REPORT

OF

SUBSURFACE INVESTIGATION

FOR

LICKING THORNWOOD DRIVE PROJECT

LICKING COUNTY, OHIO

(PID #78116)

Prepared for:

HNTB Corporation
1100 Superior Avenue
Suite 1330
Cleveland, Ohio 44114-2531

Prepared by:

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6121 Huntley Road
Columbus, Ohio 43229

DLZ Job No. 0821-3004.00

October 12, 2009

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I. Introduction

This report presents the findings of a subsurface investigation performed by DLZ Ohio, Inc. for the Licking County Thornwood Drive reconstruction project. This project is located in the City of Newark and begins approximately 500 feet north of the intersection of Thornwood Drive and Beaver Run Road. It ends near the intersection Reddington Road and Cherry Valley Road. The total length of the project is approximately 4 miles.

The scope of the project involves the widening and re-alignment of Thornwood Drive to provide standard lane widths, graded shoulders, upgraded horizontal and vertical alignments, and clear zone grading where possible. In addition, left turn lanes will be provided on Thornwood Drive at relocated River Road, West Main Street and James Road. The following intersecting roads will be widened to accommodate left turn lanes: West Main Street, James Road, and Lees Road. The profile grade along most of the Thornwood Drive is not anticipated to change by more than a few feet. However, fills of up to 12 feet may be required near the existing railroad tracks (between Stations 134+00.00 and 157+00.00), the areas between Stations 175+00.00 and 195+00.00 and in the existing ditch lines.

The geotechnical engineer has planned and supervised the performance of the geotechnical engineering services, considered the findings, and prepared this report in accordance with generally accepted geotechnical engineering practices. No other warranties, either expressed or implied, are made as to the professional advice included in this report.

II. Field Exploration

The original subsurface investigation consisted of drilling 71 borings, B-001 through B-071. However, due to a change in the original scope of work, B-021-1, B-028-1, and B-042-1, and B-060-1 were added and borings B-057, B-060, B-062, B-064 and B-065 were eliminated from the original plan. Borings B-002, B-021-1, B-028-1, B-041 and B-042, B-058, and B-060-1 were drilled in the proposed ditches and sidehill fill areas. As a result, a total of 63 roadway borings were drilled for the pavement subgrade evaluation. A majority of the roadway borings were drilled on Thornwood Drive. However, of the 63 roadway borings, two borings, B-030 and B-031, were drilled on Lees Road while four borings, B-051 through B-054, were drilled on James Road/Main Street and boring B-066 was drilled on Reddington Road Connector. In addition, five roadway borings, B-067 through B-071, were drilled on Reddington Road. The borings were generally drilled to depths between 6.5 and 22.5 feet deep, with the majority of them drilled to a depth of 10.0 feet. However, boring B-042 was drilled to a depth 42.0 feet.

The borings were drilled on April 2, 2009 and August 27, 2009, using an all-terrain vehicle mounted or truck mounted, rotary-type drill rig. Additional information regarding the drilling procedures are presented in Appendix I.

During the subsurface exploration, several borings encountered very soft and organic soils. In accordance with the Specifications for Geotechnical Explorations, the existing borings should have been extended and additional borings should have been drilled to refine the limits of the poor soils. In April 2009, DLZ informed HNTB that we intended to stop work on the project until we received direction about the extent of the additional exploration, since the additional drilling and analyses would be beyond the original scope of services.

On July 28, 2009, DLZ met with ODOT District 5 personnel to discuss the additional work based on the presence of the poor soils. The ODOT personnel indicated that additional funds were not available at this time for significant additional drilling and analyses regarding the poor soils. Therefore, it was decided that DLZ would drill a few additional borings and perform testing but that stability and settlement analyses would be performed at a later time by others. The results of the few additional borings and laboratory testing are presented in this report. The exceptions to this are the results of consolidation tests which will be completed later and submitted under separate cover.

DLZ prepared a letter dated August 3, 2009 that documented the results of the meeting on July 28, 2009. A copy of this letter is presented in Appendix I.

Boring locations were determined by DLZ Ohio, Inc. personnel and initially marked in the field by Jobes-Henderson & Associates personnel. Subsequent additional borings or borings that required location adjustment were marked in the field by DLZ Ohio, Inc. personnel. The approximate locations of the borings, in reference to the station numbers on the project plans, are shown on the Boring Logs in Appendix I. The ground surface elevations at all of the borings were estimated using the site plans provided by HNTB at Cleveland Office, between August and September of 2009. The estimated elevations at the boring locations are included on the Boring Logs.

III. Geology of the Site

The project area is located within the glaciated portion of the Allegheny Plateau Physiographic Province. The site also lies east of the Allegheny Escarpment, which bisects the Licking County from north to south. This physiographic region is characterized by ridges and flat uplands, which are covered by a thin layer of glacial drift and dissected by steep valleys. The project area is located on an outwash terrace.

The primary drainage in the area is provided by the Licking River and associated tributaries. Thornwood Drive is located immediately west of the South Fork of the Licking River.

Subsurface information obtained from the Groundwater Resources Map of Licking County indicates that the project lies in a large buried valley aquifer system of the ancient Newark River. The outwash deposits that filled the valley are in excess of 200 feet in thickness. Information suggests that highly productive water zones are present in the valley fill. Yields of between 100 and 500 gallons per minute can be derived from these deposits.

IV. Subsurface Conditions

The following sections present the generalized subsurface conditions encountered by the borings. For more detailed information, refer to the Boring Logs presented in Appendix I. Results of laboratory tests are shown on the Boring Logs in Appendix I.

A. Soil Conditions

At the ground surface, the borings drilled on the existing pavement areas generally encountered between 5 and 15 inches of asphalt concrete while the borings drilled outside of the existing roadway encountered between 2 and 9 inches of topsoil or between 1 and 6 inches of aggregate. However, asphalt concrete, topsoil or aggregate were not encountered at the ground surface of borings B-002, B-010, B-019 and B021. Below the surface materials, the borings generally encountered cohesive materials mostly consisting of Sandy Silt (A-4a), Silt (A-4b), Silt and Clay (A-6a), Silty Clay (A-6b). Granular materials, mostly Gravel with Sand (A-1-b), were also encountered in the borings. Occasionally, Clay (A-7-6), Gravel (A-1-a), Coarse and Fine Sand (A-3a), Gravel with Sand and Silt (A-2-4) were also encountered in isolated borings. Organic Silt (A-8a) and Organic Clay (A-8b) was present at depths between 12 inches and 8.5 feet in borings B-001, B-005, B-011, B-014, B-018 and B-020. These organic silt soils contained organic contents ranging from 5.4 to 11.4 percent. Clay (A-7-6) and Silty Clay (A-6b) with high organic contents, (but not classified as organic soils) were encountered between depths of 1.5 and 7.0 feet in borings B-021, B-028, B-029 and B-033. The organic contents of these cohesive soils ranged from 4 to 8 percent. Bedrock was not encountered in the majority of borings within the depths of investigation. However, highly weathered and decomposed sandstone was encountered between depths of 2.0 feet (Elevation 965.6) and 8.0 feet (Elevation 1012.5) in borings B-055, B-056, B-058, B-60-1, B-061, and B-063. These borings are located near the north end of the project area.

Standard penetration blow counts (N-values) in the subgrade soils, within seven feet of the estimated finished grade of the proposed roadway, varied from WOH (weight of hammer) to 83 blows per 12 inches of penetration, with an average N-value of approximately 13, indicating very loose to dense or very soft to hard material. The higher blow counts may be due to the presence of gravel or rock fragments occasionally encountered in the soil. The natural moisture contents of the subgrade soils ranged from

5% to 89%, with an average of 9.5%. The high moisture contents generally were present in soils containing high organic contents.

B. Groundwater Conditions

Seepage was first encountered at depths between 3.0 and 18.5 feet, with elevations ranging from 964.9 to 880.2 feet. Groundwater levels were observed at depths between 5.0 and 18.8 feet, with elevations ranging from 949.0 to 870.5 feet. It should be noted that water levels may fluctuate due to rainfall, surface drainage, site topography, and other climatic factors. During construction or at other times during the project life, the water level may be higher or lower than observed at the time of the investigation.

V. Conclusions and Recommendations

A. Pavement Design Information

A summary of the subgrade soils encountered by the borings, the average group indices, CBR values, and number of samples for each soil type are listed in Table 1 below. It should be noted that only information pertaining to samples within the upper seven feet of the anticipated subgrade is presented.

Table 1.

Subgrade Soils			
ODOT Classification	**Group Index**	**CBR**	**No. Samples**
A-1-a	0	12	7
A-1-b	0	12	29
A-2-4	0	12	13
A-3	0	12	3
A-3a	0	12	2
A-4a	5	8	53
A-4b	8	6	22
A-6a	9	6	67
A-6b	11	5	37
A-7-6	15	4	9
A-8a	20	0	6
A-8b	20	0	2

As indicated, the group indices of the soils varied from 0 to 19, with an average of 6.5, which correlates with a CBR value of 7.

B. Subgrade Recommendations

The existing subgrade soils at the boring locations were evaluated for suitability according to the ODOT Geotechnical Bulletin GB-1 "Plan Subgrade." It should be noted that only samples within 7 feet of the estimated finished grade were evaluated. The GB-1 Soil Investigation Summary Sheet is included in Appendix II.

According to the GB-1, any soil with moisture content exceeding the optimum moisture content of the soil by three or more percentage points, or has low N-values, is considered problematic soil and will likely require some form of subgrade treatment. The stabilization options available include undercutting, cement stabilization, and lime stabilization. However, the cement or lime stabilization may not be effective in very weak soils (N-values less than 5 blows per foot).

Results of this surface investigation indicate that approximately 48 percent of the samples, located within 7 feet of the estimated finished grade, had moisture contents exceeding their corresponding optimum moisture contents by more than 3 percent and that approximately 59 percent of the samples had low N-values. The natural moisture contents of the subgrade soil ranged from 5% to 89%, with an average of 19.2%, and the N-values varied from WOH to 83, with an average of 13. The low N-value of each boring varied from WOH to 20, with an average of 7.5. Silt (A-4b), Organic Silt (A-8a) and Organic Clay (A-8b) were present within the subgrade elevations in isolated boring locations. As a result, subgrade stabilization is required for portions of the project area.

In accordance with the results of the GB-1 analysis, chemical stabilization of 12 to 16 inches of subgrade soil at 24 boring locations in conjunction with undercutting of 1 to 5 feet at 15 boring locations is an appropriate subgrade treatment. Alternatively, undercutting of 1 to 5 feet in 39 of the 63 boring locations may be considered. Based on these results, subgrade stabilization is required of approximately 62 percent of the project areas.

Based on the soil information, organic soils were present within the subgrade elevations in isolated boring locations. It is probable that organic soils may be encountered at other locations along the proposed alignment that were not disclosed by the borings. Since chemical stabilization may not be effective in organic soils, undercutting of 1 to 5 feet of existing subgrade appears to be a preferred option. The undercut area should be replaced with compacted Type B or Type C granular material (ODOT Item 703.16.C) and should extend 18 inches beyond the edge of the pavement, paved shoulders, or paved medians. Before placing the compacted granular material, proofroll the entire undercut area. If any areas rut or deflect, overexcavate the soft or loose soils and replace with compacted Type B or Type C granular material. Please note that the ODOT Geotechnical Bulletin GB-1 requires that a geotextile fabric Type D (ODOT Item 712.09) be placed in the bottom of

the undercut for separation purposes. A summary of the recommended depths of undercuts at each of the treatment areas is presented in Table 2 below.

Table 2.

Treatment Areas		Referencing Boring Locations	Recommended Depth of Undercuts, ft.
Beginning Station*	**Ending Station***		
6+00.00	10+00.00	B-001	7.0[1]
14+00.00	18+00.00	B-003	1.0
22+00.00	29+50.00	B-005, B-006	3.0
31+50.00	39+50.00	B-008, B-009	3.0
46+50.00	50+50.00	B-012	3.0
54+50.00	58+50.00	B-014	5.0[1]
58+50.00	66+50.00	B-015 through B-017	3.0
70+50.00	78+50.00	B-019 through B-021	5.0[2]
82+50.00	92+50.00	B-022, B-023, B-024	3.0
101+50.00	109+50.00	B-028, B-029	3.0
118+50.00	130+50.00	B-035, B-036, B-037	3.5
134+50.00	138+50.00	B-039	3.0
162+50.00	166+50.00	B-046	3.0
166+50.00	170+50.00	B-047	5.0[2]
174+50.00	178+50.00	B-049	2.0
194+50.00	198+50.00	B-061	2.0
13+00.00 (Lees Rd)	17+00.00 (Lees Rd)	B-030	3.0
17+00.00 (Lees Rd)	21+00.00 (Lees Rd)	B-031	5.0[2]
13+00.00 (James/Main St)	17+00.00 (James/Main St)	B-051	1.0
19+00.00 (James/Main St)	23+00.00 (James/Main St)	B-053	5.0[2]
21+00.00 (Reddington Rd Connector)	25+00.00 (Reddington Rd Connector)	B-066	5.0[2]
18+00.00 (Reddington Rd)	22+00.00 (Reddington Rd)	B-067	5.0[2]
22+00.00 (Reddington Rd)	25+00.00 (Reddington Rd)	B-068	2.0

*Stationing is referenced to Thornwood Drive unless noted otherwise.

[1]Deeper undercut is recommended to remove the underlying organic soils.

[2]Undercutting of 5 feet due to the existence of organic soils or soils with N-values less than 5.

According to GB-1, for projects where it is determined that 30 percent or more of the subgrade area must be stabilized, consideration should be given to stabilizing the entire project. If the owner chooses to treat the subgrade of the entire project, it is recommended that an overall subgrade treatment of 3.0 feet of undercutting be performed, except where organic soils or soils with N-values less than 5 are present the undercutting extend deeper as noted in Table 2.

Given the high moisture contents in the existing subgrade soils and the low permeability of in-place subgrade, underdrain systems should be considered for the proposed pavement.

C. Sidehill Fill Design

The ODOT Geotechnical Bulletin GB-2, *Special Benching and Sidehill Embankment Fills*, was used to determine the cut angles and the stability of the proposed sidehill fill between Stations 130+50 and 130+75 and also between Stations 190+50 and 197+50. Results of the special benching analyses are included in Appendix III. It should be noted that the evaluation of the embankment stability is not within the scope of this subsurface investigation.

VII. Closing Remarks

We appreciate having the opportunity to be of service to you on this project. Please do not hesitate to call if you have any questions concerning our report.

Respectfully submitted,

DLZ OHIO, INC.

Eric W. Tse, P.E.
Senior Geotechnical Engineer

Dorothy A Adams, P.E.
Senior Geotechnical Engineer

Pete Nix, P.E.
Geotechnical Engineering Division Manager

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APPENDIX I

August 3, 2009 Letter from DLZ to HNTB
General Information – Drilling Procedures and Logs of Borings
Legend – Boring Log Terminology
Boring Logs – Seventy (70) Borings

August 3, 2009

HNTB
1100 Superior Avenue, Ste. 1330
Cleveland, OH 44114

Attn: Mr. Jon Lorincz, P.E.

Re: Subsurface Exploration Status
LIC-Thornwood Drive
DLZ Job No. 0821-3004.00

Mr. Lorincz:

This letter supplements our April 28, 2009 and June 19, 2009 letters that provided information about the geotechnical effort to date, the findings from the borings, and the costs we have incurred on the project. This letter is provided to clarify the geotechnical scope and budget for the remainder of the project. This clarification was the result of a meeting on July 28, 2009 between the undersigned and Nikunj Kadakia and Dave Slatzer from ODOT District 5.

Based on these discussions, DLZ will perform the following items of work to complete this phase of the subsurface exploration for the project. DLZ will perform this work within the existing, original budget for the project ($95,463):

- DLZ will complete the remaining borings on the project at roughly 400-foot centers. Sampling will be performed in accordance with GB-1. In addition, DLZ will extend a roadway boring near the proposed culvert location to a depth of 20 feet. DLZ will also drill four additional borings to depths of 20 feet to develop two cross-sections in the area where soft, organic soils were encountered.
- A law enforcement office will be used for traffic control during the drilling operations; this effort wasn't included in the original cost estimate but we believe we can complete the work and still remain within the existing budget.
- DLZ will perform the subgrade evaluation in accordance with GB-1; this work was included in the original geotechnical scope of work.
- DLZ will evaluate the cut slopes; this work was also included in the original geotechnical scope of work.
- DLZ ***will not*** evaluate the embankments that will be founded on the soft, organic soils beyond what is required as part of the subgrade evaluation. It is anticipated that settlement and slope stability analyses will be required and that these analyses will be performed by others. Two consolidation tests will be performed as part of the existing exploration to be used later in these analyses.

6121 HUNTLEY ROAD COLUMBUS, OHIO 43229-1003 PHONE: (614) 888-0040 FAX: (614) 848-6712

We hope this information is helpful and clarifies the remaining geotechnical scope of work for the project. If you have any questions or need any additional information, please don't hesitate to contact us.

Sincerely,

DLZ OHIO, INC.

Pete Nix, P.E.
Geotechnical Engineering and Drilling Division Manager

GENERAL INFORMATION
DRILLING PROCEDURES AND LOGS OF BORINGS

Drilling and sampling were conducted in accordance with procedures generally recognized and accepted as standardized methods of investigation of subsurface conditions concerning geotechnical engineering considerations. Borings were drilled with either a truck-mounted or ATV-mounted drill rig.

Drive split-barrel sampling was performed in 1.5 foot increments at intervals not exceeding 5 feet. In the event the sampler encountered resistance to penetration of 6 inches or less after 50 blows of the drop hammer, the sampling increment was discontinued. Standard penetration data were recorded and one or more representative samples were preserved from each sampling increment.

In borings where rock was cored, NXM or NQ size diamond coring tools were used.

In the laboratory all samples were visually classified by a geotechnical engineer. Moisture contents of representative fine-grained soil samples were determined. A limited number of samples, considered representative of foundation materials present, were selected for performance of grain-size analyses and plasticity characteristics tests. The results of these tests are shown on the boring logs.

The boring logs included in the Appendix have been prepared on the basis of the field record of drilling and sampling, and the results of the laboratory examination and testing of samples. Stratification lines on the boring logs indicating changes in soil stratigraphy represent depths of changes approximated by the driller, by sampling effort and recovery, and by laboratory test results. Actual depths to changes may differ somewhat from the estimated depths, or transitions may occur gradually and not be sharply defined. The boring logs presented in this report therefore contain both factual and interpretative information and are not an exact copy of the field log.

Although it is considered that the borings have disclosed information generally representative of site conditions, it should be expected that between borings conditions may occur which are not precisely represented by any one of the borings. Soil deposition processes and natural geologic forces are such that soil and rock types and conditions may change in short vertical intervals and horizontal distances.

Soil/rock samples will be stored at our laboratory for a period of six months. After this period of time, they will be discarded, unless notified to the contrary by the client.

LEGEND – BORING LOG TERMINOLOGY

Explanation of each column, progressing from left to right

1. Depth (in feet) – refers to distance below the ground surface.

2. Elevation (in feet) – is referenced to mean sea level, unless otherwise noted.

3. Standard Penetration (N) – the number of blows required to drive a 2-inch O.D., 1-3/8 inch I.D., split-barrel sampler, using a 140-pound hammer with a 30-inch free fall. The blows are recorded in 6-inch drive increments. Standard penetration resistance is determined from the total number of blows required for one foot of penetration by summing the second and third 6-inch increments of an 18-inch drive.

   50/n – indicates number of blows (50) to drive a split-barrel sampler a certain number of inches (n) other than the normal 6-inch increment.

4. The length of the sampler drive is indicated graphically by horizontal lines across the "Standard Penetration" and "Recovery" columns.

5. Sample recovery from each drive is indicated numerically in the column headed "Recovery".

6. The drive sample location is designated by the heavy vertical bar in the "Sample No., Drive" column.

7. The length of hydraulically pressed "Undisturbed" samples is indicated graphically by horizontal lines across the "Press" column.

8. Sample numbers are designated consecutively, increasing in depth.

9. Soil Description

   a. The following terms are used to describe the relative compactness and consistency of soils:

   Granular Soils – Compactness

Term	Blows/Foot Standard Penetration
Very Loose	0 – 4
Loose	4 – 10
Medium Dense	10 – 30
Dense	30 – 50
Very Dense	over 50

   Cohesive Soils – Consistency

Term	Unconfined Compression tons/sq.ft.	Blows/Foot Standard Penetration	Hand Manipulation
Very Soft	less than 0.25	below 2	Easily penetrated by fist
Soft	0.25 – 0.50	2 – 4	Easily penetrated by thumb
Medium Stiff	0.50 – 1.0	4 – 8	Penetrated by thumb with moderate pressure
Stiff	1.0 – 2.0	8 – 15	Readily indented by thumb but not penetrated
Very Stiff	2.0 – 4.0	15 – 30	Readily indented by thumb nail
Hard	over 4.0	over 30	Indented with difficulty by thumb nail

   b. Color – If a soil is a uniform color throughout, the term is single, modified by such adjective as light and dark. If the predominant color is shaded by a secondary color, the secondary color precedes the primary color. If two major and distinct colors are swirled throughout the soil, the colors are modified by the term "mottled".

   c. Texture is based on the Ohio Department of Transportation Classification System. Soil particle size definitions are as follows:

Description		Size	Description		Size
Boulders		Larger than 8"	Sand	– Coarse	2.0 mm to 0.42 mm
Cobbles		8" to 3"		– Fine	0.42 mm to 0.074 mm
Gravel	– Coarse	3" to ¾"	Silt		0.074 mm to 0.005 mm
	– Fine	¾" to 2.0 mm	Clay		smaller than 0.005 mm

d. The main soil component is listed first. The minor components are listed in order of decreasing percentage of particle size.

e. Modifiers to main soil descriptions are indicated as a percentage by weight of particle sizes.

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

f. Moisture content of **cohesionless soils** (sands and gravels) is described as follows:

Term	Relative Moisture or Appearance
Dry	No moisture present
Damp	Internal moisture, but none to little surface moisture
Moist	Free water on surface
Wet	Voids filled with free water

g. The moisture content of **cohesive soils** (silts and clays) is expressed relative to plastic properties.

Term	Relative Moisture or Appearance
Dry	Powdery
Damp	Moisture content slightly below plastic limit
Moist	Moisture content above plastic limit but below liquid limit
Wet	Moisture content above liquid limit

10. Rock Hardness and Rock Quality Designation

a. The following terms are used to describe the relative strength of the **bedrock**.

Term	Description
Very Weak	Core can be carved with a knife and scratched by fingernail. Can be excavated readily with a point of a pick. Pieces 1-inch or more in thickness can be broken by finger pressure.
Weak	Core can be grooved or gouged readily by a knife or pick. Can be excavated in small fragments by moderate blows of a pick point. Small, thin pieces can be broken by finger pressure.
Slightly Strong	Core can be grooved or gouged 0.05 inch deep by firm pressure of a knife or pick point. Can be excavated in small chips to pieces about 1-inch maximum size by hard blows of the point of a geologist's pick.
Moderately Strong	Core can be scratched with a knife or pick. Grooves or gouges to ¼" deep can be excavated by hand blows of a geologist's pick. Requires moderate hammer blows to detach hand specimen.
Strong	Core can be scratched with a knife or pick only with difficulty. Requires hard hammer blows to detach hand specimen. Sharp and resistant edges are present on hand specimen.
Very Strong	Core cannot be scratched by a knife or sharp pick. Breaking of hand specimens requires hard repeated blows of the geologist hammer.
Extremely Strong	Core cannot be scratched by a knife or sharp pick. Chipping of hand specimens requires hard repeated blows of the geologist hammer.

b. Rock Quality Designation, RQD – This value is expressed in percent and is an indirect measure of rock soundness. It is obtained by summing the total length of all core pieces which are at least four inches long, and then dividing this sum by the total length of the core run.

11. Gradation – when tests are performed, the percentage of each particle size is listed in the appropriate column (defined in Item 9c).

12. When a test is performed to determine the natural moisture content, liquid limit moisture content, or plastic limit moisture content, the moisture content is indicated graphically.

13. The corrected standard penetration (N_{60}) value in blows per foot is indicated graphically.

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

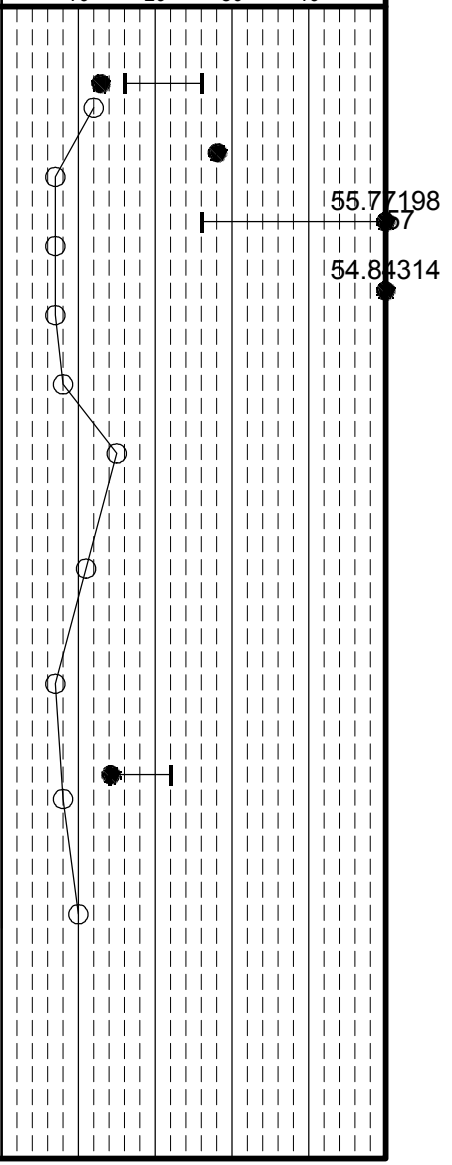
LOG OF: Boring B-001 | *Location:* Sta 7+95.86, 5.92' left | *Date Drilled:* 4/6/2009

WATER OBSERVATIONS:
Water seepage at: 7.0-12.5
Water level at completion: 16.7

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 887.2	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.0	886.2						Asphalt Conctete Pavement - 11.5"							
2.5	884.7	11 8 4	8	1			Stiff brown SANDY SILT (A-4a), some fine to coarse sand, some gravel, little clay; damp.		27	13	---	12	29	19
4.0	883.2	2 3 4	12	2		1.0	Medium stiff gray SILT (A-4b), trace to little fine to coarse sand; damp to moist.							
5		2 3 4	14	3		1.5	Stiff black ORGANIC SILT (A-8a), "AND" clay, little fine to coarse sand; contains decayed organic material; moist. LOI @750 C=8.6%		0	9	---	9	44	38
7.0	880.2	2 3 4	13	4		1.25								
10		2 4 4	4	5			Loose to medium dense gray GRAVEL WITH SAND, SILT, AND CLAY (A-2-6), little to some silty clay; contains possible cobbles; moist to wet.							
		7 7 8	5	6										
12.5	874.7	6 4 7	8	7										
15		2 3 4	6	8		1.5	Stiff gray SANDY SILT (A-4a), some fine to coarse sand, some clay, trace gravel; damp to moist.							
		2 3 5	10	9		1.5			8	10	---	16	39	27
20.0	867.2	3 4 6	11	10		1.25								
25							Bottom of Boring - 20.0'							

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢ LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

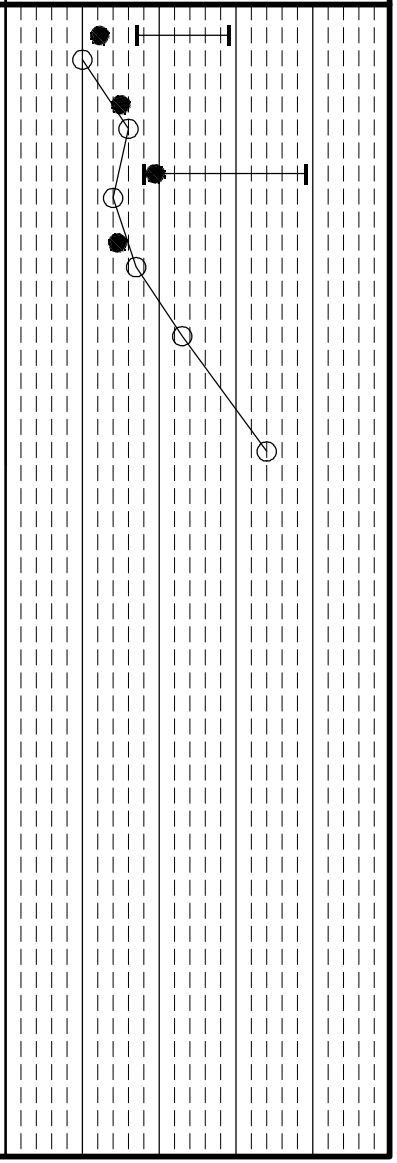
Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-002 | *Location:* Sta 11+95.48, 24.59' left | *Date Drilled:* 4/14/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	893.2	2 3 4	14	1			Loose to medium dense brown GRAVEL WITH SAND, SILT, AND CLAY (A-2-6), some to "and" fine to coarse sand, little silt; little to some clay; damp to moist.		52	15	---	10	12	11
		2 4 7	12	2										
		3 4 6	12	3					30	23	---	14	12	21
5		3 5 7	16	4		3.0								
		4 8 8	18	5		2.75								
10.0 10	883.2	8 11 13	18	6		4.5+								
							Bottom of Boring - 10.0'							
15														
20														
25														



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

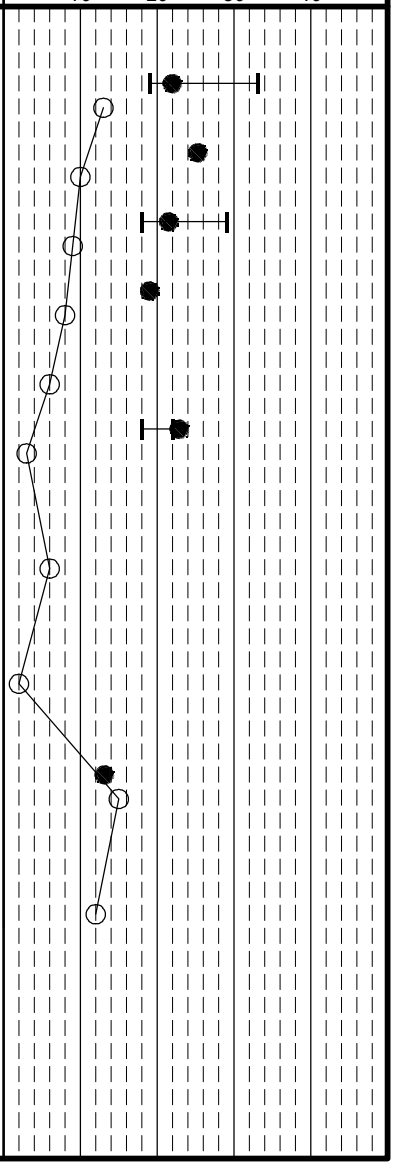
LOG OF: Boring B-003 | *Location:* Sta 15+96.33, 0.19 left | *Date Drilled:* 4/6/2009

WATER OBSERVATIONS:
Water seepage at: 7.0-15.0
Water level at completion: 15.6

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 904.1	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.0	903.1						Asphalt Concrete Pavement - 12"							
		6 8 5	15	1		2.5	Very stiff brown SILT AND CLAY (A-6a), trace fine sand; moist.		0	0	---	1	62	37
4.0	900.1	4 4 6	17	2		2.25								
5		3 4 5	18	3		1.5	Stiff brown SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; moist.		1	3	---	10	61	25
7.0	897.1	4 4 4	10	4			@ 5.5', contains little gravel.							
		3 2 4	8	5			Very loose to loose brown GRAVEL WITH SAND (A-1-b), some to "and" fine to coarse sand; little silt; trace to little clay; wet.							
10		3 2 1	10	6					38	25	---	12	15	10
		2 2 4	6	7										
15.0 15	889.1	WOH WOH 2	3	8										
		3 6 9	12	9		3.0	Very stiff brownish-gray SILT AND CLAY (A-6a), little to some gravel, little fine to coarse sand; damp.							
20.0 20	884.1	3 5 7	14	10		2.75								
25							Bottom of Boring - 20.0'							

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

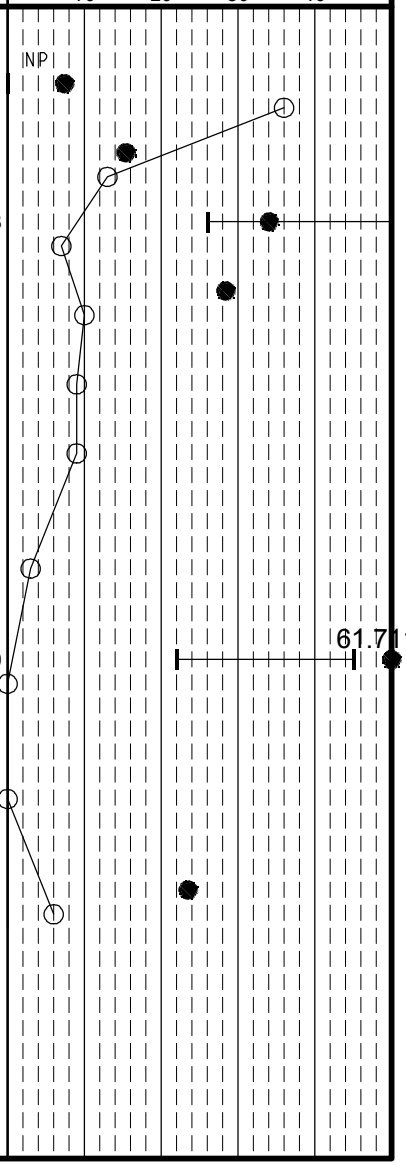
LOG OF: Boring B-004 | *Location:* Sta 20+01.83, 4.82 left | *Date Drilled:* 4/6/2009

WATER OBSERVATIONS:
Water seepage at: 18.5-20.0
Water level at completion: 18.7

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 910.0	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.0	909.0						Asphalt Concrete Pavement - 12"							
2.5	907.5	6 16 19	12	1			Dense brown GRAVEL WITH SAND (A-1-b), some fine to coarse sand, some silty clay; damp.		43	20	---	14	--23--	
4.0	906.0	9 6 7	16	2			Stiff brown SILT AND CLAY (A-6a), little fine to coarse sand, little gravel; damp.							
5.5	904.5	2 3 4	15	3		0.5	Medium stiff black CLAY (A-7-6), trace to little fine to coarse sand; contains organic material; moist.		0	2	---	8	62	28
		3 4 6	17	4		1.5	Stiff dark grayish-brown SILT AND CLAY (A-6a), little fine to coarse sand, slightly organic; damp.							
		2 4 5	18	5		1.75	@ 7.0', mottled brown and gray.							
		4 4 5	15	6		1.5								
							@ 10.0', soft, little fine sand, trace coarse sand, moist.							
12.5	897.5	WOH 1 2	18	7		0.5								
							Very soft to soft gray CLAY (A-7-6), trace fine to coarse sand, "and" silt; contains organic material (wood fibers), contains small shells; wet.							
		WOH WOH WOH	18	8		0.25			0	1	---	3	56	40
17.5	892.5	WOH WOH WOH	18	9		0.25								
							Loose gray SILT (A-4b), little fine sand, trace clay; contains organic material; moist to wet.							
20.0	890.0	1 2 4	18	10										
							Bottom of Boring - 20.0'							

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

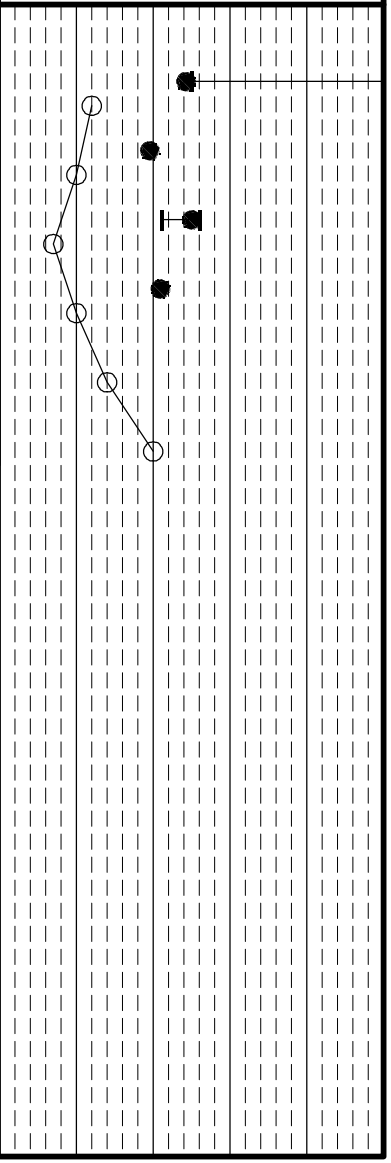
LOG OF: Boring B-005 | *Location:* Sta 23+96.74, 9.18 right | *Date Drilled:* 4/6/2009

