

NOTE: SEE SHEET 1A FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4204	1	6
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33551.1.1	BRSTP-109 (10)	PE	
33551.2.1	BRSTP-109 (10)	RW+UTIL.	
33551.3.1	BRSTP-109 (10)	CONST.	

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECT
-DET-	13+39 TO 25+08	4	5	
SOIL SAMPLES		6		

ROADWAY  
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33551.1.1 (B-4204) F.A. PROJ. \_\_\_\_\_  
COUNTY MONTGOMERY  
PROJECT DESCRIPTION BRIDGE NO. 28 ON NC 109 OVER  
ROCK CREEK

CAUTION NOTICE

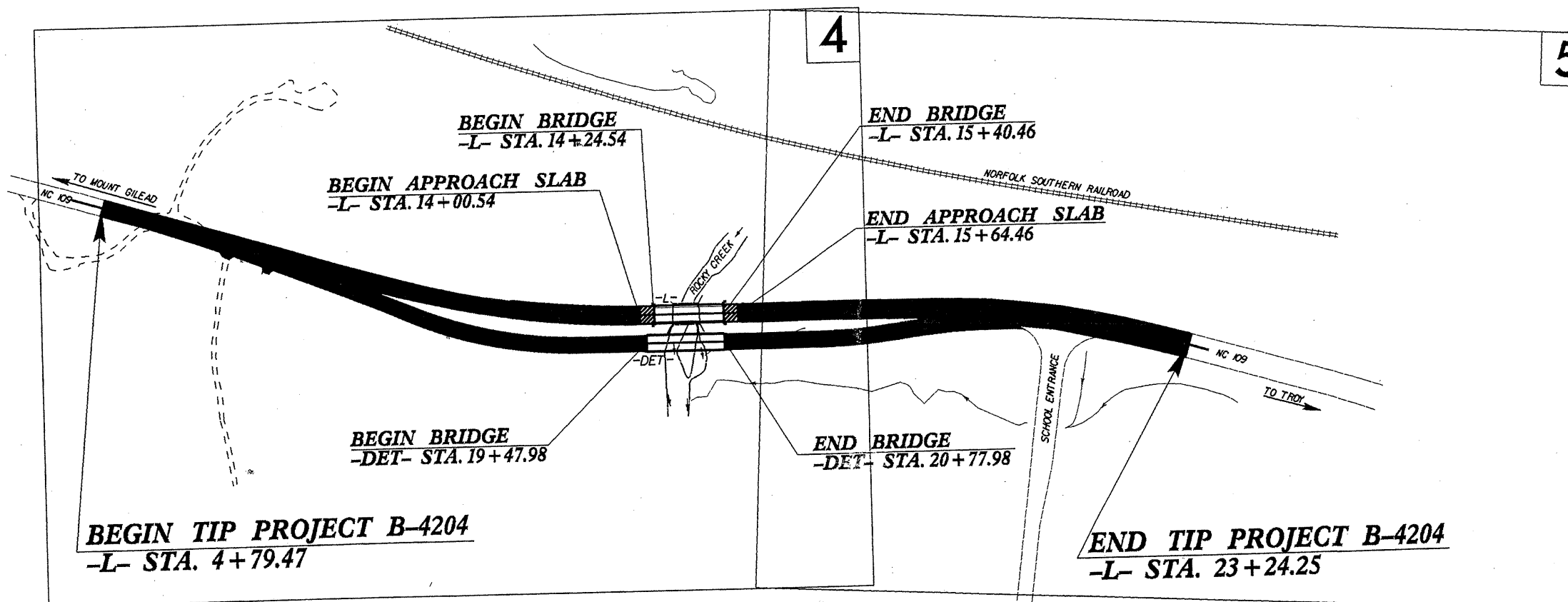
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING 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.

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

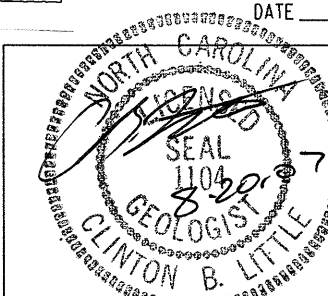
INVENTORY

CONTRACT: C202327 ID: B-4204



PERSONNEL  
RW TODD  
ML SMITH  
AC SMITH

INVESTIGATED BY JP ROGERS  
CHECKED BY CB LITTLE  
SUBMITTED BY CB LITTLE  
DATE 08/07



DRAWN BY: JP ROGERS

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS 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.

