

SECTION 00 31 00 – GEOTECHNICAL INVESTIGATIONS

PART 1 - GENERAL

1.1 SOIL BORINGS

- A. Test borings have been made at the site of the improvements. Logs of the test borings are included in a report titled “Subsurface Investigation, Field Hockey/Outdoor Tennis Complex”. The investigation and report were prepared by CTL Engineering.
- B. A copy of this report is included in this Project Manual.
- C. Logs of the test borings are not warranted by the University or the Architect/Engineer, except that they reflect the best and only information available at the time of design.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 31 00

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August 11, 2008

The EDGE Group  
1400 Goodale Blvd.  
Suite 100  
Columbus, OH 43212

Attention: Mr. Richard A. McBride, ASLA

Reference: Subsurface Investigation  
Field Hockey/Outdoor Tennis Complex  
OSU-080802  
Columbus, Ohio  
CTL Project No. 08050091COL

Dear Mr. McBride:

In accordance with your authorization to proceed, CTL Engineering, Inc. has completed the subsurface investigation at the above referenced site. Enclosed are three (3) copies of the report. A digital copy of the report was sent to Vince Jarrett with Jones-Stuckey Ltd., Inc.

Thank you for the opportunity to be of service to you on this project. If you have any questions, please contact our office.

Respectfully Submitted,

CTL ENGINEERING, INC.

  
Joe Grani, P.E.  
Project Engineer

# **SUBSURFACE INVESTIGATION**

**SUBSURFACE INVESTIGATION  
FIELD HOCKEY/OUTDOOR TENNIS COMPLEX  
OSU-080802  
COLUMBUS, OHIO  
CTL PROJECT NO. 08050091COL**

**PREPARED FOR:  
THE EDGE GROUP  
1400 GOODALE BLVD.  
SUITE 100  
COLUMBUS, OHIO 43212**

**PREPARED BY:**

**CTL ENGINEERING, INC.  
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**August 11, 2008**



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## **I. PROJECT LOCATION AND DESCRIPTION**

The project, identified as Field Hockey/Outdoor Tennis Complex, OSU-080802, involves the construction of a new Field Hockey Stadium and the reconstruction of the Varsity Tennis Center at The Ohio State University in Columbus, Ohio. The site is in the vicinity of the existing Varsity Tennis Center and located north of the existing Woody Hayes Athletic Center and west of Olentangy River Road.

The Field Hockey Stadium will be constructed in a grass field north of the existing tennis courts. It is understood that some earthwork will be required to level off the existing grade. It is also understood that the bleachers for the proposed stadium will be temporary and will be supported onto concrete slabs.

New tennis courts and a parking lot are planned in the vicinity of the existing tennis courts. Light poles, 30 to 50 feet in height, will be constructed in this area. It is understood the light poles will be supported onto foundations extending about 8 to 12 feet below existing grade. Additionally, it is understood that a small, single story, slab on grade building is planned immediately north of the tennis courts. It is assumed that the proposed grades in these areas will be similar to the existing grades.

## **II. SUBSURFACE INVESTIGATION**

Previous investigation of the site was conducted in the year 2004 (CTL Project No. 04050135). Several borings were drilled in the area of the proposed tennis courts and parking lot to depths ranging from 10 to 25 feet below existing grade. Recommendations for the proposed light poles, slab on grade building and parking lot are provided utilizing the soil information from these previous borings.

Four (4) additional borings designated as FH-1 through FH-4 were drilled as a part of this current investigation to depths ranging from 10 to 15 feet. Recommendations for the proposed field hockey stadium are provided utilizing the soil information from these borings. These test borings were drilled utilizing hollow stem augers (HSA) on May 19, 2008. Standard penetration tests were conducted using a 140-pound hammer falling 30 inches to drive a 2-inch O.D. split barrel sampler for 18 inches.

Samples obtained from the drilling operation were preserved in glass jars, visually classified in the field and laboratory, and tested for natural moisture content. Representative soil samples were subjected to additional laboratory testing including grain size analyses, Atterberg limits, unconfined compression and unit weight.



A percolation test was performed in the vicinity of boring FH-2. Results of the percolation test are appended to this report.

Ground surface elevations at the test boring locations were provided to CTL by personnel from Jones-Stuckey Ltd., Inc.

### III. FINDINGS

#### A. Visual Observations

The ground surface in the vicinity of the proposed field hockey stadium is relatively flat and is covered with grass and topsoil. Tennis courts are located south of the proposed stadium and apartments were located west of the proposed stadium. At the time of drilling, no signs of surface water retention were noted at across the site.

#### B. Subsurface Conditions

Test borings FH-1 to FH-4 generally exhibited 3 to 6 inches of topsoil at the surface. Below, the borings encountered fill or possible fill materials described as sandy silt, silty clay and/ or sand and gravel sand to the completion depths of all borings (10 to 15 feet). These soils exhibited penetration values ranging from 4 blows per foot (bpf) to 50 blows for 2 inches penetration, with natural moisture content values ranging from 5 to 28 percent

Groundwater and soil cave-in depths were recorded during the field investigation as tabulated below.

Boring No.	Groundwater Depth (feet)		Cave-In Depth (feet)
	During Drilling	At Completion	
FH-1	7.0	5.8	5.8
FH-2	Dry	Dry	---
FH-3	Dry	Dry	---
FH-4	9.1	Dry	9.4

**C. Percolation Test**

A percolation test was performed at the site in the vicinity of test boring FH-2. On May 19, 2008, three (3) holes about 8 inches in diameter were augered to depths of about 30 inches. The holes were scarified and filled with water. On May 20, 2008, a geologist from CTL Engineering refilled the holes and took percolation readings.

The percolation rates measured in the holes ranged from 13.3 to 30.0 minutes to for the water level to drop 1 inch.

**IV. DISCUSSION**

**Light Poles**

Test borings from the previous investigation are being utilized to provide recommendations for the proposed light poles. It is understood that the light poles will be 30 to 50 feet in height and are planned to be supported onto drilled pier foundations extending about 8 to 12 feet below existing grade.

The proposed light poles may be supported onto drilled piers extending into the native soils at least 10 feet below existing grade.

Groundwater levels were measured in the previous test borings drilled in this area at depths ranging from 6.0 to 14.2 feet below grade. The groundwater is generally associated with the underlying granular deposits. Groundwater should be expected during excavation and construction of the drilled piers. Concrete placement below the groundwater level will require tremie methods.

**Building**

It is understood that the proposed building will likely be constructed in the area of borings B-10 and B-11 (previous investigation). It is also understood that the building will be a single story, slab on grade building. At the time that this report was prepared, plans and finish floor elevation for the proposed building had not been provided to us. However, it is assumed that the proposed grades in this area will be similar to the existing grade.



Dark colored fill material with roots was encountered in the upper 2.5 feet of boring B-11. This dark colored fill material is not suitable to be left in place below the proposed building. This fill should be removed from below the limits of the proposed building and replaced with properly compacted engineered fill.

The native soils below the fill in boring B-11 and below the topsoil in boring B-10 were relatively weak to depths of 5.5 and 3.0 feet below grade, respectively. Building foundations constructed in this area would need to be extended through the weak soils and into the more competent underlying soils.

The relatively weak native soils may be left in-place below the floor slab provided that it is stable during proofrolling and provided that the subgrade is observed and approved by the Soils Engineer. If the soils exhibit excessive rutting or deflections during proofrolling, then the soils should be removed and replaced with properly compacted fill.

#### Tennis Courts and Parking Lots

The site is considered suitable for the intended construction. However, existing fill and relatively weak native soils were encountered in several of the borings. Utility lines located within the proposed tennis courts that are not scheduled to remain should be removed, or abandoned in place. Resulting excavations should be backfilled with properly compacted-engineered fill, preferably granular fill. If any of the sewer lines are to be abandoned in place, they should be grouted full, to avoid potential future collapse and loss of support.

At the time of construction and proofrolling, special attention should be given to the existing fill, including utility trench backfill. Fill that is clean and stable at the time of construction may be left in-place, provided that it is observed and approved by the Soils Engineer. Fill that contains organic soils or debris, or that is wet or weak (does not hold up to proofrolling) should be removed and replaced with new controlled fill.

#### Field Hockey Stadium and Bleachers

Test borings from the current investigation are utilized to provide recommendations for the proposed field hockey stadium and bleachers. At the time that this report was prepared, no plans had been provided to us. However, it is understood that the Field Hockey Stadium will be constructed in a grass field north of the existing tennis courts. It is assumed that some earthwork will be required to level off the existing grade. It is also understood that the bleachers for the proposed stadium will be temporary and will be supported onto concrete slabs.



It is understood that the bleachers will likely be constructed in the area of boring FH-1. The fill material encountered in boring FH-1 is relatively weak and not suitable to support the slabs for the bleachers. The existing fill material is not suitable to be left in place in the upper 3.0 feet of the proposed slab subgrade. This fill material should be removed to a depth of 3.0 feet below the proposed bottom of slab and replaced with properly compacted engineered fill. The fill removal should extend a minimum horizontal distance of 5 feet beyond the perimeter of the proposed slabs.

Provided that the slabs are constructed onto at least 3 feet of newly compacted engineered fill as described above, the slabs may be proportioned using a net allowable soil bearing capacity not to exceed 2.0 Kips per square foot (Ksf) or a subgrade modulus not exceeding 100 pounds per cubic inch (pci).

In the are of the proposed athletic field, fill that is clean and stable at the time of construction may be left in-place, provided that it is observed and approved by the Soils Engineer. Fill that contains organic soils or debris, or that is wet or weak (does not hold up to proofrolling) should be removed and replaced with new controlled fill.

## V. ANALYSIS AND RECOMMENDATIONS

Based upon the preceding *Discussion* as well as the soil data obtained from the field and laboratory testing, the following recommendations are provided.

### A. General Site Preparation and Earthwork

1. All topsoil and existing pavement encountered within the proposed construction limits should be removed. The topsoil may be stockpiled for use in future landscaping. Clean base course, if any, may be stockpile for reuse.
2. Any existing buried structures such as foundations, or slabs should be removed from below the new structures. Existing utilities within the proposed construction limits that are not scheduled to remain should be removed or relocated. Excavations from the removal of underground structures should be backfilled with properly compacted engineered fill, preferably granular fill. Sewer lines abandoned in-place, if any, should be grouted full, to avoid potential future collapse and loss of support.
3. Care should be taken while excavating adjacent to the existing building so as not to undermine existing footings or floor slabs.



4. During earthwork operations, care should be taken to provide adequate drainage on the surface of exposed soils. Absorption of heavy rainfall, accumulations of water and heavy construction traffic may result in softening of these soils, hence, severely weakening the strength of subgrade soils.
5. Subsequent to topsoil removal and excavation to the proposed grade, and prior to fill placement, the exposed surface should be compacted and/or proofrolled until a relatively unyielding surface is achieved. Soft or loose soils, wherever encountered, should be disked, dried and recompactd, or undercut and replaced with engineered fill or otherwise as directed by the Soils Engineer.
6. Where new fill will be placed on existing slopes, slopes that are steeper than 8:1 Horizontal to Vertical (H:V) should be continuously benched over those areas. Benches should be of sufficient width to permit operations of placing and compacting equipment.
7. Fill material required to raise the grade may consist of silty-clayey soils, crushed limestone or sand and gravel. Topsoil and/or organically contaminated soils are not considered suitable for use as engineered fill. All fill materials should be observed and approved by the Soils Engineer prior to placement.
8. The engineered fill should be placed in layers not to exceed 8 inches in loose thickness, with each layer compacted to 100 percent of the maximum dry density as determined by ASTM D-698 standard method (AASHTO T-99), or as otherwise directed by the Soils Engineer.
9. Permanently exposed slopes should be laid back at a slope rate no steeper than 2:1 Horizontal to Vertical (H:V). These slopes should be seeded and vegetation growth permitted to limit sloughing and erosion.
10. No groundwater is expected during excavation and construction of shallow foundation units. Depending upon the depth of the excavation, excavations for light poles or utilities may encounter groundwater.

**B.1 Foundation Support - Building**

1. The proposed building may be supported onto foundation units extending through the relatively weak upper soils and into the competent underlying soils. All foundation bearing surfaces should be observed and approved by the Soils Engineer.
2. Foundations for the building may be proportioned using a net allowable soil bearing capacity not to exceed 2.0 Kips per square foot (Ksf). This bearing value applies to the total of all design loads.

As an alternative to extending the foundations through the weak soils, soft soils below the footings should be removed and lean concrete placed up to the proposed footing bearing level.

3. The minimum widths for individual column and continuous footings should be 24 and 16 inches, respectively. The minimum widths are considered advisable to provide a margin of safety against local or punching shear failure.
4. Exterior footings should be constructed at a minimum depth of 3.0 feet below the lowest adjacent exterior grade, to offset the effects of frost penetration.
5. Settlement of footings supported as recommended may vary across the site due to variations in the soil composition, void ratio and loading. However, it is estimated that total and differential settlements will be within tolerable limits.
6. Building floor slabs should be supported directly on a base course of approved granular material placed on top of the newly placed engineered fill or approved in-place soils. The granular base should be of adequate thickness to provide support and to act as a capillary moisture break.