WATER OBSERVATIONS:
Water seepage at: 7.3-7.5
Water level at completion: 8.7

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 915.7	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.0	914.7						Asphalt Concrete Pavement - 12"							
2.5	913.2	5 5 7	10	1			Stiff dark gray to black ORGANIC SILT (A-8a), some clay, little fine to coarse sand, trace gravel; damp. LOI @750 C = 5.3%		8	5	---	11	47	29
		3 4 6	16	2		1.25	Medium stiff to stiff brown SILT (A-4b), little clay, trace fine to coarse sand; moist.							
5		3 4 3	18	3		0.75	@ 2.5' - 5.5', contains organic material.		0	1	---	5	77	17
		2 4 6	18	4		1.0								
7.5	908.2	4 6 8	16	5		4.0	@ 7.0', damp to moist. @ 7.3' - 7.5', seepage in thin sand seam.							
10.0	905.7	9 10 10	14	6		4.5+	Very stiff to hard brown SILT AND CLAY (A-6a), little fine to coarse sand, trace to little gravel; damp.							
							Bottom of Boring - 10.0'							

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

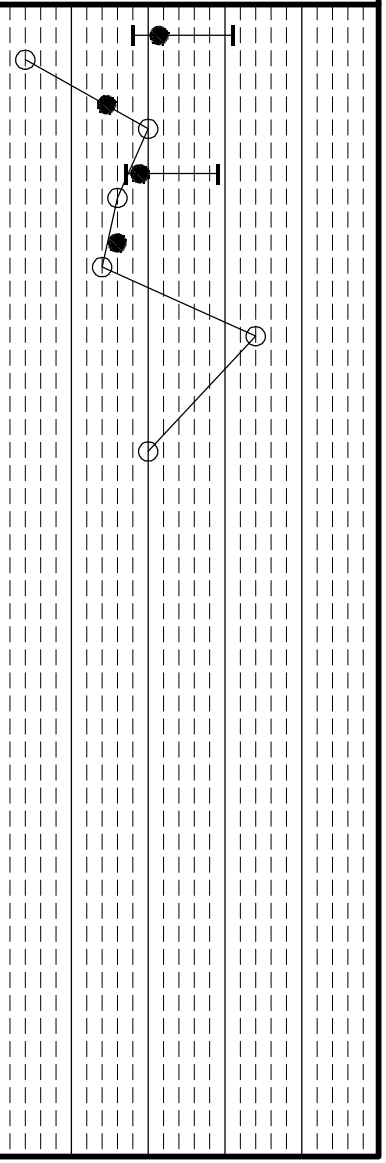
LOG OF: Boring B-006 | *Location:* Sta 27+46.31, 8.85 left | *Date Drilled:* 4/14/2009

WATER OBSERVATIONS:
Water seepage at: None observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	916.9													
0.3	916.6	1 2 1	12	1		1.0	Topsoil - 3"		19	8	---	11	41	21
		5 7 7	15	2		3.0	Stiff to very stiff dark brown SILT AND CLAY (A-6a), little to some fine to coarse sand, trace to little gravel; contains trace organic material; damp to moist. @ 1.5', brown, little to some gravel.							
		4 5 6	18	3		2.5	@ 3.0', trace to little gravel, contains trace organic material.		5	6	---	15	39	35
5		3 5 5	18	4		1.5								
		3 10 14	18	5		2.5								
8.0	908.9													
		4 6 8	18	6		4.5+	Very stiff to hard gray SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; damp to moist.							
10.0	906.9						Bottom of Boring - 10.0'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % - ●
PL ⊢ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

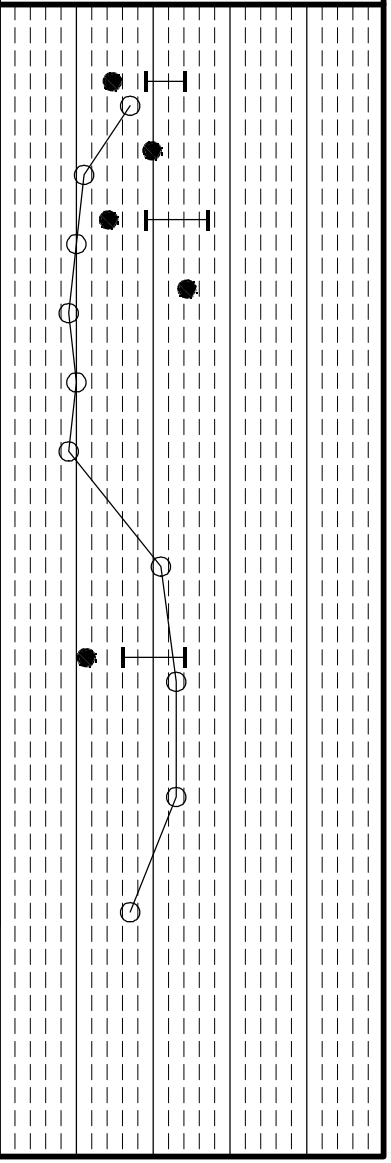
LOG OF: Boring B-007 | *Location:* Sta 29+39.49, 0.09 right | *Date Drilled:* 4/6/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	919.2													
1.0	918.2						Asphalt Concrete Pavement - 11.5"							
		4 9 8	18	1		4.5	Very stiff to hard brown SANDY SILT (A-4a), some fine to coarse sand, little clay; little gravel; damp.		12	12	---	14	44	18
		4 5 6	14	2		2.5	@ 2.5', very stiff.							
5		7 5 5	8	3		2.5			20	9	---	11	42	18
		2 4 5	14	4		2.5								
		4 4 6	15	5		2.75	@ 7.0', damp to moist.							
10.0 10	909.2	3 3 6	16	6		1.5								
							Very stiff to hard brown SANDY SILT (A-4a), some clay, little to some fine to coarse sand; trace to little gravel; damp.							
		5 8 13	18	7		4.0								
							@ 12.5', little gravel, gray.							
15		6 10 13	16	8		4.5+			14	9	---	15	37	25
		7 10 13	5	9			@ 16.5', encountered possible cobble.							
20.0 20	899.2	4 7 10	15	10		2.5								
							Bottom of Boring - 20.0'							
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

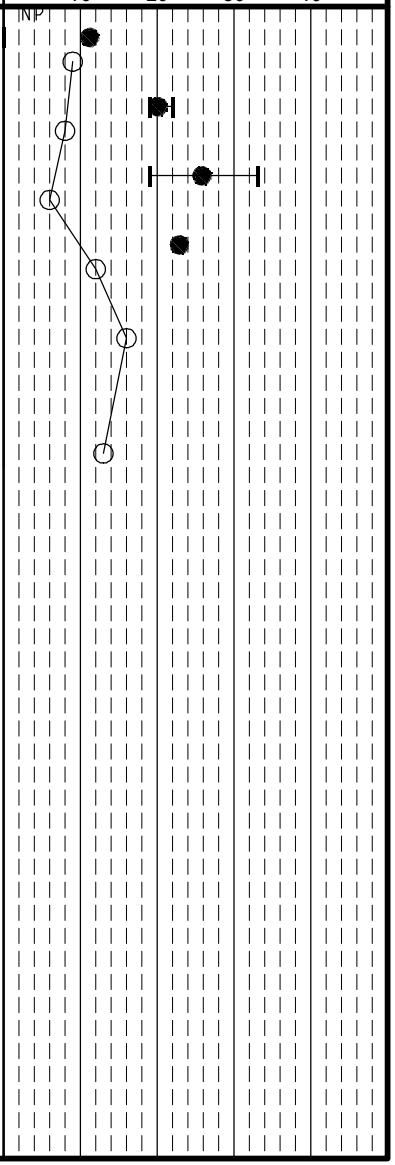
LOG OF: Boring B-008 | *Location:* Sta 33+46.31, 5.96 left | *Date Drilled:* 4/9/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 921.2	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetro-meter (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.3	920.9	5 4 5	17	1			Aggregate - 4"		31	22	---	18	22	7
1.5	919.7						Loose brown and gray GRAVEL WITH SAND AND SILT (A-2-4), "and" fine to coarse sand, some gravel; some silt; trace clay; contains trace organic material; moist.							
3.0	918.2	5 4 4	16	2					4	5	---	12	64	15
		3 3 3	18	3		1.25	Loose brown SILT (A-4b), little fine to coarse sand, trace gravel; little clay; moist.		0	1	---	4	58	37
5		4 5 7	18	4		1.5	Stiff grayish brown SILT AND CLAY (A-6a), trace fine to coarse sand; moist. @ 4.5', trace to little fine to coarse sand.							
		7 7 9	18	5		3.75	@ 6.0', very stiff, damp to moist.							
							@ 8.0', hard, damp.							
10.0 10	911.2	5 6 7	18	6		4.5+								
							Bottom of Boring - 10.0'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

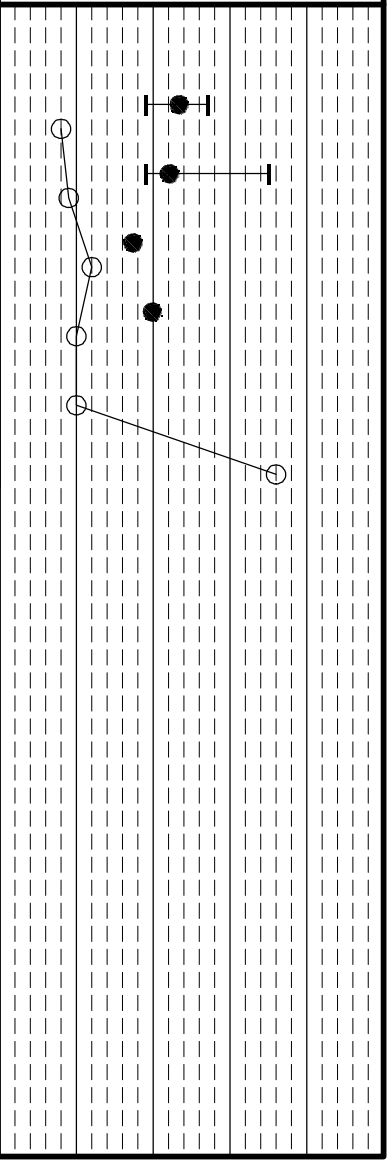
LOG OF: Boring B-009 | *Location:* Sta 37+46.31, 2.35 right | *Date Drilled:* 4/9/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: 8.5

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	922.2													
1.2	921.0						Asphalt Concrete Pavement - 14"							
3.0	919.2	5 4 4	18	1		3.5	Very stiff dark grayish brown SILT (A-4b), trace fine to coarse sand, some clay; slightly organic; moist.		0	1	---	2	68	29
4.5	917.7	3 3 6	18	2		1.5	Stiff brown SILTY CLAY (A-6b), trace fine to coarse sand; moist.		0	1	---	4	55	40
5		5 5 7	18	3		4.5+	Hard brown SILT (A-4b), trace fine sand, trace clay; damp.							
6.8	915.4	4 5		4A		4.5+	@ 6.0', little to some clay.							
7.5	914.7	5		4B			Loose to medium dense brown SANDY SILT (A-4a), trace clay; wet.							
		3 5 5	18	5		4.25								
10 10.5	911.7	8 18 17	15	6		4.5+	Very stiff to hard brown SILT AND CLAY (A-6a), trace to little fine to coarse sand, trace gravel; damp.							
							Bottom of Boring - 10.5'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



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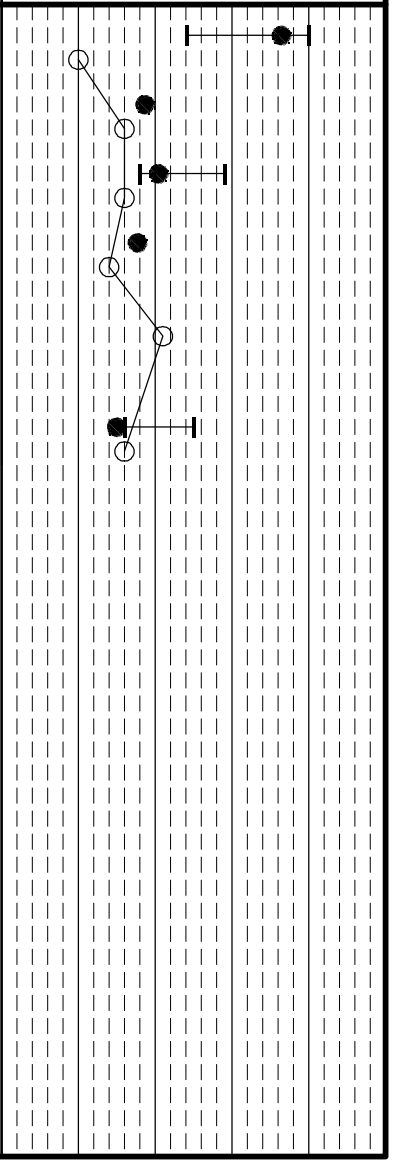
Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-010 | *Location:* Sta 41+46.35, 11.14 left | *Date Drilled:* 4/13/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 918.3	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
		2 3 4	9	1			Medium stiff dark brown SILTY CLAY (A-6b), trace fine to coarse sand; slightly organic; moist.		0	2	---	7	56	35
1.5	916.8													
		2 5 6	14	2		2.25	Stiff to very stiff mottled brown and gray SILT AND CLAY (A-6a), trace to little fine to coarse sand, trace gravel; ; damp.							
		4 5 6	18	3		3.0	@ 3.0', moist.		1	1	---	2	63	33
4.5	913.8													
5		3 5 5	18	4		1.5	Stiff to very stiff brown SANDY SILT (A-4a), little to some fine to coarse sand, little to some clay; trace to little gravel; damp to moist.							
		3 6 9	17	5		3.0								
		3 5 6	18	6		3.5			13	8	---	16	38	25
10.0 10	908.3													
							Bottom of Boring - 10.0'							
15														
20														
25														



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

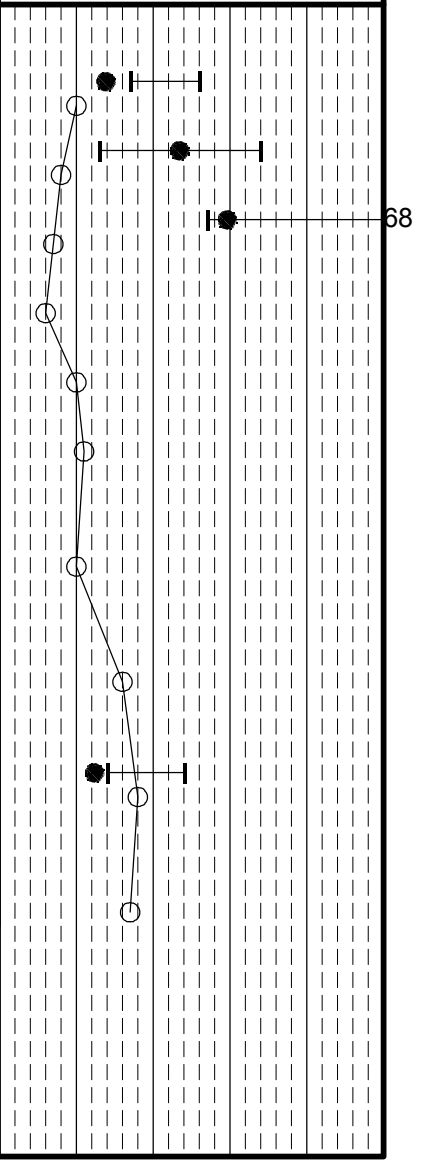
LOG OF: Boring B-011 | *Location:* Sta 44+21.43, 1.78 right | *Date Drilled:* 4/9/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 917.8	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.0	916.8						Asphalt Concrete Pavement - 12"							
2.5	915.3	2 3 7	10	1		2.5	POSSIBLE FILL: Very stiff brown SANDY SILT (A-4a), some fine to coarse sand, some gravel; little clay; damp.		24	12	---	14	35	15
4.0	913.8	5 4 4	8	2		1.0	POSSIBLE FILL: Medium stiff to stiff brown SILTY CLAY (A-6b), little to some fine to coarse sand, little gravel; ; moist.		11	8	---	12	42	27
4.5	913.3	2 3 4	16	3		1.5	Stiff black ORGANIC SILT (A-8a), little fine to coarse sand; "and" clay; moist. LOI @750 C = 12.8%		0	2	---	9	50	39
5		2 3 3	9	4		2.0	Stiff olive - brown SILTY CLAY (A-6b), trace fine sand; moist.							
		2 5 5	18	5		2.25	@ 5.5', mottled brown and light gray. @ 7.0', trace to little fine to coarse sand, trace gravel.							
10		4 6 5	15	6		2.0	@ 8.5', color grades to brown.							
		3 4 6	18	7		2.0								
13.0	904.8						Hard brownish gray SANDY SILT (A-4a), little to some fine to coarse sand, trace to little gravel; some clay; damp.							
15		5 6 10	18	8		4.5+								
		5 8 10	18	9		4.5+			6	9	---	15	42	28
20.0	897.8	5 8 9	18	10		4.5+								
20							Bottom of Boring - 20.0'							
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

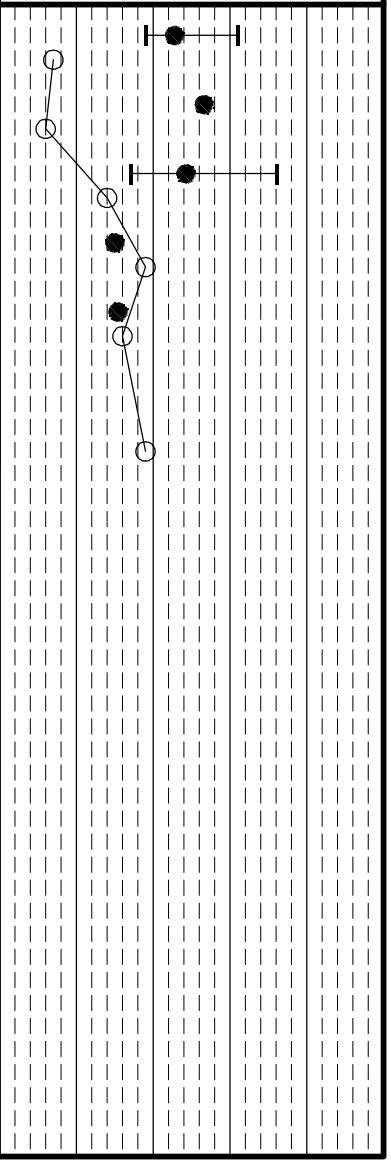
LOG OF: Boring B-012 | *Location:* Sta 48+46.32, 11.54 left | *Date Drilled:* 4/14/2009

WATER OBSERVATIONS:
Water seepage at: 4.9-5.1
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 915.7	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.4	915.3	1 2 3	17	1			Topsoil - 5"		2	3	---	6	53	36
							Stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand; trace gravel; moist.							
3.0	912.7	1 2 2	18	2		1.25								
		4 5 5	16	3		1.0	Medium stiff to stiff brown SILTY CLAY (A-6b), little fine to coarse sand, trace gravel; moist.		6	3	---	9	46	36
5		2 6 7	18	4		1.25	@ 4.5', trace to little fine to coarse sand. @ 4.9' -5.1', encountered wet silt seam.							
6.0	909.7	3 5 6	16	5		2.0	Stiff to very stiff brown SILT AND CLAY (A-6a), trace to little fine to coarse sand, trace gravel; damp to moist.							
		3 6 7	18	6		1.75								
10.0 10	905.7						Bottom of Boring - 10.0'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

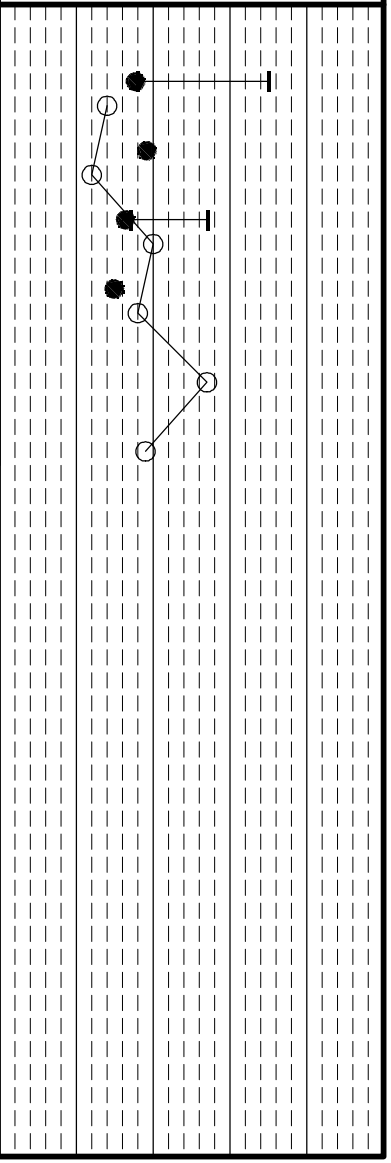
LOG OF: Boring B-013 | *Location:* Sta 52+46.38, 1.74 right | *Date Drilled:* 4/2/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 917.9	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.9	917.0						Asphalt Concrete Pavement - 11"							
		4 7 7	10	1		4.5+	Very stiff to hard brown SILTY CLAY (A-6b), trace gravel, little fine to coarse sand; damp to moist.		7	5	---	12	37	39
		5 5 7	16	2		3.0								
4.0	913.9													
5		5 9 11	10	3		2.5	Very stiff to hard brown SANDY SILT (A-4a), little to some fine to coarse sand, trace gravel; some clay; damp to moist. @ 4.5', encountered possible cobble.		7	7	---	15	40	31
		8 8 10	18	4		4.25								
		6 10 16	18	5		4.5+	@ 7.0', moist.							
		7 9 10	18	6		4.5+	@ 8.9', color grades to gray.							
10.0 10	907.9						Bottom of Boring - 10.0'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

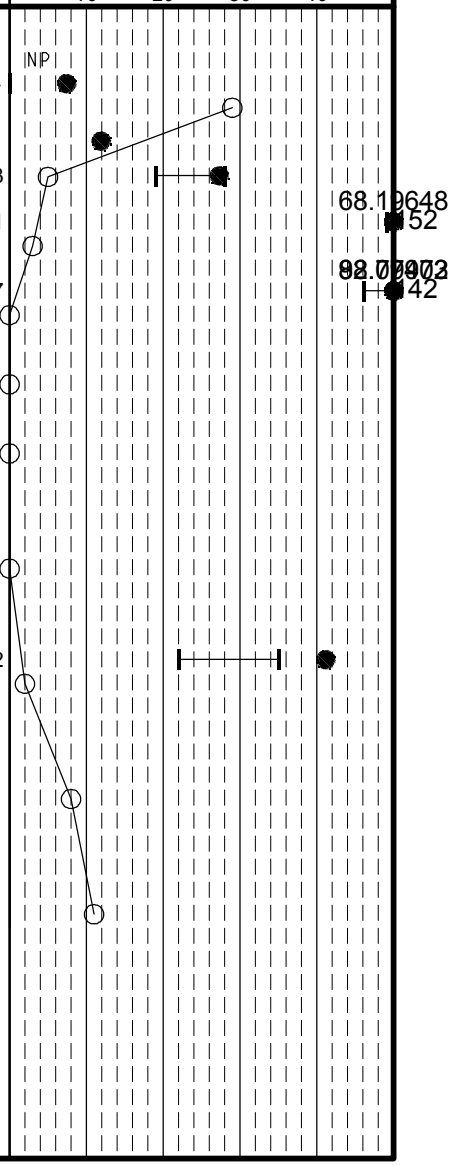
LOG OF: Boring B-014 | *Location:* Sta 56+46.16, 14.15 left | *Date Drilled:* 4/9/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 913.3	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.0	912.3						Asphalt Concrete Pavement - 11.5"							
		14 16 12	12	1			POSSIBLE FILL: Medium dense to dense brown GRAVEL WITH SAND (A-1-b), some silty clay, some fine to coarse sand; damp.		48	18	---	12	--22--	
3.0	910.3	4 2 3	18	2A 2B		0.5	Soft to medium stiff grayish brown SILT (A-4b), some clay, little fine to coarse sand, trace gravel; moist.		2	4	---	13	58	23
5		1 1 2	18	3		0.5	Soft to medium stiff black ORGANIC SILT (A-8a), trace to little fine to coarse sand; trace gravel; contains fiberous organic material (wood fragments); damp to moist. @ 4.0', LOI; 5.7% @ 440 C, 7.1% @ 750 C. @ 5.0'-7.0'; Shelby Tube #1; Starting Pressure 0 psi - End Pressure 200 psi; 15.5" recovery. @ 5.0', LOI; 9.7% @ 440 C, 11.4% @ 750 C.		0	1	---	4	54	41
		WOH WOH WOH	18	4	ST-1	0.25			5	4	---	6	48	37
8.0	905.3	WOH WOH WOH	18	5A 5B		0.25								
10		WOH WOH WOH	18	6		0.25	Soft brown and gray SILT AND CLAY (A-6a), trace fine sand; wet. @ 8.5', light gray. @ 10.5', gray.							
		WOH WOH WOH	18	7		0.25								
15		1 1 1	18	8		0.25	@ 13.0', trace organic silt.		0	0	---	1	77	22
		1 3 5	18	9		1.25	@ 15.5', stiff to very stiff, trace to little organic silt, moist.							
20.0	893.3	2 4 7	16	10		2.5								
							Bottom of Boring - 20.0'							
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

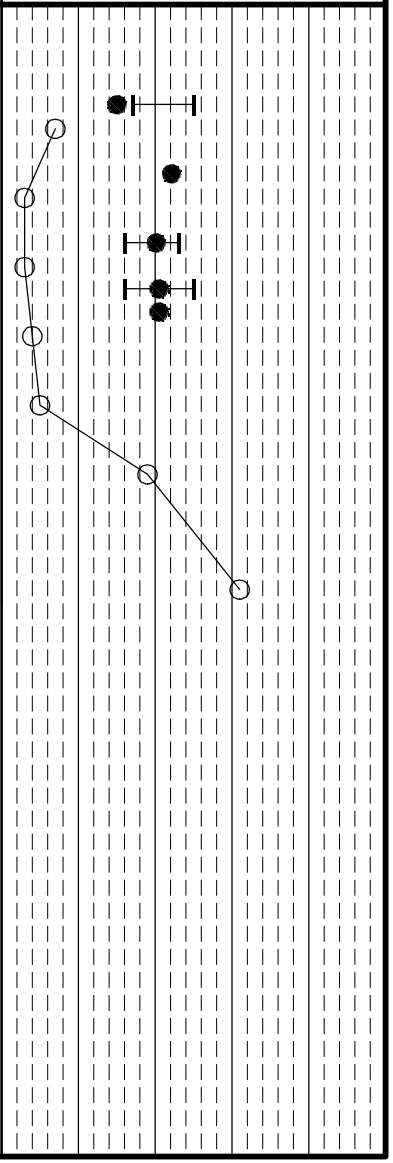
Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-015 | *Location:* Sta 60+46.85, 8.03 right | *Date Drilled:* 4/8/2009

WATER OBSERVATIONS:
Water seepage at: 4.5'-6.0', 7.5'-9.0'
Water level at completion: 7.8'

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 911.7	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.1	910.6						Asphalt Concrete Pavement - 13.5"							
		4 4 3	16	1		3.5	POSSIBLE FILL: Very stiff brown SANDY SILT (A-4a), little fine to coarse sand, trace to little gravel; damp.		11	9	---	22	38	20
		WOH 1 2	13	2		0.25	@ 3.0', soft, moist to wet.							
4.5	907.2													
5		2 1 2	12	3	ST-1	0.25	Soft brown SANDY SILT (A-4a), some fine to coarse sand, trace to little gravel, little to some clay; moist.		13	13	---	19	40	15
6.0	905.7						Shelby Tube from 5-7 ft obtained in offset boring.		0	3	---	25	49	23
		2 1 3	18	4		0.25	Soft brown SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; moist.							
		WOH 2 3	18	5		0								
9.0	902.7													
10		5 9 10	13	6		4.0	Very stiff to hard brown SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; damp.							
		6 11 19	14	7		4.5+								
13.0	898.7													
							Bottom of Boring - 13.0'							
15														
20														
25														



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

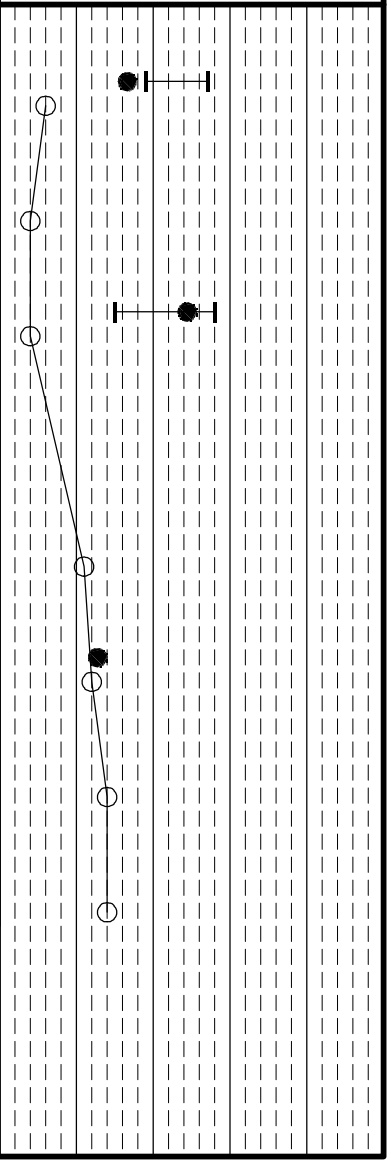
LOG OF: Boring B-016 | *Location:* Sta 64+10.44, 12.67 left | *Date Drilled:* 8/24/2009

WATER OBSERVATIONS:
Water seepage at: 11.0'-12.5'
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 908.2	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.0	907.2						Asphalt Concrete Pavement - 12"							
		5 3 3	18	1		1.5	POSSIBLE FILL: Stiff brown SANDY SILT (A-4a), little to some clay, some gravel; contains trace organics; damp to moist.		22	12	---	14	33	19
		3 2 2	10	2		1.0								
5.5	902.7						Soft gray SILT AND CLAY (A-6a), some to "and" fine to coarse sand, little gravel; moist.		18	12	---	23	27	20
		WOH 2 2	4	3		0.25								
8.5	899.7													
10.5	897.7				ST-1	-	Poor recovery in Shelby Tube, did not retain sample due to disturbance.							
		4 5 6	18	4		1.25	Stiff brown SILTY CLAY (A-6b), little gravel, trace to little fine to coarse sand; moist.							
		3 6 6	15	5		4.0	@ 13.5', Very stiff, damp.							
		3 7 7	18	6		3.0								
20.0	888.2	5 7 7	18	7		4.0								
							Bottom of Boring - 20.0'							

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

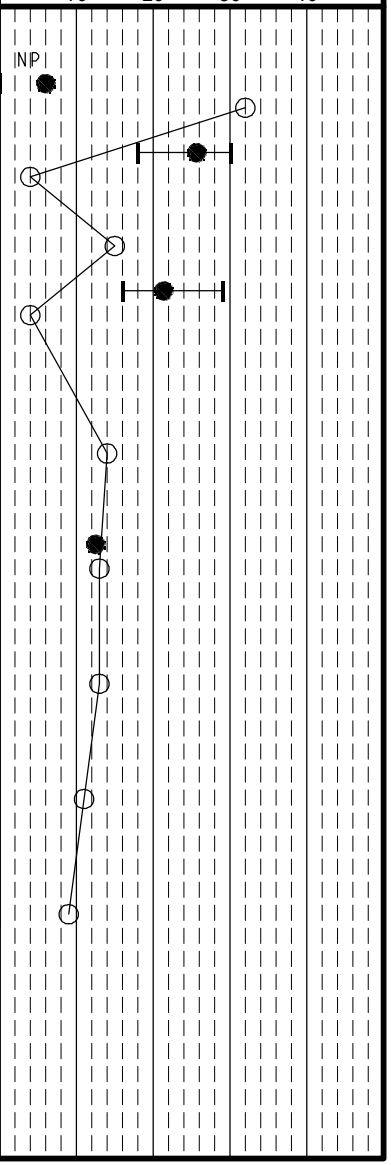
LOG OF: Boring B-017 | *Location:* Sta 64+37.70, 10.55 right | *Date Drilled:* 8/24/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	907.8													
1.0	906.8						Asphalt Concrete Pavement - 12"							
2.5	905.3	17 20 11	12	1		-	POSSIBLE FILL: Dense brown GRAVEL WITH SAND AND SILT (A-2-4), some fine to coarse sand, some silty clay; dry to damp.		40	21	---	13	--26--	
4.0	903.8	2 2 2	18	2		1.0	POSSIBLE FILL: Medium stiff brown SILT AND CLAY (A-6a), trace to little fine to coarse sand, trace gravel; moist.		2	6	---	14	51	27
5		2 1 14	3	3		1.0	Stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp to moist.							
		2 1 3	18	4		1.0			7	6	---	21	41	25
							@ 8.0', very stiff to hard.							
10		2 6 8	10	5		4.5+								
		5 5 8	18	6		4.0								
15		3 5 8	18	7		4.5+								
		4 5 6	18	8		4.5+								
20.0	887.8	4 4 5	18	9		3.0								
25							Bottom of Boring - 20.0'							

STANDARD PENETRATION (N60)
Natural Moisture Content, % - ●
PL ⊢——⊣ *LL*
Blows per foot - ○ / *Non-Plastic -* NP



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

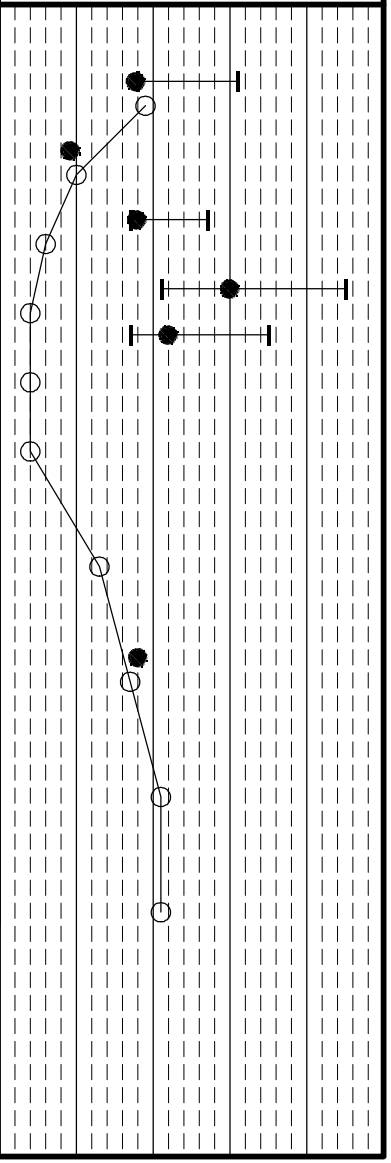
Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-018 | *Location:* Sta 68+70.76, 5.33 left | *Date Drilled:* 4/8/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	909.5													
1.0	908.5						Asphalt Concrete Pavement - 11.5"							
2.5	907.0	5 7 12	12	1		4.5	POSSIBLE FILL: Very stiff to hard brown SILT AND CLAY (A-6a), trace gravel, little to some fine to coarse sand; contains brick fragments; damp.		8	7	---	13	45	27
4.0	905.5	8 4 6	6	2			POSSIBLE FILL: Loose to medium dense brown GRAVEL WITH SAND AND SILT (A-2-4), little fine to coarse sand, trace clay; damp.							
5.5	904.0	4 3 3	6	3		1.0			16	11	---	13	40	20
		2 2 2	10	4		0.5	Soft to medium stiff brown SANDY SILT (A-4a), some fine to coarse sand, little gravel; moist.		7	6	---	18	39	30
8.5	901.0	1 2 2	6	5	ST-1	0.5	Soft to medium stiff black ORGANIC CLAY (A-8b), little fine to coarse sand, little gravel; moist. LOI @750 c = 6.7% @ 7.5', encountered small cobble/large gravel particle.		15	6	---	12	33	34
10.5	899.0	2 1 3	18	6		0.5	Soft to medium stiff brown and gray SILTY CLAY (A-6b), little fine to coarse sand, trace gravel; contains trace organic material (roots); damp to moist.							
		2 6 7	18	7		2.5	Very stiff to hard brown SILT AND CLAY (A-6a), trace to little fine to coarse sand, trace gravel; damp.							
15		3 7 10	18	8		4.5+	@ 15.0', brownish gray.							
		8 10 11	16	9		4.5+								
20.0	889.5	5 8 13	18	10		4.5+								
							Bottom of Boring - 20.0'							



