

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-4494	1	9
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33730.1.1	BRZ-1232(4)	PE	
33730.2.1	BRZ-1232(4)	R/W & UTIL.	
33730.3.1	BRZ-1232(4)	CONST.	

CONTENTS

LINE	STATION	PLAN	PROFILE
-L-	12+10 TO 17+85	4	5

CROSS SECTION	STATION	SHEET
-L-	12+50 TO 13+50	6
-L-	15+50 TO 17+50	7-9

ROADWAY
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33730.1.1 (B-4494) F.A. PROJ. BRZ-1232(4)
COUNTY CURRITUCK
PROJECT DESCRIPTION BRIDGE NO. 3 ON SR 1232 (POYNER RD.)
OVER TULLS CREEK

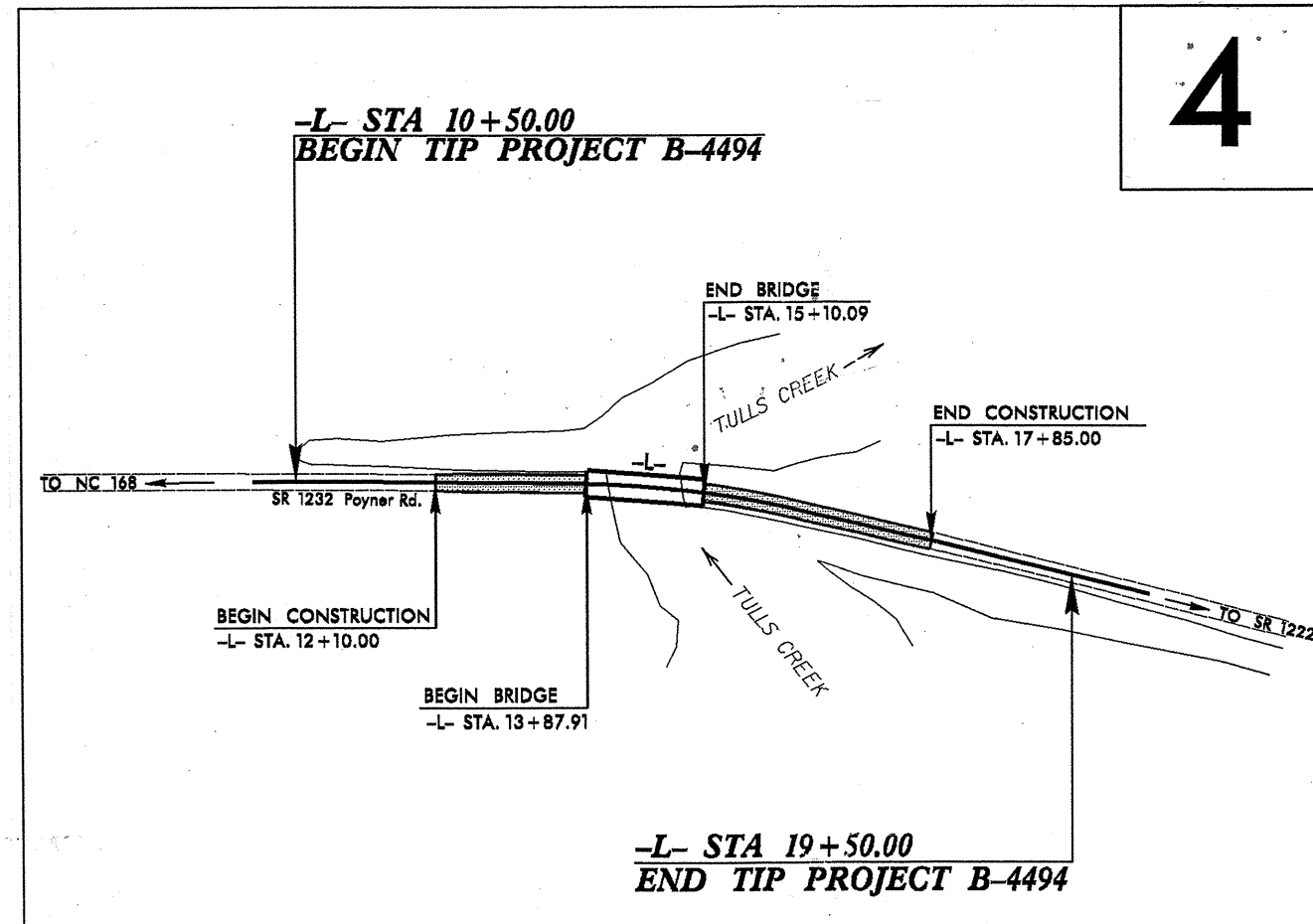
CAUTION NOTICE

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 1909 250-4086. 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 UN-PLACED 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.

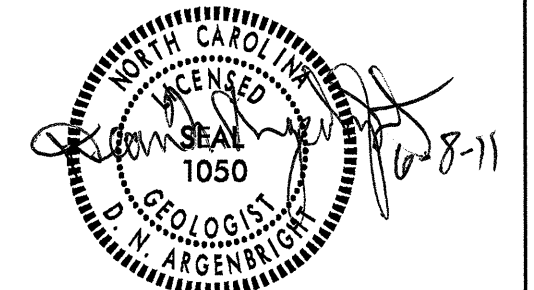
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT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



PERSONNEL
J. R. SWARTLEY
R. E. SMITH
J. M. EDMONDSON

INVESTIGATED BY F.M. WESCOTT III
CHECKED BY D.N. ARGENBRIGHT
SUBMITTED BY D.N. ARGENBRIGHT
DATE OCTOBER 2008



DRAWN BY: C.P. TURNER

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.

