

**CONTRACT: C202951** **ID: B-4497**

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

# ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 38391.1.1 (B-4497) F.A. PROJ. BRSTP-64(80)

COUNTY DAVIDSON

PROJECT DESCRIPTION REPLACE BRIDGE 39 OVER US 29-70/1-85B BUS.

ON US 64

(PROPOSED BORE & JACK PIPE UNDER -EYID-, -L-, -EYI-, & -EYIB-)  
**INVENTORY**

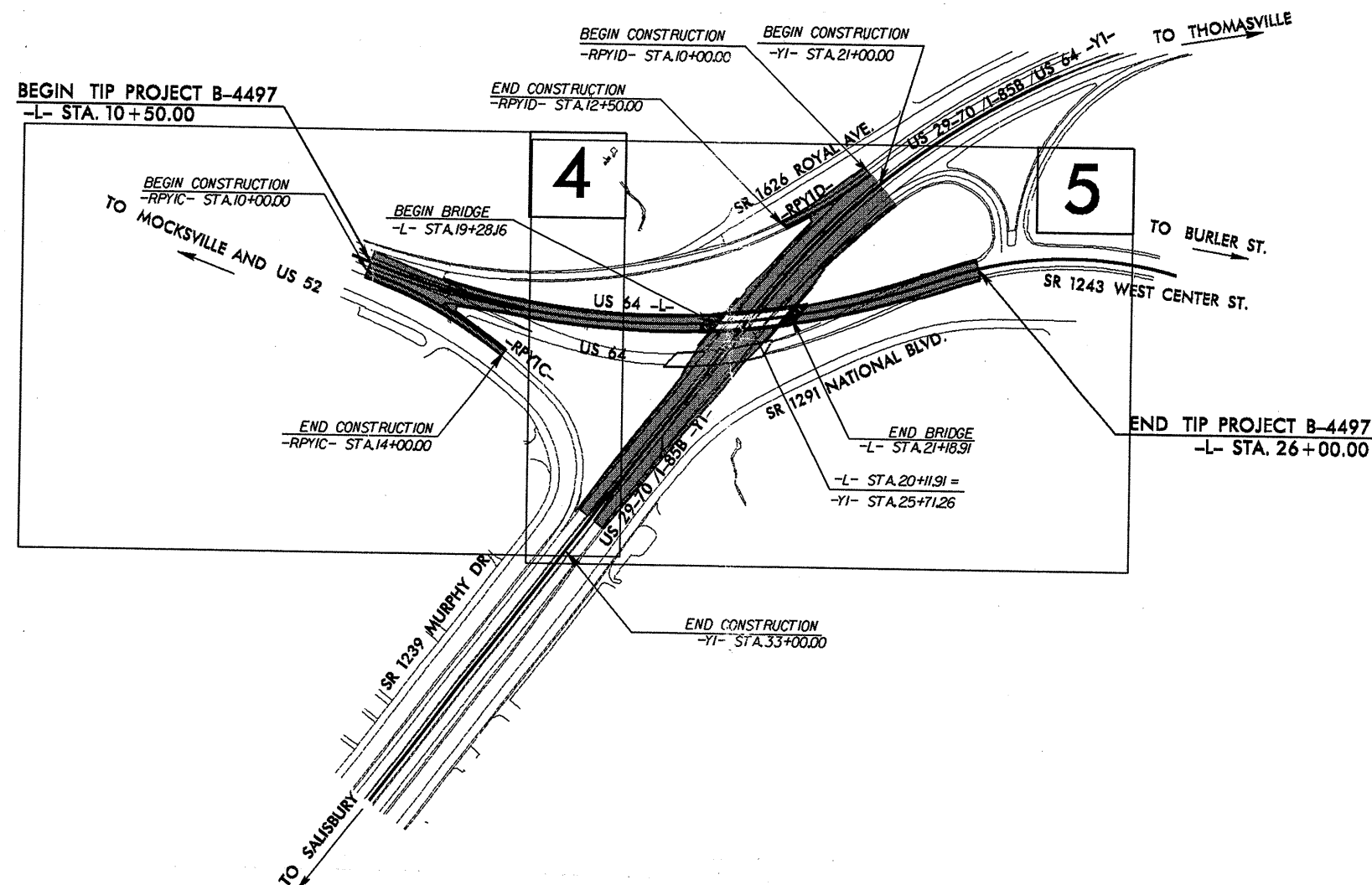
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	38391.1.1 (B-4497)	1	9
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
		P.E.	
		RW & UTIL.	

**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) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE 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 (IN-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.

