CASE STUDY
SLAB LIFT

Lifting Sunken Steps at a Mixed Use Complex

A concrete staircase in a prominent mixed-use complex in Atlanta needed urgent repairs due to a set of 75-foot-long sunken steps. This issue posed a significant trip hazard, potentially compromising visitor safety. The problem stemmed from a combination of factors working together over time. Water infiltration through expansion cracks had created voids beneath the stairs, weakening their foundation. Compounding this issue was the natural tendency of separate concrete pieces to expand and contract, moving independently from each other. This movement was particularly problematic as it caused the steps to separate from the adjacent sidewalk. Over time, the repeated cycles of expansion and contraction, coupled with the underlying voids, led to the steps sinking and rolling, creating a hazardous situation.

Local experts geotechnical were called in to tackle this tricky situation. The team faced the challenge of addressing safety concerns while preserving the structural integrity of the staircase.

Powerful Polymers

AP Lift 430 was selected as the repair material for this restoration project. This polyurethane foam has expansive properties that are suitable for lifting sunken structures. Once cured, AP Lift 430 provides support for long-term stability, aligning with the project's requirements.

Physical Properties - Cured

AP Lift 430			
Compressive Strength	(ASTM D-1621)	50 p.s.i. or 7,200 p.s.f.	3,447 millibar
Tensile Strength	(ASTM D-638)	88 p.s.i.	6,067 millibar
Expansion	(Unconfined)	22-26 times	-
Density	(ASTM-D 1622)	2.75 to 3.25 lb/ft3	44.05 to 52.06 kg/m3

Properties will vary depending on application conditions.

Painless Procedures

The repair process began with an assessment of the trip hazard. This allowed the team to determine the extent of the problem and plan their approach. Next, backer rods between the steps and sidewalk were removed to prepare the area for treatment. Alchatek Surface Guard 125 was applied around the injection area to prevent any excess polyurethane from bonding to the concrete. Protective sheets were placed to shield nearby glass surfaces.

The team drilled holes through the 8-inch concrete steps to reach the underlying soil. Soil probes revealed firm underlying conditions. The team then implemented their injection strategy. They created an initial foam layer slowly, injecting it just once every ten seconds. This gradual approach prevented existing hairline cracks from expanding during the lifting process. The team continued to inject AP Lift 430 until the steps were level. Finally, they redrilled and applied a second injection layer beneath the first to fill any voids created in the process. New backer rods were then installed.

Alchatek

To enhance the longevity of the repair, the team took an additional crucial step. They sealed the expansion joints with silicone, creating an optimal water barrier. This silicone sealant is flexible, accommodating future expansion and contraction. This extra measure was designed to protect the structure from water infiltration and movement, addressing the root causes of the original problem.

Rapid Results

In just four hours, the steps were restored to a level position, aligning with the adjacent walkway. This efficient repair method addressed the immediate safety issue while extending the structure's lifespan. By lifting the existing steps rather than replacing them, the property owner avoided substantial expenses associated with demolition, new materials, and extended labor time for a complete replacement. This approach ultimately provided significant cost savings.

About Alchatek

Alchatek is an international leader in the manufacture and supply of chemical grouts and construction products for Geotechnical, Leak Seal, and Seawall Repair applications. Providing solutions from its headquarters in Tucker, Georgia and its manufacturing facility in Reno, Nevada, Alchatek specializes in advanced construction technologies for sealing leaks, stabilizing soils, lifting concrete, and protecting infrastructure and seawall structures. To best serve its customers, Alchatek is organized onto three divisions:

The Leak Seal Division combines a full system offering of polymer chemical grouts and equipment with perhaps the most experienced technical team in the industry. It specializes in preventing water ingress through concrete infrastructure including parking garages, culverts, basements and foundations, and sewer manholes.

The Geotechnical Division offers a complete line of single component products for soil stabilization as well as two component polyurethane foams for concrete lifting, void filling, and stabilization of infrastructure. This includes lifting sunken structures such as warehouse floors, back into place.

Seawall Repair Network® is the only national network of certified contractors in the repair, preservation, and protection of Seawalls waterfront barriers. Its proprietary methods and materials are environmentally friendly and safe for use in all marine environments and provide a non-destructive solution for seawall repair at 80% less than the cost of replacement.

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