STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

STRUCTURE SUBSURFACE INVESTIGATION

STATE PROJECT <u>33185.1.1</u> I.D. NO. <u>B-3637</u>
F.A. PROJECT <u><i>BRSTP-801(2)</i></u>
COUNTY <i>DAVIE</i>
PROJECT DESCRIPTION BRIDGE 37 OVER
I–40 ON NC 801
SITE DESCRIPTION <u>BRIDGE 37 OVER I-40 (Y2</u>)
ON NC 801 (-L-)
INVENTORY

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3318	35.1.1	BR	STP-801(2)	T	P.E.	
STATE	PROJ. NO.	F.	A. PROJ. NO.	I	ESCRIF	TION
N.C.		B-3	637		1	15
STATE	STATE PI	ROJECT	REFERENCE N	0.	NO.	SHEETS

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FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE
CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

INVESTIGATED BY <u>R.Q. CALLAWAY</u> PERSONNEL <u>C.C. MURRAY</u>

CHECKED BY <u>C.B. LITTLE</u>

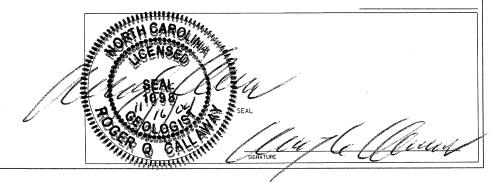
SUBMITTED BY <u>C.B. LITTLE</u>

J.E. ESTEP

DATE *JUNE 2004*

T.A. MECHUM

J.W. VANDERBURG



DRAWN BY: J.K. McCLURE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS GEOTECHNICAL UNIT

ID	STATE PROJECT	NO.	SHEET	NO.	TOTAL	SHEETS
B-3637	33185.1.1		2		ne d	-

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

COLL DECODIDATION	SOIL AND ROCK LEGEND,	ERMS, SYMBOLS, AND ABBREVIATIONS	
SOIL DESCRIPTION	GRADATION <u>WELL GRADED</u> INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN	UNIFORM- INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN TESTED, WOULD YIELD SPT REFUSAL AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL.	ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.
100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586), SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE:	GAP-GRADED- INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.	SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONG	AQUIFER - A WATER BEARING FORMATION OR STRATA.
CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:	ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS; ANGULAR,	OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLOWS:	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
VERY STIFF, GRAY SILTY CLAY, MOIST WITH INTERBEDOED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6	SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT VIELDS ON NAMES A 188 DLOVE	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	PER FOOT.	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE AROVE THE LEVEL
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS ORGANIC MATERIALS (≥5% PASSING =200) (≥5% PASSING =200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE,	AT WHICH IS IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5	COMPRESSIBILITY	GNEISS, GABBRO, SCHIST, ETC.	CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-7-6 A-3 A-6, A-7	SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 30	NON-CRYSTALLINE SEDIMENTARY ROCK THAT WOULD YELLD STY REFUSAL IF TESTED, ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM
SYMBOL BOOOGOOG	MODERATELY COMPRESSIBLE LIQUID LIMIT 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK BUT MAY NOT YIFLD	OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF BOTH THE CORE BARREL DIVIDED BY TOTAL
X PASSING # 10 50 MX	PERCENTAGE OF MATERIAL	SEDIMENTARY ROCK SPT REFUSAL, ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.	CENTER OF CORE RON AND EXPRESSED AS A PERCENTAGE.
# 40 30 MX50 MX51 MN GRANULAR CLAY MUCK.	ORGANIC MATERIAL GRANULAR SILT- CLAY SOILS SOILS OTHER MATERIAL	WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
The state of the s	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
LIQUID LIMIT 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN SOILS WITH PLASTIC INDEX 6 MX N.P. 10 MX 10 MX 11 MN 11 MN 11 MN 11 MN 11 MN 11 TT F OR	MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN	HURIZUNTAL.
GROUP INDEX 0 0 0 4 MX 8 MX 12 MX 16 MX No MX MODERATE ORGANIC	HIGHLY UNGANIC >10% >20% HIGHLY 35% AND ABOVE	(V. SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
USUAL TYPES STONE FRAGS. FINE SHITY OR CLAYEY SHITY CLAYEY ORGANIC	GROUND WATER WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING.	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE
OF MAJOR GRAVEL AND SAND SAND SAND SAND SOILS SOILS MATTER	STATIC WATER LEVEL AFTER 24 HOURS.	(SLI.) I INCH. OPEN JOINTS MAY CONTAIN CLAY, IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
GEN.RATING AS A EXCELLENT TO GOOD FAIR TO POOR FAIR TO POOR INSULTAND	∇ PW	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING FEECTS IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
AS A EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABL	E CHOICE WATER, SATORATED ZONE OF WHICH BEARING STRATA	(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY, ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	PARENT MATERIAL.
P.I. 0F A-7-5 ≤ L.L 30 : P.I. 0F A-7-6 > L.L 30	SPRING OR SEEPAGE	WITH FRESH ROCK. MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL	FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY
CONSISTENCY OR DENSENESS COMPACTNESS OR RANGE OF STANDARD RANGE OF UNCONFINED	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KADLINIZATION ROCK SHOWS SEVERE LOSS OF STRENGTH	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY PENETRATION RESISTENCE COMPRESSIVE STRENGTH (N-VALUE) (TONS/FT2)	ROADWAY EMBANKMENT WITH SOIL DESCRIPTION ROADWAY EMBANKMENT WITH SOIL DESCRIPTION ROADWAY EMBANKMENT OFFICIAL TUBE OFFICIAL TUBE OFFICIAL TUBE OFFI O	(MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES CLUMK SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL	THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
GENERALLY VERY LOOSE (4	SOU SYMBOL ALICER BORING	SEVERE ALL ROCKS EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCE((SEV.) IN STRENGTH TO STRONG SOIL, IN GRANITOID ROCKS ALL FELDSPARS ARE KAQLINIZED TO SOME	LEGGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
GRANULAR LOOSE 4 TO 10 MATERIAL MEDIUM DENSE 10 TO 30 N/A	S- BULK SAMPLE	EXTENT, SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	ITS LATERAL EXTENT.
(NON-COHESIVE) DENSE 30 TO 50 VERY DENSE >50	ROADWAY EMBANKMENTS	IF TESTED, YIELDS SPT N VALUES > 100 BPF VERY SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS, MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN
VERY SOFT <2 (0.25	INFERRED SOIL BOUNDARIES ** MONITORING WELL SAMPLE	I (V, SEV.) THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS WITH ONLY ERACMENTS OF STRONG POCK	SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
GENERALLY SOFT 2 TO 4 0.25 TO 0.5 SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1	MONITORING WELL SHIFTLE MONITORING WELL SHIFTLE RS- ROCK SAMPLE	REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS SPT N VALUES < 100 BPF	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
MATERIAL STIFF 8 TO 15 1 TO 2	TTTTT ALLUVIAL SOIL BOUNDARY INSTALLATION RT- RECOMPACTED	COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
HARD >30 2 TO 4	25/025 DIP/DIP DIRECTION OF SLOPE INDICATOR TRIAXIAL SAMPLE	SCATTERED CONCENTRATIONS, QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS ALSO AN EXAMPLE.	ROCK QUALITY DESIGNATION (R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF
TEXTURE OR GRAIN SIZE	ROCK STRUCTURES INSTALLATION CBR - CBR SAMPLE SPT N-VALUE	ROCK HARDNESS	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	● - SOUNDING ROD REF SPT REFUSAL	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE
OPENING (MM) 4.76 2.0 0.42 0.25 0.075 0.053	ABBREVIATIONS	SEVERAL HARD BLOWS OF THE GEOLOGISTS PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED	PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY (BLDR.) - (COB.) (GR.) (GR.) (GR.) (GR.)		TO DETACH HAND SPECIMEN.	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS
(CSE, SD.) (F, SD.) (SC.)	AR - AUGER REFUSAL FRAC FRACTURED SL SILT, SILTY 8T - BORING TERMINATED FRAGS FRAGMENTS SLI SLIGHTLY	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, COUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGISTS PICK, HAND SPECIMENS CAN BE DETACHED	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR
GRAIN MM 305 75 2.0 0.25 0.005 0.005 SIZE IN. 12* 3*	CL CLAY HI HIGHLY TCR - TRICONE REFUS	SAL BY MODERATE BLOWS.	SLIP PLANE.
SOIL MOISTURE - CORRELATION OF TERMS	CPT - CONE PENETRATION TEST MED MEDIUM W - MOISTURE CONTE CSE COARSE MICA MICACEOUS V VERY	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF I FOOT INTO SOIL WITH
SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION	DMT - DILATOMETER TEST MOD MODERATELY VST - VANE SHEAR T DPT - DYNAMIC PENETRATION TEST NP - NON PLASTIC	EST POINT OF A GEOLOGISTS PICK.	A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL IS LESS THAN 0.1 FOOT PENETRATION WITH 60 BLOWS.
	● - VOID RATIO PMT - PRESSUREMETER TEST / - DRY UNIT WEIGH		STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY (SAT.) FROM BELOW THE GROUND WATER TABLE	F FINE SAP SAPROLITIC FOSS FOSSILIFEROUS SD SAND, SANDY	PIECES CAN BE BROKEN BY FINGER PRESSURE.	OF STRATOM AND EXPRESSED AS A PERCENTAGE.
PLASTIC LIOUID LIMIT	-	SOFT. OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRATCHED READILY BY	STRATA ROCK QUALITY DESIGNATION (S.R.O.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EDUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED
RANGE CONTROL OF THE PROPERTY	EQUIPMENT USED ON SUBJECT PROJECT	FINGERNAIL. FRACTURE SPACING BEDDING	BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
" PLL _ PLASTIC LIMIT	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	FRACTURE SPACING BEDDING TERM SPACING TERM THICKNESS	
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	□ □ □ AHTOMATIC □ MG	NIA) VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED > 4 FEET	BENCH MARK: BL-I2 PINC 2I+53,77 -L- 29+I2.65 (2I.67 LT.)
SL SHRINKAGE LIMIT	MOBILE 8-	MODERATELY CLOSE 1 TO 3 FFFT THINLY BEDDED 0.16 - 1.5 FEET	ELEVATION: 795.78'
- DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	6° CONTINUOUS FLIGHT AUGER CORE SIZE:	CLOSE 0.6 TO LEGET VERY THINLY BEDDED 0.03 - 0.16 FEET	NOTES:
PLASTICITY	- A B HOLLOW AUGERS	THINLY LAMINATED < 0.008 FEET	
PLASTICITY INDEX (PI) DRY STRENGTH	- L CME-45C HARD FACED FINGER BITS -N	INDURATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
NONPLASTIC 0-5 VERY LOW	X CME-550 X TUNGCARBIDE INSERTS	DURDU WALLE TO THE TOTAL	
LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM	X CASING X W/ ADVANCER HOND TOOLS.	FRIABLE ROBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
HIGH PLASTICITY 26 OR MORE HIGH	PORTABLE HOIST X TRICONE 27/8 STEEL TEETH POST HOLE DIGGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE:	·
COLOR	OTHER X TRICONE 215/16 TUNGCARB. HAND AUGER	BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE:	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	CORE BIT SOUNDING ROD OTHER VANE SHEAR TEST	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.	
TO DESCRIBE APPEARANCE.	OTHER OTHER OTHER	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	
		OTHER CONTROL HUNDS ONNING.	





STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY GOVERNOR

LYNDO TIPPETT SECRETARY

November 15, 2004

NCDOT

Geotechnical Unit

12033-D Independence Blvd.

Matthews, NC 28105

STATE PROJECT 33185.1.1

B3637

COUNTY

Davie

DESCRIPTION

I.D. NUMBER

Bridge # 37 over I-40, (-Y2-) on NC 801, (-L-)

SUBJECT: Geotechnical Report – Bridge Foundation Investigation

PROJECT DESCRIPTION

This is a preliminary Bridge Foundation Investigation report in English units, for a design build project that will include raising the grade and widening a two lane bridge to four lanes.

Location:

The site is west of Winston-Salem, just inside Davie County at the intersection of I-40 and NC 801. This investigation was based on the location portrayed on Preliminary Plans.

Proposed Structure (s):

The profile for the roadway appears to be a 5 to 6 feet higher than the existing grade. The current two lane overpass will be replaced by a four lane overpass. The existing and future structures are portrayed with a skew parallel to I-40, approximately 65 degrees.

Drilling:

A CME 550 drill rig with automatic hammer was used on this project. Two borings were drilled to bearing using NW casing with a drag bit in the vicinity of the planned endbent locations. One boring was drilled in the I-40 median.

Bearing and Fixity:

All borings achieved required predicted bearing capacity. Fixity was not an issue.

PHYSIOGRAPHY and GEOLOGY

Physiography

The project is in the Piedmont Physiographic Province near the summit of a ridge that is parallel to and about 1.4 miles west of the Yadkin River. The ridge is at about 805' elevation, and the Yadkin is about 690' elevation.

Geology

Bedrock Geology

The 1985 Geologic Map of North Carolina shows the project area is located within the Pzzm unit, metamorphosed mafic rocks. The conditions encountered near the bridge are

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LOCATION: **ENTRANCE B-2** 1020 BIRCH RIDGE DRIVE RALEIGH NC

CENTURY CENTER COMPLEX

more consistent with highly weathered granitic schist.

Variation and Predictability of the Subsurface

The stratigraphy encountered in the borings appears to be systematic, but the direction of most rapid geologic change should be along NC 801. In a short distance foundation conditions could change radically.

FOUNDATION MATERIALS

Soil Section:

All of the borings penetrated a thick interval of residual soil before our bearing capacity guide value was achieved. Standard Penetration Test, (SPT), values were N less than 5 for most of the upper 30 feet on the end bents, and 25' on the interior bent which started a lower elevation. A chart of some of the subsurface conditions appears below.

				Interval of	Elevation of		
		Collar	Fill	Residual Soil	Top of	Depth to	Elevation at
Bent	Boring	Elevation	Thickness	Drilled	Residual	Bearing	Bearing
EB1	Α	785.9	0	64	721.9	54	731.9
EB1	В	787.14	0	79.5	707.64	62	725.14
B2	В	776.22	6	59	717.22	62	714.22
EB2	Α	798.13	- 14	80	718.13	74	724.13
EB2	В	791.32	2	87	704.32	79.5	711.82

Roadway Fill:

Most of the borings were sited below the fill embankment, but EB2A traversed 14' of A-7 fill. Plasticity Index, (P.I.), values of the two fill samples were 41 and 24 with liquid limit values of 74 and 63. The fill probably came from nearby residual cap clay.

Residual Soil:

The residual soil layer in the preliminary bridge borings is shown in the table above and was from 64' to nearly 90' thick. The upper soil in the borings is A-7, changing to A-5 with depth, and eventually A-4.

Weathered Rock:

Weathered rock was found in EB1-B and EB2-B at a depth of 79' and 94' respectively.

Rock:

No rock was encountered.

Hydrology:

The water level was measured at the time of boring, and at 24 hours. The water was at 770 in the EB1 Borings and the median hole. In the EB2 borings, it was a little higher.

CLOSING STATEMENT

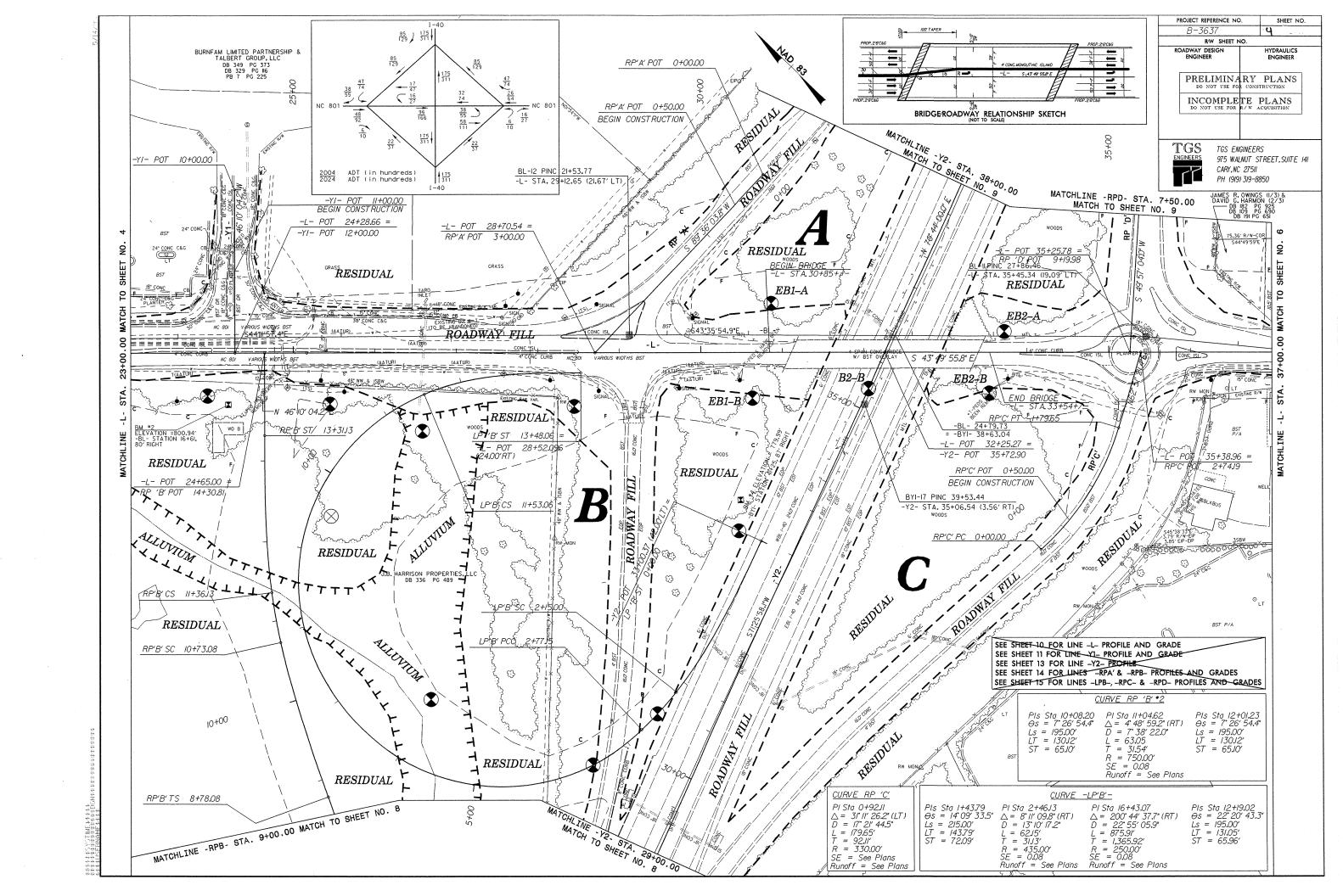
The geotechnical foundation investigation, analysis and recommendations are based on plans sealed 02/09/96. If any significant changes are made in the design or location of the proposed structure, the subsurface information and recommendations will have to be reviewed and modified as necessary.

