ID: B-4028

CONTRACT: C202878

NOTE: SEE SHEET 2A FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

CONTENTS

LINE	STATION	PLAN	PROFILE
-L-	10+50 TO 77+00	4-8	9-13

CROSS SECTIONS	STATION	SHEET
-L-	11+00 TO 12+50	14
-L-	18+50 TO 21+50	14-16
-L-	36+00 TO 42+00	16-21
-L-	51+00 TO 52+00	21-22
-L-	64+00 TO 68+50	23-26

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

ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33395.1.1 (B-4028) F.A. PROJ. BRSTP-0011(9)

COUNTY BLADEN

PROJECT DESCRIPTION BRIDGE NO.'s 12, 18 AND 42 OVER CAPE FEAR RIVER AND OVERFLOW ON NC 11

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33395.1.1 (B-4028)	1	26

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33395.1.1	BRSTP-0011(9)	P.E.
		R/W & UTIL.

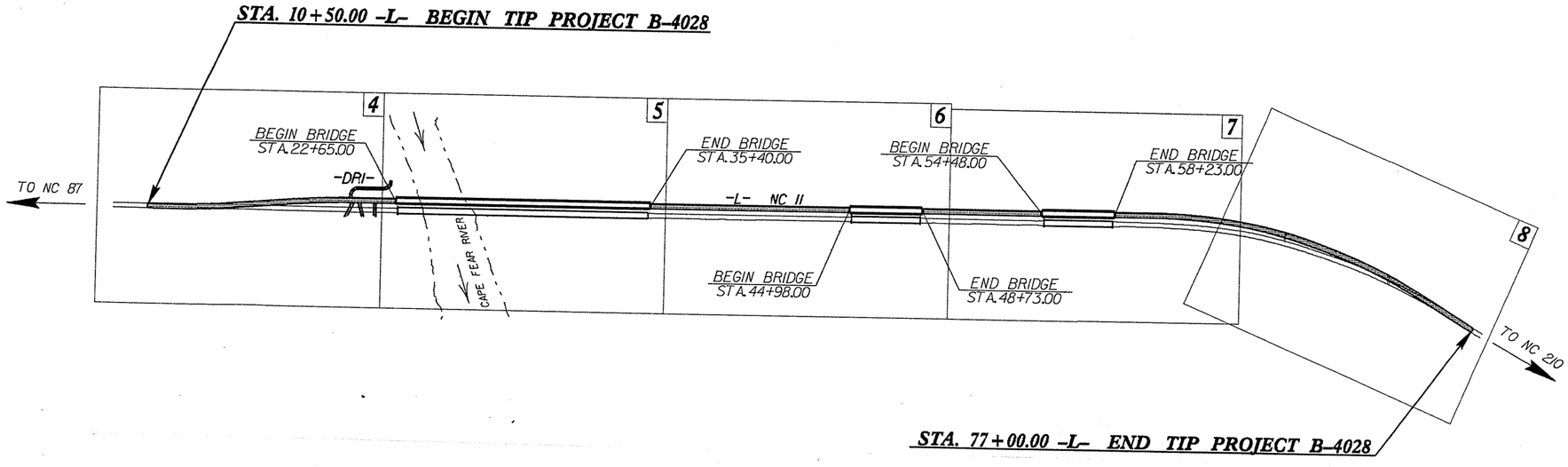
CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

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

NAD 83



PERSONNEL

CMW

JRS

RES

JME

INVESTIGATED BY J.L. STONE

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE NOVEMBER 2010

NORTH CAROLINA LICENSED SEAL 2007 GEOLOGIST JOSEPH L. STONE 11-20-10

DRAWN BY: C.R. SUMNER, J.L. STONE

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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.

PROJECT REFERENCE NO.	SHEET NO.
B-4028	2 OF 26

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING #10	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
#40	30 MX	50 MX	51 MN											
#200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN			
LIQUID LIMIT	6 MX		NP	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX				10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT^2)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	<4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.50
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	>30	>4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL — SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

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.

GRADATION

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.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%
MODERATELY ORGANIC	5 - 10%	12 - 20%
HIGHLY ORGANIC	>10%	>20%

OTHER MATERIAL	
TRACE	1 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
HIGHLY	35% AND ABOVE

GROUND WATER

- 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 SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT / DPT DMT / VST PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING W/ CORE
- SPT N-VALUE
- REF — SPT REFUSAL

ABBREVIATIONS

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, FRACTURES
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B-___
- [ ] BK-51
- [X] CME-45B
- [ ] CME-550
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [X] 6" CONTINUOUS FLIGHT AUGER
- [ ] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [X] CASING [ ] W/ ADVANCER
- [X] TRICONE 2 15/16 " STEEL TEETH
- [ ] TRICONE _____ " TUNG.-CARB.
- [ ] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC
- [ ] MANUAL

CORE SIZE:
- [ ] -B_____
- [ ] -N_____
- [ ] -H_____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [X] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [X] SOIL PROBE

ROCK DESCRIPTION

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)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES 'CLUNK' SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

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 PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOFT	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.
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 FINGERNAIL.

FRACTURE SPACING

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

BEDDING

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

INDURATION

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.

TERMS AND DEFINITIONS

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 GODD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK:

ELEVATION: FT.

NOTES:

APPROXIMATE LIMITS OF ORGANIC DEPOSITS

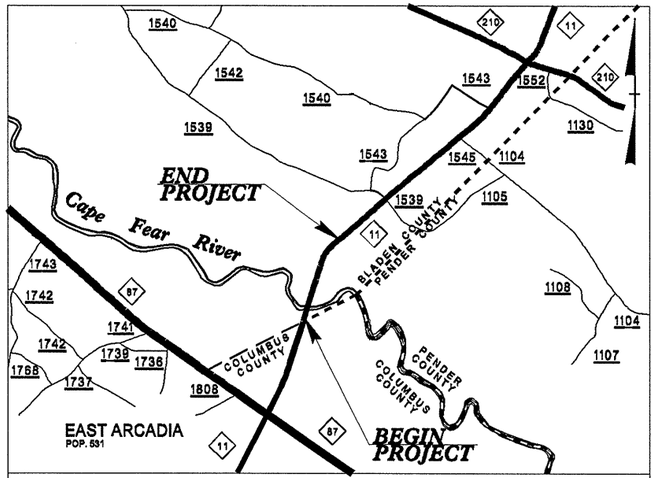
UNDIVIDED C.P. = UNDIVIDED COASTAL PLAIN

09/08/99

TIP PROJECT: B-4028

CONTRACT:

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BLADEN COUNTY

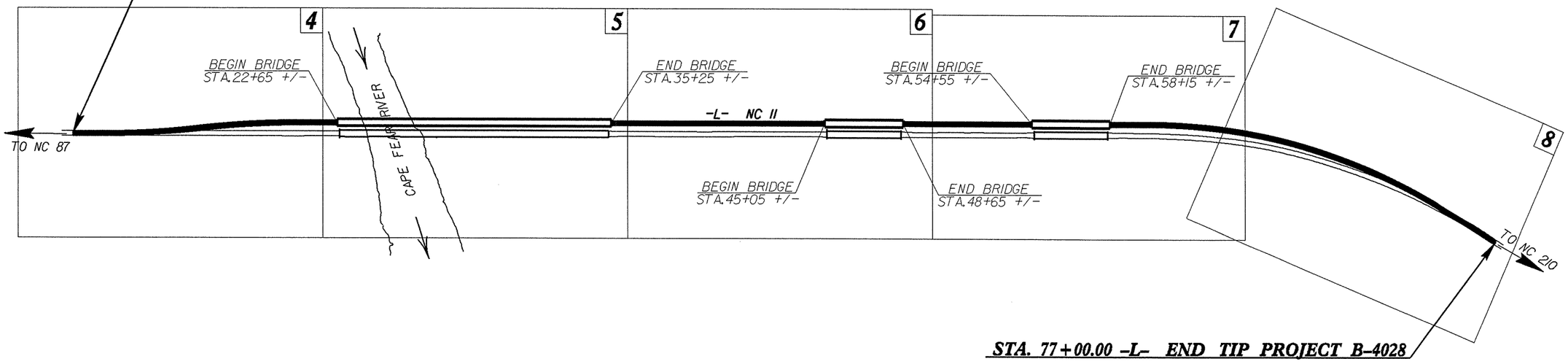
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4028	2A	26
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33395.1.1	BRSTP-0011(9)	P.E.	

LOCATION: BRIDGE NOS. 12, 18 AND 42 OVER CAPE FEAR RIVER AND OVERFLOW ON NC 11

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

NAD 83

STA. 10+50.00 -L- BEGIN TIP PROJECT B-4028



STA. 77+00.00 -L- END TIP PROJECT B-4028

NOTE: THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

NOTE: CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ———.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2011 = 3522
ADT 2031 = 6337
DHV = 11 %
D = 55 %
T = 34 % *
V = 60 MPH

* TTST 6% DUAL 28%
FUNC. CLASS = RURAL ART.