09/08/09

See Sheet 1-A For Index of Sheets  
See Sheet 1-B For Conventional Symbols

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

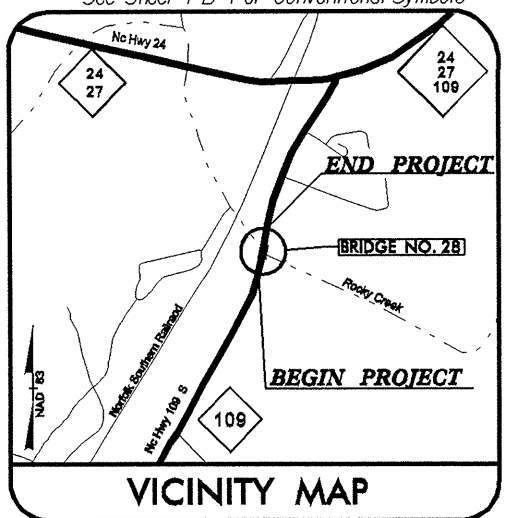
**MONTGOMERY COUNTY**

LOCATION: BRIDGE NO. 28 ON NC 109 OVER ROCKY CREEK  
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

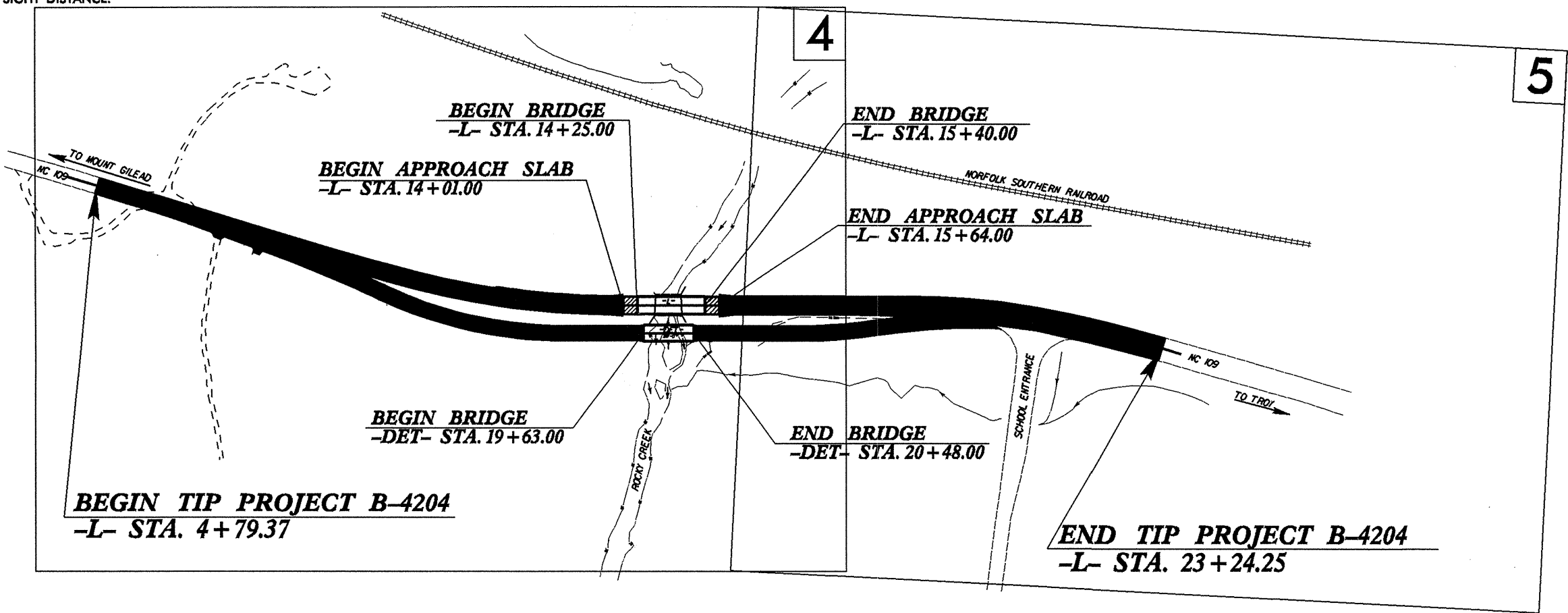
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4204	1	
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
33551.1.1	BRSTP-109 (10)	PE	

