NOTE: SEE SHEET 2A FOR PLAN SHEET STATE OF NORTH CAROLINA LAYOUT AT TIME OF INVESTIGATION DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS CONTENTS** GEOTECHNICAL ENGINEERING UNIT LINE PLAN PROFILE XSECT **STATION** ROADWAY 7-10 -L-22+00 THRU 43+50 SAMPLE RESULTS SUBSURFACE INVESTIGATION PROJ. REFERENCE NO. 38451.1.1 (B-4643) \_ F.A. PROJ. *BRNHS-49(22)* COUNTY \_STANLY PROJECT DESCRIPTION BRIDGE #24 AND APPROACHES ON NC 49 OVER CURL TAIL CREEK 464 INVENTORY -L- POT 32+95.50 END BRIDGE -L- POT 35+60.50 -L- POC STA 22+00.00 BEGIN TIP PROJECT B-4643 TO RICHFIELD C203156 -YREV - POC STA II+50.00 END CONSTRUCTION L- POT STA 43+50.00 END TIP PROJECT B-4643

| STATE | STATE | PROJECT REFERENCE NO. | SHEET | STATE | STAT

#### 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 BORNING LOGS, ROCK CORES, AND SOL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1919/250-4088, NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORNING 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 BORNINGS DR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU IN-PLACED TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSCRIVED WATER LEVELS OR SOIL MOSITURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTICATIONS ARE AS RECORDED AT THE TIME OF THE INVESTICATIONS ARE AS RECORDED AT THE TIME OF THE INVESTICATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MOIL AND WIND.

THE BIODER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSUPFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT, FOR BIDDING AND CONSTRUCTION PLAPSOSES, 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 PRINON OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIODER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HMSELF 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

PERSONNEL

J. K. STICKNEY

C. L. SMITH
M. L. SMITH

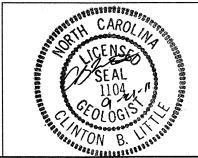
A. C. SMITH

INVESTIGATED BY J. P. ROGERS

CHECKED BY C. B. LITTLE

SUBMITTED BY C.B. LITTLE

SEPTEMBER, 2011



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.