CONTRACT: C202999 ID: B-4494

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

PROJECT REFERENCE NO. B-4494
SHEET NO. 2 OF 9

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION				GRADATION				ROCK DESCRIPTION				TERMS AND DEFINITIONS			
<p>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. EXAMPLES:</p> <p><i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>				<p>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) POORLY GRADED GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p>ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>				<p>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:</p> <p>WEATHERED ROCK (WR)</p> <p>CRYSTALLINE ROCK (CR)</p> <p>NON-CRYSTALLINE ROCK (NCR)</p> <p>COASTAL PLAIN SEDIMENTARY ROCK (CP)</p>				<p>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. 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 (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 148 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.</p>			
SOIL LEGEND AND AASHTO CLASSIFICATION				MINERALOGICAL COMPOSITION				WEATHERING				MISCELLANEOUS SYMBOLS			
<p>GENERAL CLASS. GRANULAR MATERIALS (< 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS</p> <p>GROUP CLASS. A-1, A-1-b, A-2, A-2-4, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7, A-7-5, A-7-6, A-7-7, A-7-8, A-3, A-4, A-5, A-6, A-7</p> <p>SYMBOL</p> <p>% PASSING #10, #40, #200</p> <p>LIQUID LIMIT, PLASTIC INDEX</p> <p>GROUP INDEX</p> <p>USUAL TYPES OF MAJOR MATERIALS</p> <p>GEN. RATING AS A SUBGRADE</p>				<p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p>COMPRESSIBILITY</p> <p>PERCENTAGE OF MATERIAL</p> <p>GROUND WATER</p>				<p>FRESH, VERY SLIGHT, SLIGHT, MODERATE, SEVERE, VERY SEVERE, COMPLETE</p> <p>ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>				<p>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</p> <p>SOIL SYMBOL</p> <p>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</p> <p>INFERRED SOIL BOUNDARY</p> <p>INFERRED ROCK LINE</p> <p>ALLUVIAL SOIL BOUNDARY</p> <p>DIP & DIP DIRECTION OF ROCK STRUCTURES</p> <p>SOUNDING ROD</p> <p>SPT CPT DMT VST TEST BORING</p> <p>AUGER BORING</p> <p>CORE BORING</p> <p>MONITORING WELL</p> <p>PIEZOMETER INSTALLATION</p> <p>SLOPE INDICATOR INSTALLATION</p> <p>SPT N-VALUE</p> <p>SPT REFUSAL</p>			
CONSISTENCY OR DENSENESS				TEXTURE OR GRAIN SIZE				ABBREVIATIONS				EQUIPMENT USED ON SUBJECT PROJECT			
<p>PRIMARY SOIL TYPE</p> <p>COMPACTNESS OR CONSISTENCY</p> <p>RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</p> <p>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/F²)</p>				<p>U.S. STD. SIEVE SIZE</p> <p>OPENING (MM)</p> <p>BOULDER (BLDR.)</p> <p>COBBLE (COB.)</p> <p>GRAVEL (GR.)</p> <p>COARSE SAND (CSE. SD.)</p> <p>FINE SAND (F. SD.)</p> <p>SILT (SL.)</p> <p>CLAY (CL.)</p>				<p>AR - AUGER REFUSAL</p> <p>BT - BORING TERMINATED</p> <p>CL - CLAY</p> <p>CPT - CONE PENETRATION TEST</p> <p>CSE. - COARSE SAND</p> <p>DMT - DILATOMETER TEST</p> <p>DPT - DYNAMIC PENETRATION TEST</p> <p>o - VOID RATIO</p> <p>FOSS. - FOSSILIFEROUS</p> <p>FRAC. - FRACTURED, FRACTURES</p> <p>FRAGS. - FRAGMENTS</p> <p>HI. - HIGHLY</p> <p>MED. - MEDIUM</p> <p>MICA. - MICACEOUS</p> <p>MOD. - MODERATELY</p> <p>NP - NON PLASTIC</p> <p>ORG. - ORGANIC</p> <p>PMT - PRESSUREMETER TEST</p> <p>SAP. - SAPROLITIC</p> <p>SD. - SAND, SANDY</p> <p>SL. - SILT, SILTY</p> <p>SLI. - SLIGHTLY</p> <p>TCR - TRICONE REFUSAL</p> <p>w - MOISTURE CONTENT</p> <p>v - VERY</p> <p>VST - VANE SHEAR TEST</p> <p>WEA. - WEATHERED</p> <p>% - UNIT WEIGHT</p> <p>% - DRY UNIT WEIGHT</p>				<p>DRILL UNITS:</p> <p>MOBILE B-</p> <p>BK-51</p> <p>CME-45C</p> <p>CME-550</p> <p>PORTABLE HOIST</p> <p>CME-45B</p> <p>ADVANCING TOOLS:</p> <p>CLAY BITS</p> <p>6" CONTINUOUS FLIGHT AUGER</p> <p>8" HOLLOW AUGERS</p> <p>HARD FACED FINGER BITS</p> <p>TUNG-CARBIDE INSERTS</p> <p>CASING w/ ADVANCER</p> <p>TRICONE 2 15/16" STEEL TEETH</p> <p>TRICONE TUNG-CARB.</p> <p>CORE BIT</p> <p>HAMMER TYPE:</p> <p>AUTOMATIC</p> <p>MANUAL</p> <p>CORE SIZE:</p> <p>B</p> <p>H</p> <p>HAND TOOLS:</p> <p>POST HOLE DIGGER</p> <p>HAND AUGER</p> <p>SOUNDING ROD</p> <p>VANE SHEAR TEST</p>			
SOIL MOISTURE - CORRELATION OF TERMS				ROCK HARDNESS				FRACATURE SPACING				BEDDING			
<p>SOIL MOISTURE SCALE (ATTERBERG LIMITS)</p> <p>FIELD MOISTURE DESCRIPTION</p> <p>GUIDE FOR FIELD MOISTURE DESCRIPTION</p> <p>LL - LIQUID LIMIT</p> <p>PL - PLASTIC LIMIT</p> <p>OM - OPTIMUM MOISTURE</p> <p>SL - SHRINKAGE LIMIT</p>				<p>VERY HARD</p> <p>HARD</p> <p>MODERATELY HARD</p> <p>MEDIUM HARD</p> <p>SOFT</p> <p>VERY SOFT</p> <p>CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.</p> <p>CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>				<p>TERM</p> <p>VERY WIDE</p> <p>WIDE</p> <p>MODERATELY CLOSE</p> <p>CLOSE</p> <p>VERY CLOSE</p> <p>SPACING</p> <p>MORE THAN 10 FEET</p> <p>3 TO 10 FEET</p> <p>1 TO 3 FEET</p> <p>0.16 TO 1 FEET</p> <p>LESS THAN 0.16 FEET</p>				<p>TERM</p> <p>THICKNESS</p> <p>VERY THICKLY BEDDED</p> <p>THICKLY BEDDED</p> <p>THINLY BEDDED</p> <p>VERY THINLY BEDDED</p> <p>THICKLY LAMINATED</p> <p>THINLY LAMINATED</p> <p>> 4 FEET</p> <p>1.5 - 4 FEET</p> <p>0.16 - 1.5 FEET</p> <p>0.03 - 0.16 FEET</p> <p>0.008 - 0.03 FEET</p> <p>< 0.008 FEET</p>			
PLASTICITY				INDURATION				BENCH MARK:				NOTES:			
<p>NONPLASTIC</p> <p>LOW PLASTICITY</p> <p>MED. PLASTICITY</p> <p>HIGH PLASTICITY</p> <p>PLASTICITY INDEX (PI)</p> <p>DRY STRENGTH</p> <p>VERY LOW</p> <p>SLIGHT</p> <p>MEDIUM</p> <p>HIGH</p>				<p>FRIABLE</p> <p>MODERATELY INDURATED</p> <p>INDURATED</p> <p>EXTREMELY INDURATED</p> <p>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</p> <p>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</p> <p>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p> <p>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>				<p>ELEVATION: _____ FT.</p>				<p>APPROXIMATE LIMITS OF ORGANIC SOILS</p>			
COLOR				<p>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.</p>				<p>INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p>				<p>NOTES:</p>			
<p>DESCRIPTORS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p>															

