

# CASE HISTORY

## ECP HELICAL TORQUE ANCHORS™ AND ECP STEEL PIERS™



### Villas De San Mateo Community Built on Fill Guatemala City, Guatemala

Mr. Roberto Andres Monteros Galvez of Multiproyectos in Guatemala enlisted the staff of Earth Contact Products for assistance to stabilize and restore a housing development that was built upon uncontrolled fill. Soil borings revealed that the fill consisted of a mixture of silty sand, sand and clay and had a depth of up to 9-1/2 meters (31 feet).

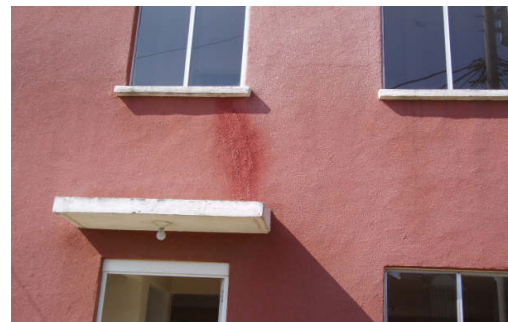
The 50 concrete block duplexes with roofs and foundation slabs made from concrete were constructed with two configurations. The single story structures required 4,650 kg (10,232 lb) service load per pile placement and the two story residences required 8,340 kg (18,730 lb) capacity piles. Due to low overhead clearance inside of the structures, the interior placements used ECP Steel Piers™ while Torque Anchor™ helical screw piles were installed on the exterior of the structures.

The engineers chose to use ECP Steel Piers™ for this project as the most economical method of underpinning the interior walls. Given the extreme depth of the fill material and the 10-1/2 meter (35 foot) shallow termination depth of the soil borings, the engineers made the assumption that suitable rock for end bearing of the piers would be found not far below the surface.

Given the extremely limited soil data available for designing helical pile deep foundations, the engineers had to assume that the soil underlying the fill, which consisted of a thin layer of pumice sand followed by silty-sand, would continue to a depth that would be sufficient to embed the Torque Anchor™ brand of helical piles.

The photograph above shows one of the streets in the development with about one-half of the houses uninhabitable and fenced off.

At left is one unit with obvious signs of foundation distress.





Project Summary			
Project:	Villas de San Mateo, Guatemala City, Guatemala		
Installing Contractor	Multiproyectos, Guatemala City, Guatemala		
Average Service Load:	10,000 lb -1 story 18,000 lb -2 story		
Helical Pile Configuration:	2-7/8" Dia. x 0.203" Wall Tubular Shaft Piles with 12" & 14" Diameter Helical Plates		
Number of Piles:	600	Depth to Bearing:	10 m (32ft)
Ultimate Helical Design Capacity:	37,000 lb	Factor of Safety:	2.1 (minimum)
Steel Resistance Piers Product:	Model 300 ECP Steel Resistance Pier 2-7/8" Dia. x 0.165" Wall Pier Pipe		
Number of Piers:	950	Depth to Bearing:	11-1/4 m (37 ft)
Ultimate Limit System Capacity:	68,000 lb	Factor of Safety:	3.8 (minimum)

A field technician from Earth Contact Products was on site at the time of the arrival of the first shipment of product and equipment. The employees of Multiproyectos were trained to operate the equipment safely, to install the products to the design requirements and to factory specifications. The foundation support and restoration project encompassed 100 residences, which required multiple shipments of products and ongoing underpinning work to bring all of the structures back to safe livable conditions.

The photographs on this page show technicians installing foundation underpinning on one of the residential structures in Villas de San Mateo.

The interior photo shows how the floor was opened for access to install the ECP Steel Piers™ for interior wall support.

Left and lower photos show the Torque Anchor™ installation process using a vibration free hydraulic torque motor.

Finally, we can see a view of the restored structure.