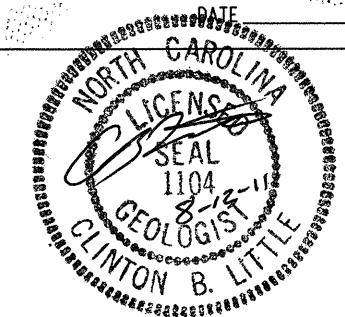
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**PERSONNEL**

- JK STICKNEY**
- ML SMITH**
- CL SMITH**
- AC SMITH**

INVESTIGATED BY JE BEVERLY  
 CHECKED BY C. LITTLE  
 SUBMITTED BY C. LITTLE  
 DATE AUGUST 2011



DRAWN BY: ROLFSMEYER, McCLURE

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IS IT CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.





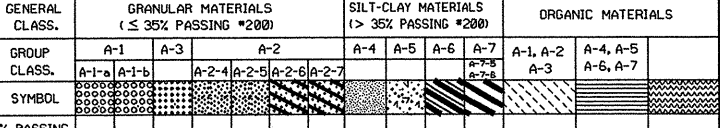






















NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

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

PROJECT REFERENCE NO. 38391.I.(B-4497)	SHEET NO. 2
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**SUBSURFACE INVESTIGATION**

**SOIL AND ROCK LEGEND, TERMS, 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 (AASHTO T206, 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: <i>VERY STIFF, GRAN. SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</i>		WELL-GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - 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. <b>ANGULARITY OF GRAINS</b> THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <b>ANGULAR</b> , <b>SUBANGULAR</b> , <b>SUBROUNDED</b> , OR <b>ROUNDED</b> .		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 IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS: <b>WEATHERED ROCK (WR)</b>  NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. <b>CRYSTALLINE ROCK (CR)</b>  FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC. <b>NON-CRYSTALLINE ROCK (NCR)</b>  FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. <b>COASTAL PLAIN SEDIMENTARY ROCK (CP)</b>  COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.		<b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. <b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA. <b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. <b>ARGILLACEOUS</b> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. <b>ARTESIAN</b> - 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 GROUND SURFACE. <b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. <b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. <b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. <b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. <b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. <b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. <b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. <b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. <b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. <b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. <b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. <b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. <b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. <b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. <b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. <b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. <b>ROCK QUALITY DESIGNATION (RQD)</b> - 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 EXPRESSED AS A PERCENTAGE. <b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. <b>SILL</b> - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. <b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. <b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS (IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 60 BLOWS. <b>STRATA CORE RECOVERY (SRECJ)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. <b>STRATA ROCK QUALITY DESIGNATION (SRQD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY 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. <b>TOPSOIL (TS.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.	
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b> GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS GROUP CLASS. A-1, A-1-b, A-3, A-2, A-2-4, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7, A-1, A-2, A-3, A-4, A-5, A-6, A-7 SYMBOL 		<b>MINERALOGICAL COMPOSITION</b> MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE. <b>COMPRESSIBILITY</b> SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50 <b>PERCENTAGE OF MATERIAL</b> <b>ORGANIC MATERIAL</b> TRACE OF ORGANIC MATTER 2 - 3% LITTLE ORGANIC MATTER 3 - 5% MODERATELY ORGANIC 5 - 10% HIGHLY ORGANIC >10% <b>SILT - CLAY</b> SOILS 3 - 5% 5 - 12% 12 - 20% >20% <b>OTHER MATERIAL</b> TRACE 1 - 10% LITTLE 10 - 20% SOME 20 - 35% HIGHLY 35% AND ABOVE		<b>WEATHERING</b> <b>FRESH</b> ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. <b>VERY SLIGHT (V SL.)</b> ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. <b>SLIGHT (SL.)</b> ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. <b>MODERATE (MOD.)</b> SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN 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. <b>MODERATELY SEVERE (MOD. SEV.)</b> ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i> <b>SEVERE (SEV.)</b> ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, YIELDS SPT N VALUES &gt; 100 BPF</i> <b>VERY SEVERE (V SEV.)</b> ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES &lt; 100 BPF</i> <b>COMPLETE</b> ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.			