Respectfully Submitted

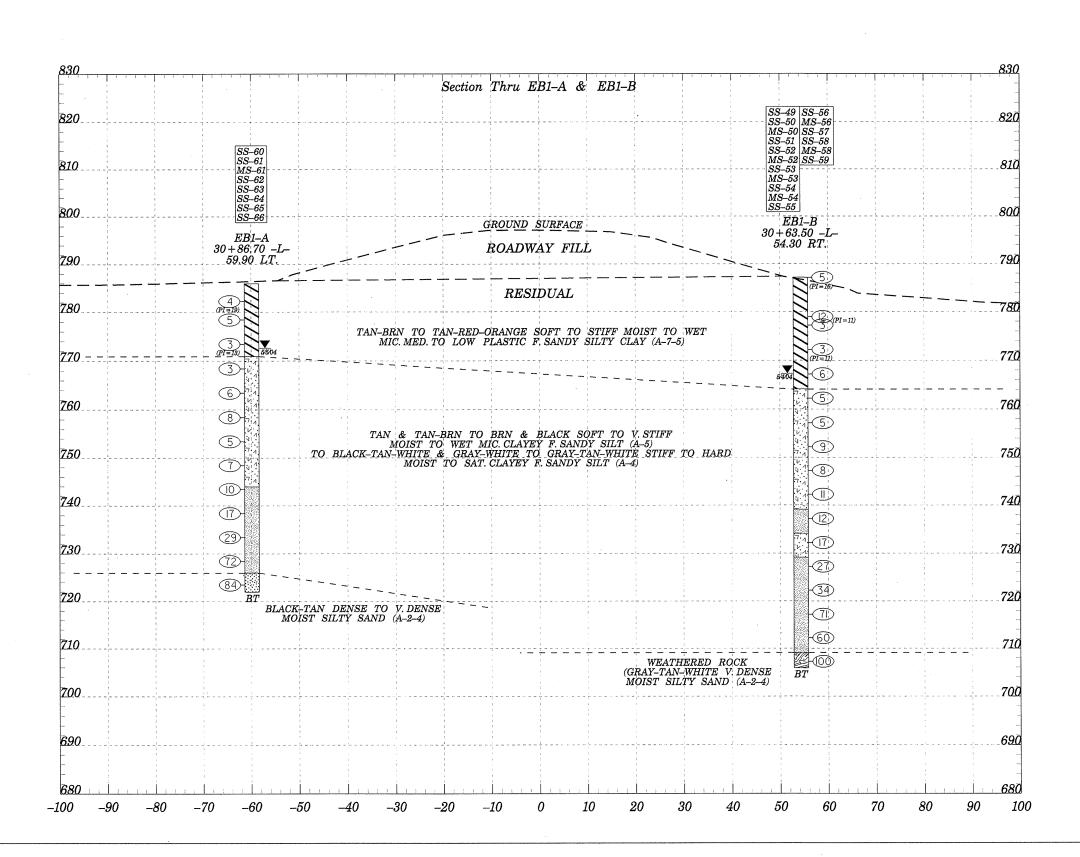
Mellen Roger O Callaway, L.G.# 1098

Project Geologist

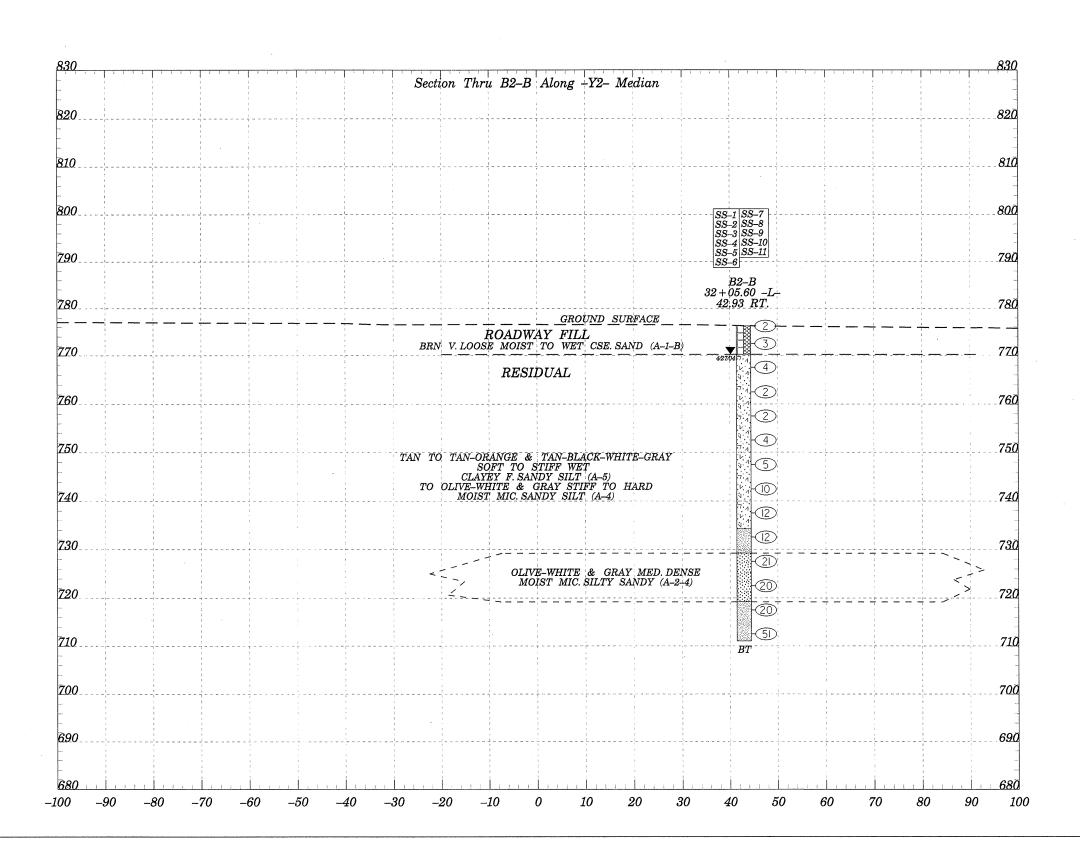
Geotechnical Unit, Matthews Field Office



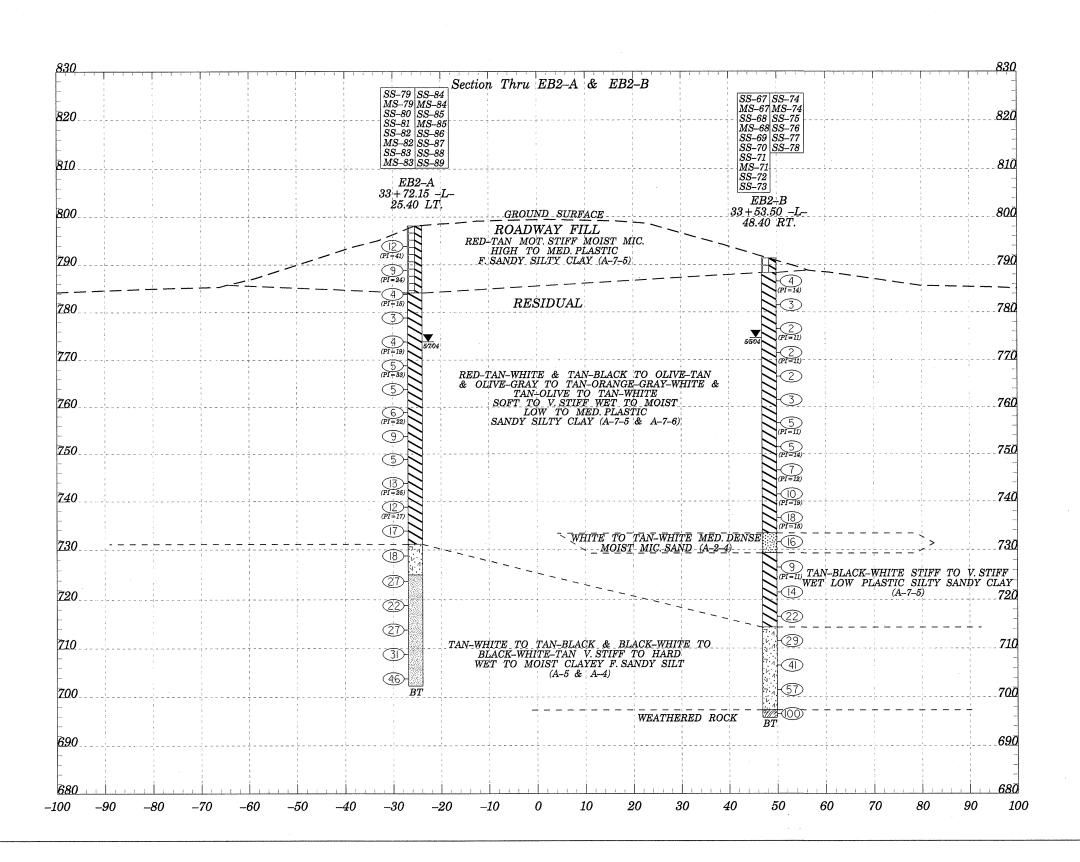
PROJECT REFERENCE NO	SHEET NO.
B-3637	5 :
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
	RY PLANS CONSTRUCTION
INCOMPLE DO NOT USE FOR	TE PLANS

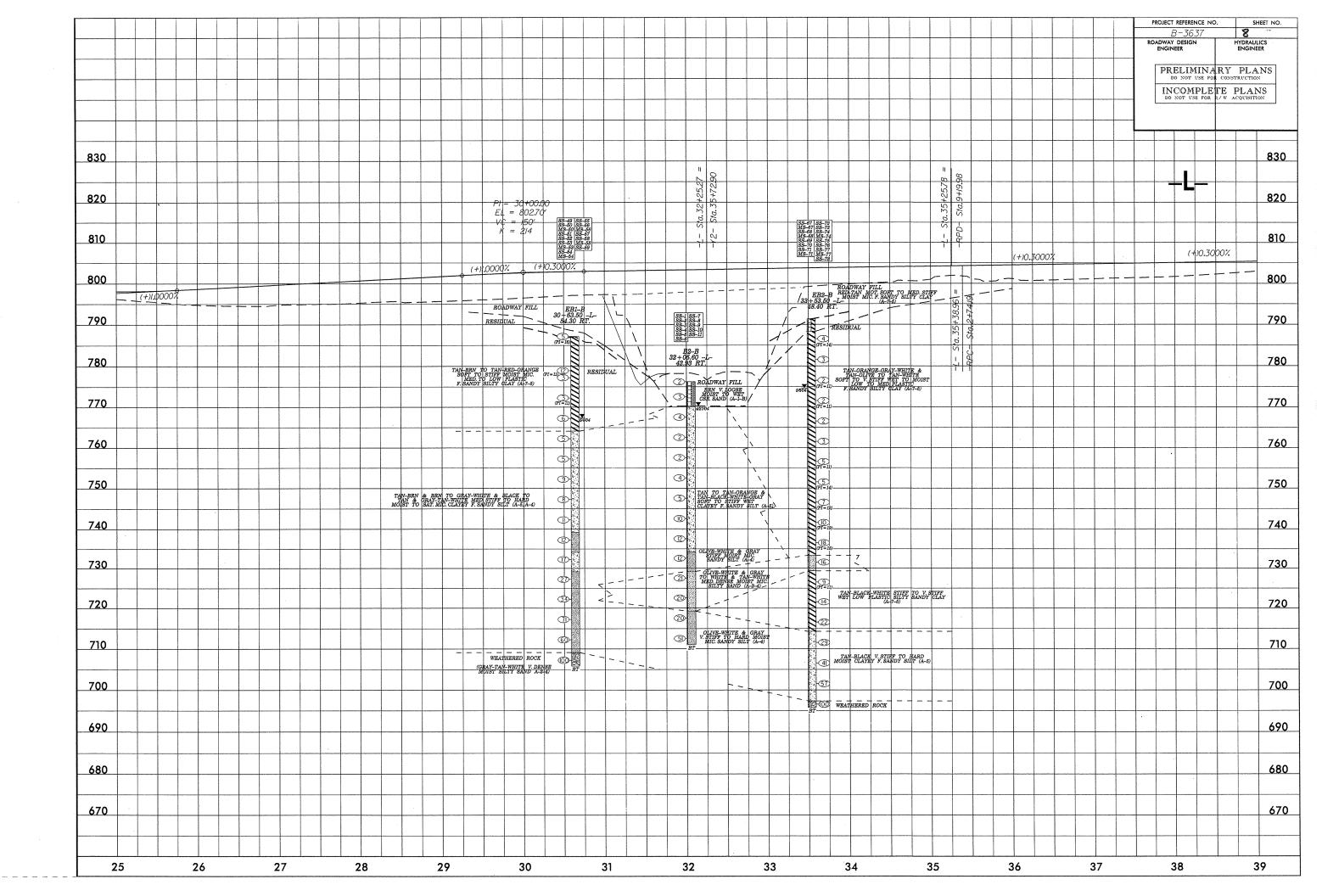


B-3637 6 = OADWAY DESIGN HYDRAULICS ENGINEER PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	PROJECT REFERENCE NO	SHEET NO
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION INCOMPLETE PLANS	B-3637	6 -
DO NOT USE FOR CONSTRUCTION INCOMPLETE PLANS	ROADWAY DESIGN ENGINEER	
		4.