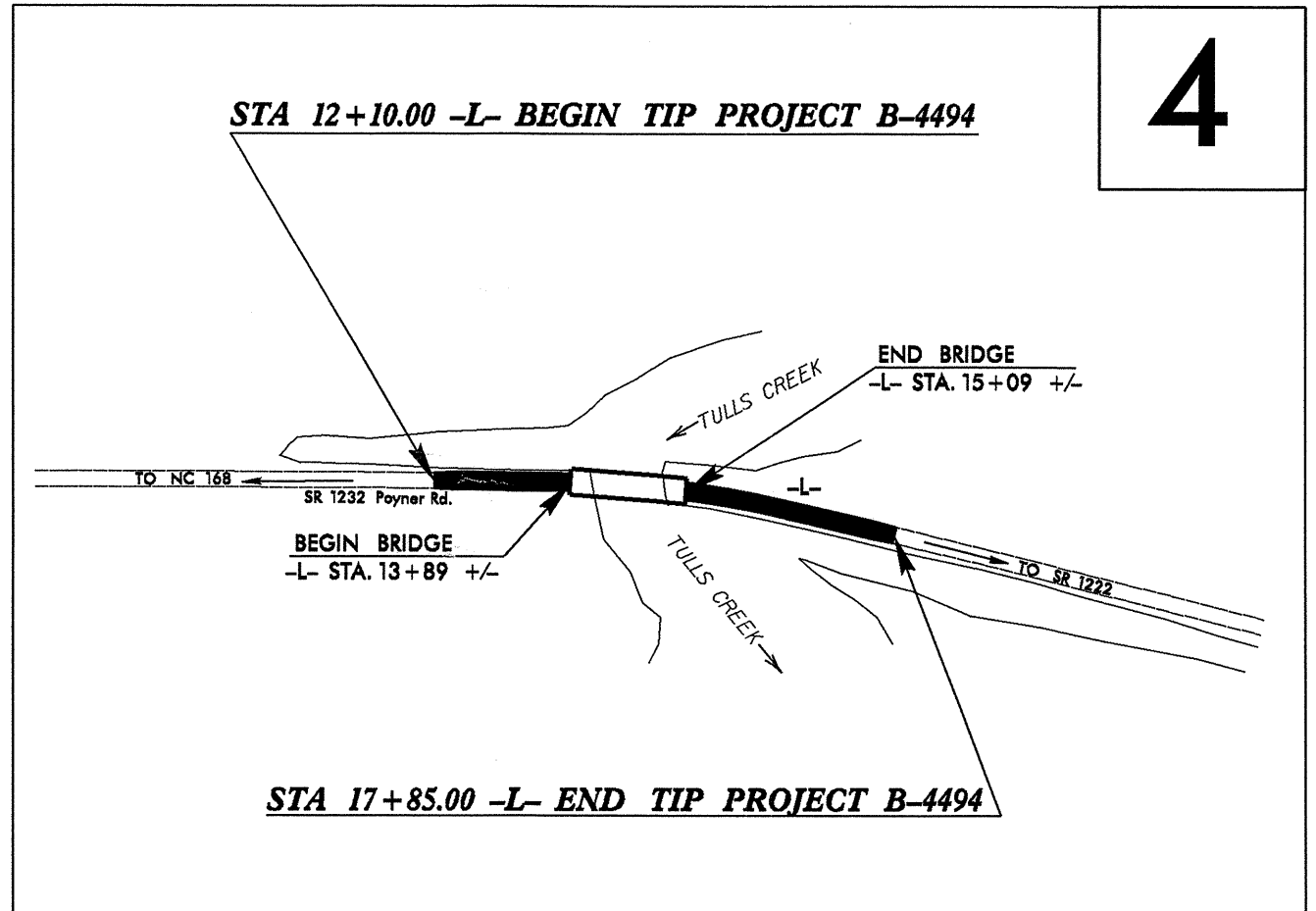
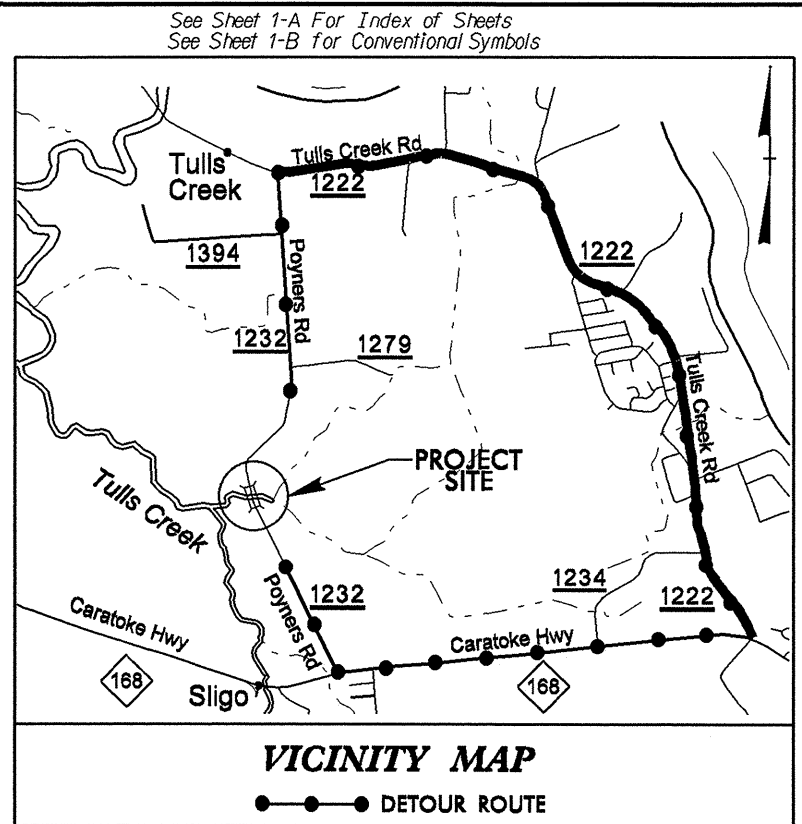
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4494	2A	9
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33730.1.1	BRZ-1232(4)	PE	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CURRITUCK COUNTY

