

CONTRACT: C201290 ID: B-3509

CONTENTS:		SHEET NUMBERS		
LINE	STATION	PLAN	PROFILE	X-SECTS.
-L-	17+50 to 24+50	4		6-10
-L DETOUR-	12+77 to 20+00	4	5	

NOTE: REFER TO SHEET 2A FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION.

DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 GEOTECHNICAL UNIT

ROADWAY
 SUBSURFACE INVESTIGATION

STATE PROJECT 331222.1 I.D. NO. B-3509
 F.A. PROJECT BRSTP-700(1)
 COUNTY ROCKINGHAM
 PROJECT DESCRIPTION BRIDGE NO. 75 ON SR 3003
(MEADOW RD.) OVER SMITH RIVER

INVENTORY

NOTE: This Subsurface Investigation Inventory replaces the original Inventory dated October 2003.



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33122.1.1(B-3509)	1	10

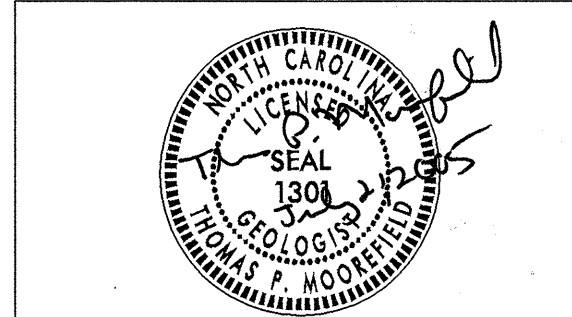
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THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR 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.

INVESTIGATED BY T.P. MOOREFIELD PERSONNEL J.L. PEDRO
 CHECKED BY N.T. ROBERSON L. B. MADISON
 SUBMITTED BY N.T. ROBERSON W. T. DUGGINS
 DATE JULY 2005 H.R. CONLEY



DRAWN BY: J.L. PEDRO, T.T. WALKER

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.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
B-3509	33122.1.1	2	10

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 WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 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: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: <i>VERY STIFF, GRAY SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY 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. THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	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. 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: WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)	ALLUVIUM (ALLUV.) - SOILS WHICH 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 WHICH 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 DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (F.P.) - 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, MOTTLING 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 SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (R.Q.D.) - 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 WHICH 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, WHICH 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 B.P.F.) 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 LESS THAN 0.1 FOOT PENETRATION WITH 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 (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	WEATHERING	
GENERAL CLASS. GRANULAR MATERIALS (< .85% PASSING #200) SILT-CLAY MATERIALS (< .85% PASSING #200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V. SL.) 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 (SL.) 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. SEVERE (SEV.) ALL ROCKS 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. 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. <i>IF TESTED, YIELDS SPT N VALUES < 100 B.P.F.</i> 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.	
COMPRESSION	PERCENTAGE OF MATERIAL	GROUND WATER	
SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 30 MODERATELY COMPRESSIBLE LIQUID LIMIT 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50	ORGANIC MATERIAL GRANULAR SOILS SILT-CLAY SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE	▽ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING. ▽ STATIC WATER LEVEL AFTER 24 HOURS. ▽ PW. PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA ○ SPRING OR SEEPAGE	
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS		
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)	ROADWAY EMBANKMENT WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS INFERRED SOIL BOUNDARIES INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP/DIP DIRECTION OF ROCK STRUCTURES	SPT DMT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION SPT N-VALUE SPT REFUSAL	
VERY LOOSE 4 LOOSE 4 TO 10 MEDIUM DENSE 10 TO 30 DENSE 30 TO 50 VERY DENSE >50 VERY SOFT <2 SOFT 2 TO 4 MEDIUM STIFF 4 TO 8 STIFF 8 TO 15 VERY STIFF 15 TO 30 HARD >30	25/025 25/025	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 FRAGS. - FRAGMENTS MED. - MEDIUM	
TEXTURE OR GRAIN SIZE	ABBREVIATIONS	EQUIPMENT USED ON SUBJECT PROJECT	
U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 4.76 2.0 0.42 0.25 0.075 0.053	PMT - PRESSUREMETER TEST SD - SAND, SANDY SL - SILT, SILTY SLI - SLIGHTLY SILTY TCR - TRICONE REFUSAL - UNIT WEIGHT γ _d - DRY UNIT WEIGHT w - MOISTURE CONTENT WR - WEATHERED ROCK V - VERY VST - VANE SHEAR TEST	DRILL UNITS: MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST OTHER OTHER ADVANCING TOOLS: CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING w/ ADVANCER TRICONE STEEL TEETH TRICONE TUNG-CARB. CORE BIT OTHER	
SOIL MOISTURE - CORRELATION OF TERMS	ROCK HARDNESS	INDURATION	
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 - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE SL SHRINKAGE LIMIT - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. MODERATELY HARD 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. MEDIUM HARD 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. SOFT 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. VERY SOFT 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.	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	
PLASTICITY	FRACTURE SPACING	BEDDING	
NONPLASTIC 0-5 DRY STRENGTH VERY LOW LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 OR MORE HIGH	TERM SPACING 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	TERM THICKNESS 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	BENCH MARK: N/A ELEVATION: N/A
COLOR	INDURATION		NOTES:
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.			

SUMMARY OF EARTHWORK (IN CUBIC YARDS)