DRAWN BY: \_J. E. ROLFSMEYER/J.P. ROGERS

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

## SUBSURFACE INVESTIGATION

	SOIL AND ROCK LEGEND, TER	MS, 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 180 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO TZOS, 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	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.  JUNIFORM: 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	IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.	DNE ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.			
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR,	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:  WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100	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.			
VERY STIFF, GRAY, SUDY CLAY, MOST WITH INTERBEDGED FINE SHID LAVERS, HISHLY PLASTIC, A-7-6	SUBANGULAR, SUBROUNDED, OR ROUNDED.  MINERALOGICAL COMPOSITION	ROCK (WR)  ROCK (WR)  ROCK (WR)  ROCK (WR)	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL			
SOIL LEGEND AND AASHTO CLASSIFICATION  GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS OCCANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS	CRYSTALLINE FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE,	AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.			
CLASS. (≤35% PASSING #200) (>35% PASSING #200)	WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	The iss, gabero, schist, etc.	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.			
GROUP CLASS. A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 CLASS. A-1-a A-1-b A-2-4 A-2-6 A-2-7 A-3 A-6, A-7	COMPRESSIBILITY  SLIGHTLY COMPRESSIBLE  MODERATELY COMPRESSIBLE  LIQUID LIMIT EDUAL TO 31-50	NON-CRYSTALLINE ROCK (NCR) SEDIMENTARY ROCK THAT WOULD YELD SYD REYSAL IT TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.			
SYMBOL BOOGBOOG COOK COOK COOK COOK COOK COOK COOK C	HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50	SEDIMENTARY ROCK SEDIME	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY T LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.			
7. PASSING GRANULAR SILT- MUCK.	PERCENTAGE OF MATERIAL  GRANULAR SILT - CLAY	WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.			
4 40 38 PK 58 MX 51 MN S01LS S	UNGANIC MATERIAL SOILS SOILS OTHER MATERIAL  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 HORIZONTAL.			
LIGUID LIMIT PLASTIC INDEX 6 MX NP 18 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 501LS WITH LITTLE OR HIGHLY	LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%     MODERATELY ORGANIC 5 - 10% 12 - 20% SDME 20 - 35%     HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, (V SLI,) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF	<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 0 4 MX 8 MX 12 MX 16 MX No MX MODERATE ORGANIC	GROUND WATER  WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	OF A CRYSTALLINE NATURE.  SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO  (SLIJ) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	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 BRAVEL, AND HIE SILTY OR CLAYEY SILTY CLAYEY DIGANIC OR MAJOR BRAVEL AND SAND GRAVEL AND SAND SOILS SOILS MATTER	STATIC WATER LEVEL AFTER 24 HOURS	CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.			
GEN. RATING	VPW DEDCHED WATER CATHRATER ZONE OR WATER READING CIDATA	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND MEATHERING EFFECTS, IN  (HOD.) 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	FLDAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.			
P1 OF A-7-5 SUBGROUP IS ≤ LL - 30 ; P1 OF A-7-6 SUBGROUP IS > LL - 30	- O-MING OR SEEP	MITH FRESH ROCK.  MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.			
CONSISTENCY OR DENSENESS  RANGE OF STANDARD RANGE OF UNCONFINED	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION, ROCK SHOWS SEVERE LOSS OF STRENGTH (MOD, SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK, ROCK GIVES "CLUNK' SOUND WHEN STRUCK.	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.			
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY PENETRATION RESISTENCE COMPRESSIVE STRENGTH (N-VALUE) (TONS/FT2)	ROADWAY EMBANKMENT (RE) SPT DOT DUT TEST BORING W/ CORE W/ CORE	1F TESTED, WOULD YIELD SPT REFUSAL SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.			
GENERALLY VERY LOOSE <4  CONTROL CONTR	SOIL SYMBOL AUGER BORING - SPT N-VALUE	(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.			
GRANULAR	ARTIFICIAL FILL (AF) OTHER - CORE BORING REF SPT REFUSAL	IF TESTED, YIELDS SPT N VALUES > 100 BPF  VERY SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT	SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.  PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF A			
VERY DENSE   >50	INFERRED SOIL BOUNDARY MONITORING WELL	(V SEV.)  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				
GENERALLY SOFT 2 TO 4 0.25 TO 0.50 SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0	INFERRED ROCK LINE  A PIEZOMETER INSTALLATION	VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS SPT N VALUES < 199 BPF  COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND				
MATERIAL STIFF 8 TO 15 1 TO 2 (COHESIVE) VERY STIFF 15 TO 30 2 TO 4 HARD >30 >4		SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.				
TEXTURE OR GRAIN SIZE	25/02/5 DIP & DIP DIRECTION OF ROCK STRUCTURES CONE PENETROMETER TEST	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	● SDUNDING ROD	VERY HARD  CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	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			
POUR DED CORRIE GRAVEI COARSE FINE SILT CLAY	ABBREVIATIONS  AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.			
SAND	BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED  CL CLAY MOD MODERATELY 7 - UNIT WEIGHT	MODERATELY 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.	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.			
SIZE IN. 12 3	CPT - COME PENETRATION TEST NP - NON PLASTIC  CSE COARSE  ORG ORGANIC  DMT - DILATOMETER TEST  PMT - PRESSUREMETER TEST  SAMPLE ABBREVIATIONS	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.	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			
SOIL MOISTURE - CORRELATION OF TERMS  SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION	DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	POINT OF A GEOLOGIST'S PICK.  SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS	A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.			
(ATTERBERG LIMITS)  DESCRIPTION  - SATURATED - USUALLY LIQUID; VERY WET, USUALLY	F - FINE SL - SILT, SILTY ST - SHELBY TUBE FOSS, - FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT, SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.			
LL_ LIOUID LIMIT (SAT.) FROM BELOW THE GROUND WATER TABLE	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXI FRAGS FRAGMENTS ## - MOISTURE CONTENT CBR - CALIFORNIA BEARINI HI HIGHLY V - VERY RATIO	SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY	STRATA ROCK QUALITY DESIGNATION (SROD) - 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.			
PLASTIC   SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	FINGERNAIL. FRACTURE SPACING BEDDING	IOPSOIL (IS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.			
(PI) PL PLASTIC LIMIT	DRILL UNITS: ADVANCING TODLS: HAMMER TYPE:	TERM SPACING TERM THICKNESS	BENCH MARK:			
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	MOBILE B- CLAY BITS X AUTOMATIC MANUAL	WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET	ELEVATION: FT.			
SL SHRINKAGE LIMIT	6° CONTINUOUS FLIGHT AUGER CORE SIZE:	CLOSE 0.16 TO 1 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET	NOTES:			
- DRY - (D) ATTAIN OPTIMUM MOISTURE	BK-51 X 8'HOLLOW AUGERSB	VERY CLOSE LESS THAN 0.16 FEET THINLY LAMINATED < 0.008 FEET  INDURATION	COLLAR ELEVATIONS OBTAINED FROM: 64643_Is_tin.tin FILE.			
PLASTICITY  PLASTICITY INDEX (P) DRY STRENGTH	CME-45C HARD FACED FINGER BITS -N	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.				
NONPLASTIC 0-5 VERY LOW	CME-550 X TUNGCARBIDE INSERTS -H	ERIORI F RUBBING WITH FINGER FREES NUMEROUS GRAINS:				
LOW PLASTICITY         6-15         SLIGHT           MED. PLASTICITY         16-25         MEDIUM           HIGH PLASTICITY         26 OR MORE         HIGH	CASING W/ ADVANCER HAND TOOLS: PORTABLE HOIST TRICONE STEEL TEETH POST HOLE DIGGER	GENILE BLOW BY HAMMER DISINIEGRATES SAMPLE.  MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE;				
COLOR	X CME 550X TRICONE TUNG,-CARB. 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, YELLOW-BROWN, BLUE-GRAY).	CORE BIT SOUNDING ROD VANE SHEAR TEST	DIFFICULT TO BREAK WITH HAMMER.				
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		EXTREMELY INDURATED SHAPP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.				

