

A CASE HISTORY

Project:

Tohatchi High School Gym
Tohatchi, New Mexico

Geotechnical Engineering:

Western Technologies, Inc.
Albuquerque, New Mexico

General Contractor:

PC Construction
Gallup, New Mexico

Structural Engineering:

TECH, Inc.
Farmington, New Mexico

Underpinning Contractor:

Vic Peery Construction
Albuquerque, New Mexico

Job Description:

This 10-year-old school gymnasium was built on a hillside leveled with fill over shale bedrock. Settlement of up to 6 inches across the diagonal length of the gym floor with slight horizontal movement caused by an underground water source necessitated some type of repair. Chance HELICAL PIER[®] Foundation Systems screw anchors and brackets were selected as the most cost-effective method to correct the problem.

Repair:

The wood gym floor and concrete slab were removed. Around the interior of the gym and the exterior of the tilt-up building, 132 anchors (each with three helices of 8-, 10- and 12-inch diameters on a 1 $\frac{3}{4}$ -inch-square shaft) were installed to depths of 13 to 24 $\frac{1}{2}$ feet on intervals of 6 to 8 feet. The anchors were installed by a 10,000 ft.-lb. hydraulic motor mounted on a skid loader.

Design load capacities of these anchors varied from 21 to 40 Kips. All piers were installed with a 2:1 safety factor to provide ultimate capacities from 42 to 80 Kips.




Chance Heavy-Duty underpinning brackets (40,000-lb. working capacity) connected the anchors to the foundation footing. 30-ton jacks were mounted on the brackets to lift the foundation in intermediate steps back to level.

The adjoining locker rooms were supported by 120 Chance screw anchors (each with an 8-inch-diameter helix on a 1 $\frac{1}{2}$ -inch-square shaft) and slab brackets on 6-ft. grids. These slab anchors were installed through 8-inch



holes cored through the slab to average depths of 20 feet for the 6 Kips design load. The anchors were installed by a custom-made 5,000 ft.-lb. portable drive rig bolted to the slab

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at each location. To lift the slab back to level, approximately 150 ft.-lb. of torque was applied to the slab-brackets' lifting bolts.

To resist lateral forces, 12 Chance tieback anchors

were installed on the uphill side of the gym to depths of 40 feet. A new grade beam was cast with sleeves in it to allow post-tensioning these anchors. The tiebacks were tested to 65 Kips and locked off at the design load of 40 Kips.



Heavy-Duty underpinning brackets installed outside and inside perimeter of foundation.



Slab-leveling anchor being installed and bracket bolt visible through core which was refilled after final adjustment.