

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.	33614.1.1 (B-4273)	1	10
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33614.1.1	BRNHS-0401(14)	P.E.	
		RAW & UTIL.	

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECT
-L-	11+50.00-30+50.00	4-5		
-DET-	12+02.56-30+39.39	4-5	6	7-9
SAMPLE RESULTS		10		

ROADWAY
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33614.1.1 (B-4273) F.A. PROJ. BRNHS-0401(14)
COUNTY SCOTLAND /HOKE
PROJECT DESCRIPTION BRIDGE NO. 47 OVER LUMBER RIVER
ON US 401

INVENTORY

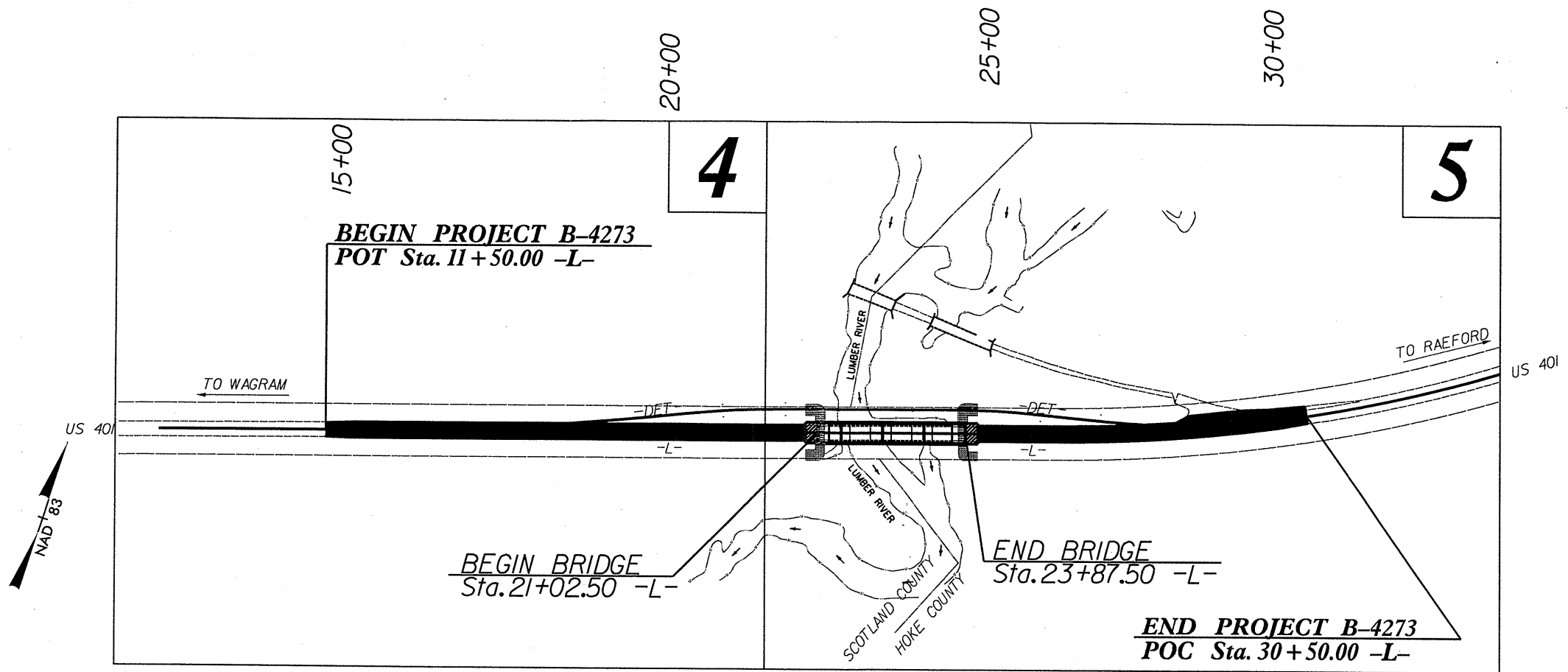
CAUTION NOTICE
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1919 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

