GEOTECHNICAL CONSULTANTS INC.

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720 Greencrest Drive
Westerville, Ohio 43081-4902

June 26, 2002

Mr. James Dorenbusch
Phillip Markwood Architects
240 North 5th Street
Suite 140
Columbus, Ohio 43215

Reference: **Proposed Belmont Technical College Development**
Hammond Road
Belmont County, Ohio
GCI Project No. 02-G-09991

Dear Mr. Dorenbusch:

As you requested and authorized, GCI has performed a preliminary subsurface exploration for the proposed Belmont Technical College development to be located on the west side of Hammond Road in Belmont County, Ohio. A General Site Location Map (© DeLorme Mapping) is attached to this report.

SITE MINING HISTORY

On February 22, 2002, GCI concluded a preliminary mining activity study for the site. Our study found that the site was strip mined from the early 1970's to the mid to late 1980's. Strip mining was performed to remove a coal seam that had an approximate bottom elevation of 1170 feet (msl). Underground mining took place to the north and south of the site, but does not appear to have been performed below the site. A letter of our findings (dated 2/22/02) is attached to this report.

PROJECT DESCRIPTION

The project consists of developing an approximately 45± acre site with several structures as part of the Belmont Technical College Campus. At the writing of this report, site grading, building types, and locations had not been determined. We understand through telephone conversations with the client that buildings will be from one to three stories in height. Development of the site would also include pavement areas (roadways and paring) and underground utilities.

SITE DESCRIPTION

Presently, the site is relatively open land with grass and weed cover. Topographically, the site slopes downward to a ravine located in the south central portion of the site. Site grades range from approximately ±1260 feet in the northeast corner and ±1232 feet in the northwest corner down to ±1176 feet near the bottom of the ravine, along the south edge of the site.

BORINGS AND SUBSURFACE CONDITIONS

On the date of 4/30/02, GCI performed 2 borings (B-1 and B-2) along the eastern portion of the site. Wet site conditions prevented us from completing the remaining borings on 4/30/02. We returned to the site on

6/17/02, (after the site had dried) to complete the remaining 4 borings (B-3 through B-6). Note that our original scope was to perform eight (8) borings drilled to an average depth of 50 feet, for a total of 400 lineal feet of drilling. Because the borings went deeper than 50 feet, we reduced the number of borings to stay within the 400 total lineal feet of drilling as proposed. The test borings were performed using conventional rotary drilling equipment. Split spoon samples and standard penetration tests were performed at predetermined intervals as the borings were extended down to final depth. Attached is a sketch showing the approximate boring locations and copies of the boring logs. The client provided the base map of the sketch. Elevations provided on the boring logs were estimated from topographic information shown on the provided topographic plan and not field verified by GCI. Because of the sloping nature of the site, the boring locations and elevations should be considered approximate. We suggest that the boring locations be surveyed for accuracy.

The general subsurface profile encountered in our borings consisted of approximately 1 to 3 feet of a brown clay-silt "cap" fill overlying approximately 40 to 75.5 feet of strip mine spoils. Below the mine spoils we encountered natural shale bedrock. These conditions are discussed below.

Clay-Silt Fill "Cap" and Strip Mine Spoils

Each of the borings encountered a brown clay-silt with sand and gravel fill cap at the surface. This material was placed over the mine spoils and ranged in thickness from 1 to 3 feet.

Below the brown clay-silt fill cap, we encountered mine spoils that extended to depths of 43 feet to 77.5 feet below the ground surface. These spoils consisted of gray and brown mixtures of shale fragments in a clay silt matrix. The spoils contained zones of clay silt, as well as zones predominated by rock fragments. Cobbles and boulders were noted throughout the mine spoils at the boring locations. During our drilling we did not encounter any significant void spaces within the mine spoil.

Standard penetration N-values recorded within the mine spoil varied from 3 blows-per-foot to greater than 50 blows-per-foot.

Bedrock

Below the mine soils we encountered natural gray shale bedrock. Our truck mounted drill rig was able to penetrate 3 to 12 feet into the shale before encountering auger refusal. Standard penetration attempts were generally unsuccessful in recovering samples within the more intact shale, with sampling attempts yielding N-values of 50 blows for generally an inch or less of penetration.

Groundwater

Groundwater seepage was encountered in borings B-2 through B-6. Seepage was generally encountered within the mine spoil fill mass at depths ranging from 31 feet to 57 feet below the ground surface. This seepage appears to represent a trapped water condition. Note that groundwater levels can fluctuate due to season, local precipitation events, and other factors that may differ from the time the measurements were made.

PRELIMINARY GEOTECHNICAL EVALUATION

The site is located in a former strip mining area. Our preliminary mining study performed in February of 2002 indicates the area was strip mined to remove a coal seam with an approximate bottom elevation of 1170 feet. This generally coincides with the depth of mine spoils we encountered in our borings and current site topography provided to GCI by the client. The borings suggest the top of the shale bedrock ranges between about 1150 feet to 1170 feet. Accurately determining the ground surface elevation at the boring locations would provide a better assessment of the elevation of the bedrock.

While no site layout or grading plan has been prepared, we understand the project consists of developing the site with one to three story structures and associated roadways, utilities, and other improvements. We anticipate that the site will be graded to create level building pads and pavement areas.

The following paragraphs discuss the impact of the subsurface conditions on building area development and foundations. These discussions are general and preliminary because we do not have a final site building size and layout plan and site grading plan.

Deep Strip Mine Fill

As was noted above, each of the borings encountered relatively deep strip mine fill. These mine spoils consisted generally of variably graded mixtures of sand and gravel size rock fragments and clay-silt. Boulders and cobbles were noted within the fill material and at varying elevations and frequency. Large boulders are expected to be encountered within the strip mine spoils. No large voids, significant organic material or other obvious indications of subsurface conditions that would be considered "geotechnically" detrimental to the project were noted during this preliminary boring program.

