

Case History

ECP Slab Piers Repair 160 PPB-166 Slab Piers



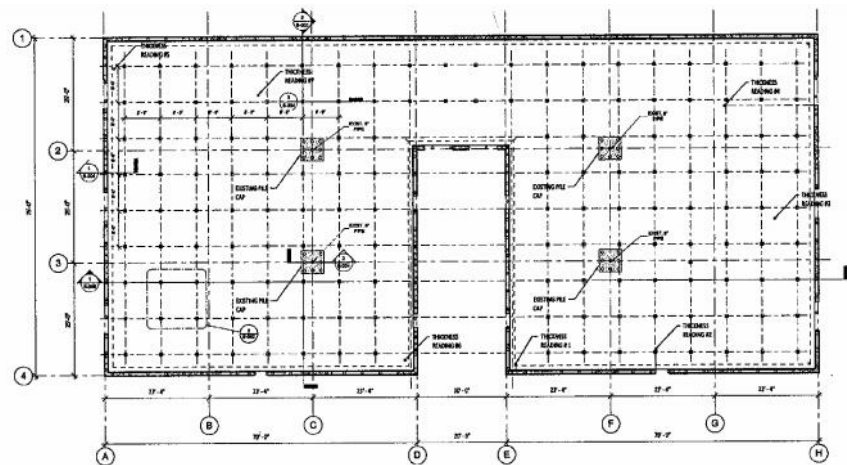
Earth Contact Products, LLC.

Office Building Settled in Florida

Located Over Four
Feet of Compressible
Organic Soil

An office building in Palm Beach County, Florida, built in 1989, experienced slab settlement. The 11,150 ft² structure uses structural columns supported upon deep foundations, with a floating concrete slab on the interior. Significant distress occurred inside the building as seen in the photographs. The movements were caused by differential settlement of the slab. Soil testing revealed that the settlement was due to a stratum of highly organic soil located seven feet below grade and extending to eleven feet.

Gill Engineering Services, Inc. prepared structural engineering plans that would stabilize the sinking concrete floor and recover lost elevations. Several different methods for the repair had been suggested to the owner. The owner decided to award the repair contract to Foundation Professionals of Florida (FPI). The plan would use 160 ECP PPB-166 Slab Piers plus void filling with structural polyurethane. The ECP Slab Pier supports were laid out in a geometric pattern across the entire slab as shown in the sketch below.



Slab Repair Plan – Placements are shown as small circles.

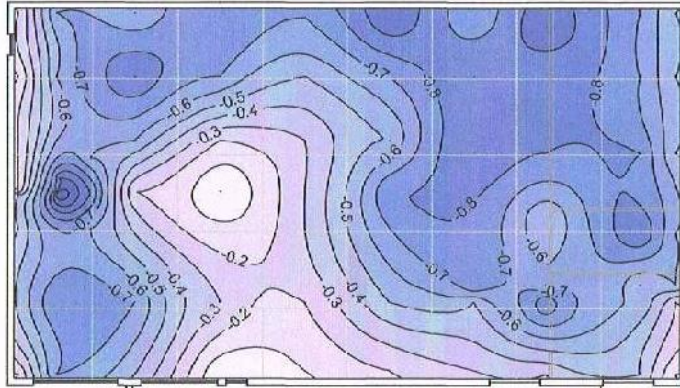


Following the installation of the steel piers and the recovery of lost elevations, more than 5,800 pounds of structural polyurethane grout was injected under the slab to fill the void.

The first task for Foundation Professionals of Florida was to core drill holes for access through the slab at designated ECP Slab Pier installation locations. The photo at right shows technicians core drilling a hole in the slab.



A drive stand was then bolted over a slab access hole. This device was used to support and align the equipment needed to advance the steel pier pipe through the unstable organic soil until firm end bearing was encountered. The pier pipe was installed using vibration free and portable hydraulic equipment. The configuration is shown in the sketch at right and in photo below, near right.