**REVISED 25% PLANS**

**TIP PROJECT: B-4204**



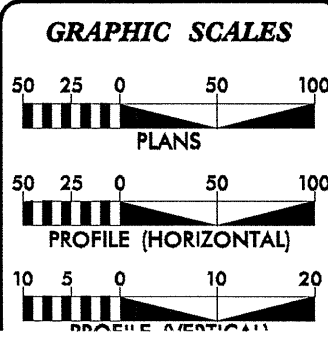
(THIS PROJECT IS NOT INCLUDED WITHIN ANY MUNICIPAL BOUNDARIES)  
\*\* DESIGN EXCEPTION REQUIRED FOR VERTICAL ALIGNMENT AND VERTICAL STOPPING SIGHT DISTANCE.



NCDOT CONTACT : CATHY HOUSER, P.E.  
ROADWAY DESIGN-ENGINEERING COORDINATION

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD

INCOMPLETE PLANS  
DO NOT USE FOR R/W ACQUISITION  
PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION



**DESIGN DATA**

ADT 2008 =	8,060
ADT 2028 =	13,100
DHV =	12 %
D =	60 %
T =	7 % *
**V =	60 MPH
* TTST 4% DUAL 3%	
FUNC. CLASS =	RURAL MAJOR COLLECTOR

**PROJECT LENGTH**

Length Roadway Tip Project B-4204 =	0.327 Miles
Length Structure Tip Project B-4204 =	0.022 Miles
Total Length Tip Project B-4204 =	0.349 Miles

Prepared In the Office of:

**THE LPA GROUP**  
TRANSPORTATION CONSULTANTS

THE LPA GROUP of North Carolina, p.a.  
5000 Falls of Neuse Rd., Suite 304  
Raleigh, North Carolina 27609

2006 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
APRIL 18, 2008

**LETTING DATE:**  
APRIL 21, 2009

**Jennifer D. Farino, P.E.**  
PROJECT ENGINEER

**Jody L. Cole**  
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**ROADWAY DESIGN ENGINEER**

\_\_\_\_\_ P.E.

**DIVISION OF HIGHWAYS**  
STATE OF NORTH CAROLINA

P.E.

-AUG-2007 09:05  
projects\B4204\_GEO\_RDWY\_Montgomery\CADD\_GEO\TECH\PlanProj\B4204\_rdy\_tsh.dgn  
Inrogers AT GER22283

**CONTRACT:**

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 GEOTECHNICAL ENGINEERING UNIT

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: VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6		WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. LINEIFORM - 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.		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 0.1 FOOT PER 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:		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. 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 GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - 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 ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLED IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - 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. SAPROLITE (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 RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N 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 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SRQD) - 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. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.																																																																														
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b> <table border="1"> <tr> <th>GENERAL CLASS.</th> <th colspan="4">GRANULAR MATERIALS (&lt;= 35% PASSING #200)</th> <th colspan="4">SILT-CLAY MATERIALS (&gt; 35% PASSING #200)</th> <th colspan="4">ORGANIC MATERIALS</th> </tr> <tr> <td>GROUP CLASS.</td> <td>A-1</td><td>A-2</td><td>A-3</td><td>A-4</td> <td>A-5</td><td>A-6</td><td>A-7</td><td>A-8</td> <td>A-9</td><td>A-10</td><td>A-11</td><td>A-12</td> <td>A-13</td><td>A-14</td><td>A-15</td> </tr> <tr> <td>SYMBOL</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td> </tr> <tr> <td>% PASSING</td> <td>100</td><td>75</td><td>60</td><td>40</td> <td>30</td><td>20</td><td>10</td><td>5</td> <td>5</td><td>10</td><td>20</td><td>40</td> <td>50</td><td>60</td><td>75</td> </tr> </table>		GENERAL CLASS.	GRANULAR MATERIALS (<= 35% PASSING #200)				SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS				GROUP CLASS.	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12	A-13	A-14	A-15	SYMBOL																% PASSING	100	75	60	40	30	20	10	5	5	10	20	40	50	60	75	<b>ANGULARITY OF GRAINS</b> THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.		<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>WEATHERING</b> FRESH - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SLI) - 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. SLIGHT (SLI) - 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. MODERATE (MOD) - 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. MODERATELY SEVERE (MOD. SEV) - 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. IF TESTED, WOULD YIELD SPT REFUSAL. SEVERE (SEV) - 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. IF TESTED, YIELDS SPT N VALUES > 100 BPF. VERY SEVERE (V SEV) - 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. IF TESTED, YIELDS SPT N VALUES < 100 BPF. COMPLETE - 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.																	
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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

