

A CASE HISTORY

Construction at the mall

Job Description:

In Oklahoma City, OK, the existing structure houses a large retail department store. Due to growth in the area, a multi-screen cinema construction was planned adjacent to the store. The finished floor elevation of the new building was approximately ten feet below the footing of the existing structure. The designer had to address the problem of supporting the existing structure while the soil was excavated adjacent to the footing of the retail store. Also, the store in the existing structure needed to maintain operations without disruption from movements or vibrations during construction of the cinema.



Above is a view of the job site where workers are installing supplemental support. Atlas Resistance® Pre-Drilled Piers provided support to the existing structure during excavation.

Background Information:

The retail department store was constructed upon approximately three feet of clayey sand fill. Below this fill material was ten feet of clay and clayey shale. The Standard Penetration Blow Counts for the clay and clayey shale was from 23 to over 50. The dense soils and rock made conventional underpinning impossible.

Description of Design:

The engineers recommended supplemental support for the existing structure using Atlas Resistance® Pre-Drilled Piers. Suitable bearing for the Piers was recommended to be approximately 14 feet below the existing footing. The concern was being able to support the existing

structure off of a layer of shale approximately 4 feet below the bottom of the proposed excavation. Given the high Standard Penetration Blow Counts found on the site, the engineers recommended that an access hole be bored through the clayey shale and shale at the higher elevations so that the Atlas Resistance® Piers can be bearing on the selected stratum at the desired elevation below the new construction.

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PROJECT SUMMARY

Number of Piers:	6
Part Numbers:	AP-2-UFPD-4000.219
Avg. Pier Depth:	14 feet through clayey shale
Avg. Working Load:	8,000 to 15,000 pounds
Design Load:	30,000 pounds
Factor of Safety:	2 : 1 (100% above design load)
	4 : 1 (300% above ultimate capacity)

Rapid Installation:

Photograph at left below shows the rock drill boring a hole through the dense soil and shale to the target depth for the end bearing Atlas Resistance® Pre-Drilled Pier Pipe. Before the boring machine was positioned and carefully

aligned to produce a vertical hole, an excavation was dug to permit later mounting and driving of the Atlas Resistance® Pre-Drilled Pier System. Notice in the photo at right below how the footing is smoothed perpendicular to the load bearing exterior wall of the

existing structure prior to drilling. Not only is the vertical face of the footing prepared, the bottom of the footing is also cut perpendicular to the vertical face and smoothed to provide a bearing surface for the pier bracket. This insures proper uniform load transfer from the Pier to the footing.



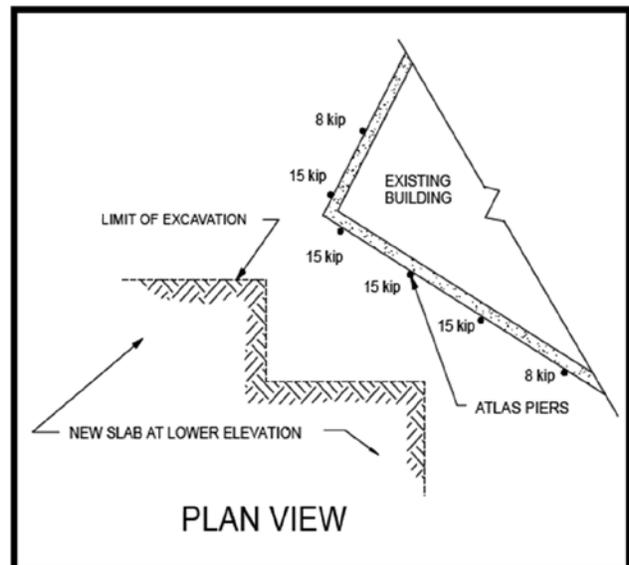
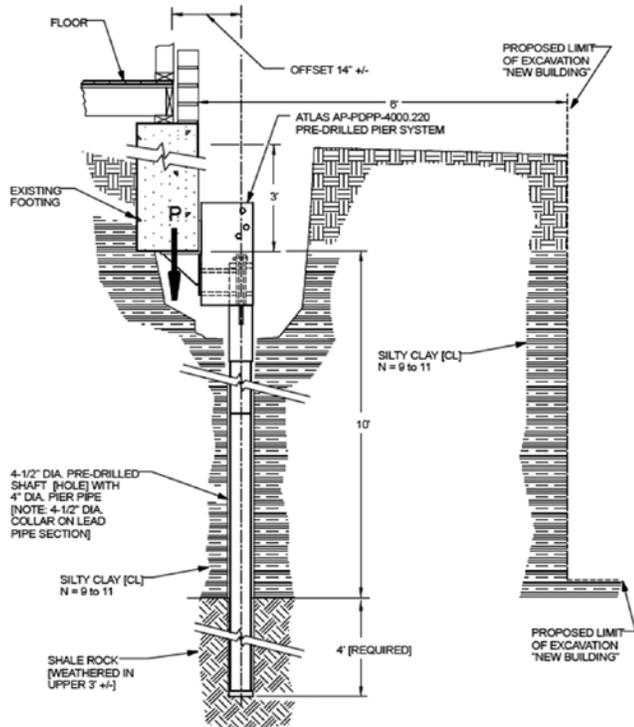
Rock drilling operation adjacent to the structural wall. Notice that the footing is notched to allow the pier to be installed as close as possible to the wall load. The entire installation takes place in an excavation not larger than 3 feet square.

Economical On-Time Completion:

The sketch right shows the Pier Location Plan on the existing foundation, and the proximity of the excavation. Below is a cross-

sectional detail of the design. Notice the challenge given to the designers in penetrating the stiff soils to achieve supplemental support at the target depth.

Atlas Resistance® Pre-Drilled Piers were the logical choice. The pier combines the strength, reliability and rapid installation of standard Atlas Piers, but is designed with an offset to permit installation in a bored hole.



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After the installation hole was bored, the Atlas Resistance® Pier was installed to the target bearing stratum approximately 4 feet below the limit of the proposed excavation. The perforated Pier Pipe was

filled with grout under pressure to fill the voids, then each pier was loaded to the design force specified by the engineer.



Here, a technician uses quiet, vibration-free hydraulic equipment to install an Atlas Resistance® Pier.

Success:

The selection of the Atlas Resistance® Pre-Drilled Pier System allowed the project to continue without delay. The Piers provided the design support, and there was no damage to the existing structure during construction of the multi-screen cinema.



Close-up view of the installed pier. The Atlas Resistance® Pre-Drilled Pier System is constructed of 1/2" and 3/4" steel for heavy-duty applications. The assembly weighs nearly 300 pounds and has an ultimate capacity of 76,000 pounds!