PROJECT: B-3509

DATE: March 16, 2006

COUNTY: Rockingham

SHEET 1 of 1

LINE	STATION	STATION	EXCAVATION				EMBANKMENT				BORROW	WASTE				
			TOTAL UNCLASS	ROCK	TOTAL UNDERCUT	UNSUITABLE EARTH	SUITABLE EARTH	TOTAL	ROCK	EARTH		EMBANK. +15%	ROCK	SUITABLE	UNSUITABLE	TOTAL
-L-	10+60.00	12+19.78	106	0	0	0	106	52	0	52	60	0	0	46	0	46
-L- Circle	10+00.00	12+38.76	24	0	0	0	24	708	0	708	814	790	0	0	0	0
-L-	13+36.31	13+95.00	7	0	0	0	7	29	0	29	33	26	0	0	0	0
BRIDGE																
SUBTOTAL			137	0	0	0	137	789	0	789	907	817	0	46	0	46
BRIDGE																
-L-	17+65.00	25+00.00	1,592	0	0	0	1,592	191		191	220	0	0	1,372	0	1,372
-Y1-	10+58.41	12+50.00	22		0	0	22	77		77	89	67	0	0	0	0
SUBTOTAL			1,614	0	0	0	1,614	268	0	268	309	67	0	1,372	0	1,372
DETOUR	12+00.00	21+50.00	7,007	10	0	0	6,997	152	10	142	173	0		6,834	0	6,834
SUBTOTAL			7,007	10	0	0	6,997	152	10	142	173	0	0	6,834	0	6,834
PROJECT SUBTOTALS			8,758	10	0	0	8,748	1,209	10	1,199	1,389	884	0	8,252	0	8,252
LOSS DUE TO CLEARING AND GRUBBING			(340)				(340)							(340)		(340)
EARTH WASTE TO REPLACE BORROW												(884)		(884)		(884)
PROJECT TOTALS			8,418	10	0	0	8,408	1,209	10	1,199	1,389	0	0	7,028	0	7,028
REMOVE DETOUR								3,743		3,743	4,304	4,304				
PROJECT TOTALS			8,418	10	0	0	8,408	4,952	10	4,942	5,693	4,304	0	7,028	0	7,028
EST. 5% FOR REPLACING TOP SOIL ON BORROW PIT												215				
GRAND TOTALS			8,418									4,520				7,028
SAY			8,675									4,800				7,050

Undercut Excavation (Contingency) = 250 cy
 -L- Pavement Structure Volume = 306 cy



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Michael F. Easley
GOVERNOR

P.O. BOX 25201, RALEIGH, N.C. 27611-5201

Lyndo Tippet
SECRETARY

July 26, 2005

STATE PROJECT: 33122.1.1 (B-3509)
FEDERAL PROJECT: BRSTP-700(1)
COUNTY: Rockingham

DESCRIPTION: Bridge No. 75 on SR 3003 (Meadow Rd.) over Smith River

SUBJECT: Geotechnical Report – Inventory

NOTE: This subsurface inventory report replaces the original inventory report dated October 27, 2003. This revised report includes the results of five additional Standard Penetration borings drilled into the detour cut area left of -L- Sta. 18+00 to 22+00. These five borings were completed in June, 2005.

PROJECT DESCRIPTION

This project consists of the approaches to a replacement bridge to be constructed over the Smith River on -L- (SR-3003, Meadow Road) and the adjacent detour bridge approaches. A temporary detour bridge is to be constructed left of the existing structure. A 20 to 25' cut into Triassic rock (left of -L- Sta. 17+80 to 21+50) is required in order to construct the eastern detour approach. The project is approximately 0.27 miles in length. The field investigation focused primarily on the detour bridge approaches (-L- DETOUR). There are no significant changes to the grades, or the alignments, of -L- and associated -Y- lines.

The initial geotechnical field investigation was conducted in April and September of 2003. In June 2005, five additional Standard Penetration borings were drilled into the detour cut area left of -L- Sta. 18+00 to 22+00. Borings were advanced using BK-51 and CME-550 ATV-mounted drill machines with automatic hammers. Standard Penetration Tests were performed in each boring. Two additional hand auger borings were also completed. Representative soil samples were collected for visual classification in the field and for laboratory analysis by the Materials and Tests Unit. Two borings from the bridge structure investigation have been incorporated into this report.

AREAS OF SPECIAL GEOTECHNICAL INTEREST

- 1) Non-crystalline Rock: The non-crystalline rock delineated on this project includes primarily Triassic shale. Non-crystalline rock occurs above or within 6 feet of proposed grade at the following locations:

Alignment	Station	Offset
-L-	18+00 to 24+00	LT

- 2) Potential Hazardous Site: A strong petroleum odor was detected in samples of the alluvial soil from the boring at -L DETOUR- Sta. 13+63 (see Profile Sheet No. 5). The GeoEnvironmental Section of the Geotechnical Unit was notified of the potential contamination in April, 2003.

PHYSIOGRAPHY AND GEOLOGY

The project is located in the town of Eden, situated in the northwestern portion of the Piedmont physiographic province. The western end of the project is adjacent to an historic district which includes a textile mill and associated buildings, along with several more recent businesses. The eastern portion of the project consists of a wooded area left of -L- , and several businesses and parking areas to the right of -L-.

The project occurs within the Dan River Triassic Basin. The underlying bedrock consists of Triassic shale, siltstone, sandstone, and conglomerate of the Stoneville and Cow Branch Formations.

SOIL PROPERTIES

Artificial Fill Soils: Artificial fill soil occurs in two areas. Approximately 15 feet of artificial fill soil underlies the mill parking lot and grassy area just west of the river and left of -L-. The fill soil consists of medium stiff, dry to moist, silty sandy clay (AASHTO classification of A-6 and A-7-6). The fill soil overlies alluvial soil in the area adjacent to the river.

A second area of fill soil occurs left of -L DETOUR- Sta. 16+70 to 17+30. This soil, approximately 5 feet in thickness, covers a sewer line that slopes downward from the roadway embankment to the alluvial area (see Plansheet No. 4A). The fill soil appears similar to the adjacent roadway embankment soil, consisting of medium stiff, dry sandy silt (A-4) with gravel-size rock fragments. The fill soil overlies the Triassic rock outcrop and the alluvial soil.

Roadway Embankment Soils: Embankment fill soil occurs at both ends of the existing bridge. Approximately fourteen feet of embankment fill soil occurs right of -L DETOUR- Sta. 13+50 to 14+25 (see Cross-section Sheet No. 6). The fill soil consists of soft to medium stiff, dry to moist, silty sandy clay (A-6) and plastic sandy clay (A-7-6) and overlies alluvial soil on the west side of the river.

East of the river, ten of fifteen feet of embankment fill occurs along centerline and right of -L DETOUR- Sta. 16+65 to 17+35 (see Profile Sheet No. 5 and Cross-section Sheet No. 6). This soil consists of brown, stiff to very stiff, dry sandy silt (A-4) with gravel-size rock fragments. The embankment fill soil overlies either alluvial soil or weathered Triassic rock.