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

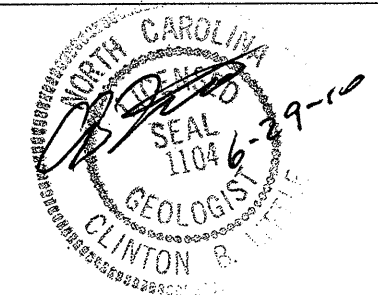
ID: B-4273

CONTRACT: C202949



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INVESTIGATED BY C. B. LITTLE
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SUBMITTED BY C. B. LITTLE
DATE JUNE 2010



DRAWN BY: C. E. BURRIS

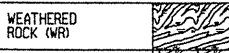
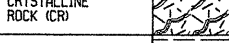
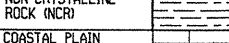
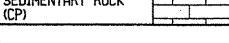
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NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION

PROJECT REFERENCE NO.
33614.11(B-4273) SHEET NO.
2

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 (AASHTO T208, 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: <i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</i>							WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <u>ANGULAR</u> , <u>SUBANGULAR</u> , <u>SUBROUNDED</u> , OR <u>ROUNDED</u> .					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 60 BLOWS PER 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:  NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.  FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.  FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.  COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.					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. 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 (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 60 BLOWS PER 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.				
SOIL LEGEND AND AASHTO CLASSIFICATION							MINERALOGICAL COMPOSITION					WEATHERING					GROUND WATER				
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS							MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.					FRESH ROCK GENERALLY FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.					WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP				
COMPRESSIBILITY							PERCENTAGE OF MATERIAL					GROUND WATER					MISCELLANEOUS SYMBOLS				
SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE							ORGANIC MATERIAL GRANULAR SOILS SILT-CLAY SOILS OTHER MATERIAL					SPT DMT TEST BORING TEST BORING W/ CORE					ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION				
TRACE OF ORGANIC MATTER LITTLE ORGANIC MATTER MODERATELY ORGANIC HIGHLY ORGANIC							TRACE LITTLE SOME HIGHLY					SPT N-VALUE SPT REFUSAL					SOIL SYMBOL				
GROUP INDEX 0, 1, 2, 3, 4, 5, 6, 7							TRACE 1-10% LITTLE 10-20% SOME 20-35% HIGHLY 35% AND ABOVE					ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT					INFERRED SOIL BOUNDARY				
LIQUID LIMIT, PLASTIC INDEX, GROUP INDEX							HIGHLY ORGANIC SOILS					MONITORING WELL					INFERRED ROCK LINE				
USUAL TYPES OF MAJOR MATERIALS							SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER					PIEZOMETER INSTALLATION					ALLUVIAL SOIL BOUNDARY				
GEN. RATING AS A SUBGRADE							HIGHLY ORGANIC SOILS					SLOPE INDICATOR INSTALLATION					DIP & DIP DIRECTION OF ROCK STRUCTURES				
EXCELLENT TO GOOD, FAIR TO POOR, POOR, UNSUITABLE							HIGHLY ORGANIC SOILS					CONE PENETROMETER TEST					SOUNDING ROD				
PI OF A-7-5 SUBGROUP IS <= LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30							HIGHLY ORGANIC SOILS					SOUNDING ROD					SOUNDING ROD				
TEXTURE OR GRAIN SIZE							ABBREVIATIONS					FRACTURE SPACING					BEDDING				
U.S. STD. SIEVE SIZE OPENINGS (MM) 4, 10, 40, 60, 200, 270							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, HL - HIGHLY					VERY HARD, HARD, MODERATELY HARD, MEDIUM HARD, SOFT, VERY SOFT					TERMS, THICKNESS				
BOULDER, COBBLE, GRAVEL, COARSE SAND (C.S.E. SD.), FINE SAND (F. SD.), SILT (SL.), CLAY (CL.)							MED. - MEDIUM, MICA - MICA CEASOUS, 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					CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.					VERY THICKLY BEDDED, THICKLY BEDDED, THINLY BEDDED, VERY THINLY BEDDED, THICKLY LAMINATED, THINLY LAMINATED				
SOIL MOISTURE - CORRELATION OF TERMS							EQUIPMENT USED ON SUBJECT PROJECT					INDURATION					NOTES				
SOIL MOISTURE SCALE (ATTERBERG LIMITS)							DRILL UNITS, ADVANCING TOOLS, HAMMER TYPE, CORE SIZE, HAND TOOLS					FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.					CROSS SECTIONS CONTAIN ONLY VANE SHEAR TEST BORINGS				
FIELD MOISTURE DESCRIPTION							MOBILE B, BK-51, CME-45C, CME-550, PORTABLE MOIST					FRIABLE, MODERATELY INDURATED, INDURATED, EXTREMELY INDURATED					ELEVATION: FT.				
GUIDE FOR FIELD MOISTURE DESCRIPTION							CAY BITS, 6" CONTINUOUS FLIGHT AUGER, 8" HOLLOW AUGERS, HARD FACED FINGER BITS, TUNG-CARBIDE INSERTS, CASING w/ ADVANCER, TRICONE * STEEL TEETH, TRICONE 2 1/2" TUNG-CARB., CORE BIT					RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.					NOTES:				
LIQUID LIMIT (LL), PLASTIC LIMIT (PL), OPTIMUM MOISTURE SHRINKAGE LIMIT (OM, SL)							MOBILE B, BK-51, CME-45C, CME-550, PORTABLE MOIST					RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.					NOTES:				
SATURATED (SAT), WET (W), MOIST (M), DRY (D)							MOBILE B, BK-51, CME-45C, CME-550, PORTABLE MOIST					RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.					NOTES:				
PLASTICITY INDEX (PI), DRY STRENGTH							MOBILE B, BK-51, CME-45C, CME-550, PORTABLE MOIST					RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.					NOTES:				
NONPLASTIC, LOW PLASTICITY, MED. PLASTICITY, HIGH PLASTICITY							MOBILE B, BK-51, CME-45C, CME-550, PORTABLE MOIST					RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.					NOTES:				
COLOR							MOBILE B, BK-51, CME-45C, CME-550, PORTABLE MOIST					RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.					NOTES:				
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.							MOBILE B, BK-51, CME-45C, CME-550, PORTABLE MOIST					RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.					NOTES:				