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4028 = 0.884 MILES
LENGTH STRUCTURES TIP PROJECT B-4028 = 0.375 MILES
TOTAL LENGTH TIP PROJECT B-4028 = 1.259 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 19, 2010

LETTING DATE:
MARCH 15, 2011

BRENDA MOORE, P.E.
PROJECT ENGINEER

JOYCE DREW
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

November 29, 2010

STATE PROJECT:	33395.1.1 (B-4028)
F.A. PROJECT:	BRSTP-0011(9)
COUNTY:	Bladen
DESCRIPTION:	Bridge Nos. 12, 18 and 42 over Cape Fear River and Overflow on NC 11
SUBJECT:	Geotechnical Inventory

Project Description

This project area lies along NC 11 in southeastern Bladen County, at the existing NC 11 Cape Fear River crossing. Proposed construction begins approximately 1200 feet south of the existing bridge over the Cape Fear River and extends northward approximately 1.2 miles. This geotechnical investigation was confined to the areas of proposed construction.

Fieldwork for this project was conducted from December 2009 and January 2010. Standard Penetration Test borings were advanced with a CME 45-B 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 alignment, totaling 1.2 miles was investigated. Subsurface profiles and selected cross sections of this alignment are included in this report.

Line	Station(±)
-L-	10+50 to 77+00

Areas of Special Geotechnical Interest

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

Line	Station(±)
-L-	10+50 to 66+83

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

TELEPHONE: 919-250-4088
FAX: 919-250-4237
Website: www.ncdot.org./doh

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

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

Line	Station(±)
-L-	36+04 to 39+75
-L-	40+15 to 41+75
-L-	51+17 to 51+85
-L-	64+19 to 68+27

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

Line	Station(±)
-L-	17+00 to 19+00
-L-	35+00 to 71+00

3) Along the following sections borrow pit ponds were encountered.

Line	Station(±)
-L-	35+96 to 39+74
-L-	39+98 to 44+97
-L-	52+32 to 54+26

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 1± foot above sea level along the bed of the Cape Fear River to 49± feet above sea level along the upland section at the southern end of the project.

Surficial soils in this area are generally classified as undivided coastal plain sediments and alluvial sediments; all are underlain by the Peedee Formation.

Ground Water

Ground water data was collected from December 2009 through January 2010, during a time of above normal precipitation. Ground water elevations ranged from 3± to 39± 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 1± to 6± feet of soft to medium stiff clayey sandy silt (A-4), 3± to 5± feet of very stiff silty sandy clay (A-7-6) and 5 or more feet of loose to medium dense sand (A-2-4). These undivided coastal plain sediments were encountered along the upland sections at the beginning and the end of the project.

Alluvial soils were encountered within the floodplain of the Cape Fear River. They are comprised of 5± to 21± feet of very soft to medium stiff silty clay, silty sandy clay, and sandy clay (A-7-6, A-6), and 2± to 17± feet of loose to medium dense sand (A-2-4, A-3, A-1-b). Vane shear analysis completed within the clay soils show shear strength values ranging from 4 psf to 200 psf. Additionally, several areas containing surficial organic deposits were identified. These areas were comprised of 2± to 6± feet of very soft silty clay and very loose sand with little organic matter (A-7-5, A-2-4) and very soft muck. Laboratory analysis of these soils show organic percentages ranging from 3.6% to 30.6% and moisture contents ranging from 41.5% to 512%. Vane shear tests completed within these organic soils show shear strengths ranging from 42 psf to 1002 psf.

Soils that are described as formational have been identified as belonging to the Peedee Formation. Where encountered, these deposits are composed of 8± to 13± feet of loose to medium dense sand (A-2-4, A-3, and A-1-b), 2± to 13± feet of medium stiff to hard sandy clay (A-6), and 5± feet of moderately hard limestone.

Soils classified as artificial fill are composed of 2± to 3± feet of loose to dense sand (A-2-4), with sandy clay layers (A-6.)

Soils identified as roadway embankment are comprised of 1± to 19± feet of loose to dense sand (A-2-4) with stiff sandy clay layers (A-6). These soils were encountered along the existing NC 11 embankment.

Undisturbed Samples

Undisturbed thin wall Shelby tube samples were collected at the following locations and submitted for testing.

Sample	Station	Depth	Test
ST-1	35+50 70'LT	10.8-12.1	Triaxial, Consolidation
ST-2	39+50 82'LT	10.5-12.5	Consolidation
ST-3	39+50 82'LT	5.0-6.8	Consolidation
ST-4	35+50 70'LT	5.0-6.5	Consolidation

Respectfully Submitted,

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

Earthwork Balance Sheet

Volumes in Cubic Yards

PROJECT: B-4028 COUNTY: Bladen DATE: 4/4/2012 COMPILED BY: jbw SHEET 1 OF 1 SHEETS

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. +25%		ROCK	SUITABLE	UNSUIT.	TOTAL
Phase 1															
-L- Sta. 17+00.00	-L- Sta. 22+65.00 (Beg. Br.)	1,174				1,174	2,758		2,758	3,448	2,274				
-DR1- 10+12.00	-DR1- 12+62.73	81				81	618		618	773	692				
	SUBTOTAL	1,255				1,255	3,376		3,376	4,220	2,965				
-L- Sta. 35+40.00 (End Br.)	-L- Sta. 44+98.00 (Beg. Br.)						27,916		27,916	34,895	34,895				
	SUBTOTAL						27,916		27,916	34,895	34,895				
-L- Sta. 48+73.00 (End Br.)	-L- Sta. 54+48.00 (Beg. Br.)			233			22,282		22,282	27,853	27,853			233	233
	SUBTOTAL			233			22,282		22,282	27,853	27,853			233	233
-L- Sta. 58+23.00 (End Br.)	-L- Sta. 69+50.00 (End Const.	36				36	28,268		28,268	35,335	35,299				
	SUBTOTAL	36				36	28,268		28,268	35,335	35,299				
Remove Existing															
-L- Sta. 10+50.00	-L- Sta.22+65.00 (Beg. Br.)	2,796		562		2,796	1,288		1,288	1,610			1,186	562	1,748
	SUBTOTAL	2,796		562		2,796	1,288		1,288	1,610			1,186	562	1,748
-L- Sta. 35+40.00 (End Br.)	-L- Sta.44+98.00 (Beg. Br.)	9,314				9,314							9,314		9,314
	SUBTOTAL	9,314				9,314							9,314		9,314
-L- Sta. 48+73.00 (End Br.)	-L- Sta. 54+48.00 (Beg. Br.)	3,544				3,544	368		368	460			3,084		3,084
	SUBTOTAL	3,544				3,544	368		368	460			3,084		3,084
-L- Sta. 58+23.00 (End Br.)	-L- Sta. 77+00.00 (End Const.	8,947				8,947	3,379		3,379	4,224			4,723		4,723
	SUBTOTAL	8,947				8,947	3,379		3,379	4,224			4,723		4,723
	TOTAL	25,892		795		25,892	86,877		86,877	108,596	101,012			795	19,102
MATERIAL FOR SHOULDER CONSTRUCTION							2,014		2,014	2,518	2,518				
LOSS DUE TO CLEARING & GRUBBING															
ADDITIONAL UNDERCUT				2,500			2,500		2,500	3,125	3,125			2,500	2,500
ROCK WASTE TO REPLACE BORROW															
ADJUST FOR ROCK WASTE															
WASTE IN LIEU OF BORROW															
	PROJECT TOTAL	25,892		3,295		25,892	91,391		91,391	114,239	106,654			3,295	21,602
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT											5,333				
	GRAND TOTAL	25,892		3,295		25,892	91,391		91,391	114,239	111,987			3,295	21,602
	SAY	**26,000**		**3,350**							**112,500**				

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.	SHEET NO.
B-4028	4

R/W SHEET NO.