LOCATION: BRIDGE NO. 3 OVER TULLS CREEK ON SR 1232 (POYNER RD)

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

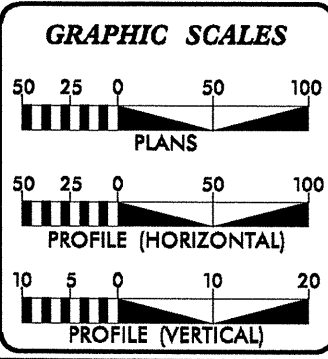


- NOTE:**
1. THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
 2. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD .
 3. SUB REGIONAL TIER DESIGN GUIDELINES FOR BRIDGE PROJECTS WERE USED TO DEVELOP THIS PROJECT (V=40 MPH).

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

CONTRACT: TIP PROJECT: B-4494

CONTRACT:



DESIGN DATA

ADT 2011 =	1240
ADT 2030 =	1900
DHV =	10 %
D =	60 %
T =	3 % *
V =	50 MPH
FUNC. CLASS =	RURAL LOCAL
* TTST 1%	DUAL 2%

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4494	=	0.086 MILES
LENGTH OF STRUCTURE TIP PROJECT B-4494	=	0.023 MILES
TOTAL LENGTH OF TIP PROJECT B-4494	=	0.109 MILES

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

2006 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: APRIL 16, 2010	GARY R. LOVERING, PE PROJECT ENGINEER
LETTING DATE: APRIL 19, 2011	EDWARD S. ROBBINS, PE 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.

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

June 2, 2011

STATE PROJECT: 33730.1.1 B-4494
F. A. PROJECT: BRZ-1232 (4)
COUNTY: Currituck
DESCRIPTION: Bridge No. 3 on SR 1232 over Tulls Creek
SUBJECT: Geotechnical Report – Inventory

Project Description

This project consists of the improvement of the SR 1232 roadway to accommodate the proposed bridge replacement. The total length of the roadway project is 0.109 miles.

The following base lines were investigated for this project:

<u>Line</u>	<u>Station(±)</u>
-L-	12+10 to 17+85

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:

<u>Line</u>	<u>Station (±)</u>
-L-	12+10 to 17+85

2) The following section contains relatively soft organic soils which have the potential for subgrade problems during construction:

<u>Line</u>	<u>Station(±)</u>
-L-	12+10 to 17+85

Physiography, Geology and Ground Water

The project is located in the Coastal Plain Physiographic Province. Topography at the site is nearly flat to moderately sloping. Elevations along the proposed roadway range from 2± to 4± feet.

The geology of the project consists of Recent age coastal plain sediments overlying marine deposits of Tertiary age. Based on previous investigations in the area the Pliocene age Yorktown Formation underlies the alluvial soils. These soils will not be further described in this report. Drainage along the project is provided by Tulls Creek. Surface drainage is generally good in areas with moderate relief and fair to poor in low lying portions of the project.

Ground water data was collected primarily in August 2008 during above average rainfall conditions. Typically, ground water levels were measured at depths of 3± to 4± feet below the surface of the roadway embankment. Ground water in the flood plain was at or near the ground surface.

Soils

Soils encountered during this investigation are separated into two major categories based on origin and occurrence. These categories are roadway embankment and alluvial soils.


Roadway Embankment soil is present in the embankment of the existing roadway. These soils consist of up to 6.5± feet of soft to very stiff sandy silt (A-4), sandy clay (A-6) and loose sand (A-2-4).

Alluvial soils were encountered beneath the roadway embankment. The alluvial deposits were organic in nature along the entire length of the project. Soils within these areas consisted of very soft to medium stiff muck (A-5, A-7-5). Organic content of a tested sample was 21.2 percent. Vane Shear tests taken left of station 16+50 and right of station 17+50 indicate shear strengths typically ranging from 74 to 573 psf in the organic soils. These soils have poor engineering properties and have the potential to cause subgrade stability problems or embankment stability/settlement problems. The organic deposits are underlain by very loose to medium dense sand (A-2-4, A-3). These soils exhibit good to excellent engineering properties.

Undisturbed Samples

<u>Sample No.</u>	<u>Station</u>	<u>Depth(m)</u>	<u>Test</u>
ST-1	15+50, 6' LT	9.8-11.8	Consolidation

Prepared by:


Dean Argenbright
Regional Geological Engineer

FINAL EARTHWORK BALANCE SHEET

Volumes in Cubic Yards

PROJECT: B-4494

COUNTY: Currituck

DATE: 7/1/11

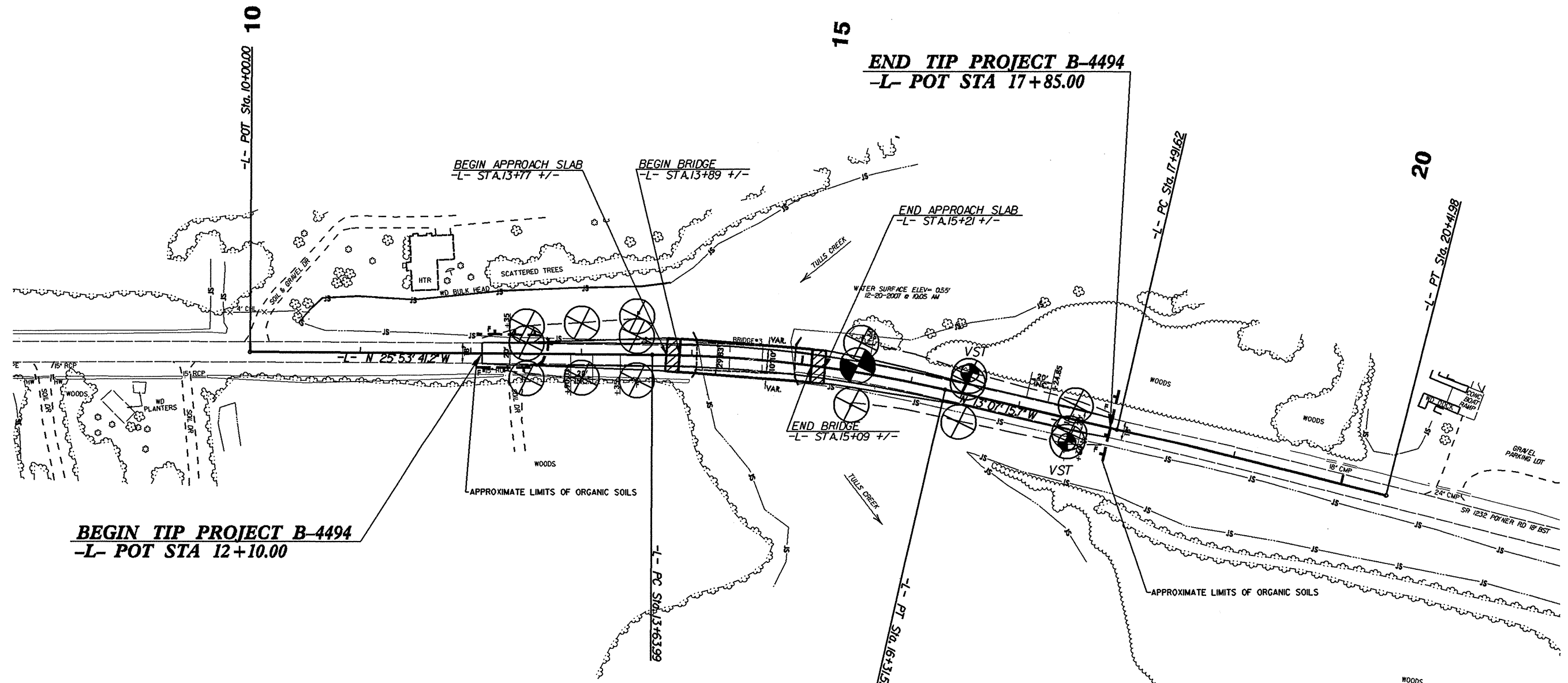
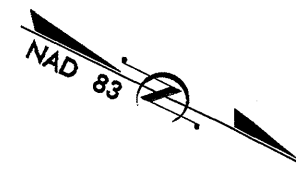
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SHEET 1 OF 1 SHEETS

LOCATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
	TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. (+) 30%		ROCK	SUITABLE	UNSUIT.	TOTAL
-L- 12+10 to 13+87.91	2				2	429		429	558	556				
SUBTOTAL	2				2	429		429	558	556				
-L- 15+10.09 to 17+85	1				1	504		504	655	654				
SUBTOTAL	1				1	504		504	655	654				
PROJECT TOTAL:	3				3	933		933	1213	1210				
Est. 5% to Replace Topsoil on Borrow Pit						47		47	61	61				
GRAND TOTAL:	3				3	980		980	1274	1271				
SAY:	5									1280				
PER GEOTECH RECOMMENDATION: ESTIMATED 500 CUBIC YARDS OF UNDERCUT TO BE USED IN THE DISCRETION OF THE RESIDENT ENGINEER.														

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.

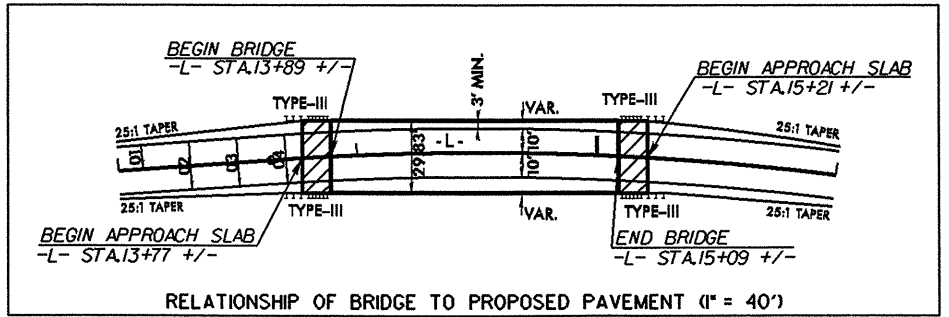
PROJECT REFERENCE NO. B-4494	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
FOR -L- PROFILE SEE SHEET 5	



BEGIN TIP PROJECT B-4494
-L- POT STA 12+10.00

END TIP PROJECT B-4494
-L- POT STA 17+85.00

-L-	
PI Sta 14+98.31	PI Sta 19+16.81
$\Delta = 12' 46" 25.4" (RT)$	$\Delta = 1' 15" 06.5" (RT)$
$D = 4' 46" 28.7"$	$D = 0' 30" 00.0"$
$L = 267.53'$	$L = 250.36'$
$T = 134.32'$	$T = 125.19'$
$R = 1,200.00'$	$R = 11,459.16'$
$SE = .04$	
RUNOFF = SEE PLANS	



RELATIONSHIP OF BRIDGE TO PROPOSED PAVEMENT (I" = 40')