PROJECT REFERENCE NO. B-4643

SHEET NO. 2 Volumes in Cubic Yards

COUNTY: Stanly

DATE: 2/4/2013

COMPILED BY:

KDA/IY

SHEET

**EMBANKMENT (Cubic Yards) EXCAVATION (Cubic Yards)** WASTE (CUBIC Yards) **STATION STATION** TOTAL UNDERCUT UNSUIT. SUITABLE TOTAL **ROCK** EARTH EMBANK. **BORROW** ROCK SUITABLE UNSUIT. TOTAL UNCLASS. UNCLASS. UNCLASS. +20% C.Y. PHASE ONE -L- 22+00.00 32+95.50 3,370 3,370 3,418 3,418 4,102 732 -L- 35+60.50 6,490 7,788 7,623 43+50.00 165 165 6,490 3,535 9,908 11,890 SUBTOTAL 3,535 9,908 8,355 PHASE TWO -L- 22+50 33+00 349 349 502 502 602 253 4,190 224 -L- 33+50 43+50 4,190 224 269 3,921 3,921 -YREV-10+18.00 11+50.00 108 108 77 77 92 16 16 SUBTOTAL 4,647 803 964 253 3,937 3,937 4,647 803 SUBTOTAL SUBTOTAL TOTAL 8,182 8,182 10,711 10,711 12,853 8,608 3,937 3,937 LOSS DUE TO CLEARING & GRUBBING -600 -600 600 ESTMATED SHOULDER MATERIAL 1,122 1,122 1,346 1,346 PROJECT TOTAL 7,582 7,582 11,833 11,833 14,200 10,554 3,937 3,937 EST. 5% TO REPLACE TOP SOIL ON BORROW PIT 528 GRAND TOTAL 7,582 7,582 11,833 14,200 11,082 3,937 3,937 11,833 11,500 SAY 8,000 CLASS IV SUBGRADE STABILIZATION = 1,000 TONS GEOTEXTILE FOR SOIL STABILIZATION = 2,000 SY ESTIMATED SHALLOW UNDERCUT =500 CY ESTIMATED UNDERCUT = 700 CY SELECT GRANULAR MATERIAL = 500 CY EST. DRAINAGE DITCH EXCAVATION = 739 CY