Normal strip mining activities would include dumping the mine spoils in place using a dragline. During this work no effort is generally made to control the thickness of the dump materials nor is there any compactive effort applied during its placement. From this standpoint, the strip mine spoils would be characterized as an uncontrolled fill. This is somewhat supported by the erratic blow counts that were recorded within the mine spoil fill.

Inherent with any uncontrolled fill, is the possibility that the fill will consolidate with time (below its own weight and the weight of new construction). This consolidation can induce building settlements, both total and differential. Cutting grades will tend to reduce post construction settlements, as the cut fill would have acted as a surcharge, pre-consolidating the underlying fill. Due to the erratic nature of the fill it would be difficult to accurately quantify the amount of settlement that could occur.

Deep Foundations

Conventional practice would be to extend foundations through the fill to bear in the underlying rock using deep foundation elements such as drilled piers (caissons) or driven piles. Boulders in the fill and the depth to bearing are two obvious problems that would impact a deep foundation solution. Additionally, the expense of such a foundation system could be prohibitive to the project.

Soil Modification

In our opinion, an alternative to deep foundations would be to modify fills in place to reduce, but not eliminate, potential building settlements. In combination with soil modification, we suggest utilizing building construction that would be more tolerant of movement/settlement. In our opinion, when properly implemented, these principles can provide a satisfactorily performing building pad.

Appropriate soil modification methods would depend on several factors including finish grading (*i.e.* cut vs. fill condition), use and size of the building, and the depth of mine spoils. We would envision a soil modification program consisting of two key elements:

1. Partial Removal and Replacement

   The first element could consist of partial removal and replacement of existing fills from below the proposed building footprints. This excavation would extend to a depth of approximately 3 to 5 feet below design bottom-of-foundation grade. The materials would then be replaced in a controlled manner resulting in a uniform mat of soil below the building area (after in-place densification – see below). Large rock would be culled from the fill during the process. The purpose of this work is to construct a stiffened mat of controlled fill below the building helping to control long-term building movements. Principally, this stiffened mat should allow the building to settle more uniformly as the strip mine spoils consolidate over time.

2. In-Place Densification

After the fills are removed, but before they are replaced, we suggest a program to densify some of the remaining spoils in-place. Due to the thickness of the spoils we suggest using "deep dynamic compaction" as a means of densifying in-place fill. Deep dynamic compaction is the process of systematically dropping a heavy weight from a crane in a grid pattern across the proposed building footprint. Varying the drop height and mass weight can control the energy applied. The applied energy results in densification of the in-place fills; and in general terms, the greater the applied energy the deeper is the zone affected by the densification. For one to two-story buildings, dropping a 12 ton weight from a height of 60 feet would be appropriate. For two to three-story structures, increasing the drop weight to 15 tons would be appropriate. A specialty contractor experienced with the process best implements this process.

The dynamic compaction program could adversely affect existing structures located near the area of deep dynamic compaction. This may be a consideration during site layout and site preparation phases of the project. However, the specialty contractor should assess conditions prior to finalizing the dynamic compaction program. Additionally, the cost per square foot would be higher for smaller structures as opposed to larger ones. By dynamically compacting two or more building pads at the same time, both the cost and potential disturbance to proposed closely spaced adjacent structures can be reduced.

The actual site preparation procedures will vary according to several factors including site grading, building type and acceptable settlement risk. Various site modification procedures with associated levels of risk mitigation can be implemented to reduce potential settlement concerns.

Building Considerations

We anticipate single story structures will be wood framed with relatively light loads, and multi-story buildings are expected to be steel-frame structures with moderate loads. Pre-engineered steel buildings will typically tolerate much more movement when compared to wood frame and/or load bearing masonry construction, and in our opinion, this is the suggested construction for the site. For this same reason, flexible asphalt pavements would be expected to perform better than a rigid concrete pavement.

With regard to foundations, continuous strip footings are recommended for wall support. Continuous footings have the ability to redistribute load and control differential movement due to non-uniform bearing conditions, varying compressibility of bearing materials and undetected/unmodified, soft/loose areas remaining in the fill. In addition, we recommend that continuous strip footings be designed as grade beam type foundations with sufficient top and bottom steel to span a 10-foot loss-of-support zone. This design will aid in minimizing potential settlement due to deep existing fill conditions.

RECOMMENDATIONS

Once a site development scheme and site-grading plan have been developed, we recommend specific explorations for each of the buildings. This would consist of a series of borings across the building pads and parking and drive areas. Building specific recommendations (i.e. undercutting depth, dynamic compaction program, etc.) can be made after completion of the additional explorations.

FINAL

In summary, it is our opinion that the site can be developed for its intended use with some precautions. The boring information indicates that a deep deposit of somewhat erratic, uncontrolled strip mine spoil fill underlies the site. The fill raises an issue of settlement in its present condition. Bypassing the fill by using deep foundations (caissons) to rock is feasible, but is anticipated to be cost prohibitive. In our opinion, modification of the fill in-place and constructing a building that is more tolerant of movement (i.e., a light steel-frame, pre-engineered structure with an concrete slab-on-grade) can combine to complete satisfactorily performing building on the site. These conditions are aimed at reducing settlement and improving building performance. They will not eliminate settlement.

We have recommended additional, building specific explorations be performed after the site and grading plans have been developed. Once we have completed the additional studies, we can provide final site preparation and foundation recommendations for each building site.

This report has been prepared for the exclusive use of Phillip Markwood Architects and their consultants for specific application to the proposed Belmont Technical College development located off Hammond Road in Belmont County, Ohio in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied is made. The intent of this letter is to provide the findings of the test borings and to discuss in a preliminary manner the impact subsurface conditions will have on developing the site.