<b>USUAL TYPES OF MAJOR MATERIALS</b> STONE FRAGS. GRAVEL AND SAND FINE SAND SILTY OR CLAYEY GRAVEL AND SAND SILTY SOILS CLAYEY SOILS GEN. RATING AS A SUBGRADE EXCELLENT TO GOOD FAIR TO POOR FAIR TO POOR POOR UNSUITABLE PI OF A-7-5 SUBGROUP IS <= LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30		<b>GROUND WATER</b>  WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING  STATIC WATER LEVEL AFTER 24 HOURS  PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA  SPRING OR SEEP		<b>MISCELLANEOUS SYMBOLS</b>  ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION  SOIL SYMBOL  ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT  INFERRED SOIL BOUNDARY  INFERRED ROCK LINE  ALLUVIAL SOIL BOUNDARY  DIP & DIP DIRECTION OF ROCK STRUCTURES  SPT TEST BORING  AUGER BORING  CORE BORING  MONITORING WELL  PIEZOMETER INSTALLATION  SLOPE INDICATOR INSTALLATION  CONE PENETROMETER TEST  SOUNDING ROD  TEST BORING W/ CORE  SPT N-VALUE  SPT REFUSAL			
<b>CONSISTENCY OR DENSENESS</b> PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> ) GENERALLY GRANULAR MATERIAL (NON-COHESIVE) VERY LOOSE 4 TO 10 MEDIUM DENSE 10 TO 30 DENSE 30 TO 50 VERY DENSE >50 GENERALLY SILT-CLAY MATERIAL (COHESIVE) VERY SOFT <2 SOFT 2 TO 4 MEDIUM STIFF 4 TO 8 STIFF 8 TO 15 VERY STIFF 15 TO 30 HARD >30 N/A <0.25 0.25 TO 1.0 1 TO 2 2 TO 4 >4		<b>ABBREVIATIONS</b> AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAG. - FRAGMENTS HL - HIGHLY MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT v - VERY VST - VANE SHEAR TEST WEA. - WEATHERED W - UNIT WEIGHT W <sub>d</sub> - DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RT - ROCK RS - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO		<b>ROCK HARDNESS</b> <b>VERY HARD</b> CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. <b>HARD</b> CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. <b>MODERATELY HARD</b> CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. <b>MEDIUM HARD</b> CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. <b>SOFT</b> CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. <b>VERY SOFT</b> CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.			
<b>TEXTURE OR GRAIN SIZE</b> U.S. STD. SIEVE SIZE (OPENING IN MM) 4 10 40 60 200 270 4.76 2.00 0.42 0.25 0.075 0.053 BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE. SD.) FINE SAND (F. SD.) SILT (SL.) CLAY (CL.) GRAIN SIZE MM 305 75 2.0 0.25 0.05 0.005 IN. 12 3		<b>EQUIPMENT USED ON SUBJECT PROJECT</b> DRILL UNITS: <input type="checkbox"/> MOBILE B- <input type="checkbox"/> BK-51 <input type="checkbox"/> CME-45C <input checked="" type="checkbox"/> CME-550 <input type="checkbox"/> PORTABLE HOIST ADVANCING TOOLS: <input type="checkbox"/> CLAY BITS <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER <input checked="" type="checkbox"/> 8" HOLLOW AUGERS <input type="checkbox"/> HARD FACED FINGER BITS <input checked="" type="checkbox"/> TUNG-CARBIDE INSERTS <input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER <input type="checkbox"/> TRICONE * STEEL TEETH <input type="checkbox"/> TRICONE * TUNG-CARB. <input type="checkbox"/> CORE BIT HAMMER TYPE: <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL CORE SIZE: <input type="checkbox"/> B- <input type="checkbox"/> N- <input type="checkbox"/> H- HAND TOOLS: <input type="checkbox"/> POST HOLE DIGGER <input type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST		<b>SOIL MOISTURE - CORRELATION OF TERMS</b> SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION LL - LIQUID LIMIT - SATURATED - (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE PL - PLASTIC LIMIT - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE OM - OPTIMUM MOISTURE SHRINKAGE LIMIT - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE SL - - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE		<b>FRACTURE SPACING</b> <b>TERM</b> <b>SPACING</b> VERY WIDE MORE THAN 10 FEET WIDE 3 TO 10 FEET MODERATELY CLOSE 1 TO 3 FEET CLOSE 0.16 TO 1 FEET VERY CLOSE LESS THAN 0.16 FEET <b>BEDDING</b> <b>TERM</b> <b>THICKNESS</b> VERY THICKLY BEDDED > 4 FEET THICKLY BEDDED 1.5 - 4 FEET THINLY BEDDED 0.16 - 1.5 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET	
<b>PLASTICITY</b> NONPLASTIC 0-5 VERY LOW LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 OR MORE HIGH		<b>INDURATION</b> FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. <b>FRIABLE</b> RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. <b>MODERATELY INDURATED</b> GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. <b>INDURATED</b> GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. <b>EXTREMELY INDURATED</b> SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.		<b>BENCH MARK:</b> ELEVATION: _____ FT. <b>NOTES:</b> NCDOT-LOCATION & SURVEY UNIT LOCATED BORINGS AND PROVIDED COLLAR ELEVATIONS.			
<b>COLOR</b> DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		<b>INDURATION</b>		<b>INDURATION</b>			