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

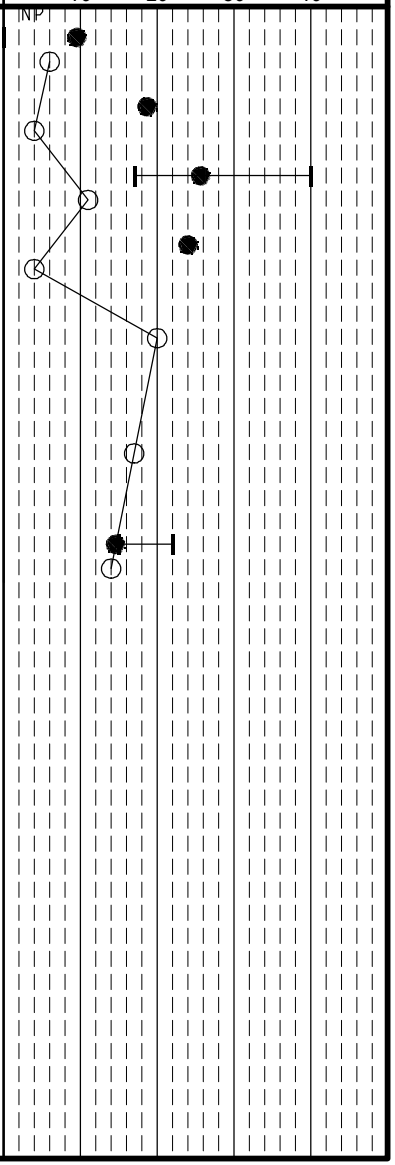
LOG OF: Boring B-019 | *Location:* Sta 72+46.68, 11.19 left | *Date Drilled:* 4/13/2009

WATER OBSERVATIONS:
Water seepage at: 4.5-10.0
Water level at completion: 8.2

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	911.7													
1.5	910.2	1 2 2	9	1			Loose brown GRAVEL (A-1-a), some to "and" fine to coarse sand, trace silty clay; damp.		58	25	---	10	--7--	
4.5	907.2	3 1 2	10	2		1.0	Medium stiff to stiff brown SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; moist.							
		2 3 5	15	3		1.5			4	2	---	7	51	36
10.5	901.2	2 1 2	14	4		0.5	Soft to medium stiff brown SANDY SILT (A-4a), some to "and" fine sand, trace to little clay; moist to wet.							
		3 5 9	16	5			@ 6.0', little coarse sand, trace to little gravel.							
		4 6 6	9	6										
12.5	899.2	4 4 6	14	7		2.0	Stiff to very stiff grayish brown SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp to moist.		14	9	---	16	40	21
							Bottom of Boring - 12.5'							

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢—⊣ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

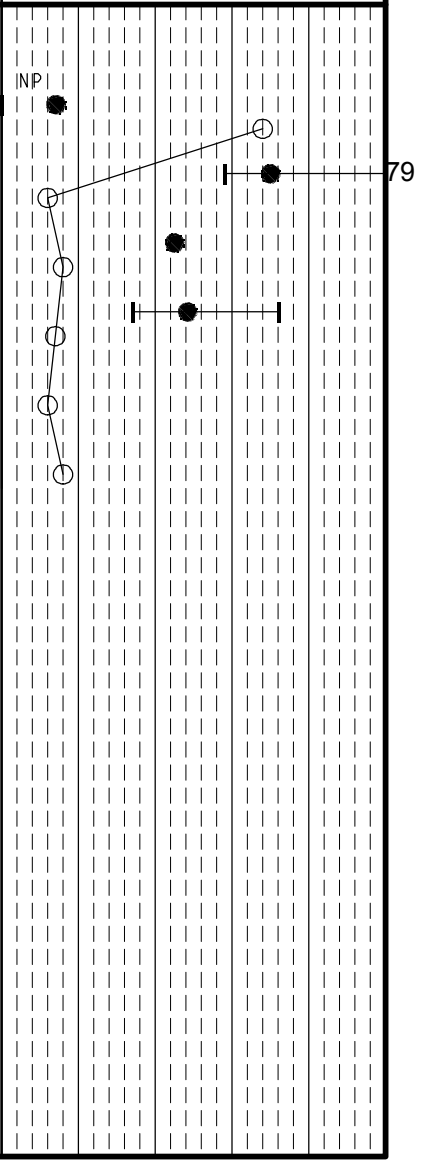
LOG OF: Boring B-020 | *Location:* Sta 76+46.32, 9.72 right | *Date Drilled:* 4/8/2009

WATER OBSERVATIONS:
Water seepage at: 9.0, 9.5-9.6
Water level at completion: 8.2

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 915.1	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.1	914.0						Asphalt Concrete Pavement - 13.5"							
3.0	912.1	9 20 13	14	1			Dense brown GRAVEL WITH SAND (A-1-b), "and" fine to coarse sand, some silty clay; damp.		38	22	---	15	--25--	
4.5	910.6	13 2 4	18	2		1.25	Stiff black ORGANIC CLAY (A-8b), trace fine to coarse sand, trace gravel; moist. LOI @ 750 C = 9.8%		2	1	---	8	53	36
5		3 3 5	18	3		1.5	Stiff mottled brown and gray SILTY CLAY (A-6b), trace fine sand; moist.							
		3 3 4	18	4		1.5			1	1	---	5	56	37
		3 2 4	18	5		1.0	@ 7.5', trace gravel.							
10 10.5	904.6	2 3 5	18	6		1.5	@ 9.0', brown, trace to little fine to coarse sand; damp to moist.							
							Bottom of Boring - 10.5'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

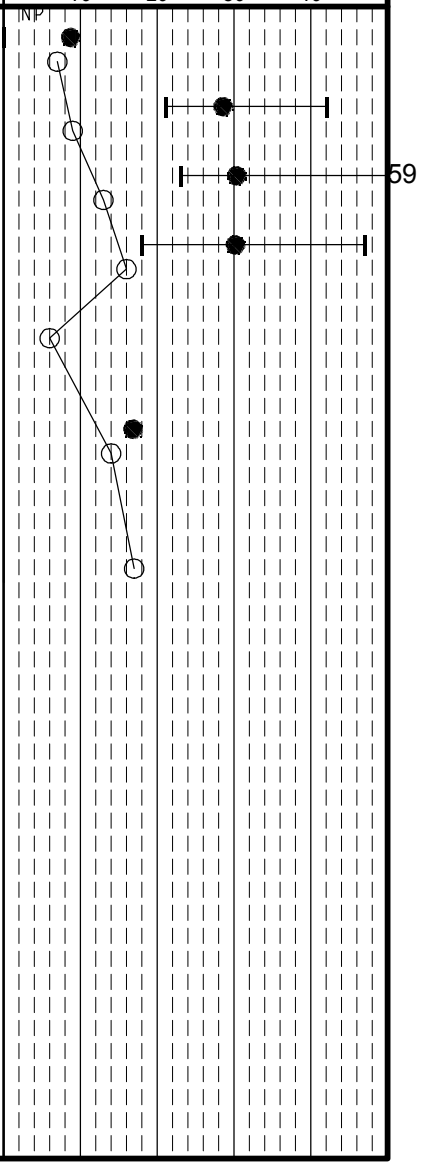
LOG OF: Boring B-021 | *Location:* Sta 80+46.53, 2.37 right | *Date Drilled:* 4/13/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	917.7													
1.5	916.2	4 2 3	12	1			Loose brown GRAVEL WITH SAND AND SILT (A-2-4), "and" fine to coarse sand, little silt; trace clay; damp.		38	20	---	16	19	7
		2 3 3	14	2		1.0	Stiff dark brown CLAY (A-7-6), trace to little fine to coarse sand, trace gravel; contains organic material; moist. LOI @750 C = 5.6%;		3	4	---	8	48	37
		3 4 5	12	3		1.25	@ 3.0', black.		0	1	---	4	47	48
5.5	912.2	3 5 6	13	4		1.25			6	1	---	4	46	43
8.0	909.7	3 2 2	10	5		0.75	Medium stiff mottled brown and gray SILTY CLAY (A-6b), trace to little fine to coarse sand, trace gravel; slightly organic; moist.							
		2 4 6	18	6		3.0	Very stiff brown SILT AND CLAY (A-6a), trace to little fine to coarse sand, trace gravel; damp.							
12.5	905.2	2 5 7	18	7		2.75								
							Bottom of Boring - 12.5'							

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

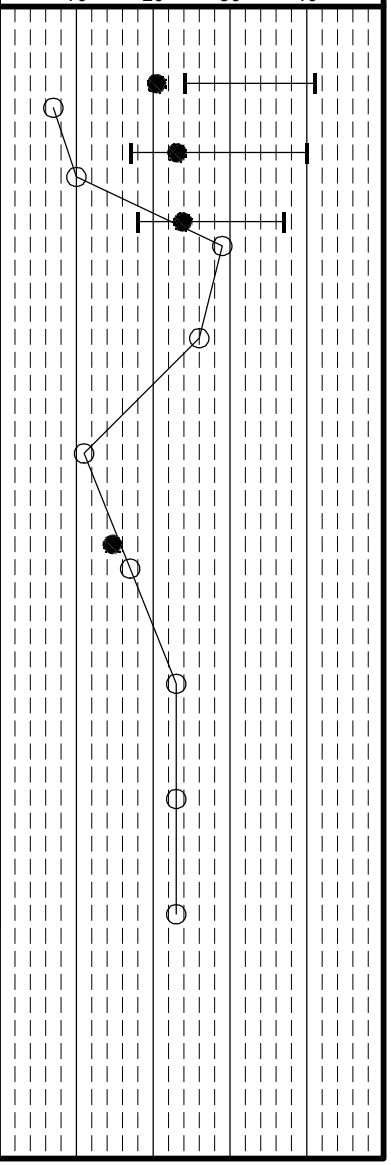
LOG OF: Boring B-021-1 | *Location:* Sta 79+98.24, 30.74 left | *Date Drilled:* 8/22/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 917.9	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.3	917.7						Topsoil - 3"							
2.5	915.4	7 2 3	15	1		-	Stiff dark brown and gray CLAY (A-7-6), "and" silt, little fine to coarse sand; trace gravel; organic; contains roots; damp.		2	6	---	13	49	30
4.0	913.9	7 4 3	18	2		2.0	Stiff to very stiff dark brown SILTY CLAY (A-6b), little fine to coarse sand; trace gravel; organic; contains roots; moist.		4	6	---	12	42	36
5		4 13 7	18	3		1.5	Stiff dark brown SILTY CLAY (A-6b), some fine to coarse sand; little gravel; moist.		13	7	---	15	35	30
8.0	909.9	5 8 10	18	4		2.0								
10		4 3 5	18	5		2.5	Very stiff gray SANDY SILT (A-4a), little clay, little gravel; damp.							
		5 6 6	18	6		3.25								
15		4 6 10	18	7		3.5								
		8 8 8	18	8		3.25								
20.0	897.9	5 7 9	18	9		3.5								
25							Bottom of Boring - 20.0'							

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



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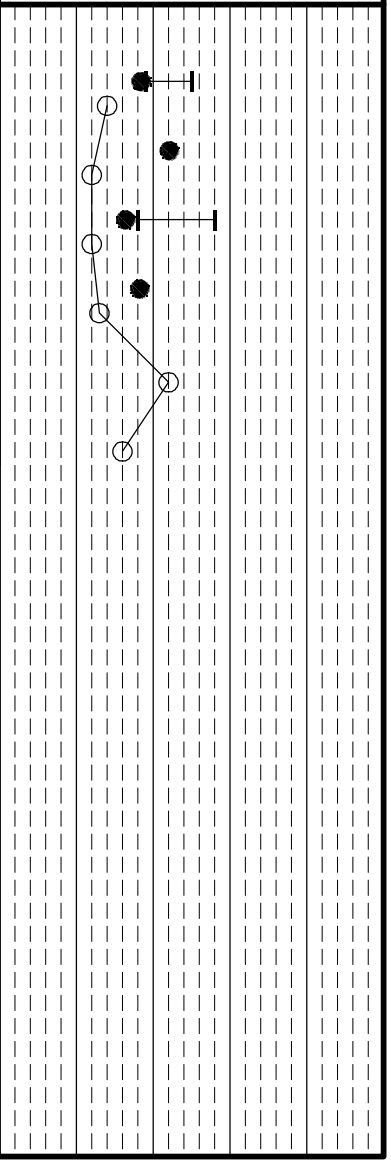
Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-022 | *Location:* Sta 84+46.68, 7.27 right | *Date Drilled:* 4/2/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 922.4	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP
0.8	921.6						Asphalt Concrete Pavement - 9"								
		4 9 5	12	1		2.0	Stiff to very stiff brown and gray SILT (A-4b), some clay, trace to little fine to coarse sand; trace gravel; damp.		4	3	---	7	61	25	
		3 5 7	18	2		2.0									
4.0	918.4														
5		3 5 7	16	3		2.0	Stiff to very stiff brown and gray SANDY SILT (A-4a), some clay, some fine to coarse sand; trace gravel; damp.		7	6	---	16	41	30	
		6 6 7	18	4		3.0									
		5 11 11	15	5		4.25	@ 7.5', very stiff to hard.								
10.0	912.4	6 8 8	18	6		4.5	@ 9.2', color grades to gray.								
							Bottom of Boring - 10.0'								
15															
20															
25															



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

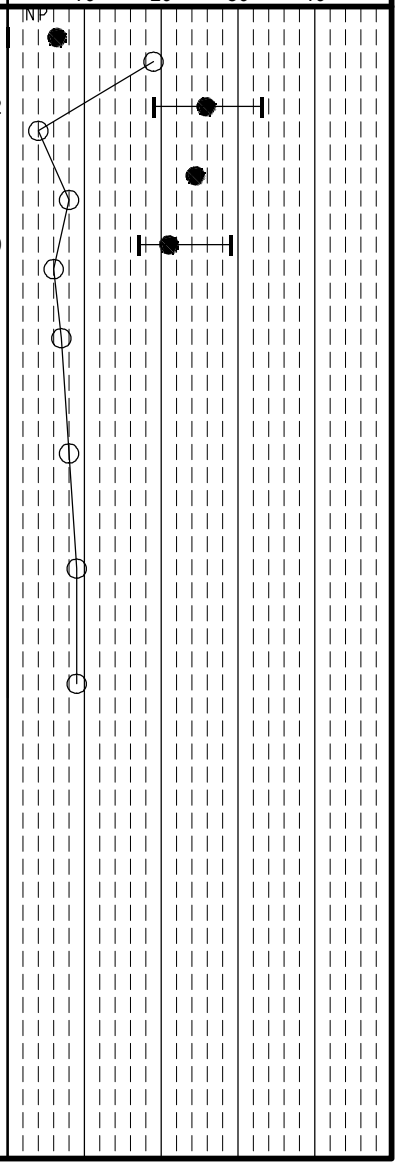
LOG OF: Boring B-023 | *Location:* Sta 88+46.56, 0.14 left | *Date Drilled:* 4/8/2009

WATER OBSERVATIONS:
Water seepage at: 6.0'-7.5', 9.5'-9.6', 11.5'-12.0'
Water level at completion: 9.8'

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 921.0	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.1	920.9	6 11 8	6	1			Aggregate - 1"		44	26	---	14	--16--	
1.5	919.5						Medium dense brown GRAVEL WITH SAND (A-1-b), "and" fine to coarse sand, little silty clay; damp.							
3.0	918.0	4 1 3	18	2		0.25	Soft dark brown SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; moist.		2	5	---	10	51	32
		3 3 5	18	3		1.0	Medium stiff to stiff brown SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; moist.							
6.0	915.0	3 3 3	18	4		1.5			2	3	---	10	56	29
		3 3 4	18	5		1.0	Medium stiff brown SANDY SILT (A-4a), little to some fine to coarse sand, trace to little gravel; moist.							
9.6	911.4	2 4 4	16	6		0.5	@ 8.5' - 9.6', soft, wet.							
						4.5	Hard brown SILT AND CLAY (A-6a), trace to little fine to coarse sand, trace gravel; damp.							
		3 4 5	18	7A 7B 7C		4.5	@ 11.5' - 12.0', silty clayey sand (sand seam), wet.							
15.0	906.0	2 3 6	15	8		4.5								
							Bottom of Boring - 15.0'							

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

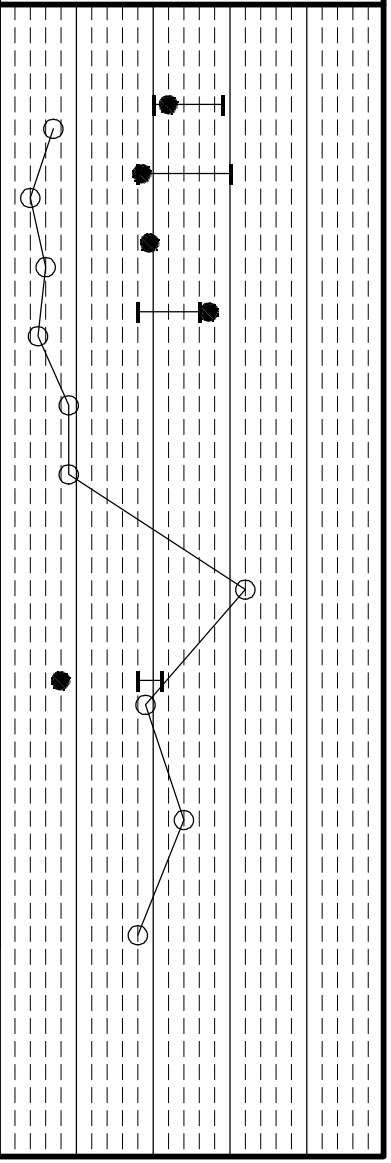
LOG OF: Boring B-024 | *Location:* Sta 90+63.54, 6.75 right | *Date Drilled:* 4/8/2009

WATER OBSERVATIONS:
Water seepage at: 11.8'-11.9', 14.2'-14.4', 16.5'-18.0'
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 917.7	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.3	916.4						Asphalt Concrete Pavement - 15"							
3.0	914.7	5 4 3	14	1			Medium stiff brown SILT (A-4b), some fine to coarse sand, trace gravel; damp.		6	9	---	13	51	21
		1 2 2	13	2		0.75	Medium stiff dark brown SILT AND CLAY (A-6a), some fine to coarse sand, little gravel; damp to moist.		18	10	---	16	37	19
5		1 3 3	15	3		0.75	@ 4.5', brown, trace gravel; moist.							
6.4	911.3	2 2 3	18	4		0.5	Medium stiff dark brown SANDY SILT (A-4a), some to "and" fine to coarse sand, trace gravel; little clay; wet.		1	15	---	20	45	19
7.5	910.2	3 4 5	16	5		0.75	Stiff brown SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; moist.							
10		1 3 6	16	6		1.5	@ 11.0', hard, damp to moist.							
13.5	904.2	6 14 17	18	7		4.5								
15		4 8 11	16	8			Medium dense dark gray GRAVEL WITH SAND AND SILT (A-2-4), some silt, some fine to coarse sand; little clay; damp.		40	12	---	16	21	11
		8 11 13	9	9			@ 16.5' - 18.0', wet.							
20		6 9 9	18	10										
20.5	897.2						Bottom of Boring - 20.5'							
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

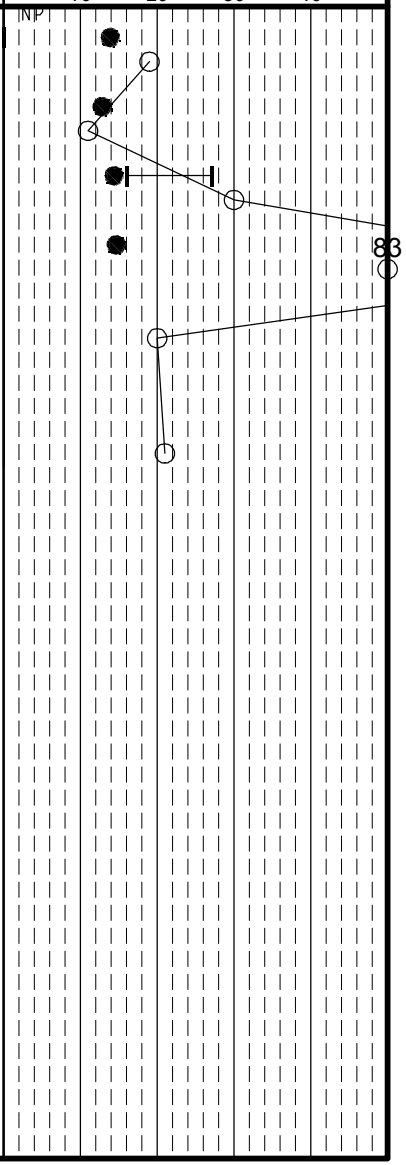
LOG OF: Boring B-025 | *Location:* Sta 94+46.63, 1.25 right | *Date Drilled:* 4/13/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.3	918.4													
	918.1	8 7 6	9	1			Topsoil - 3"		21	18	---	17	--44--	
		3 3 5	2	2			Loose to medium dense brown SANDY SILT (A-4a), some to "and" fine to coarse sand, some gravel; trace to little clay; damp to moist.							
3.0	915.4	3 7 14	16	3		2.0	Very stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp.		6	9	---	16	38	31
5		21 27 31	18	4		4.5+	@ 4.5', hard.							
		4 6 8	16	5		4.5+								
		4 6 9	18	6		4.5+	@ 9.0', contains trace organic material.							
10.0	908.4						Bottom of Boring - 10.0'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % - ●
PL ⊢——⊣ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

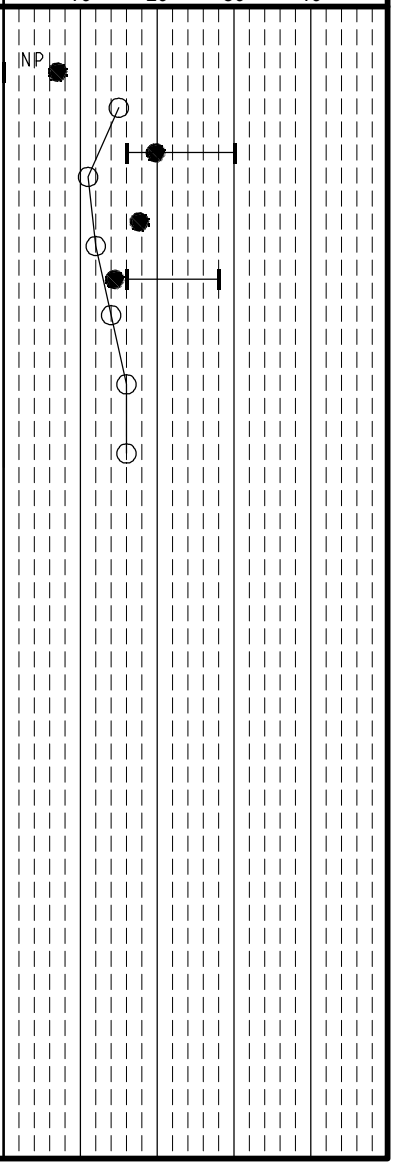
LOG OF: Boring B-026 | *Location:* Sta 98+20.34, 11.12 right | *Date Drilled:* 4/8/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 920.7	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetro-meter (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.0	919.7						Asphalt Concrete Pavement - 12"							
2.0	918.7	5 9 6	18	1A 1B		3.5	Medium dense brown GRAVEL WITH SAND (A-1-b), some silty clay, some fine to coarse sand; damp to moist.		54	14	---	10	--22--	
		11 6 5	14	2		4.5	Very stiff to hard brown SILT AND CLAY (A-6a), little fine to coarse sand, trace to little gravel; damp.		2	6	---	11	46	35
5		4 6 6	18	3		2.5	@ 4.0', moist.							
		5 8 6	18	4A 4B		4.5 0.5			18	6	---	13	33	30
		5 7 9	18	5A 5B		3.5 4.5	@ 6.5' - 7.0', moist to wet (thin sand seam).							
10.0	910.7	5 6 10	18	6		4.5								
							Bottom of Boring - 10.0'							

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

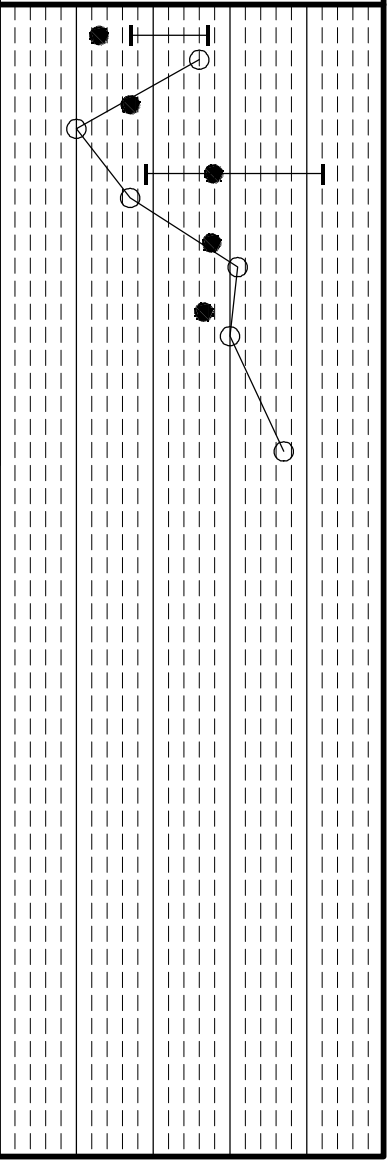
LOG OF: Boring B-027 | *Location:* Sta 101+46.62, 2.21 left | *Date Drilled:* 4/13/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.3	916.7	8 9 9	12	1		1.0	Topsoil - 4"		20	15	---	15	31	19
		2 3 4	13	2		1.0	Medium stiff to stiff brown SANDY SILT (A-4a), some fine to coarse sand, little to some gravel; damp to moist. @ 1.5', contains organic material.							
3.0	914.0	5 6 6	16	3		1.5	Stiff brown CLAY (A-7-6), trace fine to coarse sand; moist.		0	1	---	3	49	47
5		5 9 13	16	4		1.75								
6.0	911.0	6 8 13	15	5		1.75	Medium stiff brown SILT (A-4b), trace clay, trace fine sand; moist.							
8.0	909.0													
10.0	907.0	6 11 15	18	6		3.5	Very stiff grayish brown SILT AND CLAY (A-6a), little fine to coarse sand, trace to little gravel; contains trace organic material; damp.							
10							Bottom of Boring - 10.0'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢—⊣ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



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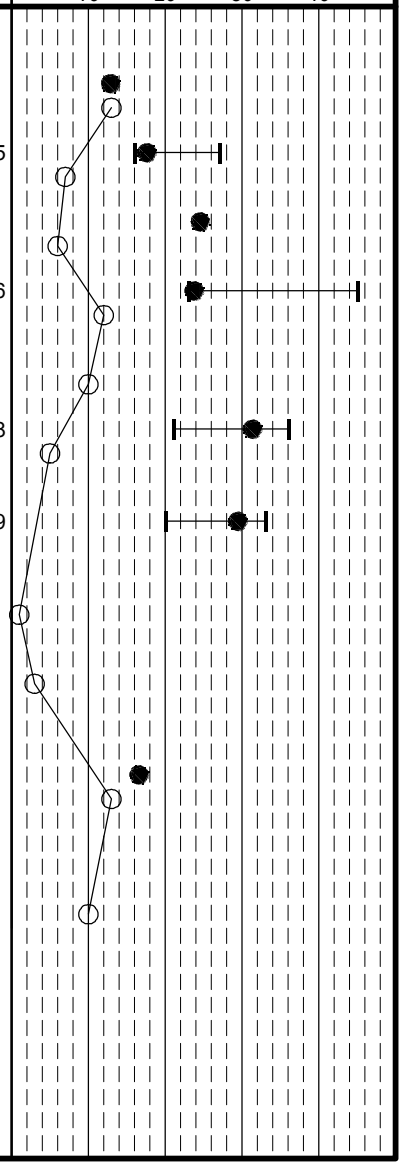
Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-028 | *Location:* Sta 103+28.06, 8.42 right | *Date Drilled:* 4/2/2009

WATER OBSERVATIONS:
Water seepage at: 12.0-14.5
Water level at completion: 18.8

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	916.9													
1.0	915.9						Asphalt Concrete Pavement - 12"							
		3 6 7	6	1		4.5+	Very stiff to hard brown SILT AND CLAY (A-6a), little to some gravel, little to some fine to coarse sand; damp to moist.							
		4 4 3	15	2		3.5	@2.5', trace gravel.		5	8	---	19	43	25
							@ 3.3' - 3.5', encountered organic silt seam.							
5		3 2 4	13	3		3.5	@ 4.0', contains few silt lenses.							
5.5	911.4													
		3 5 7	16	4		2.5	Very stiff dark brown to black CLAY (A-7-6), trace fine to coarse sand; "and" silt; damp to moist.		0	5	---	4	55	36
7.0	909.9													
		4 4 6	18	5		1.75	Stiff mottled brown and gray SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; moist.							
8.5	908.4													
		3 2 3	18	6		0.75	Medium stiff mottled brown and gray SILT AND CLAY (A-6a), trace fine to coarse sand; moist.		0	0	---	0	72	28
10														
					ST-1				0	0	---	1	70	29
12.0	904.9													
		WOH WOH 1	16	7			Very loose brown COARSE AND FINE SAND (A-3a), little to some silty clay; wet.							
14.5	902.4	WOH WOH 3	18	8A 8B										
15							Medium stiff brown SILT AND CLAY (A-6a), little fine to coarse sand, trace to little gravel; moist.							
		4 5 8	16	9		1.0	@ 15.5', color grades to gray.							
							@ 18.0', stiff.							
		2 4 6	16	10		1.25								
20.0 20	896.9													
							Bottom of Boring - 20.0'							
25														



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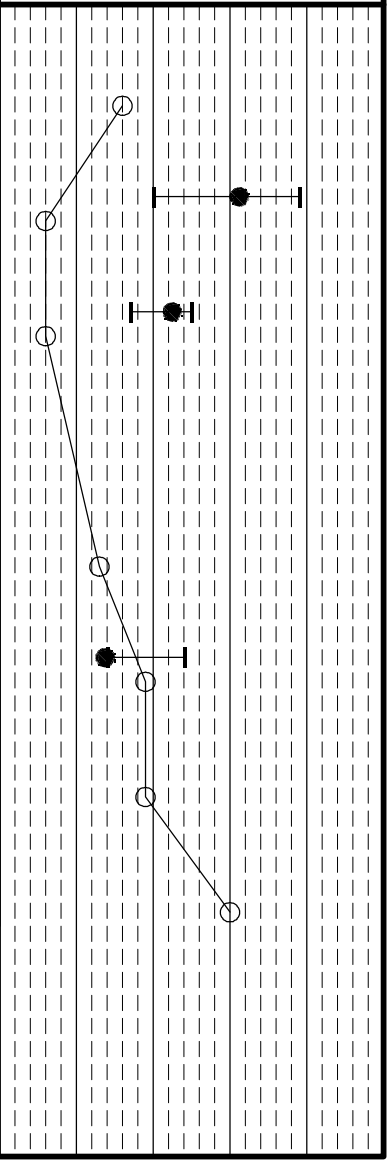
Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-028-1 | *Location:* Sta 103+26.99, 22.91 left | *Date Drilled:* 8/27/2009

WATER OBSERVATIONS:
Water seepage at: 8.5-10.0'
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 912.6	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.3	912.3						Topsoil - 3"							
		3 5 6	18	1		3.0	Medium stiff to very stiff brown SILTY CLAY (A-6b), trace to little fine to coarse sand, trace gravel; contains trace to little organics; damp to moist.							
		WOH 1 3	18	2		0.75			0	0	---	1	64	35
5 5.5	907.1													
		WOH 2 2	18	3		<0.25	Very soft to soft brown SILT (A-4b), little to some clay, trace to little fine to coarse sand; little gravel; moist.		13	4	---	6	57	20
8.5	904.1					0.25								
10 10.5	902.1				ST-1		Poor recovery in Shelby Tube, did not retain sample due to disturbance.							
		1 5 4	5	4		1.5	Stiff brown SANDY SILT (A-4a), some clay, some fine to coarse sand; trace to little gravel; damp to moist.							
		6 6 7	18	5		4.5	@ 13.0', very stiff to hard.		7	9	---	15	39	30
15														
		4 6 7	18	6		3.0								
		8 10 11	18	7		4.5								
20.0 20	892.6						Bottom of Boring - 20.0'							
25														



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

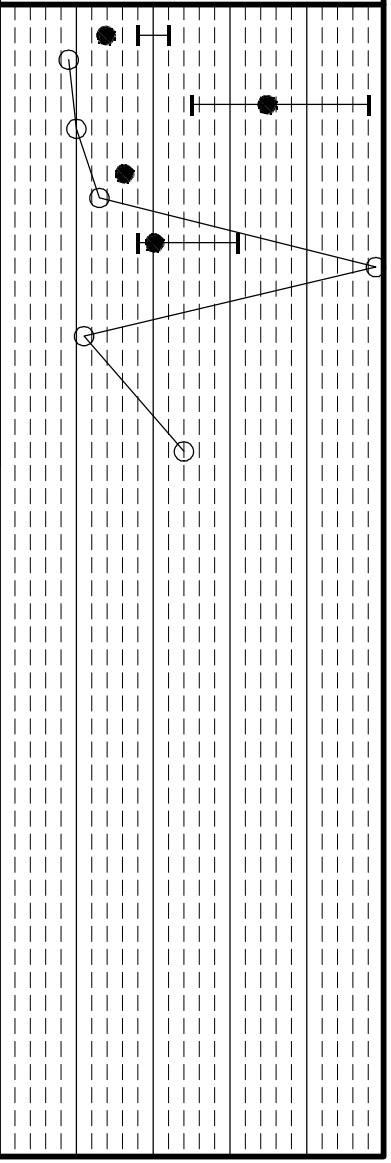
LOG OF: Boring B-029 | *Location:* Sta 107+46.59, 2.22 left | *Date Drilled:* 4/10/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	910.0													
0.3	909.7	3 2 4	16	1			Topsoil - 3"							
1.5	908.5						Stiff brown SANDY SILT (A-4a), "and" fine to coarse sand, little clay; some gravel; damp.		21	19	---	18	30	12
3.0	907.0	4 3 4	18	2		1.0	Medium stiff to stiff black CLAY (A-7-6), trace fine sand, trace gravel; "and" silt; contains organic matter; moist. LOI 750 C = 8.0%		3	0	---	8	58	31
		3 4 5	12	3		1.25								
5		9 14 20	10	4		1.75	Stiff brown SILT AND CLAY (A-6a), little fine to coarse sand, trace to little gravel; moist.		3	9	---	15	36	37
		4 4 4	18	5		3.5	@ 6.0', very stiff; damp to moist.							
10.0 10	900.0	3 7 10	16	6		4.25								
							Bottom of Boring - 10.0'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

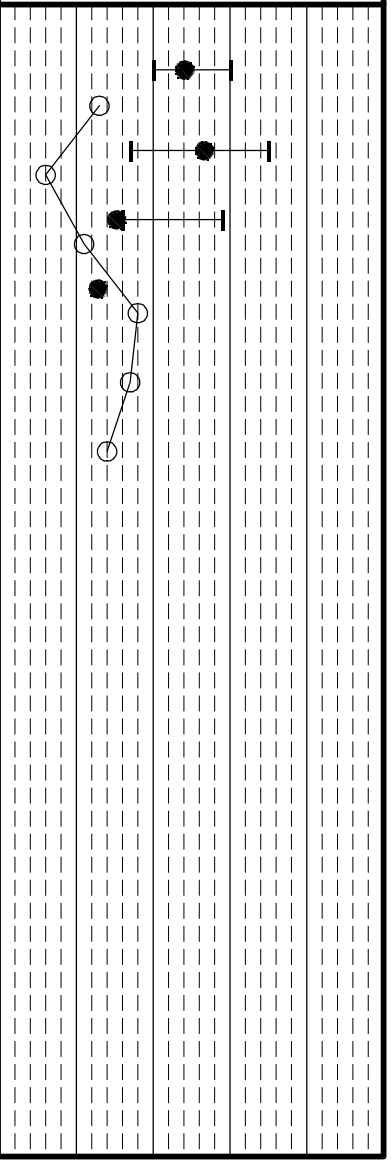
LOG OF: Boring B-030 | *Location:* Sta 15+08.01, 7.33 right | *Date Drilled:* 4/9/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Lees Rd alignment

