BRIDGE AND RETAINING WALL
FOUNDATION INVESTIGATION REPORT
I-575 over SR CR 171 (Big Shanty Road)
Northwest Corridor Project

GDOT Project No. CSNHS-0008-00(256), PI No. 0008256
Cobb County, Georgia

WILLMER ENGINEERING INC.
Project No. ATL-171-3099C

Document No.: ATL-171-3099**C**
Revision: 1
Issue Date: August 22, 2008
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Prepared For

GEORGIA TRANSPORTATION PARTNERS
Atlanta, Georgia

Prepared By

WILLMER ENGINEERING INC.
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Suite 165
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770.939.0089

August 22, 2008

VIA COURIER

Pete M. McMahon, PE
Georgia Transportation Partners
c/o PBS&J, Inc.
5665 New Northside Drive, Suite 400
Atlanta, Georgia 30328

SUBJECT: Bridge and Retaining Wall Foundation Investigation Report
I-575 over CR 171 (Big Shanty Road)
Northwest Corridor Project
GDOT Project No. CSNHS-0008-00(256), PI No. 0008256
Cobb County, Georgia
Willmer Project No. ATL-171-3099C

Dear Mr. McMahon:

Willmer Engineering Inc. (Willmer) is pleased to provide this Bridge and Retaining Wall Foundation Investigation (BFI and WFI) report for the proposed widening of I-575 bridge over CR 171 (Big Shanty Road) in Cobb County, Georgia. The BFI and WFI were performed in general accordance with our contract with Georgia Transportation Partners (GTP), dated May 12, 2007. The objective of this investigation was to gather sufficient geotechnical information to support the costing plans to be developed by GTP. Additional borings will be performed in the design/build phase of the project to provide additional information as required. This report was prepared in general accordance with Georgia Department of Transportation (GDOT) guidance documents for bridge and retaining wall foundation investigation. This report was revised to incorporate GTP comments dated December 18, 2007, and GDOT comments dated July 18, 2008.

The attached summary presents the site and subsurface conditions along the proposed bridge and retaining wall alignments, and our geotechnical recommendations related to foundation design and construction.

We appreciate the opportunity to be of service to you on this project and look forward to a continuing relationship. Please contact us if you have any questions concerning this report or require further assistance.

Sincerely,

WILLMER ENGINEERING INC.

Murthy S. Kotha
Project Engineer

Sujit K. Bhowmik, PhD, PE
Chief Engineer

James L. Willmer, PE
Executive Vice President/Principal Consultant

MSK/SKB/JLW:ks
I:\Word Processing\Projects\171-GEO\171-3099 Northwest Corridor Project (Bechtel)\Reports\3099 C - Big Shanty Road\171-3099C REVISED BFI - RWI Report - I-575 over CR 171 (Big Shanty Road) 8-22-08.doc

Attachments: **Bridge and Retaining Wall Foundation Investigations**

Figures

Appendix I

Appendix II

Revision History:

Revision	Issue Date	Document Status
A	December 5, 2007	Issued for Review
0	January 7, 2008	Issued for Use
1	August 22, 2008	Issued for Use

BRIDGE FOUNDATION INVESTIGATION	
Willmer Project Number	ATL-171-3099C
GDOT Project Number	CSNHS-0008-00(256)
Project P.I. Number	0008256
Location	I-575 Bridge over CR 171 (Big Shanty Road), Cobb County, Georgia (see Figure 1)
GENERAL INFORMATION	
Project Description	The existing I-575 bridges over CR 171 (Big Shanty Road) are planned to be replaced with two new parallel bridges as part of the proposed I-575 widening over Big Shanty Road. The bridges will be single span, 115 feet long reinforced concrete structures. New high occupancy vehicle (HOV) ramps from I-575 down to Big Shanty Road will be constructed between the two bridges. The existing bridges have three spans and are supported on H-pile bents at the end bents and H-pile footings at the intermediate bents. The BFI report for the existing bridges was obtained from GDOT, and it includes twelve borings performed by GDOT in 1976. Subsurface information from those twelve borings was used along with four new borings performed as part of the present study.
Geologic Information	The project alignment is geologically sited within the Piedmont Physiographic Province of Georgia, and is underlain by Metamorphosed Maffic Rock Formations which include amphibolite, mica schist, hornblende gneiss and biotite gneiss.
Subsurface Features	Subsurface information for this project was obtained from four borings (BB-1 through BB-4) performed by Willmer as part of the present study (see Appendix I) and twelve borings (B-1 through B-12) performed by GDOT in 1976 as part of the BFI for the existing bridges (see Appendix II). The subsurface profile is generally comprised of fill and residuum underlain by partially weathered rock and parent bedrock. It should be noted that the available logs for borings B-1 through B-12 do not differentiate between fill and residuum in the soil description. The fill material consists of loose to medium dense silty sand. The residual soils consist of loose to dense silty sand and/or very soft to firm sandy silt. During the present field investigation ground water was encountered at all boring locations between elevations 925 and 935 feet, and during the field investigation by GDOT in 1976, ground water was encountered between elevations 949 and 951 feet.

PWR AND AUGER REFUSAL ELEVATIONS (feet)				
Bridge	**Bent No.**	**Reference Boring No.**	**Top of PWR**	**Auger Refusal**
Left	1	BB-1	910	906
		B-2	912	*
		B-3	928	913
	2	BB-2	915	914
		B-4	912	905
		B-5	919	*
Right	1	B-8	922	*
		B-8A	920	*
		B-9	919	912
		BB-3	918	910
	2	B-10	908	*
		B-11	907	*
		BB-4	905	904

* Boring was not extended to auger refusal.

MAXIMUM PILE DESIGN LOADS			
Pile Type	**Load Transfer (%)**		**Design Load**
	Friction	**End Bearing**	
H-Piles	20	80	10 BP 42 = 55 Tons
			12 BP 53 = 70 Tons
			14 BP 73 = 96 Tons
			14 BP 89 = 117 Tons

FOUNDATION RECOMMENDATIONS			
Bridge	**Bent No.**	**Pile Footing (Type)**	**Pile Bent (Type)**
Left	1		H
	2		H
Right	1		H
	2		H

PILE TIP ELEVATIONS (feet)				
Bridge	**Bent No.**	**Reference Boring No.**	**H-Pile**	
			Minimum Tip	**Estimated Tip**
Left	1-Left	BB-1	915±	910±
	1-Center	B-2	918±	915±
	1-Right	B-3	925±	925±
	2-Left	BB-2	914±	914±
	2-Center	B-4	911±	909±
	2-Right	B-5	915±	909±
Right	1-Left	B-8	925±	918±
	1-Center	B-9	918±	918±
	1-Right	BB-3	915±	915±
	2-Left	B-10	920±	910±
	2-Center	B-11	919±	910±
	2-Right	BB-4	904±	904±

