



Leveling an Antique Concrete Staircase

A sunken concrete staircase posed a unique challenge in a grand mansion undergoing renovation for sale. The vintage stairs had settled unevenly, with the right side sinking three inches and the left two inches. This issue arose after the driveway slab had been replaced and the supporting slab around the staircase had been partially cut out. Rather than opting for costly replacement, the property owner sought a permanent solution to restore the staircase’s level and preserve its aesthetic harmony with the surrounding patio. A local geotech company was called upon by the general contractor to tackle this delicate task.

Powerful Polymers

AP Lift 430 was selected as the repair material for this project. This product features expansive properties, ideal for filling voids beneath the sunken stairs. Moreover, once cured, AP Lift 430 is very strong, ensuring robust support for the concrete staircase. The material’s capabilities aligned perfectly with the project’s requirements, offering stability and longevity. Importantly, using this material allowed for a cost-effective solution compared to full replacement. Additionally, this approach preserved the vintage look of the concrete staircase, maintaining its match with the existing patio.



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 strategic drilling. Two holes were carefully bored into the slab in front of the steps at a steep angle. This approach ensured the material would travel underneath and towards the back of the stairs against the porch wall. Next, injection commenced from the front in three to five-second bursts. The crew used a dial indicator to monitor movement with remarkable precision throughout the process, detecting changes as small as 1/100th of an inch. As the material spread, lifting became visible. The team paused when material emerged from the sides, allowing for initial curing. Subsequently, re-drilling and more injection from the front raised the stairs further, maintaining the original slant with the right side down. A hole was drilled in the slab next to the back right area to correct the slant. Short bursts of injection here helped level the slab. Finally, injection resumed from the front to complete the lift, achieving the final quarter-inch of elevation.

Rapid Results

The meticulous approach yielded impressive outcomes. Most notably, the final lift level perfectly matched the newly formed driveway, addressing the customer's primary concern. This precision restored functionality and enhanced the property's aesthetic appeal. The property owner expressed great satisfaction with the results. Furthermore, the successful repair of the antique staircase improved the home's resale value. By preserving the vintage concrete stairs, the project maintained the cohesive look of the exterior, seamlessly blending with the existing patio. The permanent solution eliminated potential concerns for future buyers, positively impacting the property's marketability. Ultimately, this project demonstrated how innovative repair techniques could address structural issues while preserving architectural integrity.

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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