2A

# Earthwork Balance Sheet

Volumes in Cubic Yards

PROJECT: B-4497

COUNTY: Davidson

DATE: 8/7/2012

COMPILED BY: Tonya Roach

SHEET 1 OF 1 SHEETS

CHECKED BY: C. E. Harris

STATION	STATION	EXCAVATION				EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH		EMBANK. +20%	ROCK	SUITABLE	UNSUIT.
-L- Sta 10+50.00	-L- Sta. 19+28.16(BR)	9,928				9,928	35,615	35,615	42,738	32,810		0		0
-RPY1C- Sta. 10+00.00	-RPY1C- Sta. 14+00.00	494				494	2	2	2	0		492		492
<b>SUBTOTAL</b>		10,422				10,422	35,617	35,617	42,740	32,810		492		492
-L- Sta 21+18.91(BR)	-L- Sta 26+00.00	4,179				4,179	5,672	5,672	6,806	2,627		0		0
<b>SUBTOTAL</b>		4,179				4,179	5,672	5,672	6,806	2,627		0		0
-Y1- (RT) Sta 21+00.00	-Y1- (RT) Sta 32+00.00	1,386				1,386	102	102	122	0		1,264		1,264
-RPY1D- Sta. 10+00.00	-RPY1D- Sta. 12+50.00	135				135	6	6	7	0		128		128
-Y1- (MED) Sta 21+00.00	-Y1- (MED) Sta 32+00.00	612				612	0	0	0	0		612		612
-Y1- (LT) Sta 21+00.00	-Y1- (LT) Sta 32+00.00	2,525				2,525	2,047	2,047	2,456	0		69		69
<b>SUBTOTAL</b>		4,658				4,658	2,155	2,155	2,585	0		2,073		2,073
<b>TOTAL</b>		19,259				19,259	43,444	43,444	52,131	35,437		2,565		2,565
MATERIAL TO FILL CHANNEL							403	403	484	484				
LOSS DUE TO CLEARING & GRUBBING		-100				-100				100				
EST. SHOULDER MATERIAL							3,040	3,040	3,648	3,648				
WASTE IN LIEU OF BORROW										-2,565		-2,565		-2,565
<b>PROJECT TOTALS</b>		19,159				19,159	46,887	46,887	56,263	37,104		0		0
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT										1,855				
<b>GRAND TOTALS</b>		19,159								38,959				
<b>SAY</b>		<b>20,000</b>								<b>40,000</b>				

