

NOTE: SEE SHEET 2A 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-4488	1	12
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33725.1.2	BRSTP-1763(3)	P.E.	
		RAW & UTIL.	

CONTENTS

LINE	STATION	PLAN	PROFILE
-L-	9+00 TO 20+58	4	5
-Y-	8+00 TO 15+02	4	6
-EY-	9+00 TO 22+19	4	7

CROSS SECTIONS

LINE	STATION	SHEET
-L-	11+50	8
-L-	16+50 TO 18+00	8-9
-Y-	10+00 TO 14+50	10-12

ROADWAY
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33725.1.2 (B-4488) F.A. PROJ. BRSTP-1763(3)

COUNTY CRAVEN

PROJECT DESCRIPTION BRIDGE ON SR 1763 OVER SLOCUM CREEK

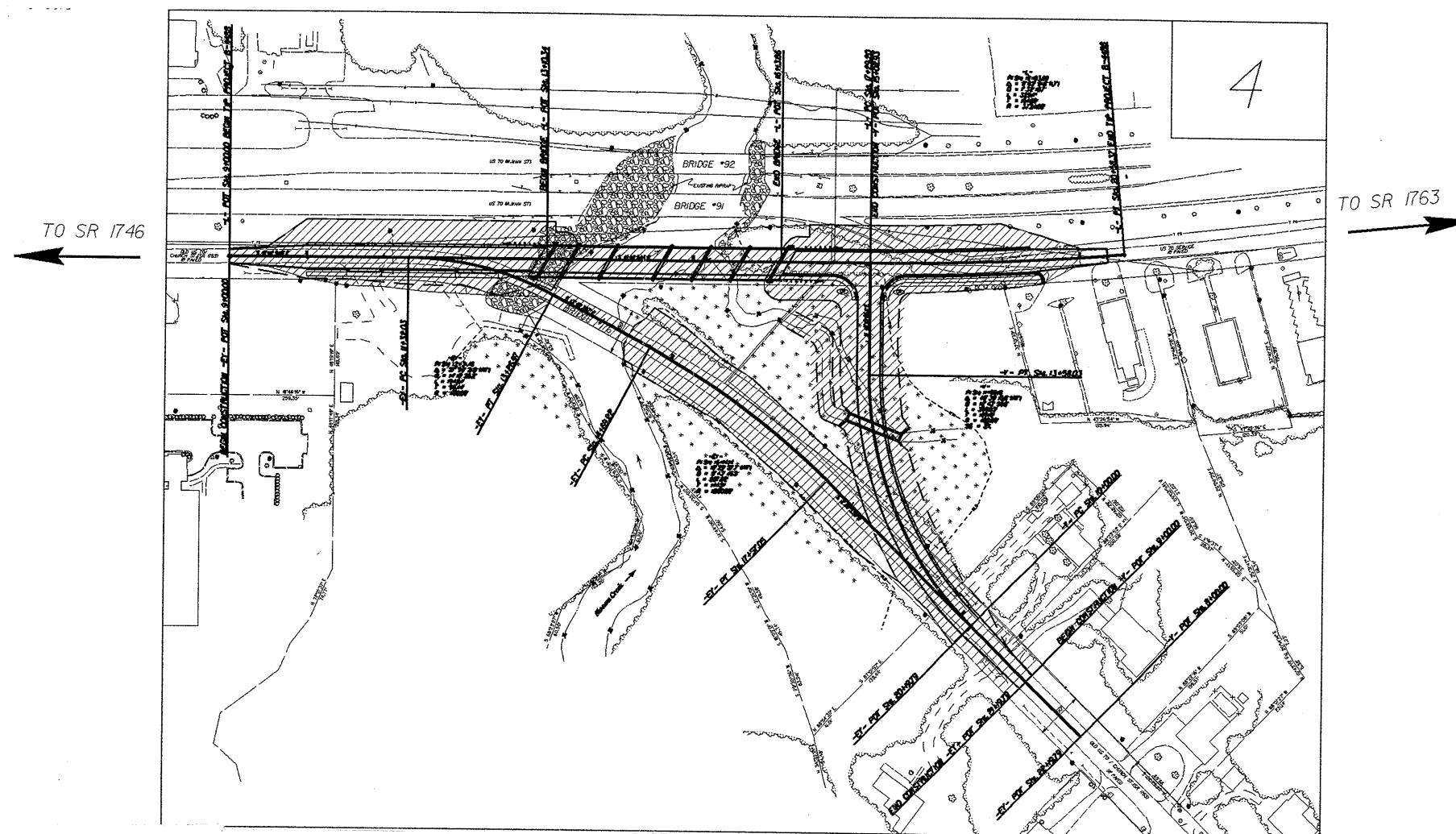
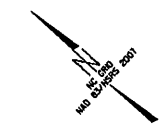
INVENTORY

CAUTION NOTICE

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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.

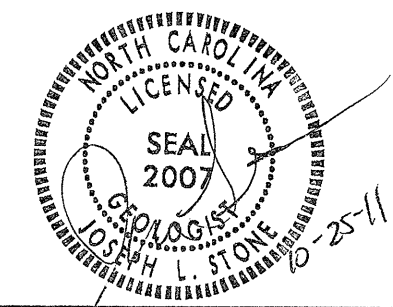


CONTRACT: C202845 ID: B-4488

PERSONNEL

JPD
JRS
RES
JME

INVESTIGATED BY J.L. STONE
CHECKED BY D.N. ARGENBRIGHT
SUBMITTED BY D.N. ARGENBRIGHT
DATE JULY 2011



DRAWN BY: C.R. SUMNER

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 ENGINEERING UNIT

PROJECT REFERENCE NO. B-4488
 SHEET NO. 2

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 (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. EXAMPLES: VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6			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. ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.			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: WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)			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 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 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SCRC) - 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.					
SOIL LEGEND AND AASHTO CLASSIFICATION			MINERALOGICAL COMPOSITION			COMPRESSIBILITY			WEATHERING					
GENERAL CLASS. GROUP CLASS. SYMBOL % PASSING LIQUID LIMIT PLASTIC INDEX GROUP INDEX USUAL TYPES OF MAJOR MATERIALS GEN. RATING AS A SUBGRADE	GRANULAR MATERIALS (≤ 35% PASSING #200) A-1, A-2, A-3, A-4, A-5, A-6, A-7	SILT-CLAY MATERIALS (> 35% PASSING #200) A-1, A-2, A-4, A-5, A-6, A-7	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.			SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE			FRESH VERY SLIGHT (V SL.) SLIGHT (SL.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE					
CONSISTENCY OR DENSENESS			MISCELLANEOUS SYMBOLS			ROCK HARDNESS			BEDDING					
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGES OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGES OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)			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			VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT			TERM SPACING TERM THICKNESS					
TEXTURE OR GRAIN SIZE U.S. STD. SIEVE SIZE OPENING (MM) BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE. SD.) FINE SAND (F. SD.) SILT (SL.) CLAY (CL.)			SPT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD			CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. 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. 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. CAN BE GROVED 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. 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.			VERY THICKLY BEDDED THICKLY BEDDED THINLY BEDDED VERY THINLY BEDDED THICKLY LAMINATED THINLY LAMINATED					
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION			ABBREVIATIONS AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE SAND DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST Ø - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HI. - HIGHLY			SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL RATIO CBR - CALIFORNIA BEARING RATIO			EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: CORE SIZE: HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST PUSH PROBE			FRIABLE MODERATELY INDURATED INDURATED EXTREMELY INDURATED		
PLASTICITY PLASTICITY INDEX (PI) DRY STRENGTH			COLOR 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.			BENCH MARK: ELEVATION: FT. NOTES: APPROXIMATE LIMITS OF ORGANIC DEPOSITS U.C.P. = UNDIVIDED COASTAL PLAIN								

