REPORT

OF

SUBSURFACE EXPLORATION

FOR

BIXBY ROAD, EAST ALTERNATIVE A

FRANKLIN COUNTY PID NO. 82404

For:

Franklin County Engineer
970 Dublin Road
Columbus, Ohio 43215-1169

By:

6121 Huntley Road
Columbus, Ohio 43229

DLZ Job No. 1121-1010.00

February 16, 2011

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APPENDIX

REPORT
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FOR
BIXBY ROAD, EAST ALTERNATIVE A
FRANKLIN COUNTY PID NO. 82404

1.0 INTRODUCTION

This report presents the findings of a subsurface exploration performed for the proposed roadway realignment and improvements referred to as the Bixby Road "East Alternative A", Franklin County PID No. 82404. "East Alternative A" includes the realignment of Bixby Road and Brice Road at Winchester Pike to create a new four legged intersection. This design will eliminate the existing skewed and offset intersections that currently exist at the site. The purpose of this subsurface exploration was to provide conclusions and recommendations regarding soil related design and construction considerations, pavement and subgrade recommendations, and earthwork operations. These recommendations will include CBR values for the pavement design, compaction requirements for site fill, construction backfill, and fill used to support pavements.

The geotechnical engineer has planned and supervised the performance of the geotechnical engineering services, has considered the findings, and has presented 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.

2.0 FIELD EXPLORATION

The field exploration consisted of drilling eleven borings (B-1 through B-11). In addition, nine pavement cores (C-1 through C-9) were also taken to assess existing pavement thicknesses. Borings in existing roadways were drilled using a truck-mounted, rotary drilling rig. Off road borings were drilled using an ATV-mounted rotary drilling rig. The borings were advanced using a 3-inch OD flight auger with samples collected using a 2-inch OD split spoon sampler. Pavement cores were collected using an electric diamond tipped core drill.

The soil borings and pavement cores were drilled on October 31, 2011 and January 5, 2012. All soil borings were advanced to depths of between 10 and 10.5 feet with the exception of boring B-4, which was drilled to a depth of 15.5 feet. The borings were backfilled and patched upon completion. Information concerning the drilling procedures and logs of the borings are presented in the Appendix.

The boring locations were marked in the field by a representative of DLZ Ohio, Inc. A Boring Location Plan is presented in the Appendix.

3.0 FINDINGS

3.1 Generalized Geology

The site has been glaciated by both the Wisconsin and Illinoian Glacial events. The area is reported as consisting primarily of deep glacial till with intermittent sand and gravel outwash seams.

3.2 Subsurface Conditions

This section presents the generalized descriptions of the subsurface conditions encountered by the borings. For more detailed information obtained during the subsurface investigation, please refer to the Boring Location Plan and the boring logs in the Appendix.

Topsoil was present in borings B-1, B-2, B-6, B-8, B-10, and B-11, and varied from 1 to 6 inches in thickness. Three inches of gravel was present at the surface in boring B-9. Fill or possible fill was encountered in four borings. In boring B-1, the fill consisted of stiff sandy silt (A-4a) from a depth of 0.2 to 1.5 feet. In boring B-6 the fill consisted of very stiff silty clay (A-6b) was present from a depth of 0.5 to 1.5 feet then silt and clay (A-6a) fill was encountered to a depth of 4.5 feet. Loose gravel (A-1-a) fill was encountered in boring B-8 to a depth of 1.5 feet. Possible fill consisting of very stiff brown sandy silt (A-4a) was encountered in boring B-9 from a depth of 0.3 to 1.5 feet.

Directly below the surface materials and any fill or possible fill, the natural soils generally consisted of medium stiff to hard sandy silt (A-4a), silty clay (A-6b), silt and clay (A-6a), and clay (A-7-6). Granular soils consisting of gravel (A-1-a), gravel with sand (A-1-b), fine sand (A-3), and coarse and fine sand (A-3a) were typically encountered below 6 feet below ground surface. Soft, wet silt (A-4b) was encountered in boring B-4 between the depths of 4.8 and 6.3 feet. Organic materials were encountered in the upper soils of borings B-2, B-4, and B-8. It should be noted that one sample from boring B-2 (between the depths of 0.3 and 1.5 feet) was classified as organic clay by air dried verses oven dried liquid limit analysis.

It should be expected that variations in conditions may occur between borings. Thickness and sequential relations of soil layers, composition, density, moisture, water seepage and water conditions may vary both in vertical interval and in short lateral distances. Stratification lines as indicated on the boring logs represent approximate depths of changes in texture, color, and moisture; in places the transition may be gradual and not sharply defined by a readily obvious line of demarcation.

3.3 Groundwater Conditions

In general, seepage was first encountered in several of the borings at a depth of approximately 8 feet below ground surface. Three borings had a measurable water level in the borehole at the completion of drilling. These borings were B-4 (at a depth of 13.8 feet), B-5 (at a depth of 6.7 feet), and B-7 (at a depth of 6.5 feet). It should be noted that moist and wet cohesive soils may not produce water over a short period of time. Therefore,

water levels may not be present at the completion of the drilling activities, but when an open excavation is left open for a longer period of time, water seepage may occur.

3.4 Pavement Cores

Nine pavement cores were collected to assess the thickness of pavement at select locations. The locations of the nine pavement cores are presented on the Boring Location Plan. Table 1 details the pavement materials encountered at each boring location.

Table 1. Pavement Materials

Boring	Surface Asphalt (inches)	Brick (inches)	Concrete (inches)	Aggregate (inches)
C-1	16			
C-2	9.5	3.5	6	
C-3	5.5			
C-4	6			6
C-5	9		10	
C-6	9	3.5	6.5	
C-7	2		8.5	
C-8	9			8
C-9	7			8

3.5 Laboratory Testing

In the laboratory, soil samples were examined and visually classified by an engineering geologist. The moisture content, grain size distribution, and Atterberg limits were determined for representative samples obtained from the borings. Laboratory test results are presented in the Appendix and summaries are included on the boring logs.

4.0 ANALYSES AND RECOMMENDATIONS

4.1 General

The subgrade soils encountered in the borings are generally considered acceptable as subgrade materials. However, some of the subgrade soils had moisture contents exceeding their optimum moisture contents and many had N-values below 10, indicating soft or loose materials. Soils containing elevated organic content were encountered in three borings, but only one sample was classified as organic lean clay (A-8b) by laboratory testing. Organic soils should be anticipated in other areas during construction.

The soils encountered near the proposed subgrade levels for the project were analyzed for suitability in accordance with the Ohio Department of Transportation, Office of Geotechnical Engineering document, “Geotechnical Bulletin 1: Plan Subgrades (GB-1),” issued July 15, 2010. The results of these analyses can be found in the Appendix. The near-surface subgrade soils encountered by the borings were generally very similar across the site. Consequently, all of the borings were used to calculate a design CBR of 6.

Generally, subgrade soils with a moisture content exceeding the optimum moisture content of the soil by three or more percentage points, have low N-values, or that were classified as silt are considered to be problematic soils. The results of the borings indicate that most of the subgrade soils exceed the optimum moisture content or have low N-values. The results of the analyses indicated some type of subgrade treatment will likely be needed for all of the new construction and the subgrades below existing roadways.

Once the existing pavements and unsuitable materials are removed to achieve the required subgrade elevation and prior to the placement of ODOT Item 304 aggregate base, the entire subgrade should be proofrolled in accordance with the Ohio Department of Transportation (ODOT) Construction Materials Specifications (CMS) 204.06. A geotechnical engineer or engineering geologist should be present to observe the proofrolling operations and to identify areas of organic or unsuitable soils. If unsuitable or organic soils are observed during proofrolling, the material should be removed and replaced with suitable compacted material. Alternatively, unsuitable soils that are soft and wet may be scarified or disced, dried to within +/- 3% of the optimum moisture content (as required to achieve stability), and recompacted in accordance with ASTM D698.

If the project is to be constructed using the 2010 ODOT Construction and Material Specifications (CMS), the top twelve inches below the subgrade level and 18 inches beyond the edge of the surface of the pavement must be prepared in accordance with ODOT item 204.03. If satisfactory subgrade stability cannot be obtained, areas of unsuitable soils should be undercut to a depth of 18 inches below subgrade elevation and replaced with compacted Type B or Type C granular material (ODOT CMS Item 703.16.C).

Soils classified as silt (A-4b) were identified during the subsurface exploration. Per ODOT CMS 203.03A, silt is not permitted as an embankment material within the top 3 feet below the surface of the subgrade.

All subgrades should be graded to drain to an underdrain, catch basin, pipe, or ditch. The subgrade should then be compacted and proofrolled in accordance with ODOT CMS Item 204.03, “Compaction of Subgrade” and Item 204.06, “Proof Rolling.”

5.0 CLOSING REMARKS

The conclusions and recommendations presented in this report are based on information disclosed by a limited number of borings widely spaced throughout the project area. The boring information must be extrapolated to determine the subsurface conditions occurring along the entire alignment. This extrapolation is based on the knowledge of soil and rock forming geologic processes and on past experience. Therefore, the recommendations presented in this report are based in part on the assumption that certain natural conditions will actually be encountered and not altered during construction. Consequently, it is recommended that construction monitoring and testing be performed to establish that soil conditions at the site are as assumed.

This subsurface investigation was performed based solely upon a geotechnical standpoint. No environmental site assessment or testing was performed as part of the exploration.

We appreciate being given the opportunity to be of service to you on this project. Please do not hesitate to call if we may be of further assistance or you have any questions concerning the exploration or the recommendations presented in this report.

Sincerely,

DLZ OHIO, INC.

Brian E. Mott, P.G.
Sr. Geologist

Timothy A. Hampshire, MSCE, P.E.
Geotechnical Engineering Division Manager

APPENDIX

General Information
Drilling Procedures and Logs of Borings
Legend – Boring Log Terminology
Boring Location Plan
Boring Logs – 11 Borings
Pavement Core Logs – 9 Core Holes
Laboratory Test Results
Ohio Department of Transportation (ODOT) GB-1 Subgrade Analyses Results

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**.

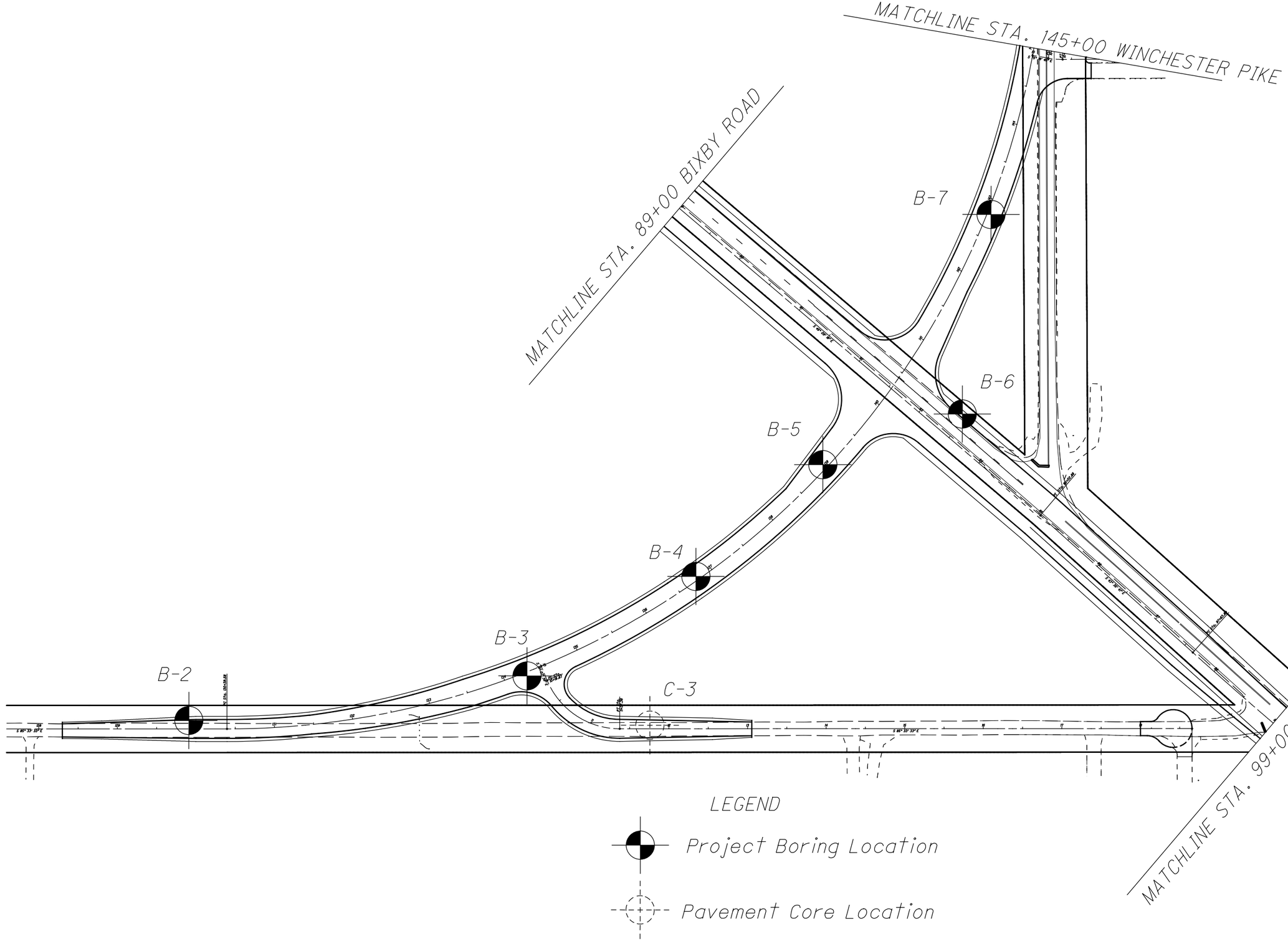
Term	Description
Very Weak	Core can be carved with a knife and scratched by fingernail. Can be excavated readily with a point of a pick. Pieces 1-inch or more in thickness can be broken by finger pressure.
Weak	Core can be grooved or gouged readily by a knife or pick. Can be excavated in small fragments 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.



N

0 30 60 120
HORIZONTAL SCALE IN FEET

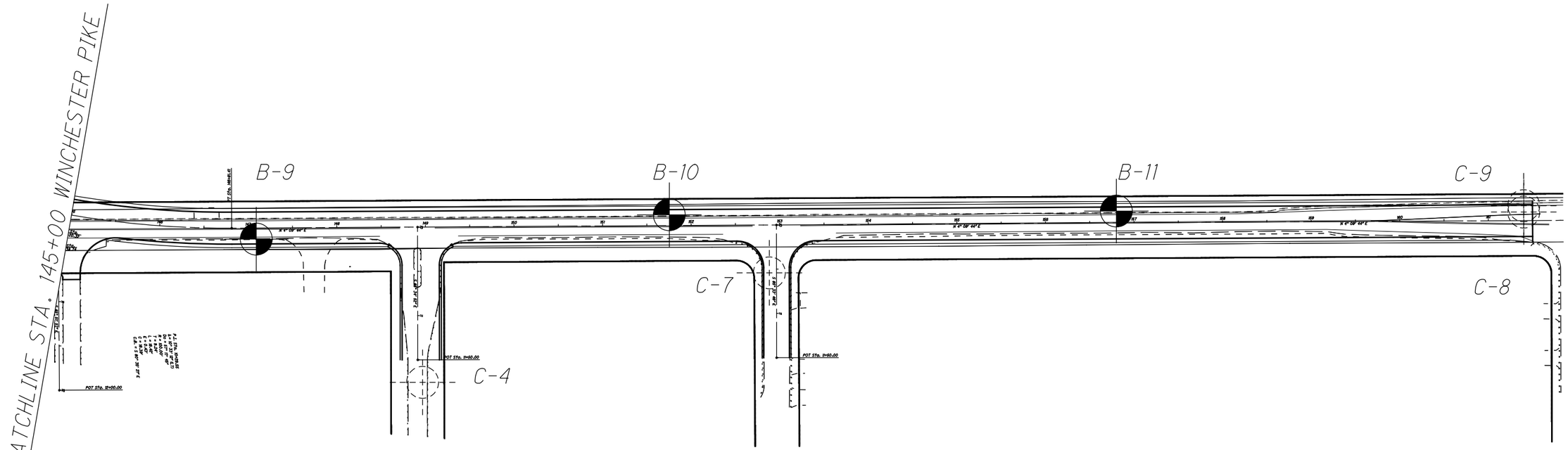
DRAWN BEM
CHECKED TAH

BORING PLAN
WINCHESTER PIKE/BIXBY ROAD

FRA-BIXBY ROAD
PID No. 82404

1 / 4

1/4



LEGEND

Project Boring Location

Pavement Core Location

HORIZONTAL SCALE IN FEET
0 30 60 120

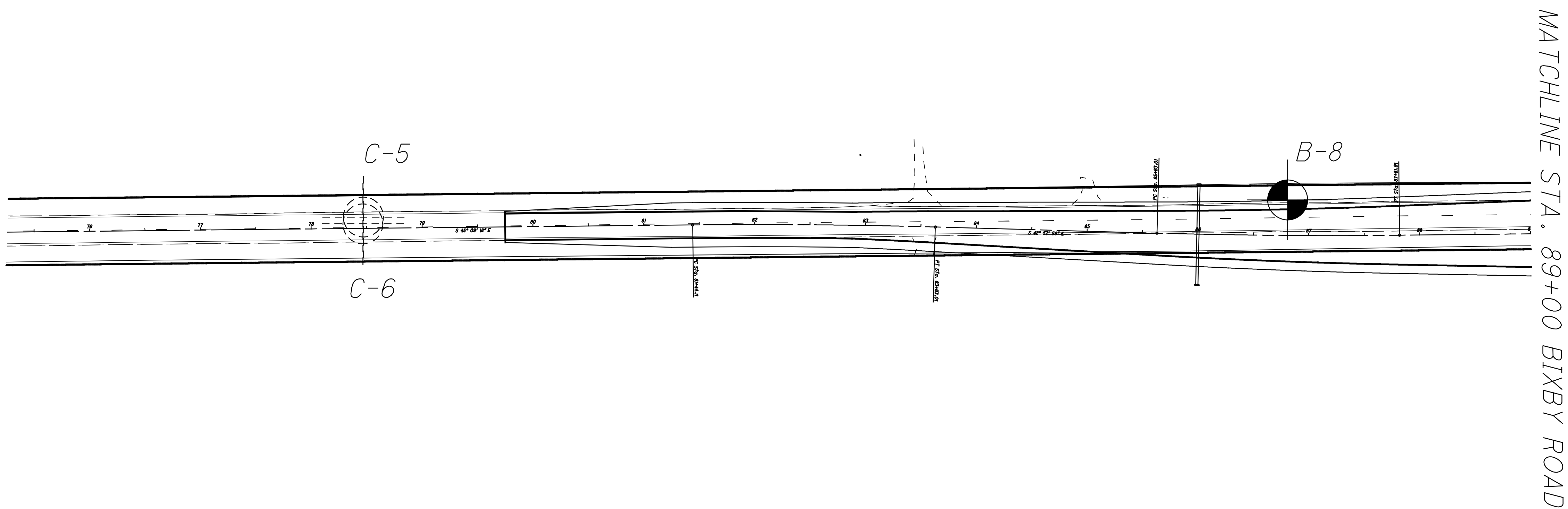
DRAWN BEM
CHECKED TAH

BORING PLAN
WINCHESTER PIKE

FRA-BIXBY ROAD
PID No. 82404

2 / 4

2
4



LEGEND

Project Boring Location

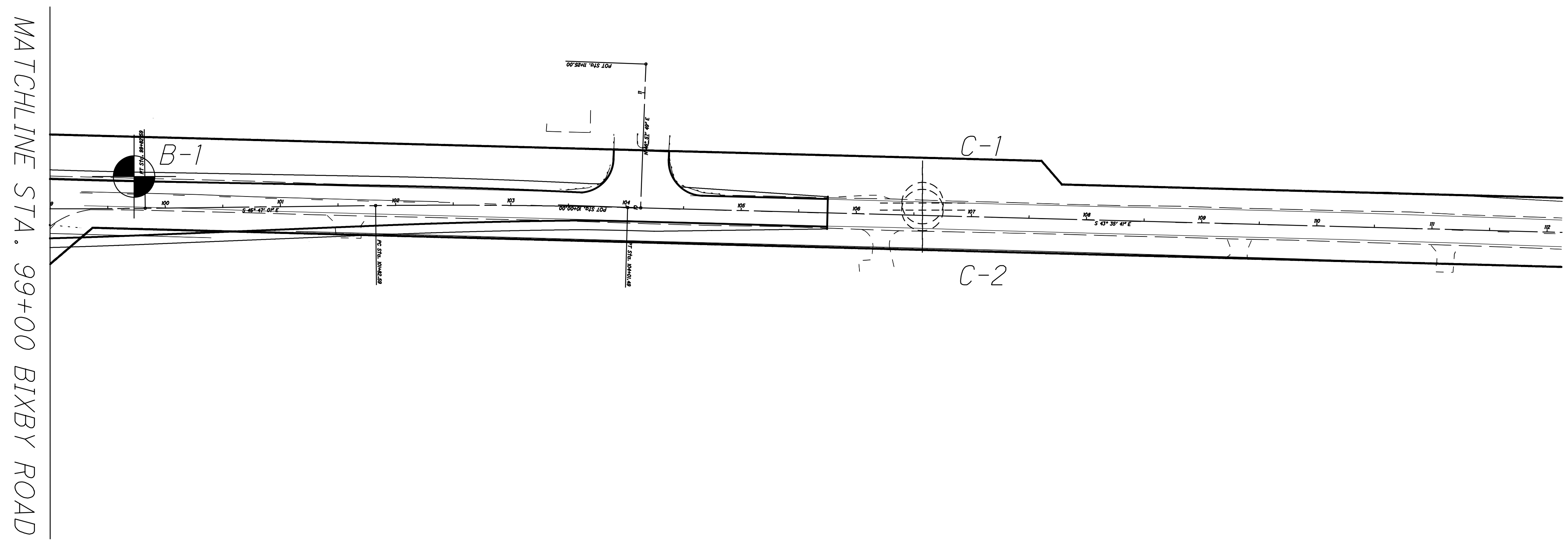
Pavement Core Location

0 30 60 120
HORIZONTAL SCALE IN FEET

DRAWN BEM
CHECKED TAH

BORING PLAN
WINCHESTER PIKE/BIXBY ROAD

FRA-BIXBY ROAD
PID No. 82404



LEGEND

Project Boring Location

Pavement Core Location

HORIZONTAL SCALE IN FEET
0 30 60 120

DRAWN BEM
CHECKED TAH

BORING PLAN
BIXBY ROAD

FRA-BIXBY ROAD
PID No. 82404

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

Client: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

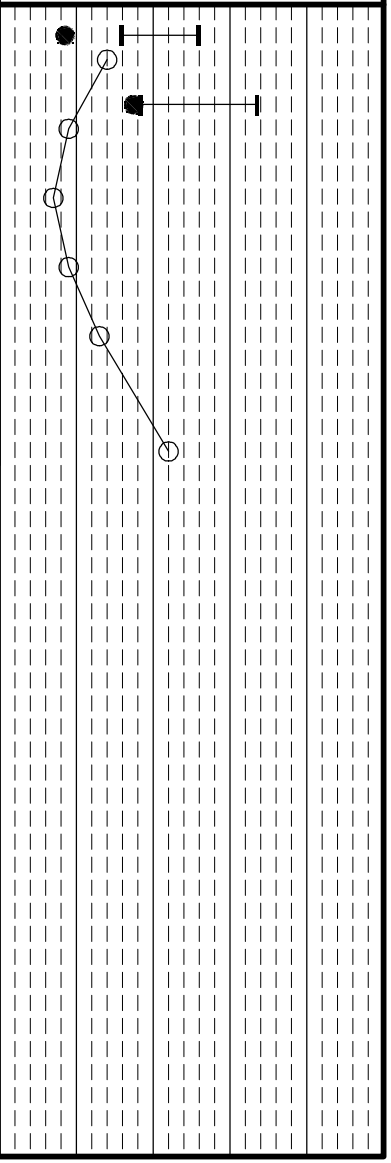
LOG OF: Boring B-1 | *Location:* As per plan | *Date Drilled:* 10/31/2011 to 10/31/2011