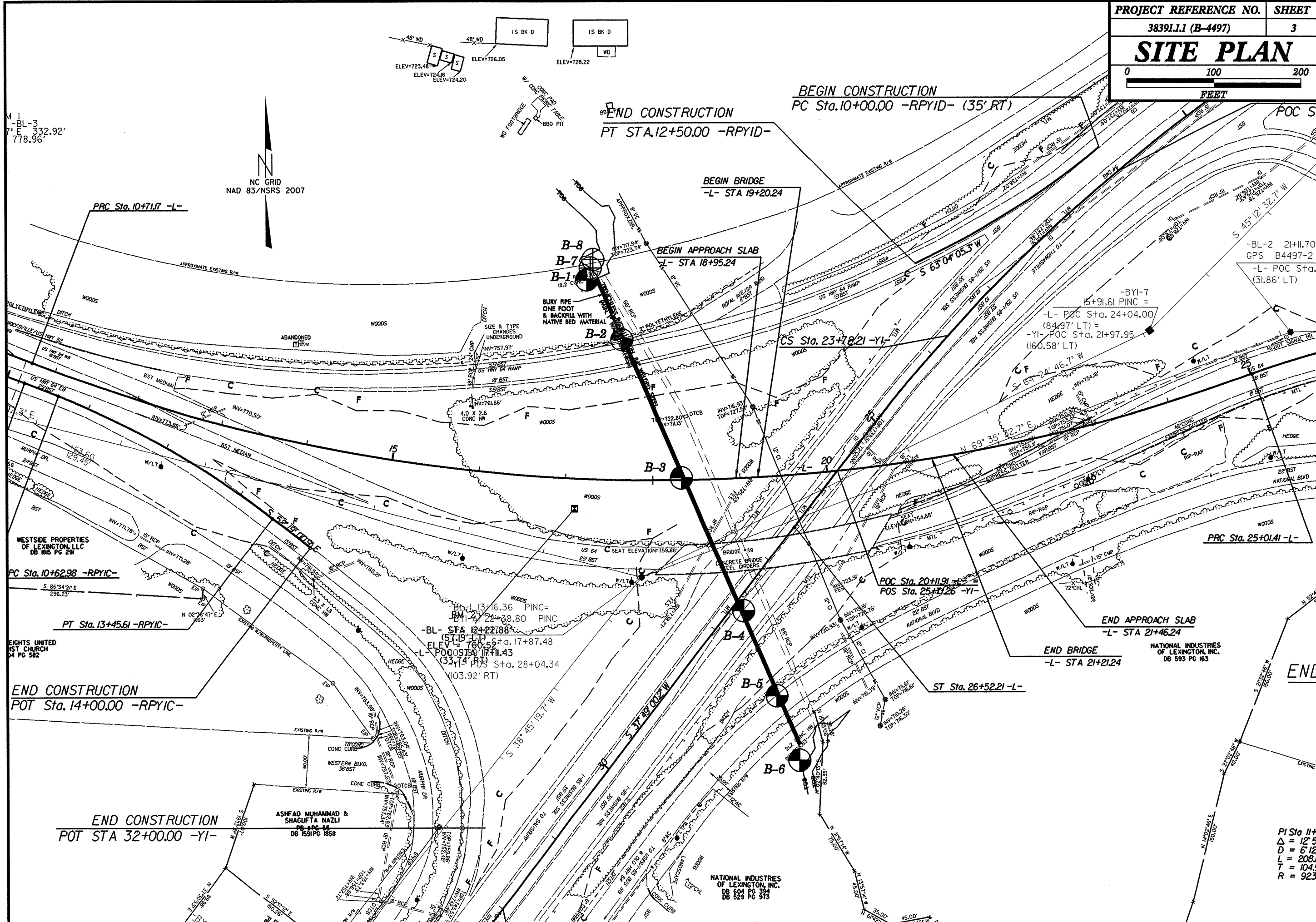
NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

NOTE: THIS INVENTORY IS FOR THE 84" WSP (JACK AND BORE) BUT THE EARTHWORK QUANTITIES SHOWN ARE FOR THE ENTIRE ROADWAY PROJECT.

ESTIMATED UNDERCUT EXCAVATION = 500 C.Y.

ESTIMATED SHALLOW UNDERCUT = 300 C.Y.

ESTIMATED DDE = 580 C.Y.



M 1  
BL-3  
778.96'  
E 332.92'

NC GRID  
NAD 83/NSRS 2007

END CONSTRUCTION  
PT STA.12+50.00 -RPYID-

BEGIN CONSTRUCTION  
PC Sta.10+00.00 -RPYID- (35' RT)

BEGIN BRIDGE  
-L- STA 19+20.24

BEGIN APPROACH SLAB  
-L- STA 18+95.24

-BYI-7  
15+91.61 PINC =  
-L- POC Sta. 24+04.00  
(84.97' LT) =  
-YI- POC Sta. 21+97.95  
(160.58' LT)

BM 13+16.36 PINC =  
BM 11+22+38.80 PINC  
ELEV = 760.52  
L- POC STA 17+87.48  
(57.19' LT)  
L- POC STA 17+11.43  
(33.14' RT)  
L- POC STA 28+04.34  
(103.92' RT)