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

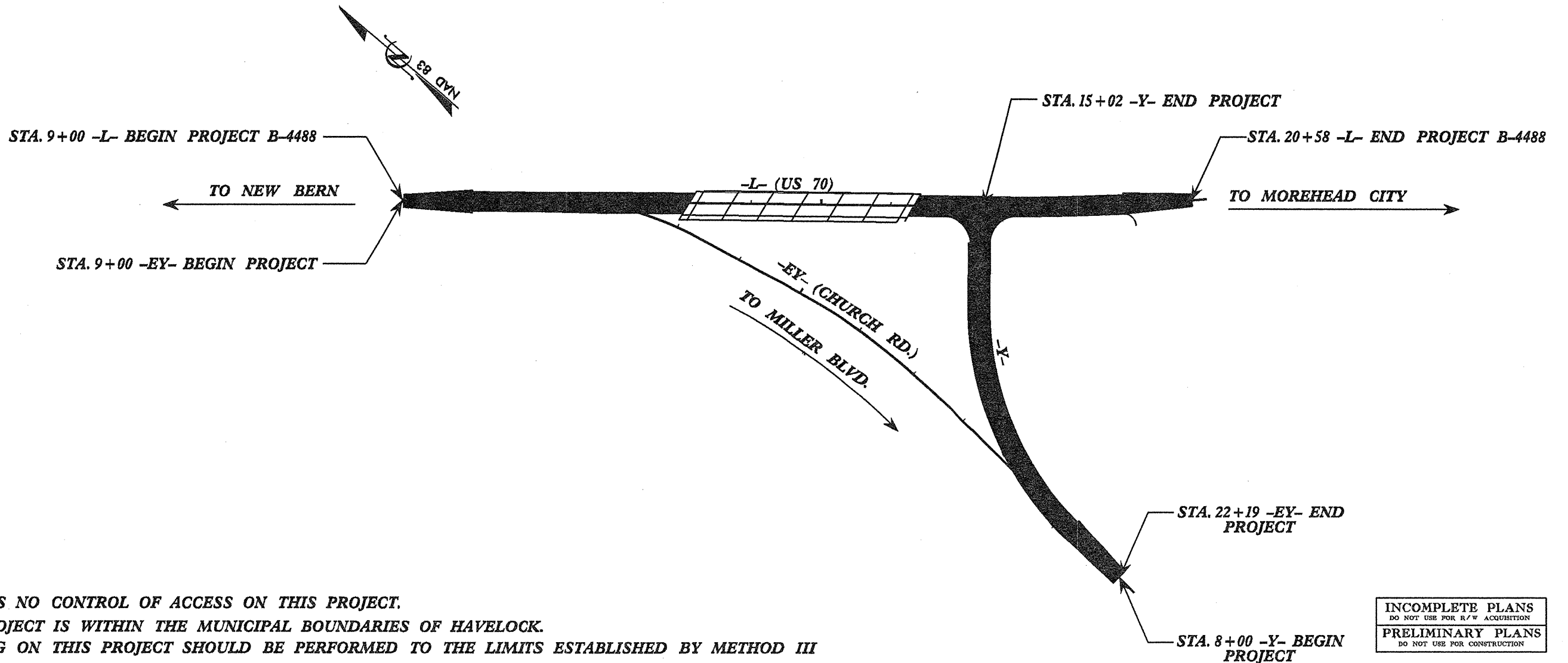
CRAVEN COUNTY

LOCATION: BRIDGE 176 OVER SLOCUM CREEK ON SR 1763

TYPE OF WORK: GRADING, PAVING, DRAINAGE, GUARDRAIL,
AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4488	2A	12
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33725.1.2	BRSTP-1763(3)	P.E.	

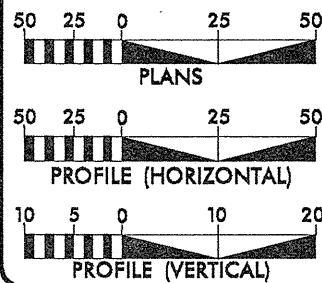
TIP PROJECT: B-4488



THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF HAVELOCK.
CLEARING ON THIS PROJECT SHOULD BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

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

GRAPHIC SCALES



DESIGN DATA

ADT 2003 = 2500
ADT 2030 = 4700
DHV = 10 %
D = 60 %
T = 5 % *
V = 40 MPH
* TTST = 2 DUAL = 3

Prepared in the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

LETTING DATE:

PROJECT ENGINEER

PROJECT DESIGN ENGINEER

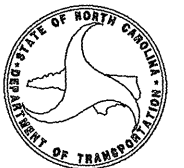
HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA



STATE HIGHWAY DESIGN ENGINEER P.E.



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

October 17, 2011

STATE PROJECT: 33725.1.2 (B-4488)
F.A. PROJECT: BRSTP-1763(3)
COUNTY: Craven
DESCRIPTION: Bridge No. 176 on SR 1763 over Slocum Creek
SUBJECT: Geotechnical Inventory

Project Description

This project is located in Craven County, between the existing US 70 and SR 1703 (Church Street) crossings over Slocum Creek. Proposed construction consists of realigning SR 1703 to accommodate the relocated bridge structure. This geotechnical investigation was confined to the areas of proposed construction.

Fieldwork for this project was conducted during April of 2011. Standard Penetration Test borings were advanced with a CME 45-B and CME-55 drill machine with an automatic hammer. 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.

The following alignments totaling 0.33± miles were investigated. Subsurface profiles and selected cross sections of these alignments are included in this report.