Alluvial Soils: Alluvial soil was encountered in two areas. The alluvial soil beneath the artificial fill soil west of the river consists of 13 feet of red-brown, loose, moist sand (A-2-4) and medium stiff to very stiff, sandy silt (A-4) (see Profile Sheet No. 5 and Cross-section Sheet No. 6). Up to 18 feet of alluvial soil is estimated to occur in the floodplain east of the river (see Profile Sheet No. 5 and Cross-section Sheet No. 6). This alluvial soil consists of gray-brown, soft to medium stiff, moist to wet, sandy silt (A-4). The sandy silt is underlain by weathered Triassic bedrock.

Residual Soils: Residual soils occur in two areas and are derived from the weathering of Triassic bedrock. West of the river, approximately ten feet of loose to medium dense, silty sand (A-2-4) and coarse sand (A-2-4) occurs beneath the alluvial soil (see Profile Sheet No. 5 and Cross-section Sheet No. 6). The residual soil grades into weathered Triassic siltstone, shale, and sandstone with depth.

Residual soil also occurs at the ground surface of the cut slope left of -L DETOUR- Sta. 17+75 to 19+30 (see Profile Sheet No. 5 and Cross-section Sheet Nos. 6 through 10). The residual soil in the cut slope is generally five to six feet in thickness and consists of medium stiff to hard, dry to moist, sandy silty clay (A-7-6 and A-6) and sandy silt (A-4), with minor amounts of very dense, dry, silty sand (A-2-4).

ROCK PROPERTIES

Weathered rock was encountered in the borings on each side of the river (see Profile Sheet No. 5 and Cross-section Sheet No. 6). The weathered rock is derived from Triassic shale, siltstone, and sandstone. Weathered Triassic rock outcrops in the existing cut slope left of -L- Sta. 18+00 to 24+00 (see Profile Sheet No. 5 and Cross-section Sheet Nos. 6 through 10). The weathered Triassic rock consists of interbedded sandstone, conglomeratic sandstone, siltstone, shale, and mudstone. Sandstone and conglomeratic sandstone are the predominate rock types from Sta. 18+00 to 19+50. Weathered siltstone and shale units are more common from Sta. 19+50 to 24+00. These rock units dip to the north at an angle 35° to 37° (see Plan Sheet No. 4 for strike and dip data). Because of the favorable orientation of the rock units, the existing 10 to 20-foot high rock slopes are stable at ratio of 1:1 (H:V) or greater.

Non-crystalline rock occurs within the detour slope cut and beneath the Smith River. The non-crystalline rock within the slope cut consists of gray, thinly-bedded shale which yielded either auger refusal, or SPT refusal (see section entitled "Rock Description" on Legend Sheet No. 2 for further explanation). The shale occurs at, or just below, the proposed subgrade of the detour. It is anticipated that the thinly-bedded shale can be excavated by ripping, or may be broken with a hoe ram.

The non-crystalline rock surface beneath the Smith River, shown on Profile Sheet No. 5, was interpreted using data from the bridge structure investigation. Additional information regarding the non-crystalline Triassic rock, included detailed core descriptions, rock core photographs, and compressive strength test results, can be found in the Structure Subsurface Investigation report. Slake tests indicate that the Triassic rock on this project is not degradable.

GROUNDWATER

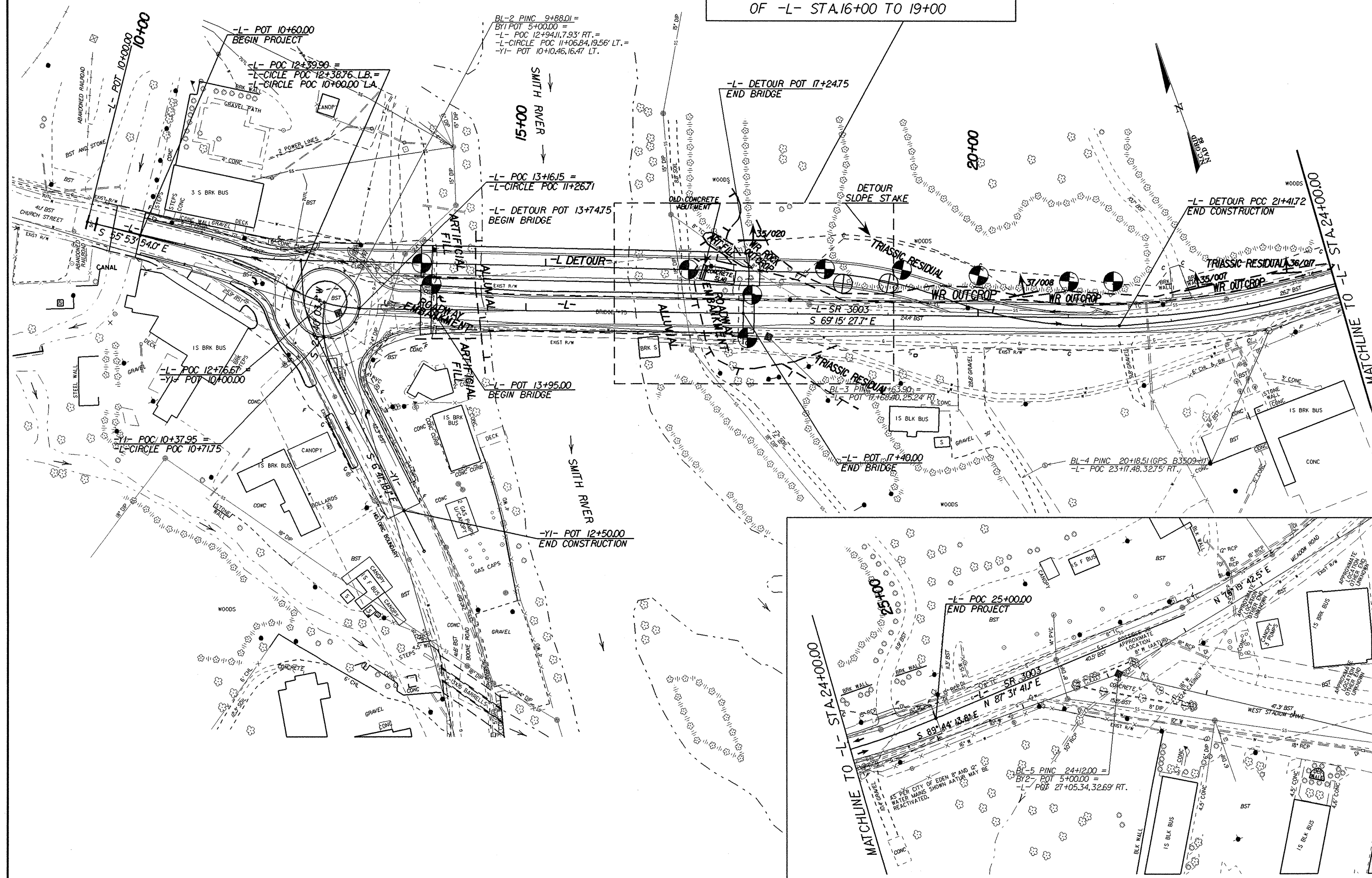
Groundwater elevations ranged from 506 to 511 feet in the alluvial soils directly adjacent to the river (see Profile Sheet No. 5 and Cross-section Sheet No. 6). Groundwater was also encountered at the base of the roadway embankment fill in the boring left of -L- Sta. 17+50 at an elevation of 522 feet.