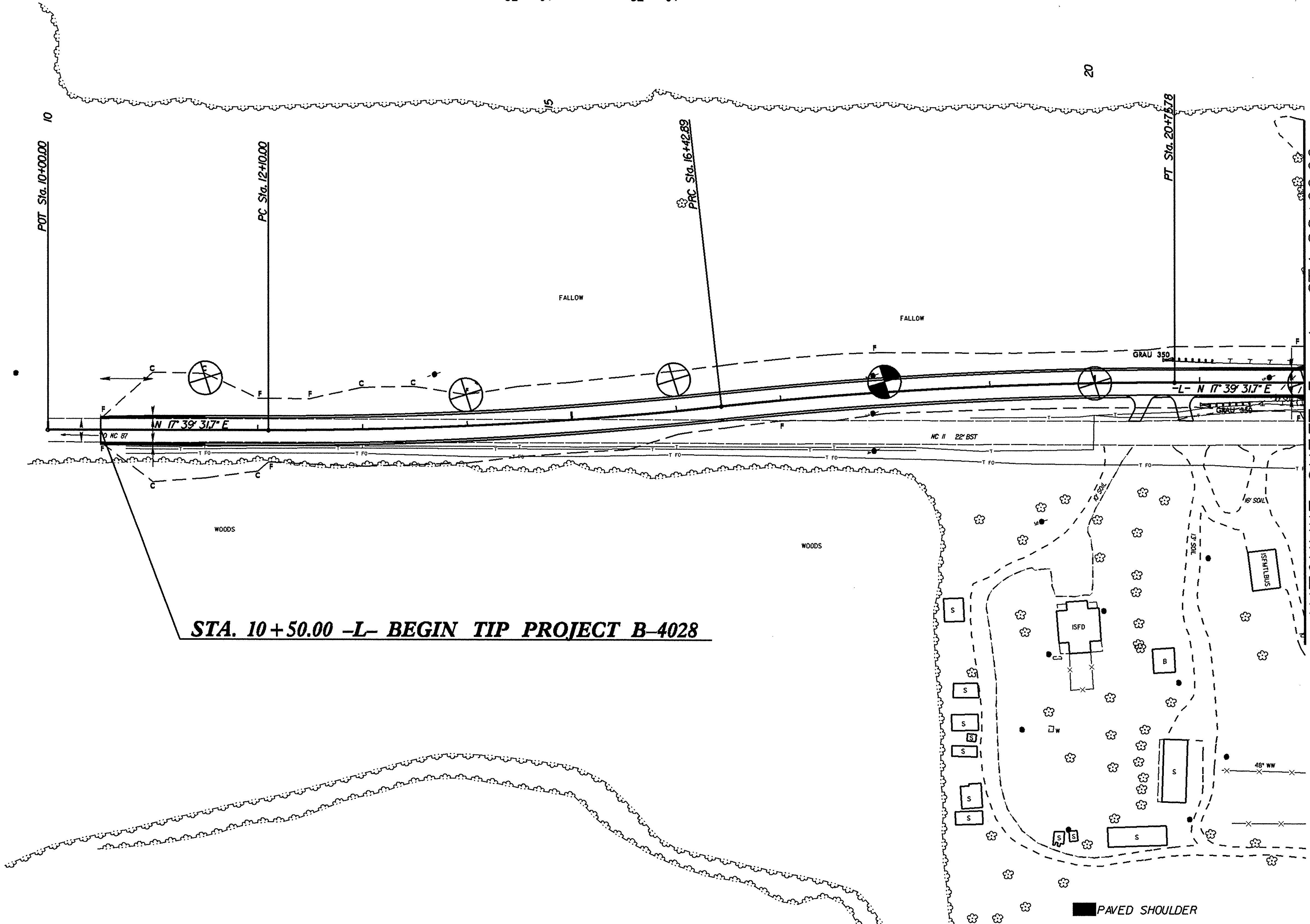
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

PI Sta 14+26.67	PI Sta 18+59.56
Δ = 6° 21' 34.8" (LT)	Δ = 6° 21' 34.8" (RT)
D = 1° 28' 08.8"	D = 1° 28' 08.8"
L = 432.89'	L = 432.89'
T = 216.67'	T = 216.67'
R = 3,900.00'	R = 3,900.00'
SE = .04	SE = .04



REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
B-4028	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/17/99

NAD 83

-L- STA. 22+00.00

-L- STA. 36+00.00

MATCHLINE SHEET 4 -L-

MATCHLINE SHEET 6 -L-

-L- N 17° 39' 31.7" E

25

30

35

WOODS

WOODS

WOODS

INV=45.55
12" RCP

INV=49.35

8" SOIL

BRIDGE #12 CONC

INV=49.44
12" RCP

SEAT ELEV=47.46'

INV=43.68

SEAT ELEV=26.37'

NOTE: COULDN'T LOCATE FIBER OPTIC LINES ACCURATELY DUE TO FLOODING ON PROJECT. TWO FIBER OPTIC LINES RUN FULL LENGTH OF PROJECT NEAR TOE OF SLOPE.

STEPS

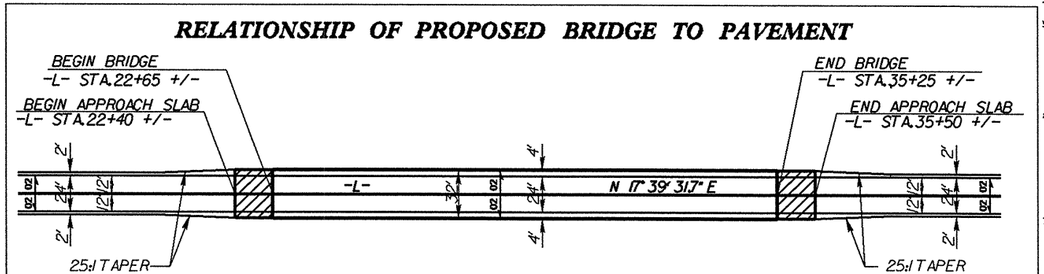
CONC. POND

ISBKD

WD DOCK

CAPE FEAR RIVER

RELATIONSHIP OF PROPOSED BRIDGE TO PAVEMENT



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dsumner

PROJECT REFERENCE NO.	SHEET NO.
B-4028	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

MATCHLINE SHEET 5 -L- STA. 36+00.00

MATCHLINE SHEET 7 -L- STA. 50+00.00

APPROXIMATE LIMITS OF ORGANIC DEPOSITS

APPROXIMATE LIMITS OF ORGANIC DEPOSITS

WOODS

POND

POND

VST

VST

GRAVEL

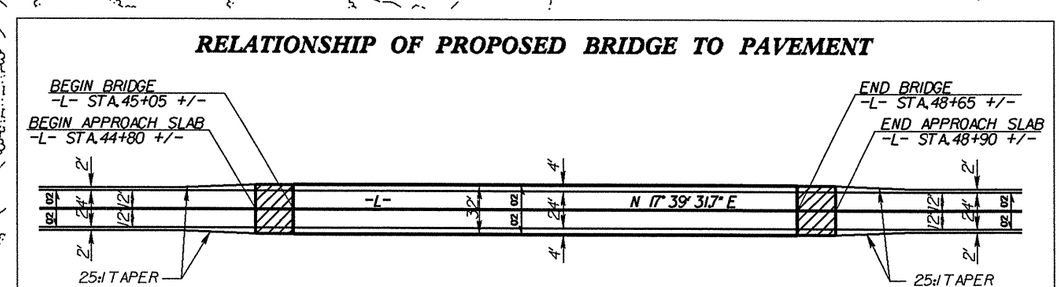
GRAVEL

N 11° 39' 31.7" E

NC 11 22' BST

BRIDGE = 18 CONC.

RELATIONSHIP OF PROPOSED BRIDGE TO PAVEMENT



REVISIONS

8/17/99

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jsumner

PROJECT REFERENCE NO.	SHEET NO.
B-4028	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/17/99

-L-
PI Sta 67+15.07
Δ = 31° 31' 02.5" (RT)
D = 2° 17' 30.6"
L = 1,375.20'
T = 705.48'
R = 2,500.00'
SE = 05

PC Sta. 60+09.59

-L- STA. 50+00.00

-L- STA. 64+00.00

MATCHLINE SHEET 6 -L-

MATCHLINE SHEET 8 -L-

APPROXIMATE LIMITS OF ORGANIC DEPOSITS

WOODS

POND

GATE

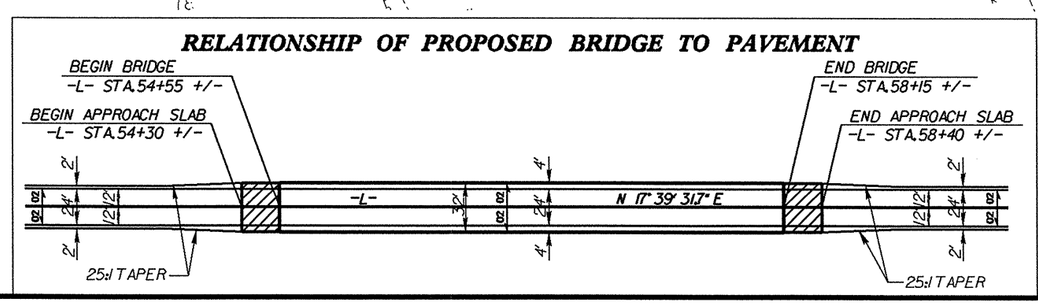
-L- N 11° 39' 31.7" E

NC 11 22' BST

55

60

RELATIONSHIP OF PROPOSED BRIDGE TO PAVEMENT



PROJECT REFERENCE NO.	SHEET NO.
B-4028	8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS

-L-
PI Sta 67+15.07
Δ = 31° 31' 02.5" (RT)
D = 2° 17' 30.6"
L = 1,375.20'
T = 705.48'
R = 2,500.00'
SE = 05

NAD 83

65

70

75

-L- STA. 64+00.00

APPROXIMATE LIMITS OF ORGANIC DEPOSITS

PT Sta 73+84.80

GRAD 350

GATE

N 49° 10' 34" E

NC II 22' BSF

WOODS

MATCHLINE SHEET 7

STA. 77+00.00 -L- END TIP PROJECT B-4028

POT Sta 77+36.98

PAVED SHOULDER

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PROJECT REFERENCE NO.	SHEET NO.
B-4028	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