<u>Line</u>	<u>Station(±)</u>
-L-	9+00 to 20+58
-Y-	8+00 to 15+02
-EY-	9+00 to 22+19

Areas of Special Geotechnical Interest

- 1) The following sections contain cohesive soils which have the potential to cause embankment stability and/or long term settlement problems:

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

TELEPHONE: 919-707-6850
FAX: 919-250-4237
Website: www.ncdot.org/doh

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

<u>Line</u>	<u>Station(±)</u>
-L-	11+25 to 11+75
-L-	17+40 to 17+75
-Y-	13+80 to 15+02

- 2) The following sections contain organic soils, which have the potential for embankment stability and/or subgrade problems during construction.

<u>Line</u>	<u>Station(±)</u>
-L-	12+20 to 13+50
-L-	15+90 to 17+50
-Y-	11+05 to 15+02

- 3) The following sections were found to exhibit seasonal high ground water.

<u>Line</u>	<u>Station(±)</u>
-L-	15+90 to 18+50
-Y-	11+00 to 15+02

Physiography and Geology

This project corridor is located within the Coastal Plain Physiographic Province. Topography along the project is nearly flat to gently sloping. Natural ground elevations ranged from -6± feet below sea level along the bed of Slocum Creek to 19± feet above sea level along the existing SR 1763 embankment.

Surficial soils in this area are generally classified as undivided coastal plain sediments and alluvial sediments; all are underlain by the Duplin Formation. Deeper borings indicate that the Pungo River and Castle Hayne Formations underlie the project site.

Ground Water

Ground water data was collected in April 2011, during a time of normal precipitation. Ground water elevations ranged from sea level to 2± feet above sea level. Additionally artesian conditions were encountered within the deeper foundation test borings. The head elevations of these artesian waters were found to be 6± feet above sea level.

Soils

Soils within this project area have been divided into five categories, undivided coastal plain soils, alluvial soils, formational soils, artificial fill soils, and roadway embankment soils.

Soils classified as undivided coastal plain are comprised of 6 or more feet of soft to stiff sandy clay (A-6), and 4 or more feet of loose sand (A-2-4). These undivided coastal plain sediments were encountered along the upland sections adjacent to the Slocum Creek floodplain.

Alluvial soils were encountered within the floodplain of Slocum Creek. They are comprised of 4± feet of loose to medium dense sand (A-2-4, A-3) and 4± to 11± feet of very soft to soft muck and loose black sand with little organic matter (A-2-4, A-2-5, A-5).

Laboratory analysis of these soils show organic percentages ranging from 16% to 59% and moisture contents ranging from 29% to 542%. Vane shear tests completed within these organic soils show shear strengths ranging from 13 psf to 251 psf.

Formational soils in this area belong to the Duplin, Pungo River and Castle Hayne Formations, and underlie the alluvial and undivided coastal plain soils.

In this area, the Duplin Formation consists of 17± to 22± feet of loose to dense sand (A-3, A-1-b).

Soils identified as the Pungo River Formation are composed of 1± to 2± feet of hard limestone, 11± feet of very stiff sandy silt (A-4), 3± feet of very stiff sandy clay (A-6), and 3± to 14± feet of medium dense sand (A-2-4).

The Castle Hayne Formation in this project area is comprised of 9± to 35± feet of loose to dense sand (A-2-4) with 2± to 25± feet of soft to hard limestone.

Roadway Embankment soils were encountered along the existing SR 1763 and US 70 alignments. These soils are comprised of 1± to 10 or more feet of loose to medium dense sand and clayey sand (A-2-4, A-3, and A-2-6).

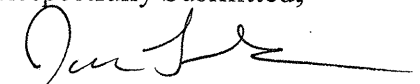
Soils described as artificial fill were encountered adjacent to the existing US 70 embankment along the southern portion of the project. These soils are composed of 2± to 3± feet of loose sand (A-2-4).

Undisturbed Samples

A undisturbed thin wall Shelby tube sample was collected at the following location and submitted for testing.

<u>Sample</u>	<u>Station</u>	<u>Depth</u>	<u>Test</u>
ST-1	-Y- 12+00 35'RT	1.0-3.0	Consolidation

Respectfully Submitted,



Joseph L. Stone, L.G.
Project Engineering Geologist

Earthwork Balance Sheet

313 •

Volumes in Cubic Yards

PROJECT: B-4488

COUNTY: Craven

DATE: 13-May-12

COMPILED BY: LJ

SHEET OF SHEETS

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE					
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. +30%		ROCK	SUITABLE	UNSUIT.	TOTAL		
9+00 L	13+00 L	254				254	868		868	1,128	874						
16+33 L	19+50 L	400		2,181		400	4,322		4,322	5,619	5,219				2,181		2,181
9+00 Y	14+50 Y	729		4,717		729	9,473		9,473	12,315	11,586				4,717		4,717
14+50 EY	19+00 EY	5,991				5,991								5,991			5,991
SUBTOTAL		7,374		6,898		7,374	14,663		14,663	19,062	17,679			5,991	6,898		12,889
SUBTOTAL																	
SUBTOTAL																	
SUBTOTAL																	
SUBTOTAL																	
TOTAL		7,374		6,898		7,374	14,663		14,663	19,062	17,679			5,991	6,898		12,889
MATERIAL FOR SHOULDER CONSTRUCTION							1,000		1,000	1,300	1,300						
LOSS DUE TO CLEARING & GRUBBING																	
ADDITIONAL UNDERCUT				3,000			3,000		3,000	3,900	3,900				3,000		3,000
SELECT GRANULAR MATERIAL IN LIEU OF BORROW									-12,177	-15,830	-15,830						
ADJUST FOR ROCK WASTE																	
WASTE IN LIEU OF BORROW											-5,991			-5,991			-5,991
PROJECT TOTAL		7,374		9,898		7,374	18,663		6,486	8,432	1,058				9,898		9,898
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT											53						
GRAND TOTAL				9,898		7,374	18,663		6,486	8,432	1,111				9,898		9,898

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.

