

# 2007 Fall Issue



Hollander 95 East Baltimore  
October Ground-breaking Ceremony

*A Structurally Sound Decision*

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## *From Soil Exploration to Foundation Design... Part 2*

Explore the second article in this four part series of articles brought to you by Fernando Garcia, PE and Diana Salazar, Msc, MBA of our Salisbury office.



## *Hollander 95: Rebirth of East Baltimore*

Meet the Hillis-Carnes team that has been involved in this project since it was first conceived and catch a glimpse of Mayor Sheila Dixon.



## *Granite Hill: A Multi-phase Approach*

Join Randall Fahs as he describes this unique project which presented both challenges in exploration and engineering.



## *Golfing "Fore" a Cause*

Find out who played hooky in September in support of two great causes.





## From Soil Exploration to Foundation Design: PART II

### A Four Part Series of Articles

By Fernando Garcia, P.E. and Diana M. Salazar, Msc, MBA

Before continuing on this series of articles, the authors want to apologize for a misprint in the previous edition which stated "...Cam clay model or the modified Cam clay model developed at the Massachusetts Institute of Technology (MIT) in Cambridge, MA..." these models have been developed and worked in Cambridge, UK.

#### SOILS EXPLORATION

In this edition, we will discuss and describe some applications of the various methodologies used to determine the type of soils, the thickness of the layers, the orientation and inclination of the layers, and finally the elevation of the groundwater level.

#### SOIL SAMPLING

Soil borings and test pits are two main ways to obtain soil samples. The former is practical, economical and does not disturb much surface area. The latter is a large scale ground opening performed by an excavator, which disturbs a larger amount of surface area.

Pros and Cons of Drilling vs. Testing Pitting:

1. In an auger boring, we obtain very punctual information from a 3 to 8 inch diameter hole.
2. The hole can remain open for 24, 48 or 72 hours by installing a pipe and the groundwater condition can be evaluated properly.
3. The test pit cannot be left open for a long period of time due to various safety risks such as someone falling into the pit or collapse.
4. The test pit may not have enough depth to safely obtain groundwater levels.

5. The test pit has a big opening and window to clearly view the thickness, characteristics and orientation of the soil layers.

There are two basic procedures that are typically utilized by Geotechnical Engineers to obtain soil samples. The first method is disturbed sampling in which samples are obtained utilizing flight augers, hand augers and excavators or shovels in test pits. The second is sometimes considered "ideal sampling" because it is almost impossible to obtain a sample that can be completely undisturbed. An example of an undisturbed sampling is taken with a sampler or with thin wall tubes commonly called "Shelby tubes". These tubes can be used very successfully in cohesive soils. For sands or granular soils, the Piston Sampler is often used which is defined as a thin wall tube incorporating a vacuum assist.

Another way to obtain undisturbed samples is by utilizing the fabrication of blocks in an open excavation, i.e. test pit, and shaving or shaping the block with a very sharp knife to reduce any potential new stress to the sample. Once the sample is ready to be used for testing at the soils lab, it is reshaped to a standard size for testing using a variety of mechanical methods. The material does not experience too much variation from its original stress condition by utilizing this method.

The same principle of "no disturbance" should be applied to samples in the tubes which are extruded at the soils laboratory before being tested to avoid stress relaxation. In this sampling section we include the Standard Penetration Test (SPT) because it is an in-situ test which includes sampling of the soils.

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Our offices provide a full range of services including: exploratory drilling & geotechnical engineering, environmental assessment & precondition surveys, construction inspection & materials testing, structural & forensic engineering, third party (building code) inspections, and specialized construction services (grouting and shoring). Our offices are fully staffed to meet the demands of any multi-task job. Call us today!

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## STANDARD PENETRATION TEST (SPT)

As mentioned in the previous article, the field in-situ testing is primarily the standard penetration test (SPT). The SPT is an in-situ dynamic penetration test designed to provide information about the strength of the soils based on energy correlations using the number of blows to penetrate 18

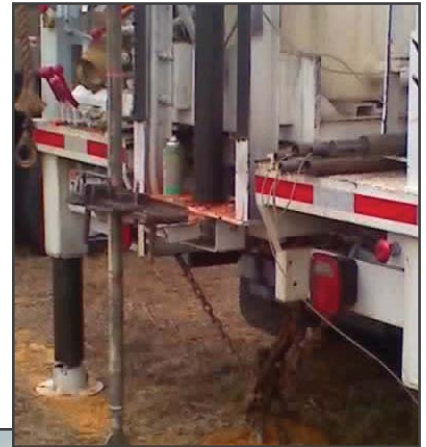


Figure 1: Drill Rig

inches in three 6-inch segments. The addition of the last two sets of blow counts is called N value and, corrected adequately in conjunction with empirical correlations, tables and formulas can give the Geotechnical Engineer the properties of soils. The test also provides a disturbed soil sample for visual classification and

characterization tests (i.e. Gradation, moisture content). Samples are taken by driving a 1-3/8 inch I.D. (2-inch O.D.) split-spoon sampler in accordance with ASTM D-1586 specifications. The sampler is first seated 6 inches to penetrate any loose cuttings and then is driven an additional foot with blows of a 140 pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot is designated as the "Penetration Resistance" or "N" value. The penetration resistance, when properly evaluated, is an index to the soil strength and compression characteristics.