August 7, 2007

STATE PROJECT: 33551.1.1 (B-4204)  
FEDERAL PROJECT: BRSTP – 109 (10)  
COUNTY: Montgomery  
DESCRIPTION: Bridge No. 28 on NC 109 over Rocky Creek

SUBJECT: Geotechnical Report - Inventory

**PROJECT DESCRIPTION**

This project is located in central Montgomery County, approximately 5-6 miles southwest of Troy. The Harrisburg Field Office investigated this project in July 2007. The Roadway investigation on this project is for a Detour Structure that will be built prior to replacing Bridge No. 28. The Detour will be located just downstream of the existing bridge. Please refer to the Roadway plans for a breakdown of all the typicals for this project. Borings were conducted with a CME-550X drill machine with an automatic hammer. Four soil samples were submitted to the Materials and Tests Unit for laboratory analysis. Rock outcrops are readily visible in the streambed and banks of Rocky Creek. The following alignment(s) was investigated:

-DET- 13+39 to 25+08 (0.22 miles)

The total length of lines investigated is 0.22 miles.

MAILING ADDRESS:  
NC DEPARTMENT OF TRANSPORTATION  
GEOTECHNICAL ENGINEERING UNIT  
1589 MAIL SERVICE CENTER  
RALEIGH NC 27699-1589

TELEPHONE: 919-250-4088  
FAX: 919-250-4237  
WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:  
CENTURY CENTER COMPLEX  
ENTRANCE B-2  
1020 BIRCH RIDGE DRIVE  
RALEIGH NC

**AREAS OF SPECIAL GEOTECHNICAL INTEREST**

**Alluvial Soils:** There is one named creek (Rocky Creek) providing drainage within the project corridor. The majority of the alluvial soils encountered on this project are on the north side of Rocky Creek. These soils are approximately six to seven feet thick and consist of stiff sandy silt (A-4). Severely weathered crystalline rock was encountered between elevation 471' and 476' in the borings performed on the north side of Rocky creek. In these same borings, auger refusal was encountered between elevation 470' and 475'. At the time of our investigation, static groundwater was not encountered in any of our borings.

The attached Inventory plans and profiles delineate horizontally and vertically any alluvial soils encountered within the project corridor.

**Artificial Fill/Roadway Embankment:** Due to the presence of numerous overhead/underground utilities and high traffic volumes, no borings were obtained in the existing Roadway (NC 109) embankment.

**Residual Soils:** Residual soils on the project are derived from the felsic, Metavolcanic rocks prevalent to this area. The dominant soil type encountered is silty clay (A-6, A-7). The clays tended to be cap clays that can extend up to 10' below the ground surface. The residual soils encountered on this project did not appear to be micaceous. Please refer to the soil descriptions on the attached profiles to view these areas in detail.

**PHYSIOGRAPHY AND GEOLOGY**

The project is located within the Carolina Slate Geological Belt. According to the North Carolina Geologic Map, the project corridor is underlain by felsic, Metavolcanic rocks (CZfv). Elevation relief (from highest point to lowest point) within the project corridor is approximately 60'. Most of the wooded areas encountered in our investigation had not been logged.