**B.2 Foundation Support - Light Poles**

1. The proposed light poles may be supported onto drilled piers extending into native soils at least 10 feet below existing grade. All foundation bearing surfaces should be observed and approved by the Soils Engineer. If the soils at the planned bearing level exhibit weak conditions, the weak soils should be removed and lean concrete placed up to the proposed bearing level.



2. Pier bases may be proportioned using an allowable end bearing capacity value not exceeding 3.0 Kips per square foot (Ksf).
3. The piers should be cased to prevent cave-in, minimize seepage into the hole and to protect the Soils Engineer/Inspector during cleaning and observation. OSHA and ADSC safety regulations should be followed during cleaning and observation.
4. Groundwater should be expected during excavation and construction of drilled pier foundation units. Concrete placement below the water level will require tremie methods.

**B.3 Foundation Support – Bleacher Slabs**

1. The proposed slabs for bleachers may be supported onto 3 feet of newly placed engineered fill as described in the Discussion section of this report. The upper 6 inches of the fill should consist of crushed granular material.
2. The slabs may be proportioned using a net allowable soil bearing capacity not to exceed 2.0 Kips per square foot (Ksf) or a subgrade modulus not exceeding 100 pounds per cubic inch (pci).

**C. Pavement Support**

In addition to the recommendations provided in the *Discussion* and *General Site Preparation and Earthwork* sections of this report, the following Construction Considerations are provided for the proposed paved areas.

**Construction Considerations**

Soils with a maximum dry weight of less than 100 pounds per cubic foot are unsuitable for use in the upper 12 inches of subgrade. Such soils, if encountered, should be removed and replaced with engineered fill.

Subsequent to site clearing, the exposed surface should be compacted and/or proofrolled in the presence of the Soils Engineer until a relatively unyielding surface is achieved. Random debris or unsuitable soils, if encountered, should be removed and replaced with properly compacted engineered fill.



In the event that excessive rutting or deflections occur during proofrolling operations, the soft soils should be excavated to a maximum depth of 24 inches below final subgrade. If the soils at the excavated depth still exhibit soft conditions, a layer of geogrid may be used to provide a stable surface for fill placement. In the event that a geogrid is used, a minimum of 12 inches of granular fill should be placed directly over the geogrid.

Proper surface drainage should be provided throughout the paved areas. Finger drains should be installed in the area of the catch basins.

All pavement materials should conform to the State of Ohio Department of Transportation Construction and Material Specifications.

Due to the variation in the near surface soils at the site, it is recommended that the pavements be designed using a relatively conservative California Bearing Ratio (CBR) value of 3.0.

#### **Pavement Compositions**

Provided the subgrade is prepared as stated in the above construction considerations, the following pavement compositions are recommended.

#### **Auto Parking – No Truck Traffic**

1.5 inches Asphalt Concrete, Surface Course

1.5 inches Asphalt Concrete, Intermediate Course

0.15 to 0.20 gallons per square yard Prime Coat

8.0 inches Aggregate Base, ODOT Item 304, compacted to the maximum density

#### **Heavy Duty Pavement**

The design of a heavy duty pavement section will depend upon several factors including the traffic type and volume. CTL can provide recommendations for Heavy Duty Pavement sections upon receiving traffic type and volume data.



**VI. CHANGED CONDITIONS**

Should details for the proposed facility be changed from those used in preparing this report, the Soils Engineer should be notified to make the necessary modifications in our recommendations to account for the changed conditions.

**VII. TESTING AND OBSERVATION**

Experience shows that subsurface conditions in an area sometimes vary from the ones indicated in the borings at their specific locations. It is therefore recommended that a Soils Technician, under the supervision of a qualified Soils Engineer, be retained on site to observe all earthwork and verify the bearing capacity value provided in this report.

**VIII. CLOSING**

CTL Engineering, Inc. has prepared this report for your use in accordance with generally accepted soil and foundation engineering practices. Analysis, conclusions and other work product of CTL Engineering, Inc. are instruments of service for this project only.

Soil samples will be retained in our laboratory for a period of 60 days, after which they will be discarded unless instructions are received from you as to their disposal.

CTL Engineering's assignment does not include, nor does this geotechnical report address, the environmental aspects of the particular site.

Respectfully Submitted,

**CTL ENGINEERING, INC.**

  
Sastry Malladi  
Staff Engineer

  
Joe Grani, P.E.  
Project Engineer





September 10, 2008

The EDGE Group  
1400 Goodale Blvd.  
Suite 100  
Columbus, OH 43212

Attention: Mr. Richard A. McBride, ASLA

Reference: Addendum to Subsurface Investigation  
Field Hockey/Outdoor Tennis Complex  
OSU-080802  
Columbus, Ohio  
CTL Project No. 08050091COL

Dear Mr. McBride:

This letter is an addendum to our report submitted on August 8, 2008 for this project. New plans were provided to us in an email on August 14, 2008.

The plans indicate that a new parking lot will be constructed west of the existing tennis courts and bleachers for the tennis courts will be constructed north of the tennis courts. It is understood that the new bleachers for the tennis courts will be supported onto drilled piers. It is also understood that periodic truck traffic is expected in the parking lot.

### **RECOMMENDATIONS**

Recommendations for the proposed tennis bleachers and parking lot are provided below.

#### **Tennis Bleachers**

1. The proposed bleachers may be supported onto drilled piers extending through any in-place fill and into native soils at least 10 feet below existing grade. If weak soils are encountered at the planned bottom of the pier, the weak soils should be removed and lean concrete placed up to the planned bottom of pier elevation.
2. Pier bases may be proportioned using an allowable end bearing capacity value not exceeding 3.0 Kips per square foot (Ksf).
3. The piers should be cased to prevent cave-in, minimize seepage into the hole and to protect the Soils Engineer/Inspector during cleaning and observation. OSHA and ADSC safety regulations should be followed during cleaning and observation.

4. Groundwater levels were measured in the previous test boring drilled in this area at depths ranging from 6.0 to 14.2 feet below grade. The groundwater is generally associated with the underlying granular deposits. Groundwater should be expected during excavation and construction of the drilled piers. Concrete placement below the groundwater level will require tremie methods.

**Pavement Support**

It is understood that some truck traffic is expected in the parking lot. The trucks will consist of TV/Satellite Trucks.

Fill materials that are clean and stable at the time of construction may be left in-place, provided that it is observed and approved by the Soils Engineer. Fill that contains organic soils or debris, or that is wet or weak (does not hold up to proofrolling) should be removed and replaced with new controlled fill.

Provided that the pavement subgrade is prepared as recommended in our August 8, 2008 report, the following pavement composition may be used for the parking lot with heavy loads.

10.0 inches Granular Base – COC Item 304

3.0 inches Level Course – COC Item 402

1.75 inches Surface Course – COC Item 404

We appreciate the opportunity to be of service to you on this project. If you have any questions or need further information, please feel free to contact our office.

Respectfully Submitted,

**CTL ENGINEERING, INC.**

*Sastry M.V.S.*  
Sastry Malladi  
Staff Engineer

*Joe Grani*  
Joe Grani, P.E.  
Project Engineer



**APPENDIX A**

**TEST BORING RECORDS**



## SOIL DESCRIPTION

### NON-COHESIVE SOIL DESCRIPTION

### STANDARD PENETRATION BLOW COUNTS PER FOOT (BPF)

Very Loose.....	0 - 4
Loose.....	5 - 10
Medium Dense.....	11 - 30
Dense.....	31 - 50
Very Dense.....	Over 50

### COHESIVE SOIL DESCRIPTION

### STANDARD PENETRATION BLOW COUNTS PER FOOT (BPF)

Very Soft.....	0 - 1
Soft.....	2 - 4
Medium Stiff.....	5 - 8
Stiff.....	9 - 15
Very Stiff.....	16 - 30
Hard.....	Over 30

### GRADATION COMPONENT

### SIZE

Boulders.....	Larger Than 8"
Cobbles.....	8" to 3"
Coarse Gravel.....	Passing 3" Retained on 3/4"
Fine Gravel.....	Passing 3/4", Retained on #10
Coarse Sand.....	Passing #10, Retained on #40
Fine Sand.....	Passing #40, Retained on #200
Silt.....	0.074mm (Passing #200) to 0.005mm
Clay.....	Smaller Than 0.005 mm

### COMPONENT MODIFIERS

### PERCENT BY WEIGHT

Trace of.....	0 - 1%
Traces of.....	2 - 10%
Little.....	11 - 20%
Some.....	21 - 35%
And.....	36 - 50%

### NON-COHESIVE SOIL DESCRIPTION

### MOISTURE TERMS

### COHESIVE SOIL DESCRIPTION

Powdery.....	Dry.....	Powdery
Some Moisture.....	Damp.....	Below Plastic Limit
Damp to the Touch.....	Moist.....	Above Plastic, Below Liquid Limit
Free Water.....	Wet.....	Above Liquid Limit



## TEST BORING RECORD

**CLIENT** : The Edge Group  
**PROJECT** : OSU Field Hockey  
**LOCATION** : Woody Hayes Athletic Center, OH  
**PROJECT NO.** : 08050091COL


**BORING NO.** : FH-1  
**SHEET** : 1 OF 1  
**DATE STARTED** : 05-19-08  
**DATE COMPLETED** : 05-19-08

<b>BORING ELEVATION</b> : 731.7 Feet <b>STATION</b> : _____ <b>OFFSET</b> : _____ <b>DEPTH</b> : 10.0 Feet	<b>BORING METHOD</b> : HSA <b>RIG TYPE</b> : Geo Probe <b>CASING DIA.</b> : 2.25 <b>CORE SIZE</b> : _____	<b>HAMMER</b> : Auto <b>DRILLER</b> : JG <b>TEMPERATURE</b> : 50° <b>WEATHER</b> : Cloudy
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**GROUNDWATER**:  Encountered at 7.0'  At completion 5.8'  Caved in at 5.8'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHTpcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
731.2		TOPSOIL (6")	0.5											
		Medium Stiff, Brown CLAYEY SILT, Little Sand, mixed with Topsoil and Organics, Damp (FILL)		SS-1	2 3 4	7	28	21		5.5*				
728.7			3.0											
	5	Soft, Gray CLAYEY SILT, Little Sand with Organics, Damp (FILL)		SS-2	1 2 2	4	28	17						
725.7			6.0											
		Medium Dense to Dense, Brown SAND AND GRAVEL, Some Silt, Trace Clay with Cobbles and Limestone Fragments, Wet (FILL)		SS-3	5 10 14	24	50	15						
				SS-4	8 20 27	47	72	14						
721.7	10	BOTTOM OF BORING	10.0											
	15													
	20													

TEST BORING/PIIT RECORD 08050091COL.GPJ CTL CORPORATE.GDT 8/11/08


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**BORING METHOD**  
 HSA - Hollow Stem Auger  
 SFA - Solid Flight Auger  
 RC - Rock Coring  
 MD - Mud Drilling  
 WD - Wash Drilling  
 HA - Hand Auger

**SAMPLING METHOD**  
 SS - Split Spoon Sample  
 ST - Shelby Tube Sample  
 CR - Rock Core Sample  
 BS - Bag Sample

**ABBREVIATIONS**  
 \* - Hand Penetrometer  
 LL - Liquid Limit  
 PL - Plastic Limit  
 PI - Plasticity Index  
 SPT - Standard Penetration Test

## TEST BORING RECORD

**CLIENT** : The Edge Group  
**PROJECT** : OSU Field Hockey  
**LOCATION** : Woody Hayes Athletic Center, OH  
**PROJECT NO.** : 08050091COL

**BORING NO.:** FH-2  
**SHEET** 1 OF 1  
**DATE STARTED** : 05-19-08  
**DATE COMPLETED** : 05-19-08

<b>BORING ELEVATION</b> : 733.7 Feet <b>STATION</b> : _____ <b>OFFSET</b> : _____ <b>DEPTH</b> : 10.0 Feet	<b>BORING METHOD</b> : HSA <b>RIG TYPE</b> : Geo Probe <b>CASING DIA.</b> : 2.25 <b>CORE SIZE</b> : _____	<b>HAMMER</b> : Auto <b>DRILLER</b> : JG <b>TEMPERATURE</b> : 50° <b>WEATHER</b> : Cloudy
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**GROUNDWATER:** Encountered at Dry At completion Dry

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHTpcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
733.2		TOPSOIL (6")	0.5											
		Loose, Brown SANDY SILT, Some Clay, Trace Gravel with Organics, Damp (FILL)		SS-1	2 4 4	8	56	18						
730.2			3.5											
	5	Soft, Brown SILTY CLAY, Trace Gravel, Moist (FILL)		SS-2	3 3 2	5		20						
727.7			6.0											
		Dense to Very Dense, Brown SAND AND GRAVEL, Little Clay, Little Silt, Moist (FILL)		SS-3	5 9 22	31	50	12						
723.7			10.0											
	10	BOTTOM OF BORING		SS-4	36 50-2"		22	5						

TEST BORING RECORD 08050091COL.GPJ C.T.L. CORPORATE.GDT 07/1/08

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 Email: [ctl@ctleng.com](mailto:ctl@ctleng.com)