Prepared by,



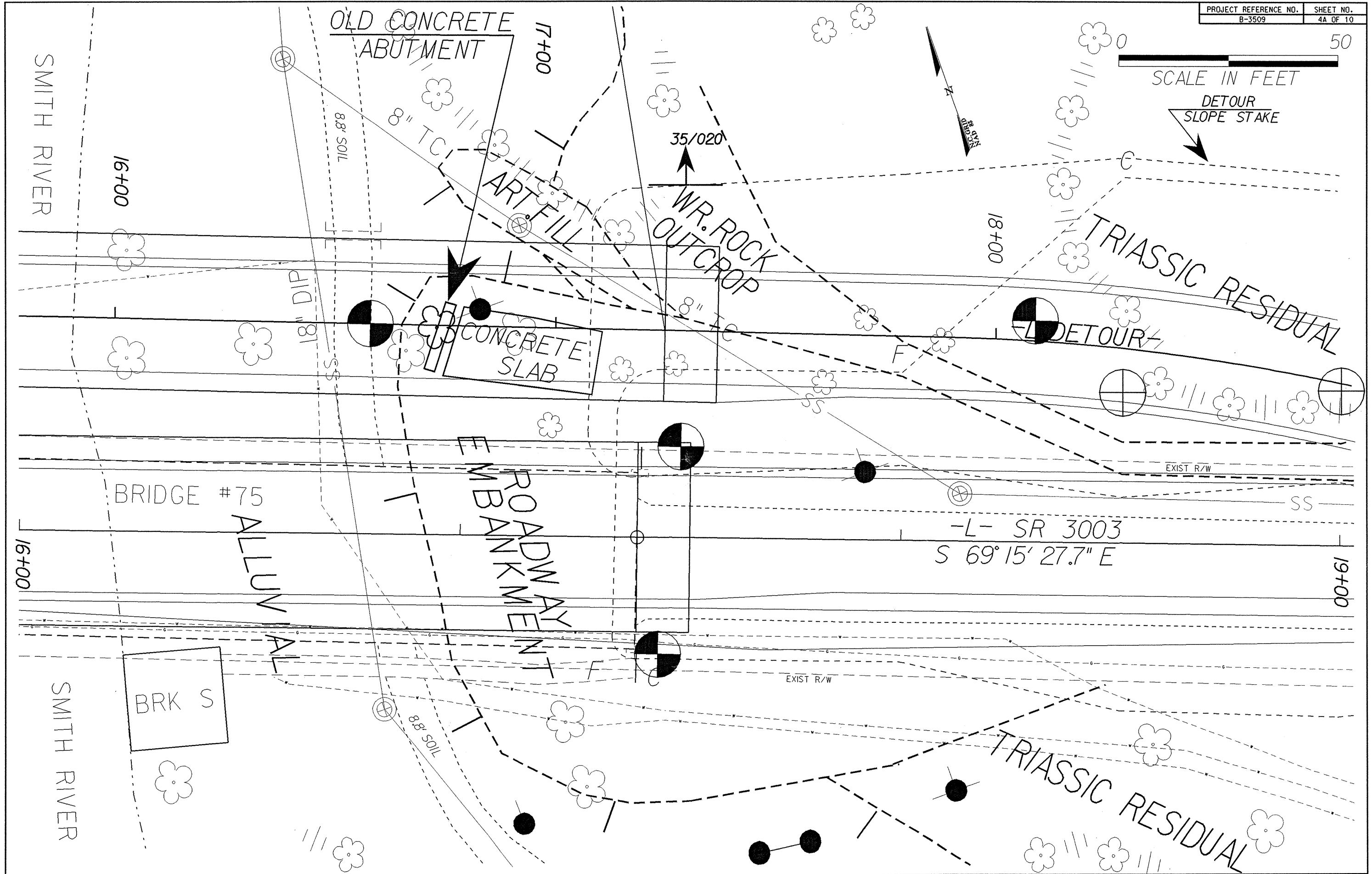
Thomas P. Moorefield, LG
Project Geologist