110	OJECT REFERENCE NO).	SHEET NO
	B-3637		7
	DWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
	PRELIMINA DO NOT USE POL		
	INCOMPLE'		





NORTH CAROLINA DEPARTMENT OF TRANSPORTATION GEOTECHNICAL HNIT ROBING LOG

			©		TC	ECHI		AL	UN	90T	BORI			LOG	SHEET	OF
PROJECT					1	B-3637		COUNTY		AVIE		GE	OLC	OGIST MECHUM		
SITE DESC						ER 1-40				O D D O D D O D O D O D O D O D O D O D	50.00	1 4 7	ION	I) (D) (D)		ND WATER
BORING N		- Δ - Δ	<u>јв</u> 785.			ATION IORTHING	30+8	1727.8		OFFSEI	-59.90 EASTIN			MENT L 3532.62	0 HR. 24 HR.	13 [:] .3
TOTAL DI						IINE CME		1 (8 (L METH	IOD NWC				TYPE AUT	
START DA						LETION D	ate 5	/4/0	4	SUR	FACE WAT	ER DEP	ТН	DEPTH	I TO ROCK	
ELEV.	DEPTH	1			1		OWS 25	PER I	FOOT 75		SAMPLE NUMBER	1 /			AND ROCK CRIPTION	
	(FT.)	0.5	<u> 10.5</u>	<u> 10.5</u>	1(F I.)		<u> </u>				NUMBER	MOI.	G	DESC	RIPTION	
70E Q	+		-													
785.9 785.0 -														(RESIDUAL) TAN-	BRN SOFT 1	TO MIC.
-	‡ 3.7	2	1	3		 	<u> </u>				SS-60	W		MEDLOW PLAS SILTY CLAY (A-	TIC F. SAND' 7-5)	Y
780.0	<u> </u>	1	2	3										(WEATHERED GN	EISS)	
-	‡ 7 . 5	1	<	3		 			-			М				
775.0	I 12.5	1	2	1			-				CC (1	_				
	12.5	1	~	1	1						SS-61 MS-61	57.8				
770.0 -	<u>+</u> 1 17.5	2		2							SS-62	M	7.1 V	TAN TO TAN-BEMOIST TO WET	MIC. CLAYEY	STIFF
	† 11.5		1	-					_		33-62	IVI	7.4	F. SANDY SILT	(A-5)	
765.0 -	+ = 22.5	3	2	4					-				V 1			
	± 22.5)	4	4								M	7.1			
760.0 -	7		3	_							66.67		7.1			
-	27.5	2	3	5		- 1 8 -	ļ				SS-63	W	フ・/ レ			
755.0 -	<u> </u>						100m 010m mar						7.1			
-	32.5	2	2	3		5-		- 				W	ν. 1			
750.0	<u> </u>												7. ₇ .			
-	☐ 37 . 5	2	3	4		- X-		- 				М	7.1			
745.0	+ 10.5			_								,,,,	7.1 V			
-	I 42.5	2	3	7					-		SS-64	W		BLACK-TAN-WHI HARD MOIST TO	TE STIFF TO WET F.SAN	1DY
740.0	<u>+</u> ,,, ,	_	_	1.0										SILT (A-4)		
-	T 47.5	5	7	10		X						W				
735.0	F		1,0	17			\				66.65					
· · · · · · · · · · · · · · · · · · ·	52.5	8	12	17			- X 2 9		-		SS-65	M				
730.0	<u> </u>	1 -		11				-15								
-	57.5	15	28	44					. XL(.	Z 		М		-		
725.0	<u> </u>								[/					BLACK-TAN DEN MOIST SILTY SA	SE TO V. DE	INSE
-	62.5	3Ø	37	47			<u> </u>			X 84.	SS-66	М				
720.0	<u> </u>						 									
-	‡	٠					<u>-</u>									
715.0	<u> </u>															
-	+						;-							BORING TERMINA	TED AT ELE	EV. 721.93
_	<u></u>	L	<u></u>				1							IN V. DENSE SIL	TY SAND (A	-2-4)

9/1

GEOTECHNICAL UNIT BORING LOG

					,									SHEET OF 2
PROJECT	N o . 33	185.				B-3637		UNTY	DAVIE		GF	EOLC	DGIST MECHUM T	,
SITE DESC						ER 1-40								GROUND WATER
BORING N	0 . EB						30+63.	.50	OFFSET	54.30			MENT L	0 HR.
COLLAR E			787.			ORTHING		65.49		EASTIN			3434.17	24 HR. 19.8
TOTAL DE						IINE CME-				IOD NWCA				PE AUTOMATIC
START DA					·	LETION DA				FACE WAT	ER DEF	TH	DEPTH TO	ROCK
ELEV.	DEPTH	l)WS PE			SAMPLE			SOIL AND	
	(FT.)	0.5	0.5	0.5	(FT.)	0 25	5 50	O .	75 IOC	NUMBER	MOI.	. Ğ	DESCRIP	TION
_	_													
787.14 -	0-	2	2	3		 				SS-49	M		(RESIDUAL) TAN-BRN	
785.0 —	_												TAN-RED-ORANGE SOME MOIST MIC. MEDLOW	
-									1				F. SANDY SILTY CLA	
780.0	-													
-	8.2	3	5	7		- X +2-				SS-50 MS-50	M 41.9			
775.0	9.9	1	-1	2		 				M3.30	41.9			
775.0	-								11					
_	14.9	3	1	2		\[\frac{3}{3} \]			<u> </u>	SS-5I	М			
770.0														
-	19.9	- 1	2	4		-4		Marie 11.00 Marie 1						
765.0 -		-	٠.		· ·									
-	- 0.4.0				١.	-				66.50		7:1	TAN-BRN TO BRN M	ED. STIFF TO
	24.9	1	2	3		- X-5				SS-52 MS-52	M 59.5	7.1	STIFF MOISTMIC.CLA SANDY SILT (A-5)	YEY F.
760.0	-					-			1	1113 32	33.3	7:1		
-	29.9	2	2	3								7.1		
755.0 -	-											7.1	•	
_	T 34.9	1	4	5	١,					SS-53		7.1		
7500	74.3	1	-1						1	MS-53	M 55.2	7:1	•	*
750.0 —						-						7.1		•
_	39.9	2	3	5	1							7.1	•	
745.0 -	_ `		,									7.1		
_	44.9	2	4	7		 			1	SS-54	М	7.1	•	
740.0			,		l '					MS-54	49.6	7.1		
140.0			_										GRAY-WHITE STIFF N	MOIST TO
	49.9	4	5	7		- * +2-				SS-55	SAT		SAT. CLAYEY F.SAND (A-4)	Y SILT
735.0	_								11			ļ.,	PLACK TO TAN V.S.	TICC CAT
-	54.9	4	6	11		*47				SS-56	М	.V.	BLACK TO TAN V.S TO MOIST MIC.F. SAN	NDY SILT
730.0	_					; \				MS-56	36.1	7.	(A-5)	
	59.9	5	10	17		/	 / 37		1	SS-57			GRAY-TAN-WHITE V.	
725.0	73.3	Ü	שו	1/			\		11	33-31	M		HARD MOIST F.SAND (A-4)	I SILI
123.0														
	64.9	9	16	18	1		X34							
720.0	 													
-	69.9	13	26	45				X	77	SS-58	М			
715.0	_									MS-58	M 19.0			
	- 740	1.0	~~					 - -						
	74.9	12	20	40				- X-60 	<u> </u>					

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION NORTH CAROLINA DEPARTMENT OF TRANSPORTATION GEOTECHNICAL UNIT BORING LOG

							91/11 11					SHEET 2	OF 2
	3185.1 . 1				3-3637	COUNTY		···	GEO	LOGIST	MECHUM		
SITE DESCRIPTION					ER 1-40 0							GROUND	WATER
BORING NO. EB						+63.50		54.30		GNMENT		0 HR.	
COLLAR ELEVATION	N 78	37.1	4	N	ORTHING 8	24665.4	49	EASTIN	I G 15	73434.1	7	24 HR.	19.8
TOTAL DEPTH 81	.3	DF	RILL	MACH	INE CME-550	X	DRILL MET	HOD NWC	AS/TRI	-CONE	HAMMER 7	YPE AUTO	MATIC
START DATE 5/	4/04		(COMPI	LETION DATE	5/4/0	4 SU	RFACE WAT	ER DEPT	Н	DEPTH 7	O ROCK	
DEPTH	BLOW	CO)UNT	PEN.	BLOW:	S PER F	F00T	SAMPLE	V	_	SOIL AN	D ROCK	
ELEV. (FT.)	0 510) 51	0.51	(FT.)	0 25	50	75 IC	O NUMBER	1 / 11	G ·	DESCRI		
710.0	0.5	7.0	0.0					<u> </u>	177	1999	HERED ROC	1/	
± 79.9	32 4	48	52	0.9				SS-59	M	(GRA	Y-TAN-WHIT	E V. DENSE	
705.0 +									59	MOIS	T SILTY SA	ND A-2-4)	
103.0													
+													
700.0 													
<u> </u>													
695.0													
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690.0 +													
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685.0 +						and another thems to the same							
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670.0 +													
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665.0 +													
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660.0 +													,
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655.0 +					<u> </u>								
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650.0 +													
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645.0 +		-											
‡						ander only make tolks and							
‡		***************************************				to the same to the							
640.0 +		-											
‡		-				AND THE REST TO SEE		-					
635.0 +										TERM	INATED B	ORING AT	
1 555.0 ±								†		ELEV.	705.84	IN	
Ŧ								a consequence of		WEAT	HERED RO	OCK	
T	<u> </u>								LL				

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION GEOTECHNICAL UNIT BORING LOG

