PARK RANGE
CONSTRUCTION, INC.

Helical Tieback Anchors Repair and Restore Tilting Foundation Wall

Denver, Colorado

The owners of this chain store contacted JR Harris & Company Structural Engineers after noticing distress along the walls and large cracks in the floor caused an unsafe working environment. The building was constructed on a site containing fill soil. In addition there was a lateral load on the stem wall caused by fill against the stem wall interior to raise the slab to the finished floor elevation. The lateral force of the soil under the slab was causing the outward rotation of the stem walls. The project required removing a portion of the concrete floor slab and the soil that was below the slab.

Project Summary	
Project:	Rotated Wall Repairs, Denver, Colorado
Engineer:	J R Harris & Co. Structural Engineers., Denver, CO
Installing Contractor:	Park Range Construction, Inc. 2755 South Raritan Street, Englewood, Colorado *(www.parkrangeconstruction.com)*
Products Installed:	TAF-150 Torque Anchor™ Tiebacks 1-1/2" Sq. Bar with 8" & 10" Dia. Helical Plates
Number of Placements:	26 Tieback Anchors
Embedment:	25 to 35 ft
Ultimate Capacity:	15,000 lb
Average Working Load:	7,500 lb
Factor of Safety:	2.0 : 1 Ultimate To Working Load

Top photo: The slab and soil was removed by conveyor.

Middle: Workers dig soil from behind the stem wall.

Above: A Torque Anchor™ is installed from outside at the specified downward angle.

Helical Torque Anchors™ were installed to provide supplemental lateral wall support and to restore the stem walls plumb (vertically upright). All of this work had to be accomplished while the retail business remained open.

Solid square shaft ECP TAF-150-60 8-10 Torque Anchor™ Tieback Anchors were installed through the wall and to a distance of 25 to 35 feet before reaching suitable shaft torsion to provide a working capacity exceeding 7,000 pounds at each placement.

Once the Torque Anchor™ Tiebacks were installed, the wall was moved back to plumb using a series of hydraulic jacks. The wall was moved 3 to 4 inches. The only evidence of the work is the row of wall plates and nuts that are visible along the exterior surfaces of the stem walls.

After the walls were realigned, select fill soil was carefully placed into excavated areas and compacted and a new reinforced concrete floor was cast.

Photographs from top left:
The technicians use a hydraulic gear motor to advance a helical Torque Anchor™ through the wall and into the soil below the building.
One technician applies a hydraulic force against the wall while the other holds a tape measure. A third technician (not visible) monitors the wall restoration.
The entire wall was restored gently and evenly by using multiple hydraulic jacks.

Photographs from top right:
The excavated area behind the stem wall was filled, compacted and then steel reinforcement was installed.
A new concrete floor was cast to complete the job.
At ribht is a view of the restored wall. The wall plates are the only evidence of the work.

ECP Torque Anchors™
Earth Contact Products, LLC.
"Designed and Engineered to Perform"