**BORING METHOD**  
 HSA - Hollow Stem Auger  
 SFA - Solid Flight Auger  
 RC - Rock Coring  
 MD - Mud Drilling  
 WD - Wash Drilling  
 HA - Hand Auger

**SAMPLING METHOD**  
 SS - Split Spoon Sample  
 ST - Shelby Tube Sample  
 CR - Rock Core Sample  
 BS - Bag Sample

**ABBREVIATIONS**  
 \* - Hand Penetrometer  
 LL - Liquid Limit  
 PL - Plastic Limit  
 PI - Plasticity Index  
 SPT - Standard Penetration Test

## TEST BORING RECORD

**CLIENT** : The Edge Group  
**PROJECT** : OSU Field Hockey  
**LOCATION** : Woody Hayes Athletic Center, OH  
**PROJECT NO.** : 08050091COL


**BORING NO.** : FH-3  
**SHEET** : 1 OF 1  
**DATE STARTED** : 05-19-08  
**DATE COMPLETED** : 05-19-08

<b>BORING ELEVATION</b> : 734.6 Feet <b>STATION</b> : _____ <b>OFFSET</b> : _____ <b>DEPTH</b> : 10.0 Feet	<b>BORING METHOD</b> : HSA <b>RIG TYPE</b> : Geo Probe <b>CASING DIA.</b> : 2.25 <b>CORE SIZE</b> : _____	<b>HAMMER</b> : Auto <b>DRILLER</b> : JG <b>TEMPERATURE</b> : 50° <b>WEATHER</b> : Cloudy
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**GROUNDWATER:** Encountered at Dry At completion Dry

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
734.4		TOPSOIL (3")	0.3											
		Medium Stiff to Stiff, Brown CLAYEY SILT, Trace Sand, Trace Gravel with Organics and Cobbles, Damp (FILL)		SS-1	3 4 3	7		14						
	5			SS-2	2 4 6	10	1							
729.1		Medium Dense to Dense, Brown SAND AND GRAVEL with Crushed Limestone and Cobbles, Damp (FILL)	5.5	SS-3	3 6 14	20	16	6						
				SS-4	5 20 16	36	39	8						
724.6	10	BOTTOM OF BORING	10.0											

TEST BORING/PIT RECORD 08050091COL.GPJ CTL CORPORATE.GOT 8/11/08

 <p>                     2860 Fisher Road                      Columbus, Ohio 43204                      Telephone: 614-276-8123                      Fax: 614-276-6377                      Email: <a href="mailto:ctl@ctieng.com">ctl@ctieng.com</a> </p>	<b>BORING METHOD</b>	<b>SAMPLING METHOD</b>	<b>ABBREVIATIONS</b>
	HSA - Hollow Stem Auger SFA - Solid Flight Auger RC - Rock Coring MD - Mud Drilling WD - Wash Drilling HA - Hand Auger	SS - Split Spoon Sample ST - Shelby Tube Sample CR - Rock Core Sample BS - Bag Sample	* - Hand Penetrometer LL - Liquid Limit PL - Plastic Limit PI - Plasticity Index SPT - Standard Penetration Test

## TEST BORING RECORD

CLIENT : <u>The Edge Group</u>	BORING NO.: <u>FH-4</u>	
PROJECT : <u>OSU Field Hockey</u>	SHEET <u>1</u> OF <u>1</u>	
LOCATION : <u>Woody Hayes Athletic Center, OH</u>	DATE STARTED : <u>05-19-08</u>	
PROJECT NO. : <u>08050091COL</u>	DATE COMPLETED : <u>05-19-08</u>	
BORING ELEVATION : <u>735.0 Feet</u>	BORING METHOD : <u>HSA</u>	HAMMER : <u>Auto</u>
STATION : _____	RIG TYPE : <u>Geo Probe</u>	DRILLER : <u>JG</u>
OFFSET : _____	CASING DIA. : <u>2.25</u>	TEMPERATURE : <u>50°</u>
DEPTH : <u>15.0 Feet</u>	CORE SIZE : _____	WEATHER : <u>Cloudy</u>

GROUNDWATER: Encountered at 9.1' At completion Dry Caved In at 9.4'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
734.5		TOPSOIL (6")	0.5								32	22	10
732.0		Medium Stiff, Brown, SANDY SILT, Little Clay, Trace Gravel with Organics, Damp (FILL)	3.0	SS-1	1 3 2	5	50	21					
	5	Medium Stiff, Brown CLAYEY SILY, Trace Sand, Trace Gravel with Organics, Damp (POSSIBLE FILL)		SS-2	1 4 4	8	72	28	122	5.0*			
				SS-3	3 3 4	7	100	27	127	5.0*			
726.2		Very Loose, Brown SILTY SAND, Some Gravel, Wet (POSSIBLE FILL)	8.8	SS-4A SS-4B SS-4C	1 2 1	3	67	23 24 16	126				
721.5		Very Stiff, Brown CLAYEY SILT, Some Sand, Little Gravel with Organics and Cobbles, Moist (POSSIBLE FILL)	13.5	SS-5	5 8	22		23		2.5*			
720.0	15	BOTTOM OF BORING	15.0		14								

TEST BORING/PIT RECORD 08050091COL.GPJ CTL CORPORATE.GDT 8/11/08

<p><b>2860 Fisher Road</b> Columbus, Ohio 43204 Telephone: 614-276-8123 Fax: 614-276-6377 Email: <a href="mailto:ctl@ctleng.com">ctl@ctleng.com</a></p>	<b>BORING METHOD</b>	<b>SAMPLING METHOD</b>	<b>ABBREVIATIONS</b>
	HSA - Hollow Stem Auger SFA - Solid Flight Auger RC - Rock Coring MD - Mud Drilling WD - Wash Drilling HA - Hand Auger	SS - Split Spoon Sample ST - Shelby Tube Sample CR - Rock Core Sample BS - Bag Sample	* - Hand Penetrometer LL - Liquid Limit PL - Plastic Limit PI - Plasticity Index SPT - Standard Penetration Test



# TEST BORING RECORD

**CLIENT** : Jones-Stuckey, Ltd.  
**PROJECT** : Woody Hayes Athletic Center Expansion & Renovation  
**LOCATION** : Columbus, Ohio  
**PROJECT NO.** : 04050135


**BORING NO.** : B-2  
**SHEET** : 1 OF 1  
**DATE STARTED** : 11-02-04  
**DATE COMPLETED** : 11-02-04

<b>BORING ELEVATION</b> : 737.9 Feet <b>STATION</b> : _____ <b>OFFSET</b> : _____ <b>DEPTH</b> : 20.0 Feet	<b>BORING METHOD</b> : HSA <b>RIG TYPE</b> : _____ <b>CASING DIA.</b> : 3.25" <b>CORE SIZE</b> : _____	<b>HAMMER</b> : Auto <b>DRILLER</b> : BG <b>TEMPERATURE</b> : _____ <b>WEATHER</b> : Clear
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**GROUNDWATER:** Encountered at 18.0' At completion 13.0' Caved in at 14.5'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
737.0		ASPHALT CONCRETE (1.5") OVER BASE COURSE(6")	0.9											
		Medium Stiff, Damp, Brown SILTY CLAY Contains Concrete Fragments (FILL)		SS-1	4 3 4	7	56	17						
733.4	5		4.5	SS-2	4 3 4	7	56	22						
		Medium Dense, Damp, Brown SILTY SAND		SS-3	4 5 10	15	44	8						
727.9	10		10.0	SS-4	14 10 10	20	33	6						
		Medium Dense, Wet, Brown Fine to Coarse SAND AND GRAVEL, Trace Clay		SS-5	4 6 6	12	56	19						
720.9	15		17.0											
		Medium Dense, Wet, Gray Fine SAND with Cobbles, Trace Silt		SS-6	9 9 10	19	56	12						
717.9	20		20.0											
		BOTTOM OF BORING												

TEST BORING/PI RECORD 04050135.GPJ CTL CORPORATE.GDT 7/8/08


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**BORING METHOD**  
 HSA - Hollow Stem Auger  
 SFA - Solid Flight Auger  
 RC - Rock Coring  
 MD - Mud Drilling  
 WD - Wash Drilling  
 HA - Hand Auger

**SAMPLING METHOD**  
 SS - Split Spoon Sample  
 ST - Shelby Tube Sample  
 CR - Rock Core Sample  
 BS - Bag Sample

**ABBREVIATIONS**  
 \* - Hand Penetrometer  
 LL - Liquid Limit  
 PL - Plastic Limit  
 PI - Plasticity Index  
 SPT - Standard Penetration Test

## TEST BORING RECORD

**CLIENT** : Jones-Stuckey, Ltd.  
**PROJECT** : Woody Hayes Athletic Center Expansion & Renovation  
**LOCATION** : Columbus, Ohio  
**PROJECT NO.** : 04050135

**BORING NO.** : B-3  
**SHEET** : 1 OF 1  
**DATE STARTED** : 11-02-04  
**DATE COMPLETED** : 11-02-04

<b>BORING ELEVATION</b> : 737.7 Feet <b>STATION</b> : _____ <b>OFFSET</b> : _____ <b>DEPTH</b> : 20.0 Feet	<b>BORING METHOD</b> : STD <b>RIG TYPE</b> : _____ <b>CASING DIA.</b> : 3.0" <b>CORE SIZE</b> : _____	<b>HAMMER</b> : Auto <b>DRILLER</b> : SK <b>TEMPERATURE</b> : _____ <b>WEATHER</b> : Rain
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**GROUNDWATER:** Encountered at 10' At completion 10.4' Caved in at 14'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
737.3		TOPSOIL(4")	0.3											
		Soft, Damp, Brown, SILTY CLAY, Some Fine Coarse Sand and Gravel. (FILL)		SS-1	1	3	14	19		3.0"	31	22	9	
				SS-2	2	4	12	19		3.0"				
732.7	5		5.0											
		Loose, Damp, Brown Fine to Coarse SAND, Little Silt, Little Gravel traces of Clay		SS-3	3	6	15	10			28	21	7	
				SS-4	1	3	14	19		3.0"				
	10													
724.2	15		13.5											
		Medium Stiff, Damp To Moist, Brown and Gray, SILT		SS-5	4	8	18	26						
					3									
719.2			18.5											
		Loose, Moist, Brown Fine SAND		SS-6	3	6	18	18						
717.7	20		20.0											
		BOTTOM OF BORING												

TEST BORING/PIT RECORD 04050135.GPJ CTL CORPORATE.GDT 7/8/08

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BORING METHOD	SAMPLING METHOD	ABBREVIATIONS
HSA - Hollow Stem Auger	SS - Split Spoon Sample	* - Hand Penetrometer
SFA - Solid Flight Auger	ST - Shelby Tube Sample	LL - Liquid Limit
RC - Rock Coring	CR - Rock Core Sample	PL - Plastic Limit
MD - Mud Drilling	BS - Bag Sample	PI - Plasticity Index
WD - Wash Drilling		SPT - Standard Penetration Test
HA - Hand Auger		

## TEST BORING RECORD

**CLIENT** : Jones-Stuckey, Ltd.  
**PROJECT** : Woody Hayes Athletic Center Expansion & Renovation  
**LOCATION** : Columbus, Ohio  
**PROJECT NO.** : 04050135


**BORING NO.** : B-4  
**SHEET** : 1 OF 1  
**DATE STARTED** : 11-03-04  
**DATE COMPLETED** : 11-03-04

<b>BORING ELEVATION</b> : 735.1 Feet <b>STATION</b> : _____ <b>OFFSET</b> : _____ <b>DEPTH</b> : 20.0 Feet	<b>BORING METHOD</b> : HSA <b>RIG TYPE</b> : _____ <b>CASING DIA.</b> : 3.25" <b>CORE SIZE</b> : _____	<b>HAMMER</b> : Auto <b>DRILLER</b> : BG <b>TEMPERATURE</b> : _____ <b>WEATHER</b> : Clear
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**GROUNDWATER:** Encountered at 17.0' At completion 9.0' Caved in at 11.5'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
734.4		TOPSOIL (8")	0.7											
733.1		Medium Stiff, Damp, Brown CLAYEY SILT (FILL)	2.0	SS-1	3 4 4	8	56	15						
	5	Stiff To Medium Stiff, Moist, Brown SILTY CLAY with Cobbles		SS-2	4 4 5	9	44	25		5.0*				
727.1			8.0	SS-3	3 4 3	7	67	23						
	10	Medium Dense, Wet, Brown Fine to Coarse SAND AND GRAVEL, Trace Clay		SS-4	10 11 13	24	33	8						
723.6		Medium Dense, Damp, Brown Fine to Coarse SAND AND GRAVEL with Limestone Fragments	11.5											
720.1	15		15.0	SS-5	7 7 9	16	44	22						
		Loose, Wet, Brown Fine SAND												
715.1	20		20.0	SS-6	5 4 5	9	22	21						
		BOTTOM OF BORING												