POC Sta. 20+119.1  
POS Sta. 25+11.26 -YI-

END APPROACH SLAB  
-L- STA 21+46.24

END BRIDGE  
-L- STA 21+21.24

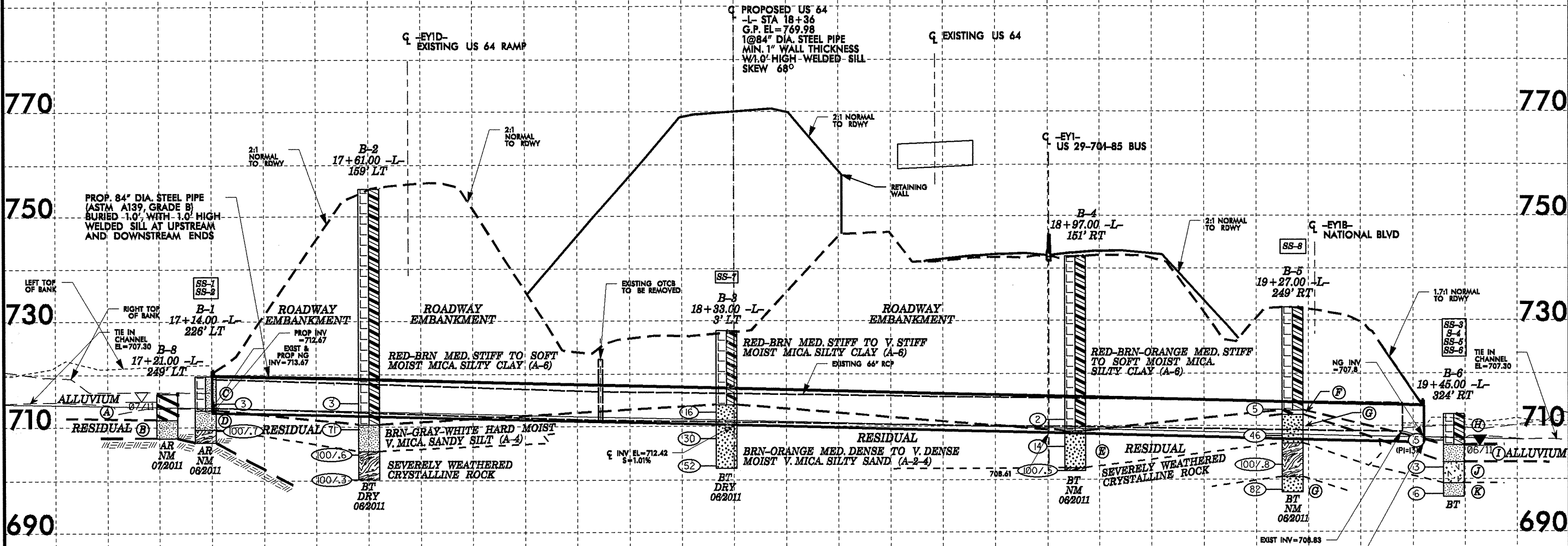
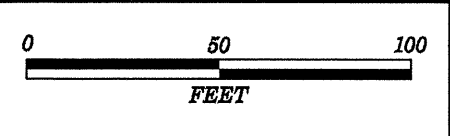
ST Sta. 26+52.21 -L-

END CONSTRUCTION  
POT Sta. 14+00.00 -RPYIC-

END CONSTRUCTION  
POT STA 32+00.00 -YI-

PI Sta 11+  
Δ = 12' 5"  
D = 6' 12"  
L = 208'  
T = 104.5'  
R = 923'

NATIONAL INDUSTRIES  
OF LEXINGTON, INC.  
DB 624 PG 354  
DB 624 PG 373



BORING DESCRIPTIONS	
(A)	ALLUV. RED-ORANGE SOFT MOIST SILTY CLAY TO GRAY STIFF MOIST SANDY SILTY CLAY (A-7)
(B)	RES. BRN-GRAY MED. DENSE TO V. DENSE MOIST SANDY SILT (A-4)
(C)	RE. BRN-GRAY SOFT MOIST CLAYEY SANDY SILT (A-4)
(D)	RES. BRN-GRAY-WHITE V. STIFF MOIST SANDY SILT (A-4)
(E)	RES. BRN-GRAY-WHITE MED. DENSE SOME MICA SILTY SAND (A-2)
(F)	ALLUV. GRAY MED. STIFF MOIST MICA SANDY SILTY CLAY (A-7)
(G)	RES. GRAY-WHITE DENSE MOIST SILTY SAND (A-2-4)
(H)	RE. BRN-GRAY LOOSE MOIST LOW PLASTIC SILTY CLAYEY SAND (A-2-6)
(I)	ALLUV. GRAY SOFT MOIST CLAYEY SANDY SILT (A-5)
(J)	RES. TAN-BRN-WHITE SOFT MOIST MICA SANDY SILT (A-5)
(K)	RES. BLACK-WHITE-GRAY MED. STIFF MOIST MICA SANDY SILT (A-4)

300' LT.      200' LT.      100' LT.      0      100' RT.      200' RT.      300' RT.      400' RT.