PROJECT: B-4643



# STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PURDUE
GOVERNOR

Eugene A. Conti, Jr. SECRETARY

September 16, 2011

STATE PROJECT:

38451.1.1 (B-4643)

FEDERAL PROJECT:

BRNHS - 49(22)

COUNTY:

Stanly

**DESCRIPTION:** 

Bridge No. 24 and approaches on NC 49 over Curl Tail creek.

SUBJECT:

Geotechnical Report – Inventory

#### PROJECT DESCRIPTION

This project is located in northern Stanly County near the town of Richfield. This report addresses the relocation of the existing –L- line (NC 49) and includes the approaches for a new Bridge No. 24. In addition, the existing Bell Road (SR 1627)/ NC 49 intersection will be re-aligned to accommodate the northern shift in the –L- (NC 49) line. Due to this northern shift in the proposed roadway, existing NC 49 will serve as the on-site detour during the construction phase of this project. The following alignments were investigated:

-L- Station 22+00.00 to 43+50.00 (0.41 miles)

-YREV- Station 10+00.00 to 11+50.00 (0.03 miles)

The total length of lines investigated is 0.44 miles (2300.00 feet).

This project was initially scoped as a PDEA investigation in 2008. The final field investigation was conducted in July 2011. All borings performed on this project were conducted with a CME-550X drill machine with an automatic hammer. Standard Penetration Tests were conducted at each boring location utilizing hollow stem augers. All soil samples taken during the investigations were submitted to the Materials and Tests Unit for laboratory analysis.

#### MAILING ADDRESS:

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

<u>Non-Crystalline Rock:</u> Non-crystalline rock was encountered within six feet of proposed grade in the following cut section:

<u>Line</u> -L- Station 28+00 to 30+00

Offset Left

According to the NC Geological map, the rock in this area is classified as metamudstone and metaargillite of the Carolina Slate Belt. Curl Tail creek flows directly on this rock within the project corridor. Please refer to the cross-sections in the attached inventory report for a graphical depiction of this area.

Alluvial Soils: Alluvial deposits encountered within the project corridor are up to six feet thick. These soils are associated with the Curl Tail Creek; which serves as the primary drainage outlet for this project. On the western side of Curl Tail creek, the deposits are thickest and consist of very loose silty sand (A-2-4). Thinner layers of silty clay (A-7) were encountered on the eastern side of Curl Tail creek. The maximum proposed roadway fill height over these deposits is approximately 11'.