TEST BORING/PIT RECORD 04050135.GPJ CTL CORPORATE.GDT 7/8/08

 <p>                 2860 Fisher Road                  Columbus, Ohio 43204                  Telephone: 614-276-8123                  Fax: 614-276-6377                  Email: <a href="mailto:ctl@ctleng.com">ctl@ctleng.com</a> </p>	<b>BORING METHOD</b> HSA - Hollow Stem Auger SFA - Solid Flight Auger RC - Rock Coring MD - Mud Drilling WD - Wash Drilling HA - Hand Auger	<b>SAMPLING METHOD</b> SS - Split Spoon Sample ST - Shelby Tube Sample CR - Rock Core Sample BS - Bag Sample	<b>ABBREVIATIONS</b> * - Hand Penetrometer LL - Liquid Limit PL - Plastic Limit PI - Plasticity Index SPT - Standard Penetration Test
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# TEST BORING RECORD

**CLIENT** : Jones-Stuckey, Ltd.  
**PROJECT** : Woody Hayes Athletic Center Expansion & Renovation  
**LOCATION** : Columbus, Ohio  
**PROJECT NO.** : 04050135

**BORING NO.** : B-5  
**SHEET** : 1 OF 2  
**DATE STARTED** : 11-03-04  
**DATE COMPLETED** : 11-03-04

<b>BORING ELEVATION</b> : 733.0 Feet <b>STATION</b> : _____ <b>OFFSET</b> : _____ <b>DEPTH</b> : 25.0 Feet	<b>BORING METHOD</b> : STD <b>RIG TYPE</b> : _____ <b>CASING DIA.</b> : 3.0" <b>CORE SIZE</b> : _____	<b>HAMMER</b> : Auto <b>DRILLER</b> : SK <b>TEMPERATURE</b> : _____ <b>WEATHER</b> : Clear
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**GROUNDWATER**: ▼ Encountered at 9.5'      At completion 10'      Caved in at 12'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
732.4		TOPSOIL(8")	0.7											
730.5	5	Medium Stiff, Damp, Brown CLAYEY SILT, Some Fine To Coarse Sand (FILL)	2.5	SS-1	2						5.0°			
					3	8	12	14						
					5									
724.5	5	Stiff To Very Stiff, Damp, Brown SANDY SILT, Some Fine To Coarse Gravel with Cobble	8.5	SS-2	6						9.0°			
					7	17	12	11						
					10									
720.0	10	Loose, Moist, Gray Silty Fine to Coarse SAND, Little Fine To Coarse Gravel	13.0	SS-3	4						9.0°			
					5	11	13	18						
					6									
715.0	15	Loose Wet, Brown Fine to Coarse SAND AND GRAVEL	18.0	SS-4	2									
					2	5	12	18						
					3									
715.0	20	Medium Dense, Damp, Gray Fine to Coarse SAND, Little Fine to Coarse Gravel	18.0	SS-5	3									
					3	6	13	15						
					3									
				SS-6	4									
					4	14	11	17						
					10									

*Continued on next page*

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**BORING METHOD**  
 HSA - Hollow Stem Auger  
 SFA - Solid Flight Auger  
 RC - Rock Coring  
 MD - Mud Drilling  
 WD - Wash Drilling  
 HA - Hand Auger

**SAMPLING METHOD**  
 SS - Split Spoon Sample  
 ST - Shelby Tube Sample  
 CR - Rock Core Sample  
 BS - Bag Sample

**ABBREVIATIONS**  
 \* - Hand Penetrometer  
 LL - Liquid Limit  
 PL - Plastic Limit  
 PI - Plasticity Index  
 SPT - Standard Penetration Test

TEST BORING/SPT RECORD 04050135.GPJ CTL CORPORATE.GDT 7/8/08

# TEST BORING RECORD

CLIENT : Jones-Stuckey, Ltd.


BORING NO.: B-5

PROJECT : Woody Hayes Athletic Center Expansion & Renovation

SHEET 2 OF 2

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT Pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
711.0		Medium Dense, Damp, Gray Fine to Coarse SAND, Little Fine to Coarse Gravel	22.0											
708.0	25	Medium to Dense Wet, Gray Fine to Coarse SAND AND GRAVEL with Cobbles and Boulders	25.0											
		BOTTOM OF BORING												
	30													
	35													
	40													
	45													

TEST BORING/PIT RECORD 04/06/13S.GPJ CTL CORPORATE.GDT 7/8/08

 <b>2860 Fisher Road</b> Columbus, Ohio 43204 Telephone: 614-276-8123 Fax: 614-276-6377 Email: <a href="mailto:ctl@ctleng.com">ctl@ctleng.com</a>	<b>BORING METHOD</b>	<b>SAMPLING METHOD</b>	<b>ABBREVIATIONS</b>
	HSA - Hollow Stem Auger SFA - Solid Flight Auger RC - Rock Coring MD - Mud Drilling WD - Wash Drilling HA - Hand Auger	SS - Split Spoon Sample ST - Shelby Tube Sample CR - Rock Core Sample BS - Bag Sample	* - Hand Penetrometer LL - Liquid Limit PL - Plastic Limit PI - Plasticity Index SPT - Standard Penetration Test

## TEST BORING RECORD

**CLIENT** : Jones-Stuckey, Ltd.  
**PROJECT** : Woody Hayes Athletic Center Expansion & Renovation  
**LOCATION** : Columbus, Ohio  
**PROJECT NO.** : 04050135

**BORING NO.** : **B-6**  
**SHEET** : 1 OF 2  
**DATE STARTED** : 11-02-04  
**DATE COMPLETED** : 11-02-04


<b>BORING ELEVATION</b> : 733.9 Feet <b>STATION</b> : _____ <b>OFFSET</b> : _____ <b>DEPTH</b> : 25.0 Feet	<b>BORING METHOD</b> : STD <b>RIG TYPE</b> : _____ <b>CASING DIA.</b> : 3.0" <b>CORE SIZE</b> : _____	<b>HAMMER</b> : Auto <b>DRILLER</b> : SK <b>TEMPERATURE</b> : _____ <b>WEATHER</b> : Rain
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**GROUNDWATER:** Encountered at 8.5' At completion 8.5' Caved in at 10.5'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
733.3		TOPSOIL(8")	0.7											
		Stiff, Damp, Brown SILTY CLAY, Little Fine to Coarse Sand and Gravel		SS-1	3 5 5	10	67	21						
731.4		Loose, Damp, Brown Silty Fine to Coarse SAND AND GRAVEL	2.5											
				SS-2	3 4 3	7	83	13						
728.9	5		5.0											
				SS-3	4 2 2	4	100	8				NP	NP	NP
		Very Loose to Loose, Damp to Wet, Brown Fine to Coarse SAND, Little Silt, Traces of Gravel		SS-4	2 1 2	3	89	24						
	10													
				SS-5	3 4 3	7	100	15						
	15													
715.4		Medium Dense, Wet, Brown Silty Fine to Coarse SAND AND GRAVEL	18.5											
				SS-6	12 12 12	24	72	16						
	20													

*Continued on next page*

TEST BORING/PIT RECORD 04050135.GPJ CTL CORPORATE.GDT 7/8/04

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# TEST BORING RECORD

CLIENT : Jones Stuckey, Ltd.  
 PROJECT : Woody Hayes Athletic Center Expansion & Renovation

BORING NO.: **B-6**  
 SHEET **2** OF **2**

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
710.4		Medium Dense, Wet, Brown Silty Fine to Coarse SAND AND GRAVEL	23.5											
708.9	25	Dense, Wet, Gray Fine to Coarse SAND AND GRAVEL	25.0	SS-7	11 13 21	34	89	12						
		BOTTOM OF BORING												

TEST BORING/PIIT RECORD 04050135.GPJ CTL CORPORATE.GDT 7/8/08

 <p>2860 Fisher Road                  Columbus, Ohio 43204                  Telephone: 614-276-8123                  Fax: 614-276-6377                  Email: <a href="mailto:ctl@ctieng.com">ctl@ctieng.com</a></p>	<b>BORING METHOD</b>	<b>SAMPLING METHOD</b>	<b>ABBREVIATIONS</b>
	HSA - Hollow Stem Auger SFA - Solid Flight Auger RC - Rock Coring MD - Mud Drilling WD - Wash Drilling HA - Hand Auger	SS - Split Spoon Sample ST - Shelby Tube Sample CR - Rock Core Sample BS - Bag Sample	* - Hand Penetrometer LL - Liquid Limit PL - Plastic Limit PI - Plasticity Index SPT - Standard Penetration Test

## TEST BORING RECORD

**CLIENT** : Jones-Stuckey, Ltd.  
**PROJECT** : Woody Hayes Athletic Center Expansion & Renovation  
**LOCATION** : Columbus, Ohio  
**PROJECT NO.** : 04050135

**BORING NO.** : B-7  
**SHEET** : 1 OF 2  
**DATE STARTED** : 11-09-04  
**DATE COMPLETED** : 11-09-04

<b>BORING ELEVATION</b> : 735.6 Feet <b>STATION</b> : _____ <b>OFFSET</b> : _____ <b>DEPTH</b> : 25.0 Feet	<b>BORING METHOD</b> : STD <b>RIG TYPE</b> : _____ <b>CASING DIA.</b> : 3.0" <b>CORE SIZE</b> : _____	<b>HAMMER</b> : Auto <b>DRILLER</b> : SK <b>TEMPERATURE</b> : _____ <b>WEATHER</b> : Clear
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**GROUNDWATER:** Encountered at 10' At completion 12.5' Caved in at 12.5'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
735.0		TOPSOIL (7")	0.6											
	5	Loose to Medium Dense, Damp, Brown Fine to Coarse SAND AND GRAVEL, Little Silt Traces of Clay		SS-1	4 4 3	7	12	9						
				SS-2	11 11 6	17	14	10						
				SS-3	5 5 3	8	15	14						
				SS-4	3 3 3	6	18	19				NP	NP	NP
722.1		Stiff, Damp, Gray SILT	13.5	SS-5	3 4 6	10	10	24						
720.6	15	Loose to Medium Dense, Damp, Brown Fine to Coarse SAND AND GRAVEL		SS-6	3 4 6	10	24	24						

*Continued on next page*

TEST BORING RECORD 04050135.GPJ CTL CORPORATE.GDT 7/8/08

<p> <b>2860 Fisher Road</b>                  Columbus, Ohio 43204                  Telephone: 614-276-8123                  Fax: 614-276-6377                  Email: <a href="mailto:ctl@ctleng.com">ctl@ctleng.com</a> </p>	<b>BORING METHOD</b>	<b>SAMPLING METHOD</b>	<b>ABBREVIATIONS</b>
	HSA - Hollow Stem Auger SFA - Solid Flight Auger RC - Rock Coring MD - Mud Drilling WD - Wash Drilling HA - Hand Auger	SS - Split Spoon Sample ST - Shelby Tube Sample CR - Rock Core Sample BS - Bag Sample	* - Hand Penetrometer LL - Liquid Limit PL - Plastic Limit PI - Plasticity Index SPT - Standard Penetration Test

# TEST BORING RECORD

CLIENT : Jones-Stuckey, Ltd.


BORING NO.: B-7

PROJECT : Woody Hayes Athletic Center Expansion & Renovation

SHEET 2 OF 2

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
712.1		Loose to Medium Dense, Damp, Brown Fine to Coarse SAND AND GRAVEL	23.5											
710.6	25	Medium Dense, Damp, Gray Fine to Coarse SAND	25.0	SS-7	2 5 12	17	24	20						
		BOTTOM OF BORING												
	30													
	35													
	40													
	45													

TEST BORING/PT RECORD 04650195.GPJ CTL CORPORATE.GDT 7/8/08

 <p>2860 Fisher Road Columbus, Ohio 43204 Telephone: 614-276-8123 Fax: 614-276-6377 Email: <a href="mailto:ctl@ctleng.com">ctl@ctleng.com</a></p>	<b>BORING METHOD</b>	<b>SAMPLING METHOD</b>	<b>ABBREVIATIONS</b>
	HSA - Hollow Stem Auger SFA - Solid Flight Auger RC - Rock Coring MD - Mud Drilling WD - Wash Drilling HA - Hand Auger	SS - Split Spoon Sample ST - Shelby Tube Sample CR - Rock Core Sample BS - Bag Sample	* - Hand Penetrometer LL - Liquid Limit PL - Plastic Limit PI - Plasticity Index SPT - Standard Penetration Test

# TEST BORING RECORD

**CLIENT** : Jones-Stuckey, Ltd.  
**PROJECT** : Woody Hayes Athletic Center Expansion & Renovation  
**LOCATION** : Columbus, Ohio  
**PROJECT NO.** : 04050135

**BORING NO.** : B-8  
**SHEET** : 1 OF 2  
**DATE STARTED** : 11-09-04  
**DATE COMPLETED** : 11-09-04

<b>BORING ELEVATION</b> : 735.5 Feet <b>STATION</b> : _____ <b>OFFSET</b> : _____ <b>DEPTH</b> : 24.5 Feet	<b>BORING METHOD</b> : STD <b>RIG TYPE</b> : _____ <b>CASING DIA.</b> : 3.0" <b>CORE SIZE</b> : _____	<b>HAMMER</b> : Auto <b>DRILLER</b> : SK <b>TEMPERATURE</b> : _____ <b>WEATHER</b> : Clear
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**GROUNDWATER:** Encountered at 11' At completion 13.1'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., kaf	ATTERBERG LIMITS			
											LL	PL	PI	
734.8		TOPSOIL(8")	0.7											
		Stiff, Damp, Dark Brown CLAYEY SILT, Little Fine to Coarse Sand and Gravel with Roots (FILL)		SS-1	3 3 6	9	13	18		5.0°				
731.3	5	Stiff, Damp, Brown SILTY CLAY, Little Fine to Coarse Sand	4.2	SS-2	4 6 7	13	15	18		7.0°				
				SS-3	5 4 5	9	18	30		5.0°	28	23	5	
727.5		Stiff, Damp, Gray SILTY CLAY, Little Fine to Coarse Sand	8.0	SS-4	3 6 6	12	18	26		6.0°				
725.5	10	Medium Dense, Damp to Moist, Brown Fine to Coarse SAND AND GRAVEL	10.0	SS-5	9 5 6	11	16	22						
720.5	15	Dense, Wet, Gray Fine to Coarse SAND AND GRAVEL	15.0	SS-6	12 14 20	34	17	3						

*Continued on next page*

<p>                 2860 Fisher Road                  Columbus, Ohio 43204                  Telephone: 614-276-8123                  Fax: 614-276-6377                  Email: <a href="mailto:ctl@ctleng.com">ctl@ctleng.com</a> </p>	<p> <b>BORING METHOD</b>                  HSA - Hollow Stem Auger                  SFA - Solid Flight Auger                  RC - Rock Coring                  MD - Mud Drilling                  WD - Wash Drilling                  HA - Hand Auger             </p>	<p> <b>SAMPLING METHOD</b>                  SS - Split Spoon Sample                  ST - Shelby Tube Sample                  CR - Rock Core Sample                  BS - Bag Sample             </p>
<p> <b>ABBREVIATIONS</b>                  * - Hand Penetrometer                  LL - Liquid Limit                  PL - Plastic Limit                  PI - Plasticity Index                  SPT - Standard Penetration Test             </p>		

TEST BORING RECORD 04050135.GPJ CTL CORPORATE.GDT 7/8/08



# TEST BORING RECORD

CLIENT : Jones-Stuckey, Ltd.