			(G		ונו ע	ECHNI		TIMU		in a		LOG	SHEET OF
PROJECT	NO . 33	185.1	١		ID.	B-3637	COUNTY	DAVIE		GE	OLO	GIST MURRAY	
SITE DESC	RIPTION	BF	RIDGE	= 37	7 OV	ER 1-40 0	N NC 80						GROUND WATER
BORING N	0. B2						+05.64	OFFSET	42.93			MENT L	0 HR.
COLLAR E			776.				324570.8		EASTIN			3540.78	24 HR. 6.0
TOTAL DE						IINE CME-550		DRILL MET					TYPE AUTOMATIC
START DA						LETION DATE			RFACE WAT	ER DEP	TH	DEPTH	TO ROCK
ELEV.	DEPTH				1		S PER F		SAMPLE				ND ROCK
	(FT.)	0.5	0.5	0.5	(FT.)	0 25	50	75 100	NUMBER	MOI.	Ğ	DESCR	RIPTION
-	-												
776.22	0-	-1	1	1		X2 = = =			 SS 	М	1 88	(ROADWAY FILL) B	PN V LOOSE
775.0	_									IVI		MOIST TO WET C	SE. SAND
-	3.7	1	2	1		¥3			SS-2	W		(Y-I-R)	
770.0	_									_	188	(RESIDUAL) TAN T	O TAN-ORANGE
_	8.7	1	2	2					SS-3	l w	12/	& TAN-BLACK-WH	HITE-GRAY SOFT
	- 0.1	1		_	'					VV	7.	TO STIFF WET CL SILT (A-5)	ATET F. SANUT
765.0 -								_			12/		
_	13.7	1	1	1		X2					7.4		
760.0 -	_										V. 1		
-	18.7	1	1	1	1				SS-4.	W	7.7		tan a
755.0		•	-	-	'					"	1		
155.0		_	_	_							7:1		
-	23.7	2	2	2		4			SS-5	W	V 1		
750.0	_		-								7.7		
	28.7	1	2	3	1	 			SS-6	W	V 1		
745.0 -	_										7:1		
-	33.7	7			١.				SS-7	147	1		
	33.1	2	4	6	'	- 410			55-1	W	7.7		
740.0 -	_										V 1		
	38.7	3	4	8		-	state total special country total		SS-8		7.1	·	
735.0 -	_										1		
_	43.7	5	5	7		12			SS-9	М		OLIVE-WHITE & G MOIST MIC. SANDY	
7700)			'					141		MICE SAIND	SILT (A I)
730.0 -	-					1 1						OLIVE-WHITE & G	RAY MED.
_	48.7	4	8	13		7 21			SS-10	М		DENSE MOIST MIC (A-2-4)	
725.0 -	_											(A-Z-4)	
	53.7	5	6	14									
7000	- 55.1			' '	'								
720.0 -	-											OLIVE-WHITE & G	RAY V. STIFF
	58.7	5	8	12		x20			SS-II	М		TO HARD MOIST I	
715.0	<u> </u>					>	<u> </u>					SILT (A-4)	
	63.7	15	22	29									
710 0		10		,			4 41_					NOTE.	
710.0 -	-						THE REST NAME OF THE PARTY NAM					NOTE: COLLAR_ELEVATIO	N FOR THIS BORING
_		•										WAS OBTAINED FF	ROM .DTM FILE
705.0	<u> </u>												
												BORING TERMINAT	ED AT ELEV. 711.02
	L											IN HARD SANDY	SILT (A-4)

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION GEOTECHNICAL UNIT BORING LOG

			(6		9 1	E C H		ا 🗚 رُ	. U	רושע				j		(Š	SHEET	OF 2
PROJECT	NO. 33	185.	1.1		ID.	B-3637	7	COU	NTY	DAVIE	-		Gl	EOLO	GIST	MECHUM	T.A.	
SITE DESC	RIPTION	BI	RIDG	E 3	7 OV	ER 1-4	10 0	NC NC	801								GROUN	ND WATER
BORING N	0. EB	2-A	В	ORIN(G LOC	ATION	33+	+72.15	5	OFFS	ET	-25.40	Al	LIGN	MENT	L	0 HR.	
COLLAR E	ELEVATIO)N	798.	13	N	ORTHING	3 8	2449	8.04			EASTIN	G	157	3705.	42	24 HR.	24.3
TOTAL DE				RILL	MACH	IINE CM	E-550)	Χ	D	RILL M	ETH	OD NWC	AS/TI	71-(CONE	HAMMER	TYPE AUT	OMATIC
START DA					.,	LETION	····				SUR	FACE WAT	ER DEI	PTH		DEPTH	TO ROCK	
ELEV.	DEPTH				}			PEF				SAMPLE	▼/				ND ROCK	
	(FT.)	0.5	0.5	10.5	(FT.)	0	25	50		75 	100	NUMBER	MOI	. <u>Ğ</u>		DESCH	RIPTION	·
798.1				ļ	ļ					 	-				(ROAD	WAY FILL) F	PED-TAN M	ОТ
. 705.0	_						- :				_			R	STIFF	MOIST MIC.	HIGH-MED.	
795.0 -	4.3	3	5	7		X -12	2					SS-79	М		(A-7-5	IC F. SAND	Y SILIY CI	_A Y
-	F					 						MS-79	34.3					
790.0	- 0.7		1	_						ļ	-	66.00		F				
	9.3	3	4	5		[-f=				<u> </u>	_	SS-80	М	F				
785.0 -	<u></u>						- <u> </u>			ļ				K				
103.0	14.3	1	2	2	1	X-4		<u>-</u>		ļ	_	SS-8I	W	K	(RESID	UAL) RED-T	AN-WHITE	ΓΩ
	_					1					-				TAN-B	LACK, OLIVE	-TAN &	
780.0	19.3	Ø	1	2		1	- 			<u> </u>	-		,,,,		WET N	GRAY SOFT	H PLASTIC	
· _	13.3	W.	1	-	'	 	15						W		SANDY	SILTY CLA	AY (A-7-5	& A-7-6)
775.0	_								and may well				_					
_	24.3	1	2	2		*4 -	-				_	SS-82 MS-82	66.1					
	<u> </u>						-			ļ	-	1413-02	00.1					
770.0	F 29.3	Ø	3	2		X 5 -				<u> </u>	-	SS-83	W					
-						T				<u> </u>	-1	MS-83	72.5					
765.0	F					+=-	<u> </u>				_							
	34.3	2	2	3		¥-5					-							
760.0 -																		
100.0	39.3	2	3	3		X6-			### ### 100	<u> </u>	-	SS-84	W				ř	
	_					1	- -				-	MS-84	60.1					
755.0	44.3	3	4	5		- X-9-									-			
=		_				1-1				<u> </u>								
750.0	10.7	1				-J					-							
	49.3	1	2	3		<u>_</u>				<u> </u>	-							
745.0	_					[-]	1				-]							
143.0	54.3	4	6	7		}:	3					SS-85	W					•
_	_					-					-	MS-85	49.5					
740.0	- 59.3	4	6	6							-	CC 0C	147			*		
=	23.3	4	Ь	Ь			<u> </u>					SS-86	W					
735.0							<u> </u>				-							
133.0	64.3	5	6	11			17				_							
1	_						-			 	-							***
730.0	- - 69.3	6	8	10			 +8				-	SS-87	W	7.1 V	IAN-W CLAYE	HITE V.STI Y F.SANDY	FF WEI SILT (A-5	5)
	- 03.3	Ų	0	שו	'		Έ	_ <u> </u>		<u> </u>	-	33 01	٧V	7				
725.0	-						<u> </u>				-				DI 4011	WILLTO TO		***************************************
1	74.3	6	10	17			127	7			-	SS-88	М		BLACK	-WHITE TO -WHITE-TAN	V. STIFF	ТО
‡	-					-7	f			<u> </u>					HARD (A-4)	MOIST CLA	YEY SANDY	SILT
	·						1.5				- 1			1.5				

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION GEOTECHNICAL UNIT BORING LOG

SHEET 2 OF 2 ID. B-3637 PROJECT NO. 33185.1.1 COUNTY DAVIE GEOLOGIST MECHUM T.A. SITE DESCRIPTION BRIDGE 37 OVER 1-40 ON NC 801 GROUND WATER BORING NO. EB2-A BORING LOCATION 33+72 OFFSET -25 ALIGNMENT L 0 HR. COLLAR ELEVATION 798.1 **NORTHING** 824498.04 EASTING 1573705.42 **24 HR.** 24.3 TOTAL DEPTH 95.8 DRILL MACHINE CME-550X DRILL METHOD NWCAS/TRI-CONE HAMMER TYPE AUTOMATIC START DATE 5/6/04 COMPLETION DATE 5/7/04 SURFACE WATER DEPTH DEPTH TO ROCK DEPTH|BLOW COUNT|PEN. BLOWS PER FOOT MOI. G SAMPLE SOIL AND ROCK 100 NUMBER DESCRIPTION 79.3 5 8 | 14 | BLACK-WHITE TO BLACK-WHITE-TAN V. STIFF TO HARD MOIST CLAYEY SANDY SILT $(\Delta - 4)$ 715.0 84.3 6 10 17 М 710.0 89.3 6 12 19 Μ 705.0 94.3 10 18 28 М SS-89 700.0 695.0 690.0 685.0 680.0 675.0 670.0 665.0 660.0 655.0 650.0 + TERMINATED BORING AT 645.0 ELEV. 702.33 IN HARD CLAYEY F. SANDY SILT (A-4)