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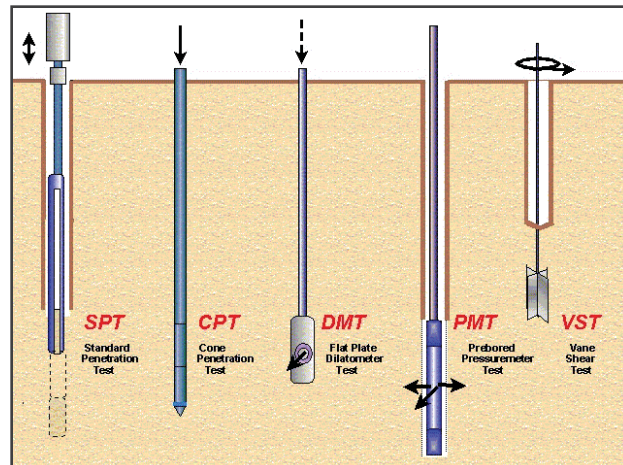


Figure 2: Split Spoon Operation - Test Sequence

# HOLLANDER 95

## *Rebirth of East Baltimore*

*By: Nicole Andrews, Director of Marketing & Sales*

### SUMMARY

In conclusion, we can summarize that there are several ways to obtain soil samples manually or with the aid of heavy equipment for the purpose of physically and visually classifying the soil samples in the laboratory.

It is very important to select the correct sampling equipment and test for the expected kind of soils at a job site based on the existing geology. For a site with mostly sandy soils and a combination of sand and gravel, standard penetration test (SPT) is an adequate sampling style which incorporates soil testing.

All the in-situ soil sampling of the site should be complemented with soils parameters testing of both disturbed and undisturbed samples to corroborate data with the appropriate laboratory classification or strength tests. In our next article scheduled for the 2008 winter issue, we will discuss the in-situ data acquisition of soils data to obtain the bearing capacity, estimate settlements and give the structural engineer the parameters to design the foundation system. §

### About the Authors

*Mr. Fernando Garcia is a Civil Engineer with a Master of Science in Geotechnical Engineering. He is the Chief Engineer in the Salisbury office of HCEA.*

*Ms. Diana Salazar is a Civil Engineer with a Master of Science in Civil Engineering. She has begun her tenure as Staff Engineer in the Salisbury office of HCEA in October 2007.*

Ground-breaking for the much-anticipated 51-acre Hollander 95 project in East Baltimore occurred on October 9, 2007. The new business park, which is expected to fuel revitalization and growth throughout the area, will bring nearly 500 new and relocated jobs. Representatives from Hillis-Carnes had the pleasure of attending the ceremony, along with Mayor Sheila Dixon, Jay Brodie from Baltimore



Development Corporation and our client, Mark Levy from H & H Rock Companies. Upon completion, Hollander 95, located on the site of the former Hollander Ridge public housing complex, will include more than 600,000 square feet of retail, office, flex, and industrial/warehouse space located near the key access points of Interstates 95 and 895 as well as the Port of Baltimore and downtown Baltimore.

Hillis-Carnes has been involved with Hollander 95 since the project was first conceived providing both environmental consulting and geotechnical engineering services. In 2004, Hillis-Carnes provided H & H Rock with a Phase I Environmental Site Assessment. We also identified jurisdictional wetlands and jurisdictional waters of the former Hollander Ridge property to prepare for the proposed alterations to 62nd Street and the construction of stormwater outfalls west of 62nd Street. This allowed H & H Rock to proceed with the next



*(Pictured L-R) Sherri Waldron, REM, CEA - Environmental Services Division Manager, Timothy Hill, PE - Director of Operations, Gina Galimberti, REM - Senior Environmental Project Manager of HCEA*

phase of the development in which Hillis-Carnes provided a geotechnical engineering and subsurface exploration program consisting of 63 soil borings to depths of 7 ft to 60 ft below existing site grades. In-situ infiltration tests were also conducted at locations offset from six to eight of the SWM area boring locations. Hillis-Carnes is currently providing testing and inspection services during construction to include: soil testing, concrete cylinder testing, and structural steel inspections. §

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## Golfing "Fore" a Cause

*15th Annual Sarah's House Golf Classic  
September 18th, 2007*

Sarah's House is a unique partnership between Anne Arundel County, the U.S. Army, and Catholic Charities. Since opening its doors in 1987, Sarah's House has assisted more than 9,000 homeless men, women and children in their journey toward independence. Participation in the Annual Golf Classic held at Queenstown Golf Club allows Sarah's House to continue to help their guests have better lives. Sponsors included: Whiting-Turner Contractors, Best Buy, and Reliance Net. This is the first year Hillis-Carnes has participated in this event. Many thanks are extended to Shannon Adkins, our Senior Administrator, for her dedication and support as the event organizer. §

*10th Annual Fairway to Life Golf Tournament  
September 24th, 2007*

Since opening its doors in 2005, the FAIRWAY TO LIFE breast care center at the University of Maryland Marlene and Stewart Greenbaum Cancer Center has provided diagnosis and follow-up care to more than 600 women in our community. The golf tournament, dinner, and live auction were held again this year at the Hunt Valley Golf Club in support of breast cancer programs. Proceeds from the event help support patient care research and cutting edge procedures to offer hope to cancer patients through better prevention, better detection, and better treatment. Sponsors included: Trigen-Baltimore Energy Corporation, the Herbert Berman Foundation, and Provident Bank. §



▲ (Pictured L-R) Robert Yonkers, PE of HCEA, Taglia Latela of 84 Lumber, David Adkins of HCEA, and Jason McCliment of the U.S. Army



(Pictured L-R) Alex Darnel, EIT, Nicole Andrews, David Buddemeyer, and David Adkins of HCEA ▶