

F.D.Rich Co. Develops Marriott Courtyard Hotel

Geopier® System employed to solve soil stabilization problem

Stamford, CT - "We identified a need for a Marriott Courtyard Hotel in Stamford and found the perfect downtown location," says the developer, John Lindell, F.D. Rich Company, Stamford. The challenge for architects Jonathan Nehmer + Associates, Inc. (JN+A) of Rockville, MD and builder Haynes Construction Company of Seymour, CT was the site, an ideal location but with constraints affecting both design and construction activity.

This \$13-million Marriott Courtyard is an urban high rise steel structure with pre-cast for the first floor and EIFS finishing in Courtyard's traditional buff for the second through eighth stories.

"Every inch of the property is built on," explains Warren Feldman, JN+A., in describing the 18,000 sf footprint of the building that comes within three inches of the property lines. Neighboring buildings bound the site on two sides, and two of



tor elected not to sheet and shore for the excavation up to 12 feet deep to carry the footings to stable bearing.

"The original plans called for removing the unsuitable material and replacing with compacted fill or lean concrete, but the adjacent property owner was concerned about the effect on his property," says structural engineer Lance Green, Cagley & Associates, Rockville, MD.

"An alternative would have been using piles for support on the glacial till, but the vibration on adjoining foundations and bringing large equipment into this tight site was unacceptable," adds Lawrence Johnsen, geotechnical engineer. "I suggested stabilizing the soil with the Geopier® system."

New England Geopier Designer James R. Wheeler, P.E., Design/Build Geotechnical, Stow, Massachusetts produced a plan using 93 Rammed Aggregate Piers to support the spread foundations in the problem areas next to the adjacent buildings. To work within Haynes' short construction window, New England Geopier installer Helical Drilling Inc., Braintree, Massachusetts and mid-Atlantic Geopier installer GeoConstructors worked four days across the weekend.

"They mobilized immediately and saved us a week and a half to two weeks time on our schedule," says Paul Willis, project manager, Haynes Construction.

To the layperson the Geopier system resembles underground shafts of compacted

Project Team for Marriott:

Owner: *Summer Hotel Partners, LLC*, Stamford, CT

Developer: *F.D. Rich Company*, Stamford, CT

Architect: *Jonathon Nehmer + Associates*, Rockville, MD

General Contractor: *Haynes Construction Company*, Seymour, CT

Geotechnical Engineer: *Heller & Johnsen*, Stratford, CT

Structural Engineer: *Cagney & Associates*, Rockville, MD

Geopier Licensee: *Helical Drilling Inc.*, Braintree, MA
and *GeoConstructors*, Leesburg, VA

Stamford's busiest thoroughfares, bound the other two sides. The builder would not be able to close streets for construction access.

Heller & Johnsen of Stratford, the geotechnical engineer, identified two soil layers over the 25-foot thick glacial outwash deposit at six to 15 feet depth. The four to 13-foot thick top fill consists of loose to medium dense, fine to coarse sand with varying amounts of brick, cinders, slag and ash. Under this is a two-foot thick layer of medium dense gray silt.

As construction began, the contrac-

High-Profile: CONNECTICUT FACILITIES DEVELOPMENT NEWS



Drilling piers on a tight site

gravel. However, this patented design-build system is a precise engineered product custom designed by Wheeler to the site conditions and 80 kip load-bearing capacity. To construct each pier, the licensed installers drilled a 30-inch diameter shaft seven to 10 feet deep below the spread footings. Then, a modified hydraulic hammer rammed 12-inch lifts of aggregate into the ground at 1one to 1.5 million-foot pounds of energy per minute. The hammer's beveled tamper compacted the gravel vertically and horizontally increasing lateral stresses and reinforcing surrounding soil.

"Stamford requires parking for ur-

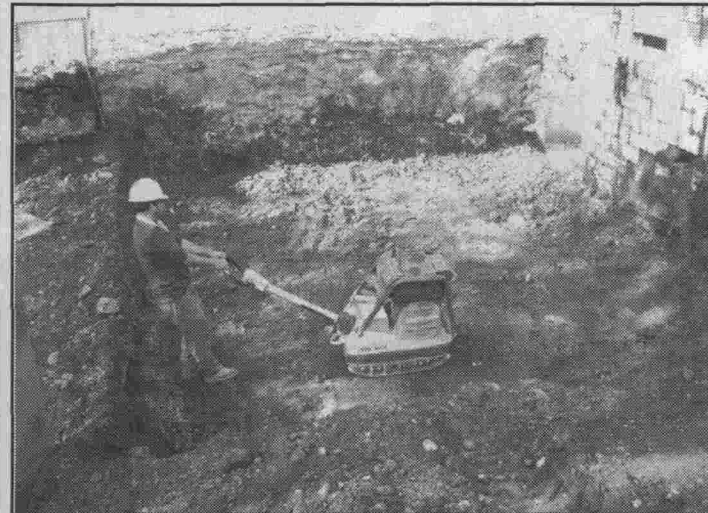


Drill, tarp and engineers, Quality Control in tight quarters

ban projects, but the city wanted to keep the street level pedestrian friendly," Feldman explains. "We could either put the garage below ground or elevate it."

JN+A designed the first floor as hotel lobby and restaurant space. A large porte-cochere leads into valet parking served by two hydraulic lifts that carry vehicles up and down from the second and third floor parking garage. To avoid bouncing headlight beams onto neighboring buildings and the street, Haynes is building a low wall just above headlight level, then will install two-story custom metal screens in classic Marriott Courtyard green in the window openings.

Marriott also expected JN+A to keep the Marriott Courtyard standards such as room size and the same amenities such as a swimming pool, exercise room and restaurant serving breakfast. According to Feldman, a typical Marriott



Compaction of foundation bearing surface.



Completed Geopier element

would have a landscaped interior, but in this case the landscaping will be a rooftop terrace above the parking garage.

Haynes had to work within tight site constraints. The city provided a small staging area by taking out some existing

parking. To bring in building materials, Willis called in a truck every half hour to off load and then leave the site. Berlin Steel of Kensington, designed micropile (concrete filled steel pipe piles) that Haynes Construction installed to form a working platform foundation for the tower crane needed for erection of precast ranging from five to 10 tons and three custom steel beams the porte-cochere opening weighing 789 pounds per foot.

Construction of the Marriott Courtyard started this past January and is slated for completion. the end of April 2004.