

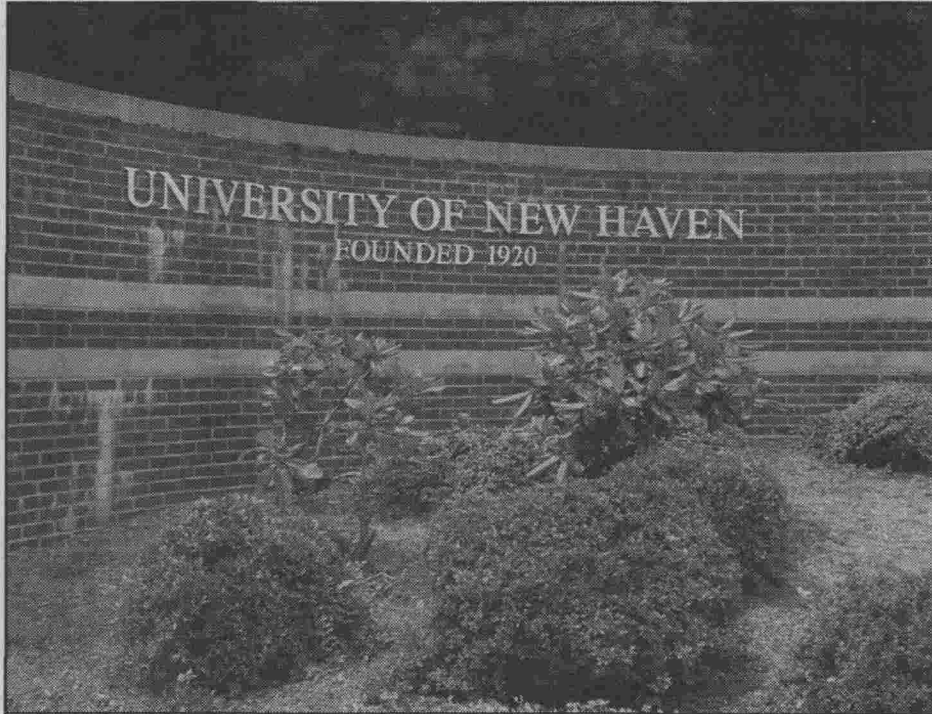
High-Profile Focus: **EDUCATIONAL FACILITIES DEVELOPMENT NEWS**

University of New Haven Builds Dormitory

Petra Construction Builder, Kagan Co. Architects

New Haven, CT - Six years ago only 15 percent of the student population at the University of New Haven lived on campus. Today nearly 50 percent of the 3,500 student population is residential. In the past six years the University has built four major dormitories to keep up with its changing demographics.

According to David Beckerman, chairman of the Acorn Group, New Haven, who is developing a new \$8-million dormitory to house 160 students and will lease it back to the university, the university has found its niches. These include a forensic science program, engineering program, ho-



tel and tourism school, and a sports management program. Within the next three years Beckerman sees three other buildings on the horizon: Henry Lee Forensic Science Building, a new recreation center and a major academic classroom building.

Since the university has limited land for expansion, the footprint of the new dormitory will cover land the university never planned for future construction. Decades ago to level the area for a practice field, the university brought in un-

specified construction fill. The eastern half of the 65,000 sf, five-story dormitory falls on this uncompacted debris while the opposite side sits on glacial till.

Geotechnical engineers Haley & Aldrich, (H&A) Inc. of East Hartford identified the unsuitable construction fill as a two to 15-foot thick layer of rubble/debris and boulder fill across the sloping site with the greatest thickness in the eastern half of the building footprint. Below the fill lies a one to five-foot layer of

medium-dense to dense alluvial soils and under this a one to seven foot layer of Glaciodeltaic deposits consisting of medium dense to dense sand with varying amounts of silt and gravel. In the deep fill area, H&A borings encountered weathered siltstone bedrock at depths in excess of 15 to 20 feet and groundwater eight to 10 feet deep.

"The challenge of this design was to create a bearing surface on the fill that was comparable to the dense half," says Raffaele Aschettino, Aschettino Associates LLC, West Haven. "Because we had fairly rigid finishes on the building, our biggest concern was preventing differential settlement."

