

REFERENCE: R-5797

PROJECT: 44997

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY COLUMBUS
PROJECT DESCRIPTION US 74 AT SR 1506 (OLD BOARDMAN ROAD/MACEDONIA CHURCH ROAD)
SITE DESCRIPTION RETAINING WALL 1 ON -WALL 1- FROM 10+00.00 TO 12+46.31 AND RETAINING WALL 2 ON -WALL 2- FROM 17+00 TO 20+00

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN & PROFILE
4-10	BORE LOGS(S)
11	SOIL TEST RESULTS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5797	1	11

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (ON-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES:
- THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 - BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

M. DURWAY

W. PESL

D. TIGNOR

T. BEARD

INVESTIGATED BY F&R, Inc.

DRAWN BY T.T. WALKER

CHECKED BY P. ALTON, P.E.

SUBMITTED BY C. WANG, P.E.

DATE SEPTEMBER 2019

SINCE **Prepared in the Office of:**

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SIGNATURE

DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

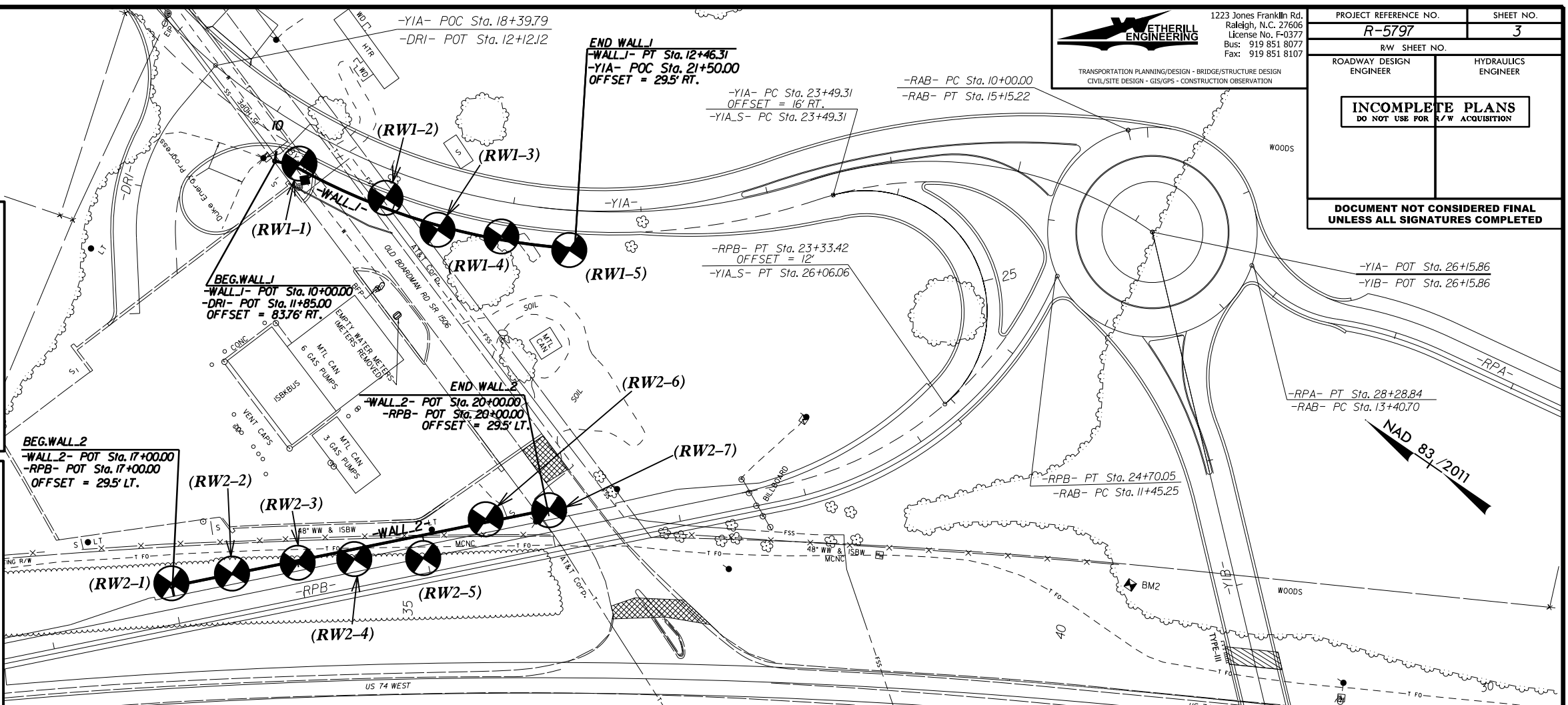
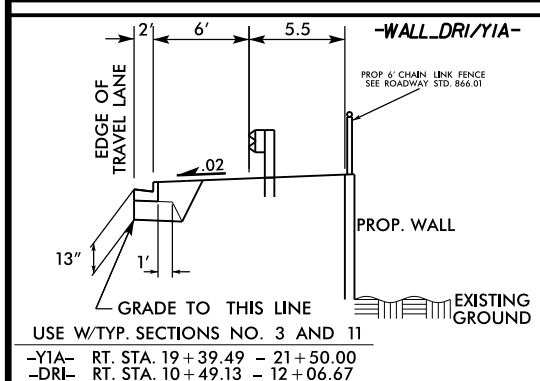
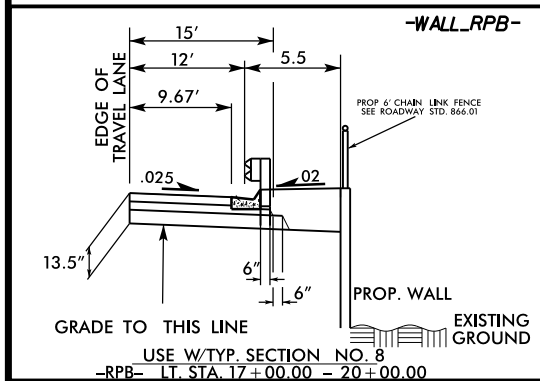
Table with 4 main columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, and TERMS AND DEFINITIONS. Includes sub-sections like SOIL LEGEND AND AASHTO CLASSIFICATION, CONSISTENCY OR DENSENESS, TEXTURE OR GRAIN SIZE, SOIL MOISTURE - CORRELATION OF TERMS, PLASTICITY, and COLOR.

