

## A CASE HISTORY

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### Problem:

When an addition was made to this building, part of the site consisted of fill. To prevent settlement of the building, wooden piles were driven through the fill to provide support for the foundation. Over time, these piles rotted, allowing the structure to settle at one end.

### Repair Solution:

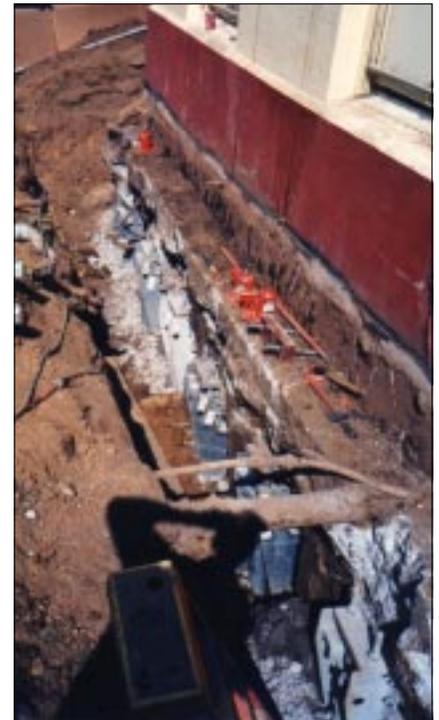
To remedy this situation, 68 remedial HELICAL PIER<sup>®</sup> Foundation Systems anchors were placed under the settling part of the structure. They now support the weight of the structure to help prevent further settlement.

HELICAL PIER Foundation Systems was developed by the Chance Co. This approach has three main components: Lead section, extensions and foundation bracket or new construction bracket. The lead section used on this job was a 1<sup>3</sup>/<sub>4</sub>-inch-square steel shaft with three helices welded to it. A helix is one pitch of a screw which provides the anchor's bearing surface as well as its means of installation. The extensions also were 1<sup>3</sup>/<sub>4</sub>-inch-square steel shaft. By adding extensions to the lead section, depths greater than 100 feet may be reached. The foundation bracket is L-shaped to



fit under and bolt to the side of the foundation. The load of the structure is transferred from the foundation to the anchor via the bracket. For new construction, a T-shaped piece is fitted over the end of the anchor. Reinforcing steel is then tied or welded to the bracket before being cast into a concrete grade beam.

The anchors are installed by a hydraulic drive motor which screws them into the ground. Installation torque is constantly monitored and directly correlates to the bearing capacity of each individual anchor. On this job, each anchor was installed to 8,000 foot pounds of torque to



support the design load of 40,000 pounds per anchor with a safety factor of two.

Installation depths: 21 to 40 feet

Anchor spacing: 4 to 5 feet.

Anchors were preloaded to 20 kips, for stabilizing only. The four-story masonry building had settled as much as 9 inches. Trying to lift the foundation could have further damaged the building.