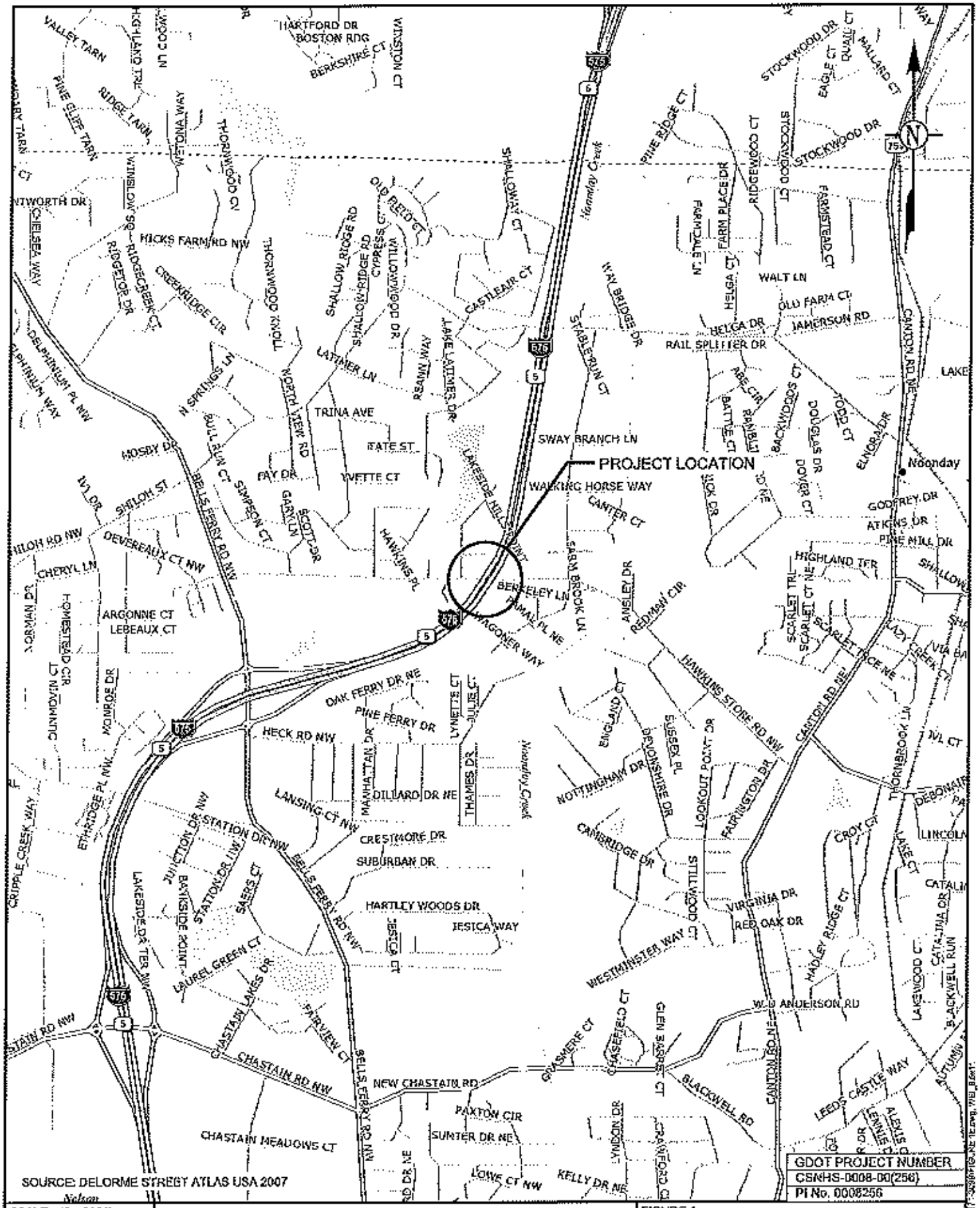
NOTES	
Elevations	All elevations referenced in this report are based on Control Points No. 508 (5/8" rebar, EL. 944.63 feet), No. 252 (60D Traverse, EL. 967.18 feet), No. 148 (1/2" rebar, EL. 956.41 feet) and No. 9203 (1/2" rebar, EL. 965.23 feet) established by the surveyors.
PDO	Driving resistance after Minimum Tip Elevations are achieved.
Points	Pile points are recommended for piles driven at all bents to insure adequate penetration into dense/very dense soils and PWR. The use of points should be at the direction of the project Geotechnical Engineer.
Down-drag Protection	To avoid inducing down-drag loads onto the piles from potential settlement of the loose to very loose silty sand and soft to very soft sandy silt layers during construction of the MSE wall, we recommend that the piles at both bents be protected from down-drag by using Jackets or other approved measures.
Waiting Period	None required (see MSE wall recommendations)
Special Problems	None.
As-built Information	As-built information should be forwarded to the Geotechnical Engineering Bureau upon completion of the foundation system.

RETAINING WALL INVESTIGATION	
Location and Description	Four retaining walls are proposed for the bridge abutments and new HOV ramps from I-575 down to CR 171 (Big Shanty Road). Wall Nos. 2 and 3 extend from Station 130+00 along the two sides of the proposed HOV ramp to the bridge abutment (approximate Station 137+75) and then wrap around to form the abutment and wing walls (see Figure 2B). Wall Nos. 4 and 5 extend from Station 146+00 along the two sides of the proposed HOV ramp to the bridge abutment (approximate station 139+55) and then wrap around to form the abutment and wing walls (see Figure 2C). The total length of each of Wall Nos. 2 and 3 is 930 feet, and the total length of each of Wall Nos. 4 and 5 is 810 feet. The maximum height of Wall Nos. 2 and 3 is about 28 feet with bottom elevations ranging from 950 to 939 feet and top elevations ranging from 957 to 967 feet. The maximum height of Wall Nos. 4 and 5 is about 29 feet with bottom elevations ranging from 967 to 941 feet and top elevations ranging from 973 to 970 feet. It is our understanding that MSE walls are planned for the abutment and wing walls. The type of wall to be used for the HOV ramps will be decided based on ease of construction and construction cost.
Subsurface Features	The subsurface profile (see Figures 7 and 8 and boring logs for W-1 through W-9) along the proposed walls is comprised of fill and residuum underlain by partially weathered rock (PWR). The fill consists of loose to medium dense silty sand and/or soft to stiff sandy silt. Fill material was not encountered at borings W-3, W-8 and W-9. The residual soils consist of very loose to dense silty sand and/or soft to stiff sandy silt underlain by partially weathered rock. Ground water was encountered at borings W-4, W-5 and W-7 between elevations 925 and 934 feet. It should be noted that the borings were performed during an extended dry period, and ground water may be encountered at a higher elevation during construction.

Soil Parameters	The following soil design parameters are recommended for use for the proposed retaining walls: Soil Unit Weight γ = 125 pcf Cohesion c = 0 psf Angle of Internal Friction ϕ = 28 degrees Coefficient of Sliding Friction μ = 0.40 (MSE wall) Coefficient of Sliding Friction μ = 0.30 (Cantilever Retaining wall) The above design parameters assume the backfill material behind the retaining wall (or MSE wall reinforced fill) to consist of silty sand compacted to the specified density, and the subgrade prepared as recommended below.
Recommendations	(i) Soft to very soft sandy silt and loose to very loose silty sand were encountered at or near the retaining wall bottom elevation at a number of locations. Any soft/loose soils from beneath the wall should be over-excavated to a minimum depth of the retest below the wall bottom and replaced with compacted wall backfill material. The exact depth and extent of over-excavation should be determined by the project Geotechnical Engineer. (ii) A maximum allowable bearing pressure of 2,000 psf is recommended for all retaining walls. (iii) It should be noted that the borings for this study were performed during an extended dry period, and ground water may be encountered at or near the wall bottom elevation at some locations. If ground water is encountered, underdrains will be required. The need for any underdrains should be evaluated during construction by the project Geotechnical Engineer. (continued)

Recommendations (continued)	(iv) At the location of maximum wall height, the design bearing pressure for the MSE walls will exceed the above recommended maximum allowable bearing pressure. Therefore, we recommend that the MSE walls be constructed in two stages to minimize differential settlement along the walls. In the first stage, the wall should be constructed to half of its final height. A minimum 45-day waiting period should be allowed after the first stage before beginning the second stage of construction. Settlement of the MSE walls should be monitored upon completion of the first stage of construction. The length of the waiting period may be increased or decreased based on the settlement monitoring data, at the discretion of the project Geotechnical Engineer. After the waiting period, the MSE wall should be constructed to the final height. (v) The backfill materials and drainage measures for the retaining walls should conform to GDOT standard specifications.
Prepared By	Murthy S. Kotha / Sujit K. Bhowmik, PhD, PE
Senior Review By	James L. Willmer, PE