8/17/99

ETHERILL ENGINEERING
 1223 Jones Franklin Rd.
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 License No. F-0377
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TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
 CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

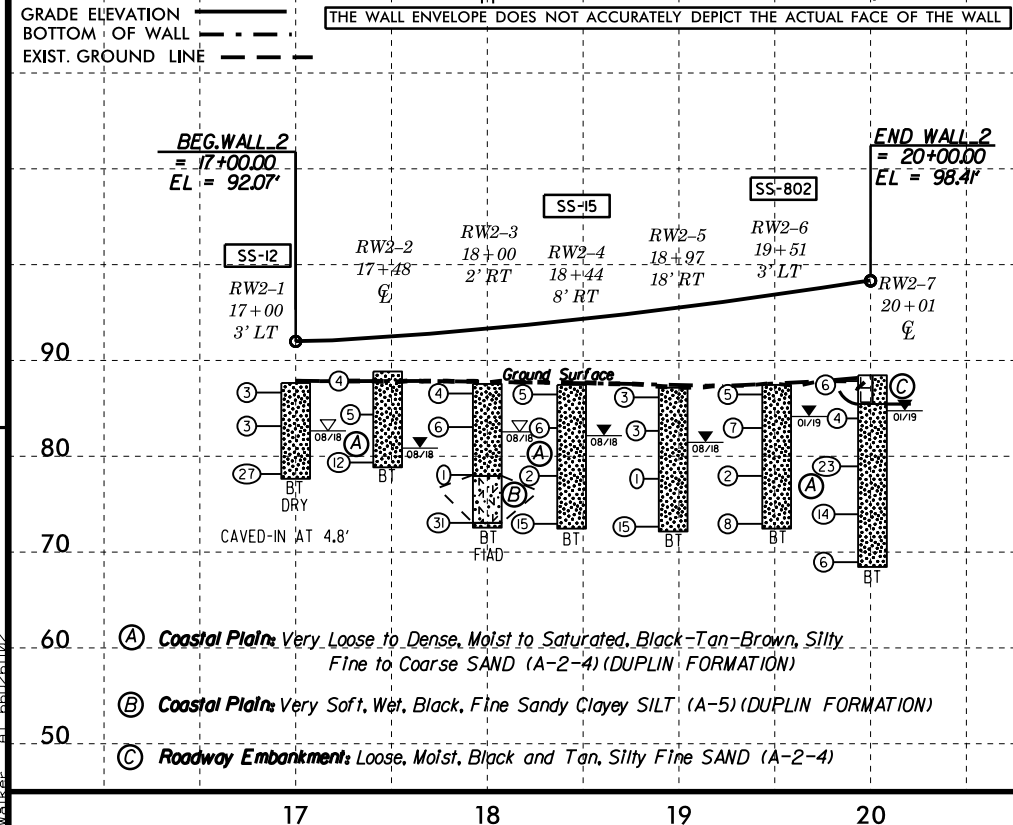
PROJECT REFERENCE NO. R-5797	SHEET NO. 3
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