BORING NO.: B-8

PROJECT : Woody Hayes Athletic Center Expansion & Renovation

SHEET 2 OF 2

STRATUM ELEVATION	SAMPLE DEPTH	SOIL MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
712.0		Dense, Wet, Gray Fine to Coarse SAND AND GRAVEL	23.5											
711.0	25	Hard, Damp, Gray SANDY SILT, Little Fine to Coarse Gravel with Shale Fragments	24.5	SS-7	34 50-5"		9	8		9.0*				
		BOTTOM OF BORING												

TEST BORING/PI RECORD 04050155.GPJ CTL CORPORATE GDT 7/8/08



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**BORING METHOD**  
HSA - Hollow Stem Auger  
SFA - Solid Flight Auger  
RC - Rock Coring  
MD - Mud Drilling  
WD - Wash Drilling  
HA - Hand Auger

**SAMPLING METHOD**  
SS - Split Spoon Sample  
ST - Shelby Tube Sample  
CR - Rock Core Sample  
BS - Bag Sample

**ABBREVIATIONS**  
\* - Hand Penetrometer  
LL - Liquid Limit  
PL - Plastic Limit  
PI - Plasticity Index  
SPT - Standard Penetration Test

## TEST BORING RECORD

**CLIENT** : Jones-Stuckey, Ltd.  
**PROJECT** : Woody Hayes Athletic Center Expansion & Renovation  
**LOCATION** : Columbus, Ohio  
**PROJECT NO.** : 04050135

**BORING NO.** : **B-9**  
**SHEET** : 1 OF 2  
**DATE STARTED** : 11-02-04  
**DATE COMPLETED** : 11-02-04


<b>BORING ELEVATION</b> : 733.8 Feet <b>STATION</b> : <b>OFFSET</b> : <b>DEPTH</b> : 25.0 Feet	<b>BORING METHOD</b> : HSA <b>RIG TYPE</b> : <b>CASING DIA.</b> : 3.25" <b>CORE SIZE</b> :	<b>HAMMER</b> : Auto <b>DRILLER</b> : MK <b>TEMPERATURE</b> : <b>WEATHER</b> : Rain
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**GROUNDWATER**: ▼ Encountered at 13.5' At completion 6.0' Caved in at 13.1'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
733.4		TOPSOIL (4")	0.3											
		Loose, Damp, Brown Fine to Coarse SAND AND GRAVEL (FILL)		SS-1	4 4 6	10	56	9						
730.8		Loose, Damp, Dark Brown Fine to Coarse SAND, Little Clay, Traces of Gravel	3.0	SS-2	3 4 5	9	56	9			NP	NP	NP	
729.3	5		4.5	SS-3	4 5 6	11	67	10						
	10	Medium Dense, Damp to Wet, Brown Fine and Coarse SAND AND GRAVEL with Cobbles and Boulders		SS-4	8 7 7	14	0							
	15			SS-5	30 9 10	19	38	8						
716.8		Medium Dense, Wet, Fine to Coarse SAND, Trace Fine to Coarse Gravel	17.0	SS-6	6 7 7	14	78	10						

Continued on next page

TEST BORING/PIIT RECORD: 04050135.GPJ CTL CORPORATE.GDT 7/8/08

 <p>                 2860 Fisher Road                  Columbus, Ohio 43204                  Telephone: 614-276-8123                  Fax: 614-276-6377                  Email: <a href="mailto:ctl@ctleng.com">ctl@ctleng.com</a> </p>	<b>BORING METHOD</b> HSA - Hollow Stem Auger SFA - Solid Flight Auger RC - Rock Coring MD - Mud Drilling WD - Wash Drilling HA - Hand Auger	<b>SAMPLING METHOD</b> SS - Split Spoon Sample ST - Shelby Tube Sample CR - Rock Core Sample BS - Bag Sample	<b>ABBREVIATIONS</b> * - Hand Penetrometer LL - Liquid Limit PL - Plastic Limit PI - Plasticity Index SPT - Standard Penetration Test
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# TEST BORING RECORD

CLIENT : Jones-Stuckey, Ltd.


BORING NO.: B-9

PROJECT : Woody Hayes Athletic Center Expansion & Renovation

SHEET 2 OF 2

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
711.8		Medium Dense, Wet, Fine to Coarse SAND, Trace Fine to Coarse Gravel	22.0											
708.8	25	Medium Dense, Wet, Gray SAND AND GRAVEL with Cobbles	25.0	SS-7	5 5 6	11	28	1						
		BOTTOM OF BORING												

TEST BORING/PIT RECORD D:\050135.GPJ CTL CORPORATE.GDT 7/8/08

 <p>2860 Fisher Road Columbus, Ohio 43204 Telephone: 614-276-8123 Fax: 614-276-6377 Email: <a href="mailto:ctl@ctleng.com">ctl@ctleng.com</a></p>	<b>BORING METHOD</b>	<b>SAMPLING METHOD</b>	<b>ABBREVIATIONS</b>
	HSA - Hollow Stem Auger SFA - Solid Flight Auger RC - Rock Coring MD - Mud Drilling WD - Wash Drilling HA - Hand Auger	SS - Split Spoon Sample ST - Shelby Tube Sample CR - Rock Core Sample BS - Bag Sample	* - Hand Penetrometer LL - Liquid Limit PL - Plastic Limit PI - Plasticity Index SPT - Standard Penetration Test

# TEST BORING RECORD

**CLIENT** : Jones-Stuckey, Ltd.  
**PROJECT** : Woody Hayes Athletic Center Expansion & Renovation  
**LOCATION** : Columbus, Ohio  
**PROJECT NO.** : 04050135

**BORING NO.** : B-10  
**SHEET** : 1 OF 2  
**DATE STARTED** : 11-09-04  
**DATE COMPLETED** : 11-09-04

<b>BORING ELEVATION</b> : 734.1 Feet <b>STATION</b> : _____ <b>OFFSET</b> : _____ <b>DEPTH</b> : 25.0 Feet	<b>BORING METHOD</b> : STD <b>RIG TYPE</b> : _____ <b>CASING DIA.</b> : 3.0" <b>CORE SIZE</b> : _____	<b>HAMMER</b> : Auto <b>DRILLER</b> : SK <b>TEMPERATURE</b> : _____ <b>WEATHER</b> : Clear
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**GROUNDWATER:** Encountered at 9' At completion 12.8'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHTpcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
733.5		TOPSOIL (7")	0.6											
		Medium Stiff to Stiff, Damp to Moist, Brown SILTY CLAY, Some Fine to Coarse Sand and Gravel		SS-1	2 2 4	6	67	20						
				SS-2	3 3 6	9	89	22						
729.1	5			SS-3	3 3 4	7	100	15				27	23	4
				SS-4	11 13 18	31	100	12						
		Loose to Dense, Damp to Moist, Brown Fine to Coarse SAND AND GRAVEL, Little Silt, Traces of Clay		SS-5	11 5 7	12	56	10						
				SS-6	18 24 35	59	56	18						
715.6	20	Hard, Damp, Gray SILT, Trace Fine Sand	18.5											

*Continued on next page*

TEST BORING/PT RECORD 04050135.GPJ CTL CORPORATE.GDT 7/8/08

<p> <b>2860 Fisher Road</b>  <b>Columbus, Ohio 43204</b>  <b>Telephone: 614-276-8123</b>  <b>Fax: 614-276-6377</b>  <b>Email: cti@ctleng.com</b> </p>	<b>BORING METHOD</b>	<b>SAMPLING METHOD</b>	<b>ABBREVIATIONS</b>
	HSA - Hollow Stem Auger SFA - Solid Flight Auger RC - Rock Coring MD - Mud Drilling WD - Wash Drilling HA - Hand Auger	SS - Split Spoon Sample ST - Shelby Tube Sample CR - Rock Core Sample BS - Bag Sample	* - Hand Penetrometer LL - Liquid Limit PL - Plastic Limit PI - Plasticity Index SPT - Standard Penetration Test

# TEST BORING RECORD

CLIENT : Jones-Stuckey, Ltd.

BORING NO.: **B-10**

PROJECT : Woody Hayes Athletic Center Expansion & Renovation

SHEET **2** OF **2**

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
709.1	25	Hard, Damp, Gray SILT, Trace Fine Sand	25.0	SS-7	17 22 30	52	50	10						
		BOTTOM OF BORING												

TEST BORING/PIIT RECORD 04050195.GPJ CTL CORPORATE.GDT 7/8/08

**CTL**  
ENGINEERING INC.

2860 Fisher Road  
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Email: [ctl@ctlieng.com](mailto:ctl@ctlieng.com)

**BORING METHOD**

HSA - Hollow Stem Auger  
SFA - Solid Flight Auger  
RC - Rock Coring  
MD - Mud Drilling  
WD - Wash Drilling  
HA - Hand Auger

**SAMPLING METHOD**

SS - Split Spoon Sample  
ST - Shelby Tube Sample  
CR - Rock Core Sample  
BS - Bag Sample

**ABBREVIATIONS**

\* - Hand Penetrometer  
LL - Liquid Limit  
PL - Plastic Limit  
PI - Plasticity Index  
SPT - Standard Penetration Test

# TEST BORING RECORD

**CLIENT** : Jones-Stuckey, Ltd.  
**PROJECT** : Woody Hayes Athletic Center Expansion & Renovation  
**LOCATION** : Columbus, Ohio  
**PROJECT NO.** : 04050135

**BORING NO.:** B-11  
**SHEET** 1 OF 2  
**DATE STARTED** : 11-09-04  
**DATE COMPLETED** : 11-09-04

<b>BORING ELEVATION</b> : 733.7 Feet <b>STATION</b> : _____ <b>OFFSET</b> : _____ <b>DEPTH</b> : 25.0 Feet	<b>BORING METHOD</b> : STD <b>RIG TYPE</b> : _____ <b>CASING DIA.</b> : 3.0" <b>CORE SIZE</b> : _____	<b>HAMMER</b> : Auto <b>DRILLER</b> : SK <b>TEMPERATURE</b> : _____ <b>WEATHER</b> : Clear
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**GROUNDWATER:** Encountered at 11'  At completion 14.2'  Caved in at 14.2'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
733.0		TOPSOIL(8")	0.7											
731.2		Medium Stiff, Moist, Dark Brown CLAYEY SILT with Roots (FILL)	2.5	SS-1	0 4 4	8	14	27		5.0*				
728.2	5	Soft, Damp, Brown and Gray SILTY CLAY, Little to Some Fine to Coarse Sand and Gravel	5.5	SS-2	2 2 2	4	18	31		3.0*				
726.2		Stiff, Wet SANDY SILT, Little Clay, Little Gravel	7.5	SS-3	1 4 6	10	18	27		2.0*	26	21	5	
723.7	10	Medium Dense, Wet, Brown Fine to Coarse SAND AND GRAVEL	10.0	SS-4	6 7 7	14	18	15						
718.7	15	Loose, Damp, Gray Fine SAND	15.0	SS-5	2 2 3	5	30	24						
	20	Hard, Damp, Gray, SANDY SILT, Little Fine to Coarse Gravel (TILL)		SS-6	10 19 26	45	31	11		9.0*				

*Continued on next page*

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**BORING METHOD**  
 HSA - Hollow Stem Auger  
 SFA - Solid Flight Auger  
 RC - Rock Coring  
 MD - Mud Drilling  
 WD - Wash Drilling  
 HA - Hand Auger

**SAMPLING METHOD**  
 SS - Split Spoon Sample  
 ST - Shelby Tube Sample  
 CR - Rock Core Sample  
 BS - Bag Sample

**ABBREVIATIONS**  
 \* - Hand Penetrometer  
 LL - Liquid Limit  
 PL - Plastic Limit  
 PI - Plasticity Index  
 SPT - Standard Penetration Test

TEST BORING/PIT RECORD 04050135.GPJ CTL CORPORATE.GDT 7/8/03

# TEST BORING RECORD

CLIENT : Jones-Stuckey, Ltd.