#### **SOIL PROPERTIES**

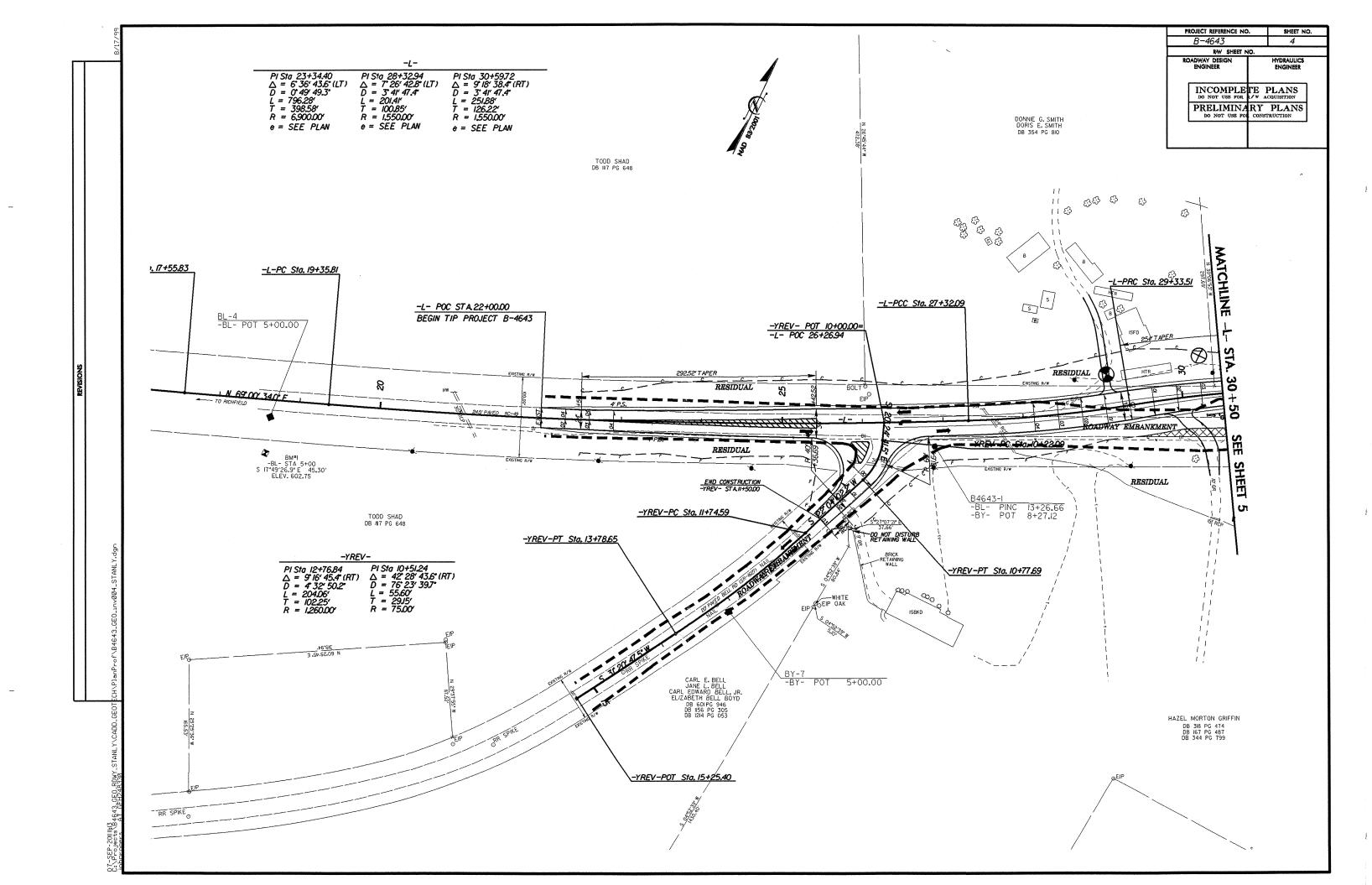
Residual Soils

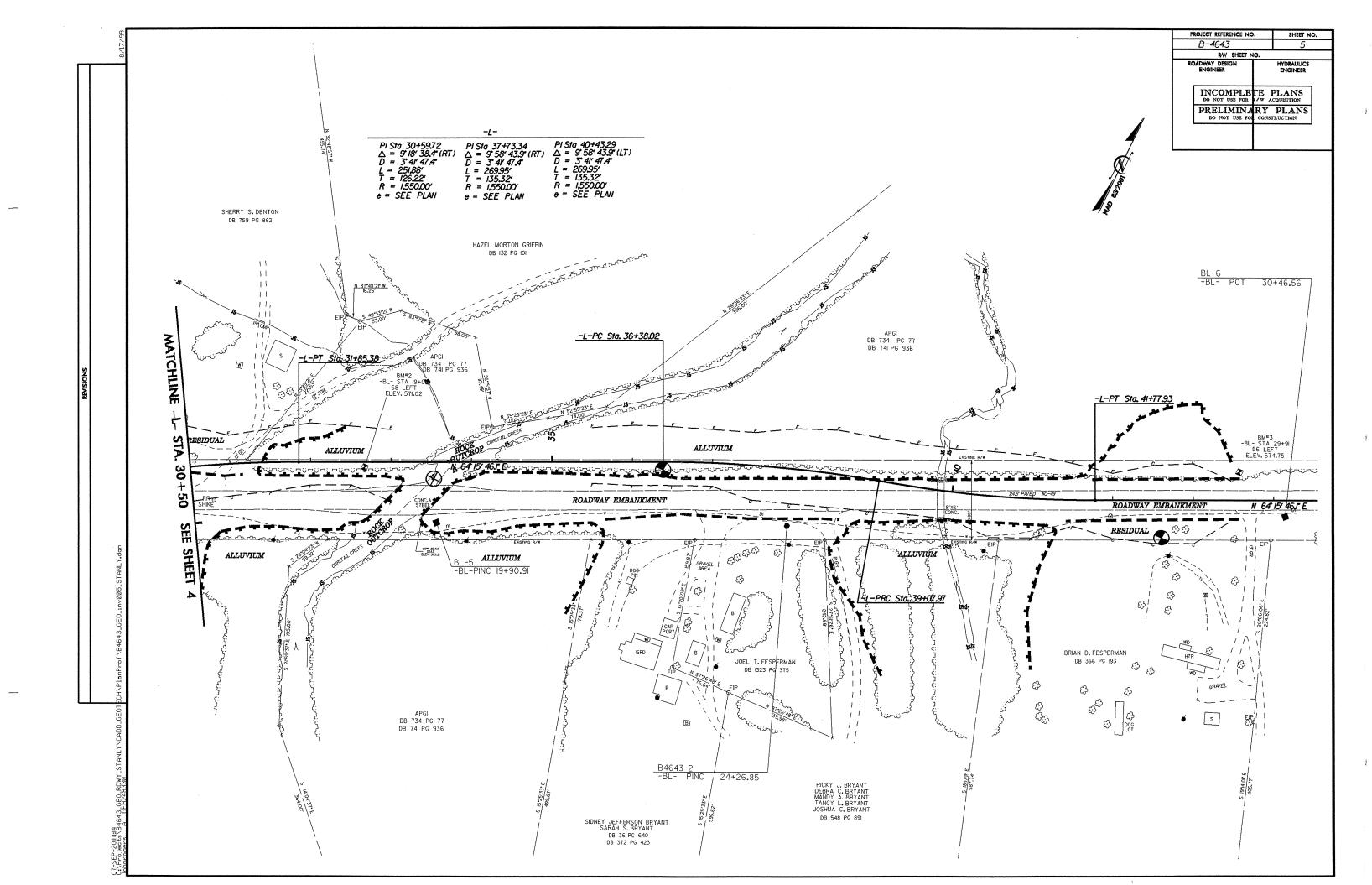
All residual soils on the project are derived from the metamudstone and argillite (CZmd) rocks encountered within the project corridor. The dominant residual soil type encountered is sandy silt (A-4). Based on the laboratory analysis performed at the Materials and Tests Unit, these silts were found to have a low plasticity (6<P.I. <15).