WALL 2

VE=5

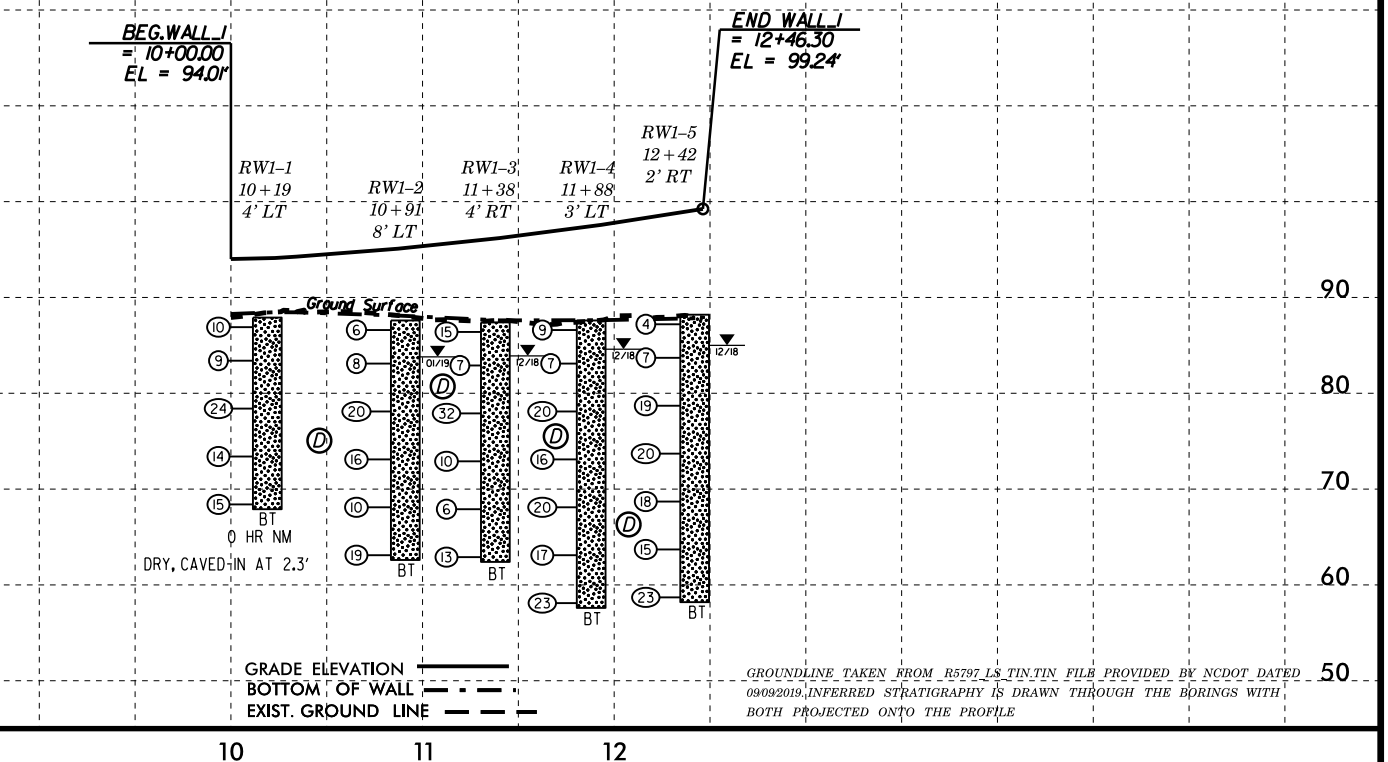
Approximate Wall Face Area = 2071.3 SQ. FT.
 THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF THE WALL