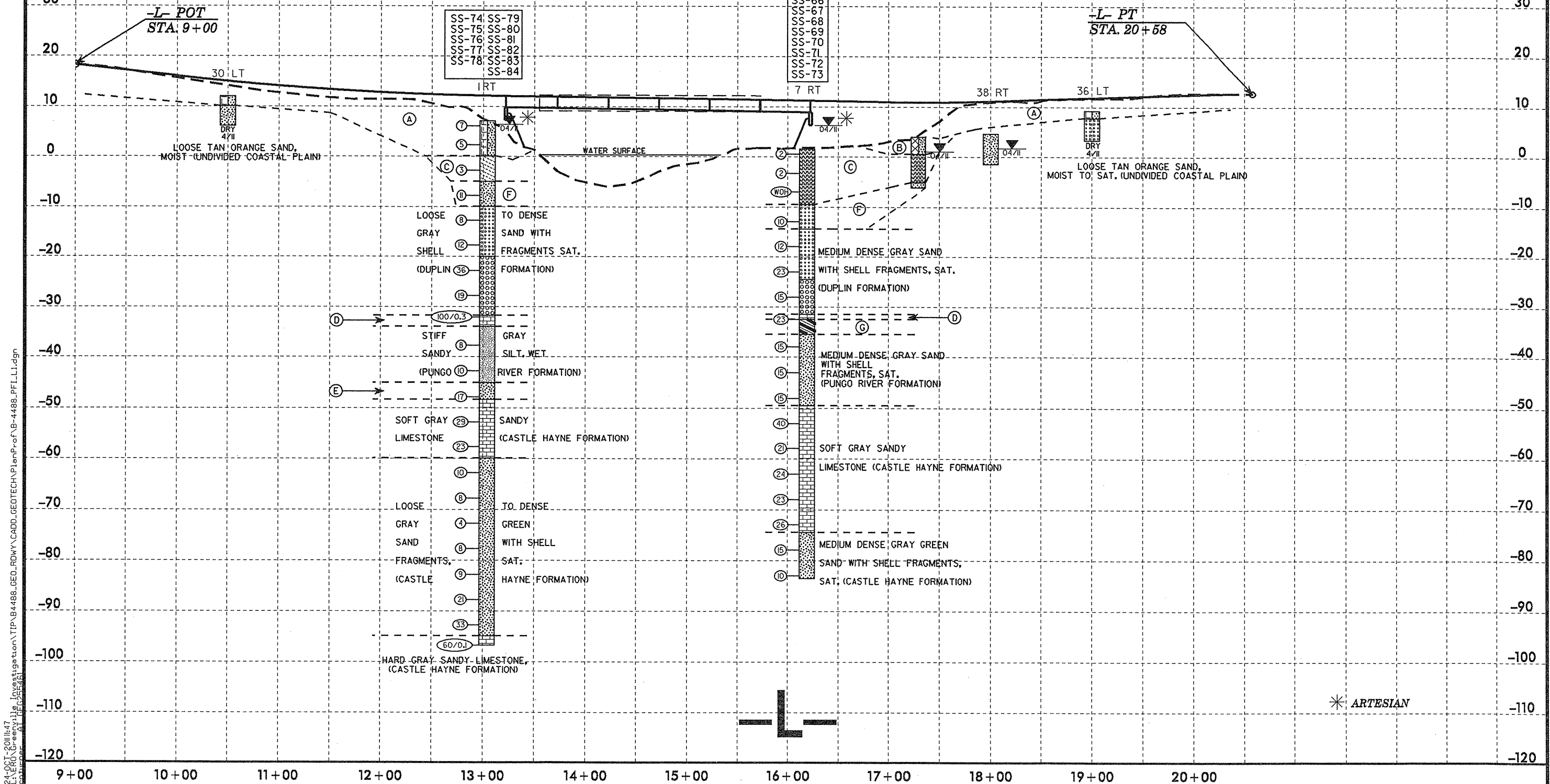
5/14/99

EB1-B SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.T.	% BY WEIGHT				% PASSING (SIEVES)			MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-74	1 RT	13+04	0.0-1.5	A-2-4(0)	19	NP	29.5	48.2	11.3	11.0	72	60	18	-	-
SS-75	1 RT	13+04	3.8-5.3	A-2-4(0)	18	NP	9.9	72.0	8.0	10.0	100	97	20	-	-
SS-76	1 RT	13+04	13.8-15.3	A-2-4(0)	19	NP	45.2	43.0	5.8	6.0	100	79	13	-	-
SS-77	1 RT	13+04	18.8-20.3	A-3(0)	16	NP	65.3	26.6	4.1	4.0	96	73	9	-	-
SS-78	1 RT	13+04	23.8-25.3	A-1-b(0)	13	NP	82.5	12.7	1.8	3.0	94	37	6	-	-
SS-79	1 RT	13+04	43.8-45.3	A-4(0)	24	NP	5.6	59.9	24.4	10.0	97	93	37	-	-
SS-80	1 RT	13+04	53.8-55.3	A-2-4(0)	18	NP	46.1	29.5	16.4	8.0	83	59	22	-	-
SS-81	1 RT	13+04	63.8-65.3	A-1-b(0)	16	NP	51.6	29.1	14.3	5.0	73	46	16	-	-
SS-82	1 RT	13+04	68.8-70.3	A-2-4(0)	24	NP	11.2	74.7	8.0	6.0	100	94	17	-	-
SS-83	1 RT	13+04	78.8-80.3	A-2-4(0)	26	NP	2.8	85.0	6.2	6.0	100	99	15	-	-
SS-84	1 RT	13+04	93.8-95.3	A-2-4(0)	23	NP	2.7	82.7	8.6	6.0	100	99	18	-	-
SS-62	7 RT	16+19	0.0-1.5	-	-	-	-	-	-	-	-	-	-	28.4	
SS-63	7 RT	16+19	7.5-9.0	-	-	-	-	-	-	-	-	-	-	16.2	
SS-64	7 RT	16+19	13.5-15.0	A-3(0)	18	NP	31.1	65.2	3.7	0.0	100	87	4	-	1.2
SS-65	7 RT	16+19	18.5-20.0	A-3(0)	20	NP	59.6	35.0	3.3	2.0	100	84	6	-	-
SS-66	7 RT	16+19	28.5-30.0	A-1-b(0)	26	NP	74.8	20.0	2.2	3.0	81	28	5	-	-
SS-67	7 RT	16+19	33.2-34.0	A-1-b(0)	22	NP	47.2	27.5	21.3	4.0	57	39	16	-	-
SS-68	7 RT	16+19	34.0-34.7	A-6(4)	33	13	25.7	31.3	24.9	18.1	95	88	42	-	-
SS-69	7 RT	16+19	43.5-45.0	A-2-4(0)	27	NP	2.4	80.7	10.8	6.0	100	100	20	-	-
SS-70	7 RT	16+19	53.5-55.0	A-1-b(0)	17	NP	80.5	8.1	7.4	4.0	82	32	11	-	-
SS-71	7 RT	16+19	63.5-65.0	A-1-b(0)	17	NP	87.5	5.9	3.6	3.0	84	27	6	-	-
SS-72	7 RT	16+19	73.5-75.0	A-1-b(0)	18	NP	84.4	7.0	5.6	3.0	92	47	9	-	-
SS-73	7 RT	16+19	78.5-80.0	A-2-4(0)	23	NP	20.0	64.8	11.1	4.0	100	96	19	-	-