NOTE: SEE PLANSHEET NO.4A FOR DETAIL OF -L- STA.16+00 TO 19+00



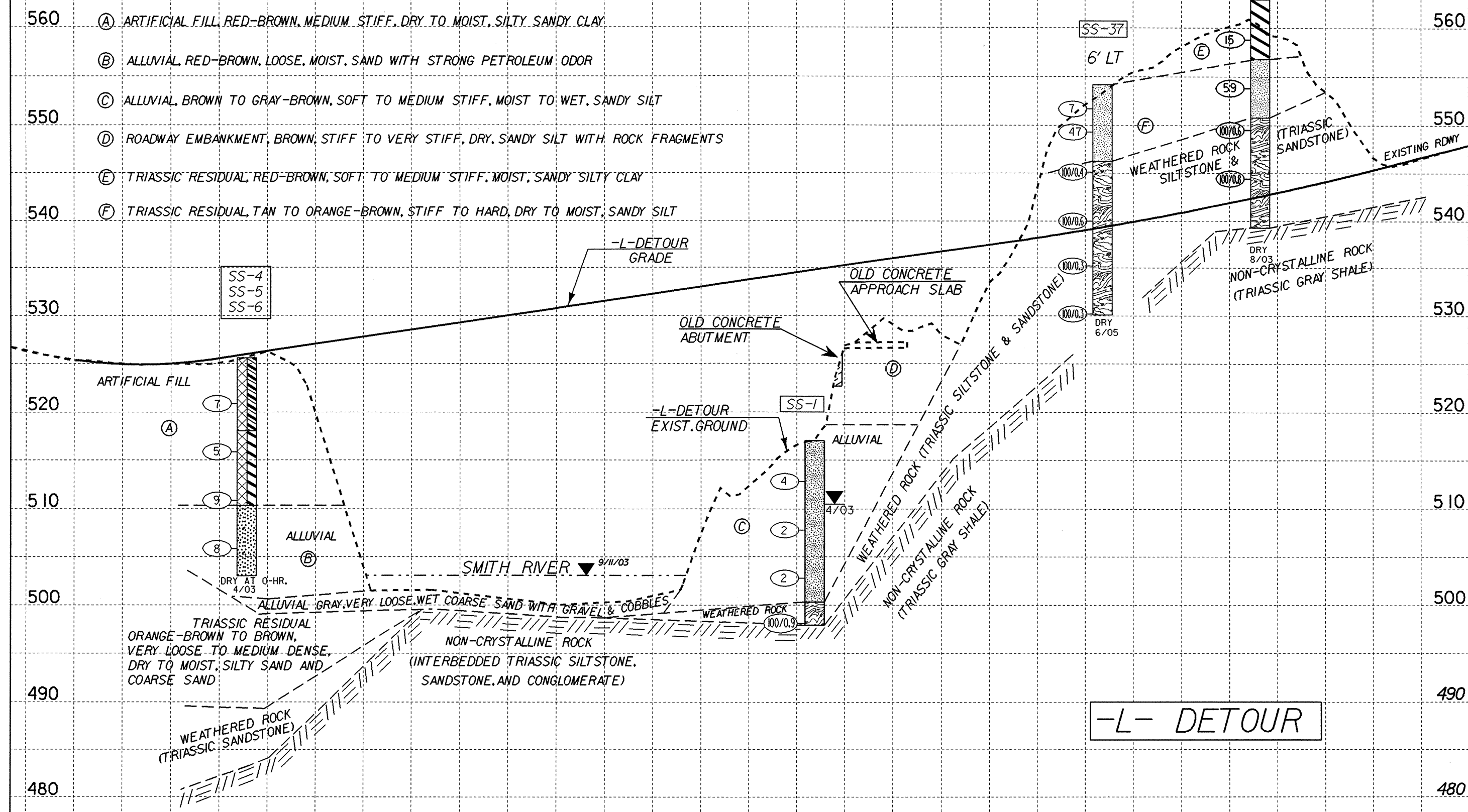
SCALE IN FEET

DETOUR
SLOPE STAKE



SOIL TEST RESULTS

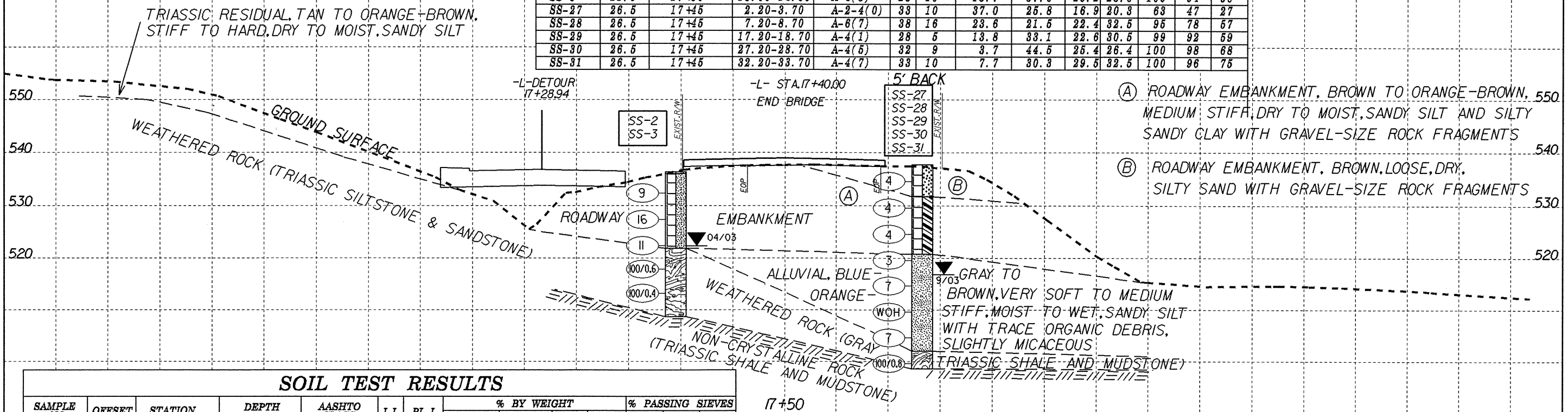
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
SS-4	0	13+63	3.7-5.2	A-6(1)	32	11	25.9	25.5	24.1	24.5	76	61	42
SS-5	0	13+63	8.7-10.2	A-7-6(15)	48	27	16.3	23.1	17.8	42.9	97	88	63
SS-6	0	13+63	18.7-20.2	A-2-4(0)	23	NP	28.0	59.8	8.2	4.1	100	92	18
SS-1	0	16+58	3.2-4.7	A-4(1)	31	9	24.7	36.5	22.4	16.3	85	70	41
SS-37	-6	18+09	2.5-4.0	A-4(1)	32	9	28.8	35.9	21.2	14.1	96	80	40
SS-38	-16	18+91	3.0-4.5	A-7-6(16)	49	18	7.1	25.2	31.6	36.3	100	95	75
SS-39	-16	18+91	8.0-9.5	A-4(1)	35	6	18.8	37.9	25.2	18.1	100	91	61