EARTHWORK BALANCE SHEET

Volumes in Cubic Yards

COUNTY Hoke

8/28/2012

SHEET 1 OF 1 SHEET

3

PROJECT **B-4273**

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	UNDERCUT EMB.	EARTH EMB.	EMBANK. 20%	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
-L-	11+50 TO	21+02.50 (Begin Bridge)	255				255	3,872			3,872	4,646	4,391	-	-	-
SUBTOTAL #1			255	-	-	-	255	3,872	-	-	3,872	4,646	4,391	-	-	-
-L-	23+87.50 (End Bridge) TO	30+50.00	258				258	1,498			1,498	1,798	1,540	-	-	-
SUBTOTAL #2			258	-	-	-	258	1,498	-	-	1,498	1,798	1,540	-	-	-
-DET-	13+50 TO	21+15 (Begin Bridge)	22				22	8,549			8,549	10,259	10,237	-	-	-
SUBTOTAL #3			22	-	-	-	22	8,549	-	-	8,549	10,259	10,237	-	-	-
-DET-	22+45 (End Bridge) TO	28+00.00	68				68	7,572			7,572	9,086	9,018	-	-	-
SUBTOTAL #4			68	-	-	-	68	7,572	-	-	7,572	9,086	9,018	-	-	-
-DET- (Removal)	13+50 TO	21+15 (Begin Bridge)	5,105				5,105							5,105	-	5,105
-DET- (Removal)	22+45 (End Bridge) TO	28+00.00	6,418				6,418							6,418	-	6,418
SUBTOTAL #5			11,523	-	-	-	11,523	-	-	-	-	-	-	11,523	-	11,523
PROJECT SUBTOTAL			12,126	-	-	-	12,126	21,491	-	-	21,491	25,789	25,186	11,523	-	11,523
SELECT MATERIAL, CLASS III IN LIEU OF BORROW											(3,500)	(4,200)	(4,200)			
PROJECT TOTAL			12,126	-	-	-	12,126	21,491	-	-	17,991	21,589	20,986	11,523	-	11,523
EST 5% TO REPLACE TOP SOIL ON BORROW PIT													1,049			
GRAND TOTAL			12,126	-	-	-	12,126	21,491	-	-	17,991	21,589	22,035	11,523	-	11,523
SAY			12,200	-	-	-							22,100			
ESTIMATED UNDERCUT = 2000 CY																