Depth (ft)	Elev. (ft) 913.1	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.7	912.4						Asphalt Concrete Pavement - 8"							
		4 9 4	18	1A 1B		4.5	Hard brown SILT (A-4b), some clay, trace fine to coarse sand; moist. @ 1.7', dark brown.		0	1	---	3	66	30
3.0	910.1	3 2 4	18	2		0.5	Soft to medium stiff mottled brown and gray SILTY CLAY (A-6b), little fine to coarse sand, trace gravel; moist.		2	5	---	8	52	33
4.0	909.1	4 4 7	18	3		2.5	Very stiff to hard brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp.		4	9	---	16	40	31
5		7 8 10	18	4		4.5+								
		8 8 9	18	5		4.5+								
10.0	903.1	5 7 7	18	6		4.5+								
10							Bottom of Boring - 10.0'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢——⊣ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

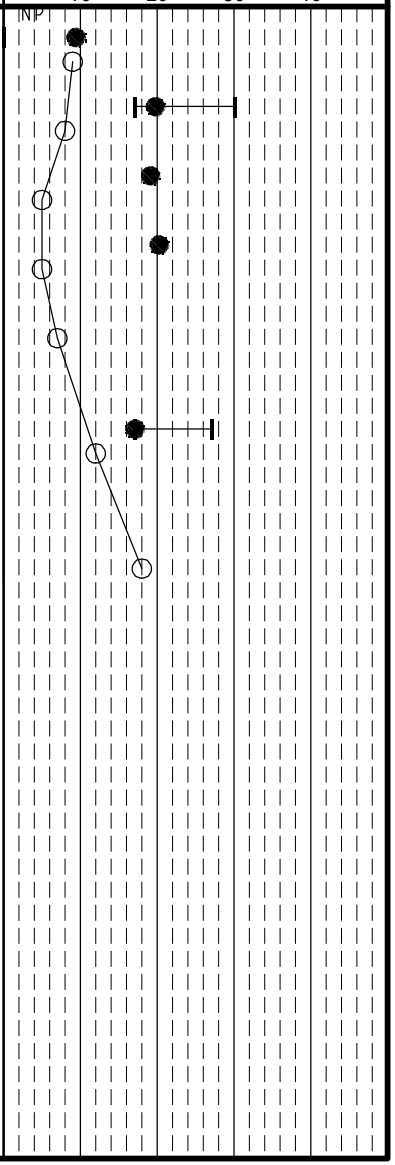
LOG OF: Boring B-031 | *Location:* Sta 19+08.63, 12.02 right left | *Date Drilled:* 4/9/2009

WATER OBSERVATIONS:
Water seepage at: 5.0-7.5, 11.5-12.0
Water level at completion: 5.0

FIELD NOTES:
Stationing referenced to lees Rd

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	909.4													
0.5	908.9	3 5 4	15	1			Aggregate (berm) - 6"		54	18	---	10	--18--	
1.5	907.9						Loose brown GRAVEL WITH SAND (A-1-b), some fine to coarse sand, little silty clay; damp.							
		3 4 4	13	2		1.25	Stiff brown SILT AND CLAY (A-6a), little to some fine to coarse sand, trace gravel; moist.		5	9	---	18	38	30
		2 2 3	18	3		0.75	@ 3.0', medium stiff.							
5		1 2 3	18	4		0.5								
		1 2 5	7	5		0.75								
8.0	901.4													
		5 5 7	18	6		2.0	Very stiff brown SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.		6	11	---	17	37	29
10							@ 10.5', color grades to gray.							
		7 7 11	18	7A 7B 7C		4.0	@ 11.5' - 12.0', silty sand seams, wet.							
12.5	896.9						Bottom of Boring - 12.5'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

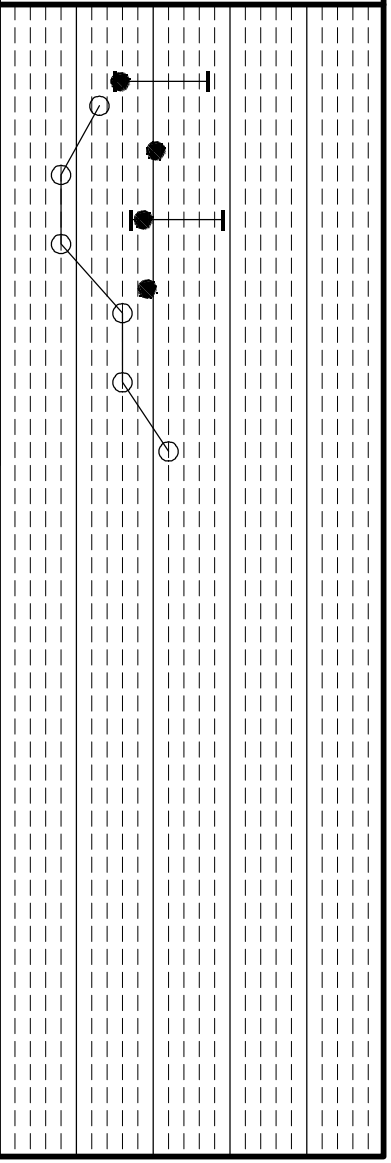
LOG OF: Boring B-032 | *Location:* Sta 111+47.00, 4.95 right | *Date Drilled:* 4/7/2009

WATER OBSERVATIONS:
Water seepage at: None observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 902.2	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.9	901.3						Asphalt Concrete Pavement - 10.5"							
		1 6 7	10	1		3.0	Very stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, trace to little gravel; damp to moist.		6	9	---	20	37	28
		5 4 4	14	2		2.5	@ 2.5', trace fine to coarse sand, trace gravel, moist.							
5		3 3 5	18	3		1.75	@ 4.0', stiff.		5	8	---	16	40	31
		6 7 9	18	4		3.0	@ 5.5', very stiff, trace to little gravel.							
		6 7 9	18	5		3.0	@ 7.0', brownish-gray							
10.0	892.2	4 11 11	18	6		2.5								
							Bottom of Boring - 10.0'							

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-033 | *Location:* Sta 114+46.41, 15.42 left | *Date Drilled:* 4/10/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.3	895.9	2 4 4	16	1		1.25	Topsoil/Aggregate Berm - 4"		44	9	---	9	30	8
2.0	894.2	3 4 2	18	2		0.75	Stiff brown SANDY SILT (A-4a), little fine to coarse sand, little to some clay; "and" gravel; damp.							
4.5	891.7	WOH 2 5	18	3		0.25	Soft to medium stiff black SILTY CLAY (A-6b), little fine to coarse sand; contains organic matter; LOI @750 C = 4.0%; damp to moist.		0	5	---	9	59	27
5		2 5 9	18	4		1.5	Stiff brown and gray SILTY CLAY (A-6b), trace fine to coarse sand; moist.							
		3 4 6	18	5		1.75			0	0	---	3	57	40
10.0	886.2	2 2 4	18	6		1.25								
							Bottom of Boring - 10.0'							

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

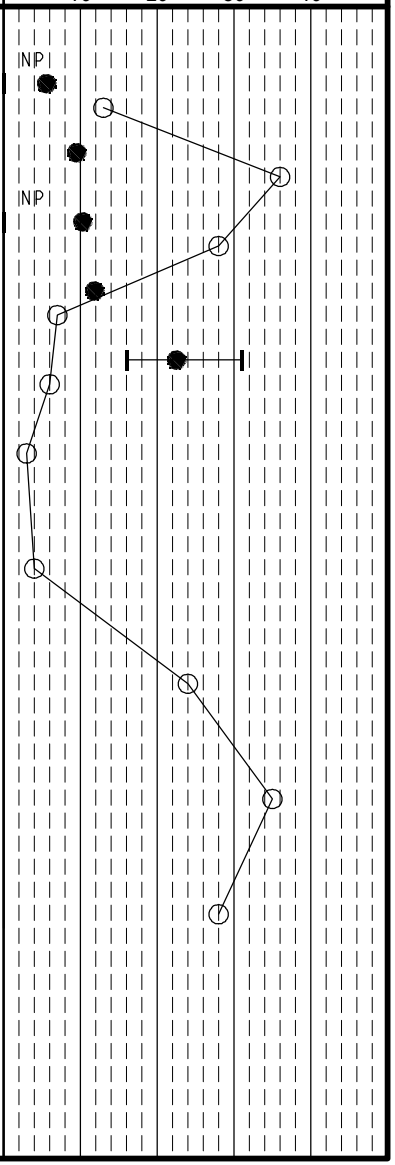
LOG OF: Boring B-034 | *Location:* Sta 116+52.00, 10.31 left | *Date Drilled:* 4/7/2009

WATER OBSERVATIONS:
Water seepage at: 11.0-20.0
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	895.9													
0.8	895.1						Asphalt Concrete Pavement - 9.5"							
		4 6 7	6	1			Medium dense brown GRAVEL WITH SAND (A-1-b), some fine to coarse sand, little silt; trace clay; damp.		58	16	---	10	12	4
		4 14 21	11	2			@ 2.5' - 4.0', dense.							
4.0	891.9													
5		7 18 9	12	3			Medium dense brown GRAVEL (A-1-a), some fine to coarse sand, trace silty clay; damp.		67	19	---	9	--5--	
		2 4 3	7	4										
7.0	888.9													
		2 3 3	10	5		0.5	Medium stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; moist.		5	8	---	19	42	26
10		1 1 2	6	6		0.75	@ 8.5'. little gravel.							
10.5	885.4													
		1 1 3	6	7			Loose to medium dense brown SANDY SILT (A-4a), trace to little gravel; wet.							
15		7 11 13	13	8										
		13 18 16	2	9			@ 15.5' - 18.0', dense.							
		9 12 15	12	10										
20.0	875.9													
20							Bottom of Boring - 20.0'							
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-035 | *Location:* Sta 120+46.83, 17.52 left | *Date Drilled:* 4/7/2009

WATER OBSERVATIONS:
Water seepage at: 13.5-15.0
Water level at completion: 13.0

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 893.2	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.2	893.0	4 7 5	16	1			Aggregate Berm - 2"		50	27	---	12	--11--	
1.5	891.7						Loose to medium dense brown GRAVEL (A-1-a), "and" fine to coarse sand, little silty clay; damp.							
3.0	890.2	4 2 3	4	2			Medium stiff dark brown SANDY SILT (A-4a), some gravel, some fine to coarse sand; little clay; damp.		28	16	---	17	28	11
		2 2 2	13	3		0.75	Medium stiff brown SILT AND CLAY (A-6a), trace to little fine to coarse sand; moist.		0	2	---	8	58	32
5		2 3 3	12	4		0.75								
		3 3 4	14	5		1.0	@ 6.0', mottled brown and gray.							
8.0	885.2													
10		3 3 3	14	6		0.75	Medium stiff brown SILTY CLAY (A-6b), "and" gravel, some fine to coarse sand; moist.		38	16	---	14	14	18
10.5	882.7													
		16 12 14	18	7			Medium dense brown GRAVEL WITH SAND AND SILT (A-2-4), trace to little silty clay; damp to moist.							
							@ 13.0', moist to wet.							
15.0	878.2	7 8 10	16	8										
							Bottom of Boring - 15.0'							
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

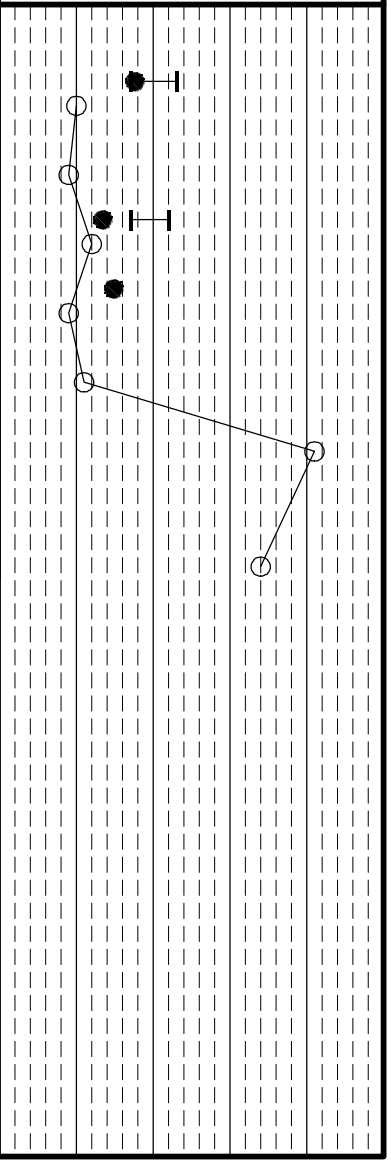
Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-036 | *Location:* Sta 124+47.01, 7.43 left | *Date Drilled:* 4/2/2009

WATER OBSERVATIONS:
Water seepage at: 7.0-8.5
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 893.9	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.0	892.9						Asphalt Concrete Pavement - 12"							
		4 4 6	15	1			Stiff brown SILT (A-4b), some fine to coarse sand, trace gravel; little clay; damp to moist.		3	11	---	16	53	17
		5 4 5	0	2										
4.0	889.9													
5		4 5 7	4	3			Stiff brown SANDY SILT (A-4a), some fine to coarse sand, little gravel; little clay; damp to moist.		15	16	---	14	40	15
		2 5 4	4	4										
7.0	886.9													
		2 3 8	12	5			Medium dense to dense brown GRAVEL WITH SAND AND SILT (A-2-4), little to some silty clay; moist.							
10		8 17 23	10	6										
10.5	883.4													
		17 17 16	16	7			Dense brown and gray GRAVEL WITH SAND (A-1-b), trace silty clay; damp to moist.							
12.5	881.4						Bottom of Boring - 12.5'							
15														
20														
25														



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

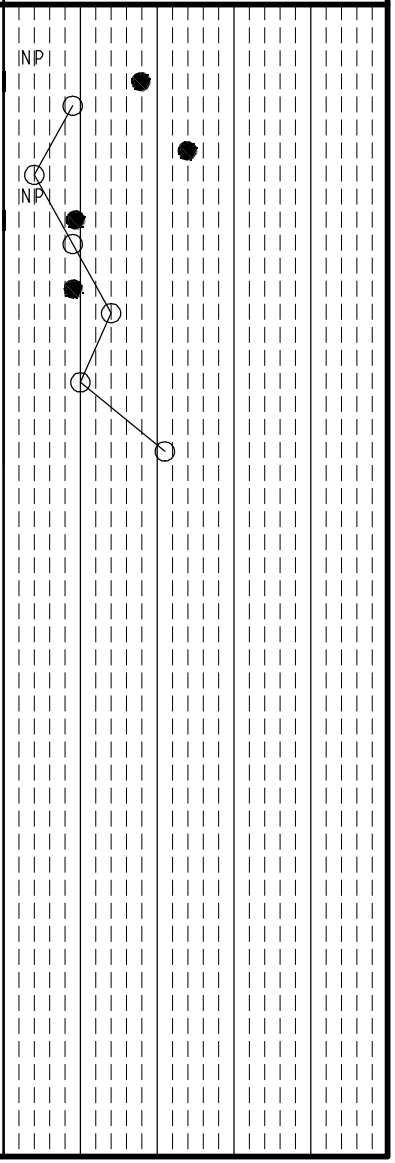
LOG OF: Boring B-037 | *Location:* Sta 128+16.95, 17.99 left | *Date Drilled:* 4/7/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	890.7													
1.0	889.7						Asphalt Concrete Pavement - 11.5"							
		5 5 4	16	1			Medium stiff to stiff dark brown SANDY SILT (A-4a), some fine to coarse sand, trace gravel; little clay; damp to moist.		6	9	---	23	48	14
		2 2 2	11	2		1.0								
4.0	886.7													
5		2 3 6	16	3			Loose to medium dense brown GRAVEL WITH SAND (A-1-b), containing 51% of fine to coarse sand, little silt; trace clay; damp to moist.		28	25	---	26	15	6
		4 6 8	12	4										
		7 5 5	14	5										
		12 11 10	8	6										
10.0	880.7						Bottom of Boring - 10.0'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢—⊣ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



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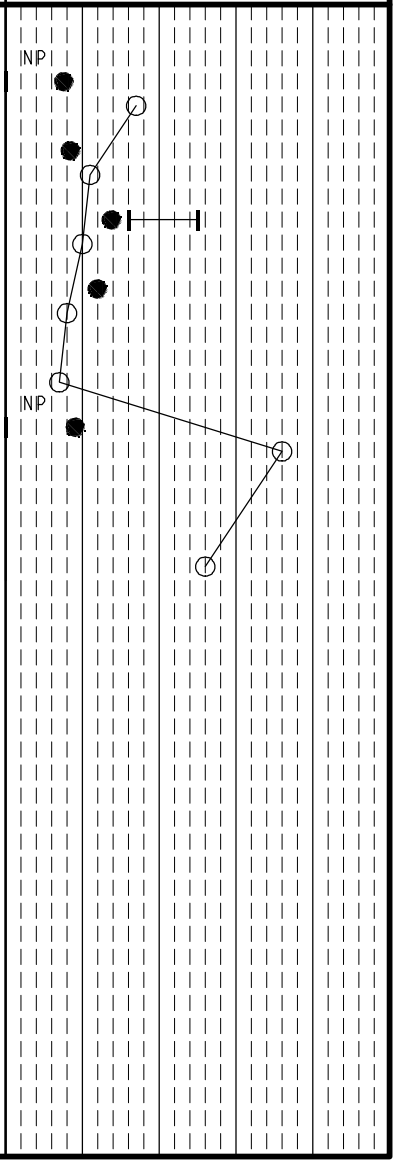
Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-038 | *Location:* Sta 132+46.76, 5.95 left | *Date Drilled:* 4/7/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 894.0	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.9	893.1						Asphalt Concrete Pavement - 11"							
		4 6 11	14	1			Medium dense brown GRAVEL WITH SAND (A-1-b), some fine to coarse sand, little silt; trace clay; damp.		51	16	---	14	15	4
		10 6 5	10	2										
4.0	890.0													
5		4 5 5	12	3			Loose to medium dense brown GRAVEL WITH SAND AND SILT (A-2-4), some silt, some fine to coarse sand; little clay; damp to moist.		37	15	---	13	22	13
		2 4 4	11	4										
		4 3 4	0	5										
8.5	885.5													
10		11 17 18	16	6			Medium dense to dense brown GRAVEL WITH SAND (A-1-b), some fine to coarse sand, little to some silty clay; damp.		54	15	---	11	--20--	
		11 13 12	14	7										
12.5	881.5													
							Bottom of Boring - 12.5'							
15														
20														
25														



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

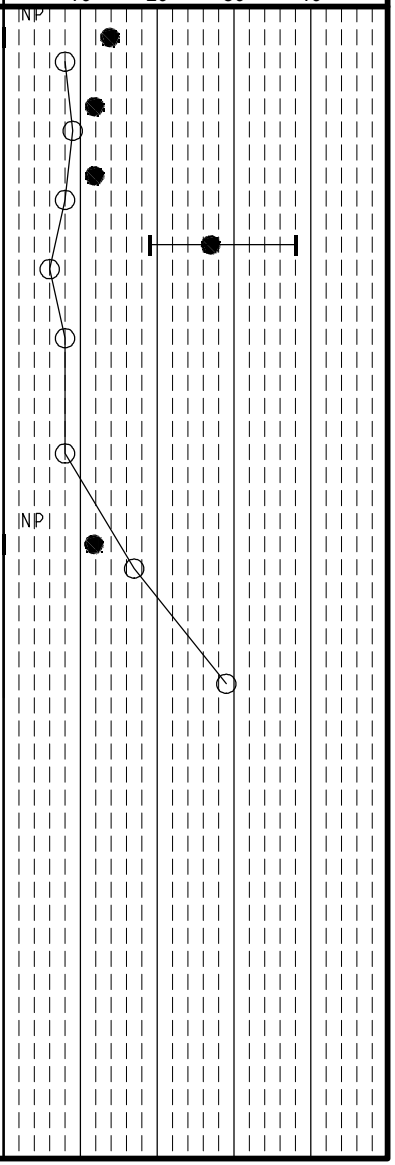
LOG OF: Boring B-039 | *Location:* Sta 136+46.75, 11.40 left | *Date Drilled:* 4/7/2009

WATER OBSERVATIONS:
Water seepage at: 13.5-15.0
Water level at completion: 11.4

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	894.2													
0.3	893.9	3 4 4	16	1		1.0	Aggregate Berm - 3"		34	5	---	5	50	6
							Medium stiff to stiff brown and gray SILT (A-4b), some gravel, trace to little fine to coarse sand; trace clay; damp to moist.							
		4 4 5	15	2		1.5	@ 1.5', brown, trace to little gravel.							
4.5	889.7	4 4 4	3	3										
5		3 3 3	16	4		0.75	Medium stiff mottled brown and gray SILTY CLAY (A-6b), trace fine to coarse sand; ; moist.		0	2	---	5	52	41
		2 3 5	14	5		1.5	@ 6.0', trace coarse sand.							
							@ 8.0', trace fine sand, no coarse sand.							
10		2 3 5	16	6		1.0								
10.5	883.7													
		8 8 9	15	7			Medium dense brown GRAVEL WITH SAND (A-1-b), some fine to coarse sand, little silty clay; ; moist.		53	18	---	11	--18--	
							@ 13.0', moist to wet.							
15.0	879.2	9 14 14	15	8										
15							Bottom of Boring - 15.0'							
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

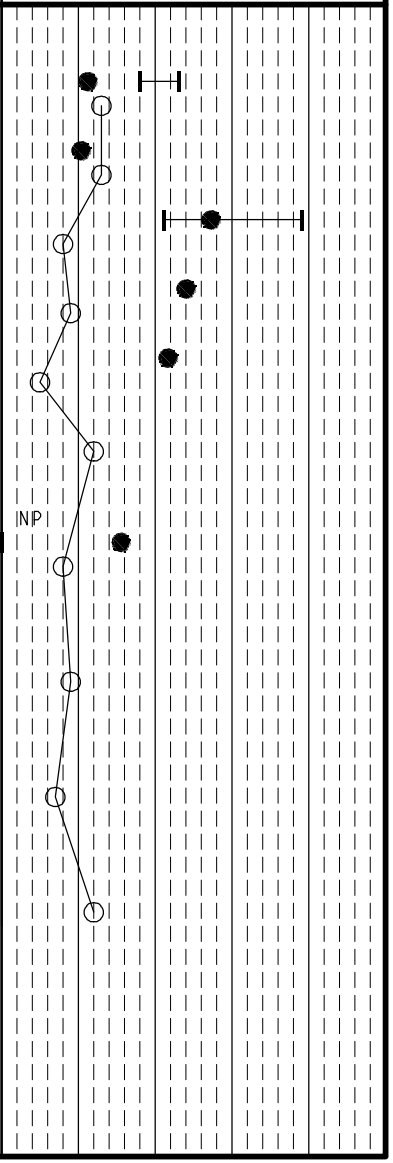
Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-040 | *Location:* Sta 140+46.37, 10.82 left | *Date Drilled:* 4/7/2009

WATER OBSERVATIONS:
Water seepage at: 8.5-20.0
Water level at completion: 8.0

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 893.7	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.9	892.8						Asphalt Concrete Pavement - 11"							
2.5	891.2	12 8 5	13	1			Medium dense brown SANDY SILT (A-4a), some fine to coarse sand, some gravel, lillte clay; damp.		21	13	---	18	32	16
		7 7 6	12	2			Stiff mottled brown and gray SILTY CLAY (A-6b), little fine to coarse sand, trace gravel; moist.							
5		6 3 5	15	3		1.5			1	5	---	7	39	48
		3 3 6	18	4		2.0								
8.5	885.2	4 2 3	12	5		0.5	@ 7.0', soft to medium stiff, trace coarse sand, trace gravel.							
10		5 6 6	5	6			Loose to medium dense brown GRAVEL WITH SAND (A-1-b), some fine to coarse sand, little silty clay; wet.							
		7 4 4	9	7					54	15	---	12	--19--	
15		5 4 5	0	8										
		3 4 3	6	9										
20.0	873.7	4 5 7	8	10										
							Bottom of Boring - 20.0'							
25														



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

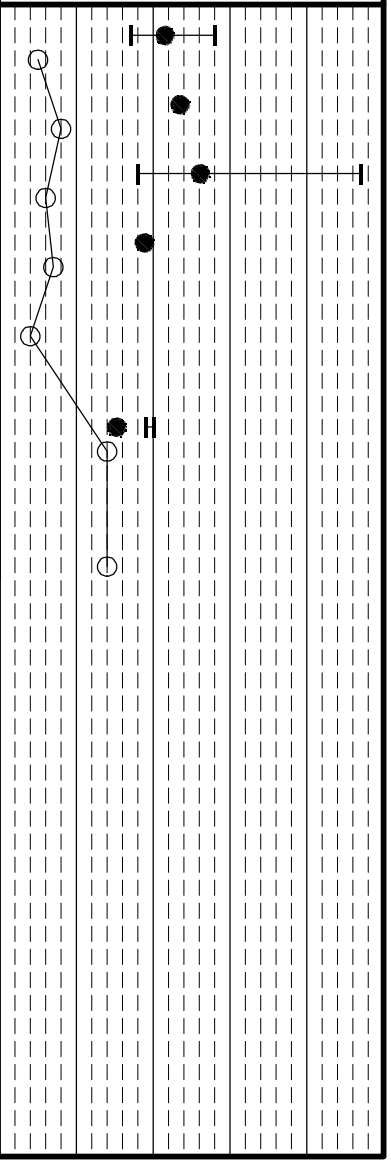
LOG OF: Boring B-041 | *Location:* Sta 144+36.91, 35.17 left | *Date Drilled:* 4/7/2009

WATER OBSERVATIONS:
Water seepage at: 11.0-12.5
Water level at completion: 5.6

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.2	892.7	WOH 1 4	12	1		0.5	Topsoil - 2"		9	9	---	19	43	20
							Medium stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; moist.							
3.0	889.9	4 3 5	13	2		1.5	@ 1.5', stiff, contains trace organic material.							
		2 3 3	12	3		1.5	Stiff mottled brown and gray CLAY (A-7-6), "and" silt, trace fine to coarse sand; moist.		0	1	---	5	44	50
5		2 2 5	10	4		0.75	@ 4.5', medium stiff, little gravel.							
		2 2 2	9	5		0.5	@ 6.0', little fine to coarse sand, little to some gravel, moist.							
8.0	884.9													
		4 7 7	13	6			Medium dense brown SANDY SILT (A-4a), "and" fine to coarse sand, some gravel; little clay; moist.		25	15	---	23	29	8
10														
		12 8 6	7	7			@ 10.5', wet.							
12.5	880.4						Bottom of Boring - 12.5'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ——— LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

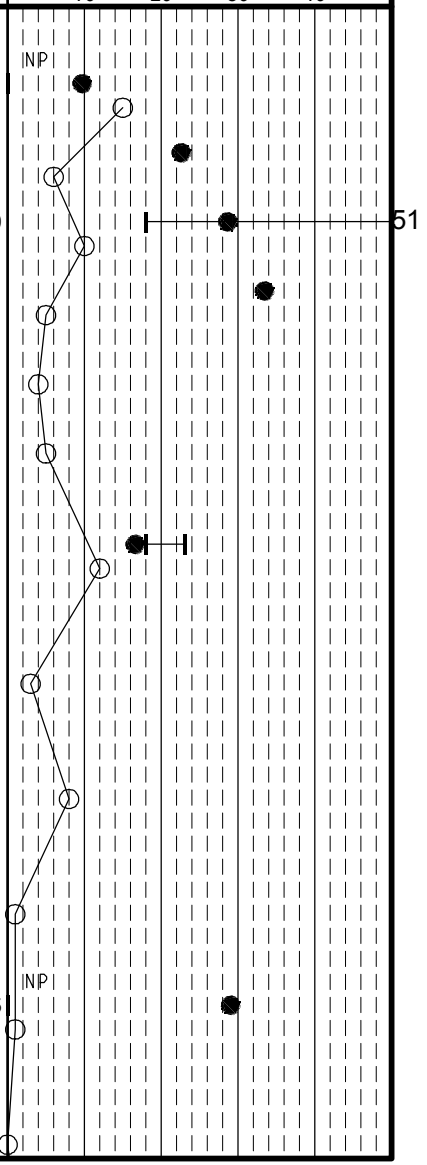
LOG OF: Boring B-042 | *Location:* Sta 148+47.31, 31.55 left | *Date Drilled:* 4/1/2009

WATER OBSERVATIONS:
Water seepage at: 6.5
Water level at completion: 7.7

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	893.4													
1.0	892.4						Asphalt Concrete Pavement - 7" Aggregate Base - 5"							
2.5	890.9	8 7 8	15	1			POSSIBLE FILL: Medium dense brown GRAVEL WITH SAND AND SILT (A-2-4), some silty clay, some fine to coarse sand; damp.		37	18	---	15	--30--	
		1 3 3	13	2										
5		4 4 6	16	3		2.0	POSSIBLE FILL: Stiff to very stiff dark brown CLAY (A-7-6), some silt, little fine to coarse sand; damp. @ 4.0', brown, trace fine sand, moist.		0	4	---	14	32	50
7.0	886.4	3 2 3	14	4		0.5	@ 5.5', soft to medium stiff.							
		1 2 2	9	5			Loose brown SANDY SILT (A-4a), "and" gravel, some fine to coarse sand; trace clay; moist to wet.							
10		1 2 3	7	6			@ 10.0', wet.							
13.0	880.4	2 3 9	6	7					43	7	---	14	30	6
		1 2 1	6	8			Very loose to loose brownish gray COARSE AND FINE SAND (A-3a), trace silty clay; moist to wet.							
15							@ 15.5', dark gray, little silty clay, contains slight organic odor.							
18.0	875.4	7 5 3	9	9										
		2 1 WOH	14	10			Very loose brown and gray SILT (A-4b), little fine sand, trace clay; moist to wet. @ 20.5' - 28.0', contains black, organic lenses.							
20														
		WOH WOH 1	18	11					0	0	---	23	62	15
		WOH WOH WOH	18	12										
25	868.4													

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢—⊣ *LL*
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-042 | *Location:* Sta 148+47.31, 31.55 left | *Date Drilled:* 4/1/2009

WATER OBSERVATIONS:
Water seepage at: 6.5
Water level at completion: 7.7

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	868.4														
		2 1 1	18	13			Very loose brown and gray SILT (A-4b), little fine sand, trace clay; moist to wet.								
							@ 28.0', no organic lenses.								
30		WOH WOH WOH	18	14											
35		WOH WOH 1	18	15											
37.0	856.4														
							Loose to medium dense brown and gray SANDY SILT (A-4a), little to some fine to coarse sand, trace to little gravel; moist to wet.								
40.0 40	853.4	3 4 5	9	16											
							Bottom of Boring - 40.0'								
45															
50															

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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

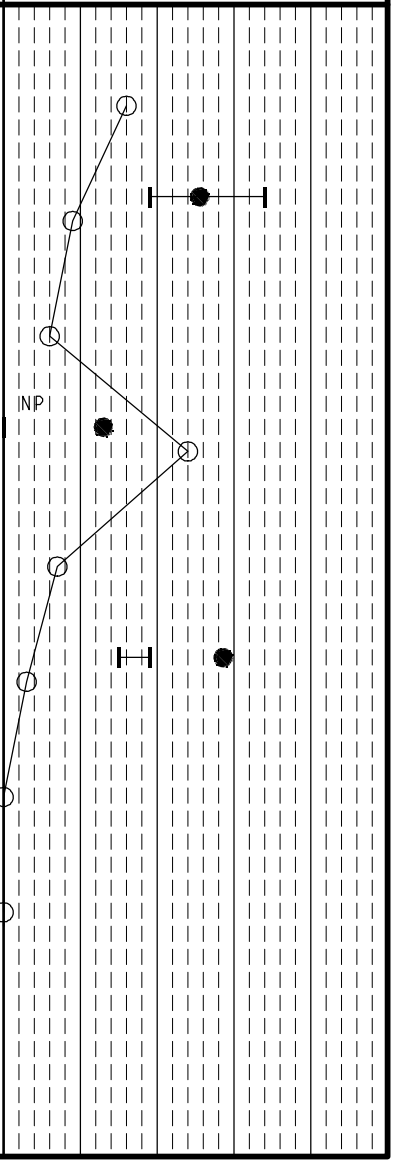
LOG OF: Boring B-042-1 | *Location:* Sta 148+50.28, 16.17 right | *Date Drilled:* 8/22/2009

WATER OBSERVATIONS:
Water seepage at: 8.0'-20.0'
Water level at completion: 7.45' (measured inside augers)

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 890.2	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.3	889.9						Topsoil - 3"							
		3 5 6	18	1		3.0	Very stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; contains trace organics; damp to moist.							
							@ 3.0', stiff.							
5		2 3 3	18	2		1.0			7	8	---	18	35	32
5.5	884.7													
		1 1 3	3	3		-	Loose brown COARSE AND FINE SAND (A-3a), little to some clay, trace to little silt; moist.							
8.0	882.2													
10		7 7 10	10	4		-	Medium dense brown GRAVEL (A-1-a), some fine to coarse sand, little silty clay; wet.		63	16	---	8	--13--	
10.5	879.7													
		3 2 3	6	5		-	Loose brown SILT (A-4b), some fine to coarse sand, little clay; wet.							
							@ 13.5', very loose, trace organic.							
15		1 1 1	18	6		-			0	0	---	24	61	15
		WOH WOH WOH	18	7		-								
		WOH WOH WOH	10	8		-								
20.0	870.2													
							Bottom of Boring - 20.0'							
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



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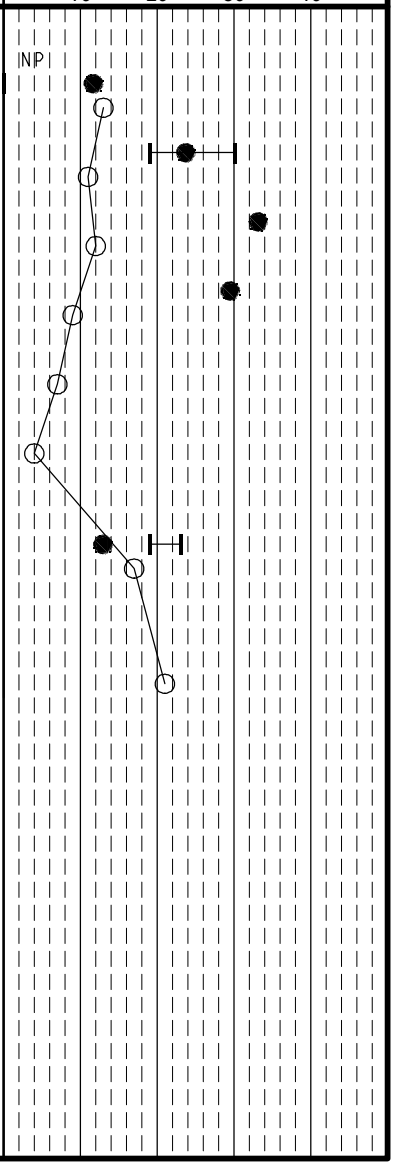
Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-043 | *Location:* Sta 152+48.20, 18.21 left | *Date Drilled:* 4/1/2009

WATER OBSERVATIONS:
Water seepage at: 8.5
Water level at completion: 6.8

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 895.3	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.0	894.3						Asphalt Concrete Pavement - 12"							
2.5	892.8	3 7 6	8	1			POSSIBLE FILL: Medium dense brown SANDY SILT (A-4a), some fine to coarse sand, little clay; little gravel; damp.		19	18	---	16	--47--	
4.0	891.3	3 5 6	16	2		1.5	POSSIBLE FILL: Stiff brown SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel, moist.		1	5	---	13	54	27
5		4 5 7	17	3		2.0	Stiff to very stiff dark gray SILT AND CLAY (A-6a), trace fine sand, trace gravel; contains organic material (roots); damp.							
		4 4 5	14	4		2.0	@ 5.5', brown and gray.							
8.5	886.8	2 4 3	11	5		1.0								
10		1 2 2	4	6			Loose brown GRAVEL WITH SAND (A-1-b), some fine to coarse sand, little silt; trace clay; wet.							
		6 8 9	13	7			@ 11.0', medium dense.		42	19	---	14	16	9
15.0	880.3	8 9 12	11	8										
							Bottom of Boring - 15.0'							
20														
25														



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

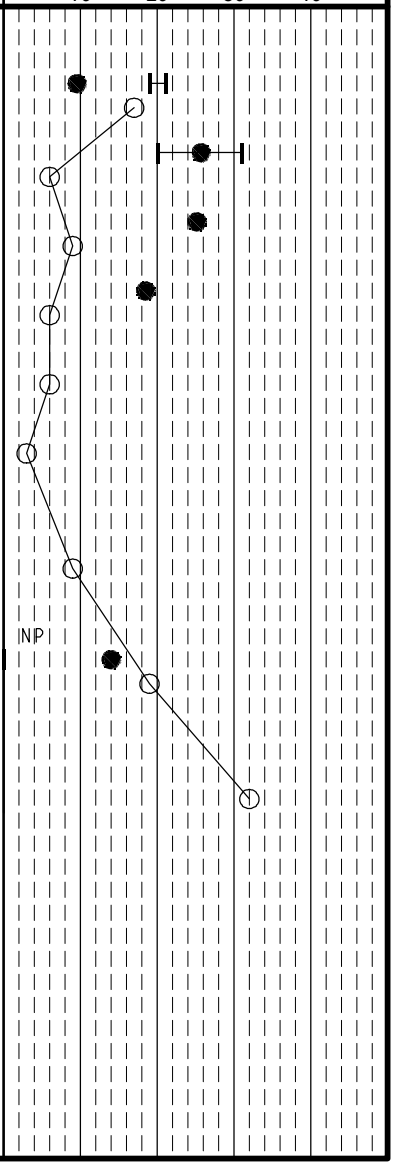
LOG OF: Boring B-044 | *Location:* Sta 156+47.56, 5.74 left | *Date Drilled:* 4/1/2009