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

FIELD NOTES:

Depth (ft)	Elev. (ft) 760.5	Blows per 6"	Recovery (in)	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	760.3	3 5 6	10	1		1.5	Topsoil - 2"		31	12	---	12	25	21
1.5	759.0						FILL: Stiff brown SANDY SILT (A-4a), some gravel, some clay; damp.							
		3 3 4	10	2		2.5			29	7	---	10	28	26
		1 2 3	14	3		1.0	Stiff to very stiff brown SILT AND CLAY (A-6a), some gravel, little fine to coarse sand; damp to moist. @ 3.0'-4.5', brown and gray mottling.							
5		1 3 4	18	4		2.0								
		5 5 5	18	5		2.0								
8.5	752.0													
10.0	750.5	9 8 9	4	6			Medium dense brown FINE SAND (A-3), little silt; wet.							
							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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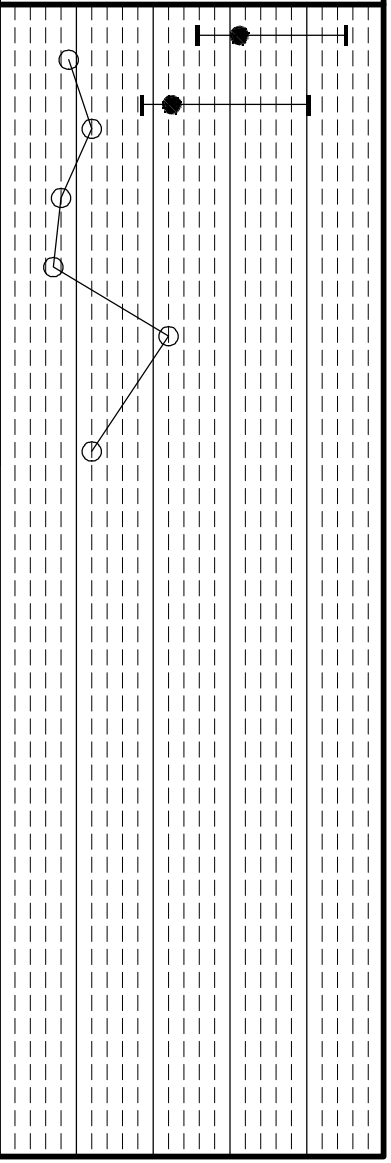
Client: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

LOG OF: Boring B-2 | *Location:* As per plan | *Date Drilled:* 10/31/2011 to 10/31/2011

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

Depth (ft)	Elev. (ft) 753.7	Blows per 6"	Recovery (in)	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	753.4	1 2 5	10	1		0.75	Topsoil - 4"		0	3	---	12	39	46
1.5	752.2						Medium stiff dark gray ORGANIC CLAY (A-8b), little coarse sand; moist.							
		1 4 5	18	2		1.0			5	2	---	10	36	47
		3 3 3	18	3		0.75	Medium stiff to stiff brown SILTY CLAY (A-6b), little fine to coarse sand, trace fine gravel; moist.							
5		4 2 3	6	4		0.25	@ 4.5'-6.0', moist to wet.							
6.0	747.7													
		4 8 9	10	5			Medium dense brown COARSE AND FINE SAND (A-3a), little fine gravel, little silt; wet.							
8.5	745.2													
		12 5 4	18	6			Loose gray FINE SAND (A-3), little silt, trace fine gravel; wet.							
10.0 10	743.7						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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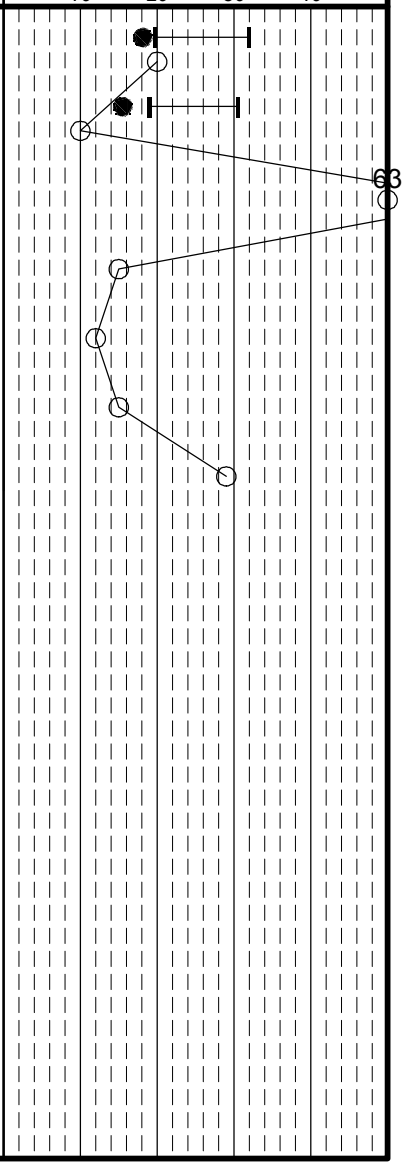
Client: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

LOG OF: Boring B-3 | *Location:* As per plan | *Date Drilled:* 1/5/2012 to 1/5/2012

WATER OBSERVATIONS:
Water seepage at: 7.9-10.5'
Water level at completion: None observed
FIELD NOTES:

Depth (ft)	Elev. (ft) 752.4	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
		4 7 11	7	1		1.25	Stiff to very stiff gray SILT AND CLAY (A-6a), some fine to coarse sand, some fine gravel; moist.		34	15	---	14	20	18
3.0	749.4	4 4 5	12	2		2.0			21	8	---	14	32	25
		7 17 40	10	3		2.75	Stiff to very stiff gray SILTY CLAY (A-6b), little fine to coarse sand, trace fine gravel; moist.							
5		6 7 7	16	4		1.25								
		4 5 6	18	5		2.25								
7.9	744.5	3												
		6 8	12	6A/B		1.0/NA	Medium dense brown COARSE AND FINE SAND (A-3a), little silt, little fine gravel; wet.							
9.0	743.4	12 11												
10		15	7	7			Medium dense brown GRAVEL (A-1-a), little fine to coarse sand, trace silt; wet.							
10.5	741.9						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



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

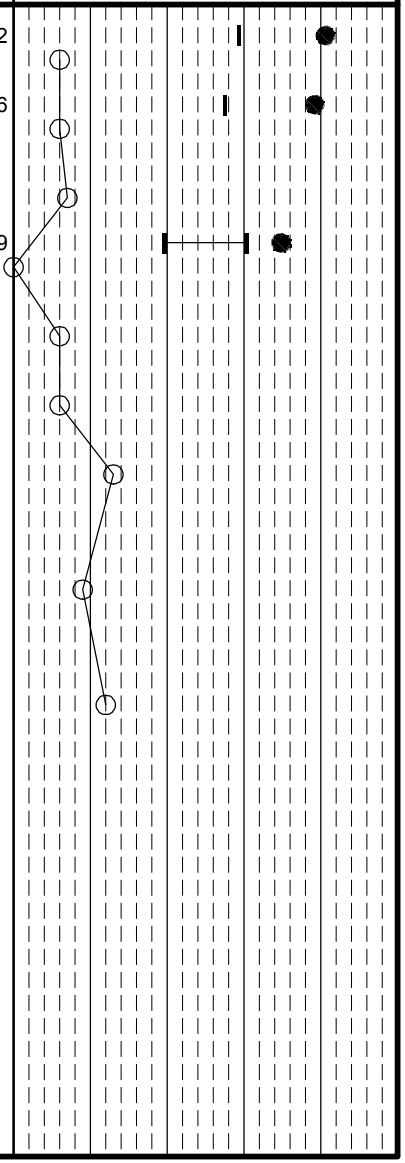
Client: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

LOG OF: Boring B-4 | *Location:* As per plan | *Date Drilled:* 1/5/2012 to 1/5/2012

WATER OBSERVATIONS:
Water seepage at: 6.3-9.0'
Water level at completion: 13.8'
FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	751.8	1 2 3	13	1		1.25	Stiff to very stiff dark gray CLAY (A-7-6), little coarse sand, trace gravel; organic; damp to moist.		8	1	---	7	41	42
		WOH 2 3	7	2		1.25			3	1	---	6	43	46
		1 3 3	6	3		1.0								
4.8	747.0	WOH												
5		WOH WOH	16	4			Very soft gray SILT (A-4b), trace fine to coarse sand; wet.		0	1	---	6	63	29
6.3	745.5	2 3		5			Medium dense brown GRAVEL WITH SAND (A-1-b), some fine to coarse sand; wet.							
7.5	744.3	2	9											
		WOH 2 3	10	6		1.25	Medium stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, trace to little fine gravel; moist; contains wet sand seams.							
10		1 5 7	18	7		1.5								
		2 4 4	16	8		1.25								
15		2 4 7	18	9		2.5								
15.5	736.3						Bottom of Boring - 15.5'							
20														
25														

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



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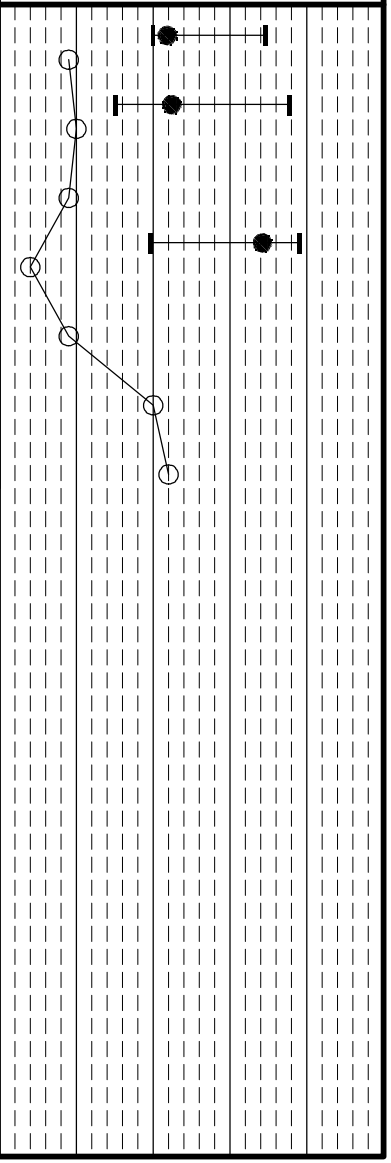
Client: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

LOG OF: Boring B-5 | *Location:* As per plan | *Date Drilled:* 1/5/2012 to 1/5/2012

WATER OBSERVATIONS:
Water seepage at: 4.8-10.5'
Water level at completion: 6.7'
FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	757.4													
1.5	755.9	3 4 4	12	1		1.25	Medium stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, trace fine gravel; moist.		1	9	---	14	40	36
		4 4 5	16	2		2.75	Stiff brown SILTY CLAY (A-6b), some fine to coarse sand, trace fine gravel; moist.		2	9	---	15	33	41
		3 4 4	15	3		2.0								
4.8	752.6													
6.1	751.3	1 2 2	16	4			Medium stiff brown SILTY CLAY (A-6b), "and" fine to coarse sand, trace fine gravel; wet.		4	23	---	23	22	28
		2 4 4	10	5			Loose to medium dense brownish gray COARSE AND FINE SAND (A-3a), little fine gravel, trace silty clay; wet.							
		3 8 10	18	6										
10.5	746.9	5 8 12	16	7										
							Bottom of Boring - 10.5'							

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



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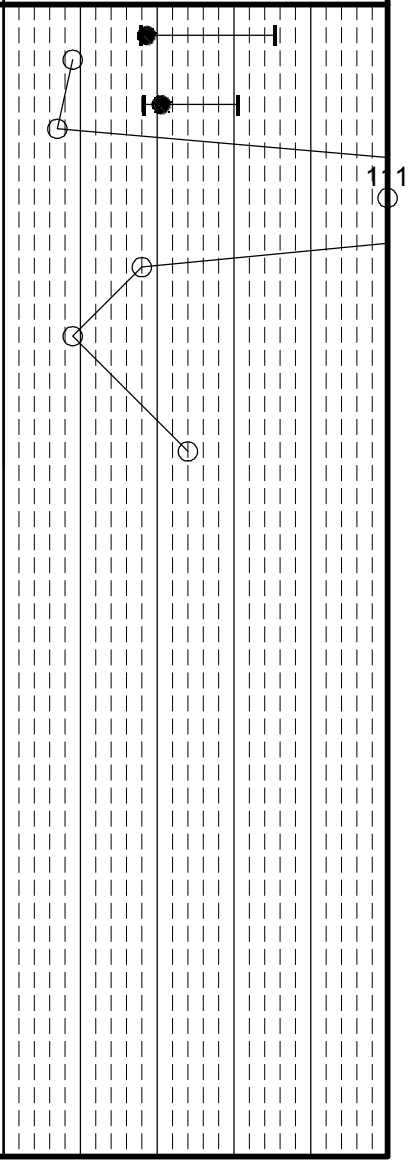
Client: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

LOG OF: Boring B-6 | *Location:* As per plan | *Date Drilled:* 10/31/2011 to 10/31/2011

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

Depth (ft)	Elev. (ft) 760.7	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.5	760.2	2 3 4	13	1		2.5	Topsoil - 6"		7	7	---	13	37	36
1.5	759.2						FILL: Very stiff brown SILTY CLAY (A-6b), some fine to coarse sand, trace fine gravel; moist.							
		1 2 3	15	2		1.0			12	9	---	14	36	29
		3 41 43	2	3			FILL: Stiff brown SILT AND CLAY (A-6a), some fine gravel, little gravel; moist. @ 3.0'-4.5', concrete fragments encountered.							
4.5	756.2													
5		12 8 6	18	4		3.0	Very stiff brown SILTY CLAY (A-6b), some fine to coarse sand, little fine gravel; damp.							
6.0	754.7													
		1 3 4	10	5			Loose brown GRAVEL WITH SAND, SILT, AND CLAY (A-2-6), little silty clay, little fine gravel; moist to wet.							
8.5	752.2													
10.0 10	750.7	10 9 9	18	6			Medium dense brown COARSE AND FINE SAND (A-3a), little fine gravel, trace silty clay; moist.							
							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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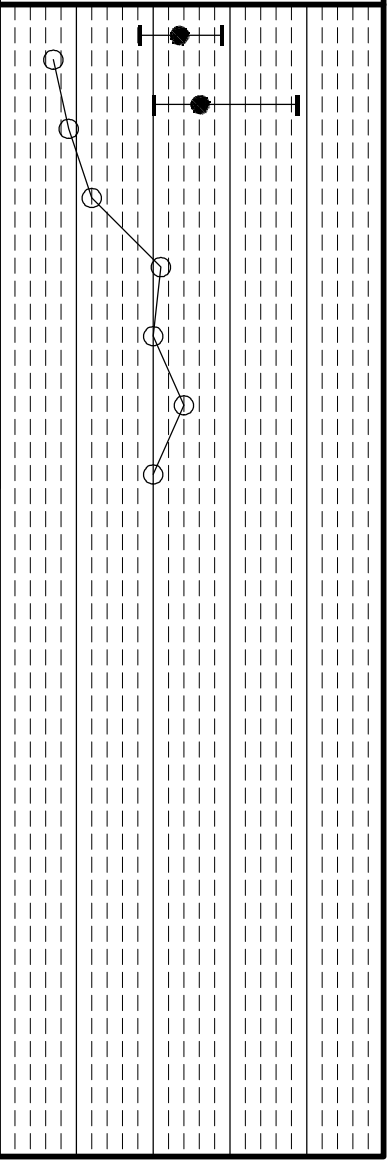
Client: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

LOG OF: Boring B-7 | *Location:* As per plan | *Date Drilled:* 1/5/2012 to 1/5/2012

WATER OBSERVATIONS:
Water seepage at: 9.2-10.5'
Water level at completion: 6.5'
FIELD NOTES:

Depth (ft)	Elev. (ft) 759.5	Blows per 6"	Recovery (in)	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 3		1		1.25	Stiff brown SILT AND CLAY (A-6a), little coarse sand; moist.		0	4	---	14	48	33
1.5	758.0		18											
		2 3 5	14	2		2.0	Very stiff brown SILTY CLAY (A-6b), little fine to coarse sand, trace to little fine gravel; moist.		1	4	---	16	35	43
		3 4 7		3		2.25								
4.5	755.0		18											
5		6 8 11	17	4		4.5	Very stiff to hard brown SILTY CLAY (A-6b), little fine to coarse sand, trace to little fine gravel; damp.							
		6 8 10	6	5		2.5	@ 6.0'-7.5', single large piece of gravel recovered.							
		4 8 14	6	6		2.0								
9.2	750.3													
10		4 8 10	14	7			Medium dense gray COARSE AND FINE SAND (A-3a), trace fine gravel, trace silt; wet.							
10.5	749.0						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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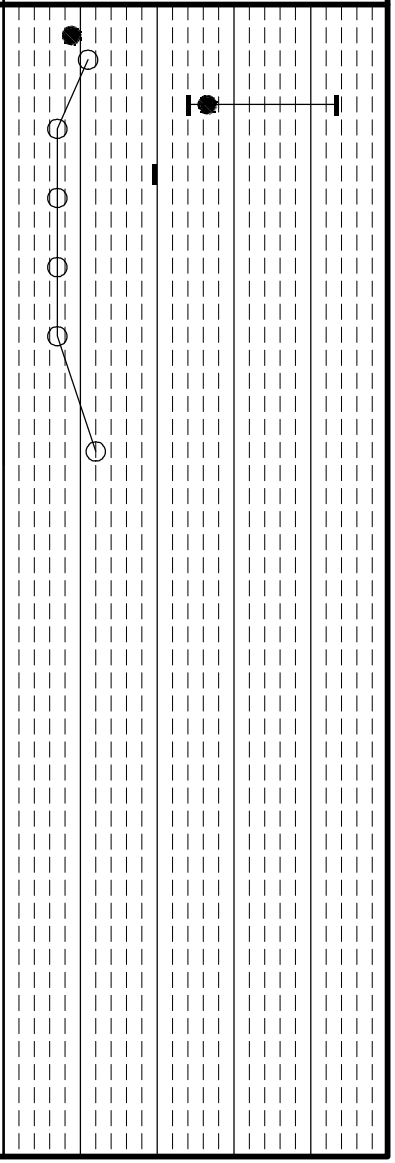
Client: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

LOG OF: Boring B-8 | *Location:* As per plan | *Date Drilled:* 10/31/2011 to 10/31/2011