WALL 1

① Coastal Plains: Loose to Dense, Moist to Saturated, Tan-Gray-Brown, Silty Fine to Coarse SAND (A-2-4) with Trace Organics (DUPLIN FORMATION)

Approximate Wall Face Area = 2006.8 SQ. FT.
 THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF THE WALL



REVISIONS
 27-SEP-2019 13:20
 F:\Projects\66166\66166-0246 (WEI-R-5797) Columbus Co Task 2\VR-5797_GEO_ROWY\CADD_GED\TECH\Sub\Retaing Walls\VR-5797_Rdg_PSH_WALL.dgn
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50

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 44997.1.1		TIP R-5797		COUNTY COLUMBUS		GEOLOGIST M. Durway										
SITE DESCRIPTION Ret. Wall 1 on -Wall_1- from 10+00.00 to 12+46.31 and Ret. Wall 2 on -Wall_2- from 17+00.00 to 20+00.00							GROUND WTR (ft)									
BORING NO. RW1-1		STATION 10+19		OFFSET 4 ft LT		ALIGNMENT -WALL1-										
COLLAR ELEV. 87.9 ft		TOTAL DEPTH 20.0 ft		NORTHING 250,281		EASTING 2,015,122										
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 83% 02/05/2018				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER D. Tignor		START DATE 01/03/18		COMP. DATE 01/03/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
90	87.9	0.0	2	4	6										87.9	GROUND SURFACE
85	84.4	3.5	4	4	5											COASTAL PLAIN Gray-Tan, Silty Fine to Coarse SAND (A-2-4) with Trace Organics (Roots) (DUPLIN FORMATION)
80	79.4	8.5	6	10	14											
75	74.4	13.5	5	7	7											
70	69.4	18.5	5	7	8											
															67.9	Boring Terminated at Elevation 67.9 ft in SAND (COASTAL PLAIN) Note: 24 Hr. =Dry, Caved-in at 2.3'

WBS 44997.1.1		TIP R-5797		COUNTY COLUMBUS		GEOLOGIST M. Durway										
SITE DESCRIPTION Ret. Wall 1 on -Wall_1- from 10+00.00 to 12+46.31 and Ret. Wall 2 on -Wall_2- from 17+00.00 to 20+00.00							GROUND WTR (ft)									
BORING NO. RW1-2		STATION 10+91		OFFSET 8 ft LT		ALIGNMENT -WALL1-										
COLLAR ELEV. 87.6 ft		TOTAL DEPTH 25.0 ft		NORTHING 250,211		EASTING 2,015,138										
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 83% 02/05/2018				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER D. Tignor		START DATE 01/03/19		COMP. DATE 01/03/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
90	87.6	0.0	2	3	3										87.6	GROUND SURFACE
85	84.1	3.5	3	4	4											COASTAL PLAIN Tan-Brown, Silty Fine to Coarse SAND (A-2-4) (DUPLIN FORMATION)
80	79.1	8.5	6	8	12											
75	74.1	13.5	5	9	7											
70	69.1	18.5	1	3	7											
65	64.1	23.5	7	9	10											
															62.6	Boring Terminated at Elevation 62.6 ft in SAND (COASTAL PLAIN) Note: Surficial Organic Soil=0.0'-0.1'