BORING NO.: **B-11**

PROJECT : Woody Hayes Athletic Center Expansion & Renovation

SHEET **2** OF **2**

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
710.2		Hard, Damp, Gray, SANDY SILT, Little Fine to Coarse Gravel (TILL)	23.5											
708.7	25	Very Dense, Wet, Gray Fine to Coarse SAND AND GRAVEL	25.0	SS-7	20 24 32	56	32	7						
		<b>BOTTOM OF BORING</b>												
	30													
	35													
	40													
	45													

TEST BORING/PIT RECORD 040501935.GPJ CTL CORPORATE.GDT 7/8/08

**GTL**  
ENGINEERING INC.

2860 Fisher Road  
Columbus, Ohio 43204  
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Fax: 614-276-6377  
Email: [ctl@ctleng.com](mailto:ctl@ctleng.com)

**BORING METHOD**

HSA - Hollow Stem Auger  
SFA - Solid Flight Auger  
RC - Rock Coring  
MD - Mud Drilling  
WD - Wash Drilling  
HA - Hand Auger

**SAMPLING METHOD**

SS - Split Spoon Sample  
ST - Shelby Tube Sample  
CR - Rock Core Sample  
BS - Bag Sample

**ABBREVIATIONS**

\* - Hand Penetrometer  
LL - Liquid Limit  
PL - Plastic Limit  
PI - Plasticity Index  
SPT - Standard Penetration Test

# TEST BORING RECORD

**CLIENT** : Jones-Stuckey, Ltd.  
**PROJECT** : Woody Hayes Athletic Center Expansion & Renovation  
**LOCATION** : Columbus, Ohio  
**PROJECT NO.** : 04050135


**BORING NO.** : P-1  
**SHEET** : 1 OF 1  
**DATE STARTED** : 11-02-04  
**DATE COMPLETED** : 11-02-04

<b>BORING ELEVATION</b> : 734.9 Feet <b>STATION</b> : <b>OFFSET</b> : <b>DEPTH</b> : 10.0 Feet	<b>BORING METHOD</b> : HSA <b>RIG TYPE</b> : <b>CASING DIA.</b> : 3.25" <b>CORE SIZE</b> :	<b>HAMMER</b> : Auto <b>DRILLER</b> : MK <b>TEMPERATURE</b> : <b>WEATHER</b> : Rain
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**GROUNDWATER:** Encountered at Dry At completion Dry Caved in at 6.1'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
733.9		ASPHALT CONCRETE (4.5") OVER BASE COURSE (8")	1.0											
		Stiff to Very Stiff, Damp, Brown SILTY CLAY, Some Fine to Coarse Sand, Traces of Gravel with Cobbles (FILL)		SS-1	4									
					4	9	67	17			4.0*	34	18	16
					5									
729.9	5		5.0	SS-2	9	18	89	20		7.0*				
		Stiff, Damp, Dark Brown SANDY SILT, Little Fine to Coarse Gravel												
					SS-3	4	12	78	22		9.0*			
					5									
726.9			8.0		7									
		Medium Dense, Damp, Brown Fine to Coarse SAND AND GRAVEL												
					SS-4	6	14	33	9					
724.9	10		10.0		7									
		BOTTOM OF BORING												
	15													
	20													

TEST BORING/SPT RECORD 04050135.GPJ CTL CORPORATE.ODT 7/8/08

 2860 Fisher Road Columbus, Ohio 43204 Telephone: 614-276-8123 Fax: 614-276-6377 Email: <a href="mailto:ctl@ctleng.com">ctl@ctleng.com</a>	<b>BORING METHOD</b> HSA - Hollow Stem Auger SFA - Solid Flight Auger RC - Rock Coring MD - Mud Drilling WD - Wash Drilling HA - Hand Auger	<b>SAMPLING METHOD</b> SS - Split Spoon Sample ST - Shelby Tube Sample CR - Rock Core Sample BS - Bag Sample	<b>ABBREVIATIONS</b> * - Hand Penetrometer LL - Liquid Limit PL - Plastic Limit PI - Plasticity Index SPT - Standard Penetration Test
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# TEST BORING RECORD

**CLIENT** : Jones-Stuckey, Ltd.  
**PROJECT** : Woody Hayes Athletic Center Expansion & Renovation  
**LOCATION** : Columbus, Ohio  
**PROJECT NO.** : 04050135

**BORING NO.:** P-2  
**SHEET** 1 OF 1  
**DATE STARTED** : 11-02-04  
**DATE COMPLETED** : 11-02-04

<b>BORING ELEVATION</b> : 735.9 Feet <b>STATION</b> : _____ <b>OFFSET</b> : _____ <b>DEPTH</b> : 10.0 Feet	<b>BORING METHOD</b> : HSA <b>RIG TYPE</b> : _____ <b>CASING DIA.</b> : 3.25" <b>CORE SIZE</b> : _____	<b>HAMMER</b> : Auto <b>DRILLER</b> : MK <b>TEMPERATURE</b> : _____ <b>WEATHER</b> : Rain
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**GROUNDWATER:** Encountered at Dry At completion Dry Caved in at 5.7

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
735.5		TOPSOIL (5")	0.4											
		Medium Stiff, Damp, Brown SILTY CLAY, Some Fine to Coarse Sand, Little Gravel (FILL)		SS-1	2 3 4	7	56	13		6.0*	24	22	2	
732.9			3.0											
	5	Stiff, Damp, Dark Brown SILTY CLAY/CLAYEY SILT, Some Fine to Coarse Sand, Little Gravel		SS-2	3 4 5	9	56	31		4.0*	43	29	14	
728.4			7.5											
		Loose, Damp, Brown Silty Fine to Coarse SAND AND GRAVEL with Cobbles		SS-3	3 4 6	10	67	19		6.0*				
725.9	10		10.0											
		BOTTOM OF BORING		SS-4	4 5 5	10	56	13						

TEST BORING/PI RECORD 04050135.GPJ CTL CORPORATE.GDT 7/2/08



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 Email: [ctl@ctleng.com](mailto:ctl@ctleng.com)

BORING METHOD	SAMPLING METHOD	ABBREVIATIONS
HSA - Hollow Stem Auger	SS - Split Spoon Sample	* - Hand Penetrometer
SFA - Solid Flight Auger	ST - Shelby Tube Sample	LL - Liquid Limit
RC - Rock Coring	CR - Rock Core Sample	PL - Plastic Limit
MD - Mud Drilling	BS - Bag Sample	PI - Plasticity Index
WD - Wash Drilling		SPT - Standard Penetration Test
HA - Hand Auger		

## TEST BORING RECORD

**CLIENT** : Jones-Stuckey, Ltd.  
**PROJECT** : Woody Hayes Athletic Center Expansion & Renovation  
**LOCATION** : Columbus, Ohio  
**PROJECT NO.** : 04050135

**BORING NO.:** P-3  
**SHEET** 1 OF 1  
**DATE STARTED** : 11-02-04  
**DATE COMPLETED** : 11-02-04

<b>BORING ELEVATION</b> : 732.3 Feet <b>STATION</b> : _____ <b>OFFSET</b> : _____ <b>DEPTH</b> : 10.0 Feet	<b>BORING METHOD</b> : HSA <b>RIG TYPE</b> : _____ <b>CASING DIA.</b> : 3.25" <b>CORE SIZE</b> : _____	<b>HAMMER</b> : Auto <b>DRILLER</b> : MK <b>TEMPERATURE</b> : _____ <b>WEATHER</b> : Rain
---	---	--

**GROUNDWATER:** Encountered at Dry At completion Dry Caved in at 9.5'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
732.0		TOPSOIL(4")	0.3											
		Medium Stiff, Damp, Brown SILTY CLAY, Some Fine to Coarse Sand, Traces of Gravel		SS-1	3 4 4	8	44	19		6.0*	31	21	10	
729.8			2.5											
				SS-2	2 2 2	4	89	29		5.0*	58	29	29	
	5													
		Soft to Medium Stiff, Damp, Brown and Gray SILTY CLAY, Traces of Sand		SS-3	1 1 1	2	100	22		4.0*				
				SS-4	4 3 4	7	100	24		4.0*				
722.3	10	BOTTOM OF BORING	10.0											

2860 Fisher Road  
 Columbus, Ohio 43204  
 Telephone: 614-276-8123  
 Fax: 614-276-6377  
 Email: [ctl@ctleng.com](mailto:ctl@ctleng.com)



**BORING METHOD**  
 HSA - Hollow Stem Auger  
 SFA - Solid Flight Auger  
 RC - Rock Coring  
 MD - Mud Drilling  
 WD - Wash Drilling  
 HA - Hand Auger

**SAMPLING METHOD**  
 SS - Split Spoon Sample  
 ST - Shelby Tube Sample  
 CR - Rock Core Sample  
 BS - Bag Sample

**ABBREVIATIONS**  
 \* - Hand Penetrometer  
 LL - Liquid Limit  
 PL - Plastic Limit  
 PI - Plasticity Index  
 SPT - Standard Penetration Test

TEST BORING/PT RECORD 04050135.GPJ CTL CORPORATE.GDT 7/8/08

## TEST BORING RECORD

**CLIENT** : Jones-Stuckey, Ltd.  
**PROJECT** : Woody Hayes Athletic Center Expansion & Renovation  
**LOCATION** : Columbus, Ohio  
**PROJECT NO.** : 04050135

**BORING NO.** : **P-4**  
**SHEET** : 1 OF 1  
**DATE STARTED** : 11-09-04  
**DATE COMPLETED** : 11-09-04

<b>BORING ELEVATION</b> : 733.4 Feet <b>STATION</b> : _____ <b>OFFSET</b> : _____ <b>DEPTH</b> : 25.0 Feet	<b>BORING METHOD</b> : STD <b>RIG TYPE</b> : _____ <b>CASING DIA.</b> : 3.0" <b>CORE SIZE</b> : _____	<b>HAMMER</b> : Auto <b>DRILLER</b> : SK <b>TEMPERATURE</b> : _____ <b>WEATHER</b> : Clear
---	--	---

**GROUNDWATER:** Encountered at Dry At completion Dry

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
732.9		TOPSOIL(6")	0.5											
		Medium Stiff, Damp, Brown, SANDY SILT, Little Fine Coarse Gravel, Trace Clay		SS-1	4 3 3	6	16	19		3.0*	36	21	15	
729.9			3.5											
		Medium Stiff, Moist, Gray SANDY SILT, Little Fine to Coarse Gravel		SS-2	3 3 3	6	15	24		5.0*				
728.4	5		5.0											
		Loose to Medium Dense, Damp, Brown and Gray Silty Fine to Coarse SAND AND GRAVEL		SS-3	4 8 5	13	16	15						
				SS-4	4 4 4	8	17	18						
723.4	10		10.0											
		BOTTOM OF BORING												
	15													
	20													

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**BORING METHOD**  
 HSA - Hollow Stem Auger  
 SFA - Solid Flight Auger  
 RC - Rock Coring  
 MD - Mud Drilling  
 WD - Wash Drilling  
 HA - Hand Auger

**SAMPLING METHOD**  
 SS - Split Spoon Sample  
 ST - Shelby Tube Sample  
 CR - Rock Core Sample  
 BS - Bag Sample

**ABBREVIATIONS**  
 \* - Hand Penetrometer  
 LL - Liquid Limit  
 PL - Plastic Limit  
 PI - Plasticity Index  
 SPT - Standard Penetration Test

TEST BORING/PIT RECORD 04050135.GPJ CTL CORPORATE.GDT 7/8/08

# TEST BORING RECORD

**CLIENT** : Jones-Stuckey, Ltd.  
**PROJECT** : Woody Hayes Athletic Center Expansion & Renovation  
**LOCATION** : Columbus, Ohio  
**PROJECT NO.** : 04050135


**BORING NO.** : R-1  
**SHEET** : 1 OF 1  
**DATE STARTED** : 11-02-04  
**DATE COMPLETED** : 11-02-04

<b>BORING ELEVATION</b> : 734.6 Feet <b>STATION</b> : <b>OFFSET</b> : <b>DEPTH</b> : 20.0 Feet	<b>BORING METHOD</b> : HSA <b>RIG TYPE</b> : <b>CASING DIA.</b> : 3.25" <b>CORE SIZE</b> :	<b>HAMMER</b> : Auto <b>DRILLER</b> : MK <b>TEMPERATURE</b> : <b>WEATHER</b> : Rain
---	---	--