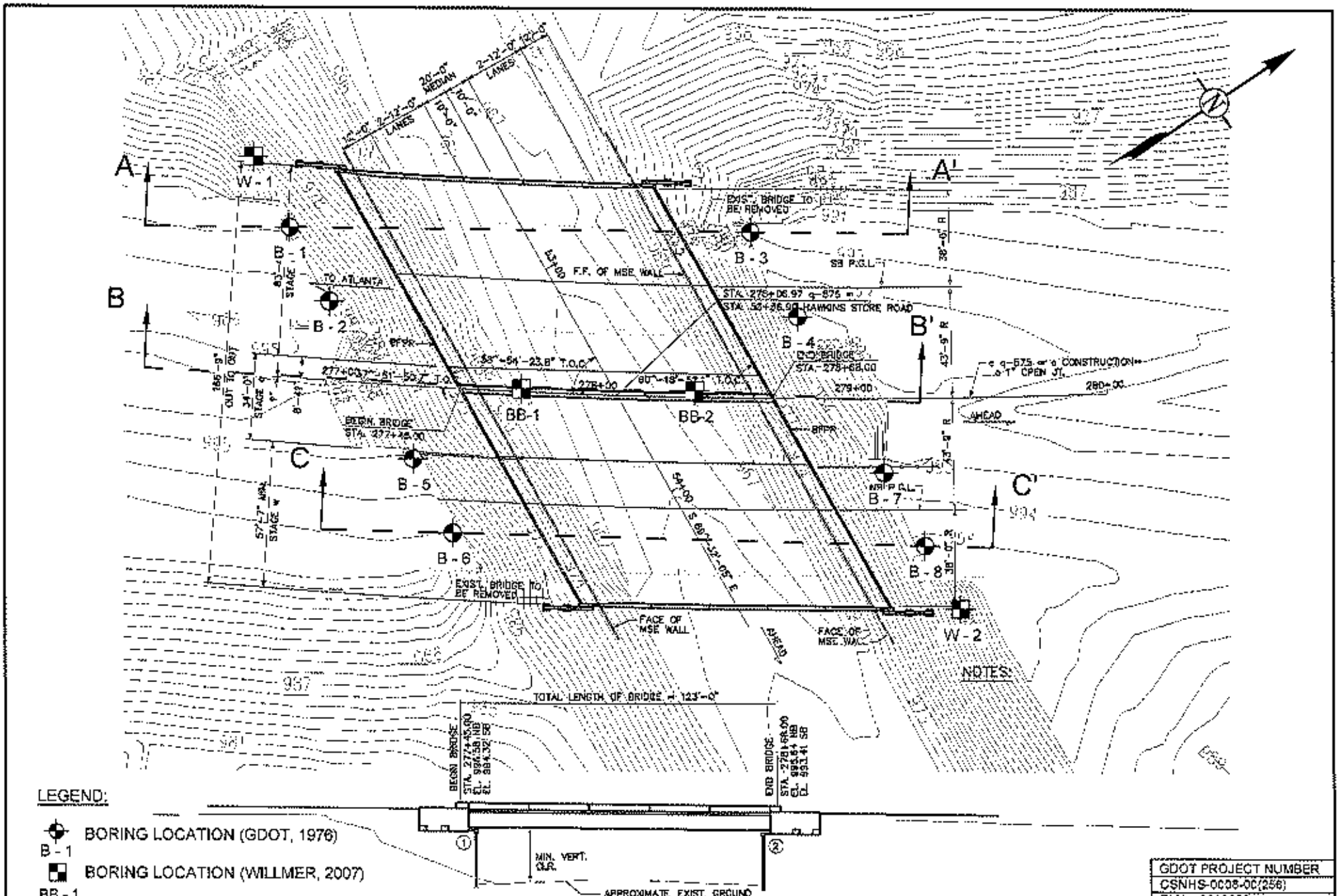
FIGURES



GDOT PROJECT NUMBER
CSNHS-0008-00(256)
PI No. 0006256

SCALE: 1" = 2000'	
DATE: 10/26/2007	GEOTECHNICAL ENGINEERING CONSTRUCTION SERVICES ENVIRONMENTAL SERVICES AND ENGINEERING 3772 PLEASANTDALE ROAD - SUITE 165 ATLANTA, GA 30340-4270
DRAWN BY: MDB	
REVIEWED BY: MK	

FIGURE 1
PROJECT LOCATION MAP
I-575 OVER C.R. 848 (HAWKINS STORE ROAD)
NORTHWEST CORRIDOR PROJECT
COBB COUNTY, GEORGIA
WILLMER PROJECT No. ATL-171-3098E



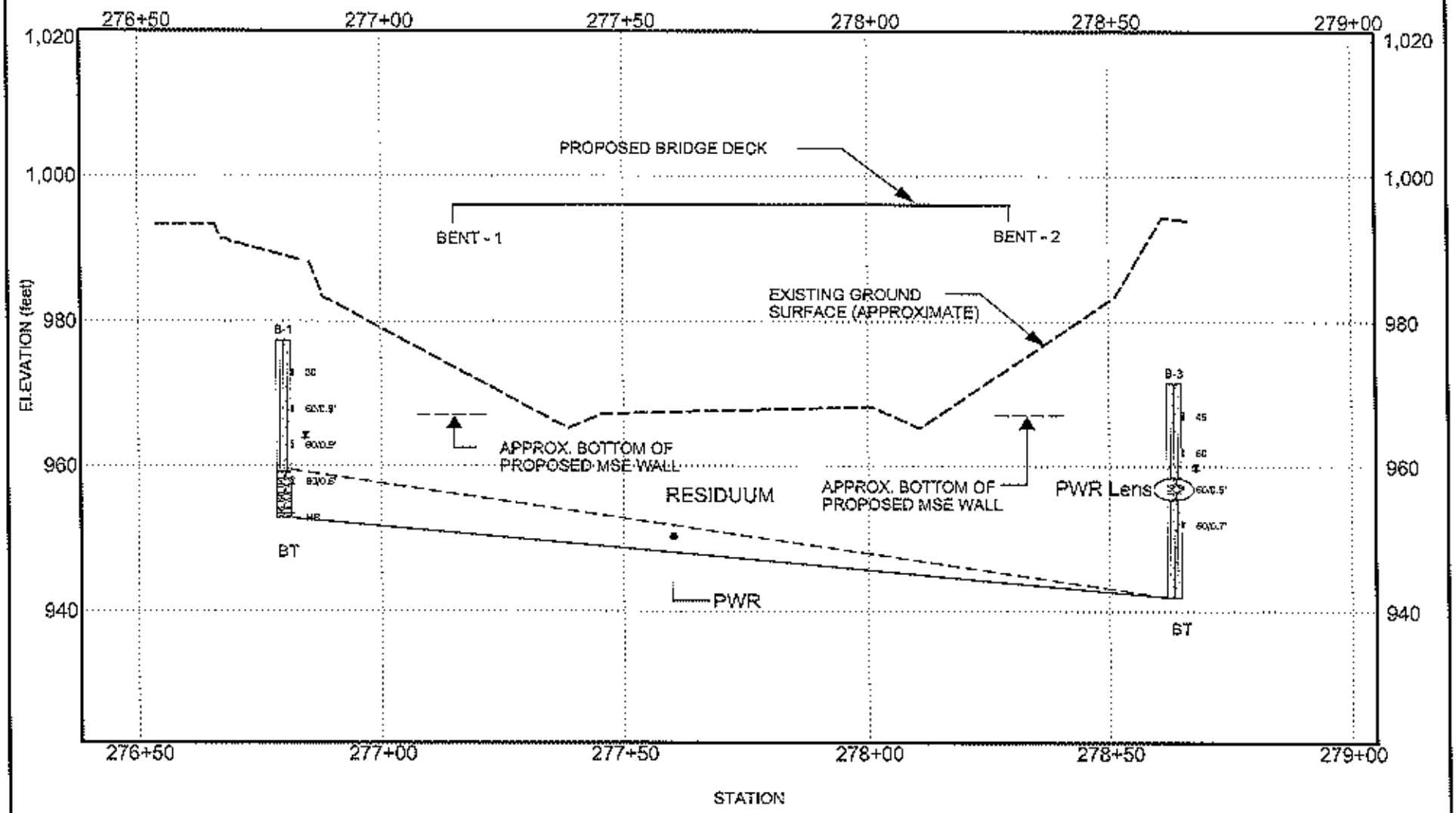
GDOT PROJECT NUMBER
CSNHS-0008-00(256)
PI No. 0008256

SCALE: 1" = 50'	
DATE: 8/3/2008	
DRAWN BY: CBS	
REVIEWED BY: MK	

WILLMER ENGINEERING, LLC

GEOTECHNICAL ENGINEERING & CONSTRUCTION SERVICES
ENVIRONMENTAL SERVICES AND ENGINEERING
3772 PLEASANTDALE ROAD - SUITE 155
ATLANTA, GA 30340-4270

FIGURE 2
BORING LOCATION PLAN
I-575 OVER C.R. 646 (HAWKINS STORE ROAD
NORTHWEST CORRIDOR PROJECT
COBB COUNTY, GEORGIA
WILLMER PROJECT No. ATL-171-3099E



LEGEND:
⧗ - Groundwater Table @ 24 hours
⧗ - Groundwater Table @ Time of Boring
BT - Boring Terminated
PWR - Partially Weathered Rock
HS - Hammer Bounce

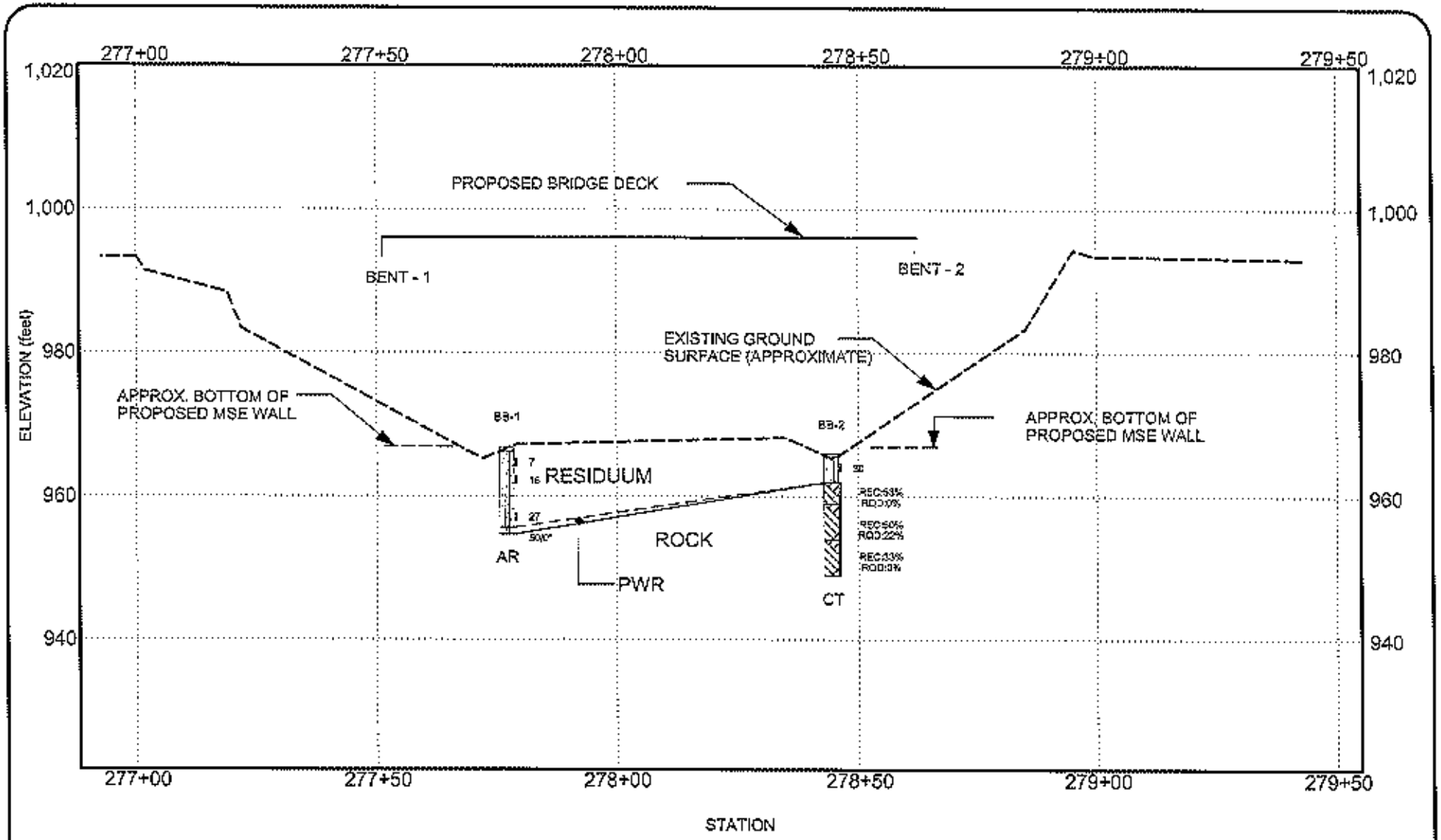
SCALE : 1 inch = 20 feet (vertical)
1 inch = 30 feet (horizontal)