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

Depth (ft)	Elev. (ft) 755.0	Blows per 6"	Recovery (in)	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	754.9	3 4 4	5	1			Topsoil - 1"		52	22	---	12	--15--	
1.5	753.5						FILL: Loose brown GRAVEL (A-1-a), some fine to coarse sand, little silty clay; damp.							
		3 2 3	3	2		1.0	Medium stiff dark gray to gray CLAY (A-7-6), little fine to coarse sand, trace gravel; organic; moist.		10	8	---	11	39	32
		3 2 3	15	3		1.0								
5		2 2 3	10	4		0.75								
6.0	749.0													
		1 2 3	15	5		0.75	Medium stiff to stiff brownish gray SILTY CLAY (A-6b), some fine to coarse sand, trace fine gravel; moist.							
		3 4 5	10	6		1.5								
10.0 10	745.0						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



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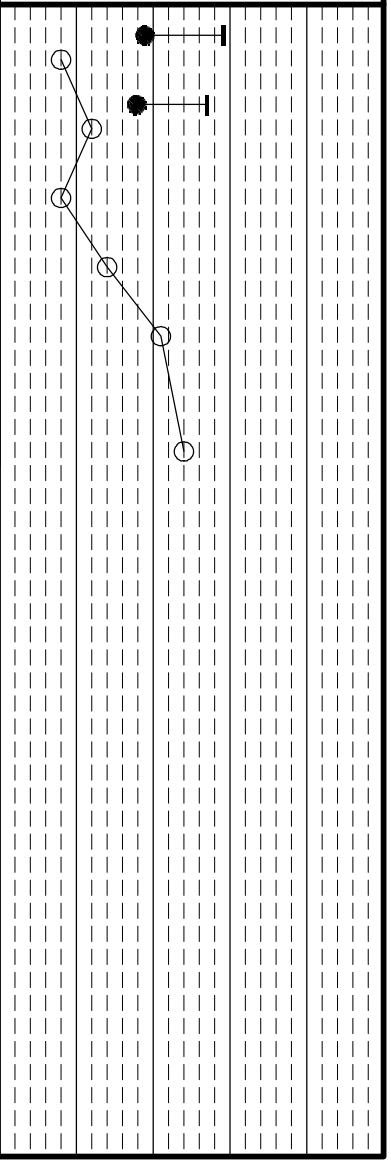
Client: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

LOG OF: Boring B-9 | *Location:* As per plan | *Date Drilled:* 10/31/2012 to 10/31/2012

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

Depth (ft)	Elev. (ft) 761.8	Blows per 6"	Recovery (in)	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	761.6	2 3 3	10	1		3.0	Gravel - 3"		8	10	---	13	38	30
1.5	760.3						POSSIBLE FILL: Very stiff brown SANDY SILT (A-4a), some clay, trace gravel; damp.							
		3 6 3	10	2		1.0			8	14	---	15	36	27
							Stiff brown SANDY SILT (A-4a), some clay, trace gravel; damp.							
		3 4 2	18	3		1.0								
5		3 4 7	18	4		1.75								
7.0	754.8	6 7 9	18	5		4.5	@ 6.0', hard.							
							Very stiff to hard brown SILTY CLAY (A-6b), little fine to coarse sand, trace fine gravel; damp to moist.							
10.0	751.8	8 8 10	18	6		3.0								
							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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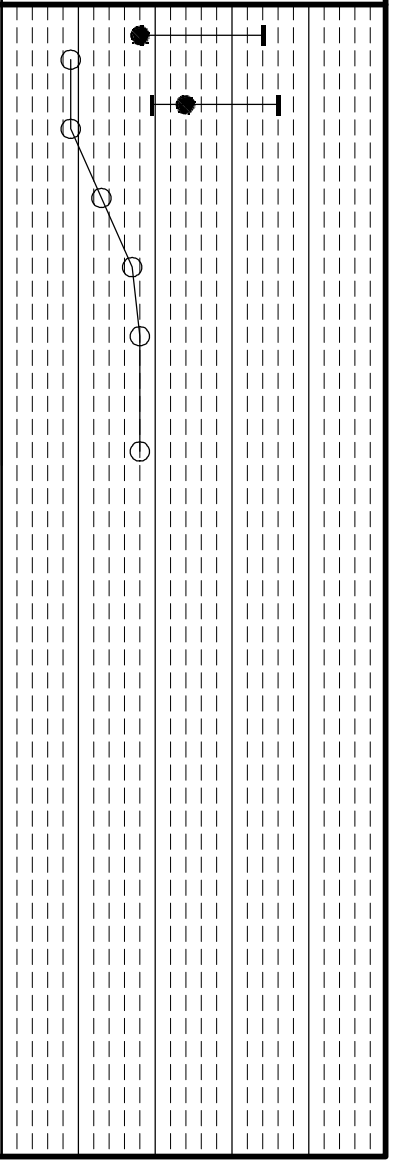
Client: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

LOG OF: Boring B-10 | *Location:* As per plan | *Date Drilled:* 10/31/2011 to 10/31/2011

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	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	764.1 / 763.9	2 4 3	12	1		1.0	Topsoil - 2" Stiff to very stiff brown SILTY CLAY (A-6b), trace to little fine to coarse sand, trace fine gravel; moist.		22	7	---	11	30	30
		2 4 3	14	2		2.0			7	5	---	12	41	35
		3 5 5	18	3		2.0								
5		5 6 7	18	4		2.0								
		6 7 7	18	5		3.75								
8.5	755.6													
10.0	754.1	11 8 6	15	6			Medium dense brown GRAVEL WITH SAND (A-1-b), some fine to coarse sand, trace to little silty clay; moist.							
10							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: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

LOG OF: Boring B-11 | *Location:* As per plan | *Date Drilled:* 10/31/2011 to 10/31/2011

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	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	765.6													
	765.4	2 2 4	18	1		1.0	Topsoi - 2"		10	6	---	13	45	27
		1 2 4	18	2		1.5	Stiff to very stiff brown SILT AND CLAY (A-6a), little to some fine to coarse sand, trace fine gravel; moist.		3	6	---	14	42	35
		2 3 4	15	3		2.0								
5		4 5 6	18	4		1.0								
		5 6 5	18	5		3.0	@ 6.0'-7.5', little fine gravel.							
8.5	757.1													
10.0	755.6	5 6 5	18	6			Medium dense brown GRAVEL WITH SAND (A-1-b), some fine to coarse sand, trace to little silty clay; moist.							
							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: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

LOG OF: Boring C-1 | *Location:* As per plan | *Date Drilled:* 10/31/2011 to 10/31/2011

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

Depth (ft)	Elev. (ft) 759.3	Blows per 6"	Recovery (in)	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)
1.3	758.0						Asphalt=16"								
							Bottom of Boring - 1.3'								
5															
10															
15															
20															
25															

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Client: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

LOG OF: Boring C-2 | *Location:* As per plan | *Date Drilled:* 10/31/2011 to 10/31/2011

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

Depth (ft)	Elev. (ft) 759.4	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.6	757.8						Asphalt=9.5"/Brick=3.5"/Concrete=6"							
							Bottom of Boring - 1.6'							

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

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Client: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

LOG OF: Boring C-3 | *Location:* As per plan | *Date Drilled:* 10/31/2011 to 10/31/2011

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

Depth (ft)	Elev. (ft) 756.0	Blows per 6"	Recovery (in)	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)
0.5	755.6						Asphalt= 5.5"/Aggregate base								
							Bottom of Boring - 0.5'								
5															
10															
15															
20															
25															

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Client: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

LOG OF: Boring C-4 | *Location:* As per plan | *Date Drilled:* 10/31/2011 to 10/31/2011

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

Depth (ft)	Elev. (ft) 761.7	Blows per 6"	Recovery (in)	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	760.7						Asphalt=6"/Aggregate=6"								
							Bottom of Boring - 1.0'								
5															
10															
15															
20															
25															

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Client: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

LOG OF: Boring C-5 | *Location:* As per plan | *Date Drilled:* 10/31/2011 to 10/31/2011

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

Depth (ft)	Elev. (ft) 759.3	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetro-meter (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
							Asphalt=9"/Concrete=10"							
1.6	757.8						Bottom of Boring - 1.6'							

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

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Client: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

LOG OF: Boring C-6 | *Location:* As per plan | *Date Drilled:* 10/31/2011 to 10/31/2011

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

Depth (ft)	Elev. (ft) 759.4	Blows per 6"	Recovery (in)	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)
1.6	757.8						Asphalt=9"/Brick=3.5"/Concrete=6.5"								
							Bottom of Boring - 1.6'								
5															
10															
15															
20															
25															

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Client: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

LOG OF: Boring C-7 | *Location:* As per plan | *Date Drilled:* 10/31/2011 to 10/31/2011

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

Depth (ft)	Elev. (ft) 764.8	Blows per 6"	Recovery (in)	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)
0.9	763.9						Asphalt=2"/Concrete=8.5"								
							Bottom of Boring - 0.9'								
5															
10															
15															
20															
25															

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

Client: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

LOG OF: Boring C-8 | *Location:* As per plan | *Date Drilled:* 10/31/2011 to 10/31/2011

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

Depth (ft)	Elev. (ft) 763.6	Blows per 6"	Recovery (in)	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)
1.4	762.2						Asphalt=9"/Aggregate=8"								
							Bottom of Boring - 1.4'								
5															
10															
15															
20															
25															

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Client: Franklin County Engineer | *Project:* Winchester Pike at Bixby-Brice | *Job No.* 1121-1010.00

LOG OF: Boring C-9 | *Location:* As per plan | *Date Drilled:* 10/31/2011 to 10/31/2011

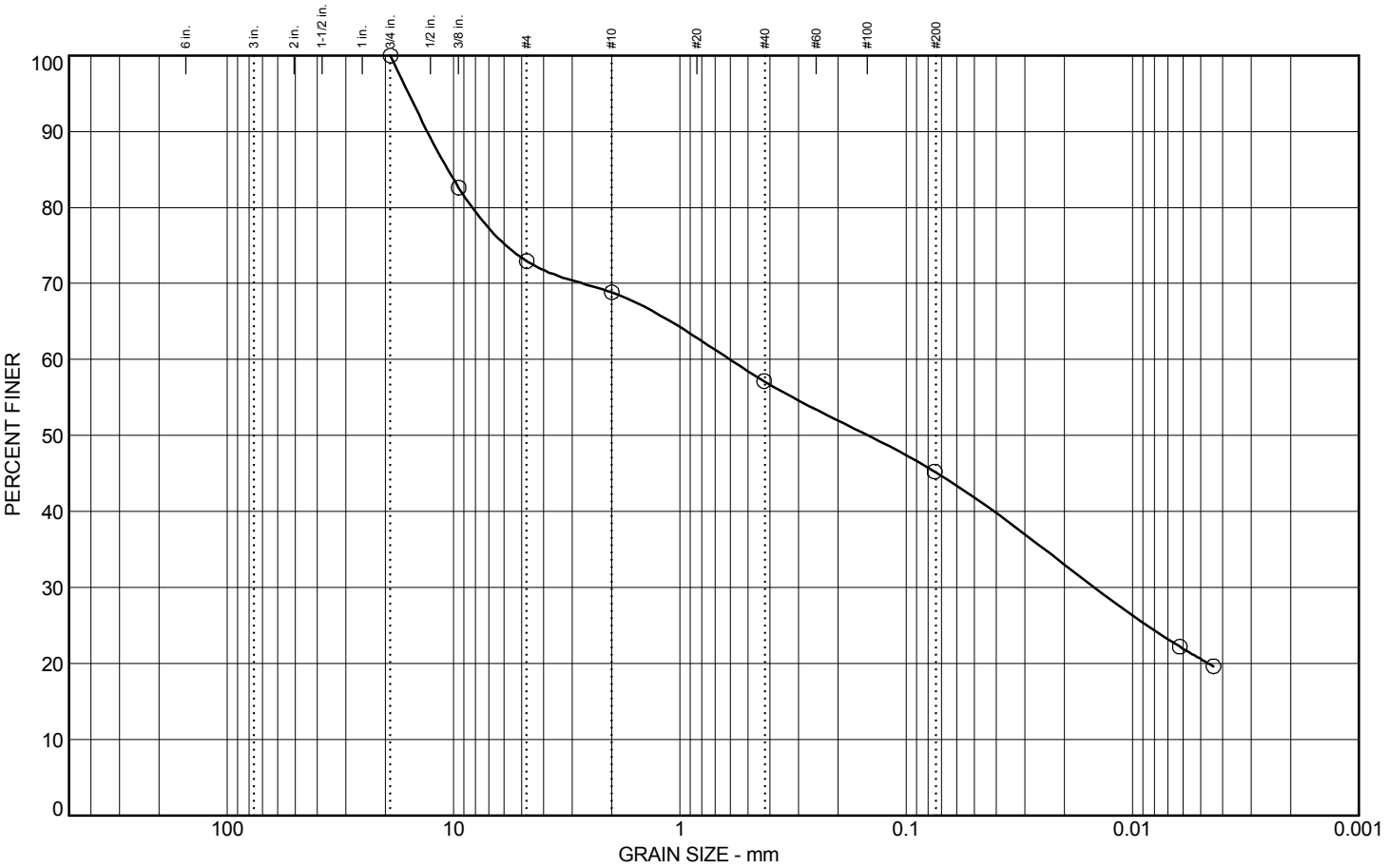
WATER OBSERVATIONS:
Water seepage at: None observed
Water level at completion: None observed
FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	763.4													
1.3	762.2						Asphalt=7"/Aggregate=8"							
							Bottom of Boring - 1.3'							

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

5 10 15 20 25

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	31.2	11.7	11.9	24.7	20.6

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
19	100.0		
9.5	82.6		
4.75	72.9		
2	68.8		
0.425	57.2		
0.075	45.2		

* (no specification provided)

Soil Description

fine to medium sand, low plasticity clay, fine gravel

General Characteristics

Moisture Content = 8.5%

Atterberg Limits

LL= 26 PL= 16 PI= 10

Coefficients

D_{85}= 10.444 D_{60}= 0.62 D_{50}= 0.15
D_{30}= 0.014 D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-4a USCS = SC

Remarks

Group Index = 2

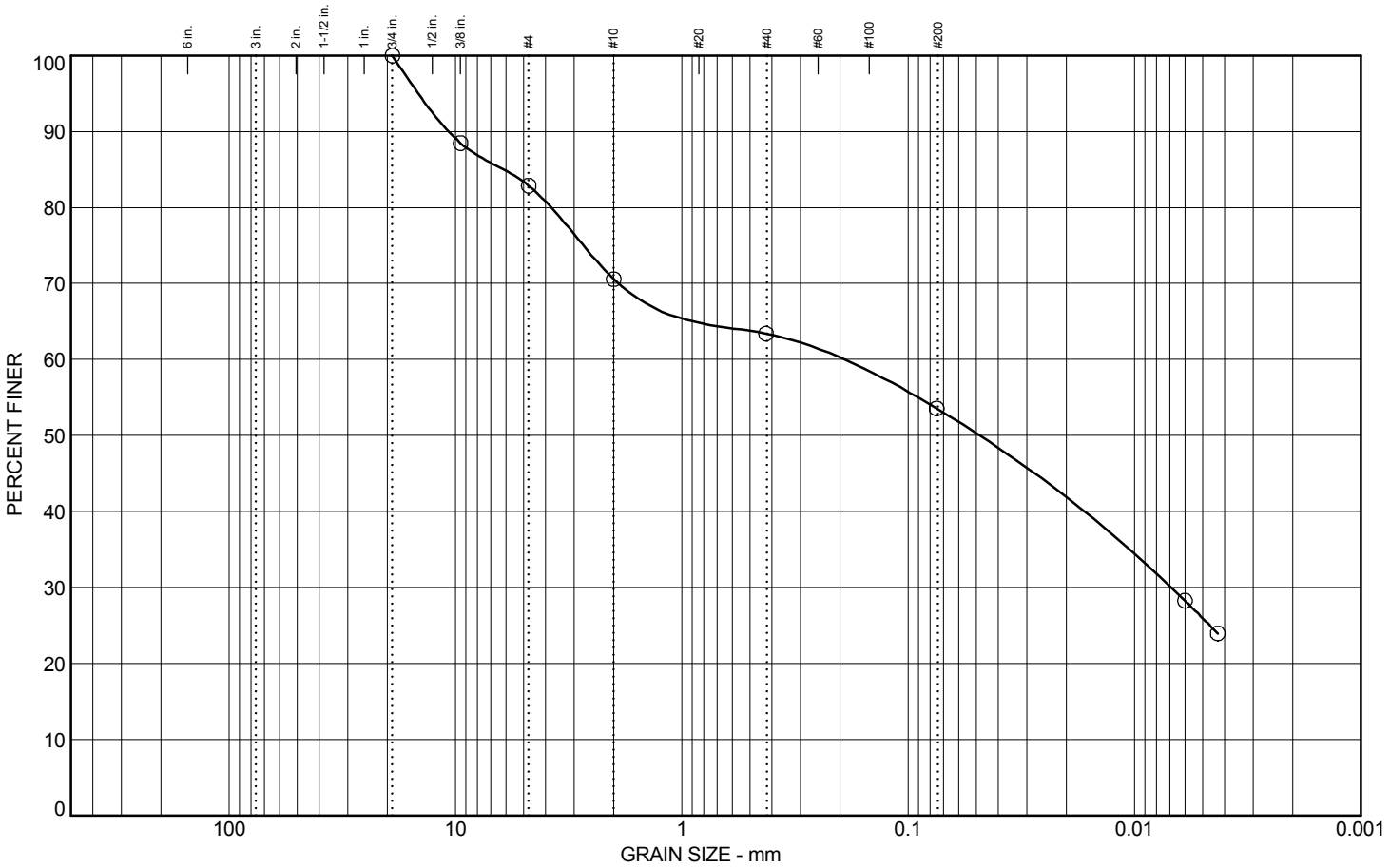
Sample No.: 1 **Source of Sample:** B-1 **Date:** 2/1/2012
Location: - **Depth / Elev:** 0' / 760.46'

DLZ

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

GRAIN SIZE II - DLZ MOD - GINT STD US LAB.GDT - 2/9/12 14:22 - S:\DEPT\GEOTECHNICAL\GINT\PROJECTS\1121-1010.00 WINCHESTER PIKE AT BIXBY-BRICE.GPJ

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	29.4	7.2	9.8	27.7	25.9

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
19	100.0		
9.5	88.5		
4.75	82.9		
2	70.6		
0.425	63.4		
0.075	53.6		

* (no specification provided)

Soil Description

low plasticity clay, fine and coarse sand, fine gravel

General Characteristics

Moisture Content = 17.4%

Atterberg Limits

LL= 33 PL= 18 PI= 15

Coefficients

D_{85}= 6.179 D_{60}= 0.234 D_{50}= 0.053
D_{30}= 0.007 D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-6a USCS = CL

Remarks

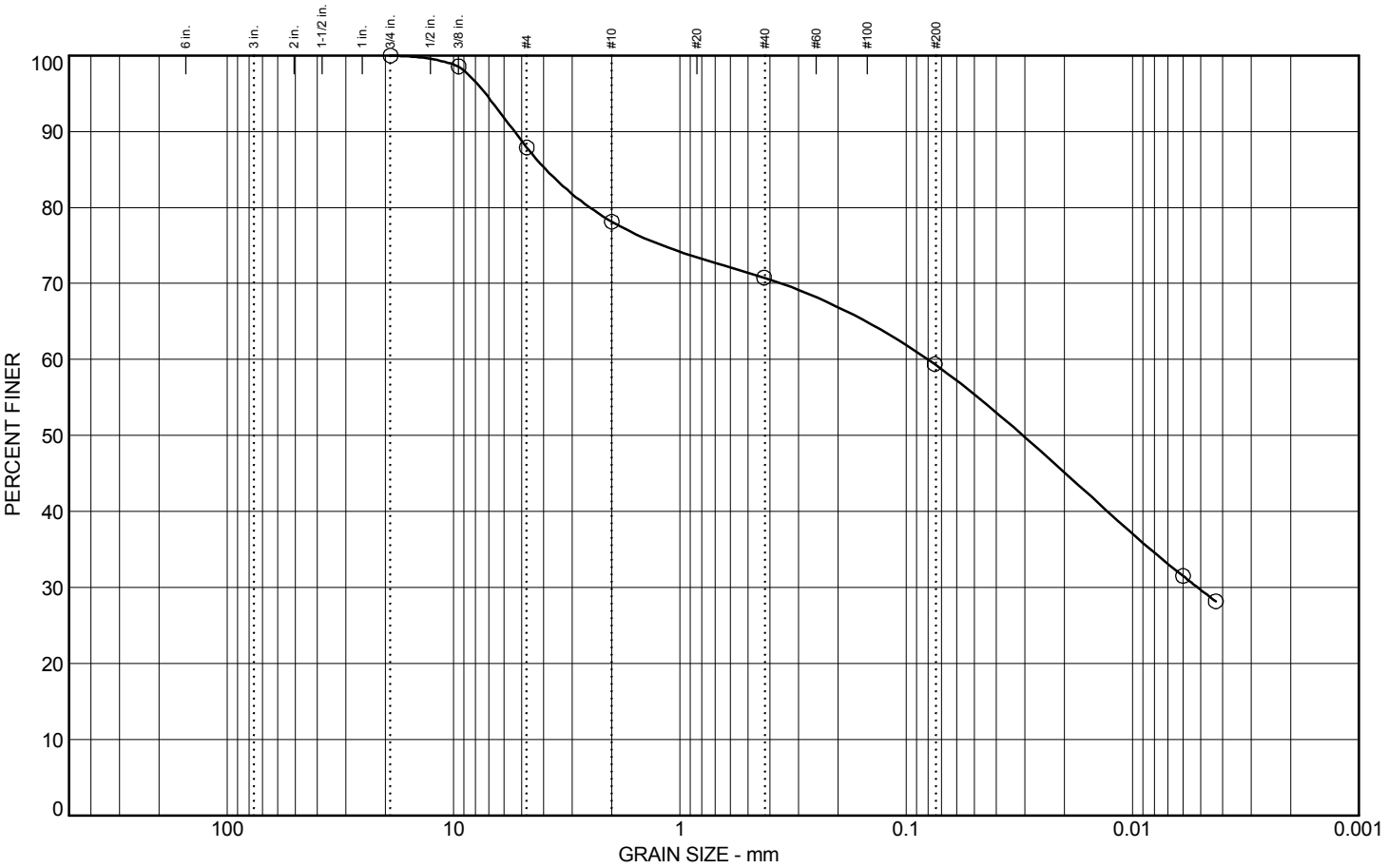
Group Index = 6

Sample No.: 2 **Source of Sample:** B-1 **Date:** 2/2/2012
Location: - **Depth / Elev:** 1.5' / 758.96'