1415

GEOTECHNICAL UNIT BORING LOG

					·	· · · · · · · · · · · · · · · · · · ·										SHEET	OF 2
PROJECT		3185.			L	B-3637		UNTY	DAV	/IE		GE	EOLO	GIST	MECHUM	T.A.	
SITE DESC							N NO C							~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		GROUN	ND WATER
BORING N		2-B				ATION	33+53.			FSET	48.40				L	0 HR.	
COLLAR I			791.3			NORTHING					EASTING			3639.		24 HR.	16.7
TOTAL DI						HINE CME			DRILL		OD NWCA			CONE		TYPE AUT	OMATIC
START DA							ATE 5/6			SUR	FACE WATI		TH			TO ROCK	
ELEV.	DEPTH	1			1		OWS PE		75 75	100	SAMPLE NUMBER	! /	L O G			ND ROCK	•
	(FT.)	0.5	0.5	<u> 10.5</u>	1(F I.)	Y	23 30		13		NUMBER	MOI.	. G		DESCI	RIPTION	
	Ī											-					
791.32 790.0 -	<u> </u>												F	(ROA	DWAY FILL) RED-TAN	мот.
	+								 - -		·			\vdash MIC.	F. SANDY	STIFF MOIS SILTY CLAY	/
705.0	4.8	2	2	2	and the same of th	X-4					SS-67	W		(RESID			
785.0 -											MS-67	45.3			RANGE-GRA	AY-WHITE & AN-WHITE	
-	9.8	Ø	1	2		x3								SOFT	TO V. STIF	F WET TO IC F. SANDY	MOIST
780.0 -	 -						1							CLAY	(A-7-5)	IC F. SANUT	SILII
-	14.8	2	1 .	1		7					SS-68	W			*		
775.0 -	± 14.0	_	1	1	'				-		MS-68	A					
-	‡	-										57.3					
770.0	<u>†</u> 19.8	Ø	1	1		X -2					SS-69	W.					
110.0	<u> </u>																
-	24.8	Ø	1	1		<u> </u> <u> </u> 2						W					
765.0 -	 -			,								.,					
-	† = 29.8	Ø	1	2	1	 -		ere com com pa			,	W					
760.0 -	± 23.0		1	-				Tama and amo				VV					
	‡																
755.0 -	34.8	1	2	3		X5_					SS-70	W					
133.0	<u> </u>																
-	39.8	2	2	3							SS-71 MS-71	W 64.8				•	-
750.0	+										MS-71	64.8					
-	44.8	3	3.	4		7-					SS-72	W	//				
745.0 -					·							"			•		
-	100						}}										
740.0	49.8	2	3	7		- 7 -	<u> </u>		<u> </u>		SS-73	W					
-	‡						ļi										
775 0	54.8	5	7	11		*	18				SS-74	М					
735.0 -	F										MS-74	31.0					
	59.8	16	8	8	1		<u> </u>				SS-75	М		WHITE DENSE	TO TAN-W	HITE MED. C.SAND (A-	2-4)
730.0	_																
-	64.8	2	1	5	,	- f -					CC 76	144		V. STIF	F WET LO	E STIFF TO W PLASTIC 7-5)	SILTY
725.0 -	+ 04.0		4))	1	1-7-					SS-76	W		SANDY	CLAY (A-	(-5)	
-	+	•				- -	<u> </u>		-								
7200	69.8	3	5	9		1	I			!		W					
720.0 -	F																
	74.8	4	8	14			22		1			W					
							<u> </u>		1			**					

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION NORTH CAROLINA DEPARTMENT OF TRANSPORTATION GEOTECHNICAL UNIT BORING LOG

			(6									ð			SHEET 2	2 OF 2
PROJECT	NO. 33	185.	1.1		ID.	3-3637	C	OUNTY	DAVIE	***************************************	Gl	EOLO	OGIST M	1ECHUM	T.A.	e de la composição de
SITE DESC	RIPTION	ВІ	RIDG	E 3	7 OV	ER 1-40	NO C	VC 8Ô				************		_	GROU	ND WATER
BORING N	10. EB	2-B	В	ORIN	G LOC.	ATION	33+53	3.50	OFFSET	48.40	A	LIGN	NMENT L		0 HR.	
COLLAR F	ELEVATIO)N	791.3	32	N	ORTHING	824	460.3	8	EASTIN	G	157	3639.26	5	24 HR.	16.7
TOTAL DE	EPTH 95	5.6	D	RILL	MACH	IINE CME	-550X		DRILL MET	HOD NWC	AS/TI	RI-	CONE	HAMMER '	TYPE AU	TOMATIC
START DA	ATE 5/	5/0	4		COMP	LETION D	ATE 5/	/6/04	SU	RFACE WAT	ER DEI	РТН		DEPTH '	ro rock	
ELEV.	DEPTH	BLO	M C	TMUC	PEN.					SAMPLE	V	10		SOIL AN	ID ROCK	
715.0	(FT.)	0.5	10.5	10.5	(FT.)	0 2	25	50	75 IO	NUMBER	MOI	. Ğ		DESCR	IPTION	
113.0	+												TAN-BLA			
-	‡ 79.8	7	10	19			X 29			SS-77	М	7.7	MOIST CI	LAYEY F.	SANDY SI	LT
710.0	 -						-\			MS-77	31.1	7.7				
-	84.8	11	16	25			1			SS-78	М	7.1	ij			
705.0 -	+ 04.0	11	10	25	,			= IE		33-10	IVI	7:1				
-	‡						<u> </u>					7.1				
7000	± 89.8	16	23	34	1			-X57	7			7:7				
700.0 -	+	,				ļ						7				
-	94.8	43	57		0.8							7//	· WEATHER	RED ROCK		
695.0 -	<u> </u>									`		75	1			
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640.0 -	 -												TERMIN	IATED B	ORING A	Τ /
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(MPsi)

DEPTH RQD UNIT WT Q(MPa)

INTERVAL

TEST RESULTS

ROCK SAMPLE RESULTS

SAMPLE NO. OFFSET

PROJECT: 33185.1.1 B-3637

COUNTY: DAVIE

SITE DESCRIPTION: BRIDGE NO. 37 OVER I-40 (-Y2-) ON NC 801 (-L-)

58.70-60.20

SOIL S	SAMPLE RESI	ULTS																	
SAMPLE NO.		STATION	DEPTH	AASHTO	N	L.L.	P.I.		% BY WEIG	HT		% PAS	SSING S	IEVES	%	%	UNIT	VOID	
,			INTERVAL	CLASS				C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC	WT. (d)	RATIO	
		EB1-A															, ,		
SS-60	59.90 LT.	30+86.7	3.70-5.20	A-7-5(17)	4	57	19	7.5	23.1	35.0	34.4	100	97	76					
SS-61	37.70 E1.	30.00.7	12.50-14.00	A-7-5(8)	3	53	13	21.5	25.5	34.8	18.2	100	85	60			-		
MS-61			12.50 11.00	11 / 5(0)	3	55	•	24.0	20.0	5					57.8				
SS-62			17.50-19.00	A-5(4)	3	47	5	9.3	40.5	36.0	14.2	100	98	60					
SS-63			27.50-29.00	A-5(6)	8	47	8	10.3	32.8	38.6	18.2	100	97	67					
SS-64			42.50-44.00	A-4(0)	-10	36	NP	26.3	41.9	23.6	8.1	100	89	40					
SS-65			52.50-54.00	A-4(0)	29	36	NP	25.7	46.0	22.2	6.1	100	87	37				•	
SS-66			62.50-64.00	A-2-4(0)	84	23	NP	33.6	49.4	12.9	4.1	100	86	24					
55 00		EB1-B	02.00	172 (1)															
SS-49	54.30 RT	30+63.5	0.00-1.50	A-7-5(15)	5	55	16	2.9	31.1	35.4	30.7	100	99	75					
SS-50			8.20-9.70	A-7-5(12)	12	54	11	2.4	32.0	35.2	30.4	100	99	76				•	
MS-50				. ,											41.9				
SS-51			14.90-16.40	A-7-5(7)	3	49	11	5.1	43.6	33.1	18.2	100	98	63					
SS-52			24.90-26.40	A-5(7)	5	51	9	5.1	42.6	34.1	18.2	100	99	65					
MS-52															59.5				
SS-53		•	34.90-36.40	A-5(7)	9	53	10	6.9	42.8	36.2	14.2	100	97	63					
MS-53															55.2				
SS-54			44.90-46.40	A-5(1)	11	52	NP	10.9	45.0	31.9	12.2	100	96	56					
MS-54															49.6				
SS-55			49.90-51.40	A-4(0)	12	. 35	NP	19.9	46.0	24.0	10.1	100	93	44					
SS-56			54.90-56.40	A-5(0)	17	44	NP	21.9	45.0	27.1	6.1	100	90	41					
MS-56		M. Carrell W. Land													36.1		•		
SS-57	T. Takking Co.	war dan	59.90-61.40	A-4(0)	27	31	NP	24.9	46.2	22.8	6.1	100	87	38					
SS-58	and the same and the same and		69.90-71.40	A-4(0)	71	28	NP .	10.7	55.7	25.4	8.1	100	97	47					
MS-58	ya ^{ngoo} "														19.0				
SS-59			79.90-81.40	A-2-4(0)	100+	25	NP	28.0	50.7	17.3	4.1	100	86	31					
		<u>B2-B</u>			_														
SS-1	42.93 RT	32+05.6	0.00-3.70	A-1-b(0)	2	20	NP	70.5	20.2	5.3	4.0	88	44	12	*				
SS-2			3.70-5.20	A-1-b(0)	3	19	NP	81.4	14.5	4.0	0.0	87	34	4					
SS-3			8.70-10.20	A-5(3)	4	46	NP	20.6	21.6	43.6		95	81	58					
SS-4			18.70-20.20	A-5(0)	2	46	NP	7.7	51.5	32.7	8.1	100	98	53					
SS-5			23.70-25.20	A-5(0)	4	46	NP	11.5	52.1	30.3	6.1	100	96	48					
SS-6	-		28.70-30.20	A-5(1)	5	47	NP	11.7	44.8	35.4	8.1	100	95	57					
SS-7			33.70-35.20	A-5(0)	10	49	NP	16.8	46.1	33.1	4.0	100	92	48					
SS-8			38.70-40.20	A-5(0)	12	48	NP	24.0	41.4	30.5	4.0	100	84	44					
SS-9			43.70-45.20	A-4(0)	12	39	NP	36.4	36.2	25.5	2.0	98	73 72	39					
SS-10			48.70-50.20	A-2-4(0)	21	38	NP	37.0	38.0	21.0	4.0	98	72	32					

TEST RESULTS

PROJECT: 33185.1.1 B-3637

COUNTY: DAVIE

SITE DESCRIPTION: BRIDGE NO. 37 OVER I-40 (-Y2-) ON NC 801 (-L-)