GCI appreciates being of service on this project. Please call with any questions regarding this letter or if we can be of further assistance.

Sincerely,
GEOTECHNICAL CONSULTANTS, INC.

Jody D. Sucharski, E.I.T.

David W. Caprio, P.E.
In-house Reviewer

Distribution: Mr. James Dorenbusch @ Phillip Markwood Architects – 3 copies
GCI File – 1 copy

Attachments: General Site Location Map (© DeLorme Mapping)
USGS Topographic Map – Zanesville East Quadrangle Map
Boring Location Plan
Boring Logs (6)
Preliminary Mining Study Letter (2/22/02)

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GENERAL NOTES FOR SOIL CLASSIFICATIONS

BORINGS, SAMPLING AND GROUNDWATER OBSERVATIONS:

Drilling and sampling were conducted in accordance with procedures generally recognized and accepted as standard methods of exploration of subsurface conditions. The borings were drilled using a truck mounted drill rig using auger boring methods with standard penetration testing performed in each boring at intervals ranging from 1.5 to 5.0 feet. The stratification lines on the logs represent the approximate boundary between soil types at that specific location and the transition may be gradual.

Water levels were made at drill locations under conditions stated on the logs. This data has been reviewed and interpretations made in the text of the report. Fluctuations in the level of the groundwater may occur due to other factors than those present at the time the measurements were made.

The Standard Penetration Test (ASTM D-1586) is performed by driving a 2.0 inch O.D. split barrel sampler a distance of 18 inches utilizing a 140 pound hammer free falling 30 inches. The number of blows required to drive the sampler each 6 inches of penetration are recorded. The summation of the blows required to drive the sampler for the final 12 inches o f penetration is termed the Standard Penetration Resistance (N). Soil density/consistency in terms of the N-value is as follows:

Cohesionless Density		Cohesive Density	
0-10	Loose	0-4	Soft
10-30	Medium Dense	4-8	Medium Stiff
30-50	Dense	8-15	Stiff
50 +	Very Dense	15-30	Very Stiff
		30 +	Hard

SOILS CLASSIFICATION PROCEDURE:

Soil samples obtained during the drilling process are preserved in plastic bags and visually classified in the laboratory. Select soil samples may be subjected to laboratory testing to determine natural moisture content, gradation, atterberg limits and unit weight. Soil classifications on logs may be adjusted based on results of laboratory testing.

The major constituent of the soil is written in capitals, while the minor constituents, only the first letter is capitalized. Minor constituents are described using the adjectives and, some, little and trace. Coarse grained soils (sand, gravel, etc.) are classified based on particle size. Fine grained soils (silt, Clay, and the mixture of the two) are classified based on plasticity. Soil classifications are based on the following tables:

PARTICLE SIZE DEFINITION

Boulders:		>12"
Cobbles:		3" to 12"
Gravel-	Coarse:	3/4" to 3"
	Fine:	No.4 (3/16") to 3/4'
Sand-	Coarse:	No.10 (2.0mm) to No.4 (4.75mm)
	Medium:	No.40 (0.425mm) to No.10 (2.0mm)
	Fine:	No. 200 (0.074mm) to No.40 (0.425mm)
Silt & Clay:		<0.074mm; classification based on overall plasticity; in general clay particle <0.005mm.