WATER OBSERVATIONS:
Water seepage at: 8.5
Water level at completion: 7.6

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 896.0	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.0	895.0						Asphalt Concrete Pavement - 11.5"							
2.5	893.5	6 9 8	13	1			POSSIBLE FILL: Medium dense brown GRAVEL WITH SAND AND SILT (A-2-4), some fine to coarse sand, little to some silt, trace clay; damp.		48	14	---	12	20	6
		3 3 3	17	2		1.0	Stiff brown SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; damp to moist.		2	4	---	14	54	26
5		3 4 5	18	3		2.25	@ 4.0', very stiff, trace to little fine to coarse sand.							
		2 3 3	16	4		2.25	@ 5.5', brown and gray.							
8.5	887.5	4 3 3	9	5		1.0	@ 7.0', little to some gravel, moist.							
10		2 1 2	6	6			Medium dense brown SANDY SILT (A-4a), little to some gravel; wet.							
10.5	885.5													
		1 5 4	16	7			Loose brown GRAVEL WITH SAND, SILT, AND CLAY (A-2-6); wet.							
13.0	883.0						@ 12.5', medium dense.							
15		7 9 10	15	8			Medium dense brown and gray GRAVEL WITH SAND (A-1-b), "and" fine to coarse sand, little silt; trace clay; moist to wet.		33	24	---	22	15	6
							@ 15.5', dense.							
17.5	878.5	7 15 16	19	9										
20							Bottom of Boring - 17.5'							
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢——⊣ LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-045 | *Location:* Sta 160+47.56, 5.23 left | *Date Drilled:* 4/1/2009 to 4/2/2009

WATER OBSERVATIONS:
Water seepage at: 6.5
Water level at completion: 8.2

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 898.0	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
1.0	897.0						Asphalt Concrete Pavement - 9" Aggregate Base - 3"								
		20 20 9	17	1			Medium dense brown GRAVEL WITH SAND (A-1-b), some silty clay, some fine to coarse sand; damp.		47	14	---	14	--25--		NP
		5 5 9	6	2											
5		3 5 4	18	3											
5.5	892.5						Loose brown GRAVEL (A-1-a), little silty clay; containing more than 50% of fine to coarse sand; damp. @ 6.5', moist to wet. @ 7.0', wet.		31	30	---	26	--13--		NP
		2 3 3	18	4											
		3 3 3	12	5											
10		3 2 2	14	6											
		2 3 3	12	7											
12.0	886.0						Very loose gray SILT (A-4b), trace to little clay, trace fine sand; wet.								
		2 4 3	8	8											
15															
		WOH WOH WOH	18	9					0	0	---	2	86	12	
					ST-1										
		1 2 5	15	10											
20.0	878.0						Medium dense brown GRAVEL WITH SAND AND SILT (A-2-4), little to some clay, little fine to coarse sand; wet.								
		3 7 9	8	11											
22.5	875.5						Bottom of Boring - 22.5'								
25															

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

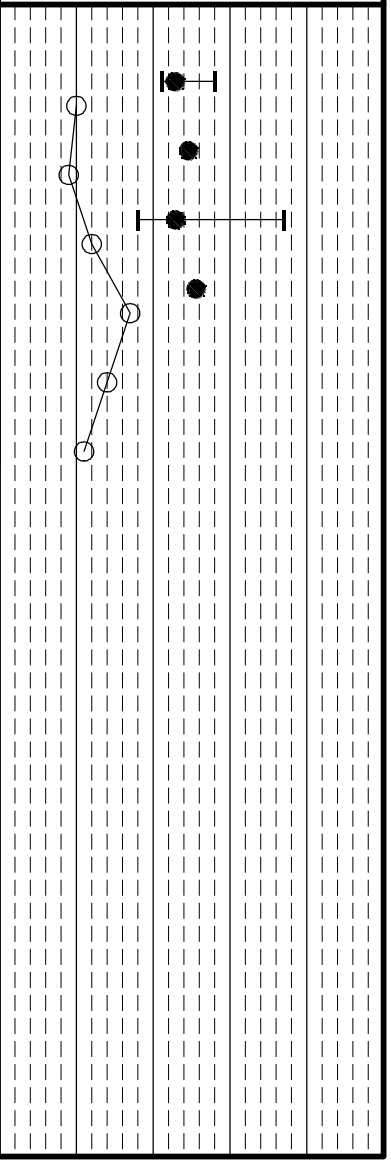
LOG OF: Boring B-046 | *Location:* Sta 164+40.47, 10.76 left | *Date Drilled:* 4/1/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 901.1	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.0	900.1						Asphalt Concrete Pavement - 7" Aggregate Base - 5"							
		6 6 4	16	1			Stiff brown SILT (A-4b), some clay, little to some fine to coarse sand; trace gravel; damp to moist.		1	7	---	13	56	23
		4 3 6	18	2		2.0								
4.0	897.1													
5		4 4 8	18	3		2.25	Stiff brown SILTY CLAY (A-6b), trace fine to coarse sand; damp to moist.		0	0	---	6	54	40
		6 8 9	18	4		2.0								
		6 7 7	18	5		2.0								
		3 5 6	18	6		1.5								
10.0 10	891.1						Bottom of Boring - 10.0'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

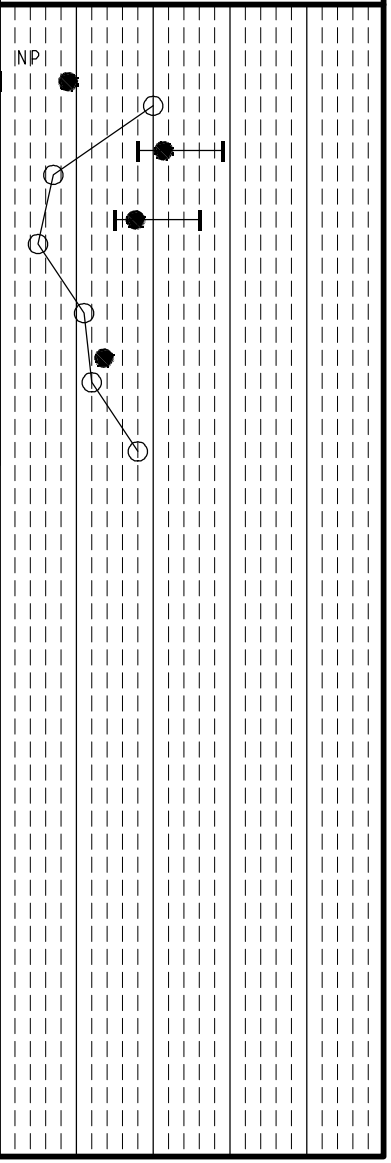
LOG OF: Boring B-047 | *Location:* Sta 168+47.01, 4.23 left | *Date Drilled:* 8/24/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 910.2	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetro-meter (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.8	909.4						Asphalt Concrete Pavement - 10"							
2.5	907.7	13 11 8	13	1		-	Medium dense brown GRAVEL WITH SAND (A-1-b), some silty clay, some fine to coarse sand; damp to moist.		49	12	---	18	--21--	
		8 3 4	18	2		2.25	Stiff to very stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp to moist.		9	6	---	14	49	22
5		2 2 3	10	3		1.25			5	9	---	19	37	30
		5 5 6	18	4		2.5	@ 5.5', little gravel.							
		6 6 6	18	5		4.0								
10.0 10	900.2	9 8 9	18	6		3.0								
							Bottom of Boring - 10.0'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % - ●
PL ⊢——⊣ *LL*
Blows per foot - ○ / *Non-Plastic -* NP



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

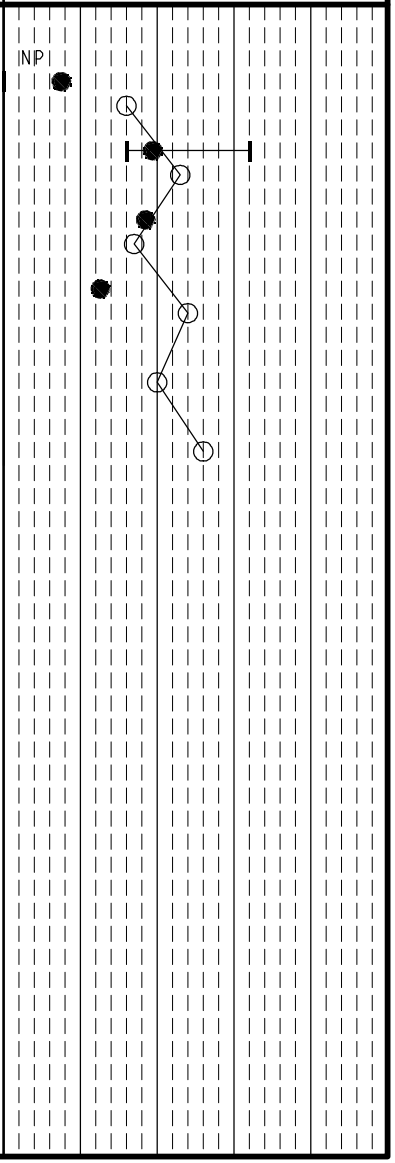
Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-048 | *Location:* Sta 172+47.18, 4.78 left | *Date Drilled:* 4/10/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.8	929.1						Asphalt Concrete Pavement - 9"							
2.5	926.6	7 6 5	6	1			Medium dense brown GRAVEL WITH SAND (A-1-b), some silty clay, little to some fine to coarse sand; damp.		59	11	---	9	--21--	
		4 7 9	16	2		2.0	Stiff to very stiff brown SILTY CLAY (A-6b), some fine to coarse sand, trace gravel; damp to moist.		4	7	---	18	35	36
5		2 5 7	16	3		1.0								
		8 8 9	18	4		2.5								
		3 7 7	18	5		4.0	@ 7.0', very stiff to hard.							
10.0	919.1	6 8 10	18	6		4.5								
							Bottom of Boring - 10.0'							
15														
20														
25														



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

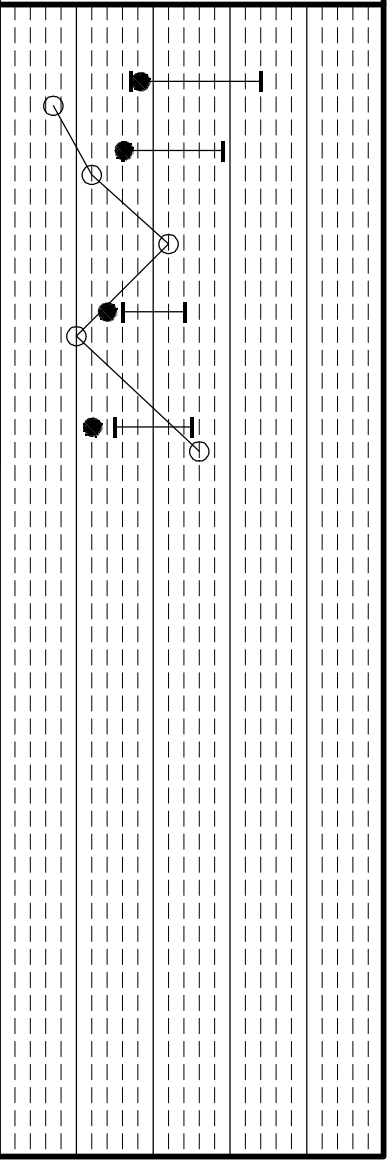
LOG OF: Boring B-049 | *Location:* Sta 176+47.14, 11.13 left | *Date Drilled:* 8/24/2009

WATER OBSERVATIONS:
Water seepage at: 5.1'-6.0'
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 942.2	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.8	941.4						Asphalt Concrete Pavement - 9"							
2.5	939.7	3 3 4	18	1		2.25	Very stiff brown SILTY CLAY (A-6b), some fine to coarse sand, trace gravel; moist.		3	6	---	17	37	37
5.1	937.1	4 5 7	18	2		4.0	Very stiff to hard brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp.		5	10	---	17	36	32
5.5	936.7	6 11 10	18	3A 3B		4.5+ -	Medium dense brown SANDY SILT (A-4a), little clay, trace gravel; moist to wet.							
		6 5 5	18	4		4.0	Very stiff to hard brown SANDY SILT (A-4a), some fine to coarse sand, trace gravel; some clay; damp. Sample #4: sample destroyed, no hydrometer test performed.							
10.0	932.2	15 12 13	18	5		4.5+			8	11	---	16	39	26
							Bottom of Boring - 10.0'							

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢——⊣ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

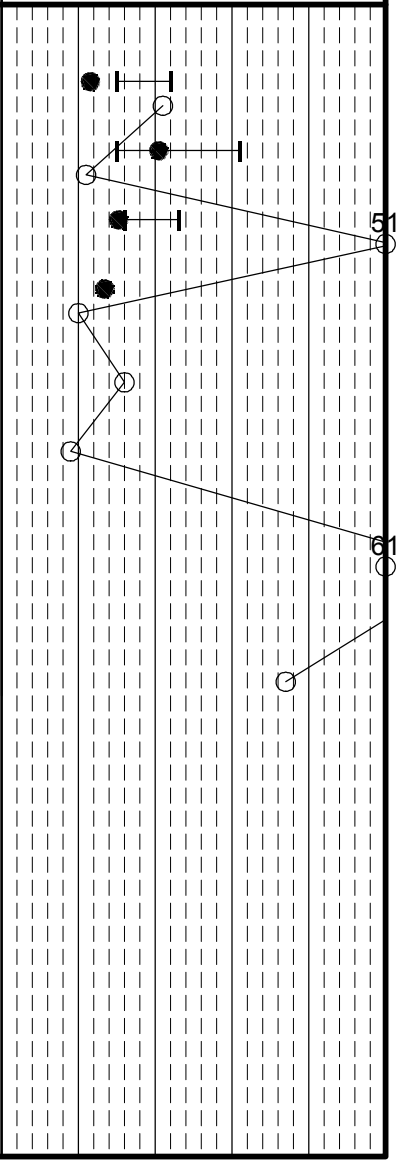
LOG OF: Boring B-050 | *Location:* Sta 180+47.05, 7.98 left | *Date Drilled:* 4/10/2009

WATER OBSERVATIONS:
Water seepage at: 7.0-10.0
Water level at completion: 14.7

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 963.7	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.7	963.0						Asphalt Concrete Pavement - 8"							
2.5	961.2	1 10 5	16	1		4.5	Hard brown SANDY SILT (A-4a), "and" fine to coarse sand,some clay; trace gravel; damp.		5	12	---	24	38	21
4.0	959.7	3 4 4	18	2		0.75	Medium stiff brown SILTY CLAY (A-6b), "and" fine to coarse sand, trace gravel, little clay; moist.		9	18	---	18	26	29
5		WOH 9 27	18	3		2.0	Stiff brown SANDY SILT (A-4a), little clay, some fine to coarse sand; trace gravel; damp to moist. @ 5.0', encountered possible cobble.		9	10	---	20	40	21
7.0	956.7	2 4 3	18	4		1.5								
		1 7 4	12	5		0.5	Loose brown SILT (A-4b), little fine sand, trace clay; wet.							
10		WOH 2 4	14	6		0.25								
							@ 10.5', dense, little to some gravel, damp to moist.							
		11 19 24	16	7										
15.0	948.7	10 14 12	16	8										
20							Bottom of Boring - 15.0'							
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ——— LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

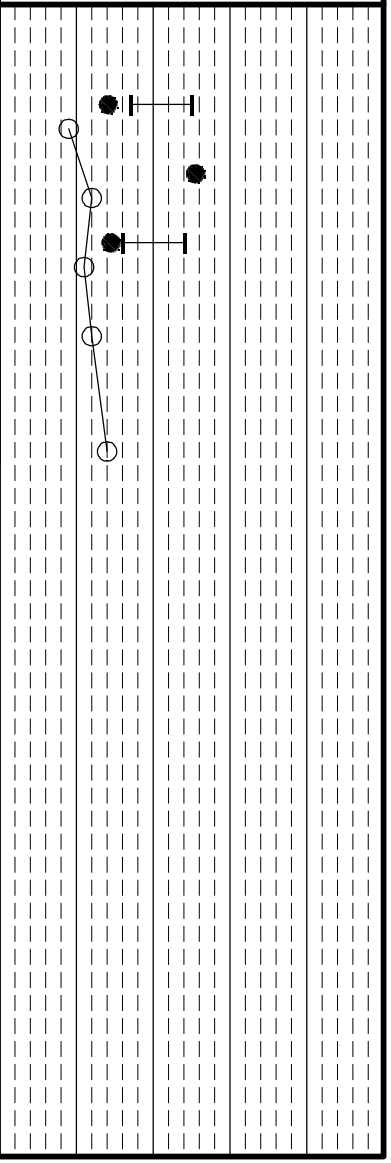
LOG OF: Boring B-051 | *Location:* Sta 14+99.65, 6.92 right | *Date Drilled:* 8/24/2009

WATER OBSERVATIONS:
Water seepage at: 3.0'-4.5'
Water level at completion: None

FIELD NOTES:
Stationing referenced to James Rd/Main St alignment

Depth (ft)	Elev. (ft) 967.9	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.9	967.0						Asphalt Concrete Pavement - 11"							
3.0	964.9	4 4 5	18	1		2.25	Very stiff brown SANDY SILT (A-4a), some clay, some fine to coarse sand, trace gravel; damp.		5	12	---	19	39	25
4.5	963.4	2 5 7	3	2		-	Medium dense brown SANDY SILT (A-4a), trace to little clay, trace coarse sand, some fine sand, trace gravel; moist to wet.		3	3	---	21	--73--	
8.0	959.9	4 4 7	10	3		3.0	Very stiff brown SANDY SILT (A-4a), some to "and" clay, some fine to coarse sand, trace to little gravel; damp.		10	12	---	18	36	24
		2 5 7	18	4		3.5								
10.0	957.9	6 8 6	18	5		4.0	Hard brown SILT AND CLAY (A-6a), little clay, trace to little gravel; damp.							
							Bottom of Boring - 10.0'							

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

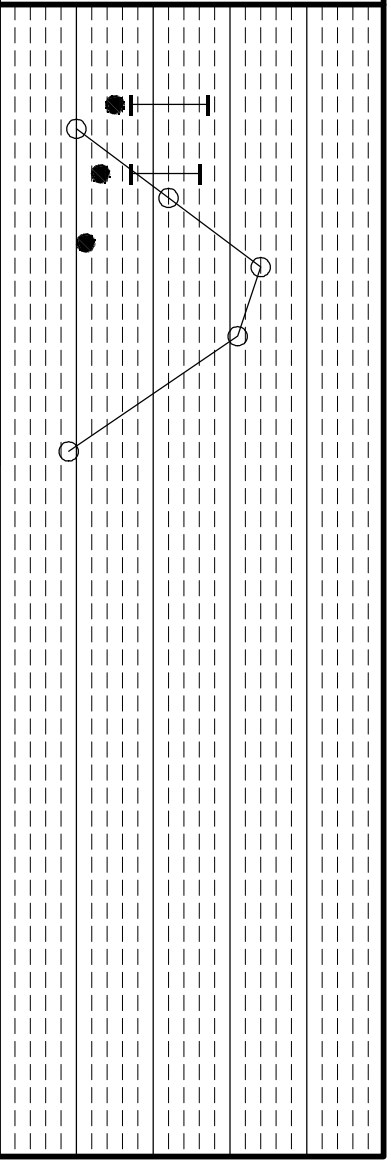
Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-052 | *Location:* Sta 18+99.73, 13.31 right | *Date Drilled:* 8/24/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to James Rd/Main St alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetro-meter (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	976.2													
1.1	975.1						Asphalt Concrete Pavement - 13"							
		4 4 6	18	1		4.0	Very stiff to hard brown SANDY SILT (A-4a), some fine to coarse sand, some clay, trace to little gravel; damp.		4	10	---	15	37	34
		8 9 12	18	2		4.5+			5	11	---	15	37	32
5		19 16 17	18	3		4.5+								
		18 16 14	18	4		2.75								
		8 4 5	18	5		4.0								
10.0 10	966.2						Bottom of Boring - 10.0'							
15														
20														
25														



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

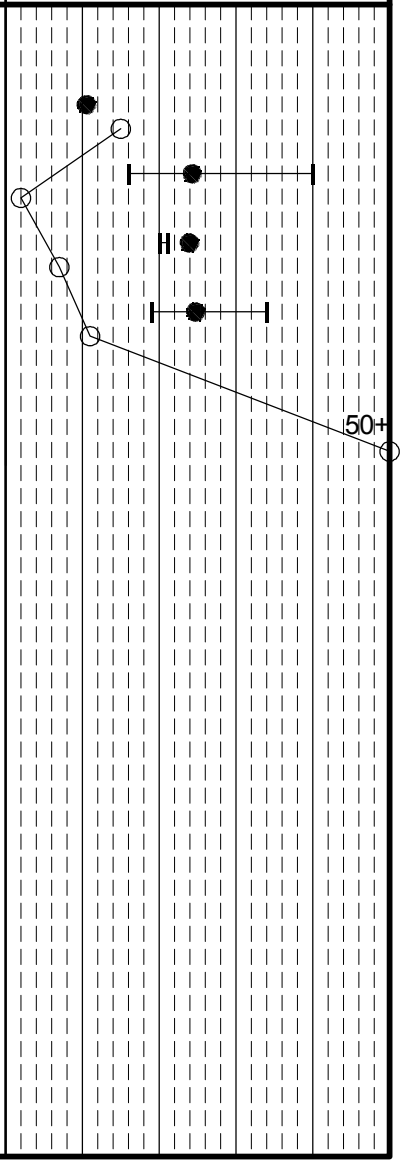
LOG OF: Boring B-053 | *Location:* Sta 20+99.44, 13.31 left | *Date Drilled:* 8/24/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to James Rd/Main St alignment

Depth (ft)	Elev. (ft) 986.1	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.1	985.0						Asphalt Concrete Pavement - 13"							
3.0	983.1	5 9 6	18	1		-	Medium dense brown SANDY SILT (A-4a), "and" fine to coarse sand, some clay, little gravel; damp. No hydrometer test performed.		13	14	---	26	--47--	
4.5	981.6	2 1 1	18	2		0.75	Medium stiff brown SILTY CLAY (A-6b), trace gravel, trace fine to coarse sand; moist to wet.		4	3	---	5	64	24
5.5	980.6	3 3 4	18	3		2.5	Very stiff brown SANDY SILT (A-4a), little clay, trace gravel. Sample S-3 destroyed; no hydrometer test performed.							
8.0	978.1	4 3 8	15	4		1.5	Stiff to very stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand; moist.		0	2	---	3	64	31
10.0	976.1	24 30 50/5	15	5		-	Very dense brown SANDY SILT (A-4a), little clay; encountered possible decomposed sandstone; damp.							
							Bottom of Boring - 10.0'							

STANDARD PENETRATION (N60)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-054 | *Location:* Sta 24+99.41, 7.78 left | *Date Drilled:* 8/24/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to James Rd/Main St alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP
	959.0														10 20 30 40
1.3	957.7						Asphalt Concrete Pavement - 15"								
3.0	956.0	17 9 10	12	1		-	Medium dense brown GRAVEL WITH SAND (A-1-b), some silty clay, some fine to coarse sand; dry to damp.		55	11	---	11	--23--		NP
5		17 22 23 50/3	18 3	2 3		- -	Dense to very dense brown GRAVEL WITH SAND AND SILT (A-2-4), some silty clay, little fine to coarse sand; dry to damp. @ 3.0', encountered possible decomposed sandstone.		58	5	---	11	--26--		NP 50+
6.5	952.5	50/5	5	4		-									50+
							Bottom of Boring - 6.5'								
10															
15															
20															
25															

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

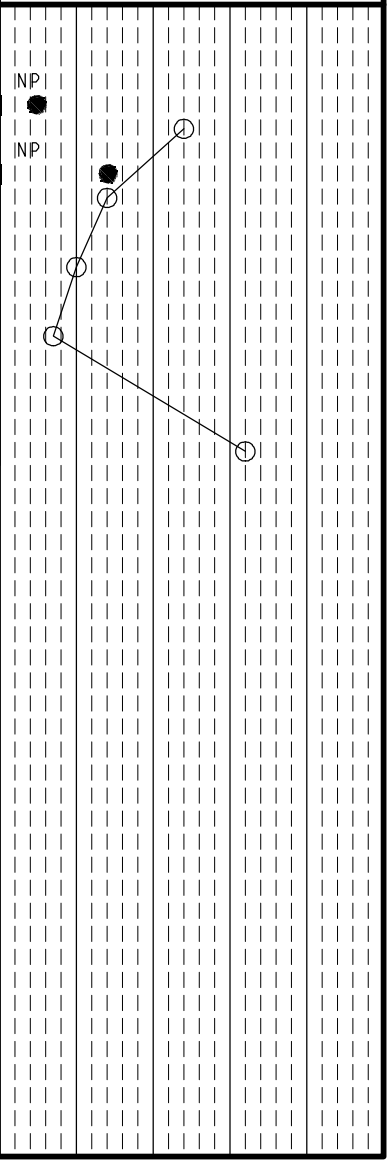
LOG OF: Boring B-055 | *Location:* Sta 184+52.92, 12.44 left | *Date Drilled:* 8/25/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	998.5													
1.0	997.5						Asphalt Concrete Pavement - 12"							
		3 12 11	5	1		-	Loose to medium dense brown GRAVEL WITH SAND (A-1-b), some fine to coarse sand, little to some silty clay; damp.		52	20	---	10	--18--	
		6 8 6	5	2		-			51	7	---	17	--25--	
5		4 4 6	10	3		-								
		3 3 4	10	4		-								
8.0	990.5													
		8 12 19	18	5		-	Soft brownish gray SANDSTONE; highly weathered.							
10.0 10	988.5						Bottom of Boring - 10.0'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢ *LL*
Blows per foot - ○ / *Non-Plastic -* NP



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

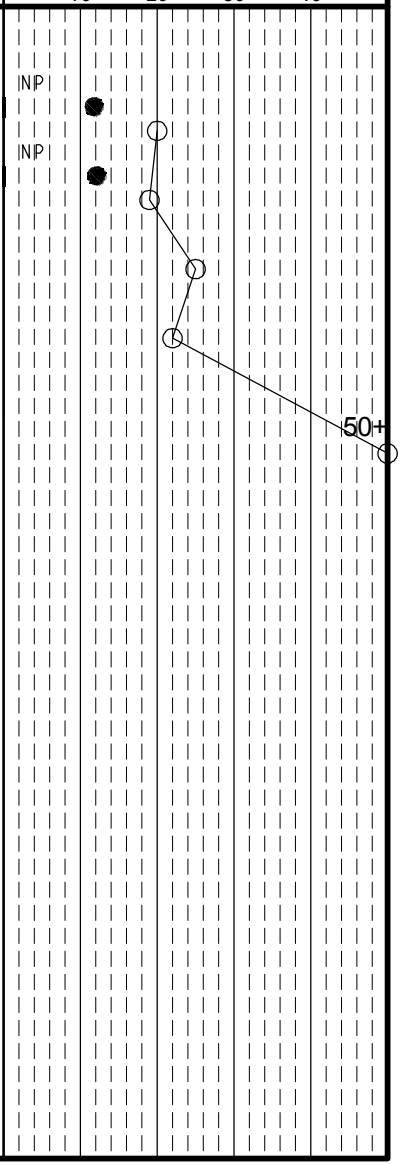
LOG OF: Boring B-056 | *Location:* Sta 188+42.85, 11.11 left | *Date Drilled:* 8/25/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 1020.5	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.9	1019.6						Asphalt Concrete Pavement - 11"							
3.0	1017.5	11 10 9	18	1		-	Medium dense brown GRAVEL WITH SAND AND SILT (A-2-4); damp.		39	9	---	39	--13--	
5		7 7 11	18	2		-	Medium dense brown FINE SAND (A-3), "and" gravel, trace to little silt, trace coarse sand; damp.		40	6	---	44	--10--	
		18 13 11	18	3		-								
8.0	1012.5	11 10 11	18	4		-								
8.9	1011.6	50/4	4	5		-	Soft brownish gray SANDSTONE; highly weathered.							
10							Bottom of Boring - 8.9'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

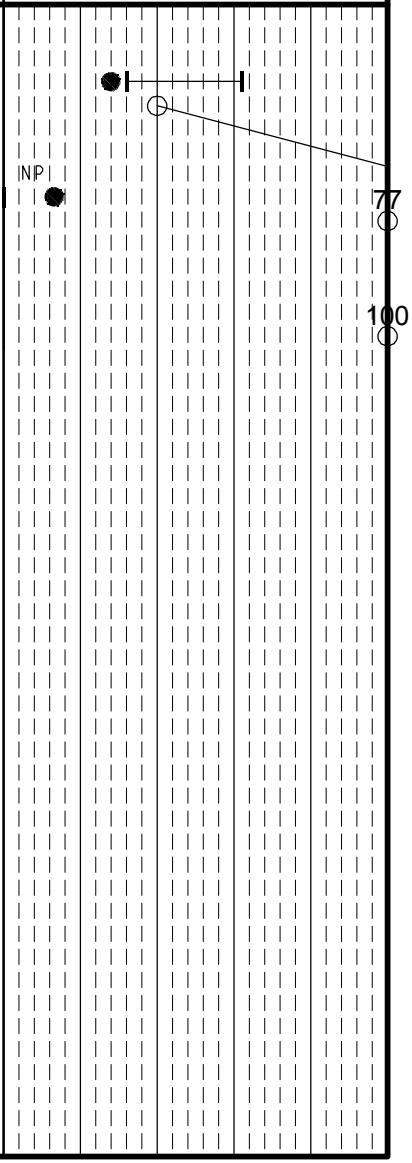
LOG OF: Boring B-058 | *Location:* Sta 191+25.19, 27.51 right | *Date Drilled:* 8/27/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 994.2	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.3	993.9						Topsoil - 3"							
		5 6 8	18	1		4.5+	Hard brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; dry to damp.		6	9	---	16	35	34
3.0	991.2													
		17 33 21	18	2		-	Very dense brown SANDY SILT (A-4a), trace to little clay, trace gravel; "and" fine to coarse sand; possible decomposed sandstone; dry to damp.		0	12	---	36	44	8
7.0	987.2	13 31 39	18	3		-								
7.5	986.7						Very weak brown SANDSTONE, fine to very fine grained, highly to severely weathered, argillaceous, thinly bedded, highly fractured to broken.							
							Bottom of Boring - 7.5'							

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — *LL*
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



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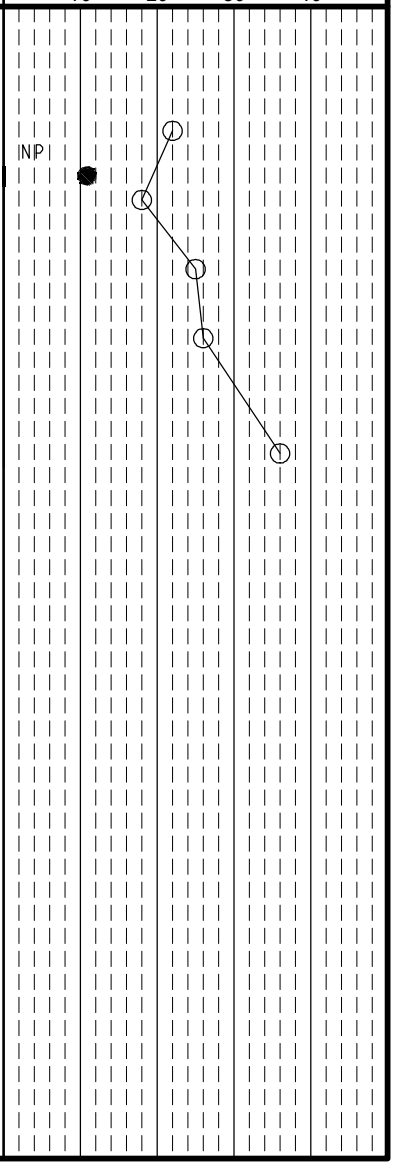
Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-059 | *Location:* Sta 192+47.11, 10.11 left | *Date Drilled:* 8/25/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP
	989.5														10 20 30 40
1.2	988.3						Asphalt Concrete Pavement - 14"								
		7 9 12	2	1		-	Medium dense brown GRAVEL WITH SAND (A-1-b), little silty clay, little fine to coarse sand; possible decomposed sandstone; damp.								
		10 9 8	12	2		-			66	7	---	9	--18--		NP
5		12 10 14	18	3		-									
		47 17 8	18	4		-									
10.0	979.5	41 14 21	18	5		-									
10							Bottom of Boring - 10.0'								
15															
20															
25															



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-060-1 | *Location:* Sta 195+53.40, 31.28 right | *Date Drilled:* 8/27/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 967.6	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
0.3	967.3						Topsoil - 4"								
2.0	965.6	1 4 10	10	1		-	Medium dense brown SANDY SILT (A-4a), little fine to coarse sand, trace clay; "and" gravel; possible decomposed sandstone; dry to damp.		48	6	---	7	--39--		NP ●
							Very weak, brown, SANDSTONE, severely weathered, broken.								○
5.0	962.6	5 10 13	3	2		-									○
							Bottom of Boring - 5.0'								

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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

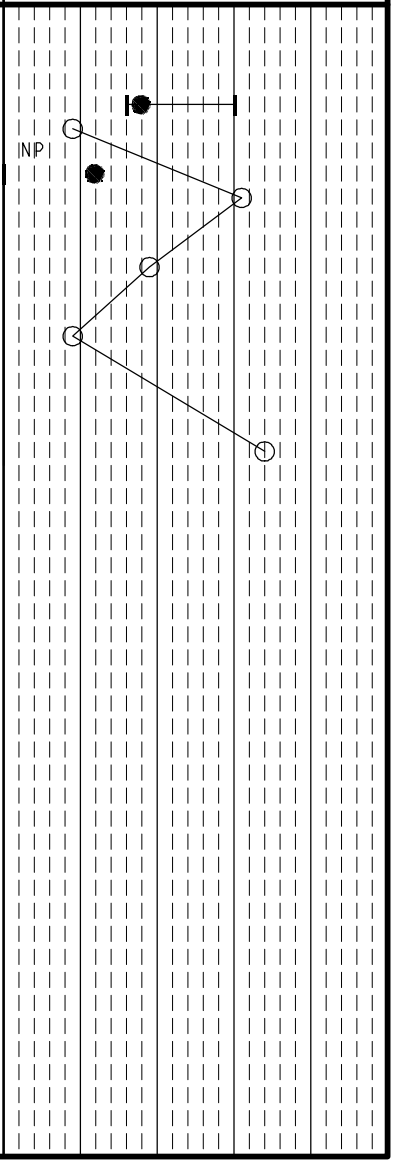
LOG OF: Boring B-061 | *Location:* Sta 196+33.09, 10.96 left | *Date Drilled:* 8/25/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft) 978.1	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.8	977.3						Asphalt Concrete Pavement - 10"							
3.0	975.1	3 4 5	18	1		2.5	Very stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; moist.		4	8	---	16	36	36
		13 16 14	10	2		-	Medium dense brown GRAVEL WITH SAND (A-1-b), some silty clay, little fine to coarse sand; damp.		64	5	---	9	--22--	
5		17 10 8	15	3		-								
8.0	970.1	8 3 6	10	4		-								
10.0	968.1	20 22 11	18	5		-	Soft brownish gray SANDSTONE; highly weathered.							
							Bottom of Boring - 10.0'							

STANDARD PENETRATION (N60)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

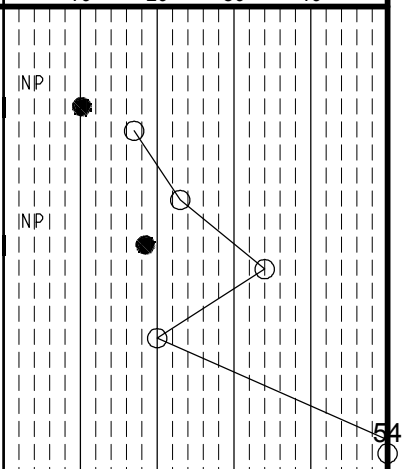
LOG OF: Boring B-063 | *Location:* Sta 200+47.52, 5.68 left | *Date Drilled:* 8/25/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Thornwood Dr alignment

