

**PROVEN:**

## *A Ram Jack Case Study*

CARROLLTON, TEXAS: in the early 1980's a group of apartments was constructed in Carrollton, Texas with all the earmarks of a great investment property for the developer. Once completed, the apartments proved to be just that: not only from revenue generated by occupancy but by exceptional gains in equity caused by the booming real estate market in the Dallas – Fort Worth metropolis.

Amidst all of the positive return being realized, however, concerns began to surface, quite literally. Sheetrock cracks, sticking doors, windows that didn't work and uneven floors indicated that something was terribly amiss. Although the complex was built using the latest and most innovative construction methods featuring a waffle slab and post-tension foundation and floor systems, signs of foundation distress were still occurring. The cause of the problems was neither the methods nor the materials used in the construction of the apartments themselves, but rather the ground on which it had been constructed.

To gain the most efficient use of the square footage of the site, the property had been altered using the cut-and-fill method of leveling; over the years, this contributed to the problem through settling of the under-compacted 10 to 18 feet of fill soils, and the release of overburdened soil pressures in an already active soil condition. A creek bed adjacent to the property extending 30 feet below the normal surface level of the site provided an opportunity for soil creep due to the lack of soil retention along the creek bank area.

Compounding these issues was the largest contributing factor of all, the Eagle Ford Formation. This soil formation is one of most active soil types found in the United States, running from the Red River to San Antonio. With soil plasticity levels of between 50 and 80 combined with the extensive seasonal moisture changes in the region, the Eagle Ford Formation has wrought havoc on all types of structures within its reach. From small residential structures to massive commercial properties, billions of dollars have been spent trying to counteract the negative influence of the Eagle Ford Formation. One of the most recognizable properties affected by the phenomenon is the DFW International Airport. The elaborate maze of runways, taxiways, highways and buildings throughout the property must be continually maintained and adjusted to ensure the safety of the airport patrons.

Likewise, the Carrollton apartments were not immune to the influences of the Eagle Ford Formation. All of these conditions combined allowed the buildings to settle dramatically; due to the rigidity of the waffle slab foundations, however, the structures primarily experienced tilting and not as much deformation as might be expected in structures settling as much as ten inches!

Concerned for the safety of their tenants as well as with protecting their investment, the apartment owners experimented with several foundation repair contractors, trying to remedy the problems they were experiencing. These contractors used a variety of different repair methods utilizing concrete. The problem with using concrete as a repair method in this type of scenario, however, is that you typically cannot get beyond the active zones in the soil and the downward pull of negative skin friction on the concrete piers, so they are not able to resist the soil's activity.



**RAM JACK®**  
FOUNDATION SOLUTIONS

## RAM JACK CASE STUDY:



With an overwhelming need to find a solution to their problem, apartment owners set out to find a company with a history of success in dealing with this type of soil condition. Ram Jack® of Texas was contacted and inquiries were made into their history and experience with this scenario. With its proven track record for repairing structures in and along the Eagle Ford Formation and their roots in the formation of an international network of Ram Jack foundation contractors extending from Canada to Costa Rica and all points in between, Ram Jack of Texas was contracted to repair the structure.

Ram Jack's history began in 1968 with the formation of its parent company, Gregory Enterprises, and now includes fourth generation employees. The history and reputation of Ram Jack gave the owners of the apartments the confidence they needed to enlist Ram Jack to provide the long-awaited solution to their problems.

Ram Jack of Texas sent in a team of experts led by Jim Roberson, a 20-plus year employee of Ram Jack, to evaluate the property. Ram Jack's vast experience in dealing with these types of problems and its innovative, state-of-the-art product line made it easy to prescribe a remedy. A number of piers were first installed inside and around the structures. With 70,000 pounds of driving force the piers were driven to an average depth of 35 feet into the unweathered shale formation below the creek bed to form a permanent bearing element, ensuring that the piers would have a stable point of resistance to counter the soil's activity.

Once all of the piers had been driven, a manifold lift system was used to raise the structure. This manifold system eliminates unnecessary stress to the foundation and slab caused by point loading, enabling a more accurate and reliable lifting process. During the lifting procedure, interior and exterior elevations were monitored to ensure a uniform recovery. In some areas the slab and foundation were raised over 10 inches, with only minor damages resulting, helping to regain much of the elevation loss in and around the structures.

The Ram Jack piers are constructed of high carbon custom manufactured steel. Ram Jack adheres to the strictest guidelines in its manufacturing process. Many of Ram Jack's products carry ICC-ES approval; this ensures code compliance for engineers and municipalities across the country. The use of steel as a piercing material allows for easy installation with minimal disruption to the property and landscaping, and eliminates the likelihood of pier failure caused by friction with the soil.

Ram Jack's industry leading warranty program and overall reputation as a reliable company created a happy ending for the apartment owners, who were certain they were facing huge liabilities and losses with the Carrolton complex. Call today and put Ram Jack's industry-leading and technology and service to work for YOU and YOUR CLIENTS!

