

Buildable Land Shortages Now Affecting Suburban Areas

by William J. Frank, P.E.

When administrators at **North Shore University Hospital** in Manhasset, New York realized the need for a new emergency room facility, they had to face what is now becoming more commonplace—a suburban facility with limited land upon which to build. Many private organizations and institutions once fled the landlocked cities to suburbia with the promise of large expanses of available raw real estate. But now suburban landowners are facing the same dilemma again—site size constraints.

In order to add the 10,000-s.f. emergency room facility, a new foundation had to be built adjacent to and more than 20 feet below the spread footings supporting the existing hospital. Portions of the existing footings extended into the footprint of the new emergency room and had to be cut off. In addition, vibrations had to be kept to a minimum so as not to damage the existing structure or adversely impact emergency room activities. This precluded driving steel sheetpiling or soldier piles through the underlying dense sand.

These site constraints required the use of sophisticated underpinning systems to support the new foundation. While underpinning systems are very common on densely developed urban sites, their use is rare in suburban settings.

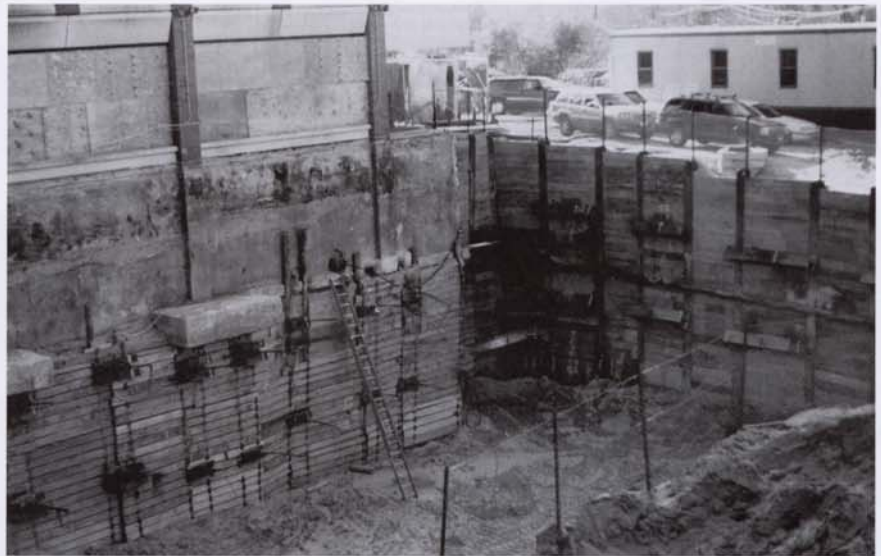
GeoDesign Inc. designed the permanent underpinning and temporary lateral earth

retention system. A system of temporary tiebacks and permanent friction mini-piles was selected to support the existing emergency room and to allow construction of the new foundation.

In order to accommodate the contractor's desired construction methods, the system was designed using two levels of temporary earth tieback anchors, each drilled beneath the existing hospital and connected to the mini-piles via steel beam wales. This provided adequate lateral

support until the permanent basement concrete walls and slabs were constructed. Timber contact lagging was fastened to the mini-piles using welded studs and/or angle plates to retain the soil beneath the existing foundation.

As suburban development continues to flourish, more facility owners will face the challenge of limited buildable land, requiring the application of similar engineering systems designed for high density urban developments. ■



North Shore University Hospital in suburban Manhasset, New York was underpinned to facilitate the addition of a new emergency room facility.