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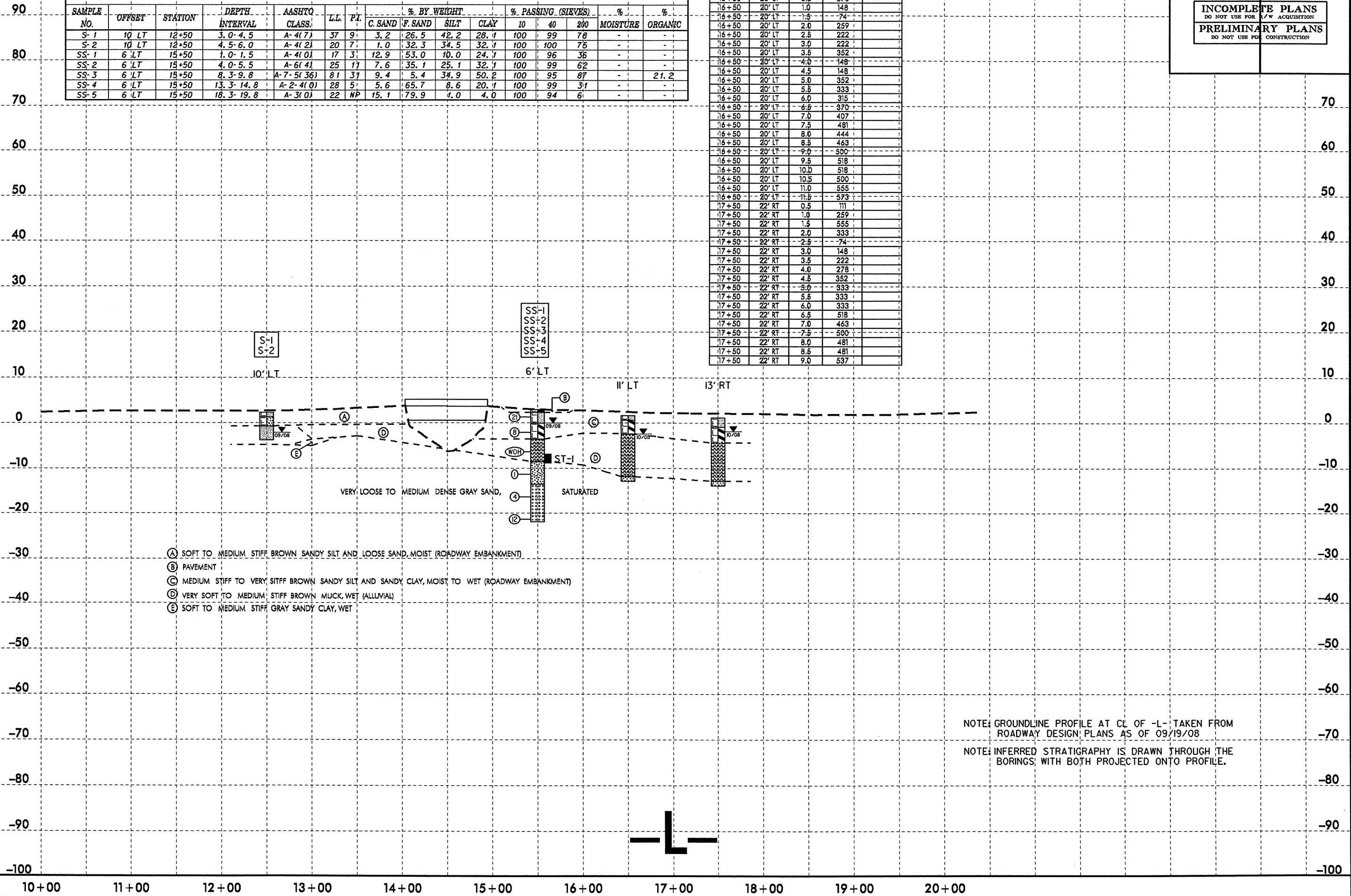
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ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION		PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

