



## Helical Tieback Anchors Stabilize and Support a Tilting Retaining Wall

Frisco, Texas



Residents of this high end neighborhood noticed cracks in the masonry retaining wall, but it was four years before repairs were scheduled. A lawsuit was filed against the developer because clay soils on the filled side were specified to be removed and replaced with non-expansive soil. A geotechnical investigation of the site confirmed that expansive clay soil still existed behind the wall.

The attorney agreed to make repairs after a delay of six months. Accurate Foundation Repair recommended Jerry



Coffee P.E. of P-delta engineering to design, supervise and be engineer of record on the project.

By the second year of delays and negotiations, the 12 to 15 foot tall retaining wall had rotated 1/2 inch to one inch out of plumb. Wall creep monitoring continued while meetings with the City attorney, heads of utilities, HOA lawyers and insurance lawyers argued about who was going to pay to correct the problem. This went on for eight months. Finally the engineering design using 144 **ECP Torque Anchor™** tieback placements was offered and agreed upon. The budget to stabilize and support the wall was approved at \$83,600.00.



### Project Summary

<b>Project:</b>	Retaining Wall Stabilization and Repair, Frisco, Texas
<b>Engineer:</b>	P-delta Engineers, Irving, Tx ( <a href="https://www.pdelta.net">https:// www.pdelta.net</a> )
<b>Installing Contractor:</b>	Accurate Foundation Repair, Ft. Worth, Texas ( <a href="https://www.steelpiers.com">https://www.steelpiers.com</a> )
<b>Products Installed:</b>	TAF-150-10" <b>ECP Torque Anchor™</b> Tiebacks 1-1/2" Sq. Bar with 12" Dia. Helical Plate TAT-150-HD Square to threaded transition PA-LWP Large Wall Plate
<b>Number of Placements:</b>	144 Tieback Anchors
<b>Embedment:</b>	18 to 20 ft
<b>Ultimate Capacity:</b>	70,000 lb

The project presented several major challenges. Accurate Foundation Repair was responsible to locate two underground high voltage lines, a 30 inch water line and a natural gas pipeline. Once these utilities were located, batter angles for each tieback anchor were calculated to avoid contact with these utility lines during construction.



To gain access to the wall, Accurate Foundation Repair removed brick fascia at each installation location. In addition the City allowed only minimal disturbance to the grass and trees on the opposite side of the wall. Accurate Foundation Repair solved this issue by drilling 30 inch diameter holes to a depth of five feet at each placement location. A worker installed a 10 inch long tieback lead section through the 30 inch hole and connected the lead to an extension shaft at the other side of the wall. After tieback installation, load testing and tensioning, the masonry was replaced and stain blended to match the original work.

The typical construction specifications required Accurate Foundation Repair to keep the jobsite clean of all boring waste and water. The work could not interrupt any homeowner traffic and the work required daily inspections by a city inspector. There were required meetings with lawyers, HOA Management Company, city officials and the project engineer.

Accurate Foundation Repair installed 144 **ECP Torque Anchor™** helical tiebacks along the length of the 1960 foot wall. To confirm load capacity of the installed tieback anchors, a tension test was performed at every 5th placement. The load test was applied and monitored for one hour before approval.



The project was very successful. As pressure was gradually applied to the wall over a three day period the wall rotation was corrected ranging from 3/4 inch to one inch. The repair has been monitored for a year and with no measured movement.

**Photographs at top:**

The top photo shows the area of masonry removed to allow anchor installation. The anchor shown in this photo is being load tested. A center-hole hydraulic ram is seen against the concrete wall.

The lower photo shows the completed anchor installation, threaded transition shaft, plate washer and the wall plate.

**Photographs left:**

Top left photo shows **ECP Torque Anchors™** fully installed and tensioned.

Photo, bottom left, is of the nearly completed project. The masonry has been replaced and will be stain matched to the original colors.

**Photographs on previous page:**

**ECP Torque Anchors™** are shown being installed using a hydraulic gear motor mounted to a mini-excavator.



**ECP Torque Anchors™**  
Earth Contact Products, LLC.

*“Designed and Engineered to Perform”*