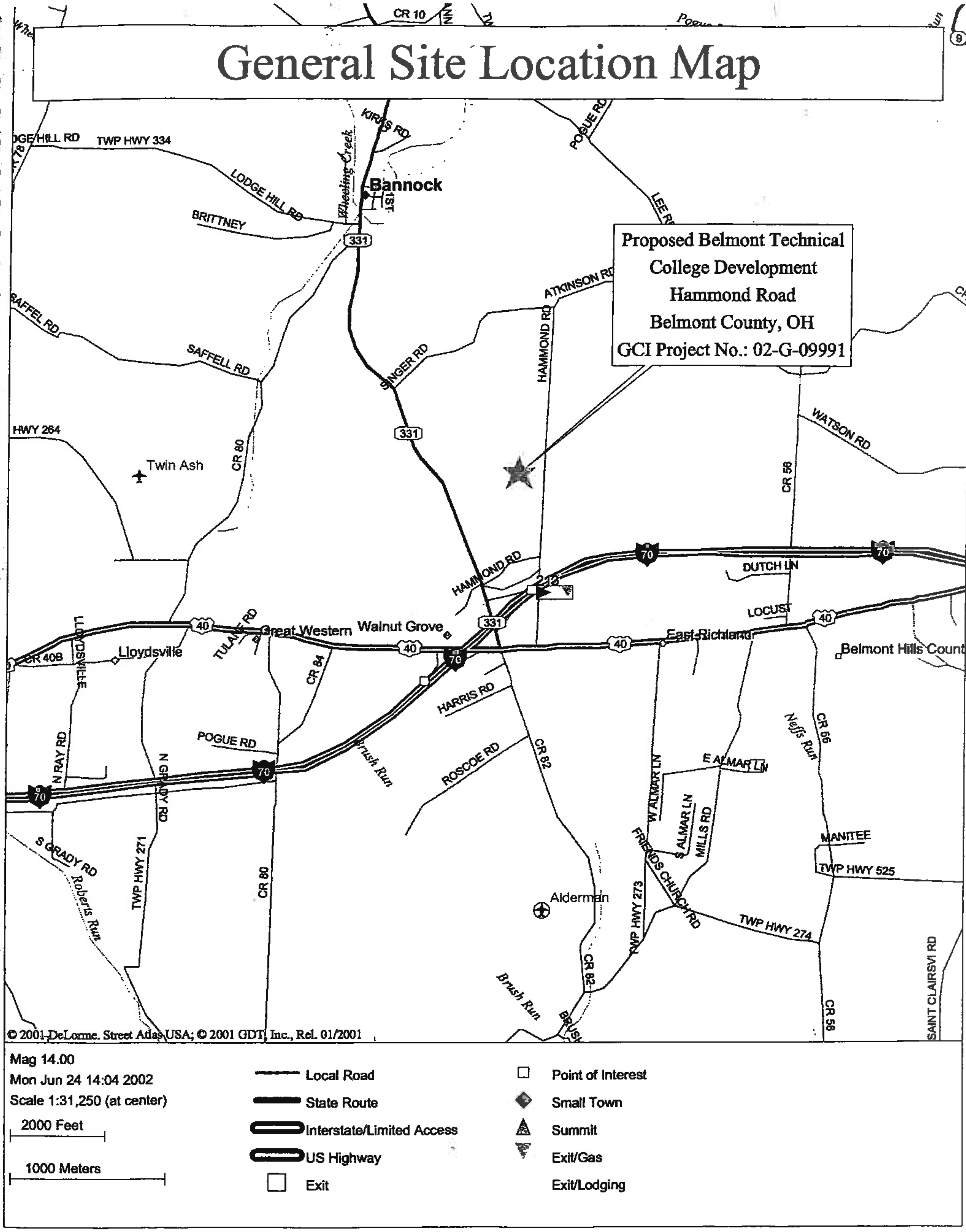
PROPORTIONS FOR DEFINING MINOR CONSTITUENT

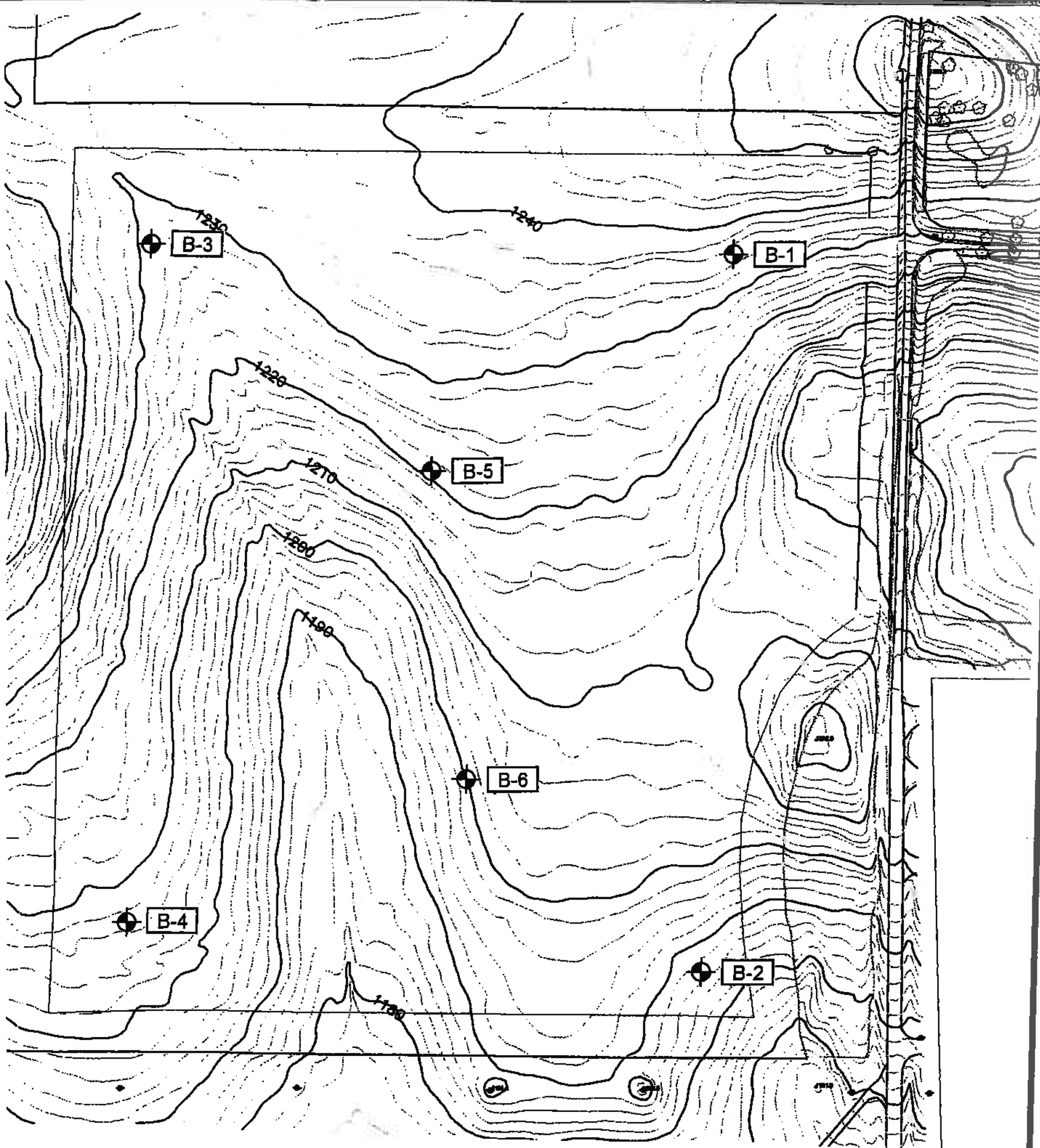
Trace:	0 to 10%
Little:	10 to 20%
Some:	20 to 35%
And:	35 to 50%

IDENTIFICATION OF COMPOSITE SILT-CLAY SOILS BASED ON OVERALL PLASTICITY

Degree of Overall Plasticity	Overall Plasticity Index, Sand-Silt-Clay Components	Soil Identification		Smallest Diameter Thread (inches)
		Major Component	Minor Component	
Non-plastic	0	SILT	Silt	None
Slight	1 to 5	Clayey SILT	Clayey Silt	1/4
Low to Medium	5 to 20	CLAY-SILT	Clay-Silt	1/8-1/16
High	20 to 40	Silty CLAY	-	1/32
Very High	40 to 60	CLAY	-	1/64