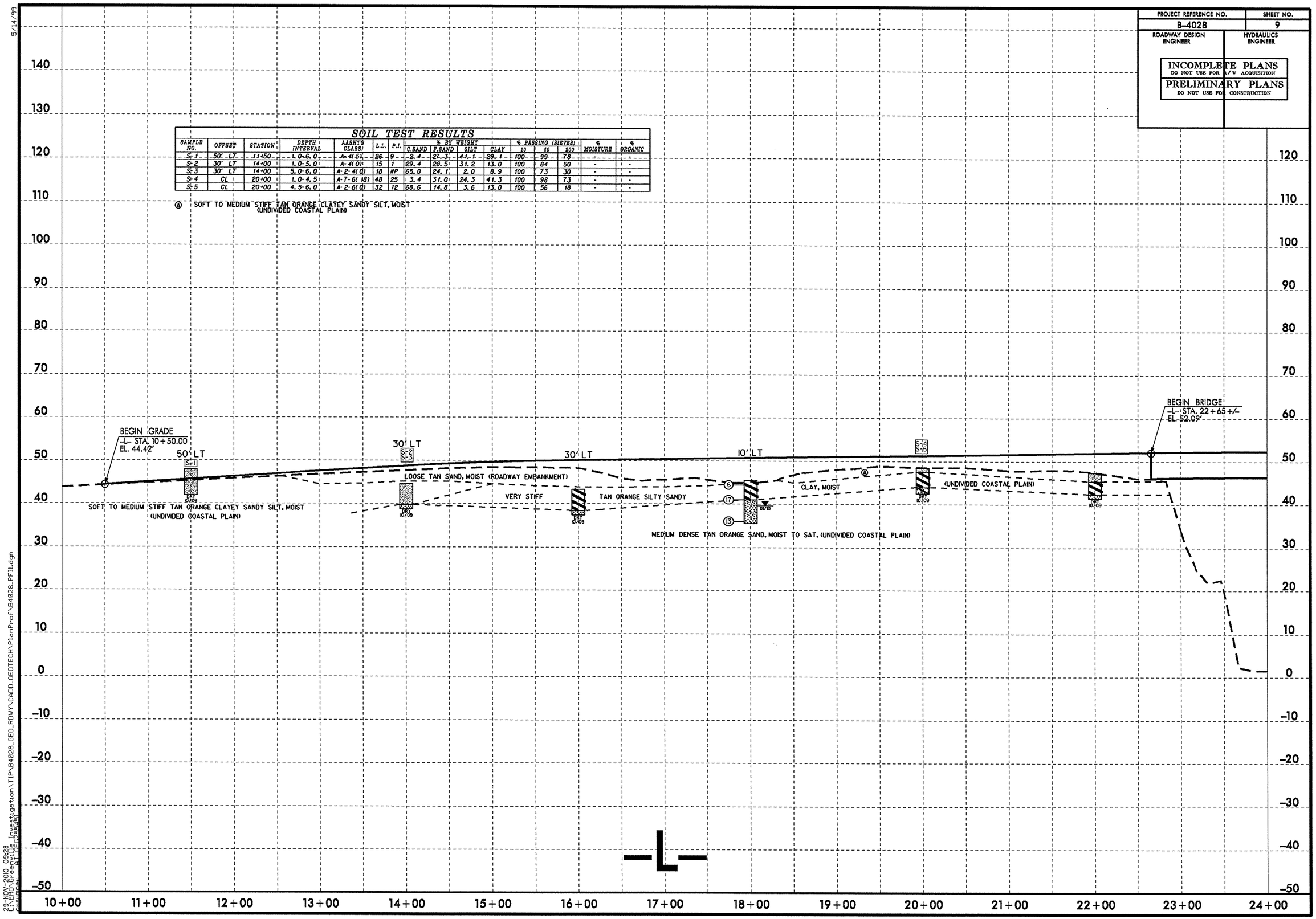
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS!	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-1	50' LT	11+50	1.0-6.0	A-4(5)	26	9	2.4	27.3	41.1	29.1	100	99	78	-	-
S-2	30' LT	14+00	1.0-5.0	A-4(0)	15	1	29.4	26.5	31.2	13.0	100	84	50	-	-
S-3	30' LT	14+00	5.0-6.0	A-2-4(0)	18	NP	65.0	24.1	2.0	8.9	100	73	30	-	-
S-4	CL	20+00	1.0-4.5	A-7-6(18)	48	25	3.4	31.0	24.3	41.3	100	98	73	-	-
S-5	CL	20+00	4.5-6.0	A-2-6(0)	32	12	68.6	14.8	3.6	13.0	100	56	18	-	-

Ⓐ SOFT TO MEDIUM STIFF TAN ORANGE CLAYEY SANDY SILT, MOIST (UNDIVIDED COASTAL PLAIN)



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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4028	10

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-5	70 LT	35+50	1.0- 4.5	A-7-6(31)	55	28	1.8	3.0	49.1	46.1	100	99	96	-	-
SS-6	70 LT	35+50	13.8- 15.3	A-6(3)	28	12	11.6	39.1	23.2	26.1	100	100	54	-	-
SS-7	70 LT	35+50	23.8- 25.3	A-1-b(0)	22	NP	84.4	10.2	3.4	2.0	100	45	6	-	-

Ⓐ DENSE TAN SAND, MOIST, AND STIFF TAN ORANGE SANDY CLAY, WET (ROADWAY EMBANKMENT)

END BRIDGE
-L- STA. 35+25+/-
EL. 31.56'

70' LT

8' LT

WOH
5
WOH
2
7
21
8

ST-4 10/09
ST-1
1/10

VERY SOFT TO MEDIUM STIFF TAN ORANGE SILTY CLAY AND SILTY SANDY CLAY, MOIST TO WET (ALLUVIAL)

LOOSE TO MEDIUM DENSE GRAY SAND, SAT. (PEEDEE FORMATION)

VANE SHEAR TESTS

STATION	OFFSET	DEPTH	S (psf)
36+50	60' LT	0.5	42
36+50	60' LT	1.0	NR
36+50	60' LT	1.5	NR
36+50	60' LT	2.0	42
36+50	60' LT	2.5	418
36+50	60' LT	3.0	230
36+50	60' LT	3.5	188
36+50	60' LT	4.0	626
36+50	60' LT	4.5	898
36+50	60' LT	5.0	814
36+50	60' LT	5.5	960

VANE SHEAR TESTS

STATION	OFFSET	DEPTH	S (psf)
37+50	60' LT	0.5	63
37+50	60' LT	1.0	376
37+50	60' LT	1.5	376
37+50	60' LT	2.0	626
37+50	60' LT	2.5	522
37+50	60' LT	3.0	626
37+50	60' LT	3.5	668
37+50	60' LT	4.0	793
37+50	60' LT	4.5	1002
37+50	60' LT	5.0	1002

-L-

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

24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00 37+00 38+00

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preliminary 81 (DEVELOPED)

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4028	11

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

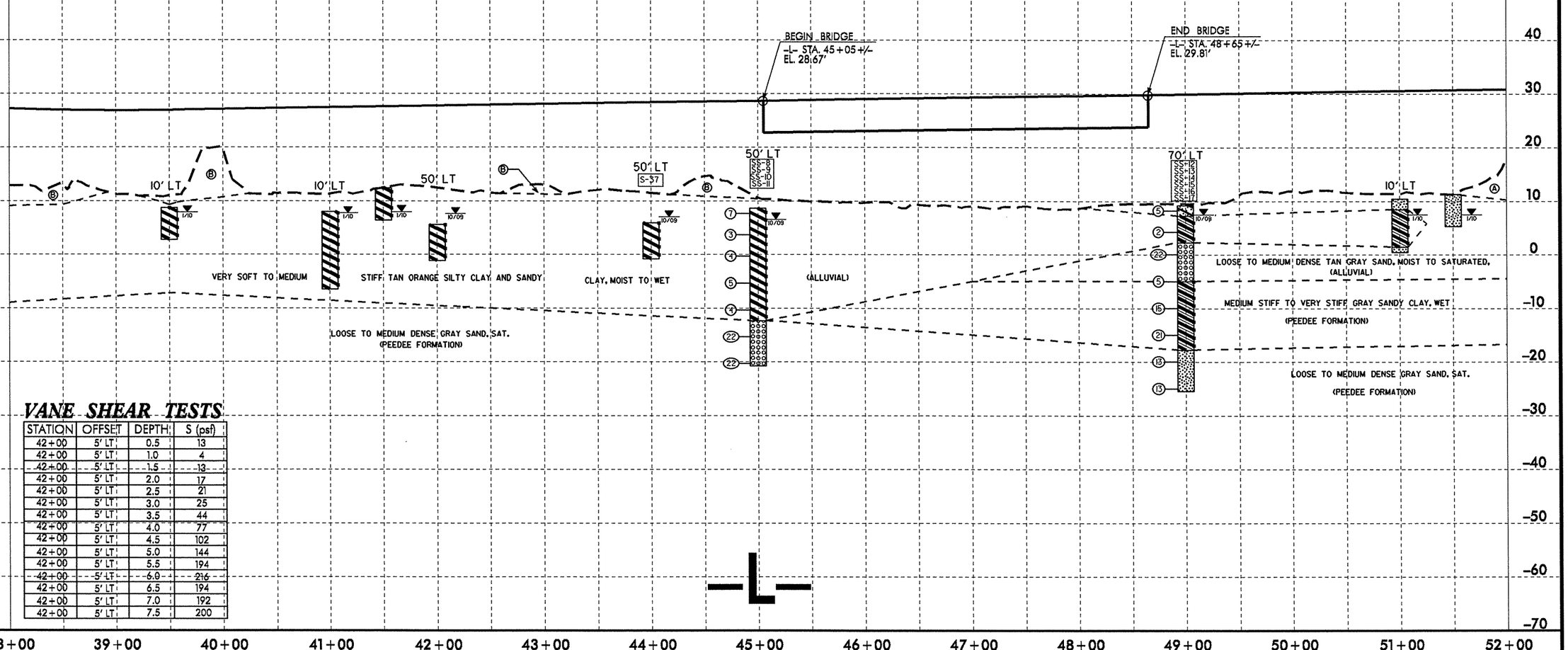
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-37	50 LT	44+00	1.0-6.8	A-7-6(21)	43	21	4.8	7.1	35.7	52.4	100	97	92	-	-
SS-8	50 LT	45+00	1.0-1.5	A-7-6(12)	45	21	32.3	6.0	17.3	44.4	100	79	63	-	-
SS-9	50 LT	45+00	8.0-9.5	A-7-6(24)	48	25	8.7	5.4	33.5	52.4	100	94	88	-	-
SS-10	50 LT	45+00	18.0-19.5	A-7-6(42)	66	39	0.4	9.3	23.8	66.5	100	100	93	-	-
SS-11	50 LT	45+00	23.0-24.5	A-1-b(0)	20	NP	81.8	12.7	2.5	3.0	98	49	6	-	-
SS-12	70 LT	49+00	1.0-1.5	A-2-6(1)	32	15	66.5	7.2	4.1	22.2	92	50	25	-	-
SS-13	70 LT	49+00	4.0-5.5	A-6(4)	32	16	40.9	11.7	9.1	38.3	100	84	48	-	-
SS-14	70 LT	49+00	8.2-9.7	A-1-b(0)	23	NP	86.2	10.6	2.2	1.0	100	48	4	-	-
SS-15	70 LT	49+00	18.2-19.7	A-6(3)	31	18	24.0	38.1	9.7	28.2	98	88	39	-	-
SS-16	70 LT	49+00	28.2-29.7	A-2-4(0)	26	10	22.9	47.9	8.1	21.2	100	96	33	-	-
SS-17	70 LT	49+00	33.2-34.7	A-2-4(0)	26	NP	5.5	76.1	4.2	14.1	100	98	23	-	-