Note: Borings B-1 and B-3 were drilled by GDOT in 1976.

GENERALIZED SUBSURFACE PROFILE
SECTION A-A' (Left)

I-575 over CR 646 (Hawkins Store Road)
GDOT Proj. # : CSNHS-0008-00(256); PI # : 0008256
Cobb County, Georgia

PROJECT #	DATE	FIGURE
171-3099E	Dec 18, 2007	3



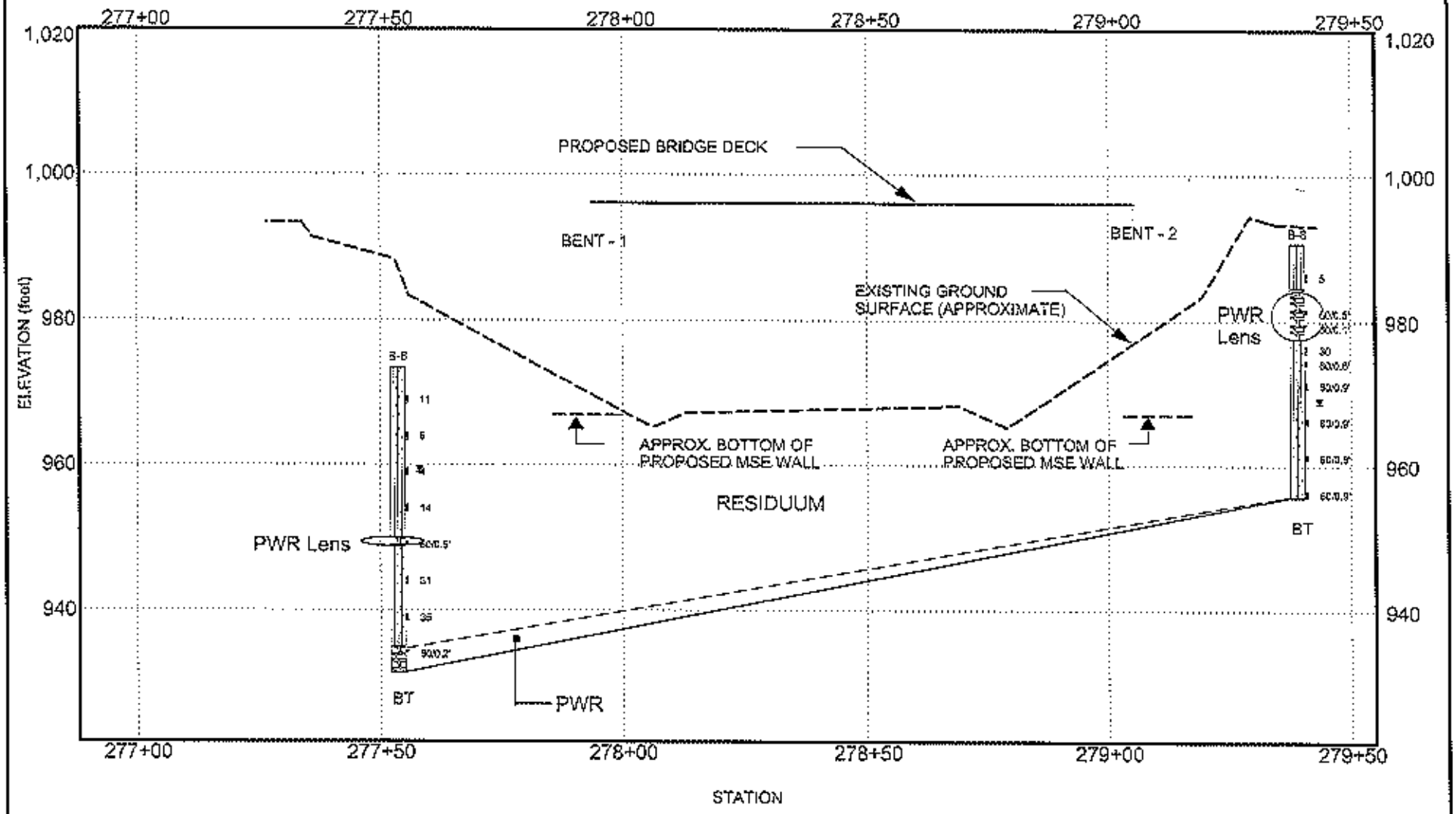
LEGEND:
AR - Auger Refusal
CT - Coring Terminated
PWR - Partially Weathered Rock
REC - Recovery
RQD - Rock Quality Description

SCALE : 1 inch = 20 feet (vertical)
1 inch = 30 feet (horizontal)

GENERALIZED SUBSURFACE PROFILE
SECTION B-B' (Center)

I-575 over CR 646 (Hawkins Store Road)
GDOT Proj. # : CSNHS-0008-00(256); PI # : 0008256
Cobb County, Georgia

PROJECT #	DATE	FIGURE
171-3099E	Dec 20, 2007	4



LEGEND:
- ⧗ - Groundwater Table @ 24 hours
- ⧖ - Groundwater Table @ Time of Boring
- AR - Auger Refusal
- BT - Boring Terminated
- PWR - Partially Weathered Rock

SCALE : 1 inch = 20 feet (vertical)
1 inch = 30 feet (horizontal)

Note: Borings B-6 and B-8 were drilled by GDOT in 1976.

GENERALIZED SUBSURFACE PROFILE
SECTION C-C' (Right)

I-575 over CR 646 (Hawkins Store Road)
GDOT Proj. # : CSNHS-0006-00(256); PI # : 0008256
Cobb County, Georgia

PROJECT #	DATE	FIGURE
171-3099E	Dec 18, 2007	5

APPENDIX I

BORING RECORD LEGEND

SM, CL, etc: - GROUP SYMBOL based on Unified Soil Classification System.
(Refer to ASTM D-2488 and Table 1 of D-2487)

N-VALUE: BLOWS PER FOOT- Standard Penetration Resistance (SPT) blow count , the sum of the second and third 6-inch increments of the SPT test.
(Refer to ASTM D-1586)

CONSISTENCY / RELATIVE DENSITY Correlated with SPT Blow Count, N:

SILTS AND CLAYS

N (blows per foot)	Consistency
0 - 2	Very Soft
3 - 4	Soft
5 - 8	Firm
9 - 15	Stiff
16 - 30	Very Stiff
31 - 50	Hard
> 50	Very Hard