Respectfully submitted,

John P. Rogers  
Project Geological Engineer

## EARTHWORK BALANCE SHEET

Volumes in Cubic Yards

3A/6

PROJECT TIP # B-4204

COUNTY Montgomery

DATE 12/2/2009

SHEET 1 OF 1

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	UNDERCUT EMB.	EARTH EMB.	EMBANK. 20%	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
<b>PHASE I</b>																
-DET-	10+00.00	19+47.98 BEGIN BRIDGE	668				668	335			335	402		266		266
-DET-	20+77.98 END BRIDGE	28+60.22	260				260	1641			1641	1969	1709			
<b>SUBTOTAL</b>			928				928	1976			1976	2371	1709	266		266
<b>PHASE II</b>																
-L-	6+25.00	14+24.54 BEGIN BRIDGE	128				128	128			128	154	26			
-L-	15+40.46 END BRIDGE	20+40.00	222				222	88			88	106	0	116		116
<b>SUBTOTAL</b>			350				350	216			216	260	26	116		116
<b>PHASE III</b>																
-L-	5+62.39	14+10.63 BEGIN BRIDGE	534				534	413			413	496		38		38
-L-	15+40.63 END BRIDGE	20+50.00	1848				1848	226			226	271		1577		1577
<b>SUBTOTAL</b>			2382				2382	639			639	767		1615		1615
<b>PROJECT SUBTOTAL</b>			3660				3660	2831			2831	3398	1735	1997		1997
WASTE IN LIEU OF BORROW													-292	-292		-292
LOSS DUE TO CLEARING & GRUBBING			-500				-500						500			
<b>PROJECT TOTAL</b>			3160				3160	2831			2831	3398	1943	1705		1705
EST 5% TO REPLACE TOP SOIL ON BORROW PIT													97			
<b>GRAND TOTAL</b>			3160										2040			
SAY			3,250										2,100			

EST. DDE = 440 C.Y.