Ⓐ DENSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

Ⓑ DENSE TAN SAND, MOIST, AND STIFF TAN ORANGE SANDY CLAY, WET (ROADWAY EMBANKMENT)



VANE SHEAR TESTS

STATION	OFFSET	DEPTH	S (psf)
42+00	5' LT	0.5	13
42+00	5' LT	1.0	4
42+00	5' LT	1.5	13
42+00	5' LT	2.0	17
42+00	5' LT	2.5	21
42+00	5' LT	3.0	25
42+00	5' LT	3.5	44
42+00	5' LT	4.0	77
42+00	5' LT	4.5	102
42+00	5' LT	5.0	144
42+00	5' LT	5.5	194
42+00	5' LT	6.0	216
42+00	5' LT	6.5	194
42+00	5' LT	7.0	192
42+00	5' LT	7.5	200

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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4028	12

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

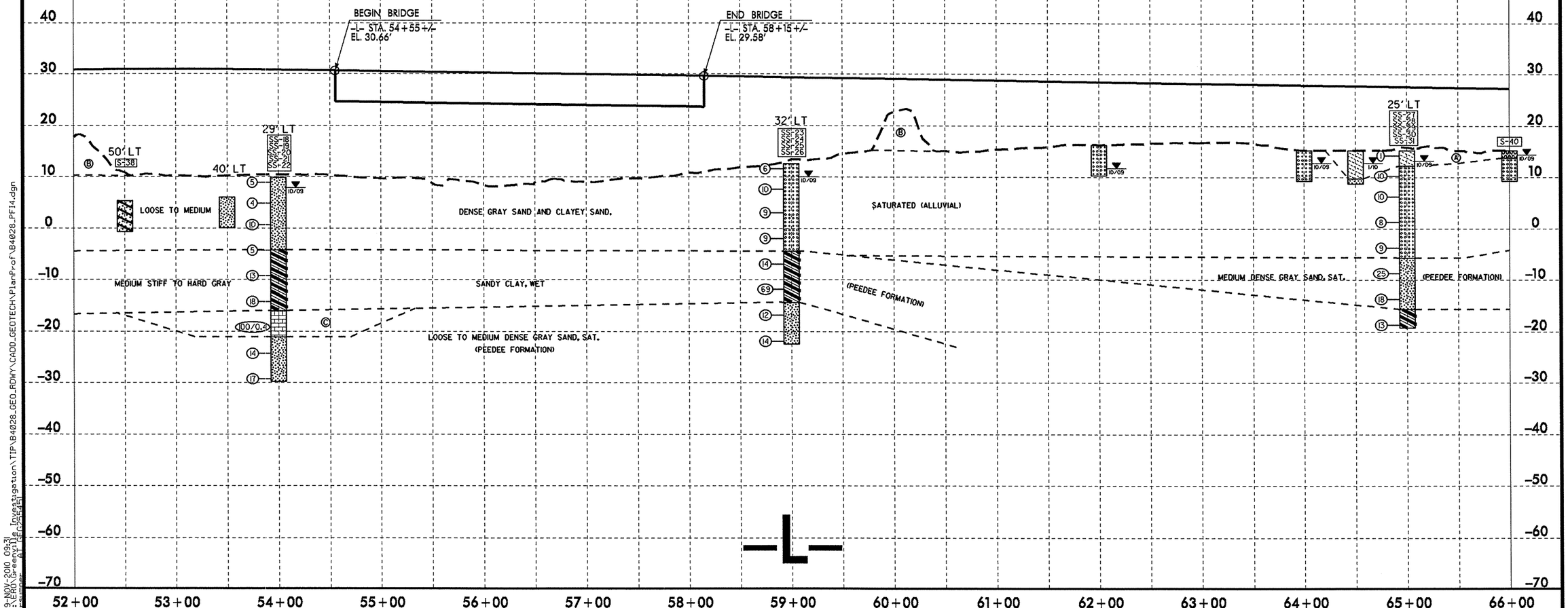
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) #10	#40	#200	% MOISTURE	% ORGANIC
S-38	50 LT	52+50	1.0-6.0	A-2-6(1)	34	16	68.3	4.9	3.5	23.2	99	55	27	-	-
SS-18	29 LT	54+00	1.0-1.5	A-2-4(0)	20	3	70.8	11.1	2.0	16.1	100	69	18	-	-
SS-19	29 LT	54+00	8.2-9.7	A-3(0)	24	NP	83.4	14.9	0.7	1.0	100	68	2	-	-
SS-20	29 LT	54+00	18.2-19.7	A-6(5)	36	20	19.4	36.1	10.3	34.3	100	93	47	-	-
SS-21	29 LT	54+00	28.2-29.7	A-4(0)	23	7	22.8	40.9	14.1	22.2	96	88	38	-	-
SS-22	29 LT	54+00	38.2-39.7	A-2-4(0)	26	2	1.5	75.9	5.4	17.1	100	99	31	-	-
SS-23	32 LT	59+00	1.0-1.5	A-3(0)	20	NP	84.6	6.4	0.0	9.0	100	57	10	-	-
SS-24	32 LT	59+00	8.5-10.0	A-3(0)	21	NP	92.0	6.0	0.0	2.0	100	56	2	-	-
SS-25	32 LT	59+00	18.5-20.0	A-6(1)	28	13	27.4	38.5	7.9	26.2	100	89	36	-	-
SS-26	32 LT	59+00	28.5-29.0	A-2-4(0)	23	3	24.4	57.4	4.1	14.1	95	83	20	-	-
SS-27	25 LT	65+00	1.0-1.5	A-2-4(0)	28	NP	75.5	9.2	5.2	10.1	100	62	16	-	-
SS-28	25 LT	65+00	4.0-5.5	A-3(0)	24	NP	85.6	11.3	0.1	3.0	100	62	3	-	-
SS-29	25 LT	65+00	13.0-14.5	A-3(0)	24	NP	87.3	11.6	0.9	0.0	97	53	1	-	-
SS-30	25 LT	65+00	23.0-24.5	A-2-4(0)	26	10	31.7	38.9	7.3	22.2	96	87	31	-	-
SS-31	25 LT	65+00	33.0-34.5	A-6(3)	37	16	2.2	64.3	8.3	25.2	100	99	43	-	-
S-40	CL	66+00	1.0-1.5	A-2-5(0)	62	NP	63.5	7.7	15.7	13.1	99	67	29	116.2	12.5

(A) VERY LOOSE BROWN SAND WITH LITTLE ORGANIC MATTER, MOIST TO SAT. AND VERY LOOSE MUCK, MOIST TO SAT (ALLUVIAL)

(B) DENSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

(C) MODERATELY HARD LIMESTONE (PEE DEE FORMATION)



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PROJECT REFERENCE NO.	SHEET NO.
B-4028	13