SOIL S	SAMPLE RES	ULTS																
SAMPLE NO.		STATION	DEPTH	AASHTO	N	L.L.	P.I.		% BY WEIG	HT		% PAS	SSING S	IEVES	%	%	UNIT	VOID
	•		INTERVAL	CLASS				C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC	WT. (d)	RATIO
		EB2-A																
SS-79	25.40 LT	33+72.15	4.30-5.80	A-7-5(40)	12	74	41	3.9	14.9	25.1	56.0	100	99	85				*
MS-79															34.3			
SS-80			9.30-10.80	A-7-5(25)	9	63	24	2.1	19.9	32.4	45.6	100	100	84				
SS-81		•	14.30-15.80	A-7-5(14)	4	57	15	3.5	31.1	36.3	29.0	100	99	75	*			
SS-82			24.80-25.80	A-7-5(12)	4	54	19	20.5	19.3	33.2	27.0	94	80	63			*	
MS-82	*														66.1			
SS-83			29.30-30.80	A-7-5(31)	5	66	33	2.3	24.9	45.9	27.0	100	99	83				
MS-83															72.5			
SS-84			39.30-40.80	A-7-5(15)	6	57	22	4.6	41.1	41.9	12.4	100	98	66				
MS-84															60.1			
SS-85			54.30-55.80	A-7-5(15)	13	60	25	21.0	23.9	38.6	16.6	100	86	62				
MS-85															49.5			
SS-86			59.30-60.80	A-7-6(7)	12	41	17	23.9	24.3	33.2	18.7	94	78	55				
SS-87			69.30-70.80	A-5(5)	18	47	7	15.1	31.5	40.9	12.4	100	92	60				
SS-88			74.30-75.80	A-4(0)	27	37	NP	33.0	33.0	21.6	12.4	100	79	39				
SS-89			94.30-95.80	A-4(0)	49	26	NP	26.3	44.4	18.9	10.4	100	89	38				
		<u>EB2-B</u>																
SS-67	48.40 RT	33+53.5	4.80-6.30	A-7-5(14)	4	54	14	3.2	27.2	37.2	32.4	100	98	79				
MS-67															45.3			
SS-68			14.80-16.30	A-7-5(11)	2	53	11	3.2	33.8	36.6	26.3	100	99	73				
MS-68	4														57.3			
SS-69			19.80-21.30	A-7-5(13)	2	53	11	3.9	25.3	44.5	26.3	100	98	80				
SS-70			34.80-36.30	A-7-5(7)	5	52	11	13.0	32.2	36.6	18.2	96	90	62				
SS-71			39.80-41.30	A-7-5(13)	5	53	14	6.9	25.1	41.6	26.3	100	97	76				
MS-71													•		64.8			
SS-72			44.80-46.30	A-7-5(10)	7	52	12	9.3	28.8	43.7	18.2	100	97	70				
SS-73			49.80-51.30	A-7-5(16)	10	53	19	6.9	25.1	45.7	22.3	98	95	74				
SS-74			54.80-56.30	A-7-5(4)	18	45	15	15.4	31.8	34.5	18.2	87	80	51				
MS-74															31.0			
SS-75			59.80-61.30	A-2-4(0)	16	36	NP	42.4	43.2	8.4	6.1	94	75	19				
SS-76			64.80-66.30	A-7-5(4)	9	49	11	21.5	37.7	34.8	6.1	100	90	50				
SS-77			79.80-81.30	A-5(3)	29	41	8	10.5	46.2	33.1	10.1	100	97	55				
MS-77															31.1			
SS-78			84.80-86.30	A-5(4)	41	36	9	8.5	48.4	32.9	10.1	100	98	56				

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO	33185.1.1	F.A.	PROJ. <i>BRSTP-801(2)</i>
COUNTY DAVIE			
PROJECT DESCRIPTION	BRIDGE NO. 32	OVER I-40	ON NC 801
SITE DESCRIPTION _RE	TAINING WALL	AT INTERS	ECTION OF
SR 1452 (YADKIN	VALLEY RD.) AN	ND NC 801	

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33185.1.1 (B-3637)	1	5

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 FELD BORRING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALIGINE BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

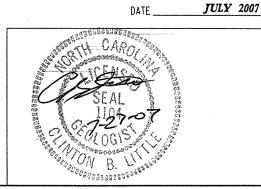
CENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A CECTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORNOS OR BETWEEN SAMPLED STRATA WITHIN THE BORRHOLE. THE LABORATORY SAMPLE DATA AND THE IN STITU IN-PLACED IEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABLITY INHERENT IN THE STANDARD TEST METHOD. THE OSSERVED WATER LEVELS OR SOIL MOSITURE CONDITIONS NOICATED NITHE SUBSURFACE ANVESTICATIONS ARE AS RECORDED AT THE TIME OF THE INVESTICATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS AND VARY CONSIDERABLY WHIT THE ACCORDING TO CLIMATIC CONDITIONS MY VARY CONSIDERABLY WHIT THE ACCORDING TO CLIMATIC CONDITIONS MY VARY CONSIDERABLY WHIT THE ACCORDING TO CLIMATIC CONDITIONS MY 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 MODE, OR DRINKING OF OR DRINKING OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND COMDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MANE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISTY MUSELE AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OF FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE OFFERING FROM THOSE MIDICATED IN THE SUBSUBFACE INFORMATION. THOSE INDICATED IN THE SUBSURFACE INFORMATION.

	C. C. MURRAY
	J. E. ESTEP
	J. W. VANDERBURG

INVESTIGATED BY	C. B. LITTLE
CHECKED BY	C. B. LITTLE
CUDMITTED DV	C. B. LITTLE

PERSONNEL



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DESCRIPTION

TITLE SHEET

SITE PLAN &

LEGEND

PROFILE

BORE LOGS

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

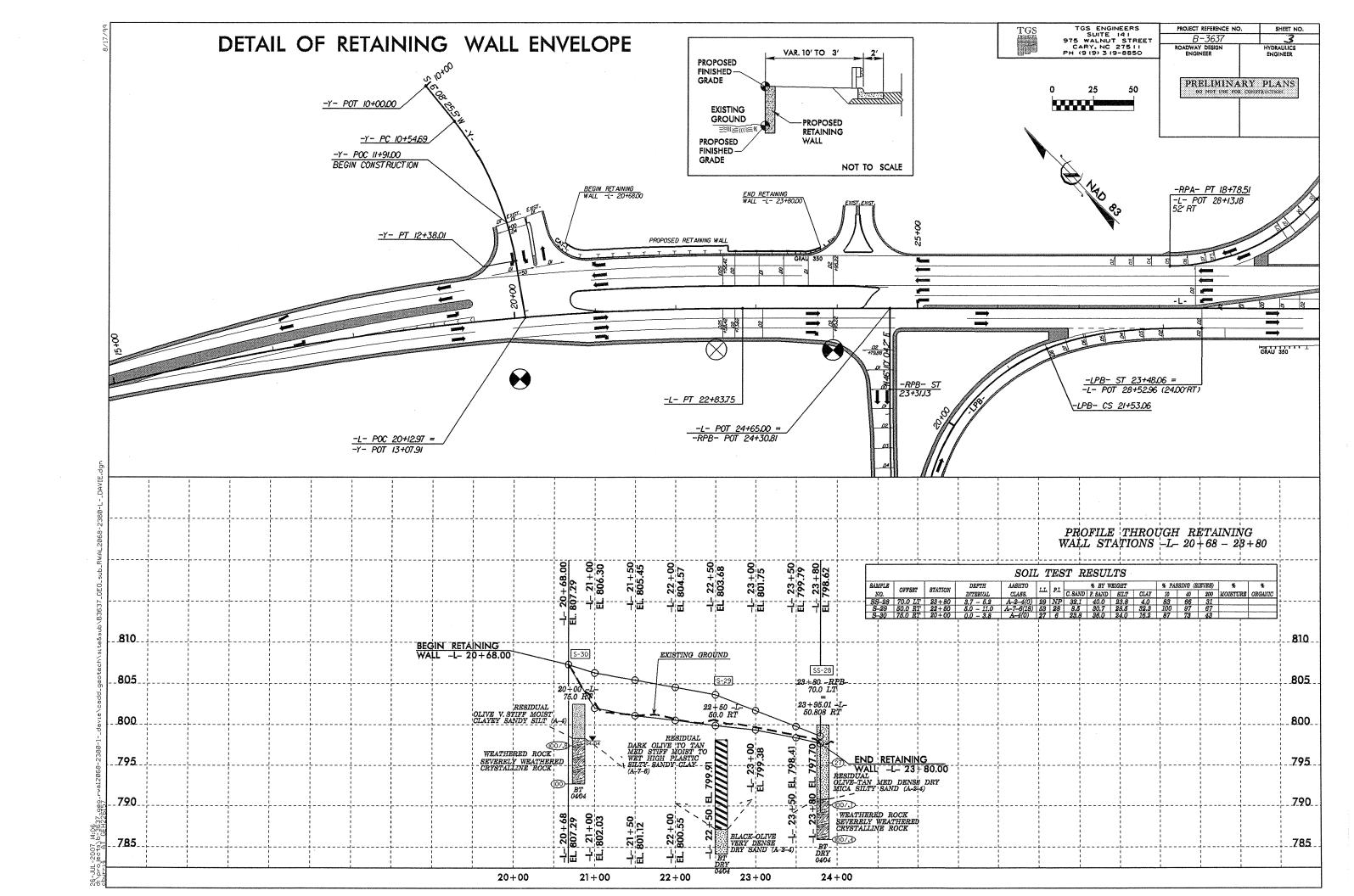
	SOIL AND ROCK LEGEND, TERM	IS, SYMBOLS, AND ABBREVIATIONS	
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST GARSHTO 1206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: **VEN STAF, BOW, SOIT DUY, MOST WITH MERBEDOED ING SWO DUES, MENU PLASTIC, A-7-6	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. LINIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE, (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDRESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS; ANGULAR, SUBROUNDED, OR ROUNDRED.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL, SPT REFUSAL, SPT REFUSAL, SPT REFUSAL, SPT REFUSAL, SPT REFUSAL, SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS, IN NON-COASTAL PLAIN NATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS: WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION. AS SHALE, SLATE, ETC.
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	THE TO COMPANY POLICY OF THE TOTAL PROPERTY	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS DUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, ONEISS, GABBRO, SCHIST, ETC.	GROUND SURFACE. <u>CALCAREOUS (CALC.)</u> SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 A-6 A-7 A-1, A-2 A-4, A-5 A-6, A-7 A-1, A-2 A-6, A-7 A-7 A-6, A-7	COMPRESSIBILITY SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50	NON-CRYSTALLINE ROCK (NCR) SEDIMENTARY ROCK THAT WOULD YELLD SY REFUSAL IF TESTED, ROCK TYPE ROCK (NCR) INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN COASTAL PLAIN SEDIMENTAS CEMENTED INTO ROCK, BUT MAY NOT YIELD	COLLUYIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
SYMBOL SOURCESSESSESSESSESSESSESSESSESSESSESSESSESS	HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50 PERCENTAGE OF MATERIAL	SEDIMENTARY ROCK SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.	COPE RECOVERY MECL - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
# 10	ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 18%	WEATHERING FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER	ROCKS OR CUTS MASSIVE ROCK. <u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
LIGUID LIMIT 46 MX 41 MN 50ILS WITH	LITTLE ORGANIC MATTER	HAMMER IF CRYSTALLINE. VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JDINTS MAY SHOW THIN CLAY COATINGS IF OPEN, IV SLIJ. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF	HORIZONTAL. <u>DIP DIRECTION (DIP AZIMUTH) -</u> THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX 0 0 0 4 MX 8 MX 12 MX 16 MX No MX MODERATE ORGANI	THE	OF A CRYSTALLINE NATURE. SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
OF MAJOR GRAVEL AND SAND GRAVEL AND SAND SOILS SOILS MATTER	STATIC WATER LEVEL AFTER 24 HOURS	(SLIJ 1 INCH. OPEN JOINTS MAY CONTAIN CLAY, IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED, CRYSTALINE ROCKS RING UNDER HAMMER BLOWS, MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
GEN. RATING AS A EXCELLENT TO GOOD FAIR TO POOR FAIR TO POOR UNSUITAB SUBGRADE	i	(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY, ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.	PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30 CONSISTENCY OR DENSENESS	SPRING OR SEEP MISCELLANEOUS SYMBOLS	MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH	THE STREAM. FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY PENETRATION RESISTENCE COMPRESSIVE STRENGTH	ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION POPT OF TEST BORING DESIGNATIONS	(MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES CLUNK SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL	THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
GENERALLY VERY LOOSE (4	S - BULK SAMPLE AUGER BORING S - BULK SAMPLE	SEVERE ALL ROCK EXCEPT OWARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED (SEV.) IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
MATERIAL MEDIUM DENSE 10 TO 30 N/A	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT THAN ROADWAY EMBANKMENT ST - SHELBY TUBE SAMPLE SAMPLE	EXTENT. SOME PRADMENTS OF STRUNG ROLK USUALLY REMAIN. IF TESTED, YIELDS SPT N VALUES > 100 BFF VERY SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT (V SEV.) THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - TRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
VERY SOFT <2 <0.25 GENERALLY SOFT 2 TO 4 0.25 TO 0.50 SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0	MONITORING WELL RS - ROCK SAMPLE PIEZOMETER NO MONITORING WELL RS - ROCK SAMPLE PIEZOMETER NO MONITORING WELL RS - ROCK SAMPLE	REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK VEATHERED TO A DEGREE SUCH THAT DNLY MINDR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED. VIELDS SYD A VALUES < 100 BPF COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
MATERIAL STIFF 8 TO 15 1 TO 2 (COHESIVE) VERY STIFF 15 TO 30 2 TO 4 HARD >30 >4	ALLUVIAL SOIL BOUNDARY INSTALLATION SAMPLE SAMPLE SAMPLE SAMPLE SIDE JNDICATOR INSTALLATION CBR - CALIFORNIA BEARING	SCATTERED CONCENTRATIONS, QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS ALSO AN EXAMPLE.	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK DUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND
TEXTURE OR GRAIN SIZE	ROCK STRUCTURES RATIO SAMPLE SPT N-VALUE	ROCK HARDNESS	EXPRESSED AS A PERCENTAGE,
U.S. STD. SIEVE SIZE 4 10 40 60 200 270 OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	SOUNDING ROD REP SPT REFUSAL	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK, CAN DE SCRATCHED BY KNIFE OR DICK ON A NATUR DIFFICILITY AND NAMED OF DESCRIPTION	SAPPOLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY (BLDR.) (CDB.) (GR.) (CSE.SD.) (CD.) (SL.) (CL.)	ABBREVIATIONS AR - AUGER REFUSAL HI HIGHLY # - MOISTURE CONTENT BT - BORING TERMINATED MED MEDIUM V - VERY	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLDWS REQUIRED TO DETACH HAND SPECIMEN. MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GRODVES TO 0.25 INCHES DEEP CAN BE	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
GRAIN MM 305 75 2.0 0.25 0.05 0.005 SIZE IN. 12 3	CL CLAY MICA MICACEOUS VST - VANE SHEAR TEST CPT - CONE PENETRATION TEST MOD MODERATELY WEA WEATHERED	HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPP) OF
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE FIELD MOISTURE CHIEF FOR FIELD MOISTURE DESCRIPTION	CSE COARSE NP - NON PLASTIC 7 - UNIT WEIGHT DMT - DILATOMETER TEST 0RG ORGANIC 7d - DRY UNIT WEIGHT DPT - DYNAMIC PENETRATION TEST PMT - PRESSUREMETER TEST • - VOID RATIO SAP SAPROLITIC	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK, CAN BE EXCAVATED IN FRAGMENTS	A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF J FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL JS PENETRATION EQUAL TO OR LESS THAN 0.J FOOT PER 60 BLOWS.
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY	F - FINE SD SAND, SANDY FOSS FOSSILIFEROUS SL SILT, SILTY FRACT- FRACTURED, FRACTURES SLI SLIGHTLY	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.	SIRATA CORE RECOVERY (SREC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK DUALITY DESIGNATION (SROD) - A MEASURE OF ROCK DUALITY DESCRIBED BY
LL LIQUID LIMIT (SAT.) FROM BELOW THE GROUND WATER TABLE PLASTIC SEMISOLID: REQUIRES DRYING TO	FRAGS FRAGMENTS TCR - TRICONE REFUSAL	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES I INCH SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.	TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
RANGE - WET - (W) SEMISOLIDE REDUIRES DEFIND TO ATTAIN OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	FRACTURE SPACING BEDDING TERM SPACING TERM THICKNESS	<u>TOPSOIL (TS.)</u> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: CLAY BITS AUTOMATIC MANUAL	VERY WIDE	BENCH MARK:
SL SHRINKAGE LIMIT	MUBILE B- X 6° CONTINUOUS FLIGHT AUGER CORE SIZE:	MODERATELY CLOSE	ELEVATION: FT.
HITHIN OF INDIA MOISTONE	BK-51 X S* HOLLOW AUGERS	VERY CLOSE LESS THAN 0.16 FEET THINLY LAMINATED < 0.000 FEET INDURATION	
PLASTICITY PLASTICITY INDEX (PI) DRY STRENGTH	CME-45C HARD FACED FINGER BITS -N	INDURATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
NONPLASTIC 0-5 VERY LOW	X CME-550	FRIARI F RUBBING WITH FINGER FREES NUMEROUS GRAINS:	
LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM	CASING W/ ADVANCER HAND TODIS	GENILE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
HIGH PLASTICITY 26 OR MORE HIGH COLOR	PORTABLE HOIST TRICONE STEEL TEETH POST HOLE DIGGER TRICONE TRICONE TRICONE HAND AUGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).	CORE BIT SOUNDING ROD	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	VANE SHEAR TEST	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	