**GROUNDWATER**: Encountered at 13.5' At completion Dry Caved in at 8.5'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	BLOWS per 12" (N)	% RECOVERY	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS			
											LL	PL	PI	
734.2		TOPSOIL (4")	0.3											
		Stiff, Damp, Brown SANDY SILT, Little Fine to Coarse Gravel, Little Clay		SS-1	4 5 5	10	67	22				23	22	1
731.6			3.0											
	5			SS-2	11 12 14	26	67	4						
				SS-3	12 14 16	30	56	4						
	10			SS-4	8 9 11	20	56	6				NP	NP	NP
		Medium Dense, Damp to Wet, Brown Fine to Coarse SAND AND GRAVEL, Little Silt, Traces of Clay with Cobbles and Boulders		SS-5	6 7 9	16	67	9						
	15			SS-6	7 9 14	23	56	7						
714.6	20	BOTTOM OF BORING	20.0											

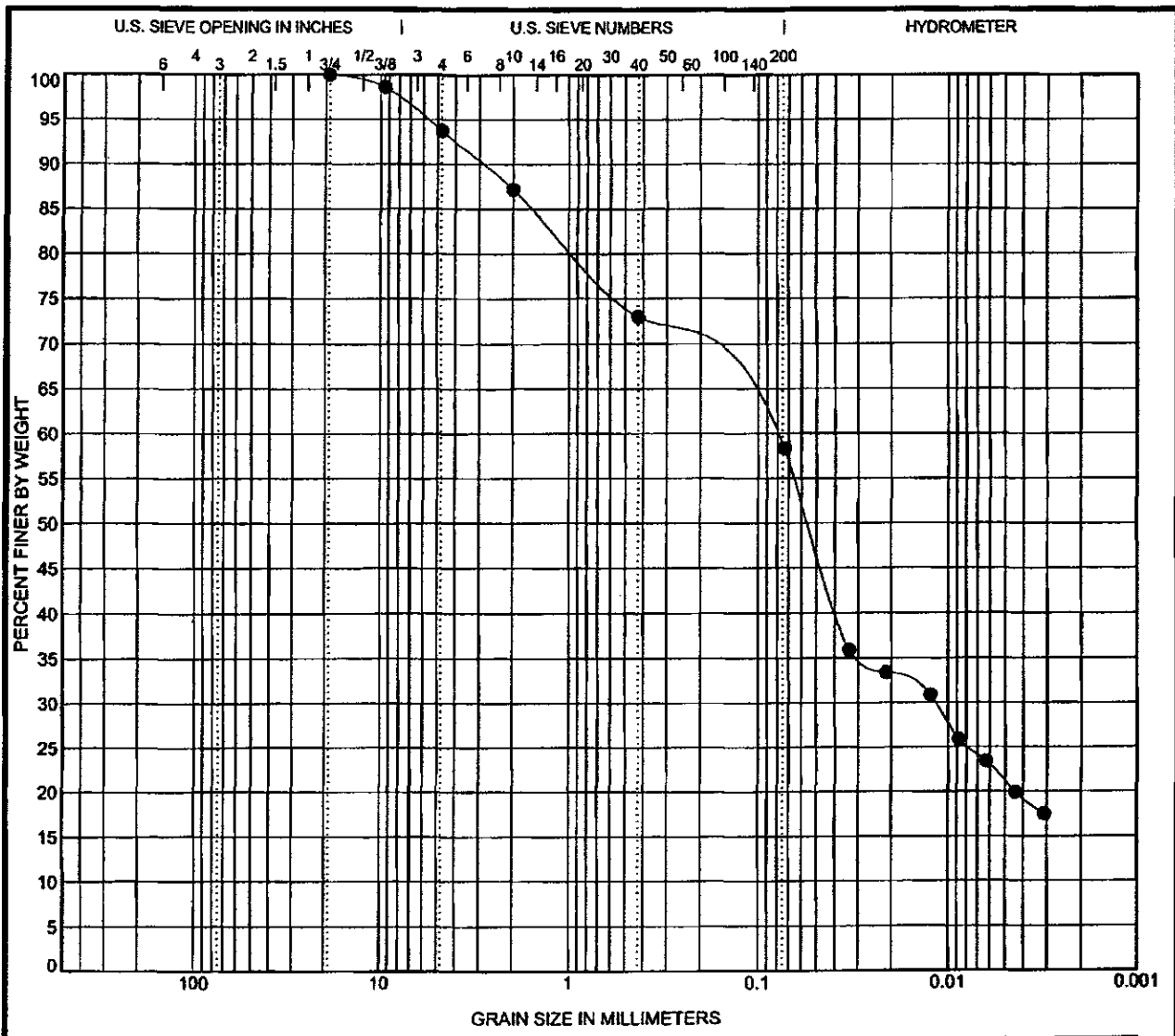
TEST BORING/PIT RECORD 04050135.GPJ CTL CORPORATE.GDT 7/8/03

 <p>                 2860 Fisher Road                  Columbus, Ohio 43204                  Telephone: 614-276-8123                  Fax: 614-276-6377                  Email: <a href="mailto:ctl@ctleng.com">ctl@ctleng.com</a> </p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">BORING METHOD</th> <th style="text-align: left;">SAMPLING METHOD</th> <th style="text-align: left;">ABBREVIATIONS</th> </tr> <tr> <td>HSA - Hollow Stem Auger</td> <td>SS - Split Spoon Sample</td> <td>* - Hand Penetrometer</td> </tr> <tr> <td>SFA - Solid Flight Auger</td> <td>ST - Shelby Tube Sample</td> <td>LL - Liquid Limit</td> </tr> <tr> <td>RC - Rock Coring</td> <td>CR - Rock Core Sample</td> <td>PL - Plastic Limit</td> </tr> <tr> <td>MD - Mud Drilling</td> <td>BS - Bag Sample</td> <td>PI - Plasticity Index</td> </tr> <tr> <td>WD - Wash Drilling</td> <td></td> <td>SPT - Standard Penetration Test</td> </tr> <tr> <td>HA - Hand Auger</td> <td></td> <td></td> </tr> </table>	BORING METHOD	SAMPLING METHOD	ABBREVIATIONS	HSA - Hollow Stem Auger	SS - Split Spoon Sample	* - Hand Penetrometer	SFA - Solid Flight Auger	ST - Shelby Tube Sample	LL - Liquid Limit	RC - Rock Coring	CR - Rock Core Sample	PL - Plastic Limit	MD - Mud Drilling	BS - Bag Sample	PI - Plasticity Index	WD - Wash Drilling		SPT - Standard Penetration Test	HA - Hand Auger			
BORING METHOD	SAMPLING METHOD	ABBREVIATIONS																					
HSA - Hollow Stem Auger	SS - Split Spoon Sample	* - Hand Penetrometer																					
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WD - Wash Drilling		SPT - Standard Penetration Test																					
HA - Hand Auger																							

**APPENDIX B**

**TEST RESULTS**





COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring No.	Sample	Depth	Classification	%MC	LL	PL	Pi	Cc	Cu
● FH-2	SS-1	0.5	<b>SANDY SILT</b> Some Clay, Traces of Gravel	18					

Boring No.	Sample	Depth	D100	D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay
● FH-2	SS-1	0.5	19	0.09	0.055	0.012		6	35	38	21

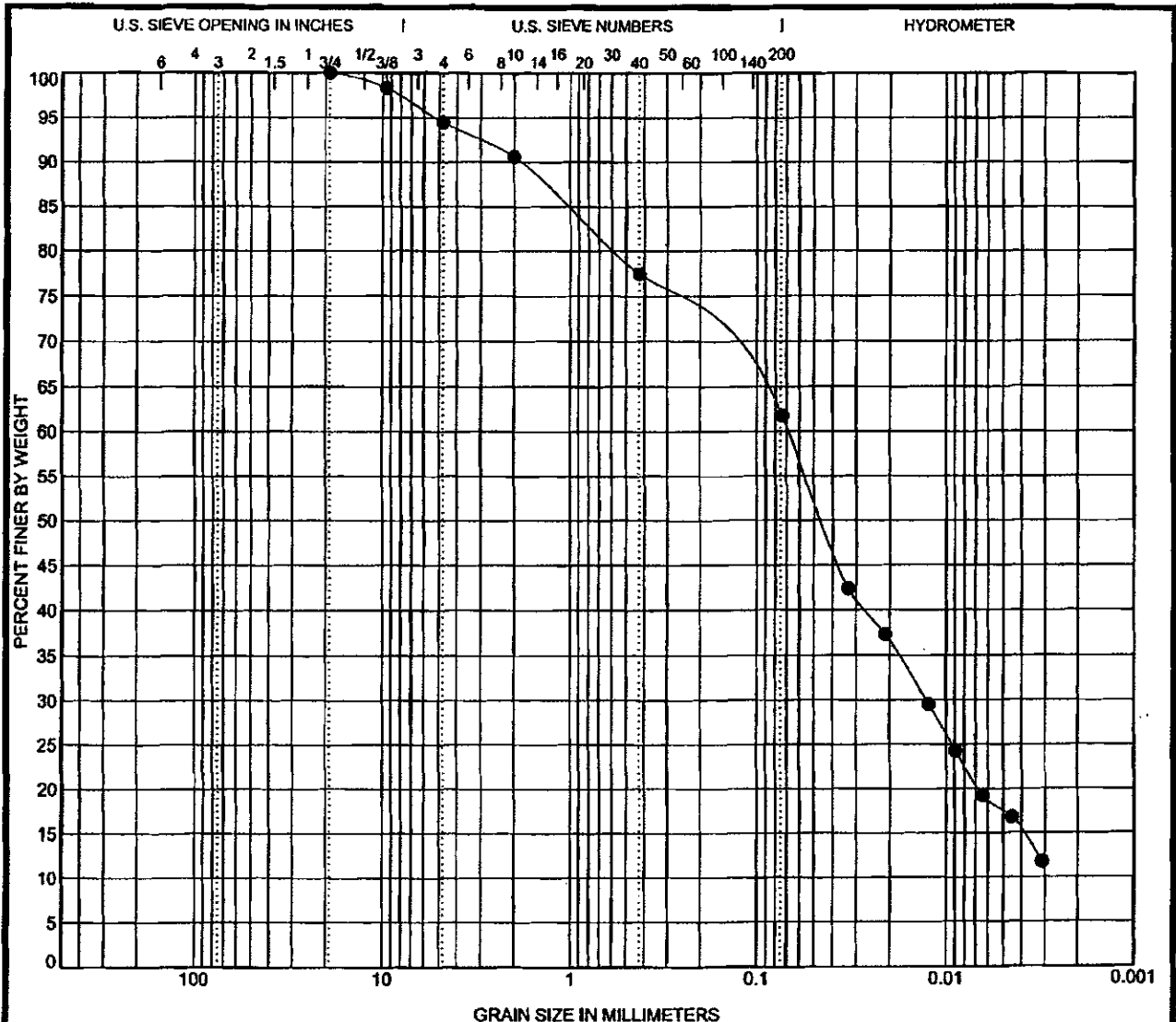
CTL GRAIN SIZE 08050091COL.GPJ CTL CORPORATE.GDT 5/2/08



CTL Engineering  
 2860 Fisher Rd.  
 Columbus, Ohio 43204  
 Telephone: 614-276-8123  
 Fax: 614-276-6377

**GRAIN SIZE DISTRIBUTION**

Project: OSU Field Hockey  
 Location: Woody Hayes Athletic Center, OH  
 CTL Project Number: 08050091COL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring No.	Sample	Depth	Classification	%MC	LL	PL	PI	Cc	Cu
● FH-4	SS-1	0.5	A-4a SANDY SILT (CL)	21	32	22	10		
			Little Clay, Traces of Gravel						

Boring No.	Sample	Depth	D100	D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay
● FH-4	SS-1	0.5	19	0.068	0.045	0.013		6	33	43	18



CTL Engineering  
 2860 Fisher Rd.  
 Columbus, Ohio 43204  
 Telephone: 614-276-8123  
 Fax: 614-276-6377

**GRAIN SIZE DISTRIBUTION**

Project: OSU Field Hockey  
 Location: Woody Hayes Athletic Center, OH  
 CTL Project Number: 08050091COL

