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Geopier foundation system helps builders adjust to soil

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As a project manager with Clark Construction Group in Bethesda, Hale Chopp knows he can't put up a building on top of loose soil. He also knows first-hand just how unpredictable the underground can be.

"There is just no way of knowing sometimes," he says. "Maybe the inspector may come out and tells you to dig down another four feet and bring in gravel. If you hit a bad spot of soil you could be digging down as far as it takes."

Such unplanned revisions to a site's foundation work cost time and money -- but Chopp is not having any such problem at the site of the new Oracle building in Reston. He's using a relatively new foundation system there, called Geopiers, and it is "taking all the guesswork out of this," he says.

For the past 100 years, foundation work has gone like this. You dig a great big hole, take out all the loose dirt, and replace it with tons of stone. The process works fine, but as Chopp points out, it can be awfully unpredictable. You just never know what's down there until you dig.

The Geopier system (<http://www.geopiers.com>) came along a dozen years ago, and has been used in the Washington, D.C. area for about the past four years. It's a more pinpointed process: to build the foundation, the contractor excavates a narrow shaft ♦ instead of a great big area ♦ and fills it with stone.

In cases where fill depths exceed five feet, Geopiers can save 10 to 50 percent of the foundation-related costs, according to Mike Cowell, president of GeoStructures in Leesburg, the firm that markets and installs the Geopier system in the mid-Atlantic and northeast regions.

Because the system offers a higher level of predictability, "we can usually shorten up the construction schedule anywhere from several weeks to a month," he says.

As senior vice president for construction and design at West Group in McLean, Va., Robert Abt used the system to support One Research Court, a four-story office building in Rockville. "It took weeks out of the schedule," he says, "and when you are talking about carrying the cost of a building for an extra few weeks, that is significant money."

He noted that the limited size of the Geopier hole makes it possible to work on the supports during inclement weather, whereas work on traditional fill typically stops in the cold and damp. "You can auger down and put the stone piers in weather that is a lot worse than you could work in for pile-type foundations or for much larger spread footings, where rain or freezing weather have much more of an impact," he says.

That does not mean that he would use it every time, however.

"It is another alternative to be considered when off-the-shelf spread footings are not appropriate," he says. "It won't beat the cost of spread footings in good soil, but when you have marginal soils -- which is true in most sites today -- it is another alternative to consider."

Cowell says Geopiers were used on 20 projects in 1999 in Washington, D.C., Virginia and Maryland, and on 30 projects in 2000. He says the growing popularity of the system is due to the relatively poor soil that underlies the Dulles Toll Road area, as well as most of the area west of I-95 from Philadelphia to Atlanta.

"The soils there are residual silts and they have a lot of differential weathering of the rock surface. You never know how deep the rock surface is going to go and therefore when a foundation project gets bid there is a large potential for going over budget, because you don't know what is underneath the ground," he says.

"With the Geopier option, we are not going real deep. We only have to go eight to 15 feet deep," and so there is far less chance of hitting surprises, he says.

As development manager on Oracle's new Reston building, Spaulding & Slye Colliers Assistant Vice President Reed Holiman says the use of Geopiers probably saved his client about \$100,000 in construction costs.

But Oracle's facilities manager says that neither time nor money were the primary reasons for using the non-traditional foundation solution. Rather, Oracle turned to the Geopiers because there was simply no other choice that would support the second building in its planned four-building complex, which should total 725,000 square feet when it is completed in 2007.

"The structural engineers have determined that that is the only procedure that can be done in order to ensure that the foundation is structurally sound," says Jack Suchland.

"It's not one of those things you would want to do every time you build a commercial office building, and we certainly didn't just go out on a limb and say, 'Hey, let's try it.' In fact, I doubt seriously that we would be doing this if it was not required for some structural reason," he says.