DLZ

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	21.9	7.4	11.4	29.7	29.7

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
19	100.0		
9.5	98.6		
4.75	87.9		
2	78.1		
0.425	70.8		
0.075	59.4		

* (no specification provided)

Soil Description

low plasticity clay, fine and coarse sand

General Characteristics

Moisture Content = 18.0%

Atterberg Limits

LL= 34 PL= 18 PI= 16

Coefficients

D_{85}= 3.674 D_{60}= 0.082 D_{50}= 0.032
D_{30}= 0.005 D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-6b USCS = CL

Remarks

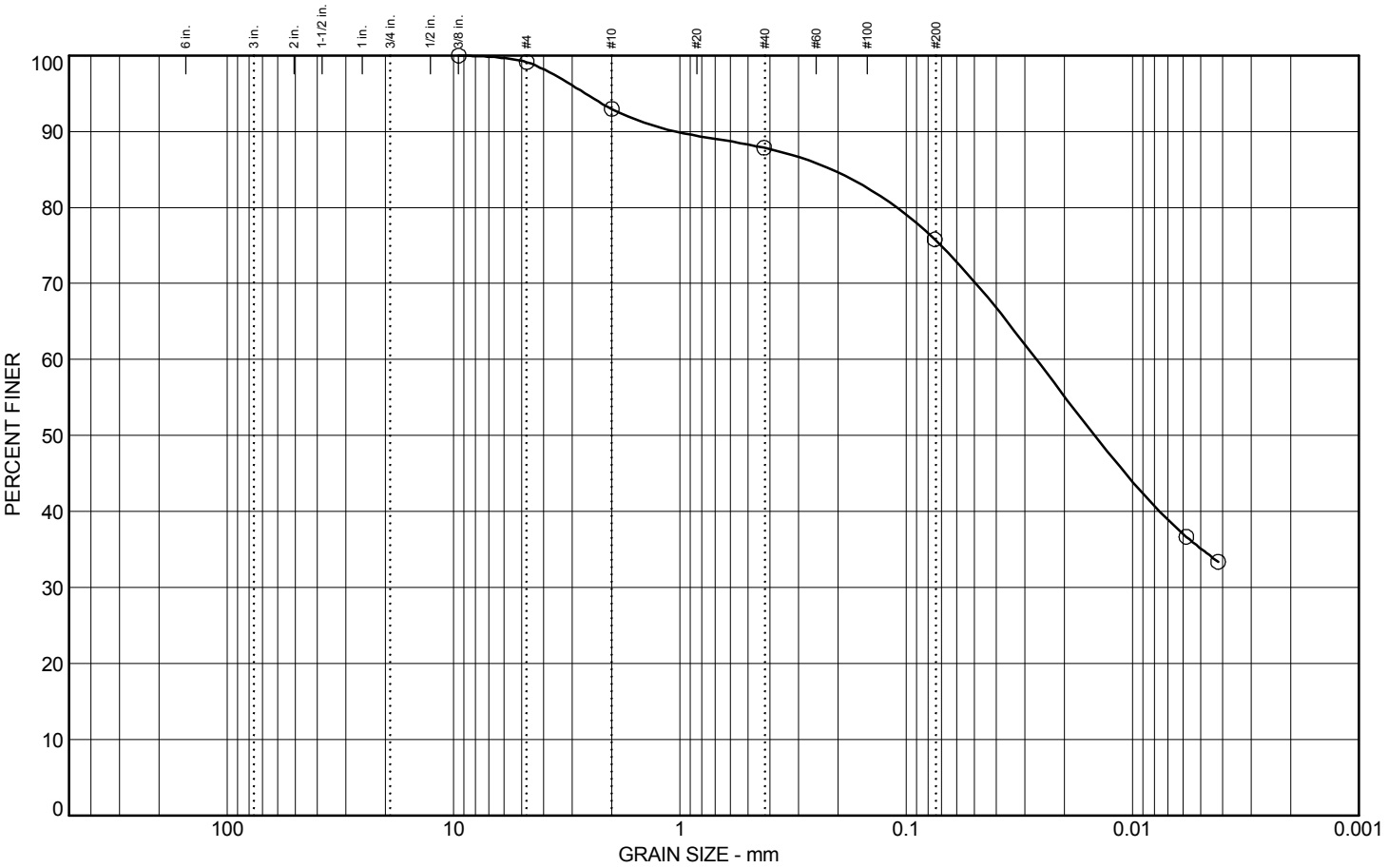
Group Index = 7

Sample No.: 1 **Source of Sample:** B-10 **Date:** 2/2/2012
Location: - **Depth / Elev:** 0' / 764.05'

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice

Project No: 1121-1010.00 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	7.0	5.1	12.1	40.7	35.1

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
9.5	100.0		
4.75	99.1		
2	93.0		
0.425	87.9		
0.075	75.8		

* (no specification provided)

Soil Description

moderate plasticity clay, fine and coarse sand

General Characteristics

Moisture Content = 23.9%

Atterberg Limits

LL= 36 PL= 19 PI= 17

Coefficients

D_{85}= 0.281 D_{60}= 0.027 D_{50}= 0.014
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-6b USCS = CL

Remarks

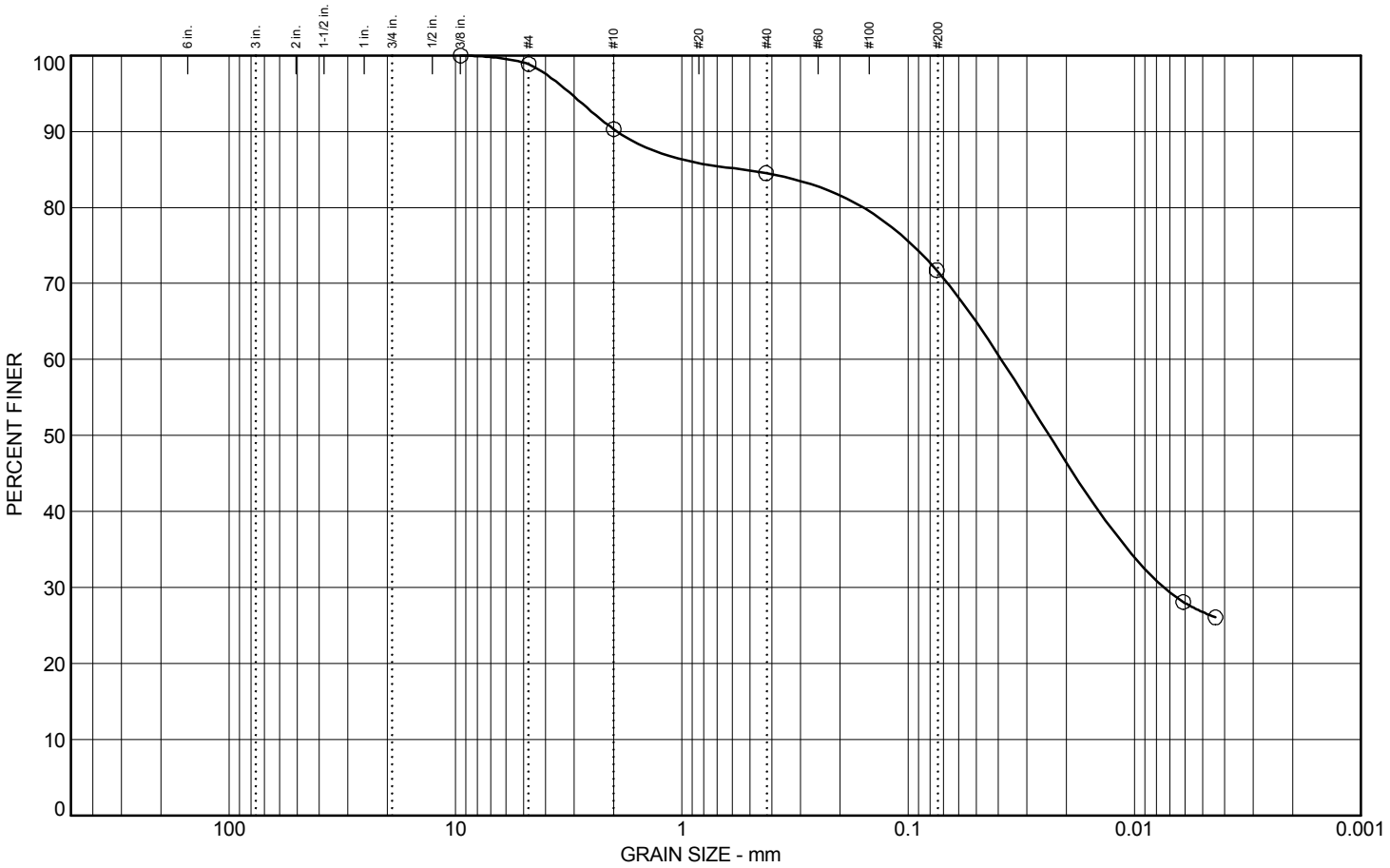
Group Index = 11

Sample No.: 2 **Source of Sample:** B-10 **Date:** 2/2/2012
Location: - **Depth / Elev:** 1.5' / 762.55'

DLZ

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	9.7	5.8	12.8	44.9	26.8

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
9.5	100.0		
4.75	98.9		
2	90.3		
0.425	84.5		
0.075	71.7		

* (no specification provided)

Soil Description

low plasticity clay, fine and coarse sand

General Characteristics

Moisture Content = 23.3%

Atterberg Limits

LL= 33 PL= 22 PI= 11

Coefficients

D_{85}= 0.484 D_{60}= 0.038 D_{50}= 0.022
D_{30}= 0.007 D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-6a USCS = CL

Remarks

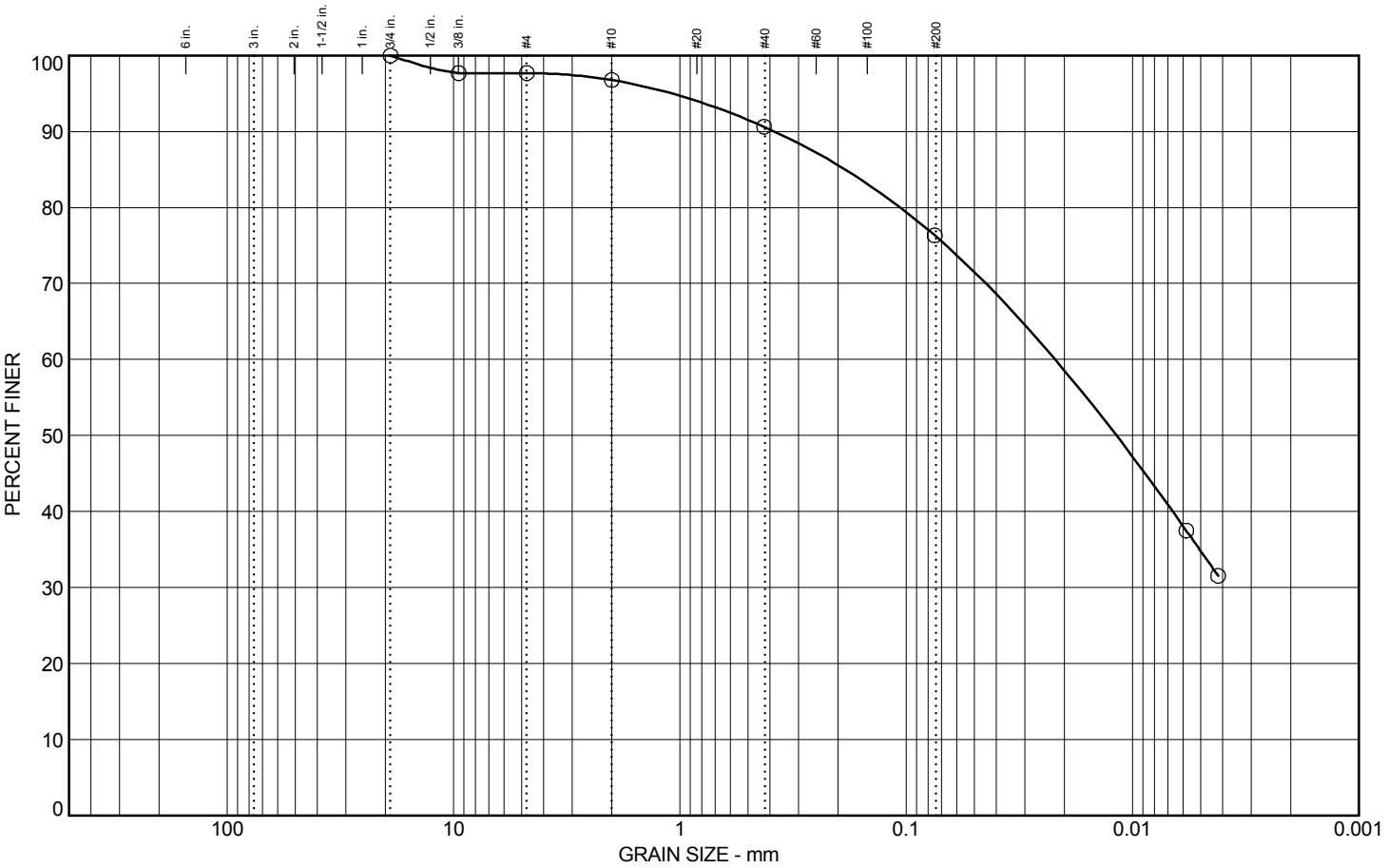
Group Index = 8

Sample No.: 1 **Source of Sample:** B-11 **Date:** 2/2/2012
Location: - **Depth / Elev:** 0' / 765.61'

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

GRAIN SIZE II - DLZ MOD - GINT STD US LAB.GDT - 2/9/12 14:23 - S:\DEPT\GEOTECHNICAL\GINT\PROJECTS\1121-1010.00 WINCHESTER PIKE AT BIXBY-BRICE.GPJ

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	3.2	6.1	14.3	41.6	34.7

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
19	100.0		
9.5	97.7		
4.75	97.7		
2	96.8		
0.425	90.6		
0.075	76.3		

* (no specification provided)

Soil Description

low plasticity clay, fine sand

General Characteristics

Moisture Content = 20.6%

Atterberg Limits

LL= 28 PL= 17 PI= 11

Coefficients

D_{85}= 0.215 D_{60}= 0.026 D_{50}= 0.013
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-6a USCS = CL

Remarks

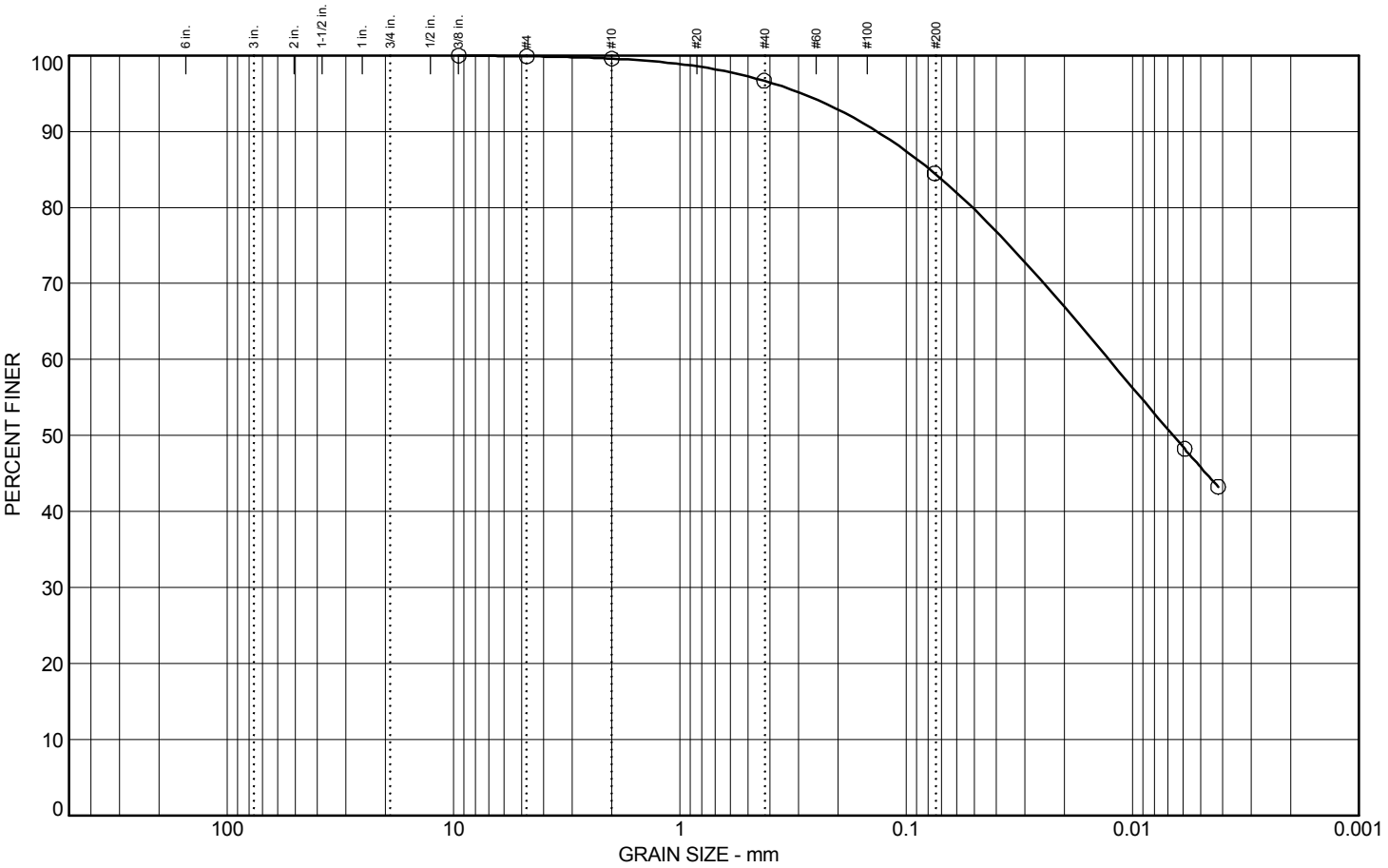
Group Index = 8

Sample No.: 2 **Source of Sample:** B-11 **Date:** 2/2/2012
Location: - **Depth / Elev:** 1.5' / 764.11'

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

GRAIN SIZE II - DLZ MOD - GINT STD US LAB.GDT - 2/9/12 14:23 - S:\DEPT\GEOTECHNICAL\GINT\PROJECTS\1121-1010.00 WINCHESTER PIKE AT BIXBY-BRICE.GPJ

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	0.4	2.9	12.2	38.7	45.8

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
9.5	100.0		
4.75	99.9		
2	99.6		
0.425	96.7		
0.075	84.5		

* (no specification provided)

Soil Description

moderate plasticity clay, fine sand

General Characteristics

Moisture Content = 31.2%

Atterberg Limits

LL= 45 PL= 26 PI= 19

Coefficients

D_{85}= 0.081 D_{60}= 0.013 D_{50}= 0.007
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-7-6 USCS = CL