WBS 38391.1.1		TIP B-4497		COUNTY DAVIDSON		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION 580 ft OAL 84 in DIA STEEL BORE & JACK PIPE UNDER -EY1D-, -L-, -EY1-, & -EY1B-							GROUND WTR (ft)								
BORING NO. B-1		STATION 17+14		OFFSET 226 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 719.7 ft		TOTAL DEPTH 12.5 ft		NORTHING 760,236		EASTING 1,623,219									
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Smith, M. L.		START DATE 06/27/11		COMP. DATE 06/27/11		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75						100
720													719.7	0.0	
													ROADWAY EMBANKMENT BRN-GRAY SOFT MOIST CLAYEY SANDY SILT (A-4)		
715	715.5	4.2	1	2	1							SS-1	M	713.2	6.5
													RESIDUAL BRN-GRAY-WHITE V. STIFF MOIST SANDY SILT (A-4)		
710	710.5	9.2	46	30	70/2							SS-2	M	709.5	10.2
													WEATHERED ROCK SEVERELY WEATHERED CRYSTALLINE ROCK		
													Boring Terminated BY AUGER REFUSAL at Elevation 707.2 ft ON CRYSTALLINE ROCK		

WBS 38391.1.1		TIP B-4497		COUNTY DAVIDSON		GEOLOGIST Stickney, J. K.								
SITE DESCRIPTION 580 ft OAL 84 in DIA STEEL BORE & JACK PIPE UNDER -EY1D-, -L-, -EY1-, & -EY1B-							GROUND WTR (ft)							
BORING NO. B-2		STATION 17+61		OFFSET 159 ft LT		ALIGNMENT -L-								
COLLAR ELEV. 755.4 ft		TOTAL DEPTH 55.2 ft		NORTHING 760,168		EASTING 1,623,259								
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic								
DRILLER Smith, M. L.		START DATE 06/27/11		COMP. DATE 06/27/11		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75					
760													755.4	0.0
													ROADWAY EMBANKMENT RED-BRN MED. STIFF TO SOFT MOIST MICA. SILTY CLAY (A-6)	
755														
750														
745														
740														
735														
730														
725														
720														
715	715.5	39.9	1	1	2									
													RESIDUAL BRN-GRAY-WHITE HARD MOIST V. MICA. SANDY SILT (A-4)	
710	710.5	44.9	12	20	51									45.0
													WEATHERED ROCK SEVERELY WEATHERED CRYSTALLINE ROCK	
705	705.5	49.9	72	28/1										49.9
													Boring Terminated at Elevation 700.2 ft IN SEVERLY WEATHERED CRYSTALLINE ROCK	
	700.5	54.9												55.2

NCDOT BORE SINGLE B4497\_GEO\_BH\_PIPE\_DAVIDSON.GPJ NC\_DOT\_GDT 7/2/11

NCDOT BORE SINGLE B4497\_GEO\_BH\_PIPE\_DAVIDSON.GPJ NC\_DOT\_GDT 7/2/11

WBS 38391.1.1		TIP B-4497		COUNTY DAVIDSON		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION 580 ft OAL 84 in DIA STEEL BORE & JACK PIPE UNDER -EY1D-, -L-, -EY1-, & -EY1B-							GROUND WTR (ft)									
BORING NO. B-3		STATION 18+33		OFFSET 2 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 728.1 ft		TOTAL DEPTH 25.9 ft		NORTHING 760,011		EASTING 1,623,327										
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009							DRILL METHOD H.S. Augers	HAMMER TYPE Automatic								
DRILLER Smith, M. L.		START DATE 06/28/11		COMP. DATE 06/28/11		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
730																
725																
720																
715	713.7	14.4	5	7	9											
710	708.7	19.4	7	14	16											
705	703.7	24.4	9	22	30											

WBS 38391.1.1		TIP B-4497		COUNTY DAVIDSON		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION 580 ft OAL 84 in DIA STEEL BORE & JACK PIPE UNDER -EY1D-, -L-, -EY1-, & -EY1B-							GROUND WTR (ft)									
BORING NO. B-4		STATION 18+97		OFFSET 151 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 742.3 ft		TOTAL DEPTH 40.6 ft		NORTHING 759,860		EASTING 1,623,398										
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009							DRILL METHOD H.S. Augers	HAMMER TYPE Automatic								
DRILLER Smith, M. L.		START DATE 06/28/11		COMP. DATE 06/28/11		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
745																
740																
735																
730																
725																
720																
715																
710	712.2	30.1	0	0	2											
705	707.2	35.1	5	6	8											
	702.2	40.1	100/5													

