four feet.

Result

The project was scheduled to last five days, but URETEK crews finished the job and left the work site in just three days, with all work completed within the budget established for the project. During URETEK's repair work, at least one traffic lane remained open on Belle Terre Parkway, assuring no significant traffic delays. After soil stabilization was completed, the prime contractor on the project performed a mill and overlay of the pavement, and city officials were pleased with the outcome.

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 crew members install injection tubes at the work site



Traffic was diverted, but remained flowing throughout the project