Remarks

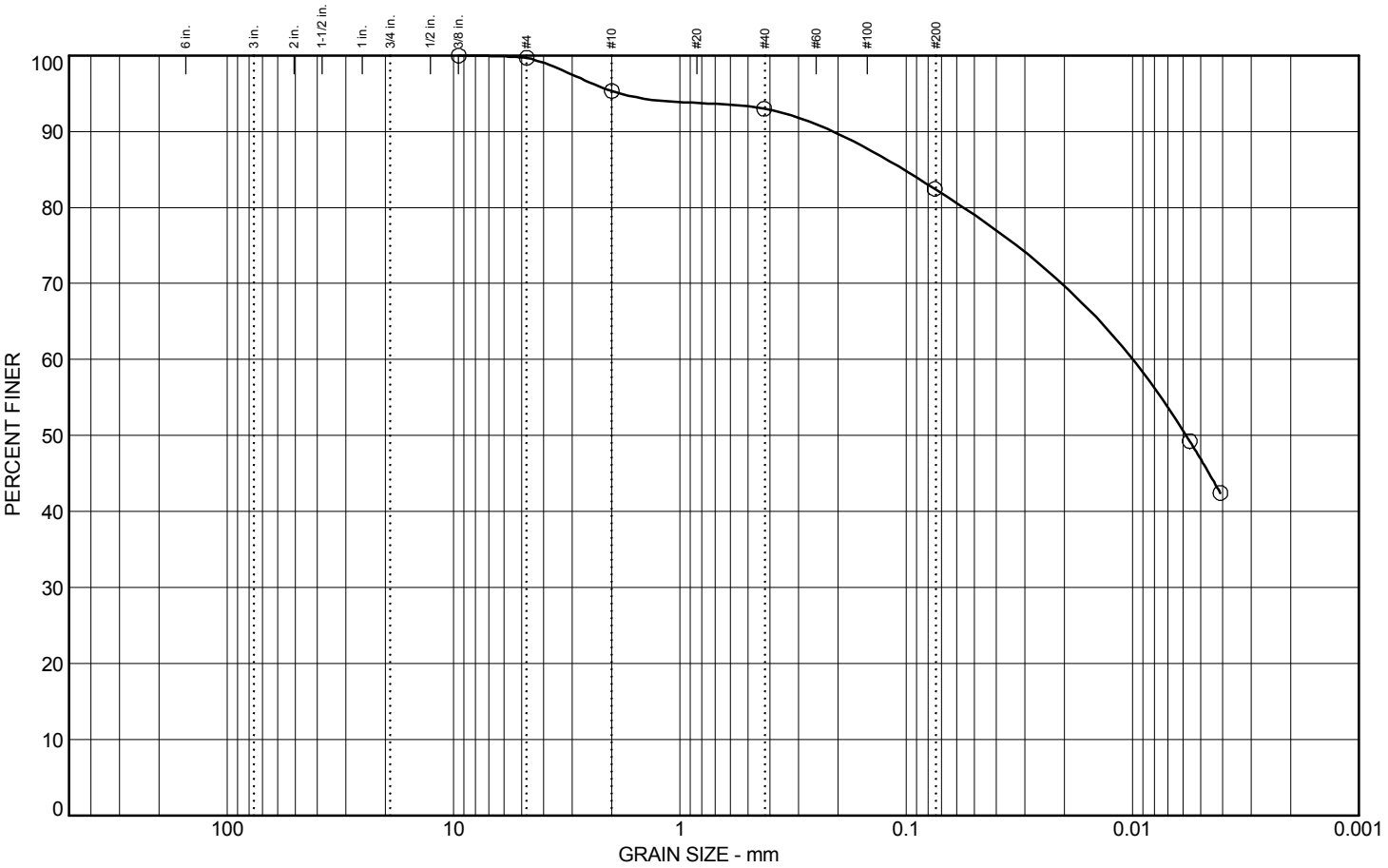
Group Index = 13

Sample No.: 1 **Source of Sample:** B-2 **Date:** 2/2/2012
Location: - **Depth / Elev:** 0' / 753.72'

DLZ

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	4.7	2.3	10.6	35.7	46.8

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
9.5	100.0		
4.75	99.7		
2	95.3		
0.425	93.0		
0.075	82.4		

* (no specification provided)

Soil Description

Organic moderate plasticity clay, fine and coarse sand

General Characteristics

Moisture Content = 22.4%

Atterberg Limits

LL= 40 PL= 18 PI= 22

Coefficients

D_{85}= 0.114 D_{60}= 0.013 D_{50}= 0.006
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-6b USCS = OL

Remarks

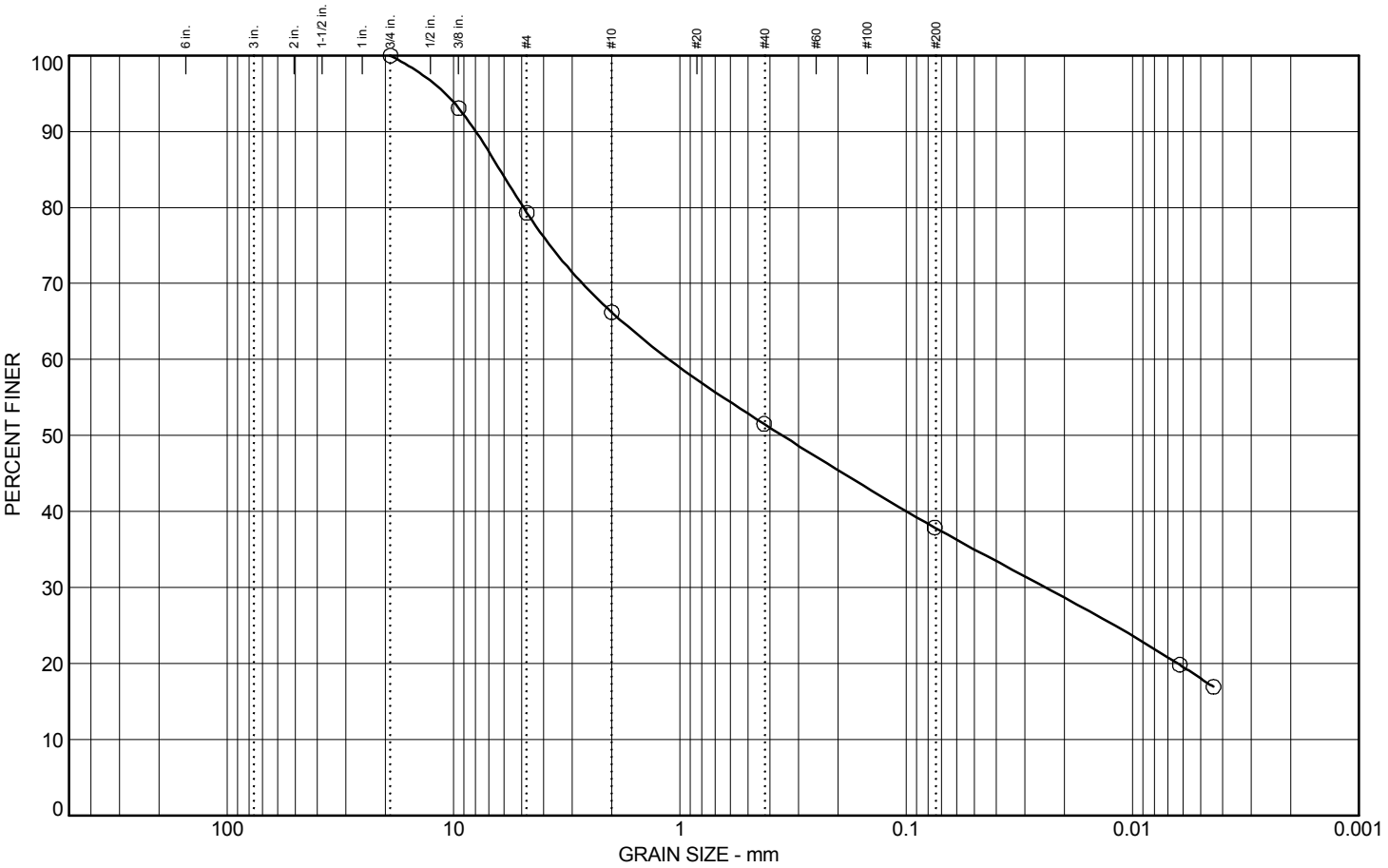
Group Index = 13

Sample No.: 2 **Source of Sample:** B-2 **Date:** 2/2/2012
Location: - **Depth / Elev:** 1.5' / 752.22'

DLZ

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	33.8	14.7	13.6	19.9	18.0

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
19	100.0		
9.5	93.1		
4.75	79.3		
2	66.2		
0.425	51.5		
0.075	37.9		

* (no specification provided)

Soil Description

fine to medium sand, low plasticity clay, fine gravel

General Characteristics

Moisture Content = 18.1%

Atterberg Limits

LL= 32 PL= 20 PI= 12

Coefficients

D_{85}= 6.329 D_{60}= 1.039 D_{50}= 0.35
D_{30}= 0.025 D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-6a USCS = SC

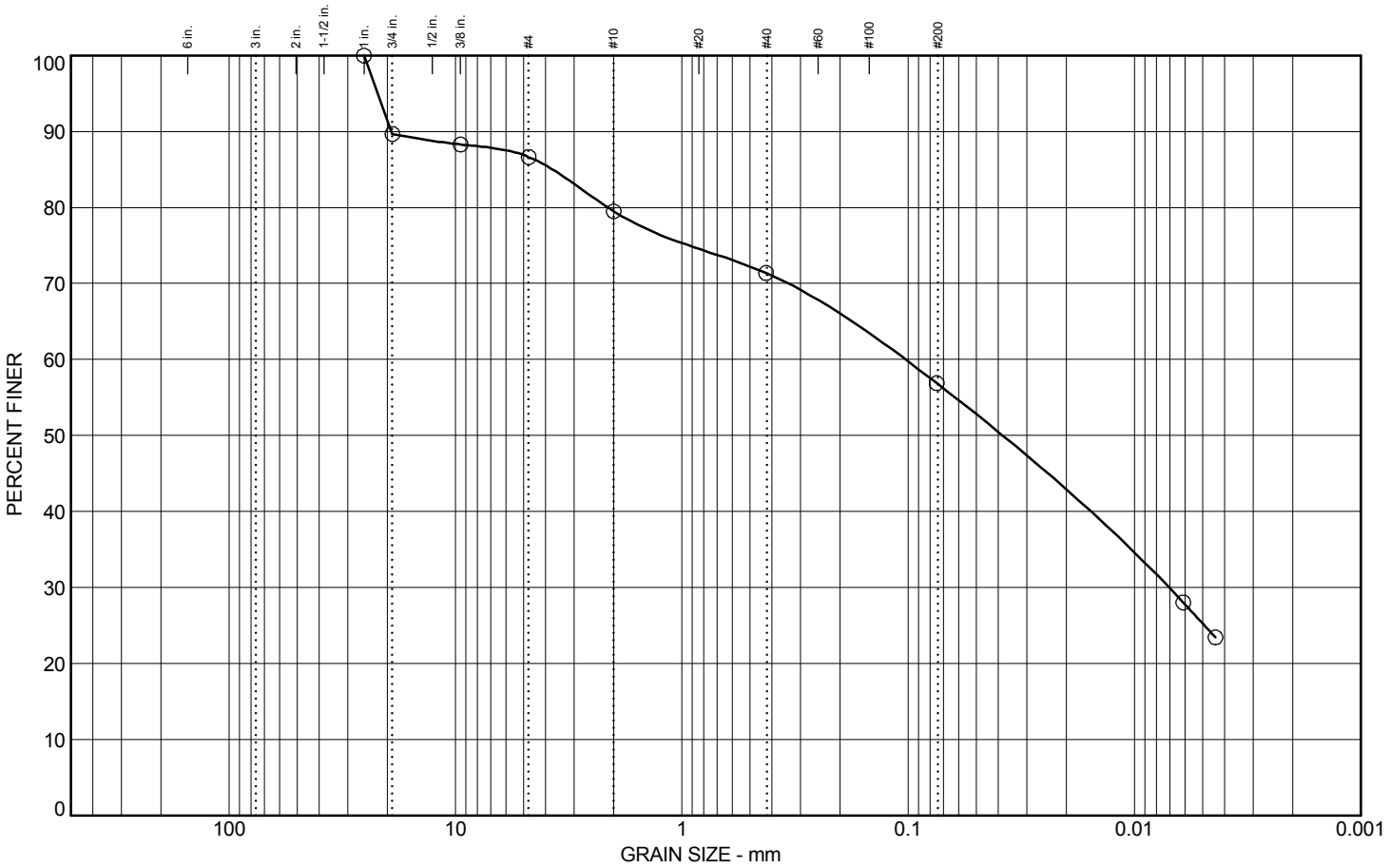
Remarks

Group Index = 1

Sample No.: 1 **Source of Sample:** B-3 **Date:** 2/2/2012
Location: - **Depth / Elev:** 0' / 752.37'

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	10.3	10.2	8.1	14.5	31.7	25.2

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
25.4	100.0		
19	89.7		
9.5	88.3		
4.75	86.6		
2	79.5		
0.425	71.4		
0.075	56.9		

* (no specification provided)

Soil Description

low plasticity clay, fine to medium sand

General Characteristics

Moisture Content = 15.5%

Atterberg Limits

LL= 31 PL= 19 PI= 12

Coefficients

D_{85}= 3.895 D_{60}= 0.109 D_{50}= 0.041
D_{30}= 0.007 D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-6a USCS = CL

Remarks

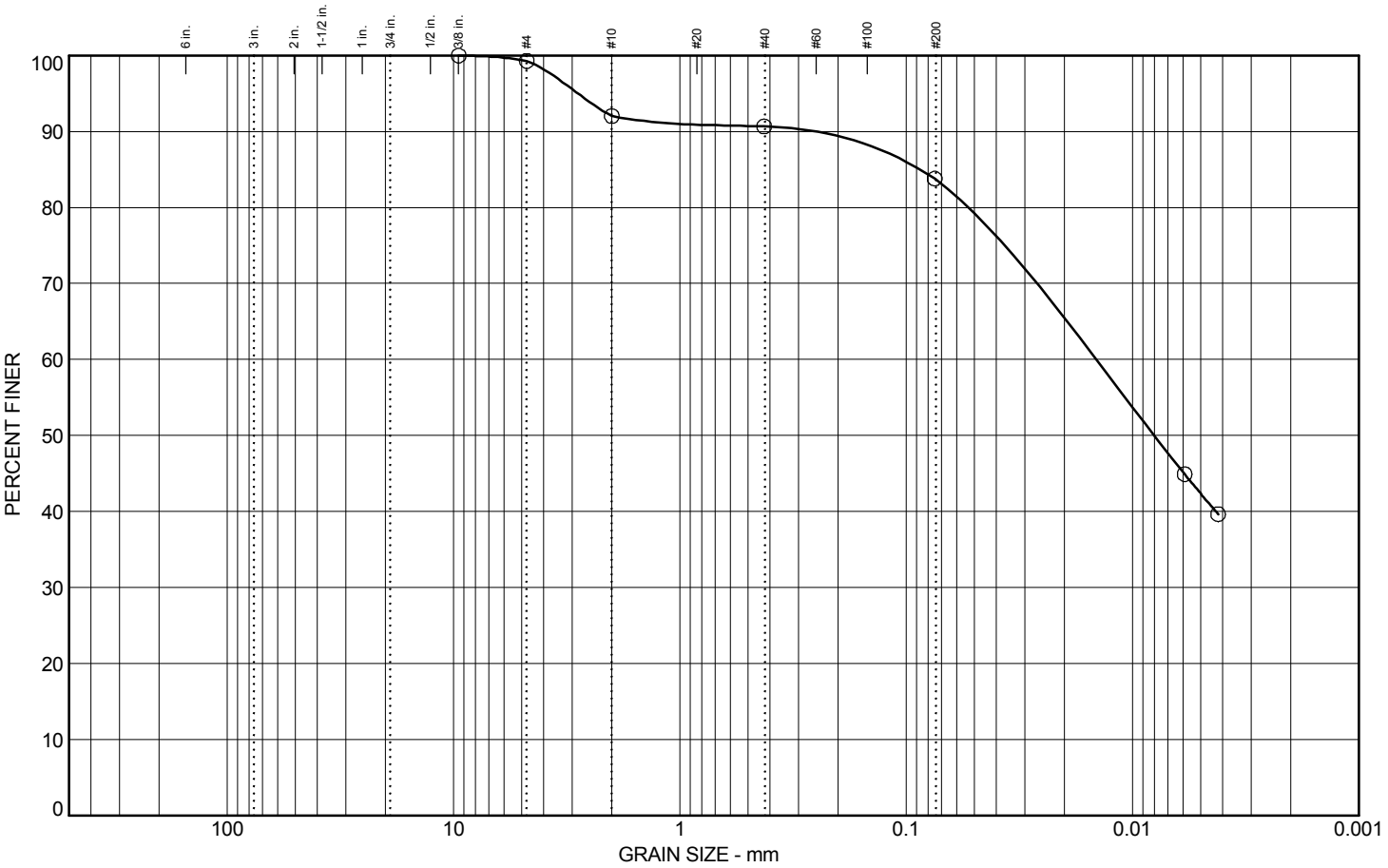
Group Index = 5

Sample No.: 2 **Source of Sample:** B-3 **Date:** 2/2/2012
Location: - **Depth / Elev:** 1.5' / 750.87'

DLZ

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	8.0	1.4	6.9	41.5	42.3

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
9.5	100.0		
4.75	99.3		
2	92.0		
0.425	90.7		
0.075	83.8		

* (no specification provided)

Soil Description

high plasticity silt, fine and coarse sand

General Characteristics

Moisture Content = 40.6%

Atterberg Limits

LL= 52 PL= 29 PI= 23

Coefficients

D_{85}= 0.102 D_{60}= 0.016 D_{50}= 0.008
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-7-6 USCS = MH

Remarks

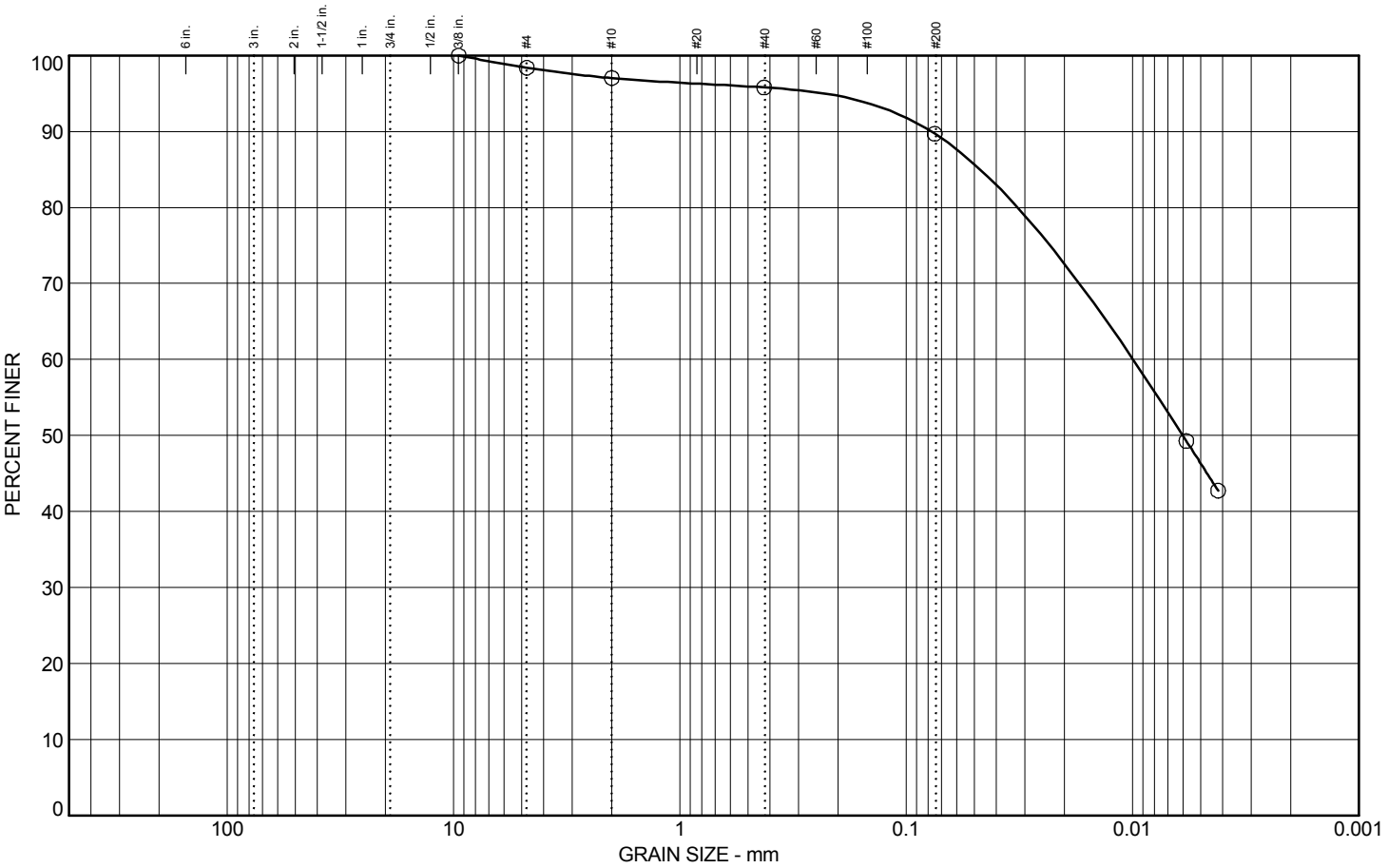
Group Index = 16

Sample No.: 1 **Source of Sample:** B-4 **Date:** 2/2/2012
Location: - **Depth / Elev:** 0' / 751.83'

DLZ

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	3.0	1.2	6.1	43.5	46.3

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
9.5	100.0		
4.75	98.4		
2	97.0		
0.425	95.8		
0.075	89.7		

* (no specification provided)

Soil Description

high plasticity clay

General Characteristics

Moisture Content = 39.2%

Atterberg Limits

LL= 54 PL= 27 PI= 27

Coefficients

D_{85}= 0.056 D_{60}= 0.011 D_{50}= 0.006
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-7-6 USCS = CH