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

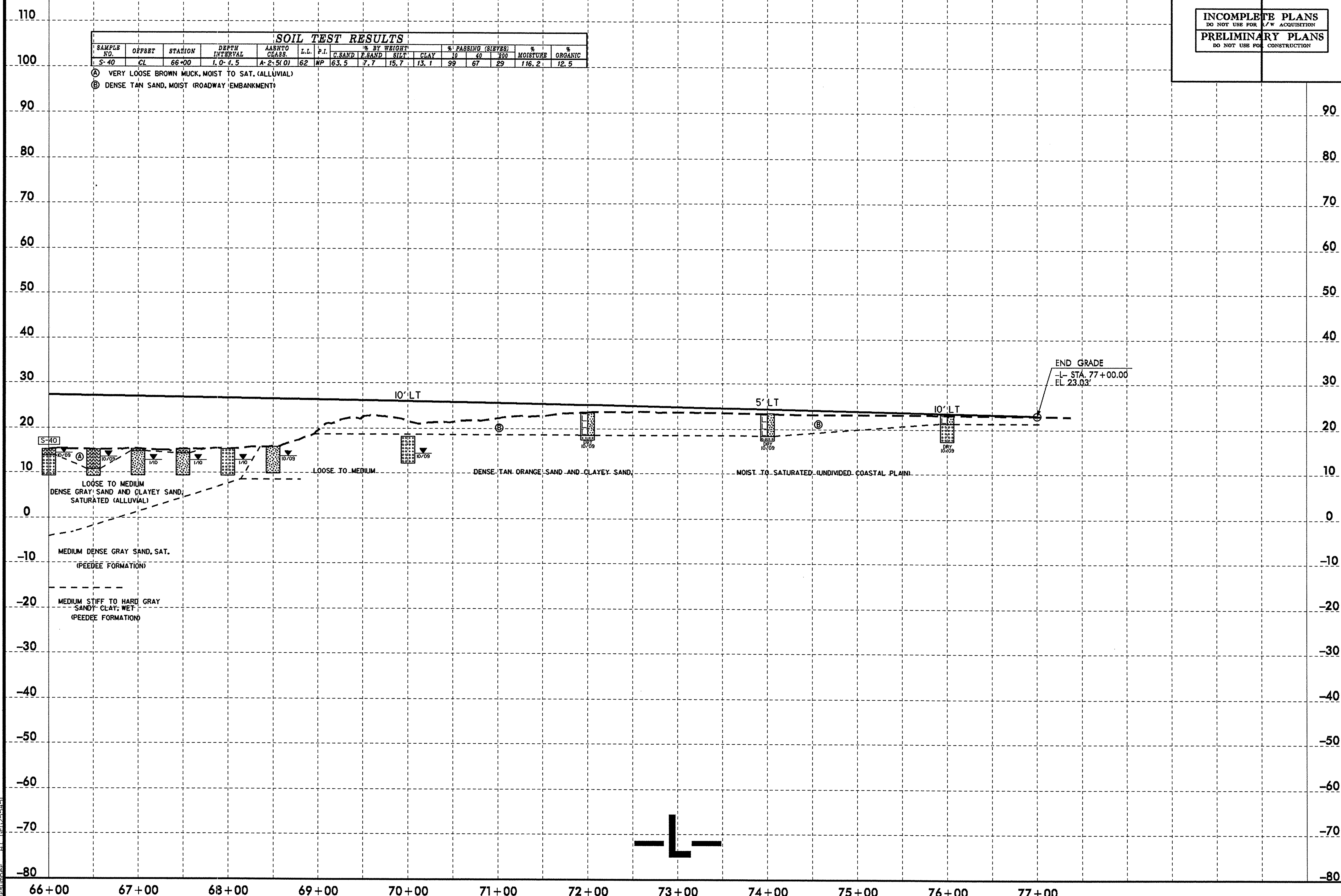
5/14/99

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-40	CL	66+00	1.0-4.5	A-2-5(0)	62	NP	63.5	7.7	15.7	13.1	99	67	29	116.2	12.5

Ⓐ VERY LOOSE BROWN MUCK, MOIST TO SAT. (ALLUVIAL)

Ⓑ DENSE TAN SAND, MOIST (ROADWAY EMBANKMENT)



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	B-4028	14

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

50 40 30

Ⓐ LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

SOFT TO MEDIUM STIFF TAN ORANGE CLAYEY SANDY SILT, MOIST (UNDIVIDED COASTAL PLAIN)

VERY STIFF TAN ORANGE SILTY SANDY CLAY, MOIST (UNDIVIDED COASTAL PLAIN)

MEDIUM DENSE TAN ORANGE SAND, MOIST TO SAT. (UNDIVIDED COASTAL PLAIN)

18+50.00

50 40 30

SOFT TO MEDIUM STIFF TAN ORANGE CLAYEY SANDY SILT, MOIST
(UNDIVIDED COASTAL PLAIN)

12+50.00

40 30

SOFT TO MEDIUM STIFF TAN ORANGE CLAYEY SANDY SILT, MOIST
(UNDIVIDED COASTAL PLAIN)

12+00.00

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) #10	#40	#200	% MOISTURE	% ORGANIC
S-1	50' Lt	11+50	1.0-6.0	A-4(5)	26	9	2.4	27.3	41.1	29.1	100	99	78	-	-

50 40 30

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SOFT TO MEDIUM STIFF TAN ORANGE CLAYEY SANDY SILT, MOIST
(UNDIVIDED COASTAL PLAIN)

11+50.00

50 40 30

SOFT TO MEDIUM STIFF TAN ORANGE CLAYEY SANDY SILT, MOIST
(UNDIVIDED COASTAL PLAIN)

11+00.00

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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4028	15

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60 50 40 70 60 50 40 30 50 40 30 50 40 30

Ⓐ LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)
Ⓑ SOFT TO MEDIUM STIFF TAN ORANGE CLAYEY SANDY SILT, MOIST (UNDIVIDED COASTAL PLAIN)

VERY STIFF TAN ORANGE SILTY SANDY CLAY, MOIST (UNDIVIDED COASTAL PLAIN)

MEDIUM DENSE TAN ORANGE SAND, MOIST TO SAT. (UNDIVIDED COASTAL PLAIN)

20+50.00

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-4	CL	20+00	1.0-4.5	A-7-6(18)	48	25	3.4	31.0	24.3	41.3	100	98	73	-	-
S-5	CL	20+00	4.5-6.0	A-2-6(0)	32	12	68.6	14.8	3.6	13.0	100	56	18	-	-

Ⓐ LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)
Ⓑ SOFT TO MEDIUM STIFF TAN ORANGE CLAYEY SANDY SILT, MOIST (UNDIVIDED COASTAL PLAIN)

S-4 S-5 DRY KD/09

VERY STIFF TAN ORANGE SILTY SANDY CLAY, MOIST (UNDIVIDED COASTAL PLAIN)

MEDIUM DENSE TAN ORANGE SAND, MOIST TO SAT. (UNDIVIDED COASTAL PLAIN)

20+00.00

Ⓐ LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

SOFT TO MEDIUM STIFF TAN ORANGE CLAYEY SANDY SILT, MOIST

VERY STIFF TAN ORANGE SILTY SANDY CLAY, MOIST (UNDIVIDED COASTAL PLAIN)

MEDIUM DENSE TAN ORANGE SAND, MOIST TO SAT. (UNDIVIDED COASTAL PLAIN)

19+50.00

Ⓐ LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

SOFT TO MEDIUM STIFF TAN ORANGE CLAYEY SANDY SILT, MOIST

VERY STIFF TAN ORANGE SILTY SANDY CLAY, MOIST (UNDIVIDED COASTAL PLAIN)

MEDIUM DENSE TAN ORANGE SAND, MOIST TO SAT. (UNDIVIDED COASTAL PLAIN)

19+00.00

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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4028	16

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-6	60' LT	36+50	1.0-6.0	A-7-5(30)	62	28	8.5	6.1	52.2	33.2	100	93	88	41.5	10.4

VANE SHEAR TESTS

STATION	OFFSET	DEPTH	S (psf)
36+50	60' LT.	0.5	42
36+50	60' LT.	1.0	NR
36+50	60' LT.	1.5	NR
36+50	60' LT.	2.0	42
36+50	60' LT.	2.5	418
36+50	60' LT.	3.0	230
36+50	60' LT.	3.5	188
36+50	60' LT.	4.0	626
36+50	60' LT.	4.5	898
36+50	60' LT.	5.0	814
36+50	60' LT.	5.5	960

Ⓐ VERY SOFT GRAY SILTY CLAY WITH LITTLE ORGANIC MATTER, WET (ALLUVIAL)

DENSE TAN SAND, MOIST AND STIFF TAN ORANGE SANDY CLAY, WET (ROADWAY EMBANKMENT)

WATER SURFACE

S-6

VERY SOFT TO MEDIUM STIFF TAN ORANGE SILTY CLAY AND SILTY SANDY CLAY, MOIST TO WET (ALLUVIAL)

LOOSE TO MEDIUM DENSE GRAY SAND, SAT. (PEEDEE FORMATION)

36+50.00

Ⓐ LOOSE TAN SAND, MOIST TO SAT. (ARTIFICIAL FILL)

DENSE TAN SAND, MOIST AND STIFF TAN ORANGE SANDY CLAY, WET (ROADWAY EMBANKMENT)

WATER SURFACE

VERY SOFT TO MEDIUM STIFF TAN ORANGE SILTY CLAY AND SILTY SANDY CLAY, MOIST TO WET (ALLUVIAL)

LOOSE TO MEDIUM DENSE GRAY SAND, SAT. (PEEDEE FORMATION)

36+00.00

Ⓐ LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)
Ⓑ SOFT TO MEDIUM STIFF TAN ORANGE CLAYEY SANDY SILT, MOIST (UNDIVIDED COASTAL PLAIN)

VERY STIFF TAN ORANGE SILTY SANDY CLAY, MOIST (UNDIVIDED COASTAL PLAIN)