- (A) LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)
- (B) LOOSE TAN SAND, MOIST TO SAT. (ARTIFICIAL FILL)
- (C) VERY SOFT TO SOFT BROWN MUCK AND LOOSE BLACK SAND WITH LITTLE ORGANIC MATTER, SAT. (ALLUVIAL)
- (D) HARD GRAY LIMESTONE (PUNGO RIVER FORMATION)
- (E) MEDIUM DENSE GRAY SAND WITH SHELL FRAGMENTS, SAT. (PUNGO RIVER FORMATION)
- (F) MEDIUM DENSE TAN GRAY SAND, SAT. (ALLUVIAL)
- (G) VERY STIFF GRAY GREEN SANDY CLAY WITH SHELL FRAGMENTS, WET (PUNGO RIVER FORMATION)

PROJECT REFERENCE NO. B-4488	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



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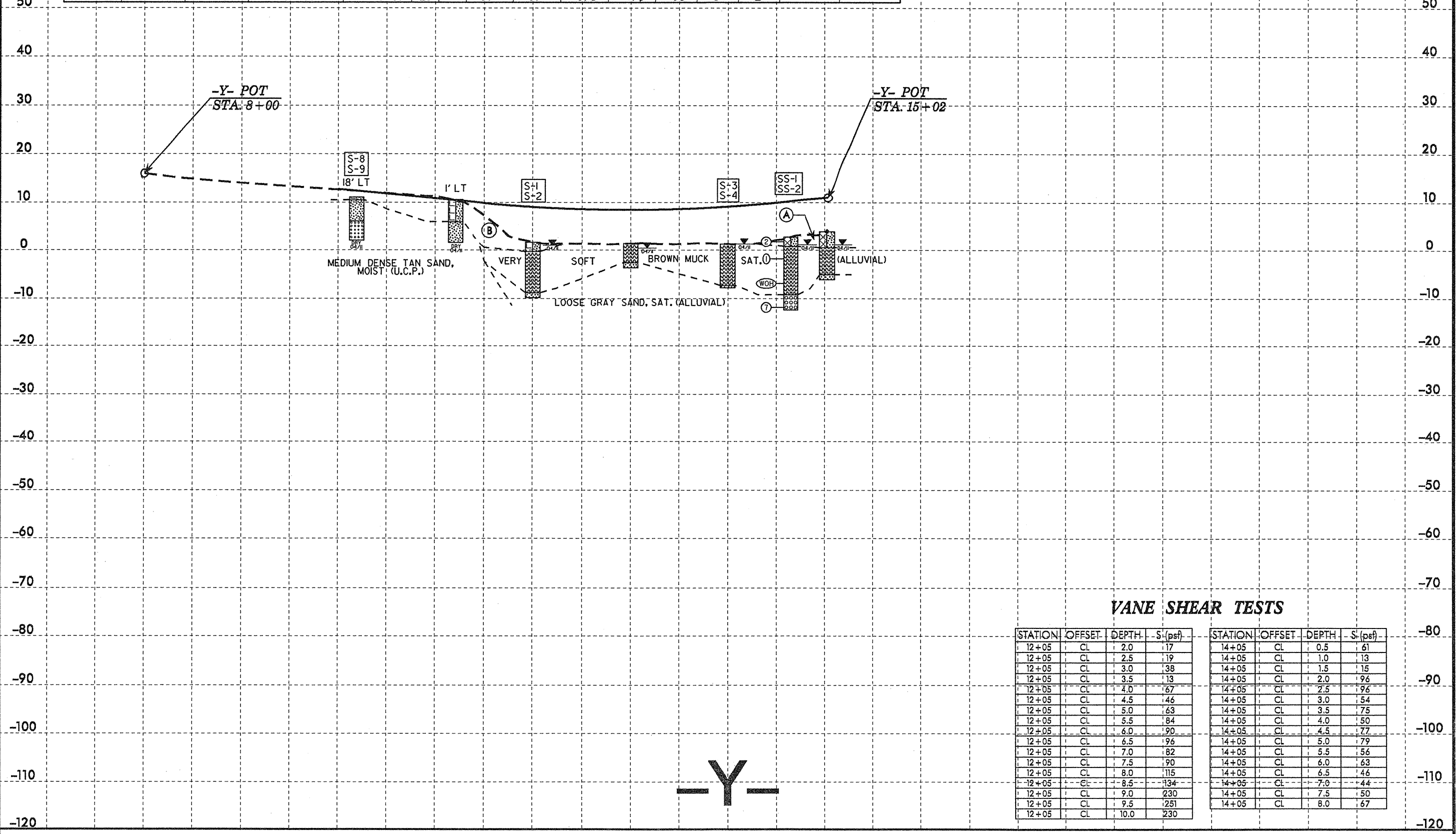
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SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-8	18' LT	10+19	1.0-5.0	A-2-4(0)	18	NP	8.3	72.9	2.7	16.1	100	98	21	-	-
S-9	18' LT	10+19	5.0-9.0	A-3(0)	17	NP	24.2	68.5	1.3	6.0	100	94	8	-	-
S-1	CL	12+00	0.0-2.0	A-2-4(0)	31	6	14.4	54.4	18.1	13.1	100	95	33	29.6	-
S-2	CL	12+00	2.0-10.5	A-5(5)	115	NP	33.0	17.3	31.5	18.1	95	72	49	532.1	52.2
S-3	CL	14+00	0.0-0.5	A-5(4.1)	300	NP	21.8	10.5	47.6	20.1	95	81	66	542.9	59.0
S-4	CL	14+00	0.5-1.0	A-2-4(0)	22	NP	12.3	76.7	4.9	6.0	100	98	12	-	-
SS-1	CL	14+65	0.5-1.5	A-2-4(0)	21	NP	12.5	66.3	9.2	12.1	99	96	23	-	-
SS-2	CL	14+65	13.0-15.1	A-1-b(0)	20	NP	79.7	18.7	0.6	1.0	83	34	2	-	-

- (A) LOOSE TAN SAND, MOIST (ARTIFICIAL FILL)
- (B) MEDIUM DENSE TAN GRAY SAND, MOIST (ROADWAY EMBANKMENT)

PROJECT REFERENCE NO. B-4488	SHEET NO. 6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