NCDOT BORE DOUBLE R-5797_GEO_BH_WALL_GPJ_NC_DOT_GDT_9/25/19

GEOTECHNICAL BORING REPORT BORE LOG

WBS 44997.1.1		TIP R-5797		COUNTY COLUMBUS		GEOLOGIST M. Durway									
SITE DESCRIPTION Ret. Wall 1 on -Wall_1- from 10+00.00 to 12+46.31 and Ret. Wall 2 on -Wall_2- from 17+00.00 to 20+00.00							GROUND WTR (ft)								
BORING NO. RW1-5		STATION 12+42		OFFSET 2 ft RT		ALIGNMENT -WALL1-									
COLLAR ELEV. 88.2 ft		TOTAL DEPTH 30.0 ft		NORTHING 250,070		EASTING 2,015,186									
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 83% 02/05/2018		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic		0 HR. NM									
DRILLER D. Tignor		START DATE 12/18/18		COMP. DATE 12/18/18		24 HR. 3.2									
DRILLER D. Tignor		START DATE 12/18/18		COMP. DATE 12/18/18		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
90															
	88.2	0.0	1	2	2	4								88.2	0.0
85	84.7	3.5	3	3	4	7							M		
													▼		
80	79.7	8.5	4	8	11	19							Sat.		
75	74.7	13.5	7	9	11	20							Sat.		
70	69.7	18.5	5	9	9	18							Sat.		
65	64.7	23.5	5	7	8	15							Sat.		
60	59.7	28.5	8	11	12	23							Sat.		
														58.2	30.0
														Boring Terminated at Elevation 58.2 ft in SAND (COASTAL PLAIN)	
														Note: Surficial Organic Soil=0.0'-0.2'	

NCDOT BORE DOUBLE R-5797_GEO_BH_WALL.GPJ_NC_DOT.GDT 9/25/19

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 44997.1.1		TIP R-5797		COUNTY COLUMBUS		GEOLOGIST M. Durway									
SITE DESCRIPTION Ret. Wall 1 on -Wall_1- from 10+00.00 to 12+46.31 and Ret. Wall 2 on -Wall_2- from 17+00.00 to 20+00.00							GROUND WTR (ft)								
BORING NO. RW2-1		STATION 17+00		OFFSET 3 ft LT		ALIGNMENT -WALL2-									
COLLAR ELEV. 87.7 ft		TOTAL DEPTH 10.0 ft		NORTHING 250,178		EASTING 2,014,795									
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 83% 02/05/2018				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER D. Tignor		START DATE 08/07/18		COMP. DATE 08/07/18		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
90	87.7	0.0												87.7	0.0
			1	1	2	•	•	•	•	•	•	M			
85	84.2	3.5	1	2	1	•	•	•	•	•	SS-12				
											20%				
80	79.2	8.5	10	14	13	•	•	•	•	•	W			77.7	10.0
Boring Terminated at Elevation 77.7 ft in SAND (COASTAL PLAIN) Notes: 1. Surficial Organic Soil=0.0'-0.1' 2. 24 Hr. =Dry, Caved-in at 4.8'															

WBS 44997.1.1		TIP R-5797		COUNTY COLUMBUS		GEOLOGIST M. Durway									
SITE DESCRIPTION Ret. Wall 1 on -Wall_1- from 10+00.00 to 12+46.31 and Ret. Wall 2 on -Wall_2- from 17+00.00 to 20+00.00							GROUND WTR (ft)								
BORING NO. RW2-2		STATION 17+48		OFFSET CL		ALIGNMENT -WALL2-									
COLLAR ELEV. 87.6 ft		TOTAL DEPTH 10.0 ft		NORTHING 250,143		EASTING 2,014,828									
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 83% 02/05/2018				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER D. Tignor		START DATE 08/07/18		COMP. DATE 08/07/18		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
90	87.6	0.0												87.6	0.0
												M			
85	84.1	3.5	WOH	2	2	•	•	•	•	•	M				
80	79.1	8.5	2	2	3	•	•	•	•	•	W			77.6	10.0
Boring Terminated at Elevation 77.6 ft in SAND (COASTAL PLAIN) Note: Surficial Organic Soil=0.0'-0.1'															

NCDOT BORE DOUBLE R-5797_GEO_BH_WALL_GPJ_NC_DOT.GDT 9/25/19

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 44997.1.1		TIP R-5797		COUNTY COLUMBUS		GEOLOGIST M. Durway											
SITE DESCRIPTION Ret. Wall 1 on -Wall_1- from 10+00.00 to 12+46.31 and Ret. Wall 2 on -Wall_2- from 17+00.00 to 20+00.00							GROUND WTR (ft)										
BORING NO. RW2-3		STATION 18+00		OFFSET 2 ft RT		ALIGNMENT -WALL2-											
COLLAR ELEV. 87.6 ft		TOTAL DEPTH 15.0 ft		NORTHING 250,106		EASTING 2,014,864											
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 83% 02/05/2018				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER D. Tignor		START DATE 08/07/18		COMP. DATE 08/07/18		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
90	87.6	0.0													87.6	GROUND SURFACE	0.0
85	84.1	3.5	1	2	2								M			COASTAL PLAIN Black and Tan, Silty Fine to Coarse SAND (A-2-4) (DUPLIN FORMATION)	
80	79.1	8.5	2	3	3								M				
75	74.1	13.5	1	0	1								W		78.0	Black, Fine Sandy Clayey SILT (A-5) (DUPLIN FORMATION)	9.6
			12	18	13								W		73.1 72.6	Gray, Silty Fine to Coarse SAND (A-2-4) (DUPLIN FORMATION) Boring Terminated at Elevation 72.6 ft in SAND (COASTAL PLAIN)	14.5 15.0
Note: Surficial Organic Soil=0.0'-0.1'																	