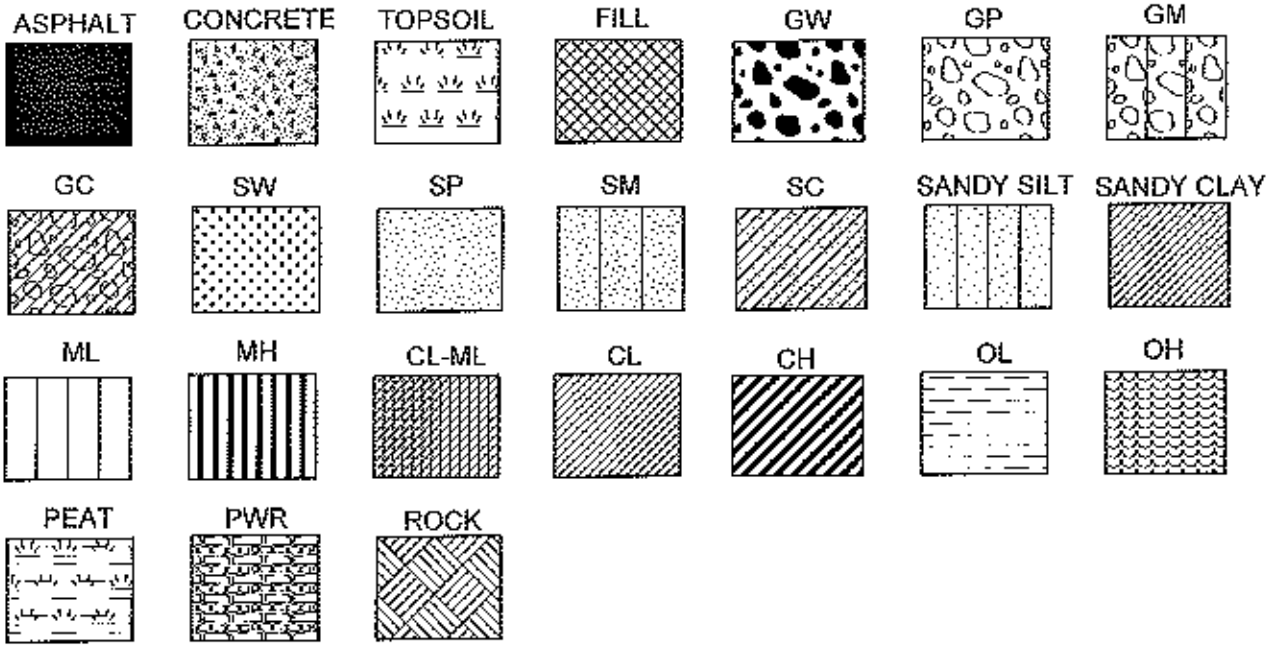
SANDS

N (blows per foot)	Relative Density
0 - 4	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
> 50	Very Dense

NOTES:

Groundwater Measurements:

- Water level at time of backfilling
- Water level at time of boring
- Caved level at 24 hours



Willmer Engineering Inc.
3772 Pleasantdale Road, Suite 165
Atlanta, Georgia 30340

UNIFIED SOIL CLASSIFICATION SYSTEM REFERENCE SHEET

MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN #200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED #4 SIEVE	CLEAN GRAVELS LITTLE OR NO FINES	(GW)	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
			(GP)	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES APPRECIABLE AMOUNT OF FINES	(GM)	SILTY GRAVELS and GRAVEL-SAND-SILT MIXTURES
			(GC)	CLAYEY GRAVELS and GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING #4 SIEVE	CLEAN SAND LITTLE OR NO FINES	(SW)	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			(SP)	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES APPRECIABLE AMOUNT OF FINES	(SM)	SILTY SANDS and SAND-SILT MIXTURES
			(SC)	CLAYEY SANDS and SAND-CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN #200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		(ML)	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR VERY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			(CL)	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			(OL)	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		(MH)	INORGANIC ELASTIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS
			(CH)	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			(OH)	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			(PT)	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

Wilson Ihrig Engineering Inc. | WE

ENGINEERING DESCRIPTION
OF
ROCK HARDNESS

Hardness	Description
Very hard	Cannot be scratched with knife or sharp pick. Breaking of hand specimens requires several hard blows of geologist's pick.
Hard	Can be scratched with knife or pick only with difficulty. Hard blow of hammer required to detach hand specimen.
Moderately hard	Can be scratched with knife or pick. can be excavated by hard blow of point of a geologist's pick. Hand specimens can be detached by moderate blow.
Medium	Can be grooved or gouged 1/16 inch deep by firm pressure on 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.
Soft	Can be gouged or grooved readily with knife or pick point. Can be excavated in chips to pieces several inches in size by moderate blows of a pick point. Small thin pieces can be broken by finger pressure.
Very soft	Can be carved with knife. Can be excavated readily with point of pick. Pieces 1 inch or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.
Partially Weathered Rock	For engineering purposes, partially weathered rock (PWR) is locally defined as residual soils exhibiting Standard Penetration Test N-values in excess of 50 blows for 6 inches of penetration.

WILLMER ENGINEERING INC. WE

Project: I-575 over CR 646 (Hawkins Store Road)	**HOLE No. BB-1**
Location: Cobb County, Georgia	Sheet 1 of 1
Project Number: 171-3099E; GDOT Proj. # : CSNHS-0008-00(256); PI # : 0008256	Location: Bent - 1
Azimuth: -- Angle from Horizontal: 90 Surface Elevation (ft): 966.65 Station: ST. 277+75, CL	
Drilling Equipment: CME 550 Drilling Method: HSA Auto Hammer	
Core Boxes: -- Samples: 4 Overburden (ft): 12 Rock (ft): -- Total Depth (ft): 12.0	
Logged By: MK Date Drilled: 10/4/07	

VERTICAL DEPTH (ft)	SAMPLE TYPE	REC%	RQD %	MATERIAL DESCRIPTION	ELEVATION (feet)	N-VALUE
0				CONCRETE = 6 inches	966.7	
	SS			RESIDUUM: Loose and medium dense black, tan and brown silty medium to fine **SAND**(micaceous) SM		7
5	SS				965	16
					960	
10	SS					27
	SS			PARTIALLY WEATHERED ROCK: Sampled as very dense gray and tan silty medium to fine **SAND** (micaceous) PWR	955	50/0"

Auger refusal encountered at 12 feet below the existing ground surface

Groundwater was not encountered at the time of boring completion.

STANDARD PENETRATION TEST DATA (blows/foot)

5 10 20 40 60 80

Bottom of MSE Wall at El. 967 (Approx.)

SAMPLER TYPE

SS - Split Spoon
ST - Shelby Tube
NQ - Rock Core, 1-7/8"
NX - Rock Core, 2-1/8"
CU - Cuttings
CT - Continuous Tube

DRILLING METHOD

HSA - Hollow Stem Auger
CFA - Continuous Flight Augers
DC - Driving Casing
RW - Rotary Wash
RC - Rock Core

Hole No. BB-1

GPJ 12/27/07

WILLE-McCHENEY INC.

Project: I-575 over CR 646 (Hawkins Store Road)

Location: Cobb County, Georgia

Project Number: 171-3099E; GDOT Proj. # : CSNHS-0008-00(256); PI # : 0008256

HOLE No. BB-2

Sheet 1 of 1

Location: Bont - 2

Azimuth: -- Angle from Horizontal: 90 Surface Elevation (ft): 966.03 Station: ST. 278+45, CL

Drilling Equipment: CME 550 Drilling Method: HSA Auto Hammer

Core Boxes: 1 Samples: 1 Overburden (ft): 4 Rock (ft): 13 Total Depth (ft): 17.0

Logged By: MK Date Drilled: 10/5/07

VERTICAL DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE	REC%	ROD %	MATERIAL DESCRIPTION	ELEVATION (feet)
		SS			CONCRETE = 6 inches RESIDUUM: Medium dense brown and tan silty medium to fine **SAND** with rock fragments — SM	966.0
5		NQ	53	0	ROCK CORE: Moderately hard black, gray and white **BIOTITE GNEISS** with seams of soil	965
10		NQ	50	22	Moderately hard black, gray and white **BIOTITE GNEISS** with seams of soil	960
15		NQ	33	0	Soft black, gray and tan **BIOTITE GNEISS** with seams of soil	955
						950

Auger refusal encountered at 4 feet below the existing ground surface

Coring was terminated at 17 feet below the existing ground surface

Groundwater was not encountered at the time of boring completion.

STANDARD PENETRATION TEST DATA (blows/foot)

5 10 20 40 60 80

N-VALUE

30

Bottom of MSE Wall at El. 967 (Approx.)