Remarks

Group Index = 18

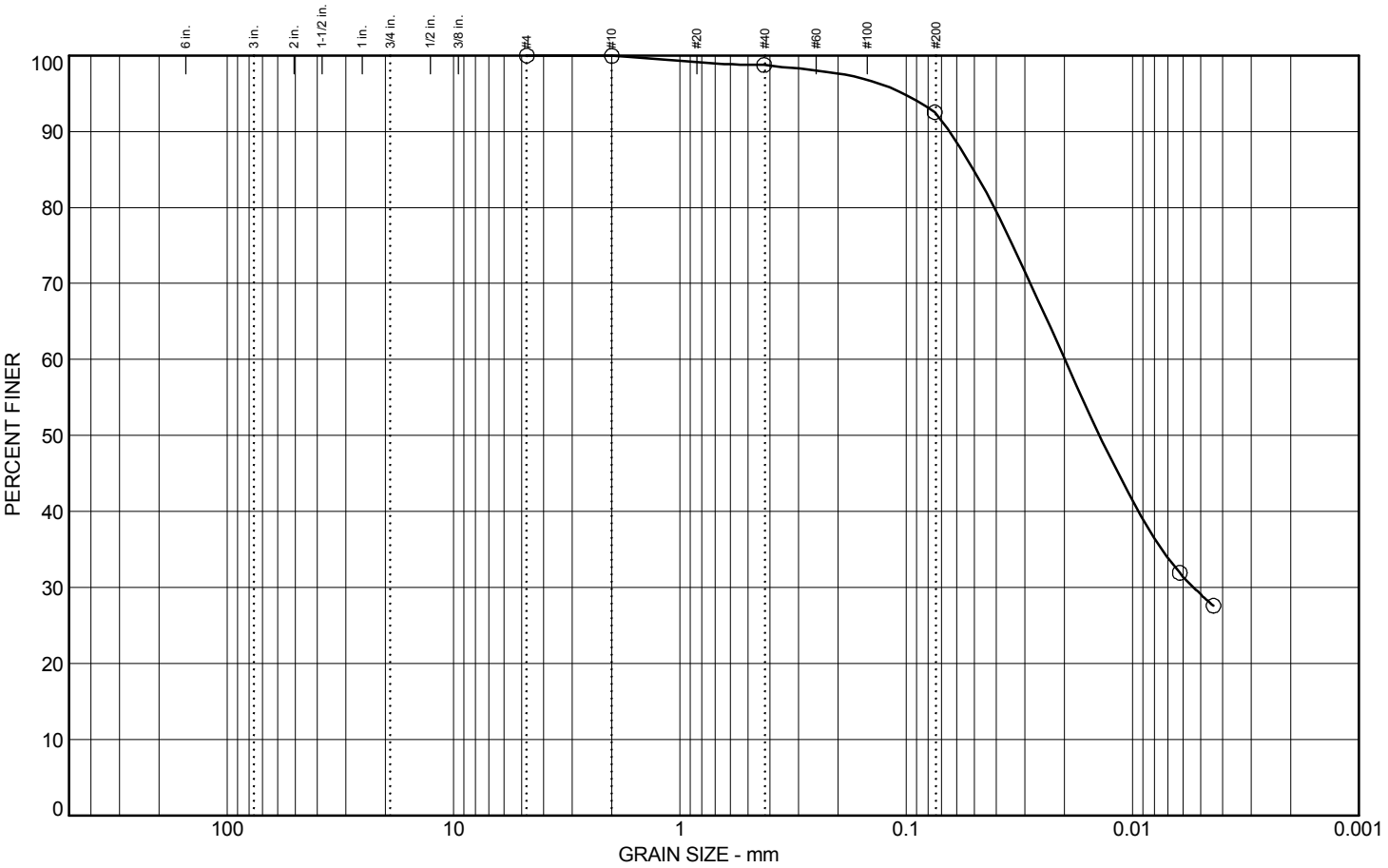
Sample No.: 2 **Source of Sample:** B-4 **Date:** 2/1/2012
Location: - **Depth / Elev:** 1.5' / 750.33'

DLZ

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

GRAIN SIZE II - DLZ MOD - GINT STD US LAB.GDT - 2/9/12 14:25 - S:\DEPT\GEOTECHNICAL\GINT\PROJECTS\1121-1010.00 WINCHESTER PIKE AT BIXBY-BRICE.GPJ

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	0.0	1.2	6.2	63.3	29.2

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4.75	100.0		
2	100.0		
0.425	98.8		
0.075	92.5		

* (no specification provided)

Soil Description

low plasticity clay

General Characteristics

Moisture Content = 34.8%

Atterberg Limits

LL= 30 PL= 20 PI= 10

Coefficients

D_{85}= 0.055 D_{60}= 0.02 D_{50}= 0.013
D_{30}= 0.005 D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-4b USCS = CL

Remarks

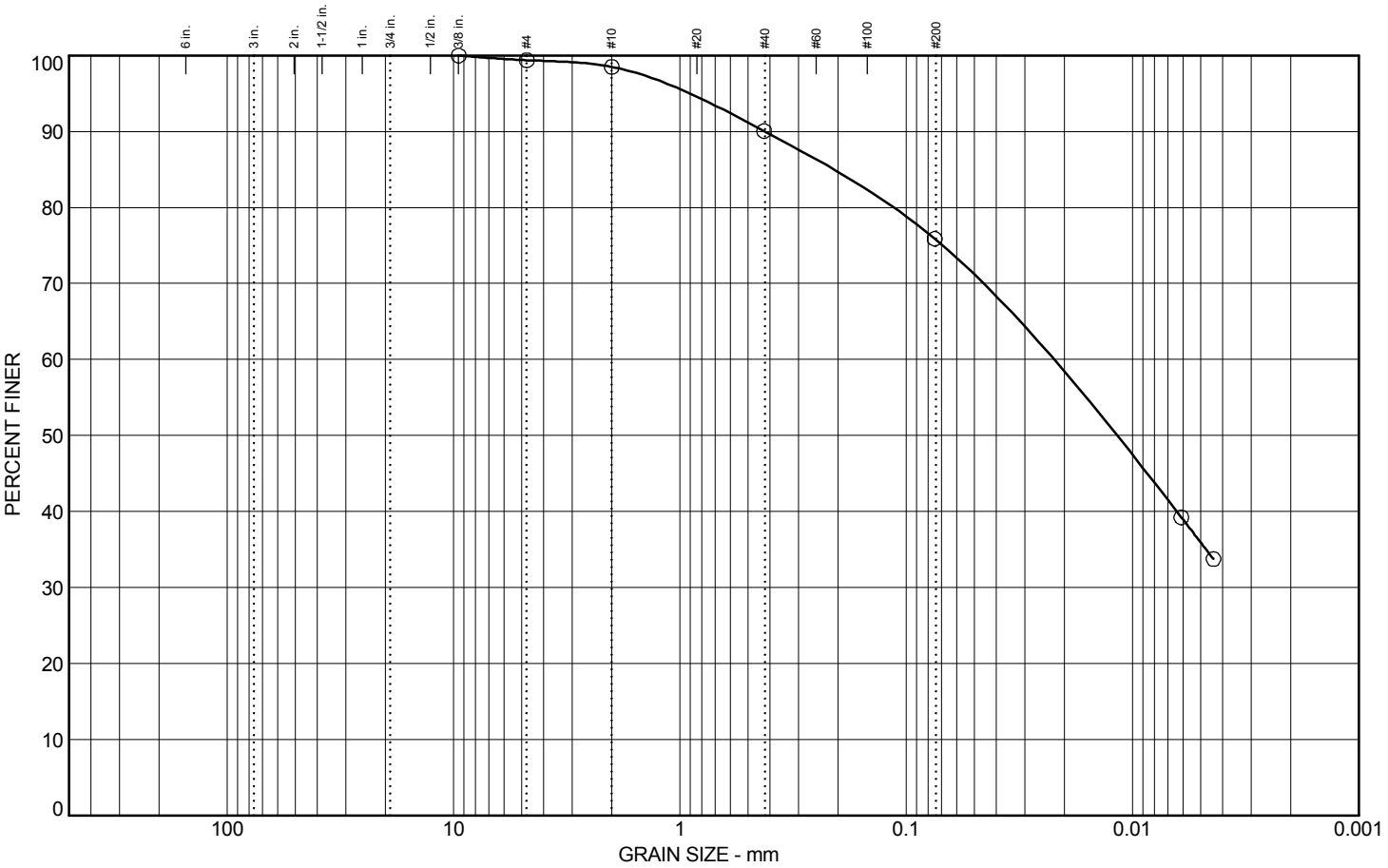
Group Index = 8

Sample No.: 4 **Source of Sample:** B-4 **Date:** 2/3/2012
Location: - **Depth / Elev:** 4.5' / 747.33'

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

GRAIN SIZE II - DLZ MOD - GINT STD US LAB.GDT - 2/9/12 14:25 - S:\DEPT\GEOTECHNICAL\GINT\PROJECTS\1121-1010.00 WINCHESTER PIKE AT BIXBY-BRICE.GPJ

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	1.5	8.4	14.2	40.0	35.9

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
9.5	100.0		
4.75	99.4		
2	98.5		
0.425	90.1		
0.075	75.9		

* (no specification provided)

Soil Description

moderate plasticity clay, fine to medium sand

General Characteristics

Moisture Content = 21.8%

Atterberg Limits

LL= 35 PL= 20 PI= 15

Coefficients

D_{85}= 0.229 D_{60}= 0.025 D_{50}= 0.013
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-6a USCS = CL

Remarks

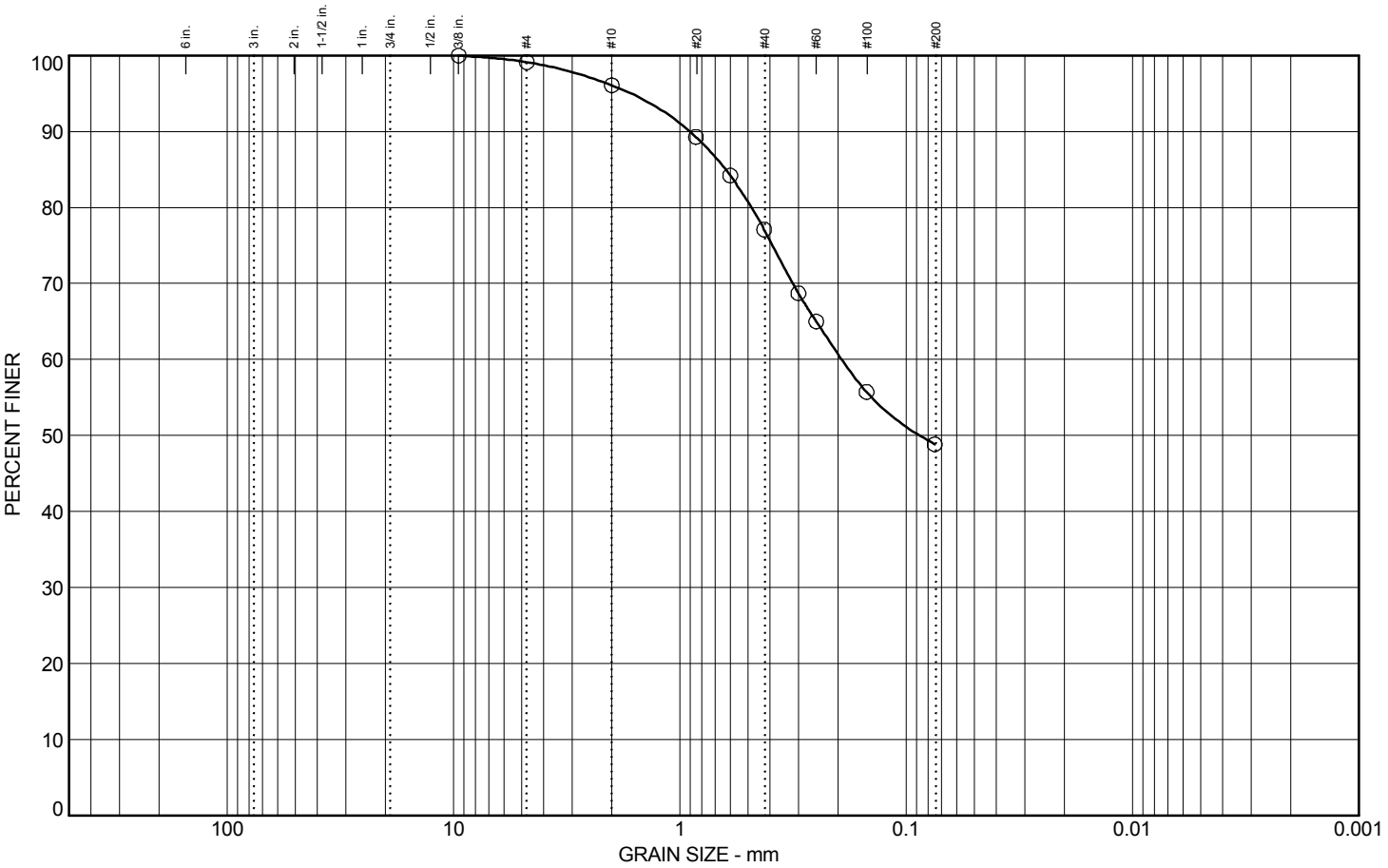
Group Index = 10

Sample No.: 1 **Source of Sample:** B-5 **Date:** 2/2/2012
Location: - **Depth / Elev:** 0' / 757.38'

DLZ

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	3.9	19.0	28.3	48.8	

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
9.5	100.0		
4.75	99.1		
2	96.1		
0.85	89.3		
0.6	84.2		
0.425	77.1		
0.3	68.7		
0.25	65.0		
0.15	55.7		
0.075	48.8		

* (no specification provided)

Soil Description

General Characteristics

Moisture Content = 20.4%

Atterberg Limits

LL= PL= PI=

Coefficients

D_{85}= 0.634 D_{60}= 0.19 D_{50}= 0.084
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = USCS =

Remarks

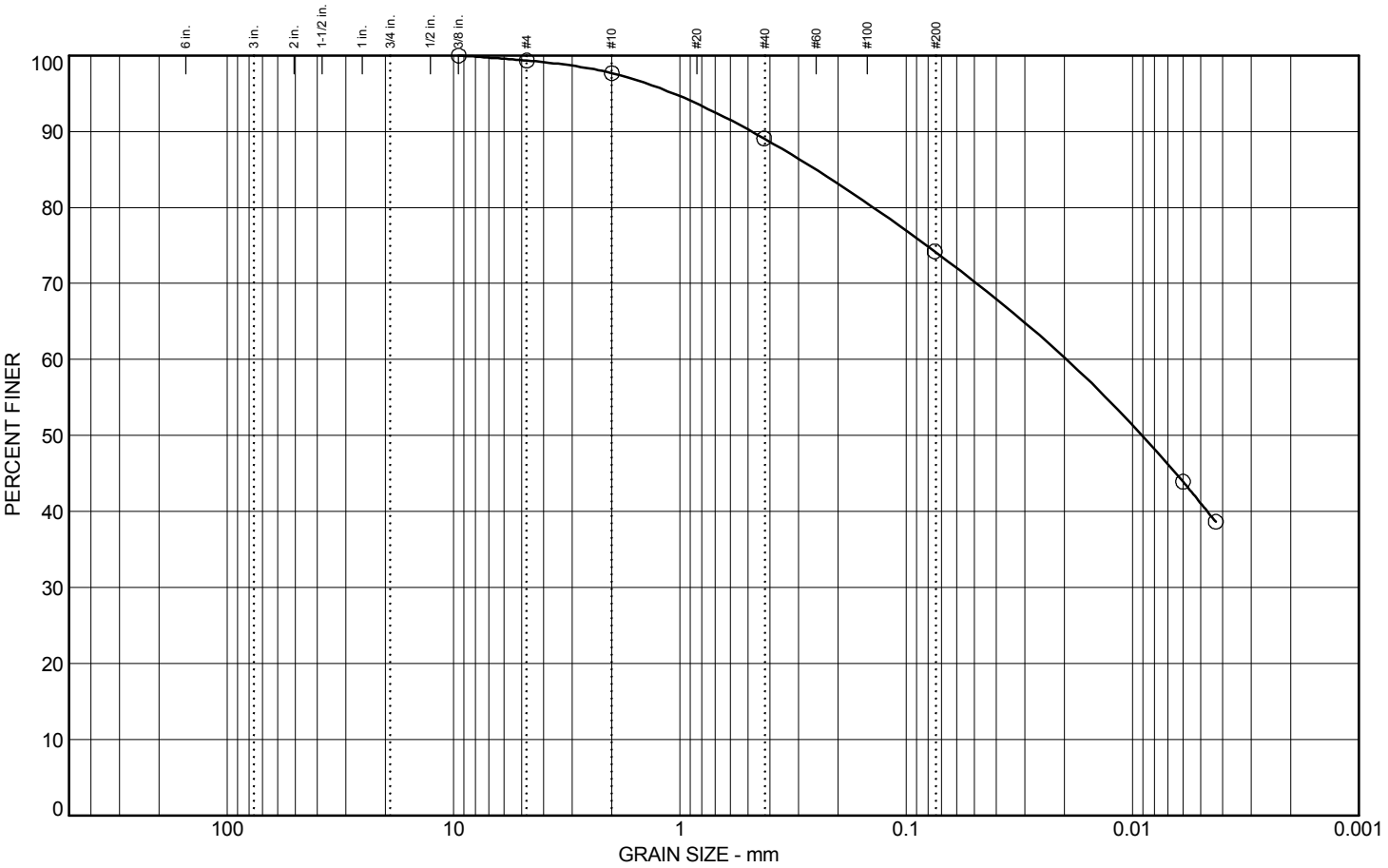
Group Index =

Sample No.: 1 **Source of Sample:** B-5 **Date:** 2/2/2012
Location: - **Depth / Elev:** 0.01' / 757.37'

DLZ

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	2.3	8.6	14.9	33.2	41.0

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
9.5	100.0		
4.75	99.3		
2	97.7		
0.425	89.1		
0.075	74.2		

* (no specification provided)

Soil Description

moderate plasticity clay, fine to medium sand

General Characteristics

Moisture Content = 22.4%

Atterberg Limits

LL= 38 PL= 15 PI= 23

Coefficients

D_{85}= 0.264 D_{60}= 0.023 D_{50}= 0.01
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-6b USCS = CL

Remarks

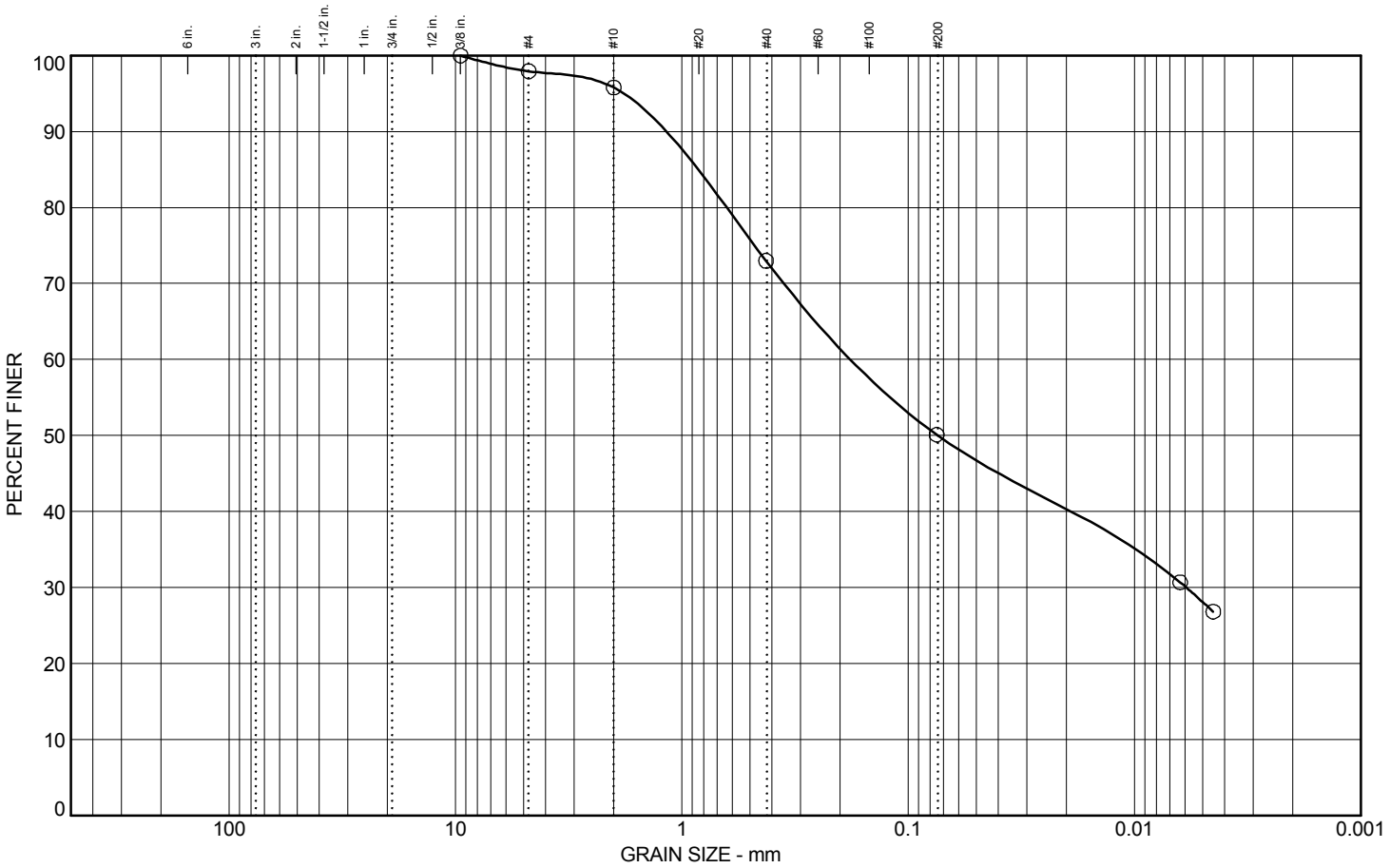
Group Index = 13

Sample No.: 2 **Source of Sample:** B-5 **Date:** 2/1/2012
Location: - **Depth / Elev:** 1.5' / 755.88'