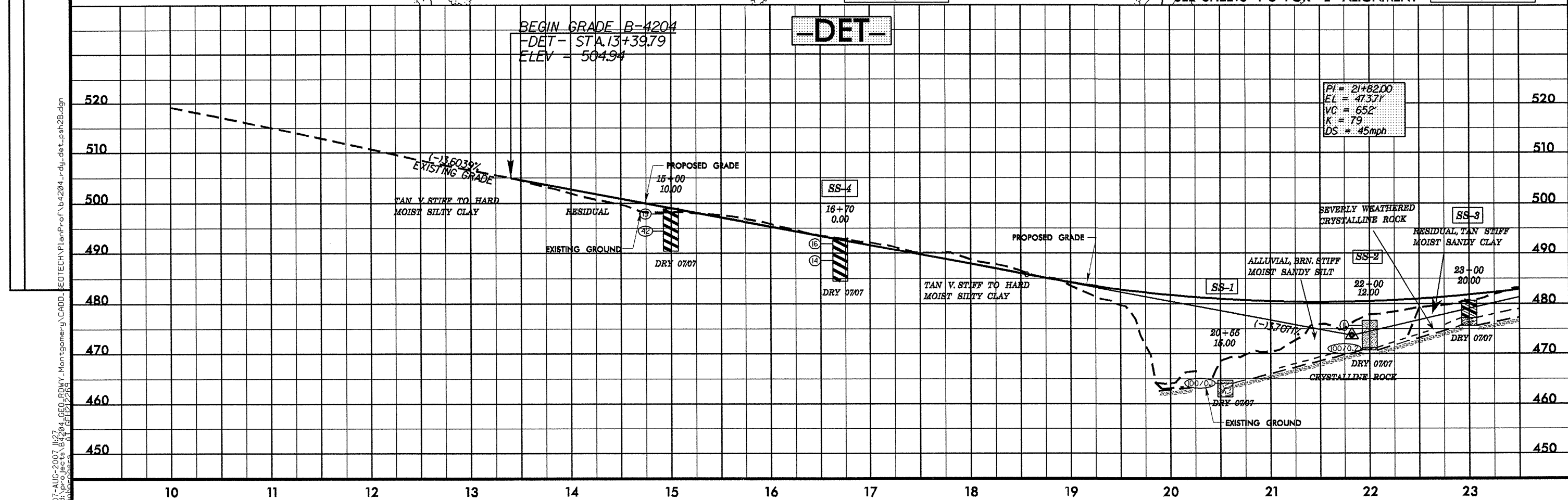
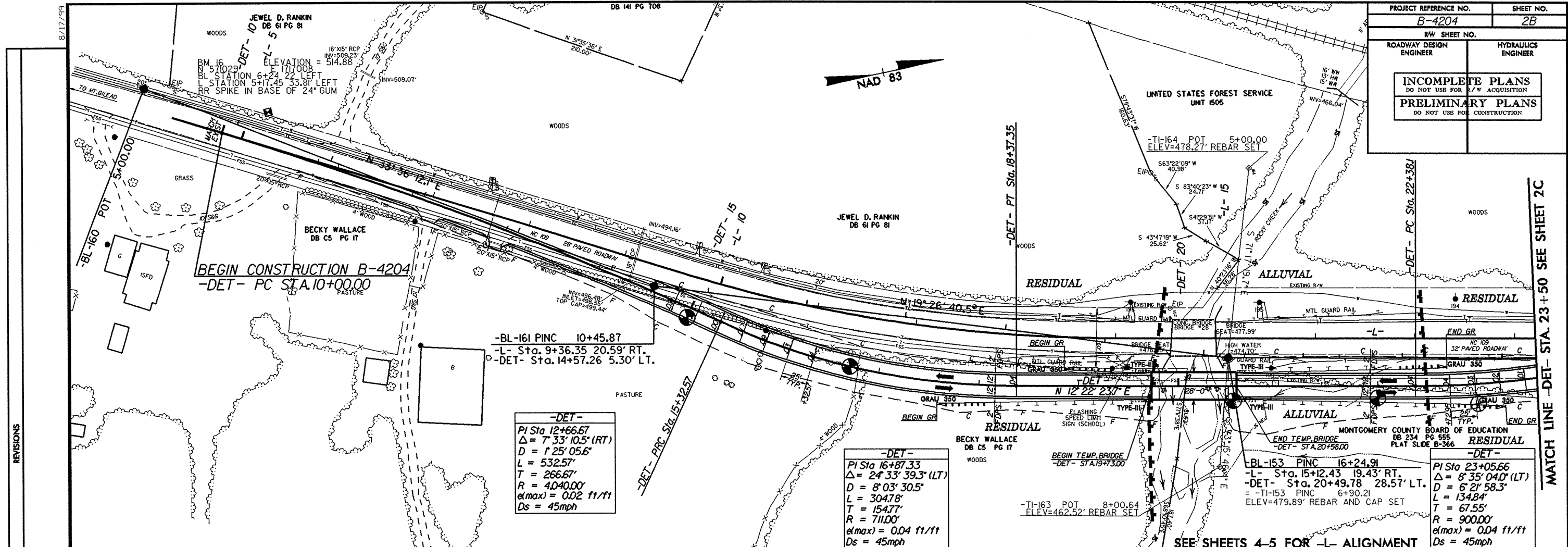
EST. SELECT GRANULAR MATERIAL = 1000 C.Y.

EST. UNDERCUT EXCAVATION = 1500 C.Y.

EST. CLASS IV SUBGRADE STABILIZATION = 1000 TONS

\* 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.





07-AUG-2007 14:27  
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 8/17/99

MATCH LINE - DET - STA. 23+50 SEE SHEET 2C

SEE SHEETS 4-5 FOR -L- ALIGNMENT

**BEGIN CONSTRUCTION B-4204**  
 -DET- PC STA. 10+00.00

-BL-161 PINC 10+45.87  
 -L- Sta. 9+36.35 20.59' RT.  
 -DET- Sta. 14+57.26 5.30' LT.