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.8	950.0						Asphalt Concrete Pavement - 10"							
		16 8 8	18	1		-	Medium dense brown GRAVEL (A-1-a), some fine to coarse sand, little silty clay; dry to damp.		57	20	---	8	--15--	
4.5	946.3	11 11 11	18	2		-								
5		8 21 12	18	3			Dense brown COARSE AND FINE SAND (A-3a), some silt, little clay; contains sandstone fragments; moist.		0	6	---	60	22	12
6.0	944.8	9 9 10	4	4		-	Medium dense brown GRAVEL WITH SAND AND SILT (A-2-4), little clay; possible decomposed sandstone; damp.							
8.0	942.8													
10.0	940.8	16 24 28	5	5		-	Soft brownish gray SANDSTONE; highly to severely weathered.							
10							Bottom of Boring - 10.0'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢——⊣ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

LOG OF: Boring B-066 | *Location:* Sta 22+99.97, 5.25 left | *Date Drilled:* 8/25/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing referenced to Reddington Rd Connector

Depth (ft)	Elev. (ft) 932.2	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) / Natural Moisture Content, % - / PL — LL / Blows per foot - ○ / Non-Plastic - NP
0.8	931.4						Asphalt Concrete Pavement - 10"								
3.0	929.2	11 3 3	10	1		-	Loose brown GRAVEL WITH SAND AND SILT (A-2-4), "and" fine to coarse sand, some silt; trace clay; dry to damp.		18	27	---	21	25	9	NP
		4 2 3	18	2		2.5	Very stiff brown SILTY CLAY (A-6b), trace fine to coarse sand; moist.		0	1	---	4	56	39	
5		5 5 4	18	3		1.5									
		5 5 6	18	4		3.5									
10.0	922.2	2 4 3	10	5		2.5	@ 8.5' contains silt seams.								
10							Bottom of Boring - 10.0'								
15															
20															
25															

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

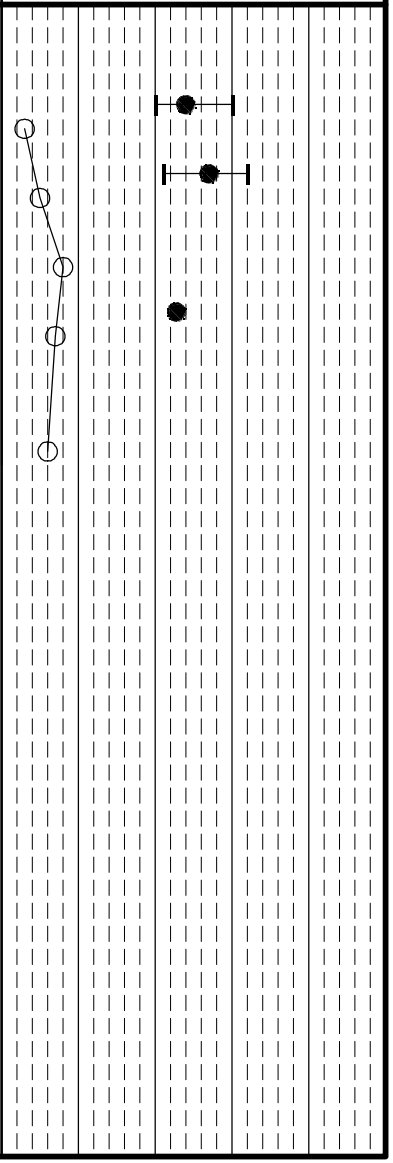
LOG OF: Boring B-067 | *Location:* Sta 19+99.45, 6.27 left | *Date Drilled:* 8/25/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing reference to Reddington Rd

Depth (ft)	Elev. (ft) 927.5	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.2	926.3						Asphalt Concrete Pavement - 14"							
3.0	924.5	3 2 1	18	1		1.5	Stiff brown SILT (A-4b), some clay, little to some fine to coarse sand; trace gravel; damp to moist.		7	10	---	10	50	23
5		1 2 3	18	2		1.5	Stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand; moist.		0	2	---	4	64	30
		4 4 4	18	3		1.75	@4.5', trace gravel.							
8.0	919.5	4 4 3	18	4		1.25								
10.0	917.5	7 3 3	18	5		-	Loose brown GRAVEL WITH SAND AND SILT (A-2-4); contains sandstone fragments; moist.							
10							Bottom of Boring - 10.0'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % - ●
PL ⊢——⊣ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



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Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

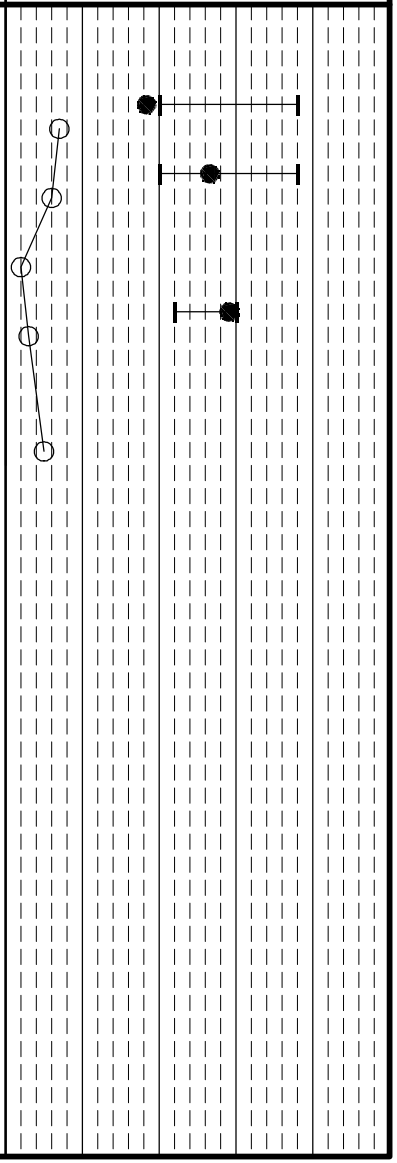
LOG OF: Boring B-068 | *Location:* Sta 23+00.00, 0.0029 right | *Date Drilled:* 8/25/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing reference to Reddington Rd

Depth (ft)	Elev. (ft) 922.5	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.8	921.8						Topsoil - 9"							
		5 4 3	18	1		3.0	Stiff to very stiff brown SILTY CLAY (A-6b), trace fine to coarse sand; damp to moist. @ 1.5', contains fine roots.		0	0	---	2	60	38
		2 3 3	12	2		1.0			0	0	---	1	67	32
4.5	918.0													
5		2 1 1	18	3		<0.5	Soft to medium stiff brown SILT (A-4b), some clay, trace fine sand; moist to wet.							
		WOH 1 2	18	4		0.75			0	0	---	1	76	23
		4 3 2	12	5		1.0								
10.0 10	912.5						Bottom of Boring - 10.0'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

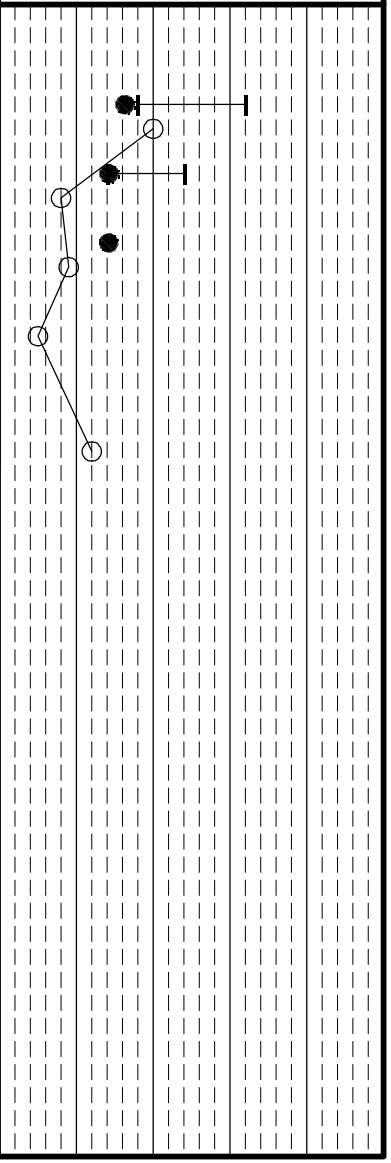
LOG OF: Boring B-069 | *Location:* Sta 27+00.00, 0.0016 left | *Date Drilled:* 8/25/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing reference to Reddington Rd

Depth (ft)	Elev. (ft) 925.1	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.4	924.7						Asphalt Concrete Pavement - 5"							
3.0	922.1	5 8 11	18	1		4.5+	Hard brown SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; damp.		3	4	---	7	56	30
		8 4 4	18	2		3.0	Stiff to very stiff brown SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.		4	12	---	22	36	26
5		7 4 5	18	3		4.5+	@4.5', hard.							
		2 3 2	18	4		2.0	@ 6.0', moist.							
8.0	917.1													
10.0	915.1	6 6 6	18	5		3.0	Very stiff gray SILT AND CLAY (A-6a), little gravel, trace fine to coarse sand; damp.							
10							Bottom of Boring - 10.0'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % - ●
PL ⊢——⊣ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

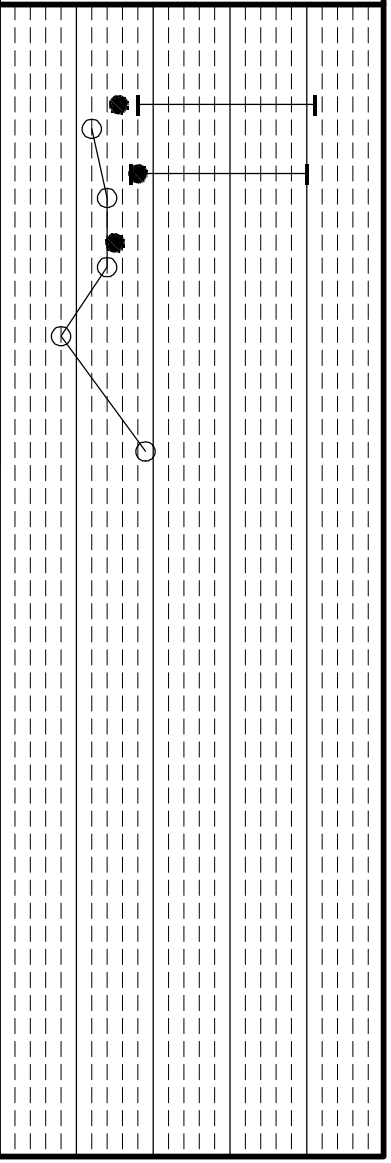
LOG OF: Boring B-070 | *Location:* Sta 30+00.00, 0.0023 left | *Date Drilled:* 8/25/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing reference to Reddington Rd

Depth (ft)	Elev. (ft) 918.0	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetro-meter (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.5	917.5						Topsoil - 6"							
3.0	915.0	4 6 6	18	1		4.5+	Hard brown CLAY (A-7-6), trace fine to coarse sand, trace gravel; damp.		0	1	---	2	59	38
5		13 7 7	18	2		4.5+	Hard brown SILTY CLAY (A-6b), little fine to coarse sand, trace gravel; damp to moist.		3	5	---	10	41	41
6.0	912.0	10 9 5	18	3		4.5+								
8.0	910.0	4 4 4	18	4		2.0	Very stiff brown SILTY CLAY (A-6b), little gravel, trace fine to coarse sand; moist.							
10.0	908.0	5 8 10	15	5		3.25	Very stiff brown SANDY SILT (A-4a), little gravel, trace clay; damp.							
10							Bottom of Boring - 10.0'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢——⊣ *LL*
Blows per foot - ○ / *Non-Plastic -* NP



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: HNTB, ODOT District-5 | *Project:* LIC-Thornwood Drive | *Job No.* 0821-3004.00

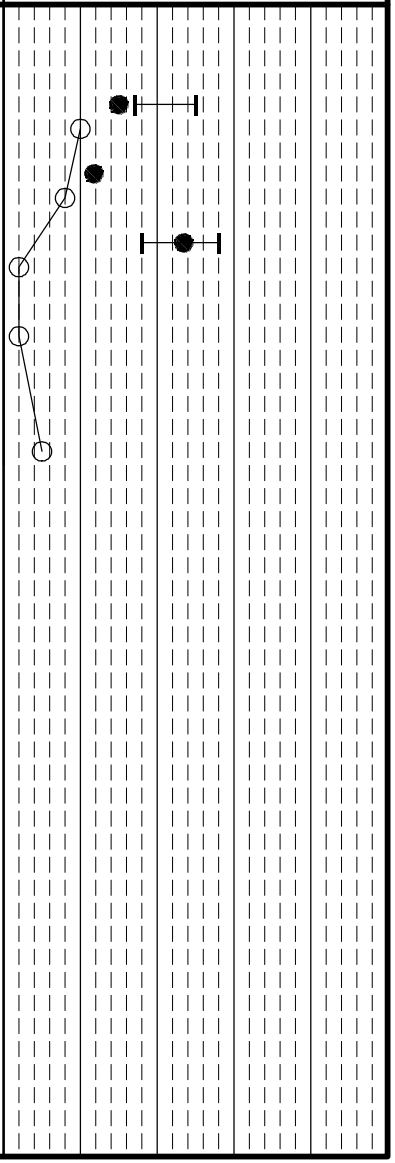
LOG OF: Boring B-071 | *Location:* Sta 32+91.07, 7.17 left | *Date Drilled:* 8/25/2009

WATER OBSERVATIONS:
Water seepage at: None Observed
Water level at completion: None

FIELD NOTES:
Stationing reference to Reddington Rd

Depth (ft)	Elev. (ft) 915.7	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.8	915.0						Asphalt Concrete Pavement - 9"							
		4 6 4	10	1		2.5	Very stiff brown SANDY SILT (A-4a), some fine to coarse sand, little to some gravel, little to some clay; damp.		10	14	---	15	40	21
		6 4 4	2	2		-	@ 3.0', gray. Not enough sample for Atterburg limits.		28	12	---	19	30	11
4.5	911.2													
5		2 1 1	8	3		1.25	Medium stiff to stiff gray SANDY SILT (A-4a), little fine to coarse sand, little gravel; some clay; moist.		15	6	---	12	45	22
		1 1 1	18	4		0.5								
							@8.0' brown and gray, little clay, trace gravel.							
10.0 10	905.7	1 2 3	10	5		1.0								
							Bottom of Boring - 10.0'							
15														
20														
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40



APPENDIX II

Summary of Subgrade Conditions
GB-1 Spreadsheet

Subgrade Analysis

V. 9.09 08/10/07

Design	7
CBR	
Item 320	No
Global CS	Option
Global LS	No

63 Total Borings

Classification Counts by Sample

R	1a	1b	3	3a	2-4	2-5	2-6	2-7	4a	4b	5	6a	6b	7-5	7-6	8a	8b
0	7	29	3	2	13	0	0	0	53	22	0	67	37	0	9	6	2
	3%	12%	1%	1%	5%				21%	9%		27%	15%		4%	2%	1%
0.0%	21.6%								78.4%								

Class @ Surface

2-5	0	
4b	8	13%
5	0	
7-5	0	
7-6	1	2%
8a	1	2%
8b	0	
R	0	

	N_{60}	N_L	PI	Clay	M	M_{OPT}	GI
Average	13.0	7.5	15.3	26.5	19.2	12.2	6.48
Maximum	83	20	152 / 49	103 / 77	48 / 99	89	23	20
Minimum	0	0	21 / 13	1 / 5	4 / 5	5	6	0

% Borings	
N_L<= 5	30%
N_L<=10	86%
N_L>=20	2%
M+	89%
R	0%

% Surface	
43%	
14%	41%
% Borings	
90%	
6%	67%	25%	90%

Rig	ER
A	61
B	86
C	62
D	
E	
F	
G	
H	

Licking County, Thornwood Drive, PID 78116

#	B #	Boring Location	Depth	To	Cut Fill	Standard Penetration n_2	n_3	N_m	Rig	N_{60}	N_L	Physical Characteristics LL	PL	PI	% Silt	% Clay	P 200	Moisture M	M_{OPT}	Classification Class	GI	Comments	Problem w/ Class	w/ MN	Treatments LS	CS	UC Class	UC MN	Analysis
1	B-001	Sta 7+95.86 5.92 LT	1.0	2.5		8	4	12	A	12		26	16	10	29	19	48	13	11	4a	3	Organic							
		Thornwood Dr.	2.5	4.0		3	4	7		7								28	10	4b		4.0'-7.0'	4b	MN			3	3	
			4.0	5.5		3	4	7		7		57	26	31	44	38	82	56		8a	19		Un	N			All	2	
			5.5	7.0		3	4	7		7	7							55		8a			Un	N			All	2	
2	B-003	Sta 15+96.33 0.19 LT	1.0	2.5		8	5	13	A	13		33	19	14	62	37	99	22	14	6a	10			MN		12		1	
		Thornwood Dr.	2.5	4.0		4	6	10		10								25	14	6a	8			MN				1	
			4.0	5.5		4	5	9		9		29	18	11	61	25	86	22	14	6a	8			MN		14		2	
			5.5	7.0		4	4	8		8	8							19	14	6a				MN				2	
3	B-004	Sta 20+01.83 4.82 LT	1.0	2.5		16	19	35	A	36		NP		NP	23		23	7	6	1b	0								
		Thornwood Dr.	2.5	4.0		6	7	13		13								15	14	6a	8								
			4.0	5.5		3	4	7		7		50	26	24	62	28	90	34	23	7-6	16			MN	--			3	
			5.5	7.0		4	6	10		10	7							28	14	6a				MN				1	
4	B-005	Sta 23+96.74 9.18 RT	1.0	2.5		5	7	12	A	12		50	25	25	47	29	76	24		8a	16	Organic	Un				All		
		Thornwood Dr.	2.5	4.0		4	6	10		10								20	10	4b		1.0'-2.5'	4b	MN			3	1	
			4.0	5.5		4	3	7		7		26	21	5	77	17	94	25	16	4b	8		4b	MN		16	3	3	
			5.5	7.0		4	6	10		10	7							21	10	4b			4b	MN			3	1	
5	B-006	Sta 27+46.31 8.85 LT	0.3	1.5	2.0	2	1	3	B	4		31	18	13	41	21	62	21	14	6a	7			MN		--		5	
		Thornwood Dr.	1.5	3.0		7	7	14		20								15	14	6a	8								
			3.0	4.5		5	6	11		16		29	17	12	39	35	74	19	14	6a	9								
			4.5	6.0		5	5	10		14	4							16	14	6a	8								
6	B-007	Sta 29+39.49 0.09 RT	1.0	2.5		9	8	17	A	17		24	19	5	44	18	62	15	14	4a	5								
		Thornwood Dr.	2.5	4.0		5	6	11		11								20	10	4a	5			MN				1	
			4.0	5.5		5	5	10		10		27	19	8	42	18	60	14	14	4a	5								
			5.5	7.0		4	5	9		9	9							24	10	4a				MN				2	
7	B-008	Sta 33+46.31 5.96 LT	0.3	1.5		4	5	9	A	9		NP		NP	22	7	29	11	10	2-4	0			N		14		1	
		Thornwood Dr.	1.5	3.0		4	4	8		8		22	19	3	64	15	79	20	14	4b	8		4b	MN		14	3	2	
			3.0	4.5		3	3	6		6		33	19	14	58	37	95	26	14	6a	10			MN		16		3	
			4.5	6.0		5	7	12		12	6							23	14	6a	8			MN				1	
8	B-009	Sta 37+46.31 2.35 RT	1.2	3.0		4	4	8	A	8		27	19	8	68	29	97	23	14	4b	8		4b	MN		14	3	2	
		Thornwood Dr.	3.0	4.5		3	6	9		9		35	19	16	55	40	95	22	16	6b	10			MN		14		2	
			4.5	6.0		5	7	12		12								17	10	4b			4b	MN			3	1	
			6.0	7.5		5	5	10		10	8							20	10	4b			4b	MN			3	1	
9	B-010	Sta 41+46.35 11.14 LT	0.0	1.5	1.8	3	4	7	B	10		40	24	16	56	35	91	36	19	6b	10			MN		12		1	
		Thornwood Dr.	1.5	3.0		5	6	11		16								19	14	6a	8								
			3.0	4.5		5	6	11		16		29	18	11	63	33	96	20	14	6a	8			M				1	
			4.5	6.0		5	5	10		14	10							18	10	4a	5			MN				1	
10	B-011	Sta 44+21.43 1.78 RT	1.0	2.5		3	7	10	A	10		26	17	9	35	15	50	14	12	4a	3	Organic							
		Thornwood Dr.	2.5	4.0		4	4	8		8		34	13	21	42	27	69	24	16	6b	11	4.0'-4.5'		MN	--			2	
			4.0	4.5		3	4	7		7		68	27	41	50	39	89	30		8a	20		Un	N			All	2	
			4.5	7.0		3	3	6		6	6								16	6b	10			N				3	
11	B-012	Sta 48+46.32 11.54 LT	0.4	1.5	1.8	2	3	5	B	7		31	19	12	53	36	89	23	14	6a	9			MN		16		3	
		Thornwood Dr.	1.5	3.0		2	2	4		6								27	14	6a	8			MN				3	
			3.0	4.5		5	5	10		14		36	17	19	46	36	82	24	12	4a	12			MN		12		1	
			4.5	6.0		6	7	13		19	6							15	10	4a	5								

Licking County, Thornwood Drive, PID 78116						Standard Penetration						Physical Characteristics						Moisture		Classification		Comments	Problem		Treatments				Analysis
#	B #	Boring Location	Depth	To	Cut Fill	n_2	n_3	N_m	Rig	N_{60}	N_L	LL	PL	PI	% Silt	% Clay	P 200	M	M_{OPT}	Class	GI		w/ Class	w/ MN	LS	CS	UC Class	UC MN	
12	B-013	Sta 52+46.38 1.74 RT	0.9	2.5		7	7	14	A	14		35	18	17	37	39	76	18	16	6b	11								
		Thornwood Dr.	2.5	4.0		5	7	12		12								19	16	6b	10								
			4.0	5.5		9	11	20		20		27	17	10	40	31	71	16	16	6b	7								
			5.5	7.0		8	10	18		18	12							15	16	6b									
13	B-014	Sta 56+46.16 14.15 LT	1.0	2.5	2.6	16	12	28	A	29		NP		NP	22		22	7	6	1b	0	Organic							
		Thornwood Dr.	2.5	4.0		2	3	5		5		28	19	9	58	23	81	27	14	4b	8	4.0'-8.0'	4b	MN		--	3	5	
			4.0	5.5		1	2	3		3		152	49	103	54	41	95	68		8a	20		Un	N			All	5	
			5.5	7.0		0	0	0		0	0	142	46	96	48	37	85	89		8a			Un	N			All	5	
14	B-015	Sta 60+46.85 8.03 RT	1.1	3.0		4	3	7	A	7		25	17	8	38	20	58	15	12	4a	5			N		16		2	
		Thornwood Dr.	3.0	4.5		1	2	3		3								22	10	4a	5			MN				5	
			4.5	6.0		1	2	3		3		23	16	7	40	15	55	20	11	4a	4			MN		--		5	
			6.0	7.5		1	3	4		4	3	25	16	9	49	23	72	21	14	6a				MN		--		5	
15	B-016	Sta 64+10.44 12.67 LT	1.0	2.5		3	3	6	C	6		27	19	8	33	19	52	17	14	4a	3			N		16		3	
		Thornwood Dr.	3.5	5.0		2	2	4		4									10	4a	5			N				5	
			6.0	7.5		2	2	4		4		28	15	13	27	20	47	24	14	6a				MN		--		5	
											4																		
16	B-017	Sta 64+37.70 10.55 RT	1.0	2.5		20	11	31	C	32		NP		NP	26		26	6	10	2-4	0								
		Thornwood Dr.	2.5	4.0		2	2	4		4		30	18	12	51	27	78	26	14	6a	9			MN		--		5	
			4.0	5.5		1	14	15		16									14	6a	8								
			5.5	7.0		1	3	4		4	4	29	16	13	41	25	66	21	14	6a				MN		--		5	
17	B-018	Sta 68+70.76 5.33 LT	1.0	2.5		7	12	19	A	19		31	18	13	45	27	72	18	14	6a	9	Organic							
		Thornwood Dr.	2.5	4.0		4	6	10		10								9	10	2-4	0	5.5'-8.5'							
			4.0	5.5		3	3	6		6		27	17	10	40	20	60	18	12	4a	5			MN		16		3	
			5.5	7.0		2	2	4		4	4	45	21	24	39	30	69	30		8b			Un	N			All	5	
18	B-019	Sta 72+46.68 11.19 LT	0.0	1.5	1.2	2	2	4	B	6		NP		NP	7		7	10	6	1a	0			MN		16		3	
		Thornwood Dr.	1.5	3.0		1	2	3		4								19	16	6b	10			N				5	
			3.0	4.5		3	5	8		11		40	17	23	51	36	87	26	16	6b	13			MN	12			1	
			4.5	6.0		1	2	3		4	4							24	10	4a	5			MN				5	
19	B-020	Sta 76+46.32 9.72 RT	1.1	3.0		20	13	33	A	34		NP		NP	25		25	7	6	1b	0	Organic							
		Thornwood Dr.	3.0	4.5		2	4	6		6		79	29	50	53	36	89	35		8b	20	3.0'-4.5'	Un	N			All	3	
			4.5	6.0		3	5	8		8								23	16	6b	10			MN				2	
			6.0	7.5		3	4	7		7	6	36	17	19	56	37	93	24	16	6b				MN		16		3	
20	B-021	Sta 80+46.53 2.37 RT	0.0	1.5	1.9	2	3	5	B	7		NP		NP	19	7	26	9	10	2-4	0	Slightly organic		N		16		2	
		Thornwood Dr.	1.5	3.0		3	3	6		9		42	21	21	48	37	85	29	18	7-6	13	1.5'-5.5'		MN	14			2	
			3.0	4.5		4	5	9		13		59	23	36	47	48	95	30	20	7-6	20			MN	12			1	
			4.5	6.0		5	6	11		16	7	47	18	29	46	43	89	17	18	7-6	17								
21	B-022	Sta 84+46.68 7.27 RT	0.8	2.5		9	5	14	A	14		25	19	6	61	25	86	18	14	4b	8		4b	MN		12	3	1	
		Thornwood Dr.	2.5	4.0		5	7	12		12								22	10	4b			4b	MN			3	1	
			4.0	5.5		5	7	12		12		28	18	10	41	30	71	16	13	4a	7								
			5.5	7.0		6	7	13		13	12							18	10	4a				MN				1	
22	B-023	Sta 88+46.56 0.14 LT	0.1	1.5	2.0	11	8	19	A	19		NP		NP	16		16	6	6	1b	0								
		Thornwood Dr.	1.5	3.0		1	3	4		4		33	19	14	51	32	83	26	14	6a	10			MN		--		5	
			3.0	4.5		3	5	8		8								24	14	6a	8			MN				2	
			4.5	6.0		3	3	6		6	4	29	17	12	56	29	85	21	14	6a	9			MN		16		3	
23	B-024	Sta 90+63.54 6.75 RT	1.3	3.0	1.5	4	3	7	A	7		29	20	9	51	21	72	22	15	4b	7		4b	MN		16	3	3	
		Thornwood Dr.	3.0	4.5		2	2	4		4		30	18	12	37	19	56	19	14	6a	5			MN		--		5	
			4.5	6.0		3	3	6		6								20	14	6a	8			MN				3	
			6.0	7.5		2	3	5		5	4	26	18	8	45	19	64	27	13	4a				MN		--		5	
24	B-025	Sta 94+46.63 1.25 RT	0.3	1.5	1.5	7	6	13	B	19		NP		NP	44		44	14	11	4a	2								
		Thornwood Dr.	1.5	3.0		3	5	8		11								13	10	4a	5								
			3.0	4.5		7	14	21		30		27	16	11	38	31	69	14	14	6a	7								
			4.5	6.0		27	31	58		83	11							15	14	6a	8								
25	B-026	Sta 98+20.34 11.12 RT	1.0	2.5		9	6	15	A	15		NP		NP	22		22	7	6	1b	0								
		Thornwood Dr.	2.5	4.0		6	5	11		11		30	16	14	46	35	81	20	14	6a	10			MN		12		1	
			4.0	5.5		6	6	12		12								18	14	6a	8			MN				1	

Licking County, Thornwood Drive, PID 78116						Standard Penetration						Physical Characteristics						Moisture		Classification		Comments	Problem		Treatments				Analysis
#	B #	Boring Location	Depth	To	Cut Fill	n_2	n_3	N_m	Rig	N_{60}	N_L	LL	PL	PI	% Silt	% Clay	P 200	M	M_{OPT}	Class	GI		w/ Class	w/ MN	LS	CS	UC Class	UC MN	
			5.5	7.0		8	6	14		14	11	28	16	12				14	14	6a									
26	B-027	Sta 101+46.62 2.21 LT	0.3	1.5	2.8	9	9	18	B	26		27	17	10	31	19	50	13	12	4a	3								
		Thornwood Dr.	1.5	3.0		3	4	7		10								17	10	4a	5			MN				1	
			3.0	4.5		6	6	12		17		42	19	23	49	47	96	28	18	7-6	14			M				1	
			4.5	6.0		9	13	22		32	10							28	18	7-6	14			M				1	
27	B-028	Sta 103+28.06 8.42 RT	1.0	2.5	1.1	6	7	13	A	13								13	14	6a	8								
		Thornwood Dr.	2.5	4.0		4	3	7		7		27	16	11	43	25	68	18	14	6a	7			MN		16		3	
			4.0	5.5		2	4	6		6								25	14	6a	8			MN				3	
			5.5	7.0		5	7	12		12	6	45	23	22	55	36	91	24	20	7-6				MN	12			1	
28	B-029	Sta 107+46.59 2.22 LT	0.3	1.5	2.1	2	4	6	B	9		22	14	8	30	12	42	14	10	4a	1	Slightly organic		MN		14		2	
		Thornwood Dr.	1.5	3.0		3	4	7		10		48	25	23	58	31	89	35	22	7-6	15	1.5'-3.0'		MN	12			1	
			3.0	4.5		4	5	9		13								16	14	6a	8								
			4.5	6.0		14	20	34		49	9	31	18	13	36	37	73	20	14	6a	9			M				1	
29	B-030	Sta 15+08.01 7.33 RT	0.7	2.5		9	4	13	A	13		30	20	10	66	30	96	24	15	4b	8		4b	MN		12	3	1	
		Lees Road	2.5	4.0		2	4	6		6		35	17	18	52	33	85	27	16	6b	11			MN		16		3	
			4.0	5.5		4	7	11		11		29	16	13	40	31	71	15	14	6a	8								
			5.5	7.0		8	10	18		18	6							13	14	6a									
30	B-031	Sta 19+08.63 12.02 RT	0.5	1.5		5	4	9	A	9		NP		NP	18		18	9	6	1b	0			N		14		1	
		Lees Road	1.5	3.0		4	4	8		8		30	17	13	38	30	68	20	14	6a	8			MN		14		2	
			3.0	4.5		2	3	5		5								19	14	6a	8			MN				5	
			4.5	6.0		2	3	5		5	5							20	14	6a	8			MN				5	
31	B-032	Sta 111+47.00 4.95 RT	0.9	2.5		6	7	13	A	13		27	15	12	37	28	65	16	14	6a	7								
		Thornwood Dr.	2.5	4.0		4	4	8		8								20	14	6a	8			MN				2	
			4.0	5.5		3	5	8		8		29	17	12	40	31	71	19	14	6a	8			MN		14		2	
			5.5	7.0		7	9	16		16	8							19	14	6a									
32	B-033	Sta 114+46.41 15.42 LT	0.3	1.5	1.5	4	4	8	B	11		25	19	6	30	8	38	12	14	4a	1	Slightly organic							
		Thornwood Dr.	1.5	3.0		4	2	6		9								18	16	6b	10	2.0'-4.5'		N				1	
			3.0	4.5		2	5	7		10		39	22	17	59	27	86	25	17	6b	11			MN		12		1	
			4.5	6.0		5	9	14		20	9							26	16	6b	10			M				1	
33	B-034	Sta 116+52.00 10.31 LT	0.8	2.5		6	7	13	A	13		NP		NP	12	4	16	6	6	1b	0								
		Thornwood Dr.	2.5	4.0		14	21	35		36								10	6	1b	0								
			4.0	5.5		18	9	27		28		NP		NP	5		5	10	6	1a	0								
			5.5	7.0		4	3	7		7	7							12	6	1a				MN				3	
34	B-035	Sta 120+46.83 17.52 LT	0.2	1.5	1.6	7	5	12	A	12		NP		NP	11		11	7	6	1a	0								
		Thornwood Dr.	1.5	3.0		2	3	5		5		24	17	7	28	11	39	12	12	4a	1			N		--		5	
			3.0	4.5		2	2	4		4		29	18	11	58	32	90	24	14	6a	8			MN		--		5	
			4.5	6.0		3	3	6		6	4							26	14	6a	8			MN				3	
35	B-036	Sta 124+47.01 7.43 LT	1.0	2.5		4	6	10	A	10		23	17	6	53	17	70	18	12	4b	7		4b	MN		12	3	1	
		Thornwood Dr.	2.5	4.0		4	5	9		9									10	4b			4b	N			3	1	
			4.0	5.5		5	7	12		12		22	17	5	40	15	55	13	12	4a	4								
			5.5	7.0		5	4	9		9	9							15	10	4a				MN				2	
36	B-037	Sta 128+16.95 17.99 LT	1.0	2.5	1.6	5	4	9	A	9		NP		NP	48	14	62	18	11	4a	5			MN		14		2	
		Thornwood Dr.	2.5	4.0		2	2	4		4								24	10	4a	5			MN				5	
			4.0	5.5		3	6	9		9		NP		NP	15	6	21	9	6	1b	0			N		14		1	
			5.5	7.0		6	8	14		14	4							9	6	1b									
37	B-038	Sta 132+46.76 5.95 LT	0.9	2.5		6	11	17	A	17		NP		NP	15	4	19	8	6	1b	0								
		Thornwood Dr.	2.5	4.0		6	5	11		11								8	6	1b	0								
			4.0	5.5		5	5	10		10		25	16	9	22	13	35	14	10	2-4	0			MN		12		1	
			5.5	6.0		4	4	8		8	8							12	10	2-4				N				2	
38	B-039	Sta 136+46.75 11.40 LT	0.3	1.5	1.5	4	4	8	A	8		NP		NP	50	6	56	14	11	4b	4		4b	N		14	3	2	
		Thornwood Dr.	1.5	3.0		4	5	9		9								12	10	4b			4b	N			3	1	
			3.0	4.5		4	4	8		8								12	16	6b	10			N				2	
			4.5	6.0		3	3	6		6	6	38	19	19	52	41	93	27	16	6b	12			MN		16		3	
39	B-040	Sta 140+46.37 10.82 LT	0.9	2.5		8	5	13	A	13		23	18	5	32	16	48	11	13	4a	3								
		Thornwood Dr.	2.5	4.0		7	6	13		13								10	16	6b	10								