13+00 14+00 15+00 16+00 17+00 18+00 19+00

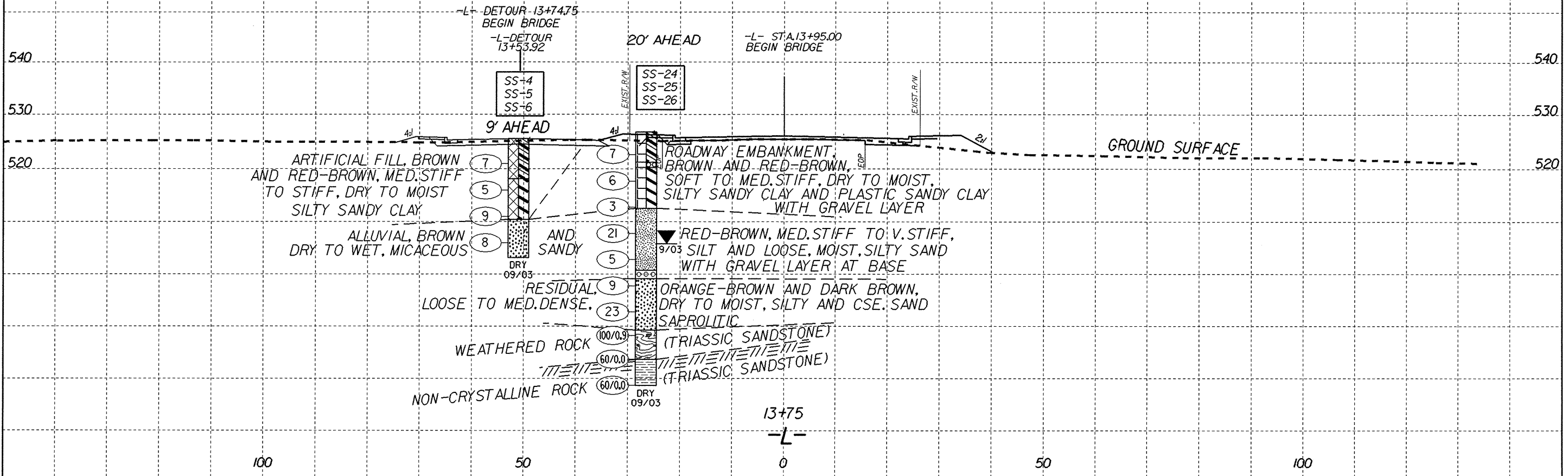
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT				% PASSING SIEVES		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
SS-2	-21.0	17+50	3.00-4.50	A-4(0)	30	9	35.9	24.5	19.2	20.4	82	59	36
SS-3	-21.0	17+50	13.00-14.50	A-4(3)	28	10	13.7	37.6	20.2	28.6	100	94	56
SS-27	26.5	17+45	2.20-3.70	A-2-4(0)	33	10	37.0	25.8	16.9	20.3	63	47	27
SS-28	26.5	17+45	7.20-8.70	A-6(7)	38	16	23.6	21.5	22.4	32.5	95	78	57
SS-29	26.5	17+45	17.20-18.70	A-4(1)	28	5	13.8	33.1	22.6	30.5	99	92	59
SS-30	26.5	17+45	27.20-28.70	A-4(6)	32	9	3.7	44.5	25.4	26.4	100	98	68
SS-31	26.5	17+45	32.20-33.70	A-4(7)	33	10	7.7	30.3	29.5	32.5	100	96	75



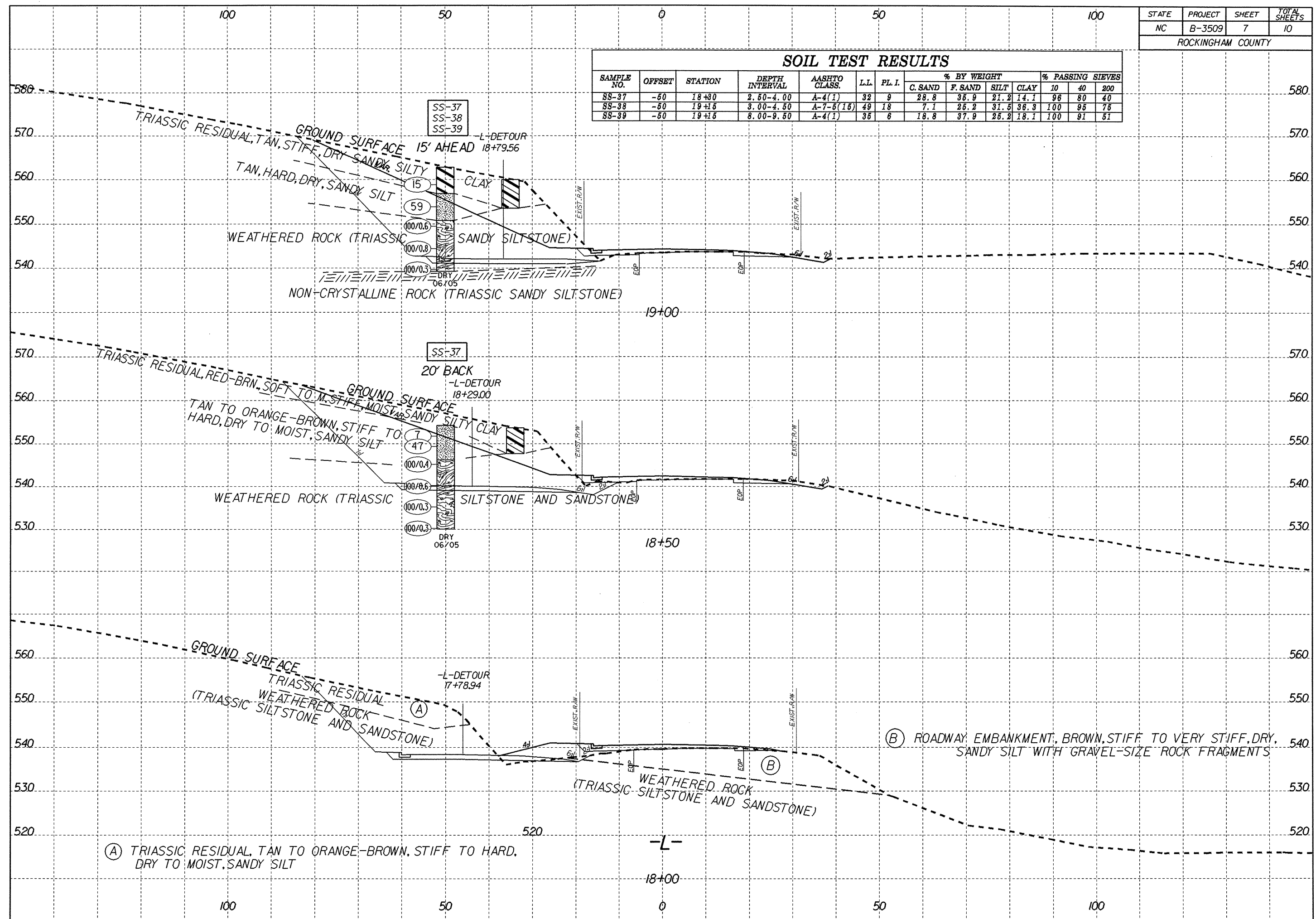
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT				% PASSING SIEVES		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
SS-4	-51.0	13+84	3.70-5.20	A-6(1)	32	11	25.9	25.5	24.1	24.5	76	61	42
SS-5	-51.0	13+84	8.70-10.20	A-7-6(15)	48	27	16.3	23.1	17.8	42.9	97	88	63
SS-6	-51.0	13+84	18.70-20.20	A-2-4(0)	23	NP	28.0	59.8	8.2	4.1	100	92	18
SS-24	27.5	13+95	3.10-4.60	A-6(5)	38	14	21.3	28.5	25.8	24.4	95	80	54
SS-25	27.5	13+95	8.10-9.60	A-7-6(17)	51	33	14.6	22.6	12.0	50.8	90	83	60
SS-26	27.5	13+95	33.10-34.60	A-2-4(0)	38	NP	60.6	24.0	11.4	4.1	93	53	18