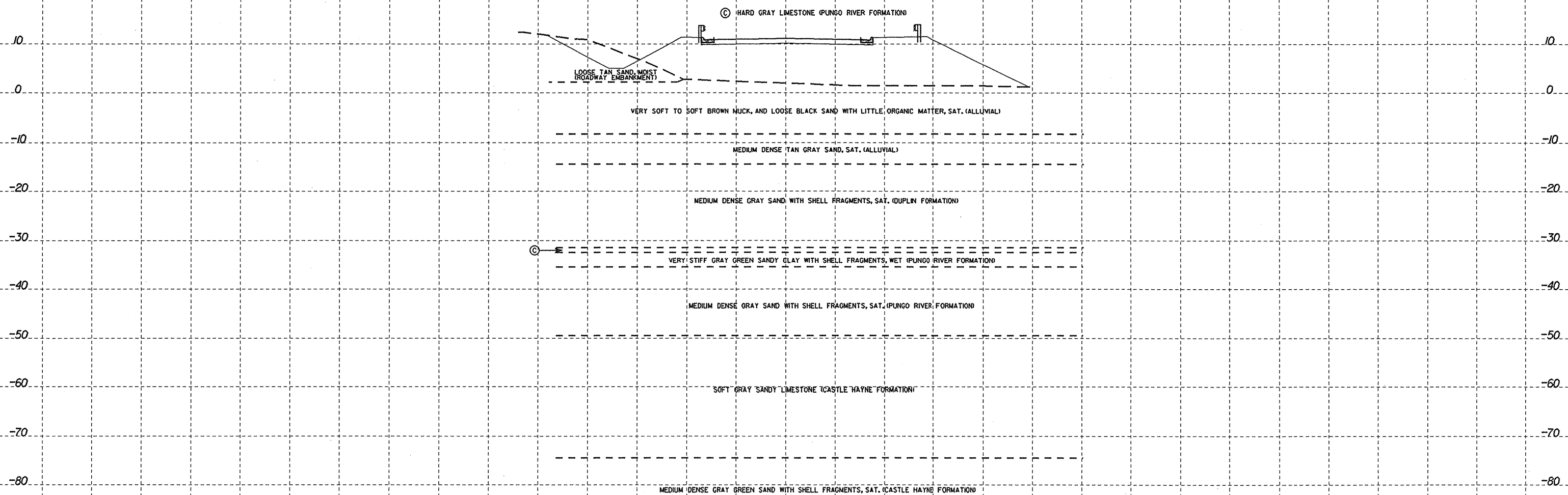
VANE SHEAR TESTS

STATION	OFFSET	DEPTH	S _v (psf)	STATION	OFFSET	DEPTH	S _v (psf)
12+05	CL	2.0	17	14+05	CL	0.5	61
12+05	CL	2.5	19	14+05	CL	1.0	13
12+05	CL	3.0	38	14+05	CL	1.5	15
12+05	CL	3.5	13	14+05	CL	2.0	96
12+05	CL	4.0	67	14+05	CL	2.5	96
12+05	CL	4.5	46	14+05	CL	3.0	54
12+05	CL	5.0	63	14+05	CL	3.5	75
12+05	CL	5.5	84	14+05	CL	4.0	50
12+05	CL	6.0	90	14+05	CL	4.5	77
12+05	CL	6.5	96	14+05	CL	5.0	79
12+05	CL	7.0	82	14+05	CL	5.5	56
12+05	CL	7.5	90	14+05	CL	6.0	63
12+05	CL	8.0	115	14+05	CL	6.5	46
12+05	CL	8.5	134	14+05	CL	7.0	44
12+05	CL	9.0	230	14+05	CL	7.5	50
12+05	CL	9.5	251	14+05	CL	8.0	67
12+05	CL	10.0	230				