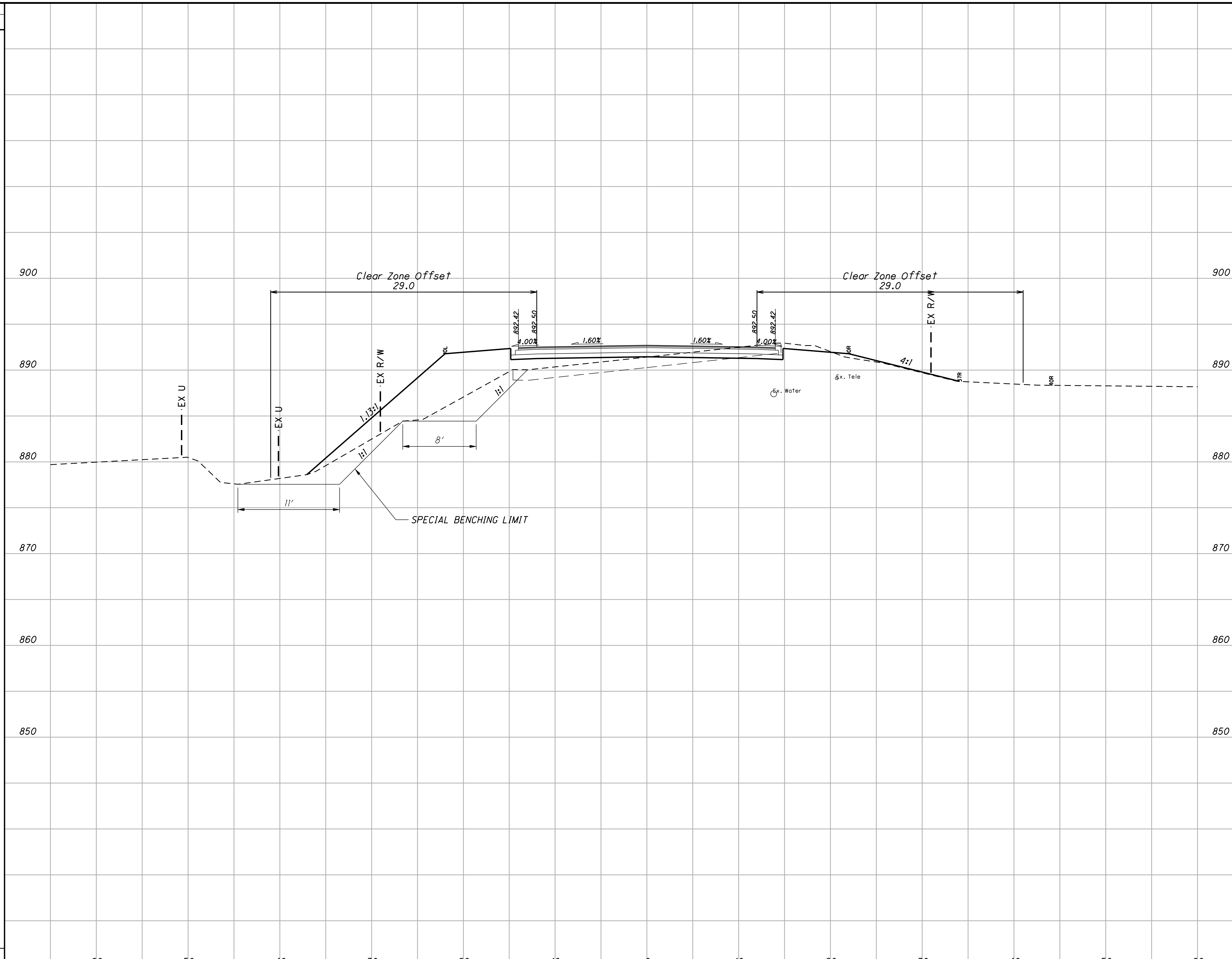
Licking County, Thornwood Drive, PID 78116						Standard Penetration						Physical Characteristics						Moisture		Classification		Comments	Problem		Treatments				Analysis
#	B #	Boring Location	Depth	To	Cut Fill	n_2	n_3	N_m	Rig	N_{60}	N_L	LL	PL	PI	% Silt	% Clay	P 200	M	M_{OPT}	Class	GI		w/ Class	w/ MN	LS	CS	UC Class	UC MN	
			4.0	5.5		3	5	8		8		39	21	18				27	16	6b	10			MN		14		2	
			5.5	7.0		3	6	9		9	8							24	16	6b				MN				2	
40	B-042-1	Sta 148+50.28 16.17 RT	0.3	2.5	7.3	5	6	11	B	16										14	6a	8							
		Thornwood Dr.	3.5	5.0		3	3	6		9		34	19	15	35	32	67	26	14	6a	8			MN		14		2	
			6.0	7.5		1	3	4		6									8	3a				N				3	
											6																		
41	B-043	Sta 152+48.20 18.21 LT	1.0	2.5	4.3	7	6	13	A	13		NP		NP	47		47	12	11	4a	2								
		Thornwood Dr.	2.5	4.0		5	6	11		11		30	19	11	54	27	81	24	14	6a	8			MN		12		1	
			4.0	5.5		5	7	12		12								33	14	6a	8			MN				1	
			5.5	7.0		4	5	9		9	9							29	14	6a				MN				2	
42	B-044	Sta 156+47.56 5.74 LT	1.0	2.5		9	8	17	A	17		21	19	2	20	6	26	10	10	2-4	0								
		Thornwood Dr.	2.5	4.0		3	3	6		6		31	20	11	54	26	80	26	15	6a	8			MN		16		3	
			4.0	5.5		4	5	9		9								25	14	6a	8			MN				2	
			5.5	7.0		3	3	6		6	6							19	14	6a				MN				3	
43	B-045	Sta 160+47.56 5.23 LT	1.0	2.5		20	9	29	A	30		NP		NP	25		25	8	6	1b	0								
		Thornwood Dr.	2.5	4.0		5	9	14		14								11	6	1b	0			MN				1	
			4.0	5.5		5	4	9		9								11	6	1b	0			MN				2	
			5.5	7.0		3	3	6		6	6	NP		NP	13		13	17	6	1a				MN		16		3	
44	B-046	Sta 164+40.47 10.76 LT	1.0	2.5		6	4	10	A	10		28	21	7	56	23	79	23	16	4b	8		4b	MN		12	3	1	
		Thornwood Dr.	2.5	4.0		3	6	9		9								25	10	4b			4b	MN			3	2	
			4.0	5.5		4	8	12		12		37	18	19	54	40	94	23	16	6b	12			MN		12		1	
			5.5	7.0		8	9	17		17	9							26	16	6b				M				1	
45	B-047	Sta 168+47.01 4.23 LT	0.8	2.5		11	8	19	C	20		NP		NP	21		21	9	6	1b	0								
		Thornwood Dr.	2.5	4.0		3	4	7		7		29	18	11	49	22	71	21	14	6a	8			MN		16		3	
			4.0	5.5		2	3	5		5		26	15	11	37	30	67	18	14	6a	7			MN		--		5	
			5.5	7.0		5	6	11		11	5								14	6a									
46	B-048	Sta 172+47.18 4.78 LT	0.8	2.5		6	5	11	B	16		NP		NP	21		21	8	6	1b	0								
		Thornwood Dr.	2.5	4.0		7	9	16		23		32	16	16	35	36	71	19	16	6b	10								
			4.0	5.5		5	7	12		17								19	16	6b	10								
			5.5	7.0		8	9	17		24	16							13	16	6b									
47	B-049	Sta 176+47.14 11.12 LT	0.8	2.5	2.7	3	4	7	C	7		34	17	17	37	37	74	18	16	6b	11			N		16		2	
		Thornwood Dr.	2.5	4.0		5	7	12		12								16	14	6a	8								
			4.0	5.1		11	10	21		22									14	6a	8								
			5.1	5.5		11	10	21		22	7	24	16	8				14	11	4a									
48	B-050	Sta 180+47.05 7.98 LT	0.7	2.5	12.3	10	5	15	B	22		22	15	7	38	21	59	12	10	4a	5								
		Thornwood Dr.	2.5	4.0		4	4	8		11		31	15	16	26	29	55	20	16	6b	6			MN		12		1	
			4.0	5.5		9	27	36		52		23	16	7	40	21	61	15	11	4a	5								
			5.5	7.0		4	3	7		10	10							13	10	4a									
49	B-051	Sta 14+99.65 6.92 RT	0.9	3.0		4	5	9	C	9		25	17	8	39	25	64	14	12	4a	6			N		14		1	
		James/Main St	3.0	4.5		5	7	12		12					73		73	26	10	4a	5			MN				1	
			4.5	6.0		4	7	11		11		24	16	8	36	24	60	15	11	4a	5			MN		12		1	
			6.0	7.5		5	7	12		12	9								10	4a									
50	B-052	Sta 18+99.73 13.31 RT	1.1	3.0	8.6	4	6	10	C	10		27	17	10	37	34	71	15	12	4a	7								
		James/Main St	3.0	4.5		9	12	21		22		26	17	9	37	32	69	13	12	4a	7								
			4.5	6.0		16	17	33		34								11	10	4a	5								
			6.0	7.5		16	14	30		31	10								10	4a									
51	B-053	Sta 20+99.44 13.31 LT	1.1	3.0		9	6	15	C	16					47		47	11	10	4a	5								
		James/Main St	3.0	4.5		1	1	2		2		40	16	24	64	24	88	24	16	6b	14			MN	--			5	
			4.5	6.0		3	4	7		7		21	20	1				24	15	4a	5			MN		16		3	
			6.0	7.5		3	8	11		11	2	34	19	15	64	31	95	25	14	6a				MN		12		1	
52	B-054	Sta 24+99.41 7.78 LT	1.3	3.0	4.5	9	10	19	C	20		NP		NP	23		23	12	6	1b	0			M				1	
		James/Main St	3.0	4.5		22	23	45		47		NP		NP	26		26	11	10	2-4	0								
			4.5	5.0		50		50		52									10	2-4	0								
			6.0	6.5		50		50		52	20								10	2-4									
53	B-055	Sta 184+52.92 12.44 LT	1.0	3.0		12	11	23	C	24		NP		NP	18		18	5	6	1b	0								

Licking County, Thornwood Drive, PID 78116						Standard Penetration						Physical Characteristics						Moisture		Classification		Comments	Problem		Treatments				Analysis
#	B #	Boring Location	Depth	To	Cut Fill	n_2	n_3	N_m	Rig	N_{60}	N_L	LL	PL	PI	% Silt	% Clay	P 200	M	M_{OPT}	Class	GI		w/ Class	w/ MN	LS	CS	UC Class	UC MN	
		Thornwood Dr.	3.0	4.5		8	6	14		14		NP		NP	25		25	14	6	1b	0			MN		12		1	
			4.5	6.0		4	6	10		10									6	1b	0								
			6.0	7.5		3	4	7		7	7								6	1b				N				2	
54	B-056	Sta 188+42.85 11.11 LT	0.9	3.0		10	9	19	C	20		NP		NP	13		13	12	10	2-4	0								
		Thornwood Dr.	3.0	4.5		7	11	18		19		NP		NP	10		10	12	8	3	0								
			4.5	6.0		13	11	24		25									8	3	0								
			6.0	7.5		10	11	21		22	19								8	3									
55	B-059	Sta 192+47.11 10.11 LT	1.2	3.0	4.0	9	12	21	C	22									6	1b	0								
		Thornwood Dr.	3.0	4.5		9	8	17		18		NP		NP	18		18	11	6	1b	0								
			4.5	6.0		10	14	24		25									6	1b	0								
			6.0	7.5		17	8	25		26	18								6	1b									
56	B-061	Sta 196+33.09 10.96 LT	0.8	3.0		4	5	9	C	9		30	14	16	36	36	72	18	14	6a	10			MN		14		2	
		Thornwood Dr.	3.0	4.5		16	14	30		31		NP		NP	22		22	12	6	1b	0			M				1	
			4.5	6.0		10	8	18		19									6	1b	0								
			6.0	7.5		3	6	9		9	9								6	1b				N				1	
57	B-063	Sta 200+47.52 5.68 LT	0.8	3.0		8	8	16	C	17		NP		NP	15		15	10	6	1a	0								
		Thornwood Dr.	3.0	4.5		11	11	22		23									6	1a	0								
			4.5	6.0		21	12	33		34		NP		NP	22	12	34	18	8	3a	0			M				1	
			6.0	7.5		9	10	19		20	17								10	2-4									
58	B-066	Sta 22+99.97 5.25 LT	0.8	3.0		3	3	6	C	6		NP		NP	25	9	34	6	10	2-4	0			N		16		3	
		Reddington Rd	3.0	4.5		2	3	5		5		37	17	20	56	39	95		16	6b	12			N	--			5	
		Connector	4.5	6.0		5	4	9		9									16	6b	10			N				1	
			6.0	7.5		5	6	11		11	5							19	16	6b									
59	B-067	Sta 19+99.45 6.27 LT	1.2	3.0		2	1	3	C	3		30	20	10	50	23	73	24	15	4b	8		4b	MN		--	3	5	
		Reddington Rd	3.0	4.5		2	3	5		5		32	21	11	64	30	94	27	16	6a	8			MN		--		5	
			4.5	6.0		4	4	8		8									14	6a	8			N				2	
			6.0	7.5		4	3	7		7	3							23	14	6a				MN				3	
60	B-068	Sta 23+00.0	0.8	3.0	7.4	4	3	7	C	7		38	20	18	60	38	98	18	16	6b	11			N		16		2	
		Reddington Rd	3.0	4.5		3	3	6		6		38	20	18	67	32	99	27	16	6b	11			MN		16		3	
			4.5	6.0		1	1	2		2									10	4b			4b	N			3	5	
			6.0	7.5		1	2	3		3	2	30	22	8	76	23	99	29	17	4b			4b	MN		--	3	5	
61	B-069	Sta 27+00.00	0.4	3.0	1.3	8	11	19	C	20		32	18	14	56	30	86	16	14	6a	10								
		Reddington Rd	3.0	4.5		4	4	8		8		24	14	10	36	26	62	14	10	4a	5			MN		14		2	
			4.5	6.0		4	5	9		9								14	10	4a	5			MN				2	
			6.0	7.5		3	2	5		5	5								10	4a				N				5	
62	B-070	Sta 30+00.00	0.5	3.0	4.7	6	6	12	C	12		41	18	23	59	38	97	16	18	7-6	13								
		Reddington Rd	3.0	4.5		7	7	14		14		40	17	23	41	41	82	18	16	6b	13								
			4.5	6.0		9	5	14		14								15	16	6b	10								
			6.0	7.5		4	4	8		8	8								16	6b				N				2	
63	B-071	Sta 32+91.07 7.17 LT	0.8	3.0		6	4	10	C	10		25	17	8	40	21	61	15	12	4a	5								
		Reddington Rd	3.0	4.5		4	4	8		8					30	11	41	12	10	4a	5			N				2	
			4.5	6.0		1	1	2		2		28	18	10	45	22	67	23	13	4a	6			MN		--		5	
			6.0	7.5		1	1	2		2	2								10	4a				N				5	
64									A																				
65									A																				
66									A																				

APPENDIX III

Sidehill Fill Design (GB-2)

SEEDING	
END WIDTH	SQ. YDS.



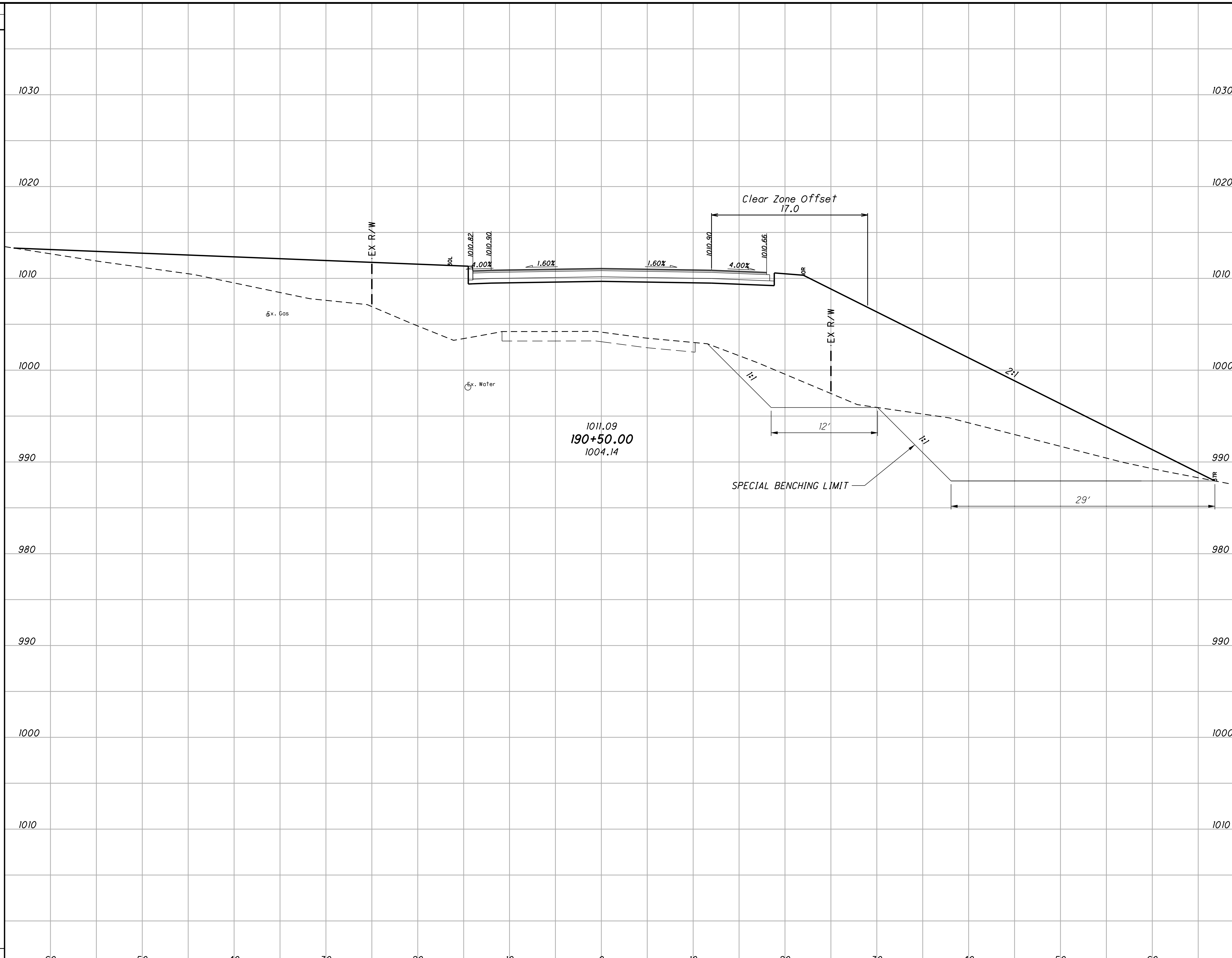
END AREA		VOLUME		CALCULATED	CHECKED
CUT	FILL	CUT	FILL		

CROSS SECTION
STATION 130+50

LIC-THORNWOOD

M:\proj\0821\3004.00\Drawings\Final\78116XS001.dgn 10/12/2009 6:47:12 PM dadams

SEEDING	
END WIDTH	SQ. YDS.



END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED | CHECKED

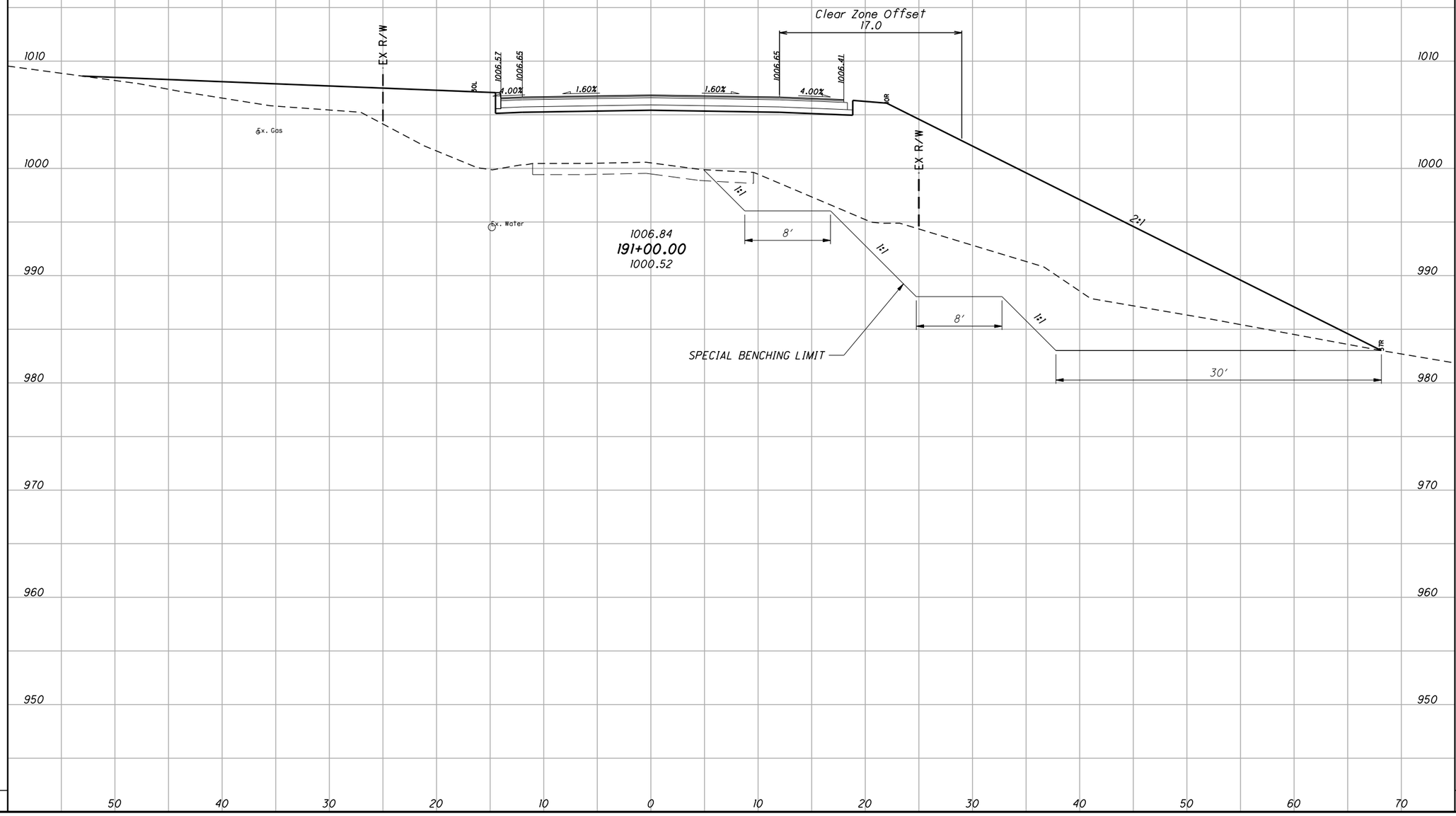
CROSS SECTION STATION 190+50

LIC-THORNWOOD

M:\proj\0821\3004.00\Drawings\Final\78116XS002.dgn 10/13/2009 8:31:58 AM dadams

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME		CALCULATED	CHECKED
CUT	FILL	CUT	FILL		



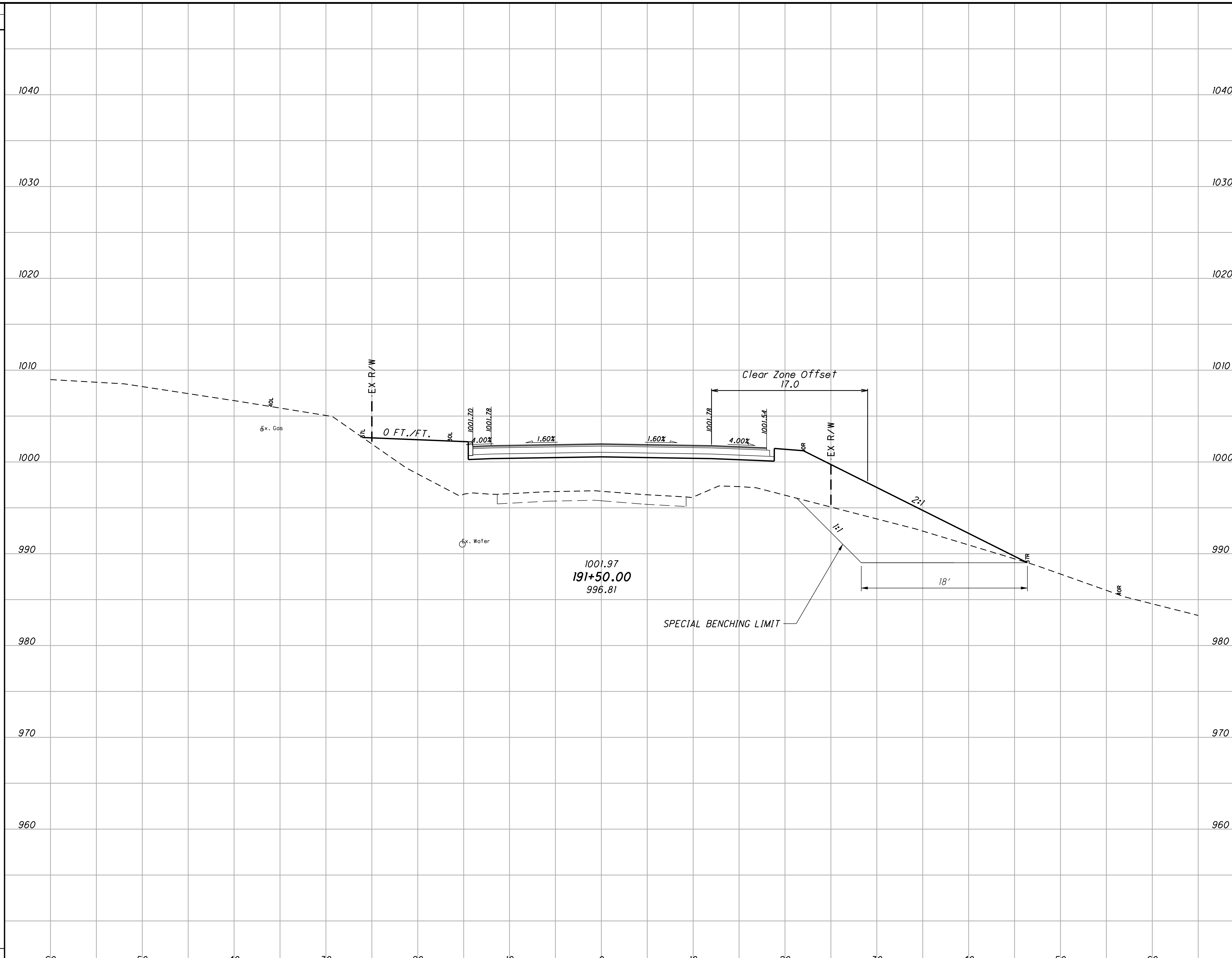
CROSS SECTION STATION 191+00

LIC-THORNWOOD

3
16

M:\pro\0821\3004.00\Drawings\Final\78116XS003.dgn 10/13/2009 8:35:03 AM dadams

SEEDING	
END WIDTH	SQ. YDS.



END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED

CHECKED

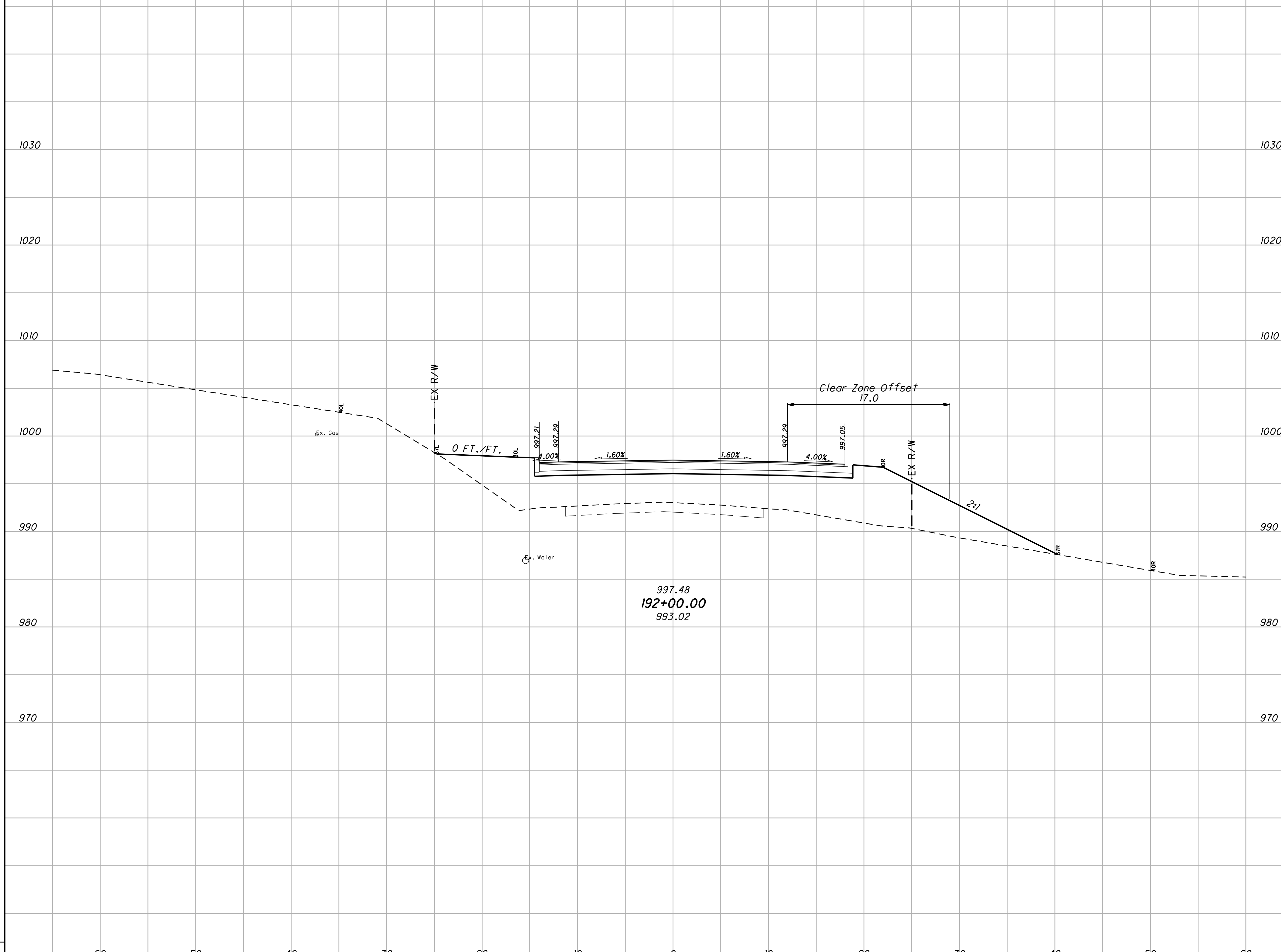
CROSS SECTION STATION 191+50

LIC-THORNWOOD

4
16

M:\proj\0821\3004.00\Drawings\Final\78116XS004.dgn 10/13/2009 8:35:49 AM dadams

SEEDING		END AREA		VOLUME			
END WIDTH	SQ. YDS.	CUT	FILL	CUT	FILL	CALCULATED	CHECKED



CROSS SECTION STATION 192+00

LIC-THORNWOOD

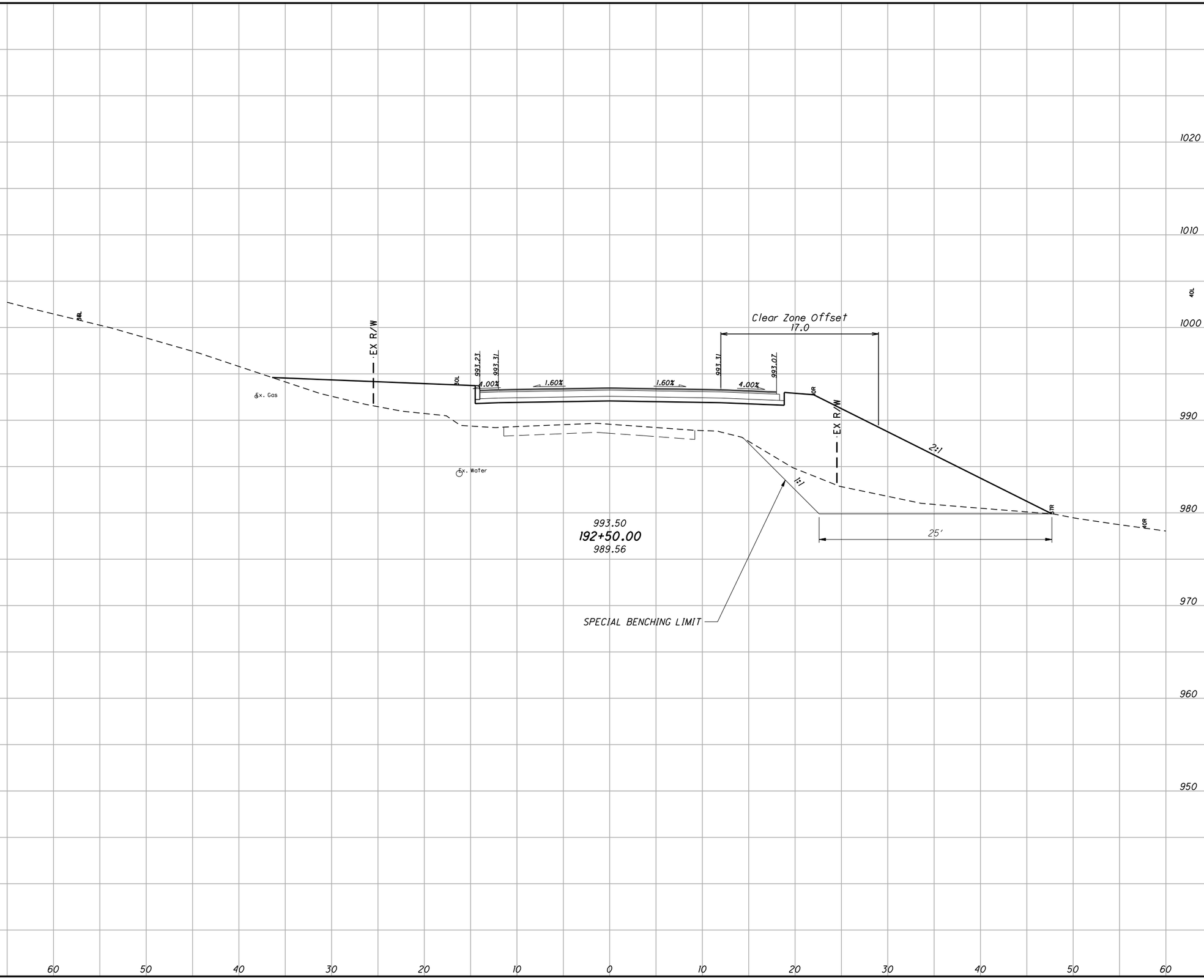
M:\proj\0821\3004.00\Drawings\Final\78116XS005.dgn 10/13/2009 8:36:35 AM dadams