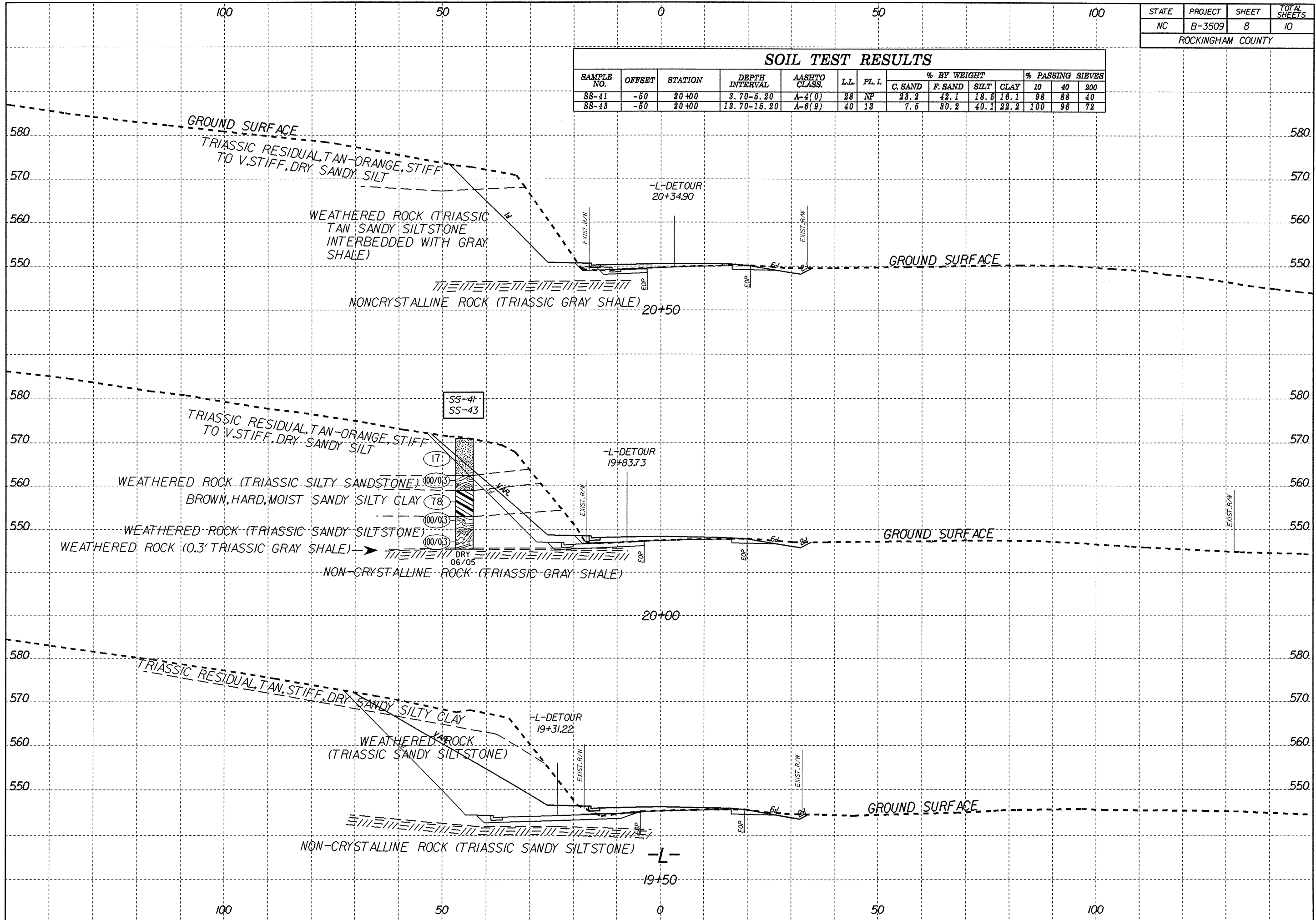
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L. I.	% BY WEIGHT				% PASSING SIEVES		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
SS-37	-50	18+30	2.50-4.00	A-4(1)	32	9	28.8	36.9	21.2	14.1	96	80	40
SS-38	-50	19+15	3.00-4.50	A-7-5(15)	49	18	7.1	26.2	31.6	36.3	100	95	75
SS-39	-50	19+15	8.00-9.50	A-4(1)	35	6	18.8	37.9	25.2	18.1	100	91	51