General Site Location Map





NORTH

⊕ Approximate Boring Location

BORING LOCATION PLAN

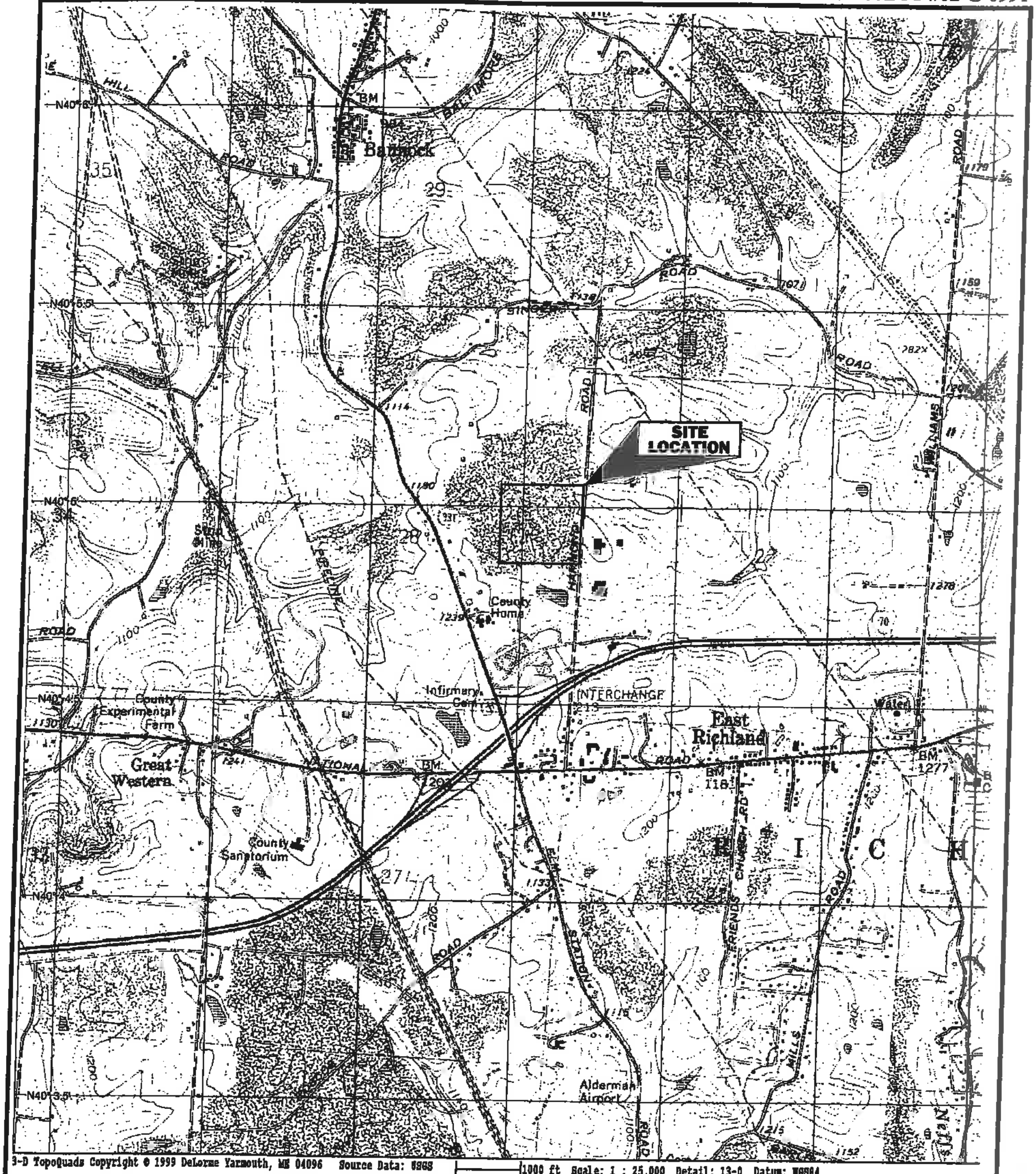
Proposed Belmont Technical College Development
Hammond Road
Belmont County, OH

Base Map: Site Topographic Map

Project No.: 02-G-09991

Date: 6/20/02 **Drawn By:** jds

Scale: Not to Scale



North

Proposed Belmont Technical College Development
Hammond Road
Belmont County, OH
Scale: "As Indicated"

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TEST BORING LOG

PROJECT NAME Proposed Belmont Technical College Development - Belmont County, Ohio
BORING NO. B- 1
PROJ. NO. 02-G-09991
SURF. ELEV. 1235±
CLIENT Phillip Markwood Architects
DATE DRILLED 4/30/2002

GROUND WATER OBSERVATION	Proportions Used		140 lb Wt. x 30" fall on 2" O.D. Sampler			
			Cohesionless Density		Cohesive Consistency	
None FEET BELOW SURFACE AT COMPLETION	trace	0 to 10%	0 - 10	Loose	0 - 4	Soft
____ FEET BELOW SURFACE AT 24 HOURS	little	10 to 20%	10 - 30	Medium Dense	4 - 8	Medium Stiff
____ FEET BELOW SURFACE AT ____ HOURS	some	20 to 35%	30 - 50	Dense	8 - 15	Stiff
	and	35 to 50%	50 +	Very Dense	15 - 30	Very Stiff
					30 +	Hard