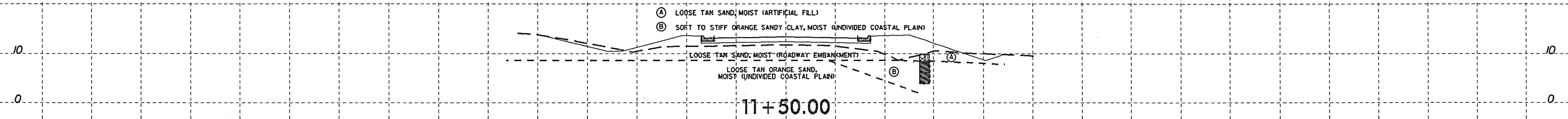
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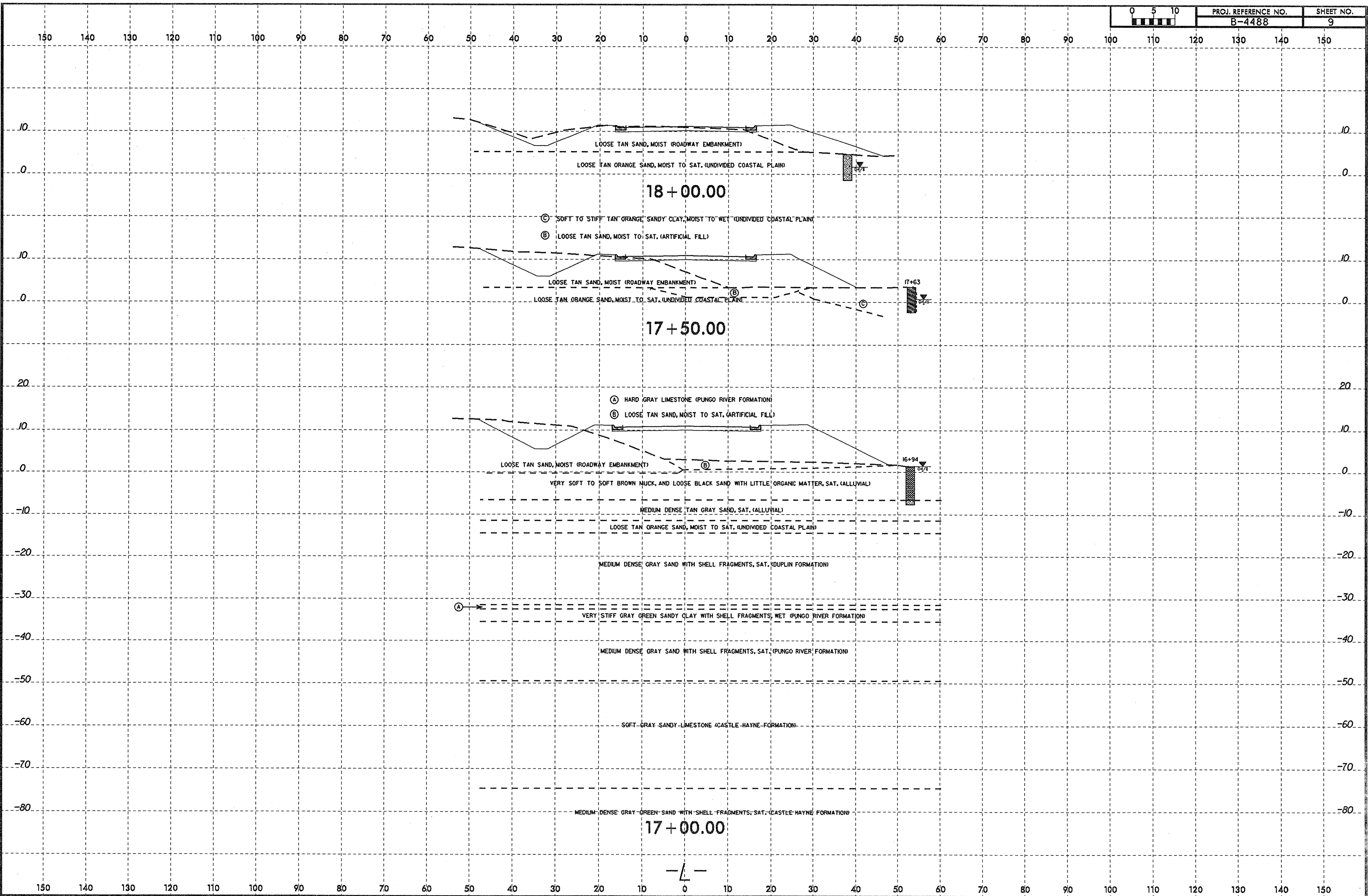
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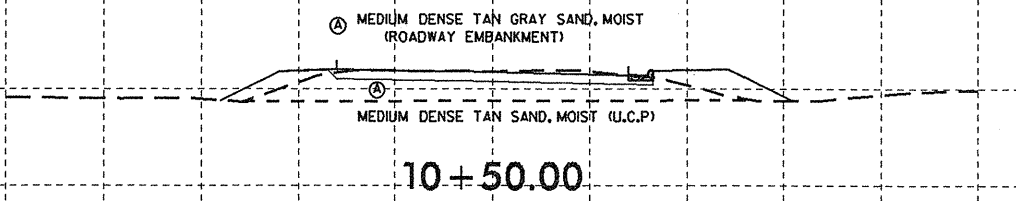
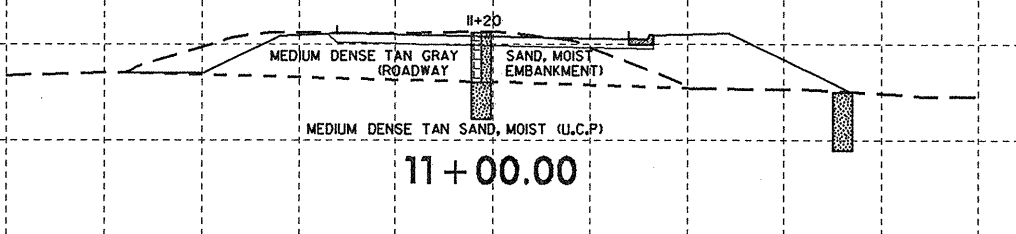
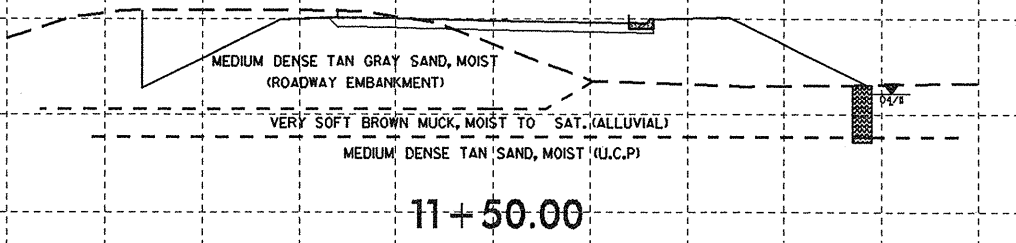
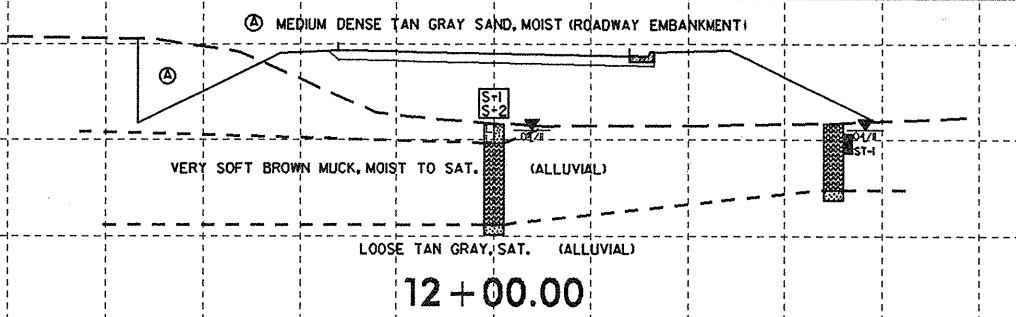


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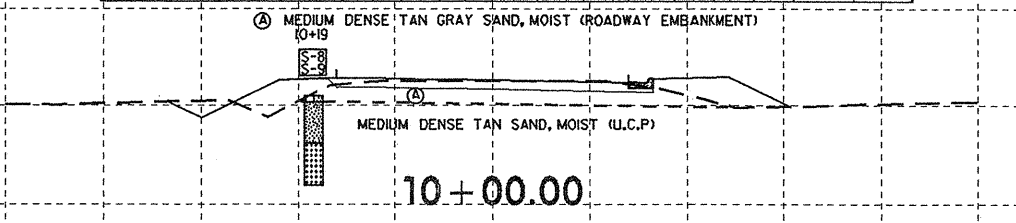
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	100		
S-1	CL	12+00	0.0-2.0	A-2-M(0)	31.6	14.4	54.4	18.1	13.1	100	95	33	29.6	-	
S-2	CL	12+00	2.0-10.5	A-5(S)	115	NP	33.0	17.3	31.5	18.1	95	72	49	532.1	52.9

VANE SHEAR TESTS

STATION	OFFSET	DEPTH	S (psi)
12+05	CL	2.0	17
12+05	CL	2.5	19
12+05	CL	3.0	38
12+05	CL	3.5	13
12+05	CL	4.0	67
12+05	CL	4.5	46
12+05	CL	5.0	63
12+05	CL	5.5	84
12+05	CL	6.0	90
12+05	CL	6.5	96
12+05	CL	7.0	82
12+05	CL	7.5	90
12+05	CL	8.0	115
12+05	CL	8.5	134
12+05	CL	9.0	230
12+05	CL	9.5	281
12+05	CL	10.0	230



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	100		
S-8	18 BT	10+19	1.0-5.0	A-2-M(0)	18	NP	8.3	72.9	2.7	16.1	100	98	21	-	
S-9	18 BT	10+19	5.0-9.0	A-3(O)	17	NP	24.8	68.5	1.3	6.0	100	94	8	-	