REVISED 02/23/06

PROJECT REFERENCE NO.

33185**.1.**1 (B-3637)

SHEET NO.



	ID. B-3637	COUNTY DAVIE	GEOLOGIST M	urray, C. C.	 	O. 33185.1.1		D. B-3637		Y DAVI			GEOLOGIST MI	urray, C. C.
	WALL AT INTERSECTION OF	SR 1452 (YADKIN VALLEY RD.)	AND NC 801	GROUND WTR (ft)	SITE DESCR	IPTION RETA	AINING V	WALL AT INTERSECTION C	F SR 1452 (YADKIN '	VALLE'	RD.) Al	ND NC 801	GROUND W
ORING NO. 2000L	STATION 20+00	OFFSET 75ft RT	ALIGNMENT -L-	0 HR. Dry	BORING NO	. 2250L		STATION 22+50	OFFSE	T 50ft R	Т		ALIGNMENT -L-	0 HR.
DLLAR ELEV. 802.5 ft	TOTAL DEPTH 9.8 ft	NORTHING 825,405	EASTING 1,572,679	24 HR. 4.5	COLLAR EL	EV. 798.2 ft		TOTAL DEPTH 14.0 ft	NORTH	ING 825	5,255		EASTING 1,572,874	24 HR.
RILL MACHINE CME-550	DRILL METHOD H.S. Augers		HAMMER TYPE			HINE CME-550		DRILL METHOD Solid Aug					HAMMER TYPE	E Automatic
TART DATE 04/29/04	COMP. DATE 04/29/04	SURFACE WATER DEPTH	I/A DEPTH TO ROO	CK N/A	START DAT			COMP. DATE 04/28/04		CE WATE	· · · · · · · · ·	TH N/A	DEPTH TO ROO	CK N/A
_EV	BLOWS PER FOOT 0 25 50	75 100 NO. MOI G	SOIL AND ROCK DESC	CRIPTION DEPTH (ft)	ELEV DEP			BLOWS PER FO 0 25 50		SAMP.	1 / 1	0 G	SOIL AND ROCK DESC	CRIPTION
05			02.5 GROUND SURF.	ACE 0.0	800							798.	2 GROUND SURF, RESIDUAL	
38.7 3.8 19 46 64/. 33.7 8.8 35 65/.5	3	- 100/,8 - M	Boring Terminated at Eleva	4.2 OCK CRYSTALLINE 9.8 tion 792.7 ft IN						S-29		787.	DARK OLIVE TO TAN MED S WET HIGH PLASTIC SILTY (A-7-6)	STIFF MOIST TO Y SANDY CLAY
			SEVERELY WEATHERED ROCK	CRYSTALLINE								- 784.	BLACK-OLIVE VERY DEN: (A-2-4) Boring Terminated at Eleva VERY DENSE S.	SE DRY SAND ation 784.2 ft IN

PROJE	CT NO.	3318	5.1.1	1	D.	B-3637		NATION CONTRACTOR OF THE PARTY	COUNTY	DAVI	E			GEOLOGIST Mur	ray, C. C.	Warten
SITE D	ESCRIF	NOIT	RETAI	INING	WA	ALL AT INT	TERSEC	TION OF S	R 1452 (Y	ADKIN'	VALLE	Y RD	.) AND NC 801		GROUND W	/TR (ft)
BORIN	G NO.	1380R	PB		ST	TATION 2	23+80		OFFSET	70ft L	Γ		ALIGNMEN	r -RPB-	0 HR.	Dry
COLLA	R ELE	/ . 800	.0 ft		то	OTAL DEP	TH 14.1	ft	NORTHIN	IG 825	,150		EASTING	1,572,974	24 HR.	Dry
DRILL	MACHI	NE CN	1E-550		DR	RILL METH	OD H.S	S. Augers						HAMMER TYPE	Automatic	
START	DATE	04/28/	04		СО	OMP. DATE	E 04/28	/04	SURFAC	E WATE	R DE	PTH	N/A	DEPTH TO ROCK	< N/A	
ELEV	DEPTH	BL	OW COL	JNT	П		BLOWS F	PER FOOT	1	SAMP.	V/	11				
(ft)	(ft)	0.5ft	0.5ft	0.5ft] 0	0 25	5 - 5	50 7	5 100	NO.	моі	G	SC ELEV. (ft)	IL AND ROCK DESCR		EPTH (fl
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-	_				П							-	OLIVE-	RESIDUAL TAN MED DENSE DR	/ MICA SILTY	
796.3	3.7											F		SAND (A-2-4)		
_	_	18	14	13	1		27			SS-28	D					
-	-															
791.3	8.7	20	55	45/.2	$\left\ \cdot \right\ $						D		790.8			9.2
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786.3	- - 13.7								: : : :					ROCK		
700.0	- 10.7	100/.4			╫			<u> </u>	100/.4	 	D	7//	785.9 Boring	Terminated at Elevation	on 785.9 ft IN	14.1
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