



CASE STUDY
DEEP SOIL
STABILIZATION WITH
POLYURETHANE

Deep Soil Stabilization with Polyurethane

A two-story residential house in North Carolina was built on poorly compacted fill dirt. After about 20 years, it began showing evidence of settling. Interior cracks appeared in the sheetrock and the some of the floors were no longer level (indicating that the footings were slowly sinking). These symptoms of unstable soil were cause by about 1 inch of settling. The engineer on the project determined that the problem was not severe enough to require helical piers. A contractor was called in to stop the sinking and reinforce the soil via deep soil ***polyurethane injection***.

Powerful Polymers

Among the most dependable products for geotech applications, AP Lift 440 structural foam provides an exceptional DOT grade solution for these types of situations. This 4 lb. density, high-strength, hydro-insensitive structural polyurethane foam is perfect for densifying soil and stabilizing foundations.



Physical Properties - Cured

AP LIFT 440			
Compressive Strength	(ASTM D-1621)	80 p.s.i. or 11,520 p.s.f	5,516 millibar
Tensile Strength	(ASTM D-638)	88 p.s.i.	5,516 millibar
Expansion	(Unconfined)	17-19 times	-
Density	(ASTM-D 1622)	3.75 to 4.25 lb/ft3	60.07 to 68.08 kg/m3
Shrinkage	(ASTM D-1042/D-756)	Negligible	Negligible

Properties will vary depending on application conditions.

Painless Procedure

An Alchemy-Spetec tech consultant worked with the contractor to draw up a plan, indicating exactly where the injection points would be located. The engineer reviewed the plan for feasibility. The contractor installed 18 injection tubes to a depth of 7 feet. 50 lbs of foam were administered through each tube, split between two different depths: 7 feet and 3.5 feet below grade. First, they injected from outside the house, installing foam beneath the exterior footings. Next, they injected from inside the house, installing foam beneath the load bearing interior walls. Spacing between injection points was approximately 5 feet.

Rapid Result

The deep soil stabilization process densified the soil and stopped the settlement. In addition, the contractors achieved a half inch lift from the exterior injections and another half inch lift from the interior injection sequence. The customer was extremely happy with the results. The engineer was impressed as well and said he would recommend this procedure in similar future scenarios.

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.

Tech Support:
404-618-0438
www.Alchatek.com

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