WBS 44997.1.1		TIP R-5797		COUNTY COLUMBUS		GEOLOGIST M. Durway											
SITE DESCRIPTION Ret. Wall 1 on -Wall_1- from 10+00.00 to 12+46.31 and Ret. Wall 2 on -Wall_2- from 17+00.00 to 20+00.00							GROUND WTR (ft)										
BORING NO. RW2-4		STATION 18+44		OFFSET 8 ft RT		ALIGNMENT -WALL2-											
COLLAR ELEV. 87.5 ft		TOTAL DEPTH 15.0 ft		NORTHING 250,071		EASTING 2,014,892											
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 83% 02/05/2018				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER D. Tignor		START DATE 08/07/18		COMP. DATE 08/07/18		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
90	87.5	0.0													87.5	GROUND SURFACE	0.0
85	84.0	3.5	1	2	3								M			COASTAL PLAIN Black and Gray, Silty Fine to Coarse SAND (A-2-4) with Trace Organics (Roots) (DUPLIN FORMATION)	
80	79.0	8.5	3	3	3								M				
75	74.0	13.5	2	1	1								SS-15	63%			
			4	6	9								W		72.5	Boring Terminated at Elevation 72.5 ft in SAND (COASTAL PLAIN)	15.0
Note: Surficial Organic Soil=0.0'-0.1'																	

NCDOT BORE DOUBLE R-5797_GEO_BH_WALL_GPJ_NC_DOT.GDT 9/27/19

**North Carolina Department of Transportation
Division of Highways
Materials and Test Unit
Soils Laboratory**

T.I.P. ID NO.: R-5797
DESCRIPTION: Retaining Wall 1 on -Wall_1- from 10+00.00 to 12+46.31 and Retaining Wall 2 on -Wall_2- from 17+00.00 to 20+00.00

REPORT ON SAMPLES OF: SOIL FOR QUALITY

F&R PROJECT #: 66V-0246
DATE SAMPLED: 8/18 to 1/19
SAMPLED FROM: Various
SUBMITTED BY: Cheng Wang

COUNTY: Columbus
RECEIVED: 8/18 to 1/19
REPORTED: 8/18 to 1/19
BY: D. Council

TEST RESULTS

PROJ. SAMPLE NO.	SS-12	SS-15	SS-802											
BORING NO.	RW2_1	RW2_4	RW2_6											
Retained #4 Sieve %	NT	0.0	0.0											
Passing #10 Sieve %	NT	99.9	99.3											
Passing #40 Sieve %	NT	67.2	75.5											
Passing #200 Sieve %	2.7	14.5	34.9											

SOIL MORTAR - 100%														
Coarse Sand Ret - #60 %	NT	67.2	47.0											
Fine Sand Ret - #270 %	NT	19.1	20.0											
Silt 0.053 - 0.010 mm %	NT	4.2	17.8											
Clay < 0.010 mm %	NT	9.5	15.2											
L.L.	NT	NP	NP											
P.L.	NT	NP	NP											
P.I.	NT	NP	NP											
AASHTO Classification	A-2-4	A-2-4	A-2-4											
Station	17+00	18+44	19+51											
Offset	3' Lt	8' Lt	3' Lt											
Depth (ft)	3.5	8.5	8.5											
to	5.0	10.0	10.0											
Alignment	-WALL2-	-WALL2-	-WALL2-											
Moisture Content (%)	20.1	63.2	123.5											
Organic Content (%)	1.5	NT	NT											

NP = Not plastic
NT = Not tested
ND = Not Determined
CL = Centerline

W.P. Alton, P.E.
Soils Engineer