John Dugan at H&A suggested looking into Geopier® soil reinforcement as an alternative and possible cost savings. Petra Construction Corp. of North Haven estimated a savings of \$30,000 with two weeks schedule advantage com-



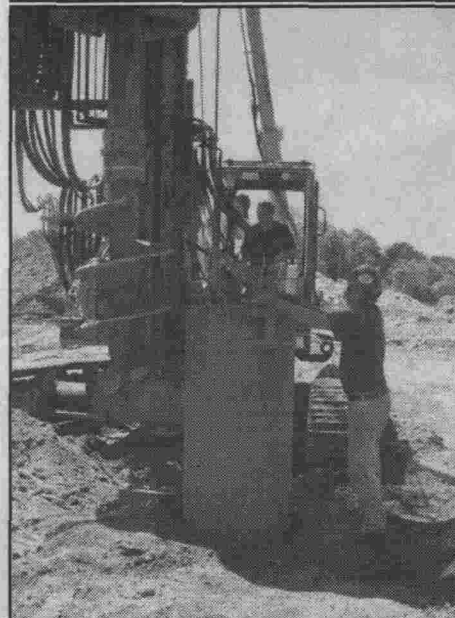
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pared to alternatives such as over-excavation and replacement. Geopier Designer James R. Wheeler, P.E. of Design/Build Geotechnical, Stow, Massachusetts produced a design of 124 Rammed Aggregate Piers to support the spread foundations with the existing fill soils.

In spite of the difficult site conditions with boulders as big as desk chairs and gigantic tree stumps, the licensed Geopier installer, Helical Drilling, Inc. Braintree, Massachusetts using its high torque drill, averaged 20 pier installations a day finishing the job in 8 working days.

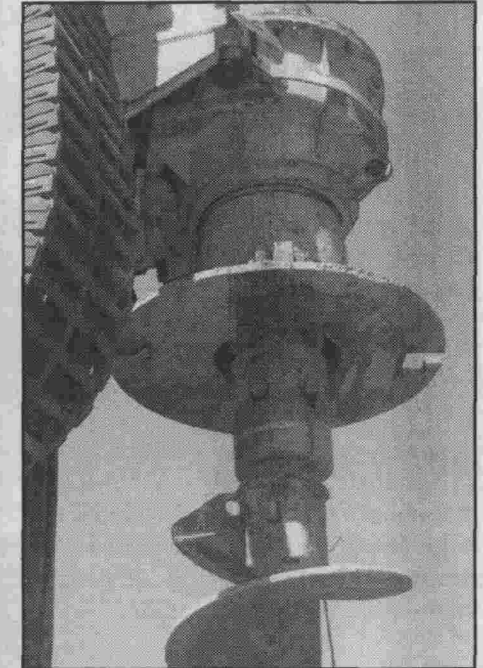
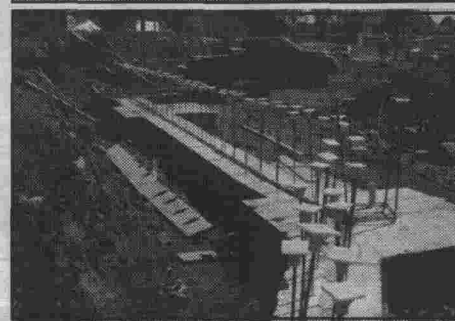
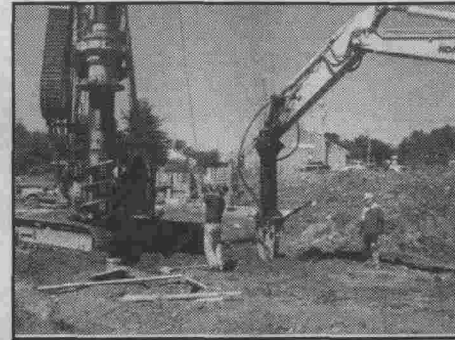
To the layperson the Geopier system resembles underground shafts of compacted gravel. However, this patented design-build system of multiple Rammed Aggregate Piers is a precise engineered product custom designed by Wheeler to the site conditions and desired 85 kip load-bearing capacity per pier. To construct each pier, Helical drilled a 30-inch diameter shaft to the nine to 11-foot design depth below the spread footings. Then, a modified hydraulic hammer rammed 12-inch lifts of 3/4 inch class two aggregate base rock into the ground at one to 1.5 million foot pounds of energy per minute. The hammer's beveled tamper compacted the gravel vertically and horizontally into the ground increasing lateral stresses and reinforcing the surrounding soil.

Since the building on its uphill side fronts on Business Route 1, Kagan designed retail space on the first level that can be leased and produce revenue for the university and tax revenue for West Haven.



"It's hoped this retail development will jump start positive development in the area," says Rosemary Benivegna, project architect, The Kagan Co.

The ground level opening onto the campus will feature a food service facility and also controlled access elevators serving dormitory floors. The structure



is steel frame partially sheathed with aluminum and glass curtain wall. Some brick veneer with stud backup will face the lower level, and a stucco exterior will face the upper levels. Colors are predominantly gray tones with blue accents in the glass spandrels framing the high energy glass curtain wall.

The architect included 10 design alternatives. Since Petra's pricing was so favorable, alternatives such as sunscreen along the ground level south facade and the signage band on the retail level are being included.

Construction started with ground breaking mid-June this year and continues on the fast track to an August 2004 completion in time for the 2004-2005 school year.