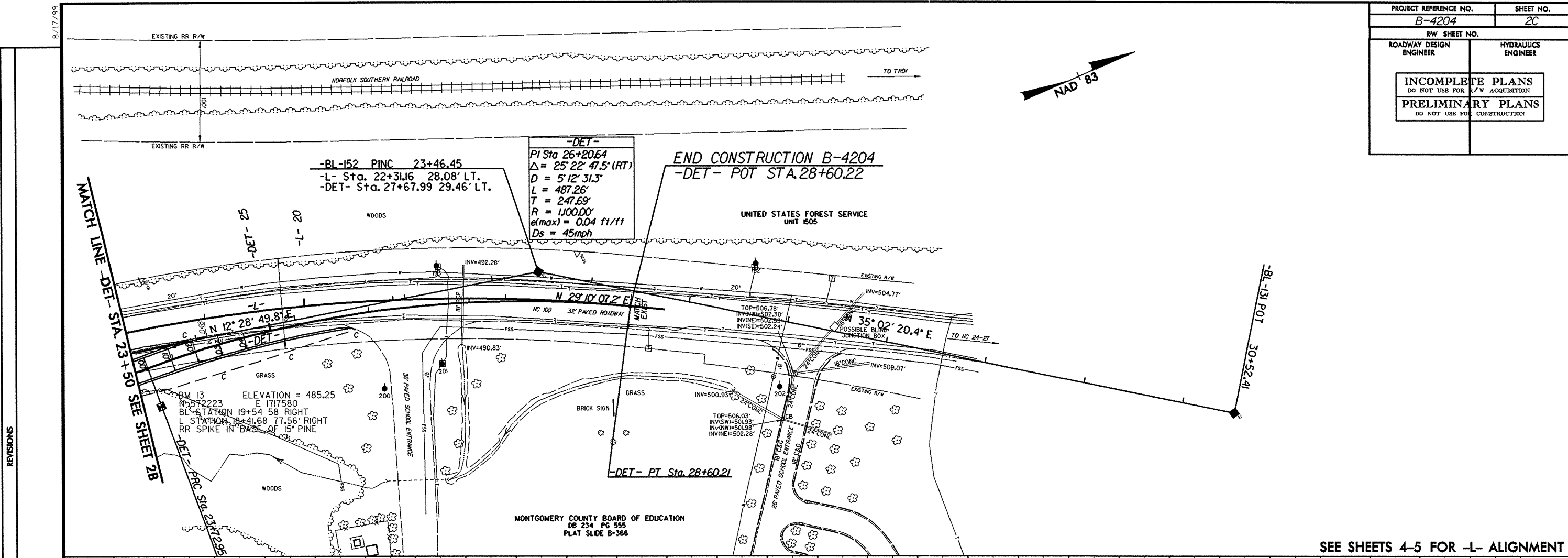
**-DET-**  
 PI Sta 12+66.67  
 $\Delta = 7' 33' 10.5''$  (RT)  
 $D = 1' 25' 05.6''$   
 $L = 532.57'$   
 $T = 266.67'$   
 $R = 4,040.00'$   
 $e(max) = 0.02$  ft/ft  
 $Ds = 45$  mph

**-DET-**  
 PI Sta 16+87.33  
 $\Delta = 2' 33' 39.3''$  (LT)  
 $D = 8' 03' 30.5''$   
 $L = 304.78'$   
 $T = 154.77'$   
 $R = 711.00'$   
 $e(max) = 0.04$  ft/ft  
 $Ds = 45$  mph

-BL-153 PINC 16+24.91  
 -L- Sta. 15+12.43 19.43' RT.  
 -DET- Sta. 20+49.78 28.57' LT.  
 -TI-153 PINC 6+90.21  
 ELEV=479.89' REBAR AND CAP SET