MEDIUM DENSE TAN ORANGE SAND, MOIST TO SAT. (UNDIVIDED COASTAL PLAIN)

21+50.00

Ⓐ LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)
Ⓑ SOFT TO MEDIUM STIFF TAN ORANGE CLAYEY SANDY SILT, MOIST (UNDIVIDED COASTAL PLAIN)

VERY STIFF TAN ORANGE SILTY SANDY CLAY, MOIST (UNDIVIDED COASTAL PLAIN)

MEDIUM DENSE TAN ORANGE SAND, MOIST TO SAT. (UNDIVIDED COASTAL PLAIN)

21+00.00

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Ⓐ VERY SOFT GRAY SILTY CLAY WITH LITTLE ORGANIC MATTER, WET (ALLUVIAL)

DENSE TAN SAND, MOIST AND STIFF TAN ORANGE SANDY CLAY, WET (ROADWAY EMBANKMENT)

WATER SURFACE

Ⓐ

VERY SOFT TO MEDIUM STIFF TAN ORANGE SILTY CLAY AND SILTY SANDY CLAY, MOIST TO WET (ALLUVIAL)

LOOSE TO MEDIUM DENSE GRAY SAND, SAT. (PEEDEE FORMATION)

38+00.00

VANE SHEAR TESTS

STATION	OFFSET	DEPTH	S (psf)
37+50	60' LT	0.5	63
37+50	60' LT	1.0	376
37+50	60' LT	1.5	376
37+50	60' LT	2.0	626
37+50	60' LT	2.5	522
37+50	60' LT	3.0	626
37+50	60' LT	3.5	668
37+50	60' LT	4.0	793
37+50	60' LT	4.5	1002
37+50	60' LT	5.0	1002

Ⓐ VERY SOFT GRAY SILTY CLAY WITH LITTLE ORGANIC MATTER, WET (ALLUVIAL)

Ⓒ SOFT, TAN SANDY CLAYEY SILT, MOIST (ALLUVIAL)

DENSE TAN SAND, MOIST AND STIFF TAN ORANGE SANDY CLAY, WET (ROADWAY EMBANKMENT)

WATER SURFACE

Ⓐ

VERY SOFT TO MEDIUM STIFF TAN ORANGE SILTY CLAY AND SILTY SANDY CLAY, MOIST TO WET (ALLUVIAL)

LOOSE TO MEDIUM DENSE GRAY SAND, SAT. (PEEDEE FORMATION)

37+50.00

Ⓐ VERY SOFT GRAY SILTY CLAY WITH LITTLE ORGANIC MATTER, WET (UNDIVIDED COASTAL PLAIN)

DENSE TAN SAND, MOIST AND STIFF TAN ORANGE SANDY CLAY, WET (ROADWAY EMBANKMENT)

WATER SURFACE

Ⓐ

VERY SOFT TO MEDIUM STIFF TAN ORANGE SILTY CLAY AND SILTY SANDY CLAY, MOIST TO WET (ALLUVIAL)

LOOSE TO MEDIUM DENSE GRAY SAND, SAT. (PEEDEE FORMATION)

37+00.00

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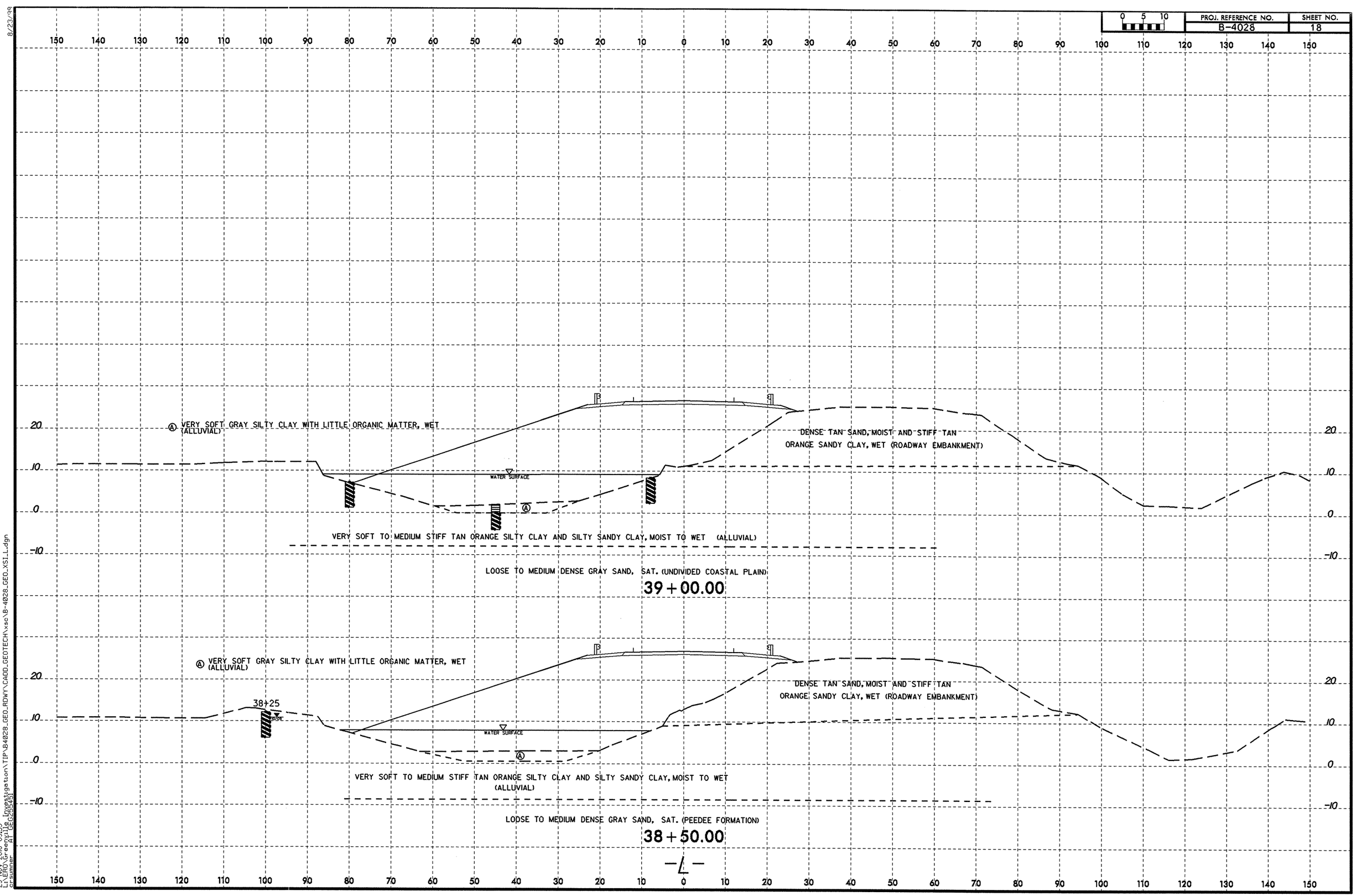

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AT GEOPAK

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4028	19

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

30 20 10 0 -10

Ⓑ DENSE TAN SAND WITH CLAY LAYERS, MOIST (ARTIFICIAL FILL)

DENSE TAN SAND, MOIST AND STIFF TAN ORANGE SANDY CLAY, WET (ROADWAY EMBANKMENT)

VERY SOFT TO MEDIUM STIFF TAN ORANGE SILTY CLAY AND SILTY SANDY CLAY, MOIST TO WET (ALLUVIAL)

LOOSE TO MEDIUM DENSE GRAY SAND, SAT. (PEEDEE FORMATION)

40+00.00

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-1	82 LT	39+50	8.5-10.0	A-7-5(23)	52	22	17.2	5.8	42.9	44.1	100	95	89	-	-
SS-2	82 LT	39+50	8.5-10.0	A-7-6(28)	51	27	1.6	8.0	48.3	42.1	100	99	94	-	-
SS-3	82 LT	39+50	18.5-20.0	A-2-4(0)	24	NP	18.1	65.1	7.7	9.0	100	100	19	-	-
SS-4	82 LT	39+50	28.5-30.0	A-3(0)	25	NP	59.1	36.2	2.7	2.0	100	96	6	-	-

40 30 20 10 0 -10 -20

Ⓐ VERY SOFT GRAY SILTY CLAY WITH LITTLE ORGANIC MATTER, WET (ALLUVIAL)

SS-1 SS-2 SS-3 SS-4

ST-3 ST-2

WATER SURFACE

DENSE TAN SAND, MOIST AND STIFF TAN ORANGE SANDY CLAY, WET (ROADWAY EMBANKMENT)

SOFT TO MEDIUM STIFF

TAN ORANGE SILTY CLAY, MOIST TO WET (ALLUVIAL)

LOOSE TO MEDIUM DENSE GRAY SAND, SATURATED (UNDIVIDED COASTAL PLAIN)

39+50.00

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PROJ. REFERENCE NO.	SHEET NO.
B-4028	20

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30 20 10 0 -10

Ⓐ VERY SOFT GRAY SILTY CLAY WITH LITTLE ORGANIC MATTER, WET (ALLUVIAL)

DENSE TAN SAND, MOIST AND STIFF TAN ORANGE SANDY CLAY, WET (ROADWAY EMBANKMENT)