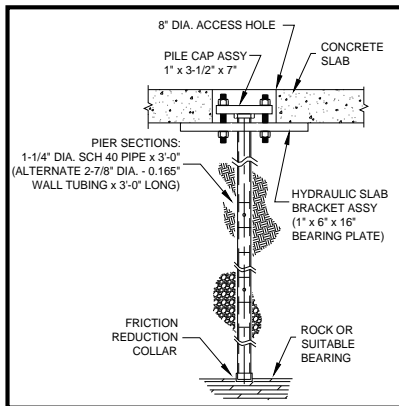


Contour map of slab settlement.

The geotechnical engineer estimated that end bearing would be encountered at approximately 25 feet. At the job site, however, some of the pier pipe was advanced to a depth of 45-1/2 feet before encountering suitable end bearing support.

Once all Slab Piers were installed, Foundation Professionals of Florida installed pier caps, lifting heads, ECP lift manifold and hydraulic rams for lost elevation recovery; and to level the slab. The lifting head and ram configuration is shown in the photograph at far right.

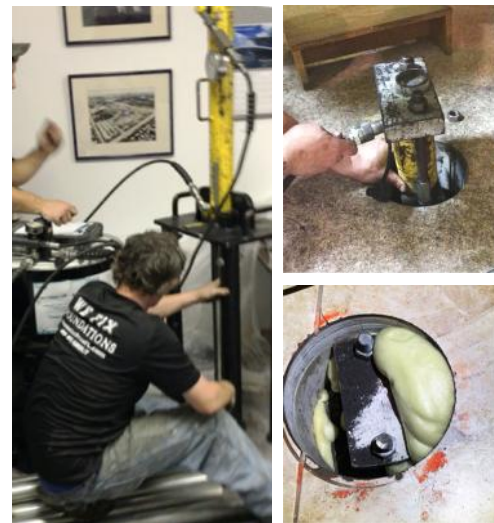
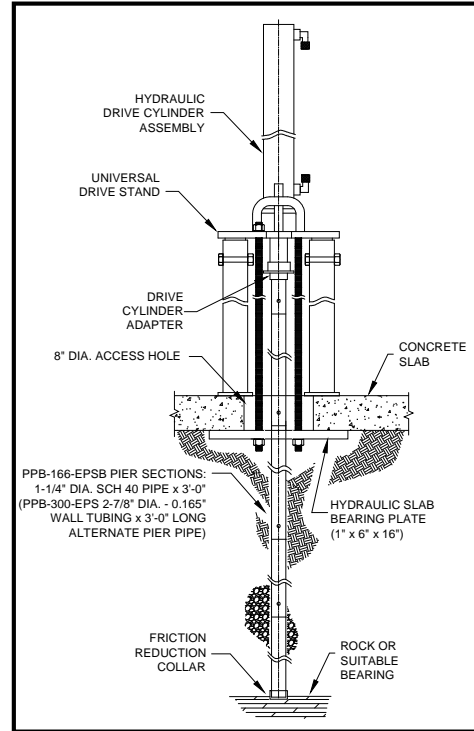
A typical concrete slab on grade requires uniform support from underlying soil. An integral part of this slab pier project was filling completely, and uniformly, the void created between the bottom of the slab and the soil. The void filling process used a two part structural polyurethane material that was injected immediately following the lifting operation.



Sketch of completed installation

One inch slab lift was anticipated and FPI calculated that 3,500 lbs of polyurethane would be required to fill the void. The actual elevation recovery was greater, and filling the void required 5,862 lbs of polyurethane.

The finished pier installation is shown at right.



Project Summary	
Project:	Office Building – West Palm Beach, Florida
Engineer:	Gill Engineering Services, Inc. Lake City, Florida
Installing Contractor:	Foundation Professionals of Florida Lake City, Florida www.foundationprosfll.com
Product Installed:	ECP PPB-166 Slab Piers
Number of Placements:	160
Average Depth:	31 ft
Depth Range:	14 ft to 45-1/2 ft
Lift:	Up to 3-1/2"
Polyurethane Void Fill:	5,862 lb