SAMPLER TYPE

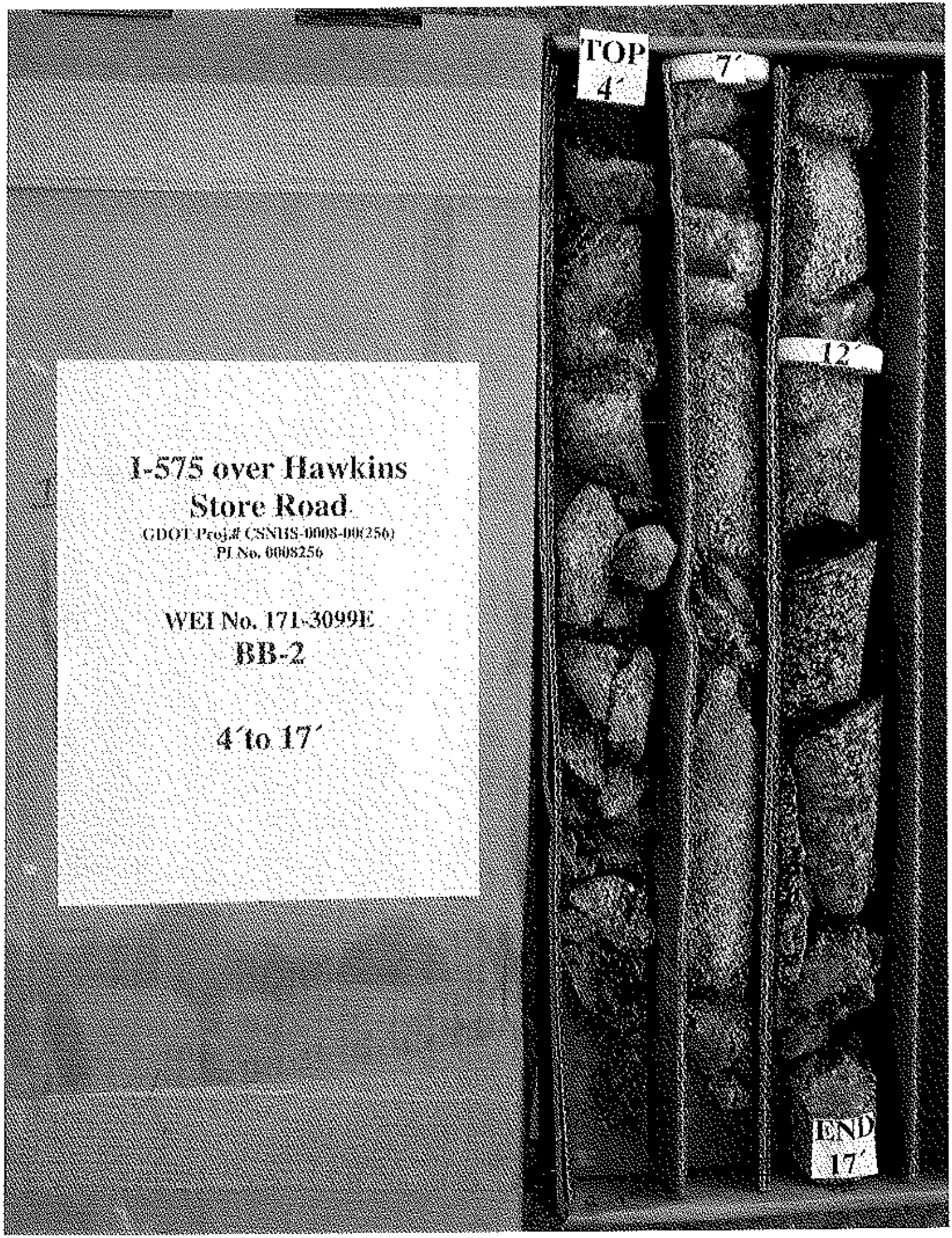
SS - Split Spoon
ST - Shelby Tube
NQ - Rock Core, 1-7/8"
NX - Rock Core, 2-1/8"
CU - Cuttings
CT - Continuous Tube

DRILLING METHOD

HSA - Hollow Stem Auger
CFA - Continuous Flight Augers
DC - Driving Casing
RW - Rotary Wash
RC - Rock Core

Hole No. BB-2

SPTN 17-3099E.GPJ 12/27/07



I-575 over Hawkins Store Road

GDOT Proj.# CSNHS-0008-00(256)
PI No. 0008256

WEI No. 171-3099E

BB-2

4´to 17´

WE

Project: I-575 over CR 646 (Hawkins Store Road)
Location: Cobb County, Georgia
Project Number: 171-3099E; GDOT Proj. # : CSNHS-0008-00(256); PI # : 0008256

HOLE No. W-1
Sheet 1 of 1
Location: Wall No. 8

Azimuth: -- Angle from Horizontal: 90 Surface Elevation (ft): 993.27 Station: ST. 276+65, 85' Lt. of CL
Drilling Equipment: CME 550 Drilling Method: HSA Auto Hammer
Core Boxes: -- Samples: 9 Overburden (ft): -- Rock (ft): -- Total Depth (ft): 40.0
Logged By: MK Date Drilled: 10/16/07

VERTICAL DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE	REC%	RQD %	MATERIAL DESCRIPTION	ELEVATION (feet)
					TOPSOIL = 1 inch / FILL	993.3
0		SS			FILL: Medium dense and loose red, brown and tan silty medium to fine **SAND** with rock fragments	
5		SS				990
		SS			Medium dense black and tan silty medium to fine **SAND** with organic odour, roots and rock fragments / FILL / SM	985
10					RESIDUUM: Medium dense red and tan silty medium to fine **SAND**	
15		SS				980
		SS			Very dense brown, black and tan silty medium to fine **SAND** with rock fragments / SM	975
20						
		SS			Very stiff and stiff reddish brown **SILT** with fine sand (slightly micaceous) / ML	970
25		SS				
						965
30		SS				
		SS			Loose to very dense brown, white and tan silty medium to fine **SAND** with rock fragments / SM	960
35						
		SS				955
40					Boring terminated at 40 feet below the exlsting ground surface	
					Groundwater was not encountered at the time of boring completion.	

STANDARD PENETRATION TEST DATA (blows/foot)
5 10 20 40 60 80

Bottom of MSE Wall (Approx.)

N-VALUE
15
5
14
16
83
22
13
9
61

SAMPLER TYPE
SS - Split Spoon
ST - Shelby Tube
NQ - Rock Core, 1-7/8"
NX - Rock Core, 2-1/8"
CU - Cuttings
CT - Continuous Tube

DRILLING METHOD
HSA - Hollow Stem Auger
CFA - Continuous Flight Augers
DC - Driving Casing
RW - Rotary Wash
RC - Rock Core

Hole No.
W-1

SPTN 171-3099E.GPJ 12/27/07

WE

Project: I-575 over CR 646 (Hawkins Store Road)
Location: Cobb County, Georgia
Project Number: 171-3099E; GDOT Proj. # : CSNHS-0008-00(256); PI # : 0008256

HOLE No. W-2
Sheet 1 of 1
Location: Wall No. 9

Azimuth: -- Angle from Horizontal: 90 Surface Elevation (ft): 996.05 Station: ST. 279+55, 85' Rt. of CL
Drilling Equipment: CME 550 Drilling Method: HSA Auto Hammer
Core Boxes: -- Samples: 5 Overburden (ft): -- Rock (ft): -- Total Depth (ft): 20.0
Logged By: MK Date Drilled: 10/16/07

VERTICAL DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE	REC%	RQD %	MATERIAL DESCRIPTION	ELEVATION (feet)
					\TOPSOIL = 1 inch / SM	996.1
5		SS			RESIDUUM: Medium dense red, brown and tan silty medium to fine **SAND** with rock fragments (micaceous)	995
		SS				
						990
10		SS			PARTIALLY WEATHERED ROCK: PWR Sampled as very dense brown and tan silty medium to fine **SAND** with rock fragments	
		SS				985
15						
						980
20		SS				

Boring terminated at 20 feet below the existing ground surface

Groundwater was not encountered at the time of boring completion.

STANDARD PENETRATION TEST DATA (blows/foot)

5 10 20 40 60 80

Bottom of MSE Wall (Approx.

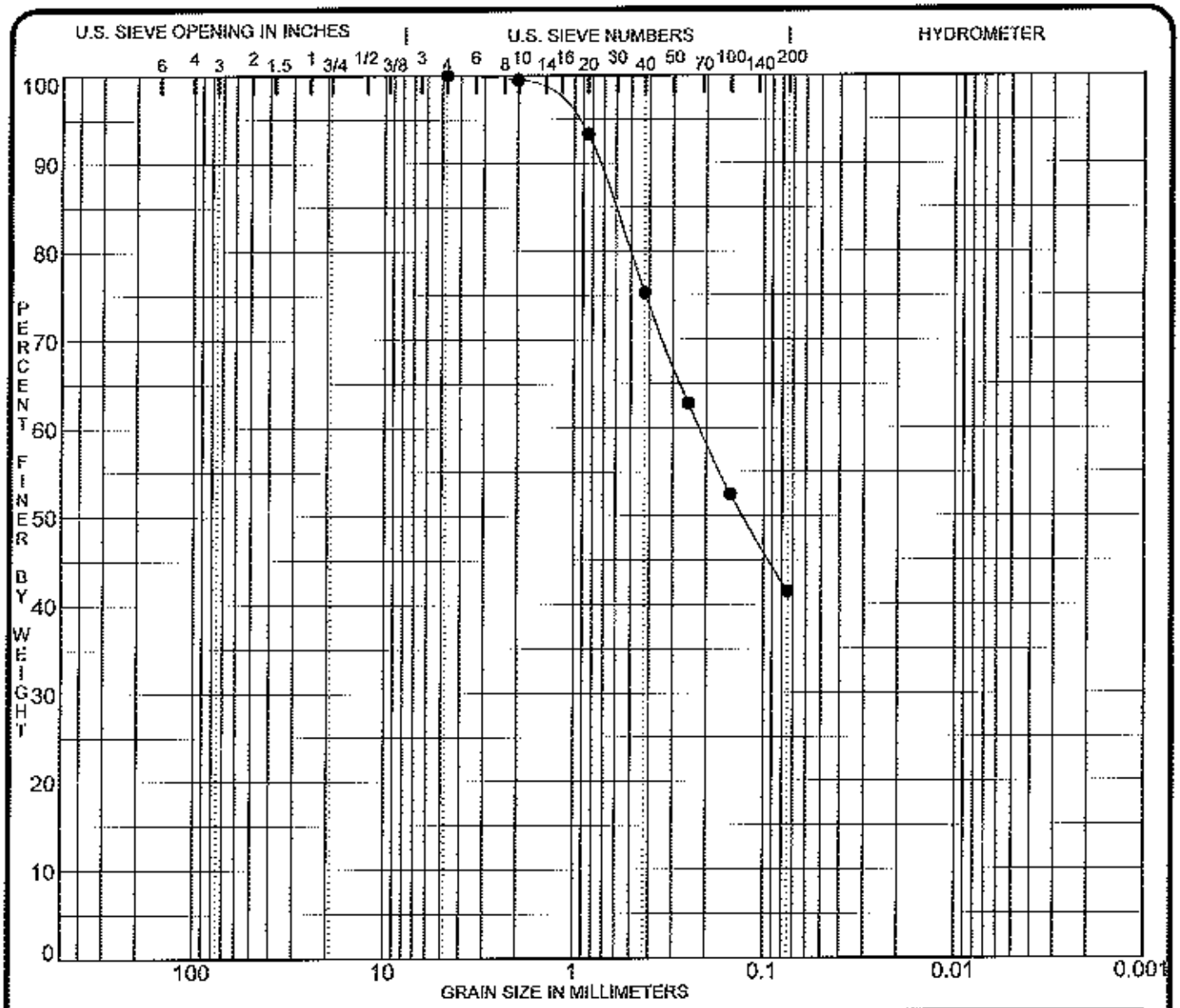
N-VALUE
11
28
50/4"
50/5"
50/1"