DLZ

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	4.2	22.8	22.9	22.1	28.0

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
9.5	100.0		
4.75	97.9		
2	95.8		
0.425	73.0		
0.075	50.1		

* (no specification provided)

Soil Description

moderate plasticity clay, fine to medium sand

General Characteristics

Moisture Content = 34.2%

Atterberg Limits

LL= 39 PL= 20 PI= 19

Coefficients

D_{85}= 0.961 D_{60}= 0.159 D_{50}= 0.074
D_{30}= 0.006 D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-6b USCS = CL

Remarks

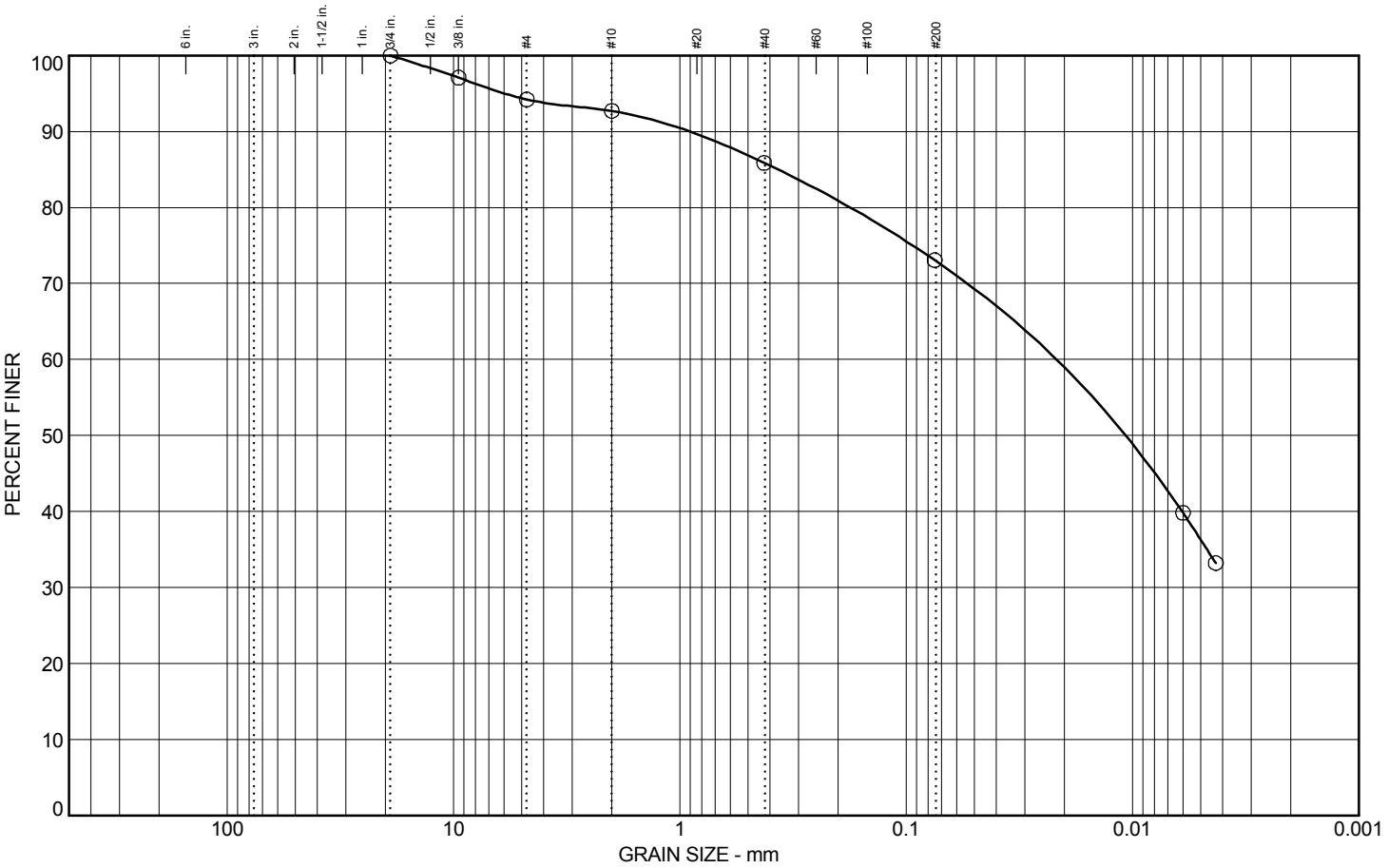
Group Index = 6

Sample No.: 4 **Source of Sample:** B-5 **Date:** 2/3/2012
Location: - **Depth / Elev:** 4.5' / 752.88'

DLZ

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	7.3	6.8	12.8	36.9	36.2

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
19	100.0		
9.5	97.1		
4.75	94.2		
2	92.7		
0.425	85.9		
0.075	73.1		

* (no specification provided)

Soil Description

moderate plasticity clay, fine to medium sand

General Characteristics

Moisture Content = 18.6%

Atterberg Limits

LL= 35 PL= 18 PI= 17

Coefficients

D_{85}= 0.378 D_{60}= 0.028 D_{50}= 0.013
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-6b USCS = CL

Remarks

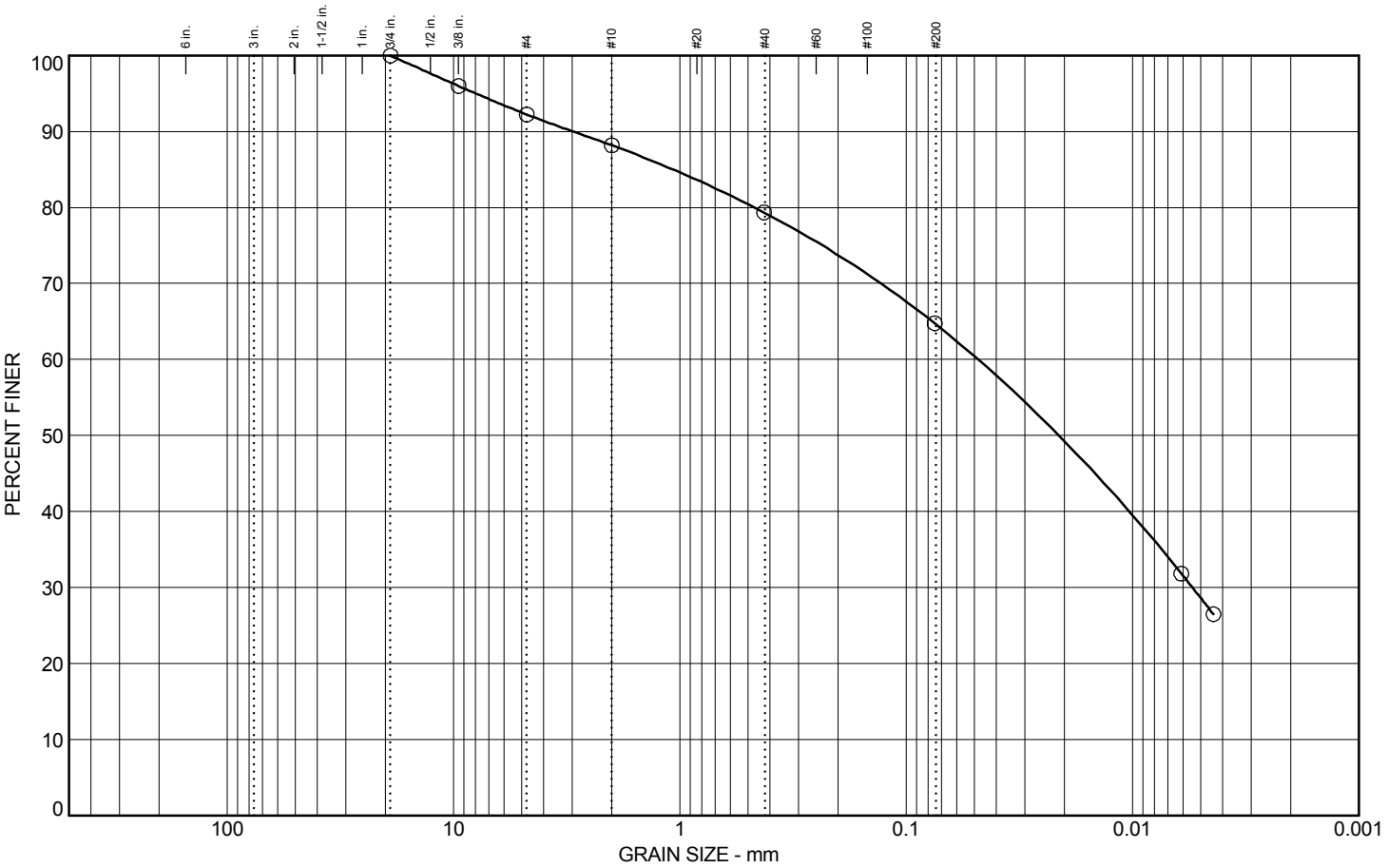
Group Index = 10

Sample No.: 1 **Source of Sample:** B-6 **Date:** 2/3/2012
Location: - **Depth / Elev:** 0' / 760.72'

DLZ

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	11.8	8.8	14.6	36.2	28.6

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
19	100.0		
9.5	96.0		
4.75	92.2		
2	88.2		
0.425	79.3		
0.075	64.8		

* (no specification provided)

Soil Description

low plasticity clay, fine to medium sand

General Characteristics

Moisture Content = 20.5%

Atterberg Limits

LL= 30 PL= 18 PI= 12

Coefficients

D_{85}= 1.145 D_{60}= 0.052 D_{50}= 0.024
D_{30}= 0.005 D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-6a USCS = CL

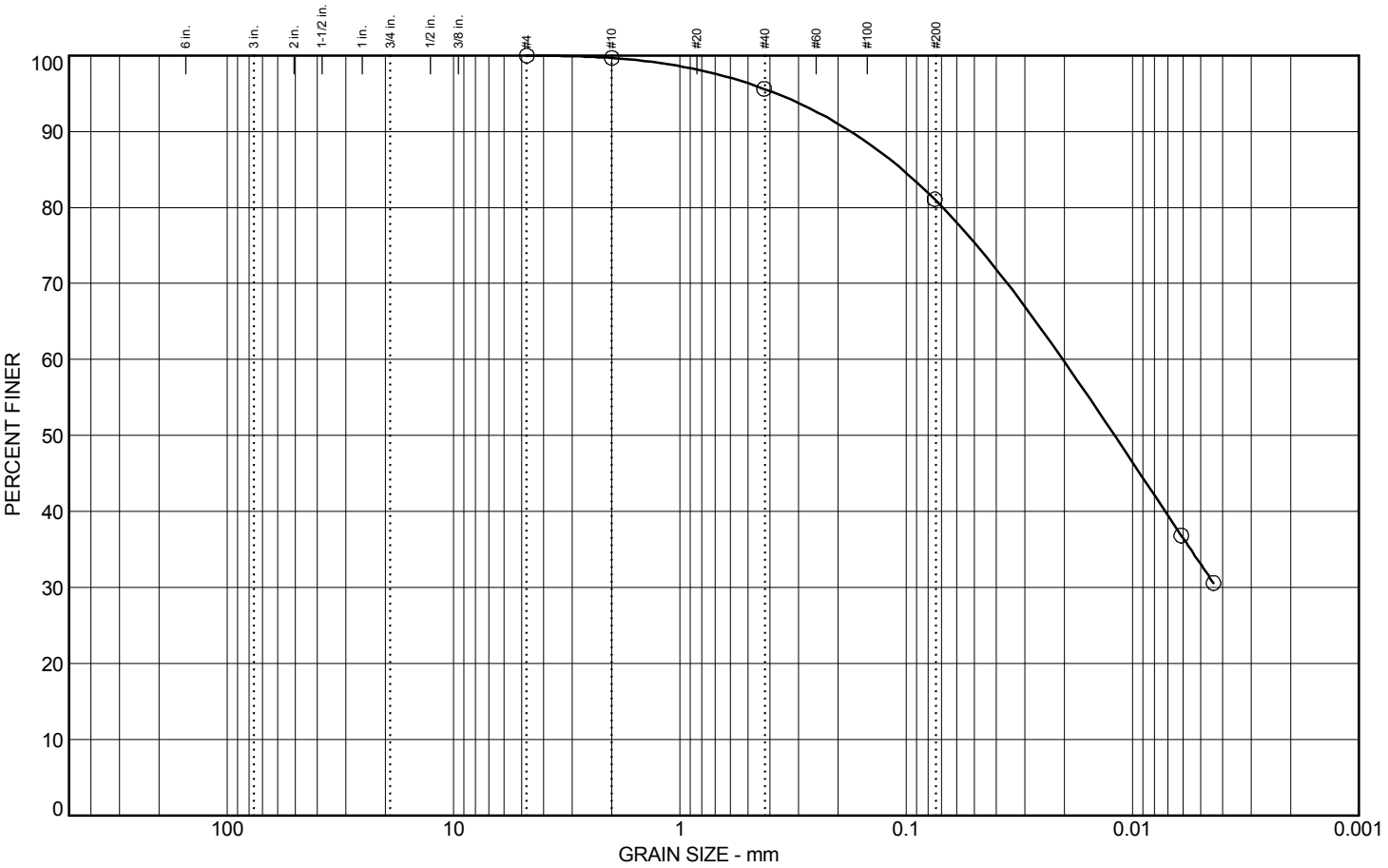
Remarks

Group Index = 7

Sample No.: 2 **Source of Sample:** B-6 **Date:** 2/3/2012
Location: - **Depth / Elev:** 1.5' / 759.22'

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	0.3	4.1	14.5	48.1	33.0

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4.75	100.0		
2	99.7		
0.425	95.6		
0.075	81.1		

* (no specification provided)

Soil Description

low plasticity clay, fine sand

General Characteristics

Moisture Content = 23.4%

Atterberg Limits

LL= 29 PL= 18 PI= 11

Coefficients

D_{85}= 0.12 D_{60}= 0.023 D_{50}= 0.013
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-6a USCS = CL

Remarks

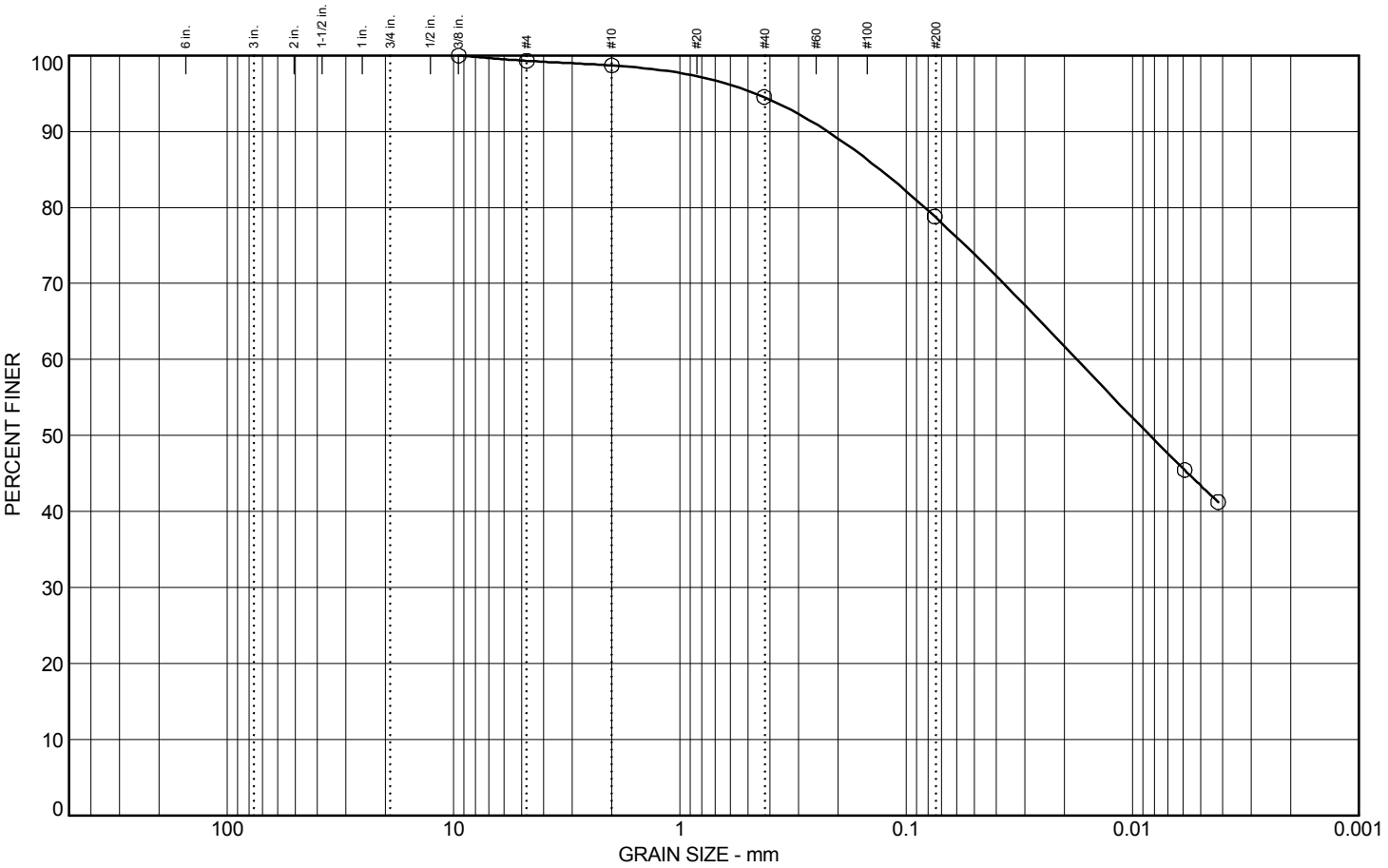
Group Index = 8

Sample No.: 1 **Source of Sample:** B-7 **Date:** 1/31/2012
Location: - **Depth / Elev:** 0' / 759.51'

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice

Project No: 1121-1010.00 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	1.3	4.1	15.7	35.4	43.4

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
9.5	100.0		
4.75	99.3		
2	98.7		
0.425	94.5		
0.075	78.8		

* (no specification provided)

Soil Description

moderate plasticity clay, fine sand

General Characteristics

Moisture Content = 26.1%

Atterberg Limits

LL= 39 PL= 20 PI= 19

Coefficients

D_{85}= 0.148 D_{60}= 0.018 D_{50}= 0.008
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-6b USCS = CL

Remarks

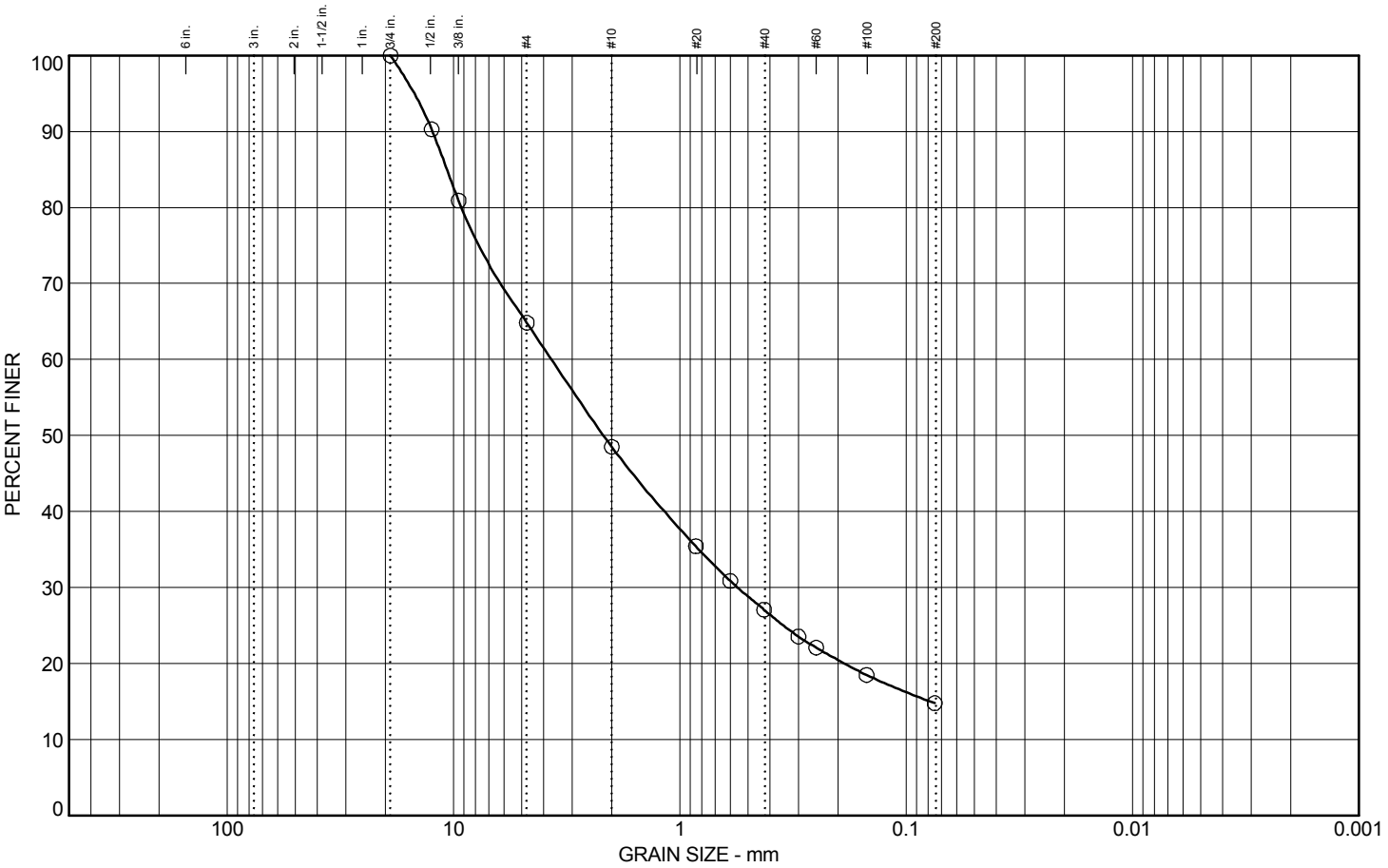
Group Index = 12

Sample No.: 2 **Source of Sample:** B-7 **Date:** 2/1/2012
Location: - **Depth / Elev:** 1.5' / 758.01'