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED

CHECKED

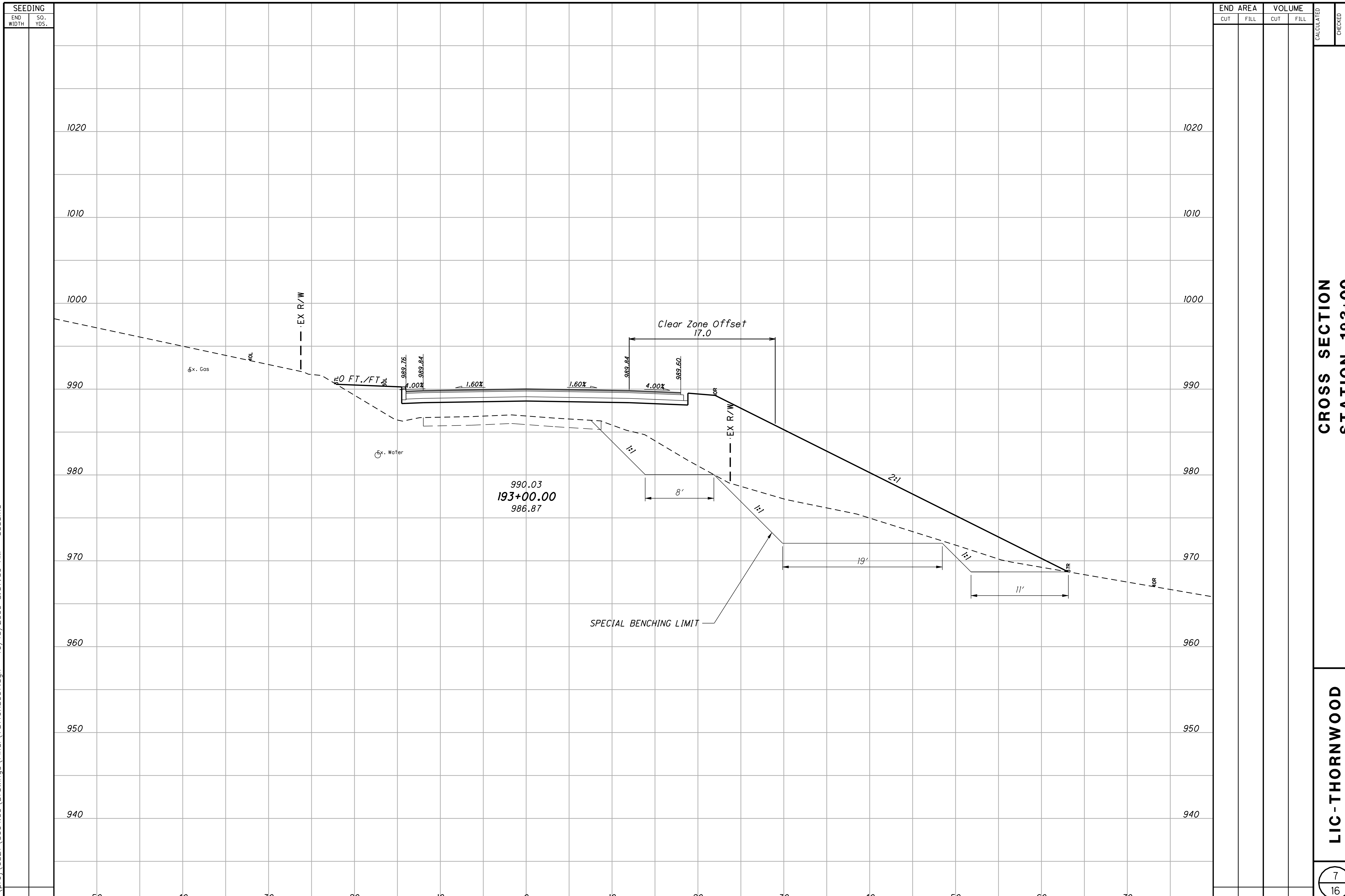


CROSS SECTION
STATION 192+50

LIC-THORNWOOD

6
16

M:\pro\0821\3004.00\Drawings\Final\78116XS006.dgn 10/13/2009 8:37:12 AM dadams



CROSS SECTION
STATION 193+00

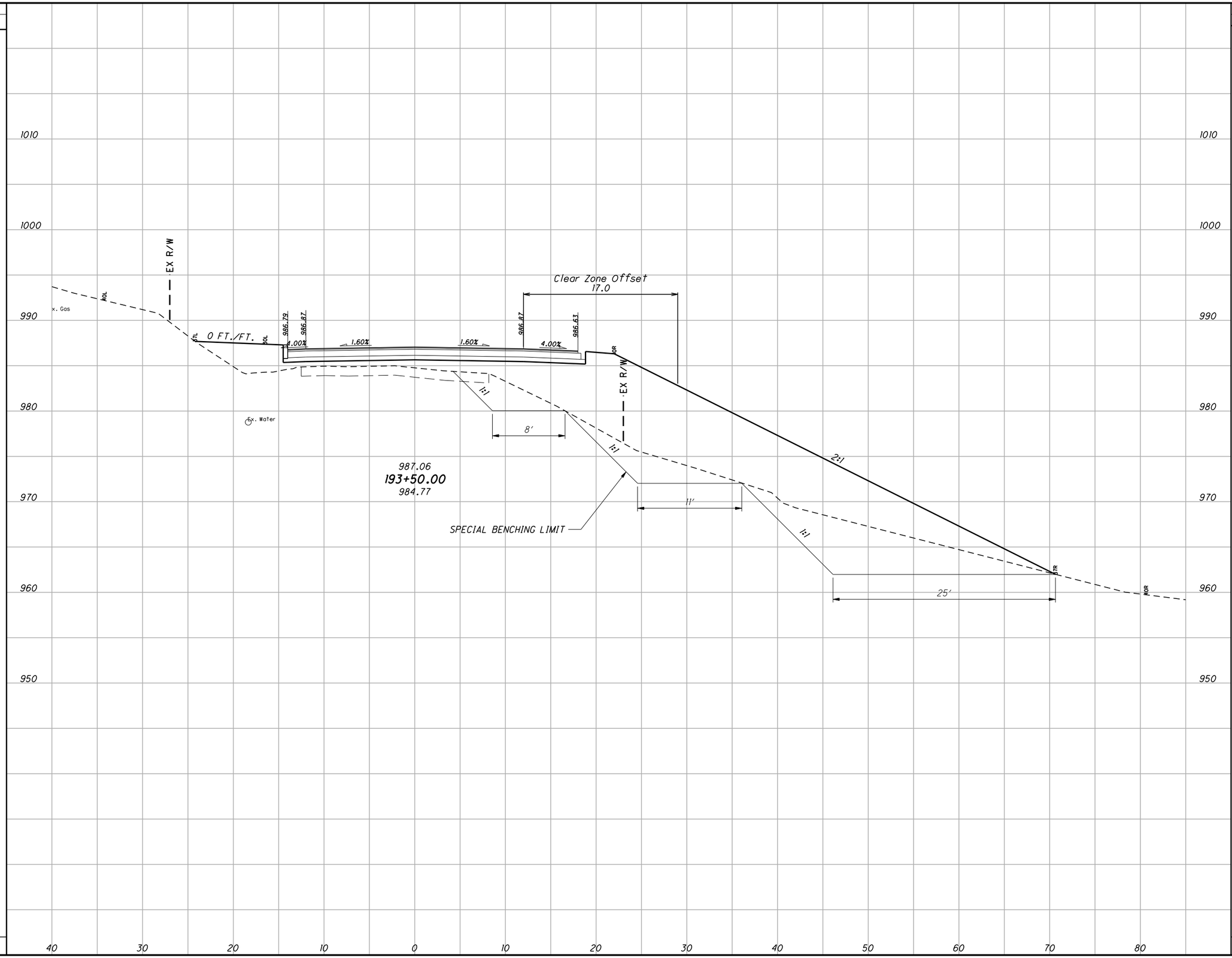
LIC-THORNWOOD

7
16

M:\proj\0821\3004.00\Drawings\Final\78116XS007.dgn 10/13/2009 8:37:59 AM dadams

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME		CALCULATED	CHECKED
CUT	FILL	CUT	FILL		



CROSS SECTION STATION 193+50

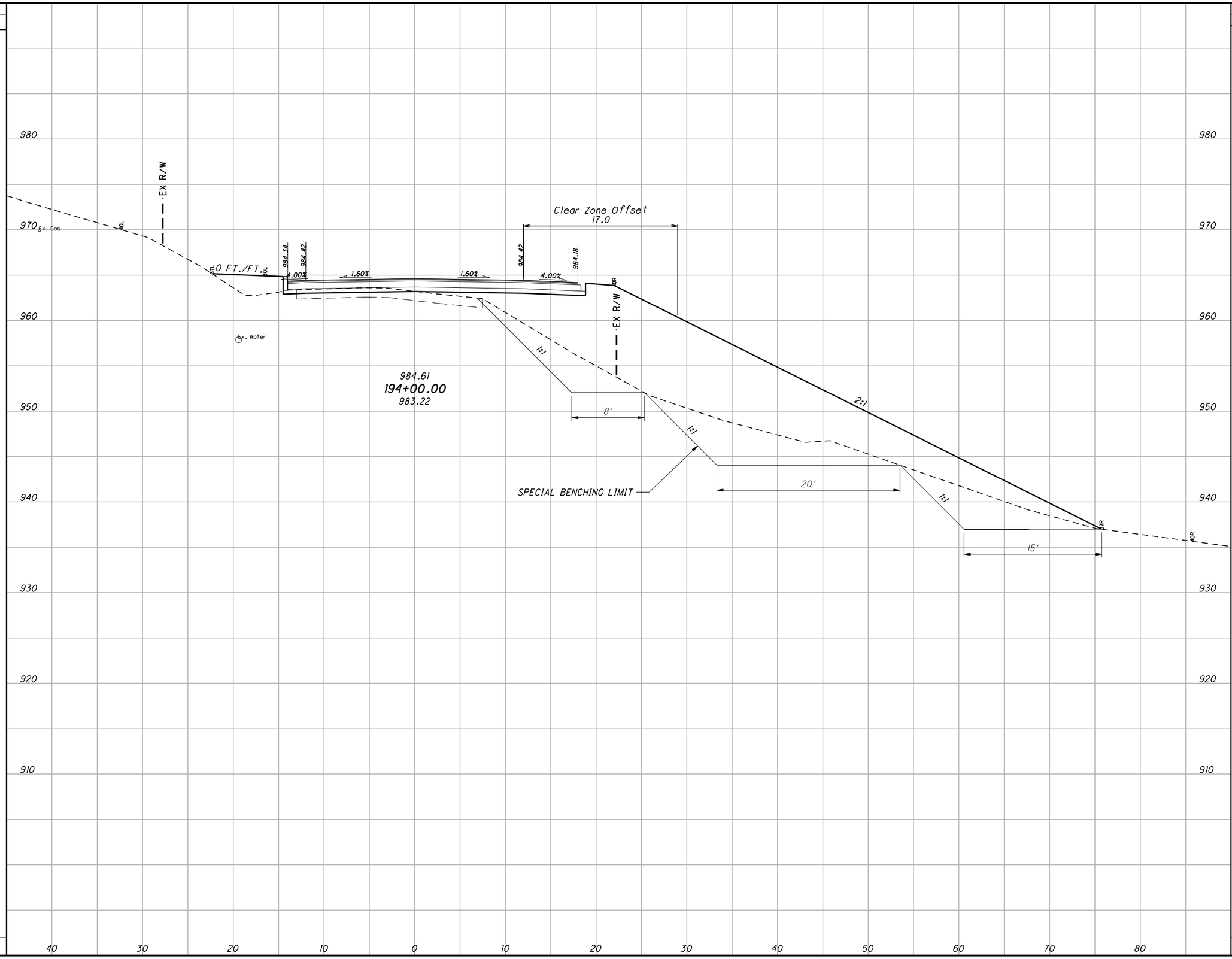
LIC-THORNWOOD

8
16

M:\proj\0821\3004.00\Drawings\Final\78116XS008.dgn 10/13/2009 8:38:51 AM dadams

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME		CALCULATED	CHECKED
CUT	FILL	CUT	FILL		



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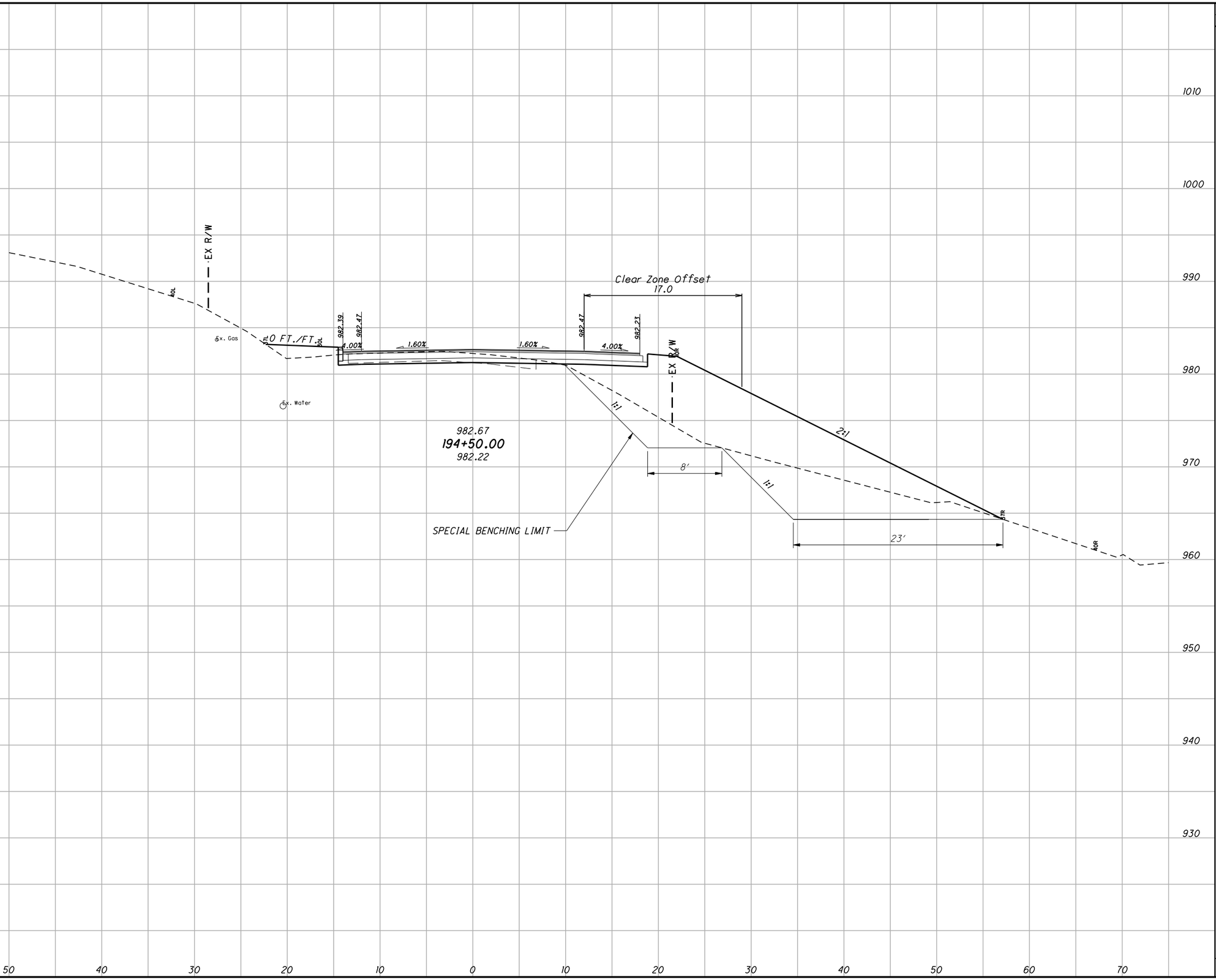
CROSS SECTION STATION 194+00

LIC-THORNWOOD

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME			
CUT	FILL	CUT	FILL	CALCULATED	CHECKED



M:\proj\0821\3004.00\Drawings\Final\78116XS010.dgn 10/13/2009 8:44:47 AM dadams

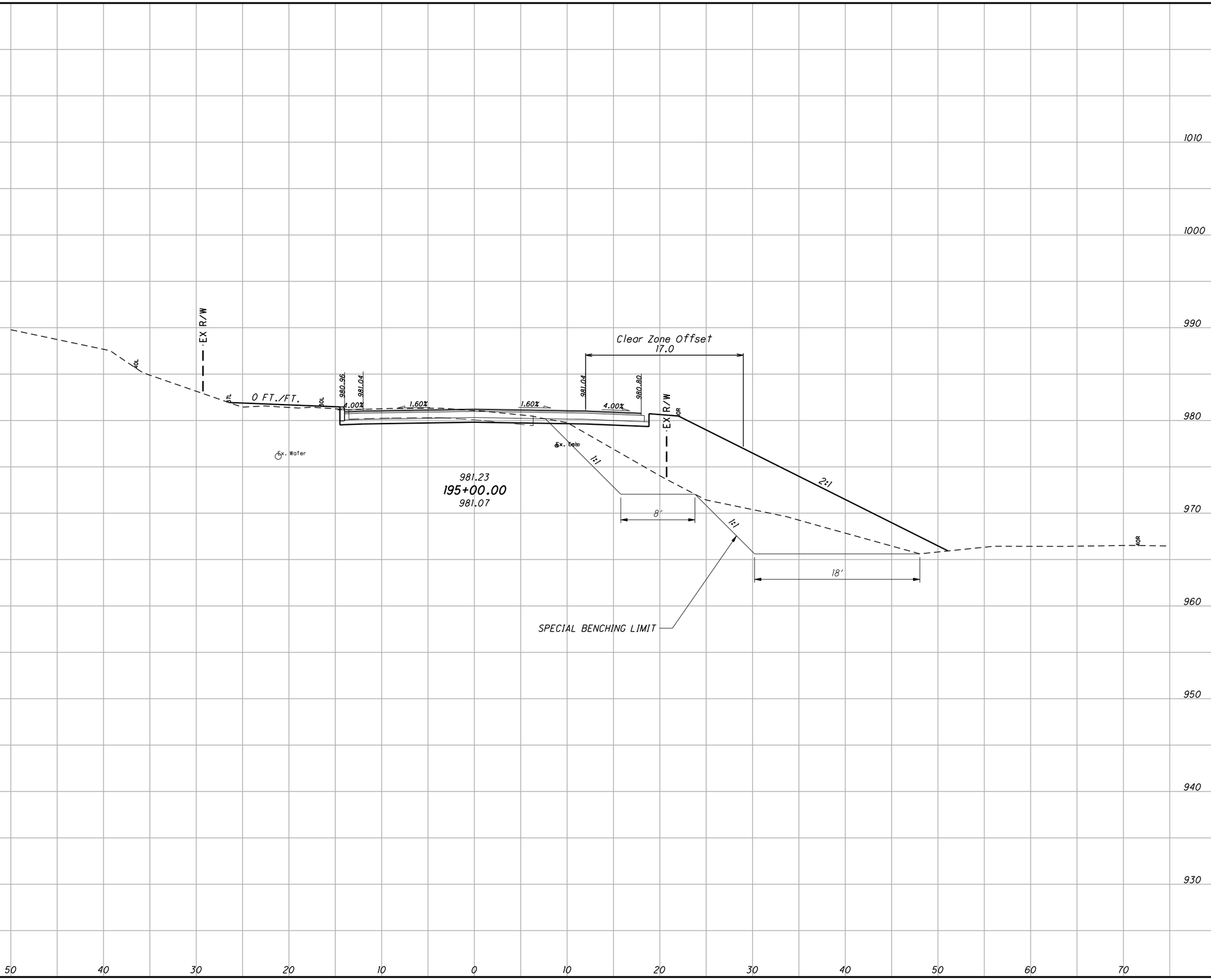
CROSS SECTION
STATION 194+50

LIC-THORNWOOD

10
16

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME		CALCULATED	CHECKED
CUT	FILL	CUT	FILL		



CROSS SECTION STATION 195+00

LIC-THORNWOOD

11
16

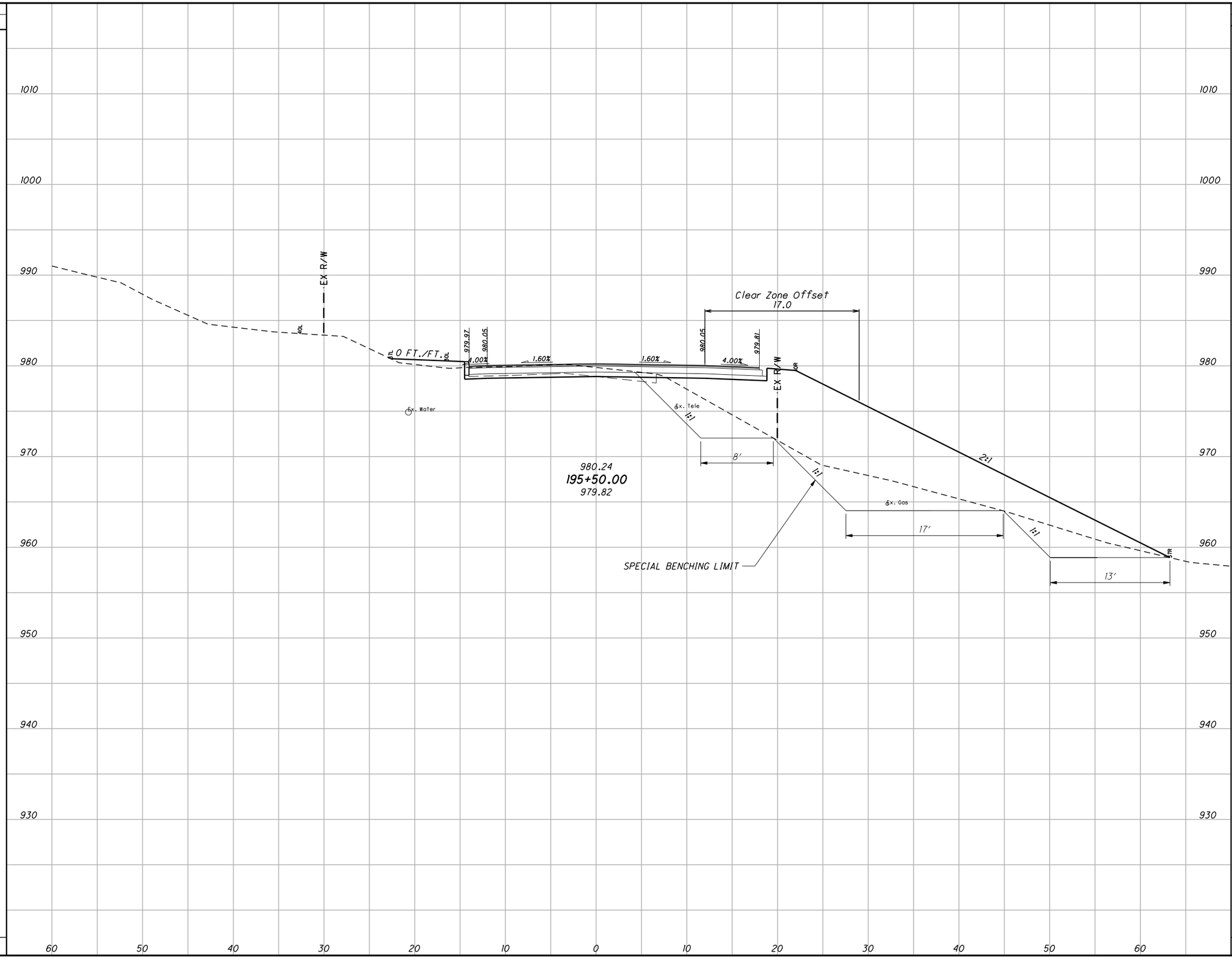
M:\proj\0821\3004.00\Drawings\Final\78116XS011.dgn 10/13/2009 8:46:06 AM dadams

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED

CHECKED



M:\pro\0821\3004.00\Drawings\Final\78116XS012.dgn 10/13/2009 8:46:44 AM dadams

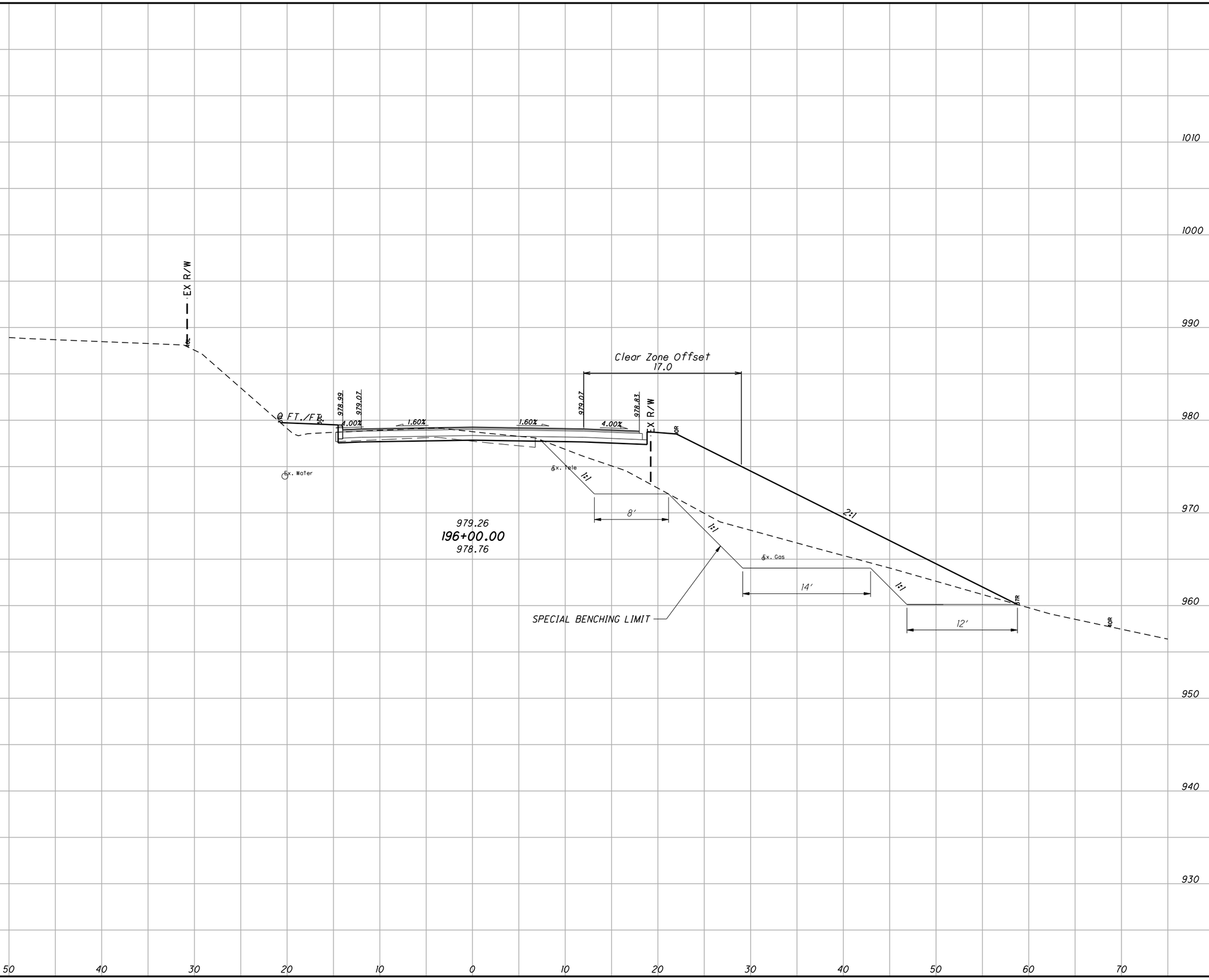
CROSS SECTION STATION 195+50

LIC-THORNWOOD

12
16

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME		CALCULATED	CHECKED
CUT	FILL	CUT	FILL		



CROSS SECTION STATION 196+00

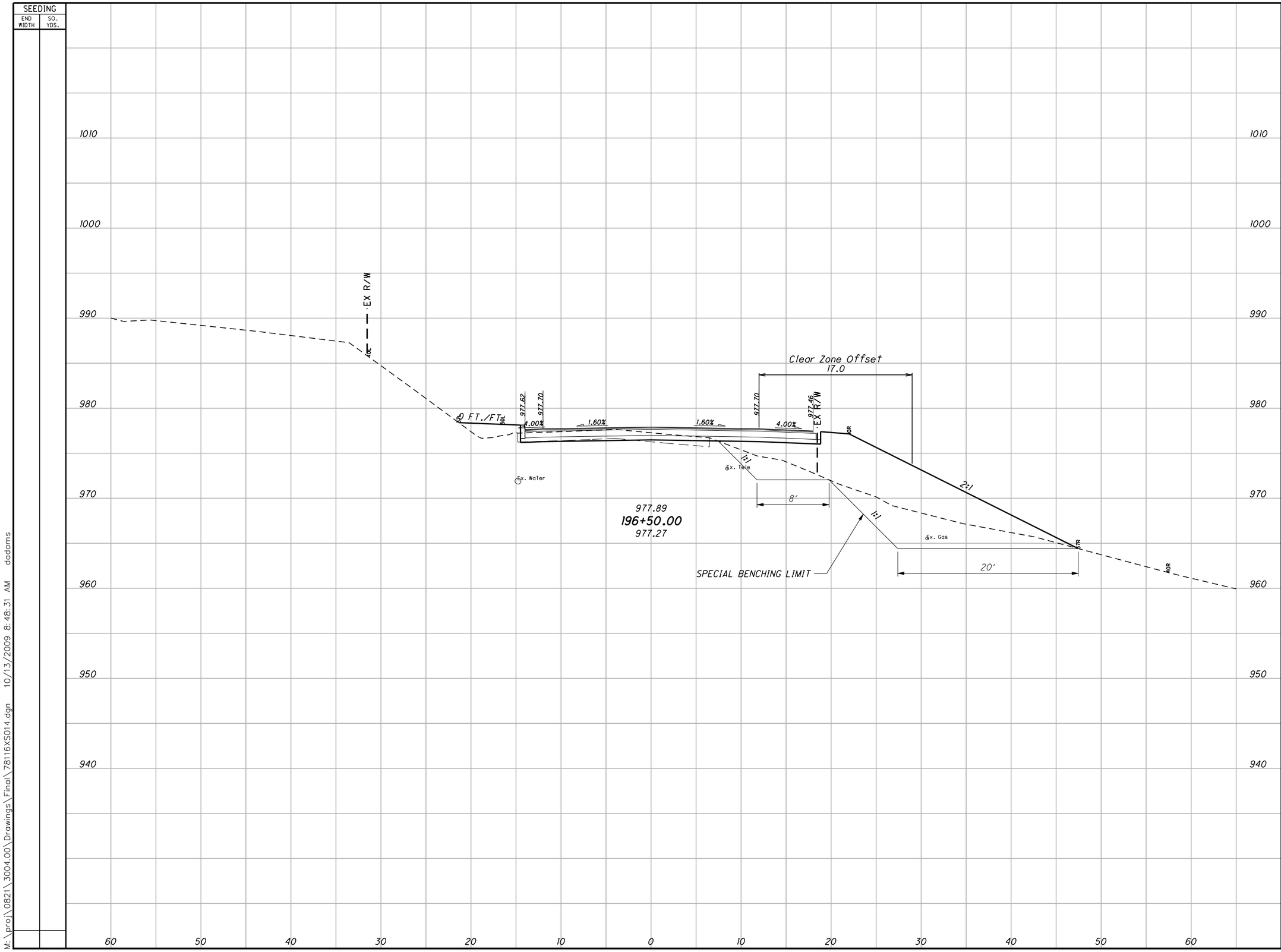
LIC-THORNWOOD

13
16

M:\proj\0821\3004.00\Drawings\Final\78116XS013.dgn 10/13/2009 8:47:31 AM dadams

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME		CALCULATED	CHECKED
CUT	FILL	CUT	FILL		



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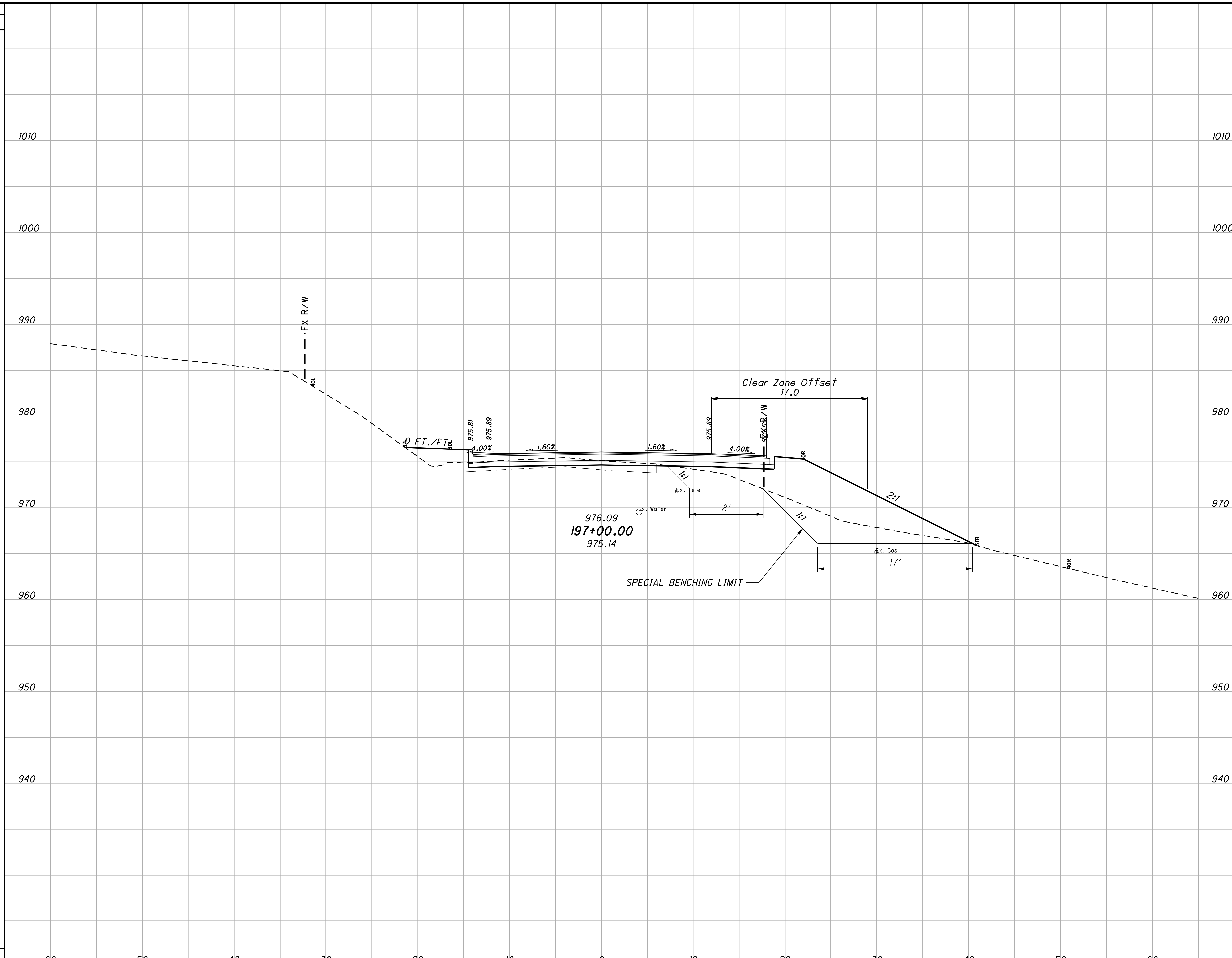
CROSS SECTION
STATION 196+50

LIC-THORNWOOD

14
16

SEEDING	
END WIDTH	SQ. YDS.



END AREA		VOLUME		CALCULATED	CHECKED
CUT	FILL	CUT	FILL		

CROSS SECTION STATION 197+00

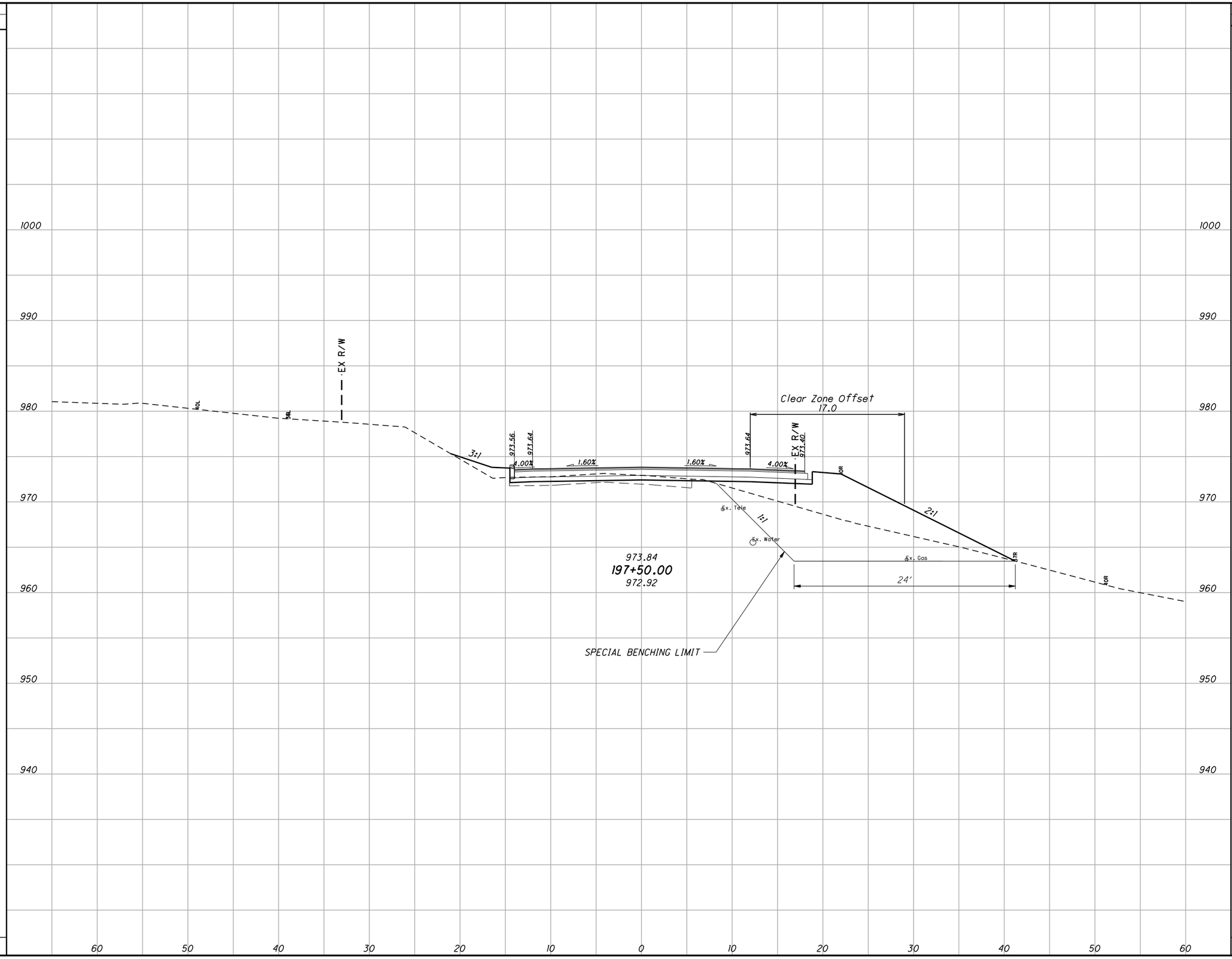
LIC-THORNWOOD

15/16

M:\proj\0821\3004.00\Drawings\Final\78116XS015.dgn 10/13/2009 9:08:11 AM dadams

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME		CALCULATED	CHECKED
CUT	FILL	CUT	FILL		



CROSS SECTION STATION 197+50

LIC-THORNWOOD

16
16

M:\proj\0821\3004.00\Drawings\Final\78116XS016.dgn 10/13/2009 9:08:50 AM dadams