LOCATION OF BORING **See Boring Location Plan**

DEPTH	Sample Depths From To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
	0.0-1.5	D	1	1	2	Very Moist	2.0	FILL: Brown Clay-Silt with Sand and Gravel
	2.0-3.5	D	2	4	6	Moist		FILL: Gray-Brown and Gray Variably Graded Mixtures of Shale and Sandstone Fragments in a Clay-Silt Matrix; Some Zones Have Higher Clay-Silt Content; Cobbles and Boulders Encountered During the Drilling Process
5	4.0-5.5	D	3	3	4	Moist		
10	8.5-10.0	D	2	2	5	Moist		
						Very Moist		
15	13.5-15.0	D	3	4	4	Moist		
20	18.5-20.0	D	7	10	8	Moist		
25	23.5-25.0	D	4	7	5	Moist		
30	28.5-30.0	D	8	8	8	Moist		
35	33.5-35.0	D	5	7	7	Moist		
40	38.5-40.0	D	11	15	18	Moist		
45	43.5-45.0	D	7	10	10	Moist		
	48.5-50.0	D	6	9	8	Moist		

*** The stratification lines represent the approximate boundary between soil types and the transition may be gradual.**

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TEST BORING LOG

PROJECT NAME: Proposed Belmont Technical College Development - Belmont County, Ohio
BORING NO. B-1
PROJ. NO. 02-G-09991
SURF. ELEV. 1235±
CLIENT: Phillip Markwood Architects
DATE DRILLED 4/30/2002

GROUND WATER OBSERVATION	Proportions Used		140 lb Wt. x 30" fall on 2" O.D. Sampler: Cohesionless Density		Cohesive Consistency	
None FEET BELOW SURFACE AT COMPLETION	trace	0 to 10%	0 - 10	Loose	0 - 4	Soft
____ FEET BELOW SURFACE AT 24 HOURS	little	10 to 20%	10 - 30	Medium Dense	4 - 8	Medium Stiff
____ FEET BELOW SURFACE AT ____ HOURS	some	20 to 35%	30 - 50	Dense	8 - 15	Stiff
	and	35 to 50%	50 +	Very Dense	15 - 30	Very Stiff
					30 +	Hard

LOCATION OF BORING: See Boring Location Plan

DEPTH	Sample Depths From To	Type of Sample	Blows per 6" on Sampler 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
55	53.5-55	D	10	8	12	Moist		
60	58.5-60	D	11	15	18	Moist		
65	63.5-65.0	D	13	18	25	Moist		
70	68.5-70	D	22	29	30	Moist		
75	73.5-75	D	18	20	30	Moist	77.5	
80	78.5-80	D	50/0			Moist	80.5	Gray SHALE
85								BOTTOM OF BORING: 80.5'
90								
95								

* The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

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TEST BORING LOG

PROJECT NAME: Proposed Belmont Technical College Development - Belmont County, Ohio
BORING NO.: B- 2
PROJ. NO.: 02-G-09991
SURF. ELEV.: 1187±
CLIENT: Phillip Markwood Architects
DATE DRILLED: 4/30/2002

GROUND WATER OBSERVATION	Proportions Used		140 lb Wt. x 30" fall on 2" O.D. Sampler — Cohesionless Density		Cohesive Consistency	
28.0 FEET BELOW SURFACE AT COMPLETION	trace	0 to 10%	0 - 10	Loose	0 - 4	Soft
____ FEET BELOW SURFACE AT 24 HOURS	little	10 to 20%	10 - 30	Medium Dense	4 - 8	Medium Stiff
____ FEET BELOW SURFACE AT ____ HOURS	some	20 to 35%	30 - 50	Dense	8 - 15	Stiff
	and	35 to 50%	50 +	Very Dense	15 - 30	Very Stiff
					30 +	Hard

LOCATION OF BORING: **See Boring Location Plan**

DEPTH	Sample Depths From To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
	0.0-1.5	D	2	2	3		1.0	FILL: Brown Clay-Silt with Sand and Gravel
	2.0-3.5	D	3	3	2	Moist		FILL: Gray-Brown and Gray Variably Graded Mixtures of Shale and Sandstone Fragments in a Clay-Silt Matrix; Some Zones Have Higher Clay-Silt Content; Cobbles and Boulders Encountered During the Drilling Process
5	4.0-5.5	D	2	3	5	Moist		
10	8.5-10.0	D	13 3	10	3	Moist		
15	13.5-15.0	D	3	3	3	Moist		
20	18.5-20.0	D	5	6	9	Moist		
25	23.5-25.0	D	10	5	5	Moist		
30	28.5-30.0	D	5	7	6	Moist		Water Seepage at 32.0'
35	33.5-35.0	D	3	3	3	Wet		
40	38.5-40.0	D	4	6	7	Moist	43.0	
45	43.5-45.0	D	50/2			Moist		Gray SHALE
	48.5-49	D	62/3			Moist	49.0	BOTTOM OF BORING: 49.0'

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TEST BORING LOG

PROJECT NAME Proposed Belmont Technical College Development - Belmont County, Ohio

BORING NO. B- 3

CLIENT Phillip Markwood Architects

PROJ. NO. 02-G-09991

SURF. ELEV. 1229±

DATE DRILLED 6/17/2002

GROUND WATER OBSERVATION	Proportions Used	140 lb Wt. x 30" fall on 2" O.D. Sampler — Cohesionless Density	Cohesive Consistency
51.0 FEET BELOW SURFACE AT COMPLETION	trace 0 to 10%	0 - 10 Loose	0 - 4 Soft
____ FEET BELOW SURFACE AT 24 HOURS	little 10 to 20%	10 - 30 Medium Dense	4 - 8 Medium Stiff
____ FEET BELOW SURFACE AT ____ HOURS	some 20 to 35%	30 - 50 Dense	8 - 15 Stiff
	and 35 to 50%	50 + Very Dense	15 - 30 Very Stiff
			30 + Hard