SOIL TEST RESULTS

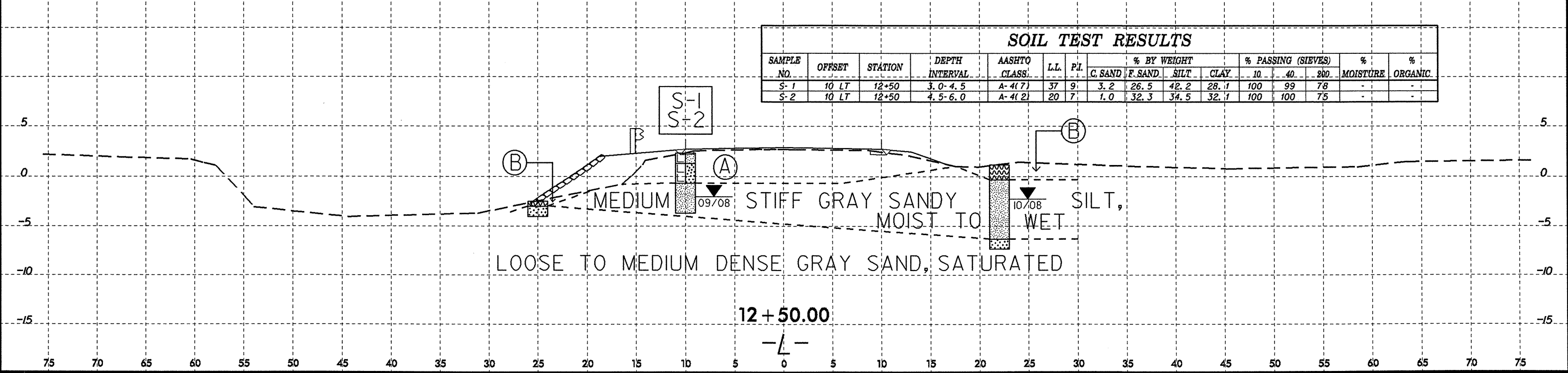
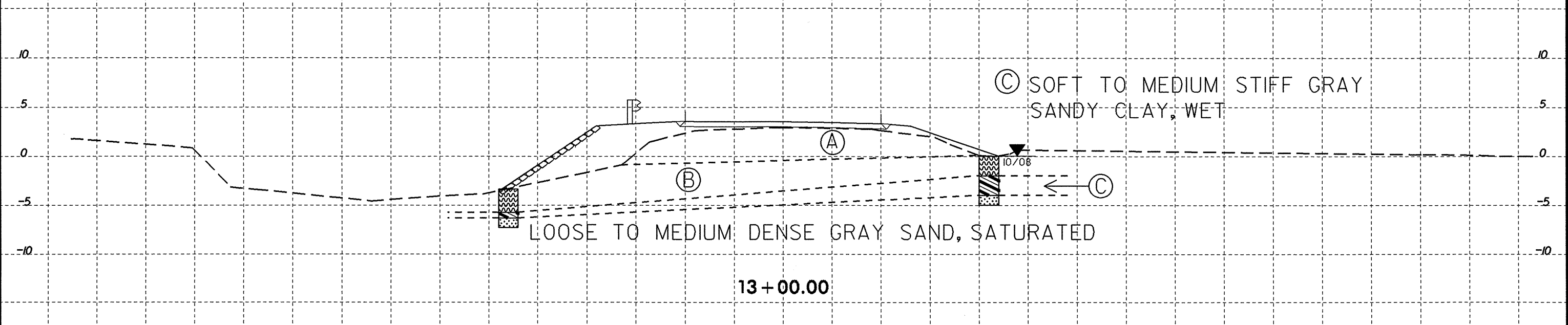
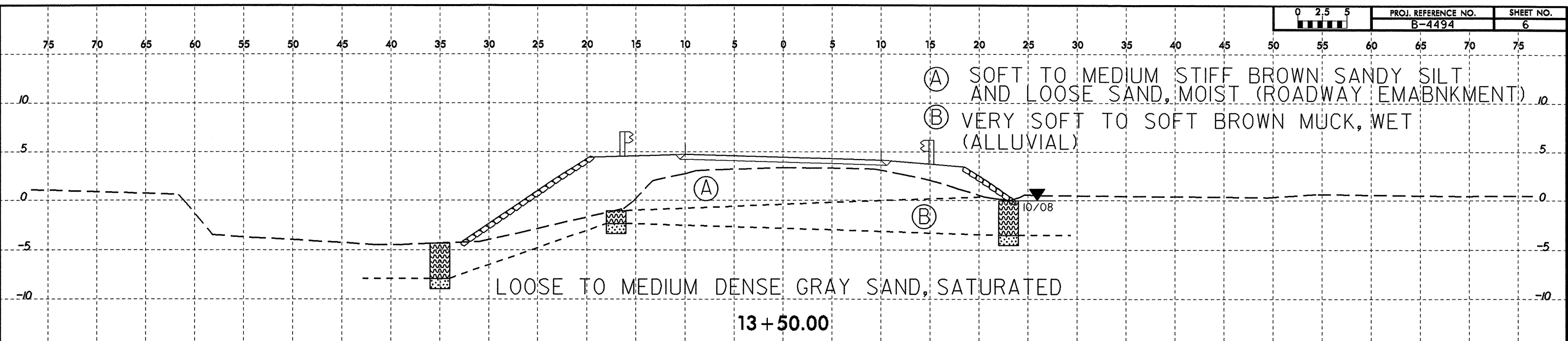
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% BY WEIGHT				% PASSING (SIEVES)			MOISTURE %	ORGANIC %
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-1	10' LT	12+50	3.0-4.5	A-4(7)	37	9	3.2	26.5	42.2	28.1	100	99	78	-	-
S-2	10' LT	12+50	4.5-6.0	A-4(2)	20	7	1.0	32.3	34.5	32.1	100	100	75	-	-
SS-1	6' LT	15+50	1.0-1.5	A-4(0)	17	3	12.9	53.0	10.0	24.1	100	96	36	-	-
SS-2	6' LT	15+50	4.0-5.5	A-6(4)	25	17	7.6	35.1	25.1	32.1	100	99	62	-	-
SS-3	6' LT	15+50	8.3-9.8	A-7-5(36)	81	37	9.4	5.4	34.9	50.2	100	95	87	-	21.2
SS-4	6' LT	15+50	13.3-14.8	A-2-4(0)	28	5	5.6	65.7	8.6	20.1	100	99	31	-	-
SS-5	6' LT	15+50	18.3-19.8	A-3(0)	22	NP	15.1	79.9	1.0	4.0	100	94	6	-	-

VANE SHEAR TESTS

STATION	OFFSET	DEPTH	S (psf)	SR (psf)
16+50	20' LT	0.5	370	
16+50	20' LT	1.0	148	
16+50	20' LT	1.5	74	
16+50	20' LT	2.0	259	
16+50	20' LT	2.5	222	
16+50	20' LT	3.0	222	
16+50	20' LT	3.5	352	
16+50	20' LT	4.0	148	
16+50	20' LT	4.5	148	
16+50	20' LT	5.0	352	
16+50	20' LT	5.5	333	
16+50	20' LT	6.0	315	
16+50	20' LT	6.5	370	
16+50	20' LT	7.0	407	
16+50	20' LT	7.5	481	
16+50	20' LT	8.0	444	
16+50	20' LT	8.5	463	
16+50	20' LT	9.0	500	
16+50	20' LT	9.5	518	
16+50	20' LT	10.0	518	
16+50	20' LT	10.5	500	
16+50	20' LT	11.0	555	
16+50	20' LT	11.5	573	
17+50	22' RT	0.5	111	
17+50	22' RT	1.0	259	
17+50	22' RT	1.5	555	
17+50	22' RT	2.0	333	
17+50	22' RT	2.5	74	
17+50	22' RT	3.0	148	
17+50	22' RT	3.5	222	
17+50	22' RT	4.0	278	
17+50	22' RT	4.5	352	
17+50	22' RT	5.0	333	
17+50	22' RT	5.5	333	
17+50	22' RT	6.0	333	
17+50	22' RT	6.5	518	
17+50	22' RT	7.0	463	
17+50	22' RT	7.5	500	
17+50	22' RT	8.0	481	
17+50	22' RT	8.5	481	
17+50	22' RT	9.0	537	