SAMPLER TYPE
SS - Split Spoon
ST - Shelby Tube
NQ - Rock Core, 1-7/8"
NX - Rock Core, 2-1/8"
CU - Cuttings
CT - Continuous Tube

DRILLING METHOD
HSA - Hollow Stem Auger
CFA - Continuous Flight Augers
DC - Driving Casing
RW - Rotary Wash
RC - Rock Core

Hole No.
W-2

SPTN 171-3099E.GPJ 12/27/07



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Soil Description	MC%	LL	PL	PI	Cc	Cu
● BB-1 (1-2.5 ft)	Black, tan and brown silty medium to fine SAND (micaceous)						

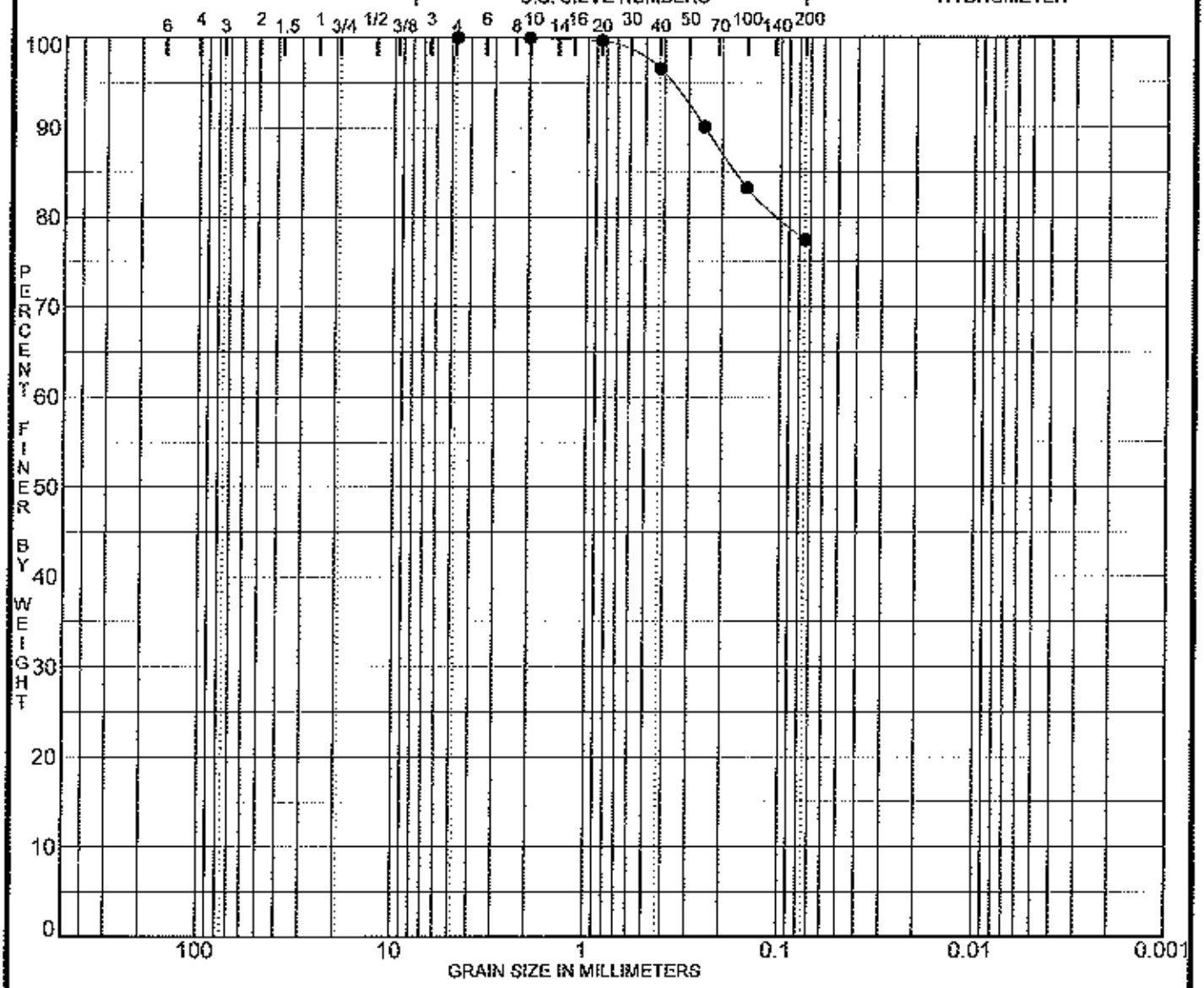
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● BB-1 (1-2.5 ft)	4.75	0.22			0.0	58.5	41.5	

PROJECT I - 575 / CR 646 (Hawkins Store Rd.)-Cobb Co, GA
GDOT Proj. #: CSNHS -0008-00(256); PI #:0008256

JOB NO. 171-3099 E
DATE 12/27/07

WILLMETH ENGINEERING WE

GRADATION CURVE



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Soil Description	MC%	LL	PL	PI	Cc	Cu
●	W-1 (23.5-25 ft)	Reddish brown SILT with fine sand (slightly micaceous)						

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	W-1 (23.5-25 ft)	4.75				0.0	22.5	77.5	

PROJECT I - 575 / CR 646 (Hawkins Store Rd.)-Cobb Co, GA
GDOT Proj. #: CSNHS -0008-00(256); PI #:0008256

JOB NO. 171-3099 E
DATE 12/27/07

Wilson Engineering | WE

GRADATION CURVE

APPENDIX II

DOT 490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND TEST, FOREST PARK, GEORGIA
SOILS ENGINEERING AND GEOLOGY BRANCH

BRIDGE SUBSURFACE INVESTIGATION

CSNHS-0008-00(256)

PROJECT PI No. 0008256 COUNTY Cobb DATE 7 - 7 - 76

LOCATION I-575 over CR 646 (Hawkins Store Road) BORING NO. B-1

BENT NO. 1 FOOTING GROUND ELEV. 977.35

PROPOSED FOOTING ELEV. PARTY CHIEF Pulliam

ELEV.	BORING LOG	SAM-PLE	BLOW	UNIFIED	W	γ	Gs	C.	∅	BC	LL	PI	% 200	% CLAY
	Gr. El.													
	Dense Micaceous Micaceous Sandy Silt	1s	30											
970		2s	60=.9'											
GWT	Very Dense Micaceous Micaceous Sandy Silt	3s	60=.9'											
960		4s	60=.6'											
	Very Dense Micaceous Micaceous Silty Sand & Grl. (W.R.)	5s	H.B.											
	Very Dense (W.R.)													
950	End Drilling													

The Department of Transportation in making this foundation report available to contractors assumes no responsibility for its accuracy.

No claim will be considered if the contractor or relies on this information in his bidding or in his construction operations and finds that it is inaccurate.

This foundation investigation report is not considered as a part of the Plans and Specifications or Contract on the job.

490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND TEST, FOREST PARK, GEORGIA
SOILS ENGINEERING AND GEOLOGY BRANCH

BRIDGE SUBSURFACE INVESTIGATION

CSNHS-0008-00(256)

PROJECT PI No. 0008256 COUNTY Cobb DATE 5 - 27 - 76

LOCATION I-575 over CR 646 (Hawkins Store Road) BORING NO. B-2

BENT NO. 1 FOOTING _____ GROUND ELEV. 974.95

PROPOSED FOOTING ELEV. _____ PARTY CHIEF Pulliam

ELEV.	BORING LOG	SAMPLE	BLOW	UNIFIED	W	γ	Gs	C.	∅	BC	LL	PI	% 200	% CLAY
	Gr. El.													
	Loose Red Micas Clayey Sandy Silt W/ Gvl.													
970	Medium Dense Mitc. Micas Sandy Silt W/ Gravel	1s	20											
	Dense Mitc. Micas Silty Sand W/ Gravel (W.R.)	2s	40											
WT														
960		3s	60											
	Very Dense Same													
		4s	H.B.											
	Very Dense													
950	(Weathered Rock)													
	Practical Refusal													

The Department of Transportation in making this foundation report available to contractors assumes no responsibility for its accuracy. No claim will be considered if the contractor relies on this information in his bidding or in his construction operations and finds that it is inaccurate.