STATE	PROJECT	SHEET	TOTAL SHEETS
NC	B-3509	8	10
ROCKINGHAM COUNTY			

SOIL TEST RESULTS													
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PL. I.	% BY WEIGHT				% PASSING SIEVES		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
SS-41	-60	20+00	3.70-6.20	A-4(0)	28	NP	23.2	42.1	18.6	16.1	98	88	40
SS-43	-60	20+00	13.70-16.20	A-6(9)	40	18	7.6	30.2	40.1	22.2	100	96	72



100

50

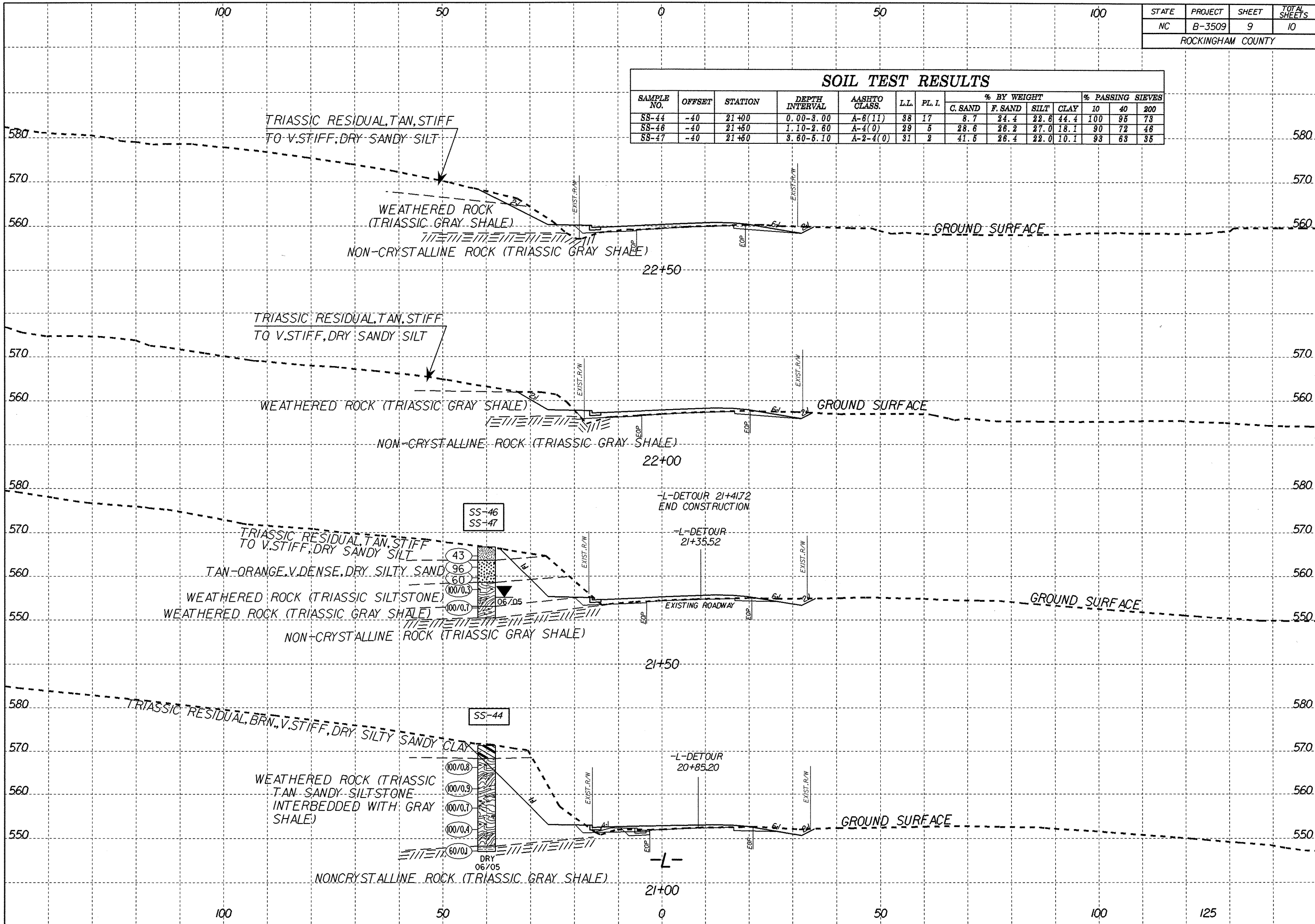
0

50

100

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L. I.	% BY WEIGHT				% PASSING SIEVES		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
SS-44	-40	21+00	0.00-3.00	A-6(11)	38	17	8.7	24.4	22.6	44.4	100	95	73
SS-46	-40	21+50	1.10-2.60	A-4(0)	29	5	28.6	26.2	27.0	18.1	90	72	46
SS-47	-40	21+50	3.60-5.10	A-2-4(0)	31	2	41.5	26.4	22.0	10.1	93	63	35



TRIASSIC RESIDUAL, TAN, STIFF
TO V. STIFF, DRY SANDY SILT

WEATHERED ROCK
(TRIASSIC GRAY SHALE)

NON-CRYSTALLINE ROCK (TRIASSIC GRAY SHALE)

TRIASSIC RESIDUAL, TAN, STIFF
TO V. STIFF, DRY SANDY SILT

WEATHERED ROCK (TRIASSIC GRAY SHALE)

NON-CRYSTALLINE ROCK (TRIASSIC GRAY SHALE)

TRIASSIC RESIDUAL, TAN, STIFF
TO V. STIFF, DRY SANDY SILT

TAN-ORANGE, V. DENSE, DRY SILTY SAND

WEATHERED ROCK (TRIASSIC SILTSTONE)

WEATHERED ROCK (TRIASSIC GRAY SHALE)

NON-CRYSTALLINE ROCK (TRIASSIC GRAY SHALE)

TRIASSIC RESIDUAL, BRN., V. STIFF, DRY SILTY SANDY CLAY

WEATHERED ROCK (TRIASSIC
TAN SANDY SILTSTONE
INTERBEDDED WITH GRAY
SHALE)

NONCRYSTALLINE ROCK (TRIASSIC GRAY SHALE)

-L-DETOUR 21+41.72
END CONSTRUCTION

-L-DETOUR
21+35.52

-L-DETOUR
20+85.20

-L-

STATE	PROJECT	SHEET	TOTAL SHEETS
NC	B-3509	10	10
ROCKINGHAM COUNTY			