WBS 38391.1.1		TIP B-4497		COUNTY DAVIDSON		GEOLOGIST Stickney, J. K.											
SITE DESCRIPTION 580 ft OAL 84 in DIA STEEL BORE & JACK PIPE UNDER -EY1D-, -L-, -EY1-, & -EY1B-							GROUND WTR (ft)										
BORING NO. B-5		STATION 19+27		OFFSET 249 ft RT		ALIGNMENT -L-											
COLLAR ELEV. 732.5 ft		TOTAL DEPTH 34.9 ft		NORTHING 759,763		EASTING 1,623,436											
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Smith, M. L.		START DATE 06/29/11		COMP. DATE 06/29/11		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
735																	732.5 GROUND SURFACE 0.0
730																	ROADWAY EMBANKMENT RED-BRN MED. STIFF MOIST MICA. SILTY CLAY (A-6)
725																	
720																	
715																	
710	714.1	18.4	2	2	3								M				713.0 ALLUVIAL GRAY MED. STIFF MOIST MICA. SANDY SILTY CLAY (A-7) 19.5
	709.1	23.4	11	20	26								SS-8	M			712.1 RESIDUAL GRAY-WHITE DENSE MOIST SILTY SAND (A-2-4) 20.4
705	704.1	28.4	20	53	477.3												706.8 WEATHERED ROCK SEVERLY WEATHERED ROCK W/ LAYERS OF BRN-GRAY-WHITE V. DENSE MOIST SILTY SAND (A-2) 25.7
700																	700.5 RESIDUAL GRAY-WHITE DENSE MOIST SILTY SAND (A-2) 32.0
	699.1	33.4	9	29	53												697.6 Boring Terminated at Elevation 697.6 ft IN RESIDUAL BRN-GRAY-WHITE MOIST V. DENSE SILTY SAND (A-2) 34.9

WBS 38391.1.1		TIP B-4497		COUNTY DAVIDSON		GEOLOGIST Stickney, J. K.											
SITE DESCRIPTION 580 ft OAL 84 in DIA STEEL BORE & JACK PIPE UNDER -EY1D-, -L-, -EY1-, & -EY1B-							GROUND WTR (ft)										
BORING NO. B-6		STATION 19+45		OFFSET 324 ft RT		ALIGNMENT -L-											
COLLAR ELEV. 712.2 ft		TOTAL DEPTH 15.5 ft		NORTHING 759,690		EASTING 1,623,462											
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Smith, M. L.		START DATE 06/29/11		COMP. DATE 06/29/11		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
715																	712.2 GROUND SURFACE 0.0
710																	ROADWAY EMBANKMENT BRN-GRAY LOOSE MOIST LOW (PI=13) PLASTIC SILTY CLAYEY SAND (A-2-6)
705	708.2	4.0	1	4	1								SS-3	M			706.4 ALLUVIAL GRAY SOFT MOIST CLAYEY SANDY SILT (A-4) 5.8
700	703.2	9.0	1	2	1								S-4	M			703.2 RESIDUAL TAN-BRN-WHITE SOFT MOIS MICA. SANDY SILT (A-5) 9.0
	698.2	14.0	2	2	4								SS-5	M			699.2 RESIDUAL BLACK-WHITE-GRAY MED. STIFF MOIST MICA. SANDY SILT (A-4) 13.0
													SS-6	M			696.7 Boring Terminated at Elevation 696.7 ft IN RESIDUAL BLACK-WHITE-GRAY MED. STIFF MOIST MICA. SANDY SILT (A-4) 15.5

NCDOT BORE SINGLE B4497\_GEO\_BH\_PIPE\_DAVIDSON.GPJ NC\_DOT\_GDT 7/21/11

NCDOT BORE SINGLE B4497\_GEO\_BH\_PIPE\_DAVIDSON.GPJ NC\_DOT\_GDT 7/21/11



WBS 38391.1.1		TIP B-4497		COUNTY DAVIDSON		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION 580 ft OAL 84 in DIA STEEL BORE & JACK PIPE UNDER -EY1D-, -L-, -EY1-, & -EY1B-							GROUND WTR (ft)									
BORING NO. B-7		STATION 17+18		OFFSET 239 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 717.3 ft		TOTAL DEPTH 8.3 ft		NORTHING 760,250		EASTING 1,623,223										
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Smith, M. L.		START DATE 07/18/11		COMP. DATE 07/18/11		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
720																
715															717.3	0.0
															710.2	7.1
710															709.0	8.3

WBS 38391.1.1		TIP B-4497		COUNTY DAVIDSON		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION 580 ft OAL 84 in DIA STEEL BORE & JACK PIPE UNDER -EY1D-, -L-, -EY1-, & -EY1B-							GROUND WTR (ft)									
BORING NO. B-8		STATION 17+21		OFFSET 249 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 716.4 ft		TOTAL DEPTH 8.4 ft		NORTHING 760,259		EASTING 1,623,226										
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Smith, M. L.		START DATE 07/18/11		COMP. DATE 07/18/11		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
720																
715															716.4	0.0
															711.4	5.0
710															708.0	8.4