* 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.



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

June 25, 2010

STATE PROJECT: 33614.1.1 (B-4273)
FEDERAL PROJECT: BRNHS-0401(14)
COUNTY: Scotland/Hoke
DESCRIPTION: Bridge 47 over Lumber River on US 401

SUBJECT: Geotechnical Report – Inventory

Project Description

The project is on the Scotland/Hoke county line on US 401, north-east of Wagram. Plans call for replacement of the existing bridge at the current location with an on-site detour to the north (upstream). The roadway will remain two lanes with minor widening for improved shoulders. The Lumber River flows from north to south within the project area.

Areas of Special Geotechnical Interest

The entire project is within the Lumber River floodplain. The floodplain is very swampy. Most of it is mapped as wetlands. The surface soils are very soft and wet, and contain organics. Standing water on the surface is common; water depth varies with weather conditions.

Physiography and Geology

The floodplain is typically flat with the ground surface near elevation 213'. The existing roadway crosses on embankment about 11' high, so the existing roadway grade elevation is near 224'. The area is in the Coastal Plain region, mapped as Cretaceous "Middendorf Formation" (Geologic Map of NC, NCGS, 1985). The formation contains predominantly sands, sandstones, and mudstones.

Soils

There is approximately 20' of recent alluvium. The upper four to six feet is very soft, organic, sand and silt. Below the very soft material is loose to medium dense sand. Accessibility for drilling was very limited in the wetland areas. We obtained one Standard Penetration Test boring (on the eastern side of the river) and numerous probes, sounding rod tests, and some vane shear tests. The Standard Penetration Test resistance in the upper material was zero. Vane Shear test values were typically 200 to 600 psf. Vane shear test data is plotted on the attached cross-sections. The test boring encountered Coastal Plain material at elevation 194' – a hard clay layer followed by loose sand. A layer of Coastal Plain rock was encountered from elevation 180' down to 175' followed by medium dense sand.

Respectfully Submitted,

Clint Little
Project Geological Engineer

STATE OF NORTH CAROLINA
DB 560 PG 1
PB 9 PG 353
PB 9 PG 354

MTL GATE

WOODS

MARJORIE J. JOHNSON
DB 408 PG 73

SEE SHEET 6 FOR -L- PROFILE
SEE SHEETS X-2 THRU X-5 FOR CROSS SECTIONS

PROJECT REFERENCE NO. B-4273	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS <small>DO NOT USE FOR CONSTRUCTION</small>	
PRELIMINARY PLANS <small>DO NOT USE FOR CONSTRUCTION</small>	

15' EASEMENT DB 408 PG 77
P-K NAIL N73°02'12"W
P-K NAIL N76°03'14"E

99.95' N67°37'08"E
80.88'

100.00' P-K NAIL S84°25'17"W

99.95' N67°37'08"E

100.00' P-K NAIL S84°25'17"W

99.95' N67°37'08"E

100.00' P-K NAIL S84°25'17"W

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100.00' P-K NAIL S84°25'17"W