DLZ

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	51.5	21.4	12.3	14.8	

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
19	100.0		
12.5	90.3		
9.5	80.9		
4.75	64.8		
2	48.5		
0.85	35.4		
0.6	30.8		
0.425	27.1		
0.3	23.5		
0.25	22.1		
0.15	18.5		
0.075	14.8		

* (no specification provided)

Soil Description

General Characteristics

Moisture Content = 8.8%

Atterberg Limits

LL= PL= PI=

Coefficients

D_{85}= 10.709 D_{60}= 3.678 D_{50}= 2.166
D_{30}= 0.556 D_{15}= 0.079 D_{10}=
C_u= C_c=

Classification

ODOT = USCS =

Remarks

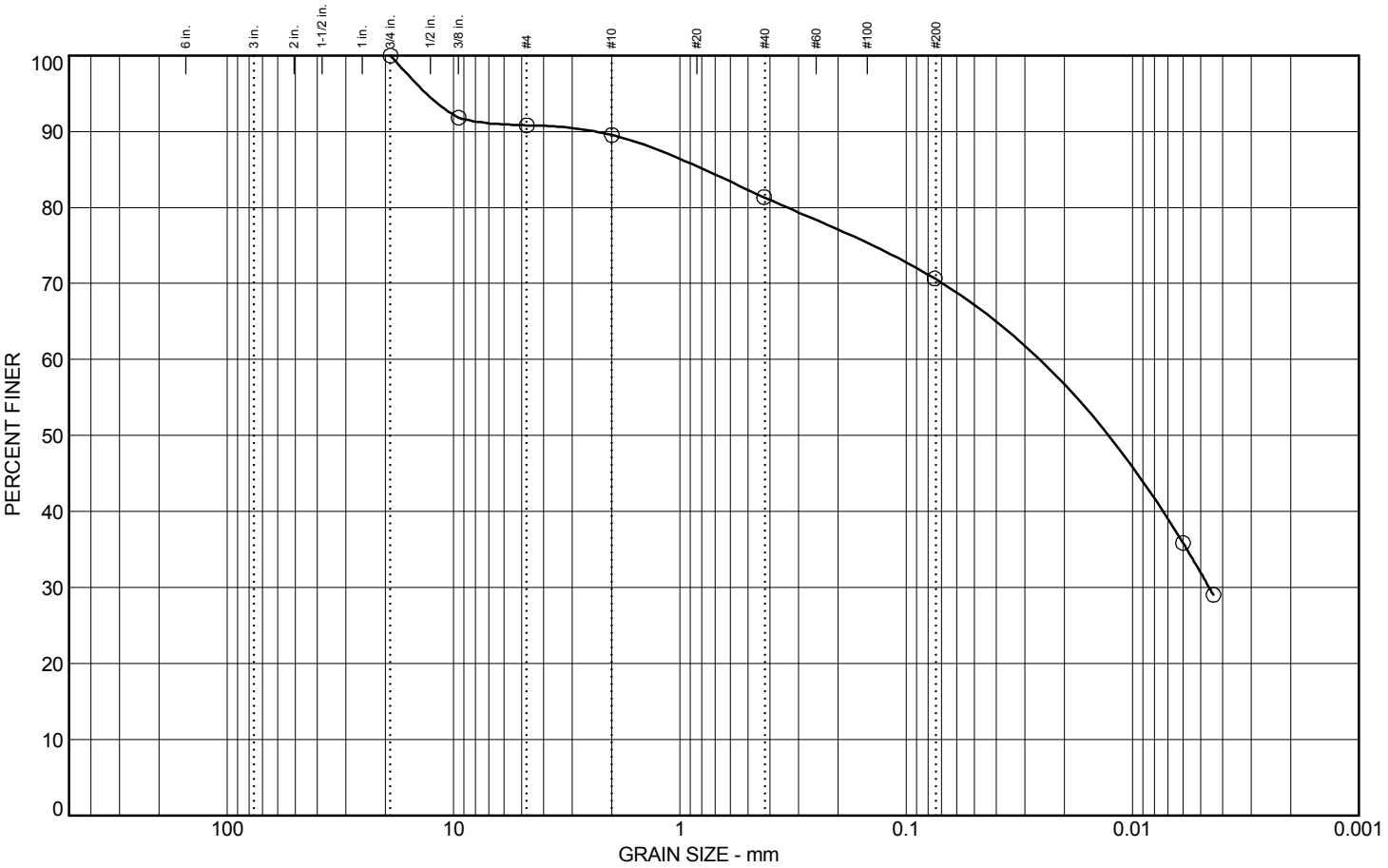
Group Index =

Sample No.: 1 **Source of Sample:** B-8 **Date:** 2/1/2012
Location: - **Depth / Elev:** 0' / 754.95'

DLZ

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	10.4	8.2	10.7	38.8	31.8

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
19	100.0		
9.5	91.8		
4.75	90.8		
2	89.6		
0.425	81.4		
0.075	70.7		

* (no specification provided)

Soil Description

moderate plasticity clay, fine to medium sand

General Characteristics

Moisture Content = 26.5%

Atterberg Limits

LL= 43 PL= 24 PI= 19

Coefficients

D_{85}= 0.846 D_{60}= 0.035 D_{50}= 0.017
D_{30}= 0.005 D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-7-6 USCS = CL

Remarks

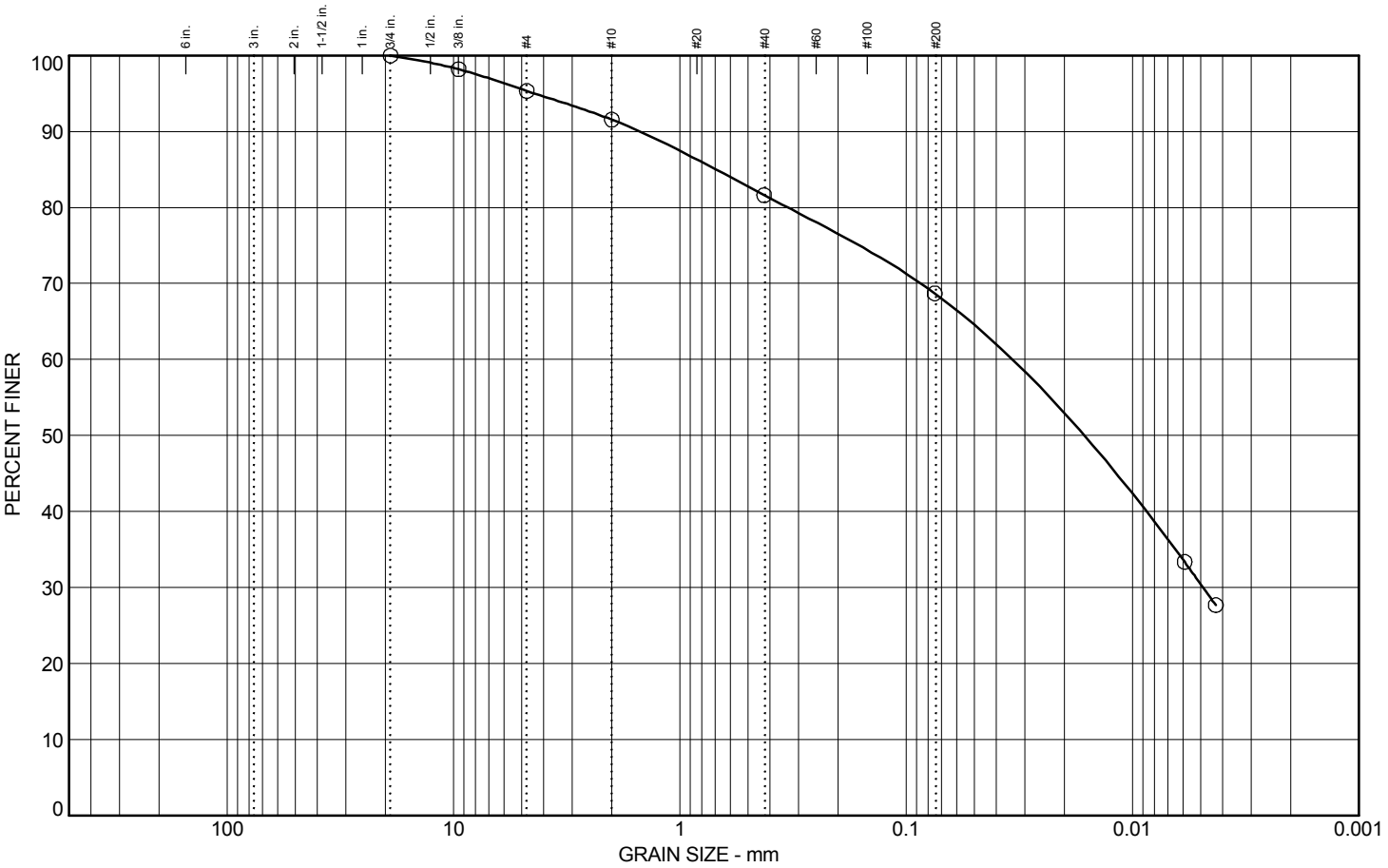
Group Index = 11

Sample No.: 2 **Source of Sample:** B-8 **Date:** 2/1/2012
Location: - **Depth / Elev:** 1.5' / 753.45'

DLZ

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	8.4	9.9	12.9	38.3	30.4

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
19	100.0		
9.5	98.2		
4.75	95.3		
2	91.6		
0.425	81.6		
0.075	68.7		

* (no specification provided)

Soil Description

low plasticity clay, fine to medium sand

General Characteristics

Moisture Content = 18.9%

Atterberg Limits

LL= 29 PL= 19 PI= 10

Coefficients

D_{85}= 0.719 D_{60}= 0.04 D_{50}= 0.02
D_{30}= 0.005 D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-4a USCS = CL

Remarks

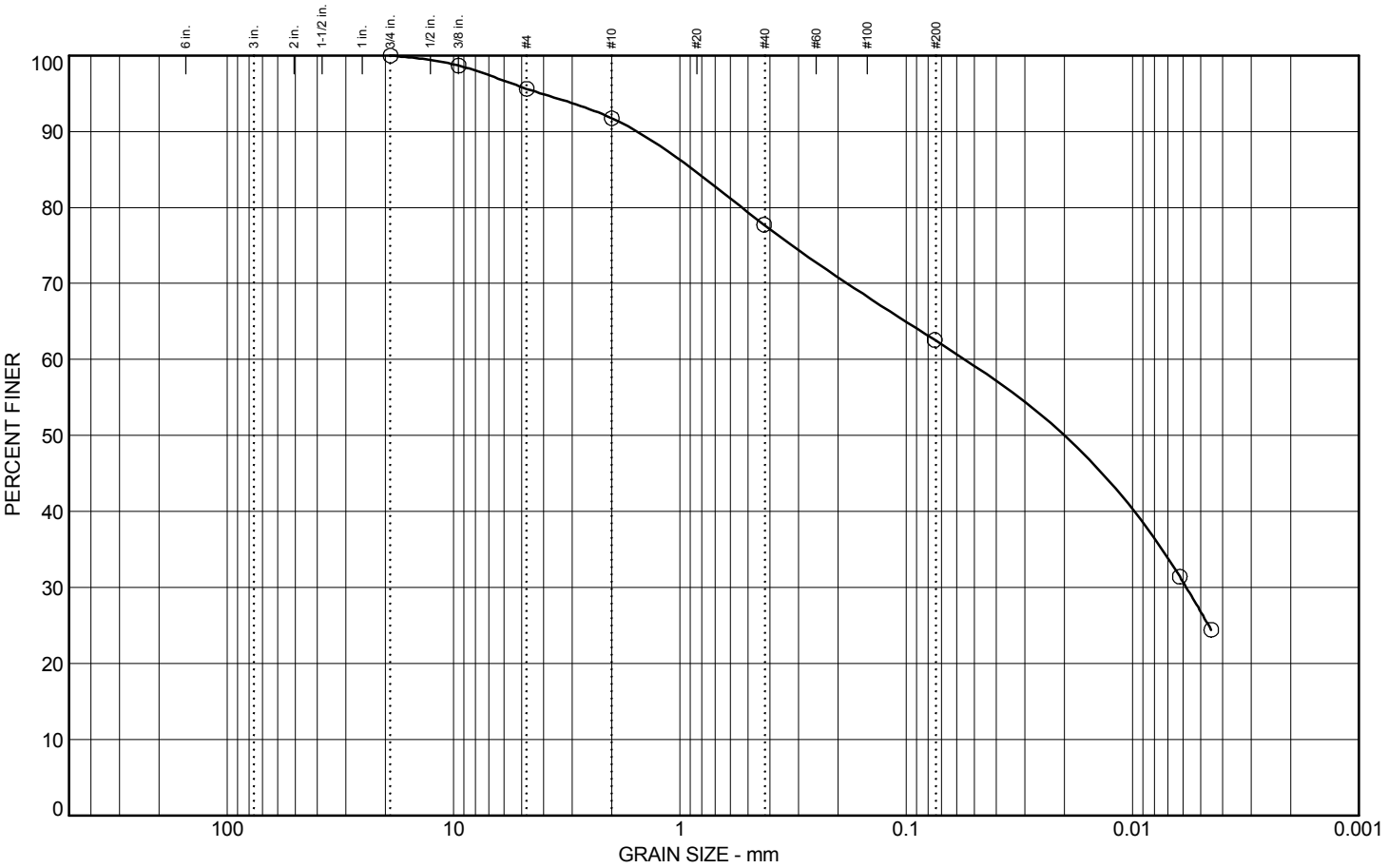
Group Index = 7

Sample No.: 1 **Source of Sample:** B-9 **Date:** 2/1/2012
Location: - **Depth / Elev:** 0' / 761.82'

DLZ

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% COBBLES	% GRAVEL		% SAND		% FINES	
	CRS.	FINE	CRS.	FINE	SILT	CLAY
0.0	0.0	8.3	14.0	15.2	35.9	26.7

SIEVE SIZE (mm)	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
19	100.0		
9.5	98.7		
4.75	95.6		
2	91.7		
0.425	77.7		
0.075	62.6		

* (no specification provided)

Soil Description

low plasticity clay, fine to medium sand

General Characteristics

Moisture Content = 17.8%

Atterberg Limits

LL= 27 PL= 18 PI= 9

Coefficients

D_{85}= 0.949 D_{60}= 0.061 D_{50}= 0.027
D_{30}= 0.006 D_{15}= D_{10}=
C_u= C_c=

Classification

ODOT = A-4a USCS = CL

Remarks

Group Index = 6

Sample No.: 2 **Source of Sample:** B-9 **Date:** 2/3/2012
Location: - **Depth / Elev:** 1.5' / 760.32'

DLZ

Client: Franklin County Engineer
Project: Winchester Pike at Bixby-Brice
Project No: 1121-1010.00 **Figure**

GRAIN SIZE II - DLZ MOD - GINT STD US LAB.GDT - 2/9/12 14:27 - S:\DEPT\GEOTECHNICAL\GINT\PROJECTS\1121-1010.00 WINCHESTER PIKE AT BIXBY-BRICE.GPJ

Subgrade Analysis

V. 12.00 12/30/11

Design CBR 6

Global Options		
320	R&R	No
206	CS	?
	LS	?
	LKD	?
206	Depth	16

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	0	1	0	0	0	0	1	0	0	1	0	1	37	0	0	0	3
		2%					2%			2%		2%	84%				7%
0%	5%								95%								

Surface Class		
2-5	0	
4b	1	9%
5	0	
7-5	0	
7-6	0	
8a	0	
8b	1	9%
R	0	

% Borings	
N_{60L}<= 5	18%
<=10	100%
>=20	0%
M+	0%
R	0%

% Surface	
82%	
18%	82%

Rig	ER
A	79
B	66
C	
D	
E	
F	
G	
H	

Total Borings	11
PID	82404
Location	FRA-Bixby "East Alt. A"

	N_{60}	N_{60L}	PI	Clay	M	M_{OPT}	GI
Average	13.4	6.8				15.4	9.66
Maximum	111	10				16	10
Minimum	0	0				6	0

UC @ Surface
21.4
36
16

Boring					Cut	Subgrade		Standard Penetration						Physical Characteristics						Moisture		Class		Comments	Problem		Undercuts	
#	B #	Boring Location	Depth	To	Fill	Depth	To	n_2	n_3	N	Rig	N_{60}	N_{60L}	LL	PL	PI	% Silt	% Clay	P 200	M	M_{OPT}	Ohio DOT	GI		w/ Class	w/ MN	UC Class	UC MN
1	B-1	As per plan	0.0	1.5	0.5	0.5	2.0	2	4	6	A	8									10	4b			4b	N	36	18
			1.5	3.0		2.0	3.5	2	4	6		8									16	6b	10			N		18
			3.0	4.5		3.5	5.0	3	4	7		9									16	6b	10			N		16
			4.5	6.0		5.0	6.5	5	6	11		14	8								16	6b	10			MN		
2	B-2	As per plan	0.0	1.5	0.0	0.0	1.5	2	5	7	A	9									16	6b	10			N		16
			1.5	3.0		1.5	3.0	4	5	9		12									16	6b	10			MN		
			3.0	4.5		3.0	4.5	3	3	6		8									16	6b	10			N		18
			4.5	6.0		4.5	6.0	2	3	5		7	7								16	6b	10			N		21
3	B-3	As per plan	0.0	1.5	2.5	2.5	4.0	7	11	18	B	20									16	6b	10					
			1.5	3.0		4.0	5.5	4	5	9		10									16	6b	10			N		15
			3.0	4.5		5.5	7.0	17	40	57		63									16	6b		Drove gravel				
			4.5	6.0		7.0	8.5	7	7	14		15	10								16	6b						
4	B-4	As per plan	0.0	1.5	3.5	3.5	5.0	2	3	5	B	6										8b			Un	N	36/All	24
			1.5	3.0		5.0	6.5	2	3	5		6										8b			Un	N	36/All	24
			3.0	4.5		6.5	8.0	3	3	6		7										8b			Un	N	36/All	21
			4.5	6.0		8.0	9.5	0	0	0		0	0								16	6b				N		48
5	B-5	As per plan	0.0	1.5	2.0	2.0	3.5	4	4	8	B	9									16	6b	10			N		16
			1.5	3.0		3.5	5.0	4	5	9		10									16	6b	10			N		15
			3.0	4.5		5.0	6.5	4	4	8		9									16	6b	10			N		16
			4.5	6.0		6.5	8.0	2	2	4		4	4								10	2-6				N		30
6	B-6	As per plan	0.0	1.5	1.0	1.0	2.5	3	4	7	A	9									16	6b	10			N		16
			1.5	3.0		2.5	4.0	2	3	5		7									16	6b	10			N		21
			3.0	4.5		4.0	5.5	41	43	84		111									16	6b	10	Drove gravel				
			4.5	6.0		5.5	7.0	8	6	14		18	7								16	6b						
7	B-7	As per plan	0.0	1.5	0.0	0.0	1.5	3	3	6	B	7									16	6b	10			N		21
			1.5	3.0		1.5	3.0	3	5	8		9									16	6b	10			N		16
			3.0	4.5		3.0	4.5	4	7	11		12									16	6b	10			MN		
			4.5	6.0		4.5	6.0	8	11	19		21	7								16	6b	10					
8	B-8	As per plan	0.0	1.5	0.5	0.5	2.0	4	4	8	A	11									6	1b	0			N		---
			1.5	3.0		2.0	3.5	2	3	5		7									16	6b	10			N		21
			3.0	4.5		3.5	5.0	2	3	5		7									16	6b	10			N		21
			4.5	6.0		5.0	6.5	2	3	5		7	7								16	6b	10			N		21
9	B-9	As per plan	0.0	1.5	0.0	0.0	1.5	3	3	6	A	8									14	6a	8			N		18
			1.5	3.0		1.5	3.0	6	3	9		12									16	6b	10			MN		
			3.0	4.5		3.0	4.5	4	2	6		8									16	6b	10			N		18
			4.5	6.0		4.5	6.0	4	7	11		14	8								16	6b	10			MN		
10	B-10	As per plan	0.0	1.5	0.0	0.0	1.5	4	3	7	A	9									16	6b	10			N		16
			1.5	3.0		1.5	3.0	4	3	7		9									16	6b	10			N		16
			3.0	4.5		3.0	4.5	5	5	10		13									16	6b	10			MN		
			4.5	6.0		4.5	6.0	6	7	13		17	9								16	6b	10					
11	B-11	As per plan	0.0	1.5	0.0	0.0	1.5	2	4	6	A	8									16	6b	10			N		18
			1.5	3.0		1.5	3.0	2	4	6		8									16	6b	10			N		18
			3.0	4.5		3.0	4.5	3	4	7		9									16	6b	10			N		16
			4.5	6.0		4.5	6.0	5	6	11		14	8								16	6b	10			MN		