CTL GRAIN SIZE 08050091COL.GPJ CTL CORPORATE QOT 5/28/08

**APPENDIX C**

**PERCOLATION TEST RESULTS**



## Percolation Test Results

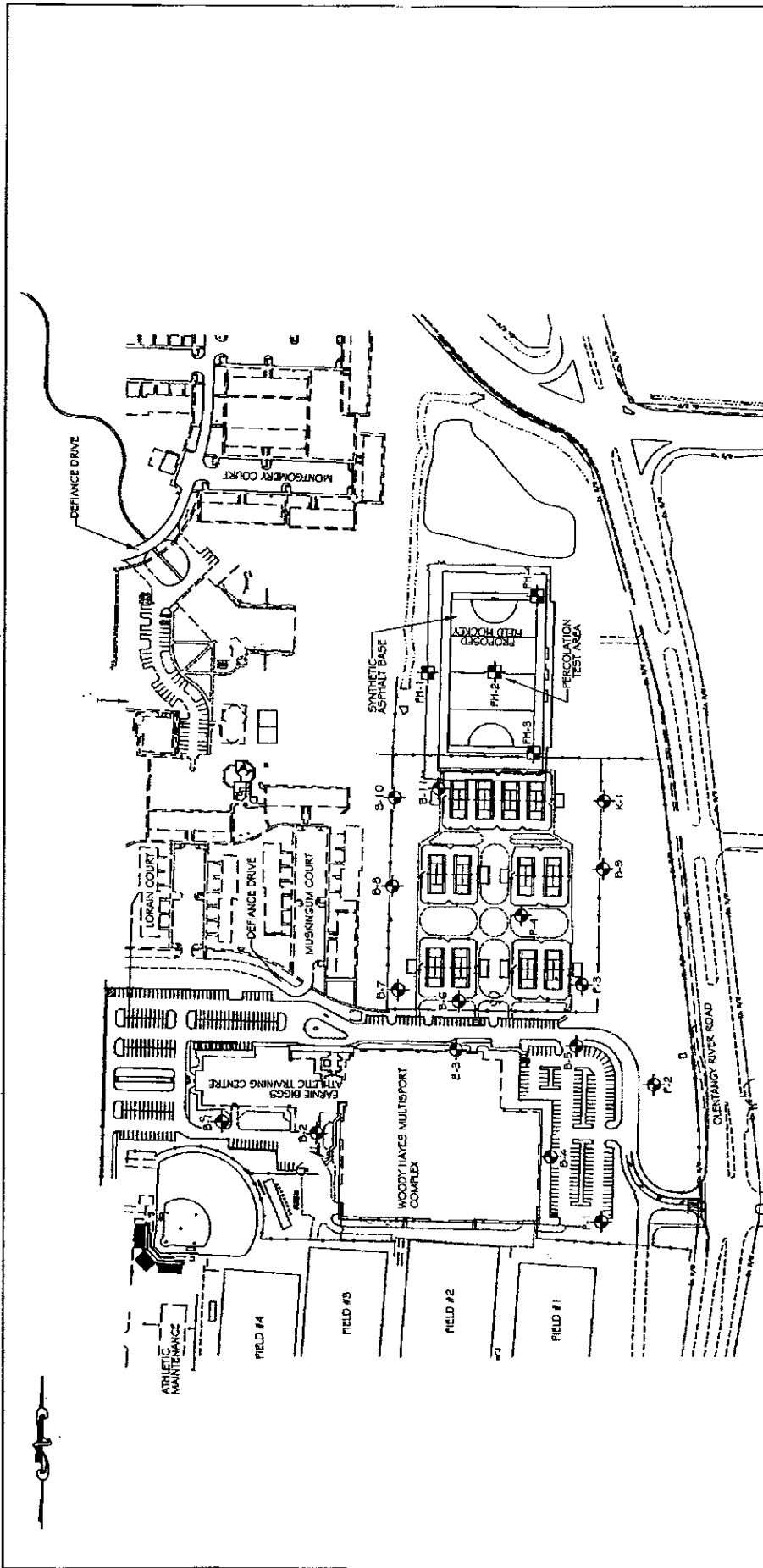
CTL Project No. 08050091COL  
 May 20, 2008  
 Near Boring FH-2

Elapsed Time Minutes	Test Hole					
	1		2		3	
	Water Level	Change	Water Level	Change	Water Level	Change
0	0.00		0.00		0.00	
1	0.13	0.13	0.13	0.13	0.25	0.25
2	0.31	0.19	0.38	0.25	0.75	0.50
3	0.38	0.06	0.38	0.00	1.25	0.50
4	0.38	0.00	0.38	0.00	1.75	0.50
5	1.00	0.63	0.50	0.13	2.00	0.25
10	1.38	0.38	1.00	0.50	3.38	1.38
15	1.50	0.13	1.25	0.25	4.25	0.88
20			1.38	0.13	5.25	1.00
25	2.13		1.63	0.25	5.88	0.63
30	2.38	0.25	2.44	0.81	6.75	0.88
35	2.88	0.50			7.25	0.50
40	3.00	0.13	2.88		8.00	0.75
45	3.25	0.25	3.00	0.13	8.88	0.88
50	3.38	0.13	3.38	0.38	9.88	1.00
55	3.63	0.25	3.63	0.25	10.00	0.13
60	3.88	0.25	3.88	0.25	10.63	0.63
75	4.31	0.44	4.38	0.50	11.50	0.88
90	4.63	0.31	5.13	0.75	13.00	1.50
105	5.31	0.69	5.88	0.75	14.25	1.25
120	5.88	0.56	6.13	0.25	15.25	1.00
135	6.31	0.44	6.88	0.75	16.00	0.75
150	6.50	0.19	7.13	0.25	16.63	0.63
<b>Avg. Percolation Rate</b>	<b>30.0 min/inch</b>		<b>24.0 min/inch</b>		<b>13.3 min/inch</b>	

**APPENDIX D**

**BORING LOCATION PLAN/SOIL PROFILE SHEETS**





		<b>BORING LOCATION PLAN</b>	
DATE	07-09-08	THE EDGE GROUP	PROJECT NO.
SCALE	A5 SHOWN	FIELD HOCKEY AND PRACTICE FIELD ONE	06050091COL
DRAWN BY	SM	WOODY HAYES ATHLETIC CENTER	PAGE
REVIEWED BY	SM	COLUMBUS, OHIO	1 OF 4

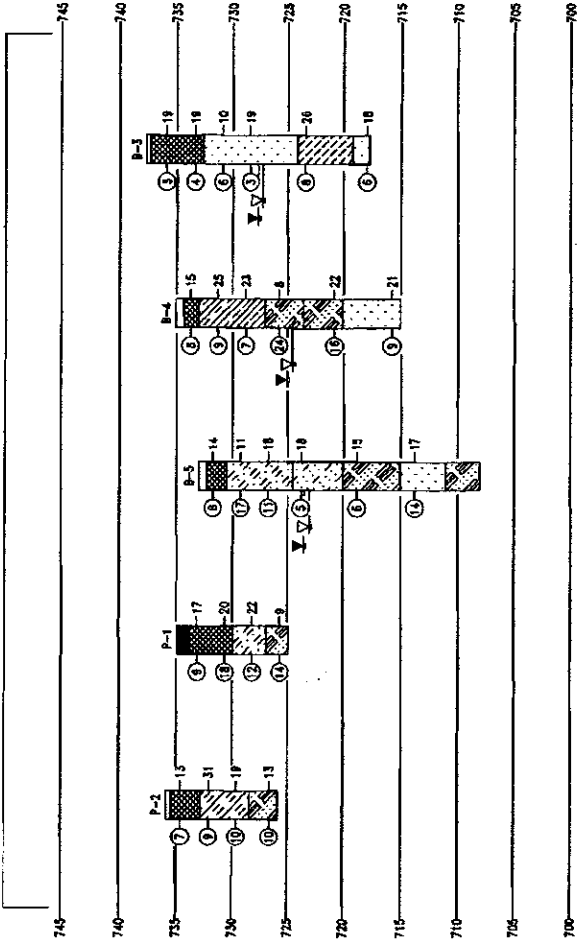
NOTE:

- ◆ APPROX. BORING LOCATIONS - PREVIOUS INVESTIGATION
- APPROX. BORING LOCATIONS - CURRENT INVESTIGATION

GROUND SURFACE ELEVATIONS AT THE TEST BORING LOCATIONS WERE PROVIDED BY PERSONNEL FROM JONES - STUCKEY LTD., INC.

0 200 300 400

PARKING LOT



**GTL** ENGINEERING  
 C/O ENGINEERING INC.  
 CONSULTING ENGINEERS  
 TESTING & INSPECTION  
 LABORATORY SERVICES

**SOIL PROFILE**

DATE: 07-08-06  
 SCALE: AS SHOWN  
 DRAWN BY: B.R.U.  
 REVIEWED BY: SM

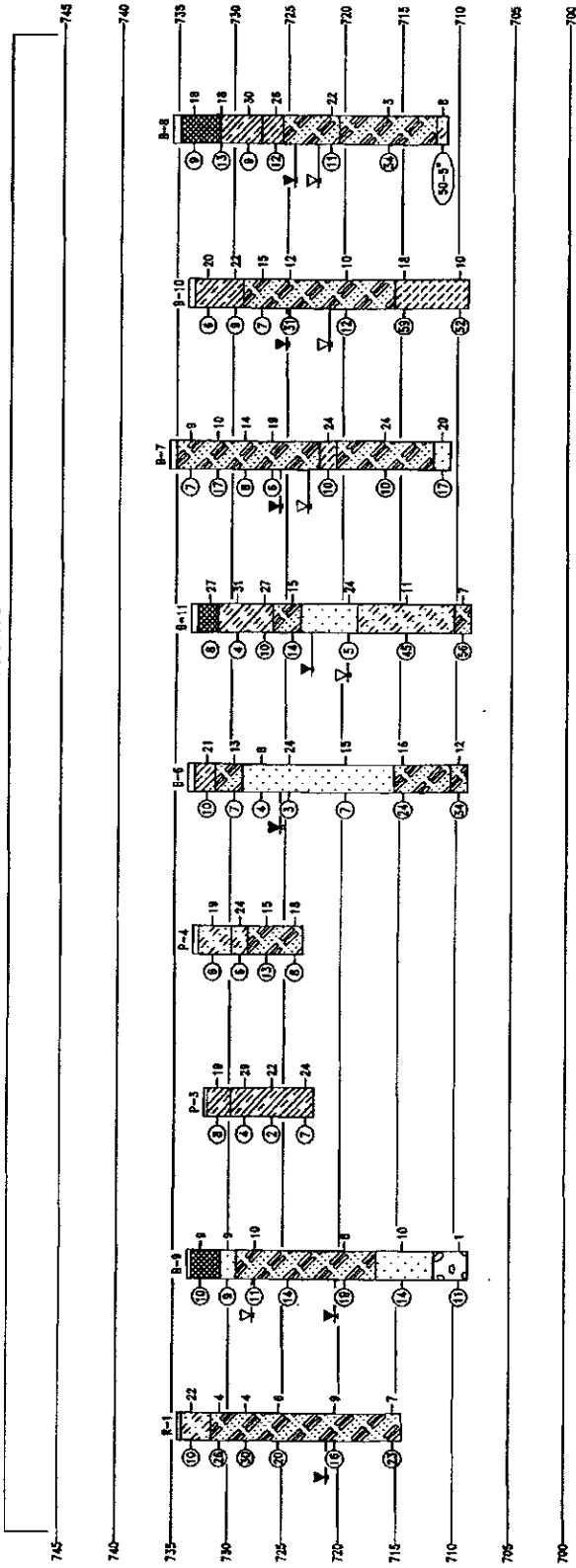
THE EDGE GROUP  
 FIELD HOCKEY AND PRACTICE FIELD ONE  
 WOODY HAYES ATHLETIC CENTER  
 COLUMBUS, OHIO

PROJECT NO. 06090091 COL  
 PAGE 2 OF 4

**LEGEND**

	SANDY CLAY		GROUND WATER DURING DRILLING		MOISTURE CONTENT IN PERCENT (M)
	SANDY SILT		GROUND WATER AT COMPLETION OF DRILLING		STANDARD PENETRATION IN BLOWS PER FOOT (N)
	CLAY		GROUND WATER AT 72 HOURS AFTER COMPLETION		
	SILTY CLAY				
	SILTY SAND				
	LIMESTONE				
	COAL				
	SHALE				
	CLAY SHALE				
	CLAY				
	SILT				
	SAND				
	BOULDERS				
	SAND & GRAVEL				
	WEATHERED SHALE				
	TOPSOIL				
	STAINLESS CONCRETE				
	CLAYEY SILT				
	CRUSHED AGGREGATE				
	GRAVEL/COBLES				
	FILL				
	REINFORCED CONCRETE				

LIGHT POLES AND TENNIS COURTS



**GTL ENGINEERING**  
 CIVIL ENGINEERING, INC.  
 CONSULTING ENGINEERS  
 1500 WOODRIDGE AVENUE  
 COLUMBUS, OHIO 43260  
 LABORATORY SERVICES

**SOIL PROFILE**

DATE: 07-08-08  
 SCALE: AS SHOWN  
 DRAWN BY: B. R. U.  
 REVIEWED BY: SM

THE EDGE GROUP  
 FIELD HOCKEY AND PRACTICE FIELD ONE  
 WOODY HATES ATHLETIC CENTER  
 COLUMBUS, OHIO

PROJECT NO. 0005009 (COL)  
 PAGE 3 OF 4

**LEGEND**

	SANDY CLAY		GROUND WATER DURING DRILLING		MOISTURE CONTENT IN PERCENT (%)
	SANDY SILT		GROUND WATER AT COMPLETION OF DRILLING		STANDARD PENETRATION IN BLOWS PER FOOT (N)
	SILTY CLAY		GROUND WATER AT 24 HOURS AFTER COMPLETION		
	SILTY SAND				
	LIMESTONE				
	COAL				
	SHALE				
	CLAY/SHALE				
	CLAY				
	SILT				
	SAND				
	BOULDERS				
	SAND & GRAVEL				
	WEATHERED SHALE				
	TOPSOIL				
	BITUMINOUS CONCRETE				
	CLAYEY SILT				
	CRUSHED AGGREGATE GRAVEL/COBLES				
	FILL				
	PEAT				