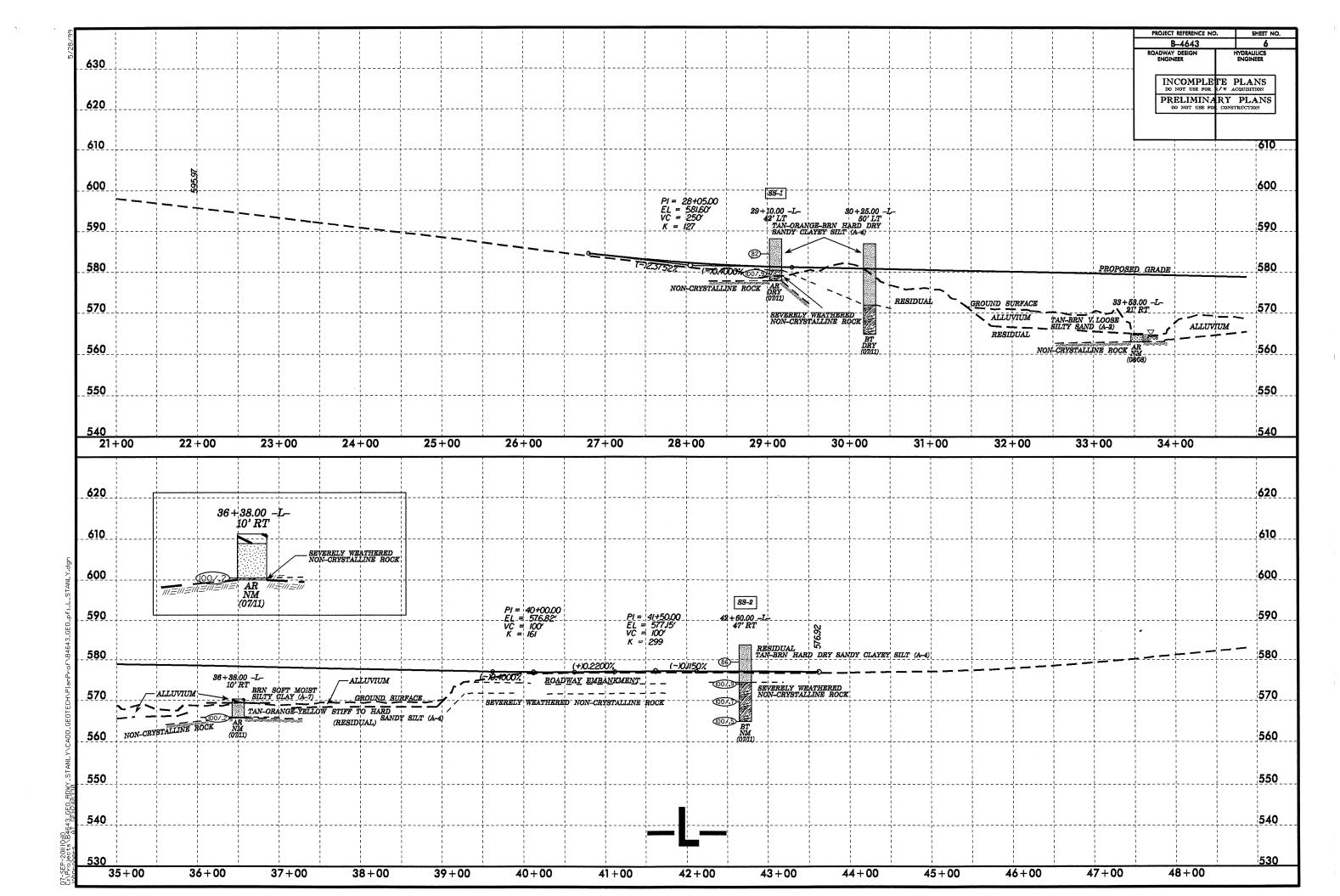
Respectfully submitted,

John P. Rogers

Project Geological Engineer







SOIL TEST RESULTS															
SAMPLE			DEPTH	AASHTO	ГО		% BY WEIGHT		% PASSING (SIEVES)			%	%		
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-1	42 LT	29+10	3.30-4.30	A-4(8)	40	10	17.4	9.1	28.9	44.5	100	87	76	•	-
SS-2	47 RT	42+60	3.90-4.90	A-4(8)	39	9	12.8	6.7	25.9	54.7	100	92	82	-	-