LOCATION OF BORING See Boring Location Plan

DEPTH	Sample Depths From To	Type of Sample	Blows per 6" on Sampler 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
	0.0-1.5	D	2	2	2	Moist		FILL: Brown Clay-Silt with Sand and Gravel
							2.0	
	2.0-3.5	D	2	3	4	Moist		FILL: Gray-Brown and Gray Variabally Graded Mixtures of Shale and Sandstone Fragments in a Clay-Silt Matrix; Some Zones Have Higher Clay-Silt Content; Cobbles and Boulders Encountered During the Drilling Process
5	4.0-5.5	D	4	5	5	Moist		
	8.5-10.0	D	6	2	4	Moist		
10						Moist		
	13.5-15.0	D	4	4	4	Moist		
15								
	18.5-20.0	D	15	16	8			
20								
	23.5-25.0	D	4	6	5	Moist		
25								
	28.5-30.0	D	5	9	8	Moist		
30								
	33.5-35.0	D	3	4	4	Moist		
35								
	38.5-40.0	D	5	8	14	Moist		
40								
	43.5-45.0	D	12	15	20	Moist		
45								
	48.5-50.0	D	11	10	10	Moist		

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TEST BORING LOG

PROJECT NAME: Proposed Belmont Technical College Development - Belmont County, Ohio
BORING NO. B- 3

CLIENT: Phillip Markwood Architects
PROJ. NO. 02-G-09991
SURF. ELEV. 1229 ±
DATE DRILLED 6/17/2002

GROUND WATER OBSERVATION	Proportions Used		140 lb Wt. x 30" fall on 2" O.D. Sampler	
			Cohesionless Density	Cohesive Consistency
51.0 FEET BELOW SURFACE AT COMPLETION	trace	0 to 10%	0 - 10 Loose	0 - 4 Soft
____ FEET BELOW SURFACE AT 24 HOURS	little	10 to 20%	10 - 30 Medium Dense	4 - 8 Medium Stiff
____ FEET BELOW SURFACE AT ____ HOURS	some	20 to 35%	30 - 50 Dense	8 - 15 Stiff
	and	35 to 50%	50 + Very Dense	15 - 30 Very Stiff
				30 + Hard

LOCATION OF BORING: See Boring Location Plan

DEPTH	Sample Depths From To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
	53.5-55	D	6	8	9	Moist		
55								
							57.0	Water Seepage at 57.0'
	58.5-60	D	17	36	50	Wet		Gray SHALE
60								
	63.5-65	D	50/1					
65								
							69.0	
70								AUGER REFUSAL AND BOTTOM OF BORING: 65.0'
75								
80								
85								
90								
95								

* The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

TEST BORING LOG

PROJECT NAME Proposed Belmont Technical College Development - Belmont County, Ohio

BORING NO. B-4

CLIENT Phillip Markwood Architects

PROJ. NO. 02-G-09991

SURF. ELEV. 1207±

DATE DRILLED 6/17/2002

GROUND WATER OBSERVATION

31.0 FEET BELOW SURFACE AT COMPLETION

_____ FEET BELOW SURFACE AT 24 HOURS

_____ FEET BELOW SURFACE AT _____ HOURS

Proportions Used

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0 - 10	Loose	0 - 4	Soft
10 - 30	Medium Dense	4 - 8	Medium Stiff
30 - 50	Dense	8 - 15	Stiff
50 +	Very Dense	15 - 30	Very Stiff
		30 +	Hard

LOCATION OF BORING **See Boring Location Plan**

DEPTH	Sample Depths From To	Type of Sample	Blows per 6" on Sampler 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
	0.0-1.5	D	2	2	3	Moist		FILL: Brown Clay-Silt with Sand and Gravel
	2.0-3.5	D	2	4	5	Moist	3.0	
5	4.0-5.5	D	4	5	6	Moist		FILL: Gray-Brown and Gray Variabally Graded Mixtures of Shale and Sandstone Fragments in a Clay-Silt Matrix; Some Zones Have Higher Clay-Silt Content; Cobbles and Boulders Encountered During the Drilling Process
10	8.5-10.0	D	2	2	2	Moist		
						Very Moist		
15	13.5-15.0	D	6	8	7	Moist		
20	18.5-20.0	D	4	4	5	Moist		
25	23.5-25.0	D	3	4	6	Moist		
30	28.5-30.0	D	5	5	7	Moist		Water Seepage at 31.0'
35	33.5-35.0	D	2	3	8	Wet		
40	38.5-40.0	D	30	5	3	Wet to Moist	43.0	
45	43.5-45.0	D	50/0			Wet		Gray SHALE
							49.5	AUGER REFUSAL AND BOTTOM OF BORING: 49.5'

*** The stratification lines represent the approximate boundary between soil types and the transition may be gradual.**

TEST BORING LOG

PROJECT NAME Proposed Belmont Technical College Development - Belmont County, Ohio

BORING NO. B-5

SURF. ELEV. 1221±

CLIENT Phillip Markwood Architects

PROJ. NO. 02-G-09991

DATE DRILLED 6/17/2002

GROUND WATER OBSERVATION		Proportions Used		140 lb Wt. x 30" fall on 2" O.D. Sampler			
				Cohesionless Density		Cohesive Consistency	
52.0	FEET BELOW SURFACE AT COMPLETION	trace	0 to 10%	0 - 10	Loose	0 - 4	Soft
____	FEET BELOW SURFACE AT 24 HOURS	little	10 to 20%	10 - 30	Medium Dense	4 - 8	Medium Stiff
____	FEET BELOW SURFACE AT ____ HOURS	some	20 to 35%	30 - 50	Dense	8 - 15	Stiff
		and	35 to 50%	50 +	Very Dense	15 - 30	Very Stiff
						30 +	Hard

