MORETRENCH

PROJECT SUMMARY

JET GROUTING

First Morris Bank
Morristown, New Jersey

When soil conditions are not conducive to the use of conventional underpinning techniques, Moretrench can often offer an alternative specialty solution. Such was the case at the site of a new branch of the First Morris Bank & Trust in Morristown, New Jersey.

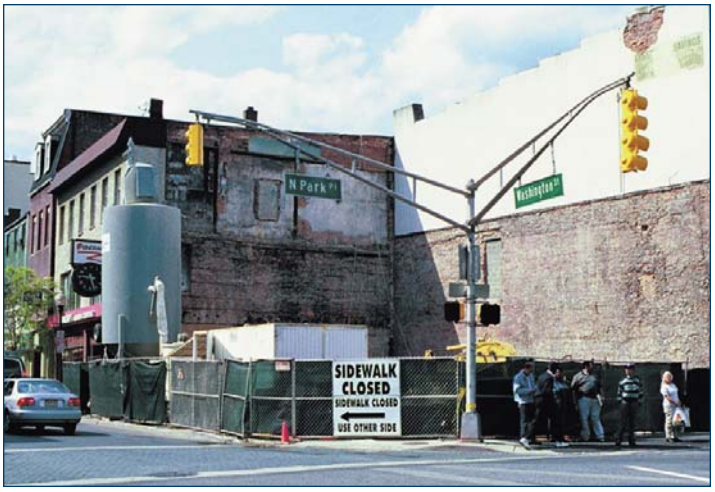
Construction of the new building on the site of a newly demolished structure required excavation below the foundation levels of two adjacent commercial buildings. The soil profile through which excavation would take place consisted of a 6 to 12 foot layer of very loose, fine to coarse sand fill with small amounts of gravel and silt, overlaying fractured and weathered schist bedrock. Underpinning to maintain the integrity of these buildings during the excavation work was critical. However, given the nature of the soils, the commonly used approach of conventional concrete underpinning by the pit method was not a viable option.

Moretrench's design-build proposal of jet grouting provided both underpinning and excavation support in one operation. For this site, jet grouting could be accomplished quickly, and at comparable cost to conventional methods.

System Selection

The new building was to be a 3-story structure with full basement, covering a footprint area of 2000 square feet. Column loads were on the order of 300 kips. The basement level was to be located 7 to 12 feet below the foundations of the adjacent structures.

Since the unconfined compressive strength requirement for the jet grout columns was relatively moderate, Moretrench selected single-fluid jet grouting to provide the excavation support and underpinning.



Top: Jet grouting provided structural underpinning for two adjacent buildings bearing on very loose sands during construction of this new, 3-story bank branch.

Above: Space limitations dictated a separate staging area adjacent to the site for the grouting equipment.

First Morris Bank, continued

In this technique, cement grout is injected into the soil under high pressure through a single rotating rod and mixed with the in situ material to form a soil-cement column of high strength and low permeability. Columns created by the single fluid method are typically two and three feet in diameter. This is the smallest column diameter created by any of the three jet grouting systems. However, because it is essentially a mixing method rather than a replacement method, single-fluid jet grouting creates the least amount of spoil, an important consideration in restricted urban environments.

Prior to production work, three test columns were installed inside the footprint of the building to verify that the design parameters for strength, and column diameters of 2.5 feet, would be achieved for the production columns.

Jet grouting was accomplished from the top of the footings to be underpinned.

Production Work

Moretrench accomplished the jet grouting from the top of the footing elevations to be underpinned. Due to space restrictions in the immediate work zone, a separate staging area was set up adjacent to the site for the jet grouting equipment.

Two and three rows of interconnected, vertical and inclined jet grout columns were installed at two feet on center from top of rock up to the underside of the building footings. Installation was sequenced to allow the soil-cement matrix to set up before construction of adjacent columns. Spoil created by jet grouting operations was allowed to solidify and removed daily by a service backhoe. One hundred and eighteen vertical and inclined columns were installed, for a total jet grouting length of 1008 feet.

Quality Control and Quality Assurance

During jet grouting, drilling and grouting parameters were recorded by Moretrench's automated data system. Wet grout and spoil samples were taken for on-site density testing.

After completion of the work, core samples were retrieved and laboratory-tested for unconfined compressive strength. Results showed that an average seven-day UCS in excess of 1000 psi had been obtained. In addition, some production columns were re-drilled, and the drilling parameters compared to those obtained for the test columns at the same age.