99.95' N67°37'08"E

100.00' P-K NAIL S84°25'17"W

STATE OF NORTH CAROLINA
DB 936 PG 238
PB 10 PG 345

POT Sta. 8+27.77

BEGIN PROJECT B-4273
Sta. 11+50.00 -L-

BL-4
PINC 27+08.58
8+98.22 -L-
18.32' RT

ROADWAY EMBANKMENT

N 72° 0' 54.9" E
ROADWAY EMBANKMENT

N 70° 32' 42.1" E

N 71° 56' 41.5" E

R. REX CARPENTER
DB 466 PG 211
PB 6 PG 50

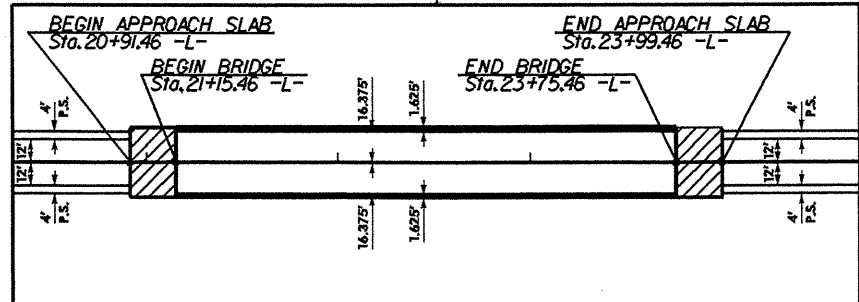
ALLUVIAL

ALLUVIAL

MATCHLINE SEE SHEET 5
STA. 20+00.00 -L-

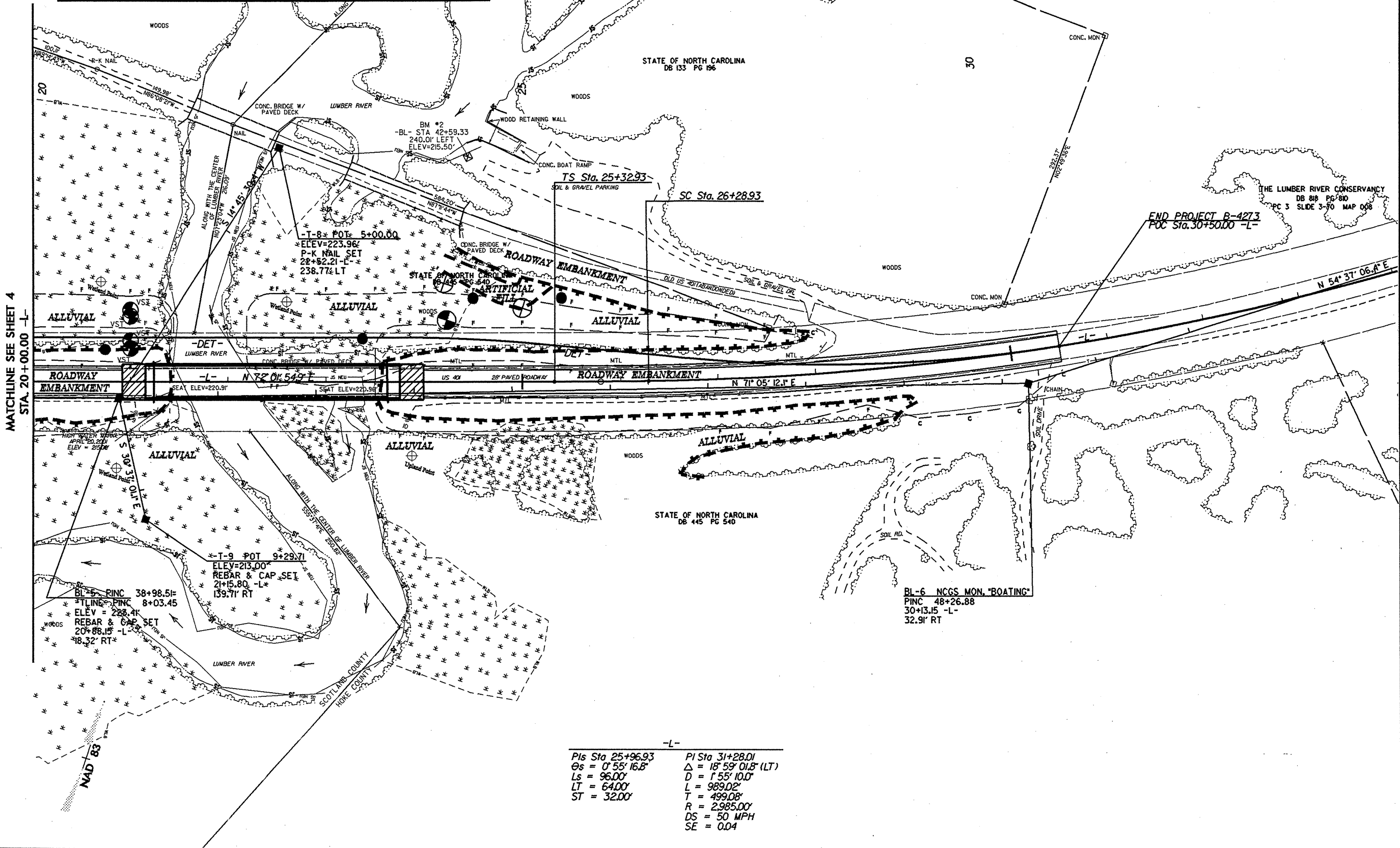
NAD 83

MAINLINE BRIDGE SKETCH



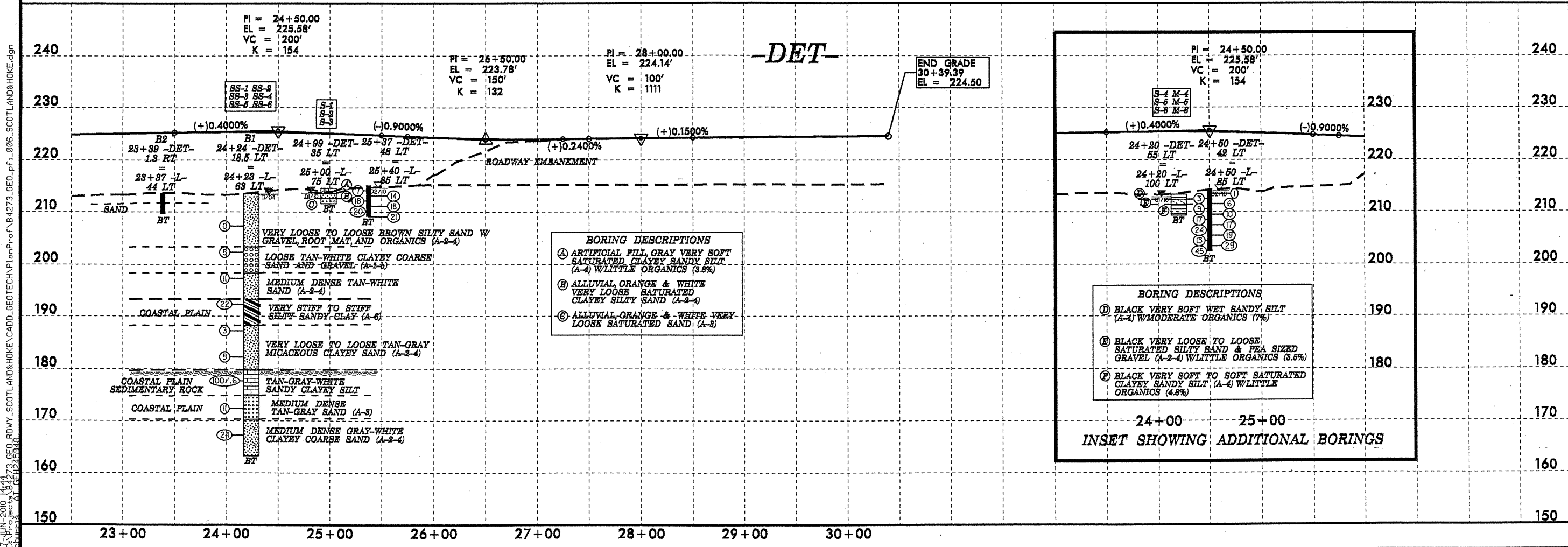
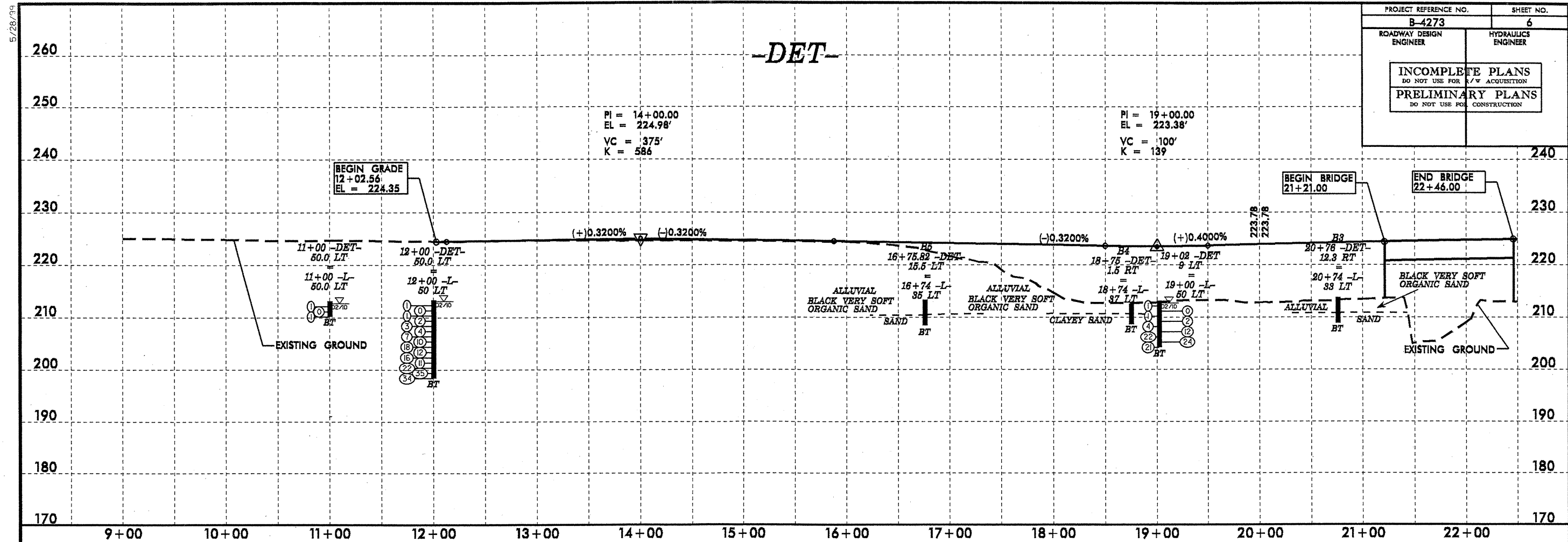
SEE SHEET 6 FOR -L- PROFILE
SEE SHEETS X-5 THRU X-10 FOR CROSS SECTIONS

PROJECT REFERENCE NO. B-4273	SHEET NO. 5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS NO. NOT USE FOR CONSTRUCTION PRELIMINARY PLANS NO. NOT USE FOR CONSTRUCTION	



-L-

PIs Sta 25+96.93	PI Sta 31+28.01
Os = 0° 55' 16.8"	Δ = 18° 59' 01.8" (LT)
LS = 96.00'	D = 1° 55' 10.0"
LT = 64.00'	L = 989.02'
ST = 32.00'	T = 499.08'
	R = 2,985.00'
	DS = 50 MPH
	SE = 0.04