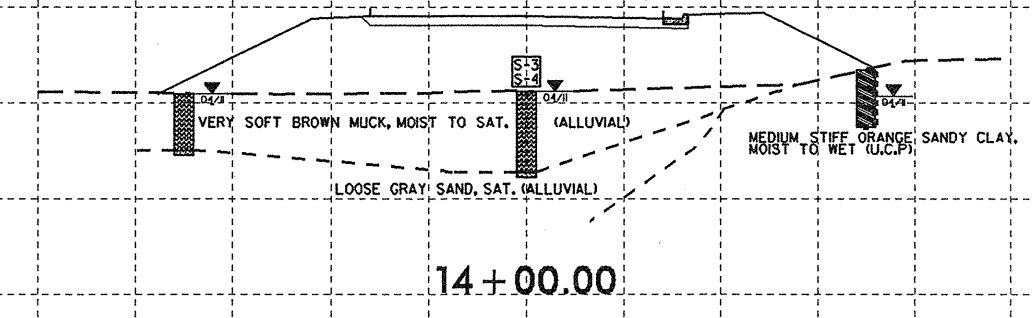
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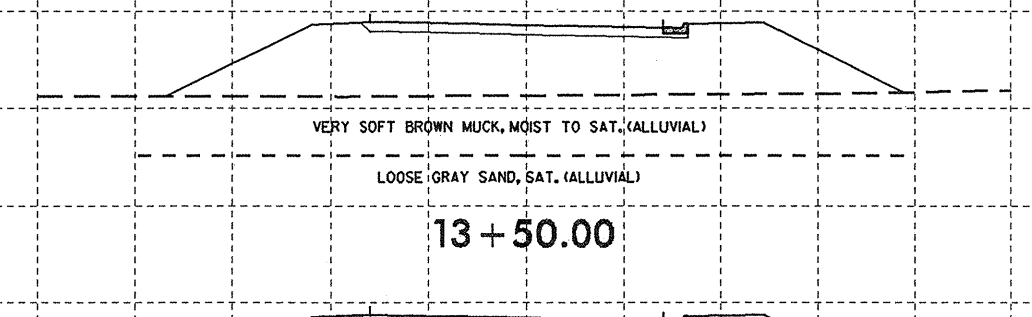
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-3	CL	14+00	0.0-0.5	A-5(4)	300	NP	21.8	10.5	47.6	20.1	95	87	66	542.9	59.0
S-4	CL	14+00	0.5-1.0	A-2-4(0)	22	NP	12.3	76.7	4.9	6.0	100	98	12	-	-

VANE SHEAR TESTS

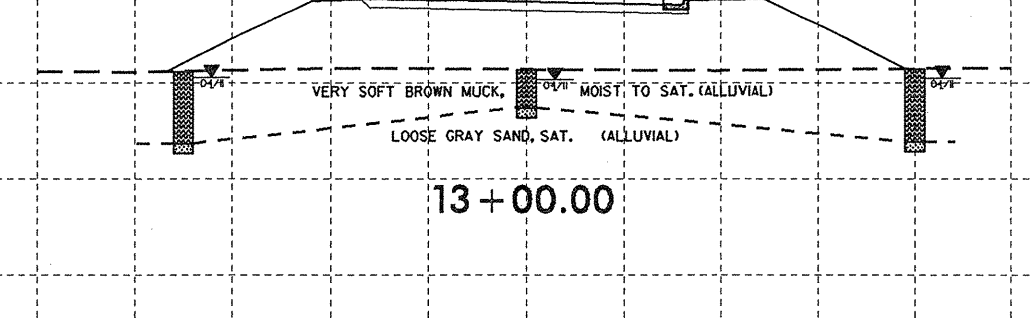
STATION	OFFSET	DEPTH	S (psf)
14+05	CL	0.5	61
14+05	CL	1.0	19
14+05	CL	1.5	15
14+05	CL	2.0	96
14+05	CL	2.5	96
14+05	CL	3.0	54
14+05	CL	3.5	75
14+05	CL	4.0	50
14+05	CL	4.5	77
14+05	CL	5.0	79
14+05	CL	5.5	56
14+05	CL	6.0	63
14+05	CL	6.5	46
14+05	CL	7.0	44
14+05	CL	7.5	50
14+05	CL	8.0	67



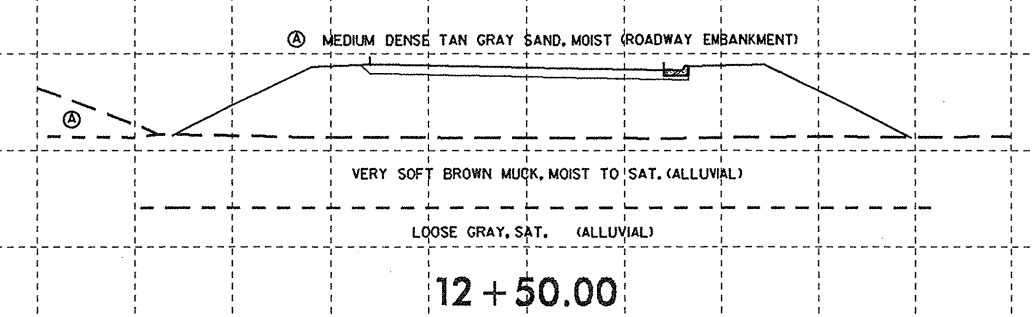
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13 + 50.00



13 + 00.00



12 + 50.00

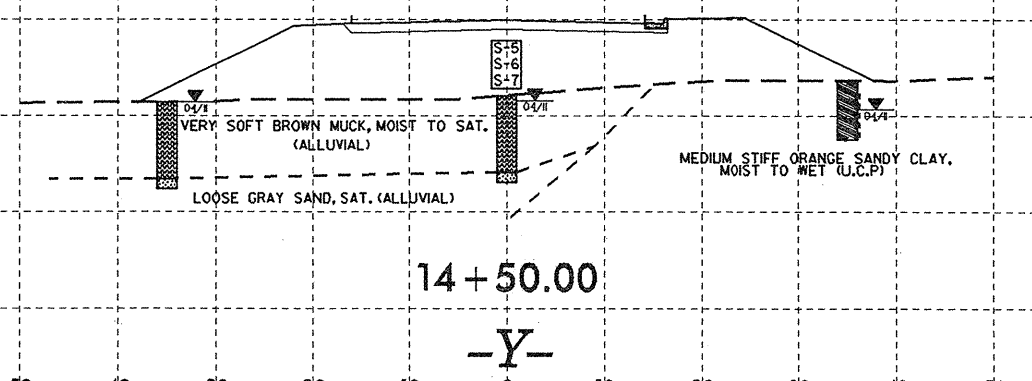
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150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AAASHO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-5	CL	14+50	0.0-0.5	A-2-5(0)	59	NP	39.5	37.9	14.6	8.1	100	61	23	115.4	-
S-6	CL	14+50	0.5-1.0	A-2-4(0)	19	NP	13.0	71.5	9.5	6.0	100	98	17	-	-
S-7	CL	14+50	1.0-8.0	A-2-5(0)	98	NP	44.1	33.4	14.4	8.1	93	66	22	393.6	37.0



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