8/23/99



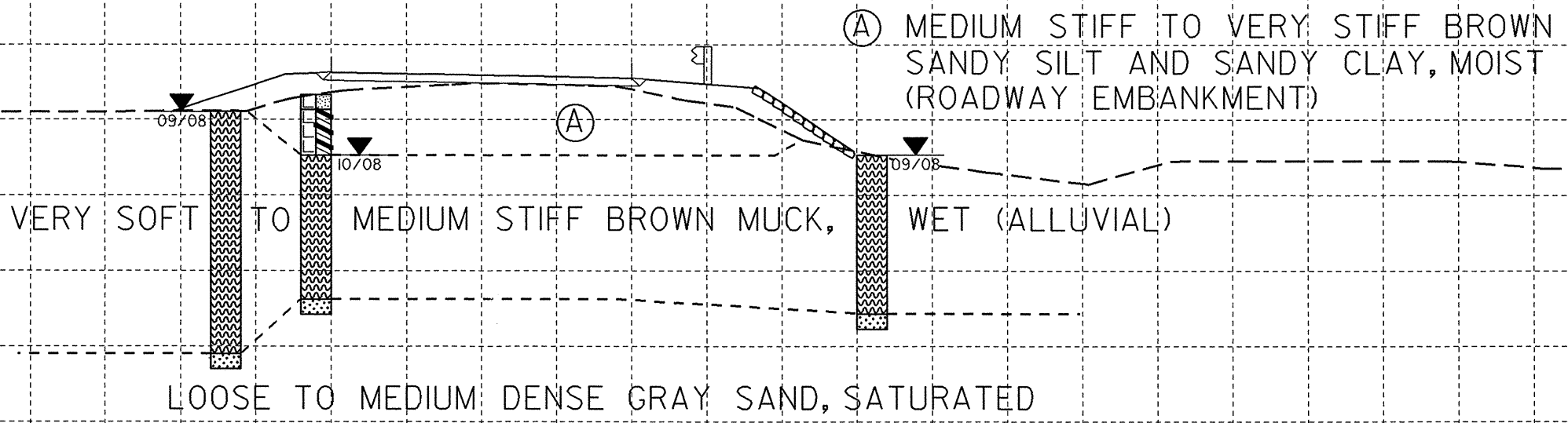
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VANE SHEAR TESTS

STATION	OFFSET	DEPTH	S (psf)	SR (psf)
16+50	20' LT	0.5	370	
16+50	20' LT	1.0	148	
16+50	20' LT	1.5	74	
16+50	20' LT	2.0	259	
16+50	20' LT	2.5	222	
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16+50	20' LT	11.5	573	



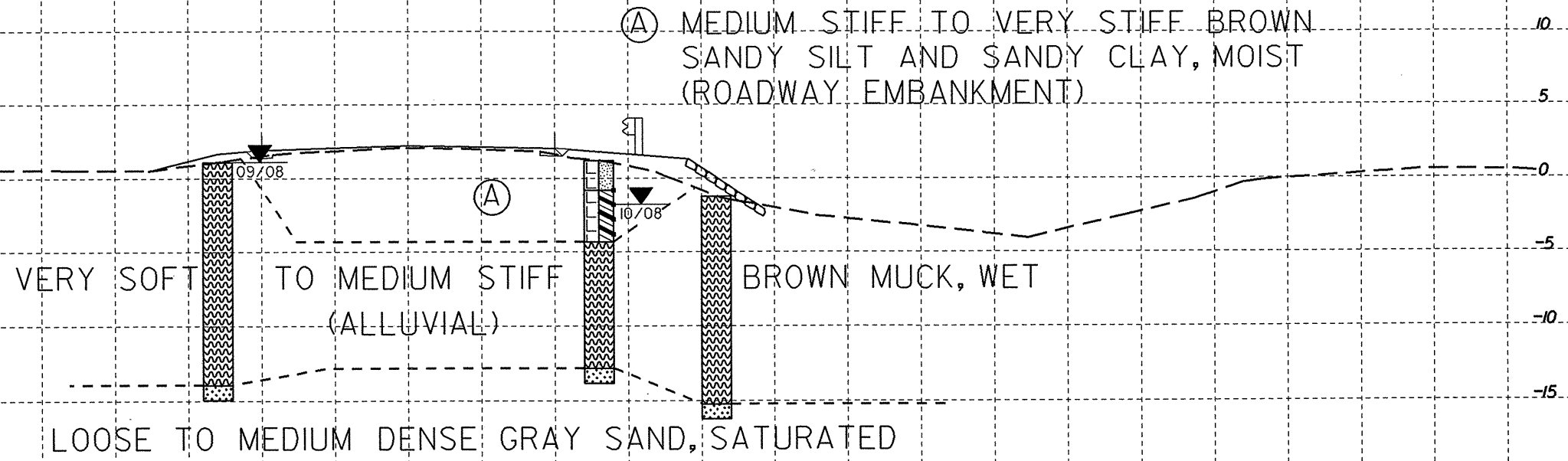
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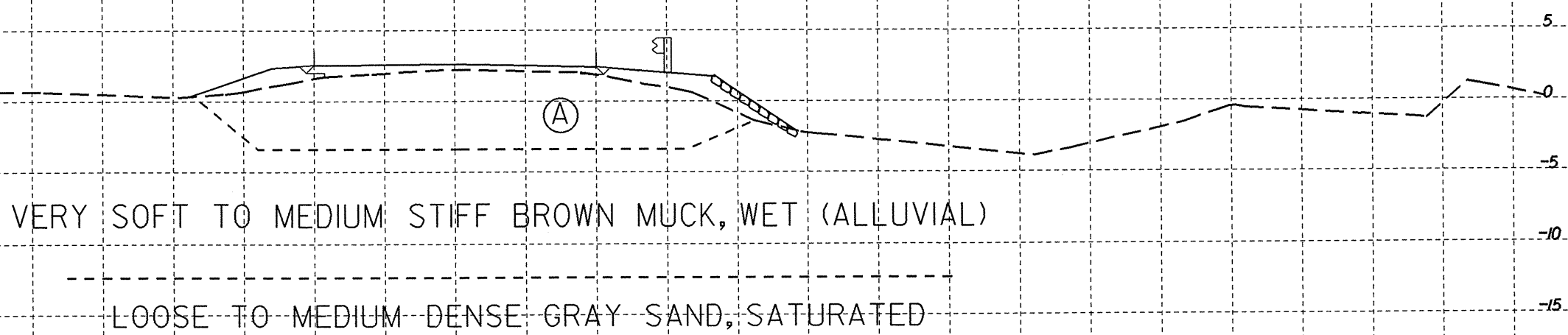
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VANE SHEAR TESTS

STATION	OFFSET	DEPTH	S (psf)	SR (psf)
17+50	22' RT	0.5	111	
17+50	22' RT	1.0	259	
17+50	22' RT	1.5	555	
17+50	22' RT	2.0	333	
17+50	22' RT	2.5	74	
17+50	22' RT	3.0	148	
17+50	22' RT	3.5	222	
17+50	22' RT	4.0	278	
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17+50	22' RT	7.0	463	
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17+50	22' RT	8.0	481	
17+50	22' RT	8.5	481	
17+50	22' RT	9.0	537	



17 + 50.00



17 + 00.00

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