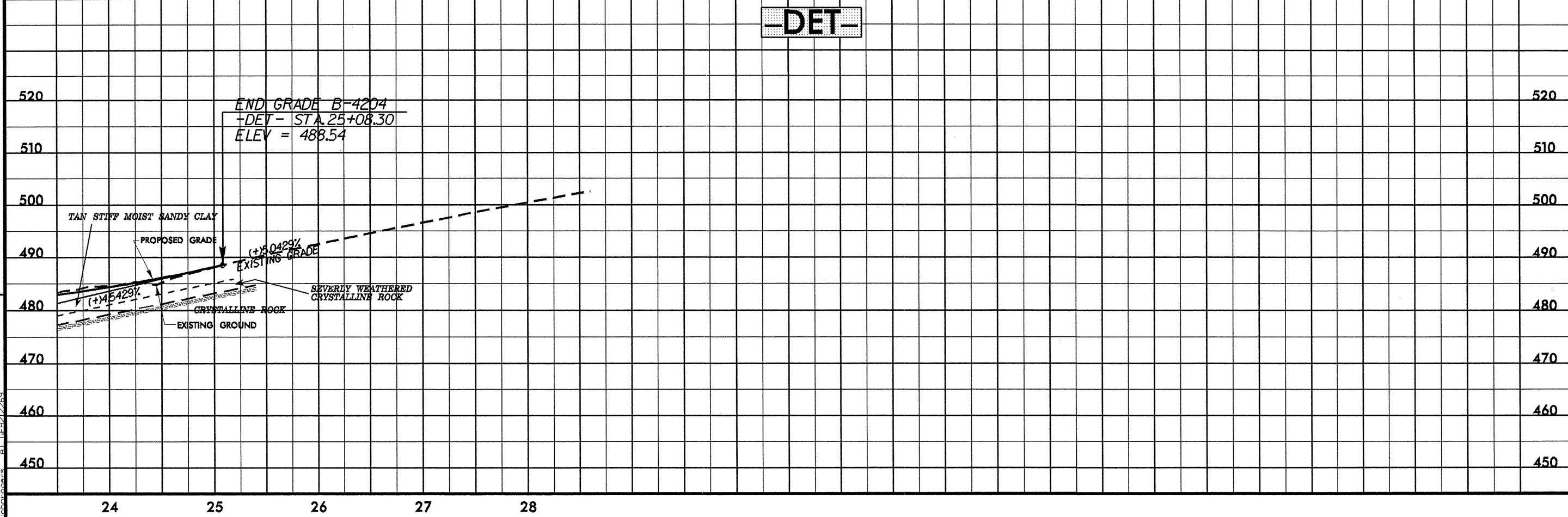
**-DET-**  
 PI Sta 23+05.66  
 $\Delta = 8' 35' 04.0''$  (LT)  
 $D = 6' 21' 58.3''$   
 $L = 134.84'$   
 $T = 67.55'$   
 $R = 900.00'$   
 $e(max) = 0.04$  ft/ft  
 $Ds = 45$  mph

PROJECT REFERENCE NO.	SHEET NO.
B-4204	2C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



REVISIONS

SEE SHEETS 4-5 FOR -L- ALIGNMENT



06-AUC-2007\_0902  
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 8/17/99

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAY  
MATERIALS & TESTS UNIT  
SOILS LABORATORY**

T. I. P. No. B-4204

**REPORT ON SAMPLES OF SOILS FOR QUALITY**

**Project** 33551.1.1 **County** MONTGOMERY **Owner** \_\_\_\_\_  
**Date: Sampled** 6/7/07 **Received** 6/28/07 **Reported** 7/2/2007  
**Sampled from** BRIDGE **By** J P ROGERS  
**Submitted by** N WAINAINA 1995 Standard Specifications

738047 TO 738050  
7/3/07

**TEST RESULTS**

Proj. Sample No.		SS-1	SS-2	SS-3	SS-4		
Lab. Sample No.		738047	738048	738049	738050		
Retained #4 Sieve	%	35	3	1	-		
Passing #10 Sieve	%	56	93	99	100		
Passing #40 Sieve	%	33	80	95	97		
Passing #200 Sieve	%	24	58	86	92		

**MINUS NO. 10 FRACTION**

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	48.2	22.6	7.0	4.2		
Fine Sand Ret - #270	%	10.2	38.8	8.2	5.6		
Silt 0.05 - 0.005 mm	%	27.5	20.5	42.7	50.2		
Clay < 0.005 mm	%	14.0	18.0	42.0	40.0		
Passing #40 Sieve	%	-	-	-	-		
Passing #200 Sieve	%	-	-	-	-		

L. L.		30	22	36	43		
P. I.		8	2	17	13		
AASHTO Classification		A-2-4(0)	A-4(0)	A-6(14)	A-7-5(15)		
Station		20+55	22+00	23+00	16+70		
OFFSET		15 RT	12 RT	20 RT	CL		
ALIGNMENT		L DET	L DET	L DET	L DET		
Depth (Ft)		0.00	0.00	0.00	0.00		
	to	0.60	1.50	1.50	1.50		

cc: J P ROGERS  
Soils File