This foundation investigation report is not considered as a part of the Plans and Specifications or Contract on the job.

DOT 490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND TEST, FOREST PARK, GEORGIA
SOILS ENGINEERING AND GEOLOGY BRANCH

BRIDGE SUBSURFACE INVESTIGATION

CSNHS-0008-00(256)

PROJECT PI No. 0008256 COUNTY Cobb DATE 7-7-76

LOCATION I-575 over CR 646 (Hawkins Store Road) BORING NO. B-3

BENT NO. 2 FOOTING 73' Lt ℄ GROUND ELEV. 971.45

PROPOSED FOOTING ELEV. 985.3 ± Pile Cut Off PARTY CHIEF Pulliam

ELEV.	BORING LOG	SAMPLE	BLOW	UNIFIED	W	γ	Gs	C.	∅	BC	LL	PI	% 200	% CLAY
	Gr. El. 971													
970	Medium Dense Mlfc. Micas Clayey Sandy Silt													
	Dense Mlfc. Micas Sandy Silt	1s	4.5											
960	Very	2s	60											
WT		3s	60=5"											
	Dense													
950		4s	60=7"											
	Same													
940	End Drilling													

The Department of Transportation in making this foundation report available to contractors assumes no responsibility for its accuracy. No claim will be considered if the contractor [illegible] information in his bidding or [illegible] conditions and finds that [illegible]. This [illegible] report is not considered as a part of the [illegible] and Specifications [illegible].

DOT .490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND TEST, FOREST PARK, GEORGIA
SOILS ENGINEERING AND GEOLOGY BRANCH

BRIDGE SUBSURFACE INVESTIGATION

CSNHS-0008-00(256)

PROJECT PI No. 0008256 COUNTY Cobb DATE 7-7-76

LOCATION I-575 over CR 646 (Hawkins Store Road) BORING NO. B-4

BENT NO. 2 FOOTING GROUND ELEV. 982.35

PROPOSED FOOTING ELEV. PARTY CHIEF Pulliam

ELEV.	BORING LOG	SAMPLE	BLOW	UNIFIED	W	γ	Gs	C.	∅	BC	LL	PI	% 200	% CLAY
	Gr. El.													
980	Dense Mitc. Micas													
	Sandy Silt W/ Gravel	1s	44											
	Very Dense Same	2s	60=.7'											
	Very Dense (Weathered Rock)													
	Dense Mitc. Micas	3s	33											
970	Sandy Silt	4s	50											
GWT		5s	62											
	Very Dense Same	6s	60=10'											
960	Very Dense (Weathered Rock)	7s	60=.5'											
	Practical Refusal													

The Department of Transportation in making this foundation report available to contractors assumes no responsibility for its accuracy.

No claim will be considered if the contractor relies on this information in his bidding or in his construction operations and finds that it is inaccurate.

This foundation investigation report is not considered as a part of the Plans and Specifications or Contract on the job.

DOT '490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND TEST, FOREST PARK, GEORGIA
SOILS ENGINEERING AND GEOLOGY BRANCH

BRIDGE SUBSURFACE INVESTIGATION

CSNHS-0008-00(256)

PROJECT PI No. 0008256 COUNTY Cobb DATE 5-27-76

LOCATION I-575 over CR 646 (Hawkins Store Road). BORING NO. B-5

BENT NO. 1 FOOTING — GROUND ELEV. 973.65

PROPOSED FOOTING ELEV. — PARTY CHIEF Pulliam

ELEV.	BORING LOG	SAMPLE	BLOW	UNIFIED	W	γ	Gs	C.	∅	BC	LL	PI	% 200	% CLAY
	Gr. El. 7													
	Medium Dense Mltc.													
970		1												
	Micas Clayey Sandy Silt W/ Gravel	2s	16											
		3u												
	Dense Mltc. Micas Silty Sand	4s	28											
960														
WT	Medium Dense Same	5s	12											
	Medium Dense Mltc. Micas Sandy Silt	6s	17											
950														
	Very Loose Same	7s	3											
	Very Dense (W.R.)													
	Practical Refusal													

The Department of Transportation in making this ... to contractors ... for its accuracy. No ... if the contractor in his bidding on ... and finds that ... investigation report is not ... the Plans and Specs ... the job.

DOT '490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND TEST, FOREST PARK, GEORGIA
SOILS ENGINEERING AND GEOLOGY BRANCH

BRIDGE SUBSURFACE INVESTIGATION

CSNHS-0008-00(256)

PROJECT PI No. 0008256 COUNTY Cobb DATE 5-27-76

LOCATION I-575 over CR 646 (Hawkins Store Road) BORING NO. B-6

BENT NO. 1 FOOTING GROUND ELEV. 973.25

PROPOSED FOOTING ELEV. PARTY CHIEF Pulliam

ELEV.	BORING LOG	SAMPLE	BLOW	UNIFIED	W	γ	Gs	C.	∅	BC	LL	PI	% 200	% CLAY
	Gr. El.													
	Medium Dense Red Micas Clayey Silty Sand	1s	11											
970	Loose Mitc. Micas Sandy Silt	2s	6											
960														
GWT	Very Loose Same	3s	4											
	Medium Dense Mitc. Micas Sandy Silt	4s	14											
950	Very Dense Same	5s	60=5'											
	Very Dense (Weathered Rock)													
	Dense Mitc. Micas	6s	31											
940														
	Sandy Silt	7s	35											
	V. Dse. Mitc. Micas Sdy. Slt. Very Dense (W.R.)	8s	60=2'											
930	Practical Refusal													

The Department of Transportation is making this foundation report available for information assumes no responsibility for its accuracy. No claim will be considered if the contractor relies on this information in his bidding or in his construction operations and finds that it is inaccurate.

This foundation investigation report is not considered as a part of the Plans and Specifications or Contract on the job.

DOT '490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND TEST, FOREST PARK, GEORGIA
SOILS ENGINEERING AND GEOLOGY BRANCH

BRIDGE SUBSURFACE INVESTIGATION

CSNHS-0008-00(256)

PROJECT PI No. 0008256 COUNTY Cobb DATE 5-26-76

LOCATION I-575 over CR 646 (Hawkins Store Road) BORING NO. B-7

BENT NO. 2 FOOTING GROUND ELEV. 988.65

PROPOSED FOOTING ELEV. PARTY CHIEF Pulliam

ELEV.	BORING LOG	SAMPLE	BLOW	UNIFIED	W	γ	Gs	C.	Ø	BC	LL	PI	% 200	% CLAY
	Gr. El. ?													
	Medium Dense Mltc. Micas Sandy Silt	1s	11											
		2s	30											
980	Dense Same	3s	49											
		4s	49											
GWT		5s	60=9"											
	Very Dense	6s	58											
970	Mltc. Micas	7s	60=9"											
	Sandy Silt	8s	60=3"											
	Very Dense (Weathered Rock)													
960	Practica Refusal													

The Department of Transportation in making this foundation report available to contractors assumes no responsibility for its accuracy.

No claim will be considered if the contractor relies on this information in his estimate or in his construction operations and finds that it is inaccurate.

This foundation investigation report is considered to be a part of the plans and specifications of the contract.

DOT '490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND TEST, FOREST PARK, GEORGIA
SOILS ENGINEERING AND GEOLOGY BRANCH

BRIDGE SUBSURFACE INVESTIGATION

CSNHS-0008-00(256)

PROJECT PI No. 0008256 COUNTY Cobb DATE 5 - 26 - 76

LOCATION I-575 over CR 646 (Hawkins Store Road) BORING NO. B-8

BENT NO. 2 FOOTING _____ GROUND ELEV. 990.65

PROPOSED FOOTING ELEV. _____ PARTY CHIEF Pulliam

ELEV.	BORING LOG	SAMPLE	BLOW	UNIFIED	W	γ	Gs	C.	ϕ	BC	LL	PI	% 200	% CLAY
990	Gr. El.													
	Loose Mltc. Micas Sandy Silt W/Gravel													
	Very Dense Mltc. Micas Sandy Silt W/Gvl.	1s	60=.5'											
	Very Dense (Weathered Rock)													
980	Very Dense Mltc.	2s	60=.5'											
	Micas Sandy Silt W/ Gravel	3s	60=.10'											
	Dense Same	4s	30											
		5s	60=.6'											
970	Very Dense	6s	60=.9'											
GWT														
	Mltc. Micas Sandy	7s	60=.9'											
960		8s	60=.8'											
	Silt W/ Gravel													
		9s	60=.9'											
	End Drilling													

The Department of Transportation in making this foundation report available to contractors assumes no responsibility for its accuracy. No claim will be considered if the contractor relies on this information in his bidding or in his construction operations and finds that it is inaccurate.

This foundation investigation report is not considered as a part of the Plans and Specifications or Contract on the job.