WATER SURFACE

Ⓐ

VERY SOFT TO MEDIUM STIFF TAN ORANGE SILTY CLAY AND SILTY SANDY CLAY, MOIST TO WET (ALLUVIAL)

LOOSE TO MEDIUM DENSE GRAY SAND, SAT. (PEEDEE FORMATION)

41+50.00

Ⓐ VERY SOFT GRAY SILTY CLAY WITH LITTLE ORGANIC MATTER, WET (ALLUVIAL)

DENSE TAN SAND, MOIST AND STIFF TAN ORANGE SANDY CLAY, WET (ROADWAY EMBANKMENT)

WATER SURFACE

Ⓐ

VERY SOFT TO MEDIUM STIFF TAN ORANGE SILTY CLAY AND SILTY SANDY CLAY, MOIST TO WET (ALLUVIAL)

LOOSE TO MEDIUM DENSE GRAY SAND, SAT. (PEEDEE FORMATION)

41+00.00

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
S-36	50 LT	40+50	1.0-6.0	A-7-5(40)	65	33	0.6	1.4	33.5	64.5	100	100	99	126.6	9.7

Ⓐ VERY SOFT GRAY SILTY CLAY WITH LITTLE ORGANIC MATTER, WET (ALLUVIAL)

Ⓒ SOFT TAN SANDY CLAYEY SILT, MOIST (ALLUVIAL)

DENSE TAN SAND, MOIST AND STIFF TAN ORANGE SANDY CLAY, WET (ROADWAY EMBANKMENT)

WATER SURFACE

S-36

Ⓐ

VERY SOFT TO MEDIUM STIFF TAN ORANGE SILTY CLAY AND SILTY SANDY CLAY, MOIST TO WET (ALLUVIAL)

LOOSE TO MEDIUM DENSE GRAY SAND, SAT. (PEEDEE FORMATION)

40+50.00

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8/23/05

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DENSE TAN SAND, MOIST
(ROADWAY EMBANKMENT)

SOFT GRAY SANDY CLAY, MOIST TO WET (ALLUVIAL)

LOOSE TAN GRAY SAND, MOIST TO SAT. (ALLUVIAL)

MEDIUM STIFF TO VERY STIFF GRAY SANDY CLAY, WET (PEEDEE FORMATION)

LOOSE TO MEDIUM DENSE GRAY SAND, SAT. (PEE DEE FORMATION)

51+00.00

VANE SHEAR TESTS

STATION	OFFSET	DEPTH	S (psf)
42+00	5' LT	0.5	13
42+00	5' LT	1.0	4
42+00	5' LT	1.5	13
42+00	5' LT	2.0	17
42+00	5' LT	2.5	21
42+00	5' LT	3.0	25
42+00	5' LT	3.5	44
42+00	5' LT	4.0	77
42+00	5' LT	4.5	102
42+00	5' LT	5.0	144
42+00	5' LT	5.5	194
42+00	5' LT	6.0	216
42+00	5' LT	6.5	194
42+00	5' LT	7.0	192
42+00	5' LT	7.5	200

DENSE TAN SAND, MOIST AND STIFF TAN ORANGE SANDY CLAY, WET (ROADWAY EMBANKMENT)

WATER SURFACE

VERY SOFT TO MEDIUM STIFF TAN ORANGE SILTY CLAY AND SILTY SANDY CLAY, MOIST TO WET (ALLUVIAL)

LOOSE TO MEDIUM DENSE GRAY SAND, SAT. (PEEDEE FORMATION)

42+00.00

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AT GEO255(5)

8/23/99

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	B-4028	22

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

30 20 10 0 -10 -20

DENSE TAN SAND, MOIST
(ROADWAY EMBANKMENT)

LOOSE TAN GRAY SAND, MOIST TO SAT. (ALLUVIAL)

MEDIUM STIFF TO VERY STIFF GRAY SANDY CLAY, WET (PEEDEE FORMATION).

LOOSE TO MEDIUM DENSE GRAY SAND, SAT. (PEEDEE FORMATION)

52+00.00

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-39	40' LT	51+50	1.0-2.5	A-7-5(20)	64	16	21.6	14.3	21.8	42.3	100	86	68	512.9	30.6

30 20 10 0 -10 -20

Ⓐ VERY SOFT MUCK, MOIST TO SAT. (ALLUVIAL)

DENSE TAN SAND, MOIST
(ROADWAY EMBANKMENT)

S-39

LOOSE TAN GRAY SAND, MOIST TO SAT. (ALLUVIAL)

MEDIUM STIFF TO VERY STIFF GRAY SANDY CLAY, WET (PEEDEE FORMATION).

LOOSE TO MEDIUM DENSE GRAY SAND, SAT (PEEDEE FORMATION)

51+50.00

—L—

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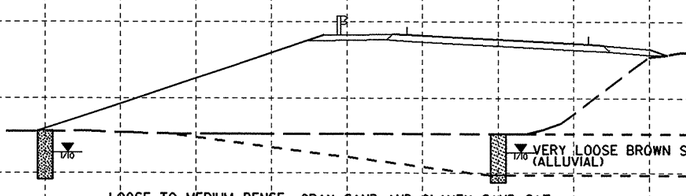
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4028	23

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

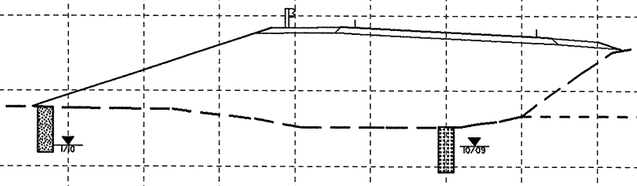
30 20 10 0 -10 -20



MEDIUM DENSE GRAY SAND, SAT. (PEEDEE FORMATION)

MEDIUM STIFF TO HARD GRAY SANDY CLAY, WET (PEEDEE FORMATION)

64 + 50.00



MEDIUM DENSE GRAY SAND, SAT. (PEEDEE FORMATION)

MEDIUM STIFF TO HARD GRAY SANDY CLAY, WET (PEEDEE FORMATION)

64 + 00.00

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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4028	24

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

30 20 10 0 -10 -20

Ⓐ VERY LOOSE BROWN MUCK MOIST TO SAT. (ALLUVIAL)

DENSE TAN SAND, MOIST
(ROADWAY EMBANKMENT)

LOOSE TO MEDIUM DENSE GRAY SAND AND CLAYEY SAND, SAT
(ALLUVIAL)

MEDIUM DENSE GRAY SAND SAT. (PEEDEE FORMATION)

MEDIUM STIFF TO HARD GRAY SANDY CLAY, WET (PEEDEE FORMATION)

65+50.00

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-27	25 LT	65+00	1.0-1.5	A-2-4(0)	28	NP	75.5	9.2	5.2	10.1	100	62	16	-	3.6
SS-28	25 LT	65+00	4.0-5.5	A-3(0)	24	NP	85.6	11.3	0.1	3.0	100	62	3	-	-
SS-29	25 LT	65+00	13.0-14.5	A-3(0)	24	NP	87.3	11.8	0.9	0.0	97	53	1	-	-
SS-30	25 LT	65+00	23.0-24.5	A-2-4(0)	26	10	31.7	38.9	7.3	22.2	96	87	31	-	-
SS-31	25 LT	65+00	33.0-34.5	A-6(3)	37	16	2.2	64.3	8.3	25.8	100	99	43	-	-

40 30 20 10 0 -10 -20

Ⓐ VERY LOOSE BROWN SAND WITH LITTLE ORGANIC MATTER, MOIST TO SAT. (ALLUVIAL)

SS-27
SS-28
SS-29
SS-30
SS-31

DENSE TAN SAND, MOIST
(ROADWAY EMBANKMENT)

LOOSE TO MEDIUM DENSE GRAY SAND AND CLAYEY SAND, SAT
(ALLUVIAL)

MEDIUM DENSE GRAY SAND SAT. (PEEDEE FORMATION)

MEDIUM STIFF TO HARD GRAY SANDY CLAY, WET (PEEDEE FORMATION)

65+00.00

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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4028	25

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

30 20 10 0 -10 -20

Ⓐ VERY LOOSE BROWN MUCK MOIST TO SAT. (ALLUVIAL)

DENSE TAN SAND, MOIST
(ROADWAY EMBANKMENT)

LOOSE TO MEDIUM DENSE GRAY SAND AND CLAYEY SAND, SAT
(ALLUVIAL)

MEDIUM DENSE GRAY SAND SAT. (PEEDEE FORMATION)

MEDIUM STIFF TO HARD GRAY SANDY CLAY, WET (PEEDEE FORMATION)

66+50.00

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-40	CL	66+00	1.0-1.5	A-2-5(0)	62	NP	63.5	7.7	15.7	13.1	99	67	29	116.2	12.5

Ⓐ VERY LOOSE BROWN MUCK MOIST TO SAT. (ALLUVIAL)

DENSE TAN SAND, MOIST
(ROADWAY EMBANKMENT)

S-40

LOOSE TO MEDIUM DENSE GRAY SAND AND CLAYEY SAND, SAT
(ALLUVIAL)

MEDIUM DENSE GRAY SAND SAT. (PEEDEE FORMATION)

MEDIUM STIFF TO HARD GRAY SANDY CLAY, WET (PEEDEE FORMATION)

66+00.00

—L—

30 20 10 0 -10 -20

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