LOCATION OF BORING **See Boring Location Plan**

DEPTH	Sample Depths From To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
	0.0-1.5	D	2	2	2	Moist		FILL: Brown Clay-Silt with Sand and Gravel
	2.0-3.5	D	2	2	3	Moist	3.0	
5	4.0-5.5	D	6	6	7	Moist		FILL: Gray-Brown and Gray Variabally Graded Mixtures of Shale and Sandstone Fragments in a Clay-Silt Matrix; Some Zones Have Higher Clay-Silt Content; Cobbles and Boulders Encountered During the Drilling Process
10	8.5-10.0	D	2	1	2	Moist		
15	13.5-15.0	D	2	2	3	Moist		
20	18.5-20.0	D	3	4	6	Moist		
25	23.5-25.0	D	4	4	5	Moist		
30	28.5-30.0	D	5	7	8	Moist		
35	33.5-35.0	D	4	10	6	Moist		
40	38.5-40.0	D	8	6	6	Moist		
45	43.5-45.0	D	3	6	7	Moist		
	48.5-50.0	D	8	5	9	Moist		

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TEST BORING LOG

PROJECT NAME Proposed Belmont Technical College Development - Belmont County, Ohio

BORING NO. B- 5

SURF. ELEV. 1221 ±

CLIENT Phillip Markwood Architects

PROJ. NO. 02-G-09991

DATE DRILLED 6/17/2002

GROUND WATER OBSERVATION	Proportions Used		140 lb Wt. x 30" fall on 2" O.D. Sampler — Cohesionless Density		Cohesive Consistency	
52.0 FEET BELOW SURFACE AT COMPLETION	trace	0 to 10%	0 - 10	Loose	0 - 4	Soft
____ FEET BELOW SURFACE AT 24 HOURS	little	10 to 20%	10 - 30	Medium Dense	4 - 8	Medium Stiff
____ FEET BELOW SURFACE AT ____ HOURS	some	20 to 35%	30 - 50	Dense	8 - 15	Stiff
	and	35 to 50%	50 +	Very Dense	15 - 30	Very Stiff
					30 +	Hard

LOCATION OF BORING See Boring Location Plan

DEPTH	Sample Depths From To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
								Water Seepage at 52.0'
	53.5-55	D	7	8	8	Wet		
55								
	58.5-60	D	6	7	9	Wet		
60								
							63.0	Gray SHALE
65								
							67.0	
70								AUGER REFUSAL AND BOTTOM OF BORING: 67.0'
75								
80								
85								
90								
95								

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TEST BORING LOG

PROJECT NAME Proposed Belmont Technical College Development - Belmont County, Ohio

BORING NO. B- 6

CLIENT Phillip Markwood Architects

PROJ. NO. 02-G-09991

SURF. ELEV. 1200±

DATE DRILLED 6/17/2002

GROUND WATER OBSERVATION

32.0 FEET BELOW SURFACE AT COMPLETION

_____ FEET BELOW SURFACE AT 24 HOURS

_____ FEET BELOW SURFACE AT _____ HOURS

Proportions Used

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0 - 10	Loose	0 - 4	Soft
10 - 30	Medium Dense	4 - 8	Medium Stiff
30 - 50	Dense	8 - 15	Stiff
50 +	Very Dense	15 - 30	Very Stiff
		30 +	Hard

LOCATION OF BORING **See Boring Location Plan**

DEPTH	Sample Depths From To	Type of Sample	Blows per 6" on Sampler 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
	0.0-1.5	D	2	3	2	Moist	1.0	FILL: Brown Clay-Silt with Sand and Gravel
	2.0-3.5	D	2	3	4	Moist		FILL: Gray-Brown and Gray Variably Graded Mixtures of Shale and Sandstone Fragments in a Clay-Silt Matrix; Some Zones Have Higher Clay-Silt Content; Cobbles and Boulders Encountered During the Drilling Process
5	4.0-5.5	D	2	2	2	Moist		
10	8.5-10.0	D	1	1	2	Moist		
15	13.5-15.0	D	2	3	3	Moist		
20	18.5-20.0	D	3	4	4	Moist		
25	23.5-25.0	D	4	6	5	Moist		
30	28.5-30.0	D	50/0			Moist		
								Water Seepage at 32.0'
35	33.5-35.0	D	3	5	5			
40	38.5-40.0	D	4	2	2	Wet		
45	43.5-45.0	D	5	8	8	Moist	46.0	
								Gray SHALE
	48.5-50.0	D	50/0			Moist		

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TEST BORING LOG

PROJECT NAME Proposed Belmont Technical College Development - Belmont County, Ohio

BORING NO. B-6

SURF. ELEV. 1200±

CLIENT Phillip Markwood Architects

PROJ. NO. 02-G-09991

DATE DRILLED 6/17/2002

GROUND WATER OBSERVATION	Proportions Used		140 lb Wt. x 30" fall on 2" O.D. Sampler Cohesionless Density		Cohesive Consistency	
32.0 FEET BELOW SURFACE AT COMPLETION	trace	0 to 10%	0 - 10	Loose	0 - 4	Soft
____ FEET BELOW SURFACE AT 24 HOURS	little	10 to 20%	10 - 30	Medium Dense	4 - 8	Medium Stiff
____ FEET BELOW SURFACE AT ____ HOURS	some	20 to 35%	30 - 50	Dense	8 - 15	Stiff
	and	35 to 50%	50 +	Very Dense	15 - 30	Very Stiff
					30 +	Hard

LOCATION OF BORING See Boring Location Plan

DEPTH	Sample Depths From	Sample Depths To	Type of Sample	Blows per 6" on Sampler 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Depth*	SOIL IDENTIFICATION Remarks include color, type of soil, etc. Rock-color, type, condition, hardness
								53.0	
55									AUGER REFUSAL AND BOTTOM OF BORING: 53.0'
60									
65									
70									
75									
80									
85									
90									
95									

* The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

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