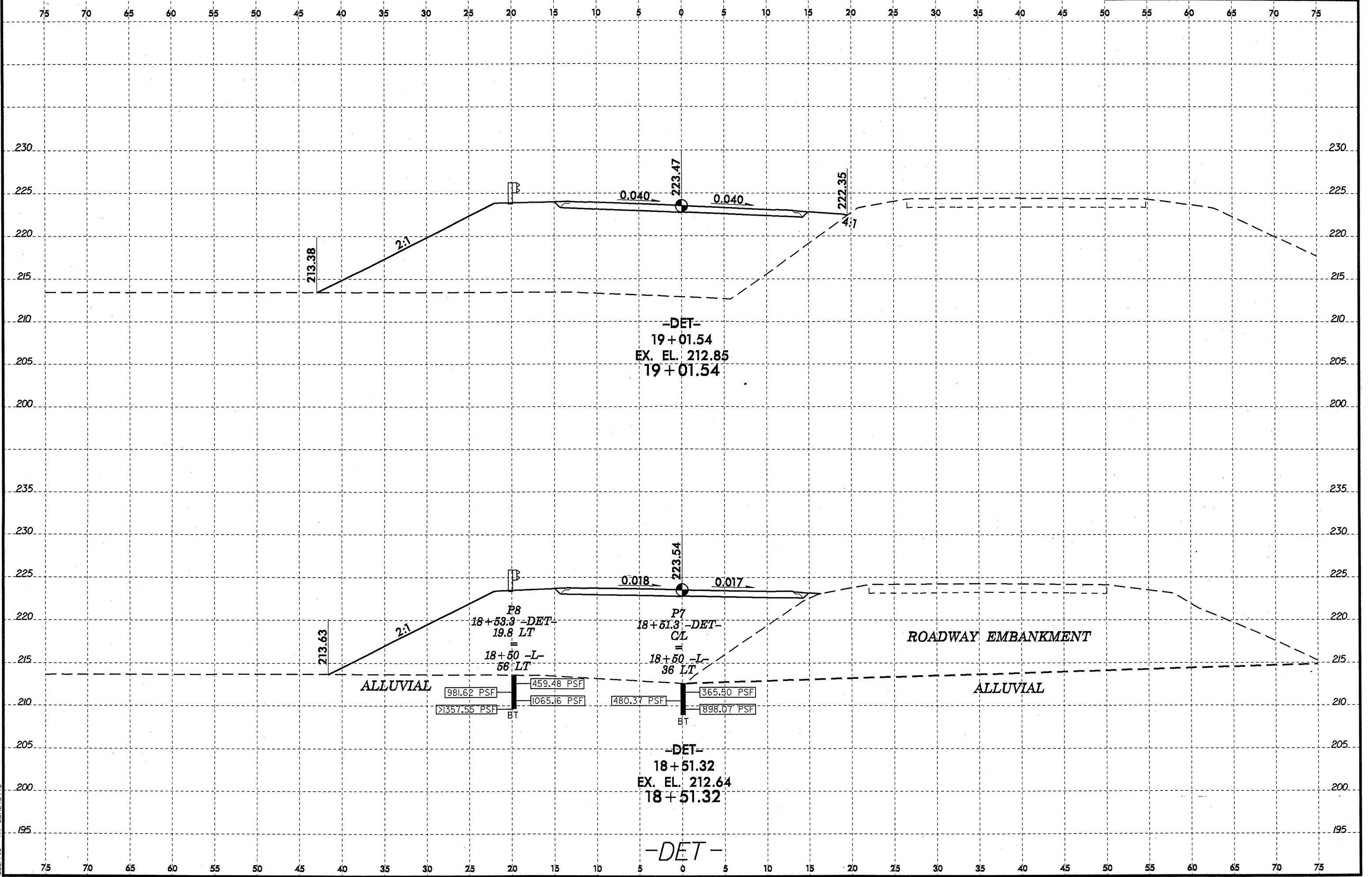
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JUN-2010 18:44

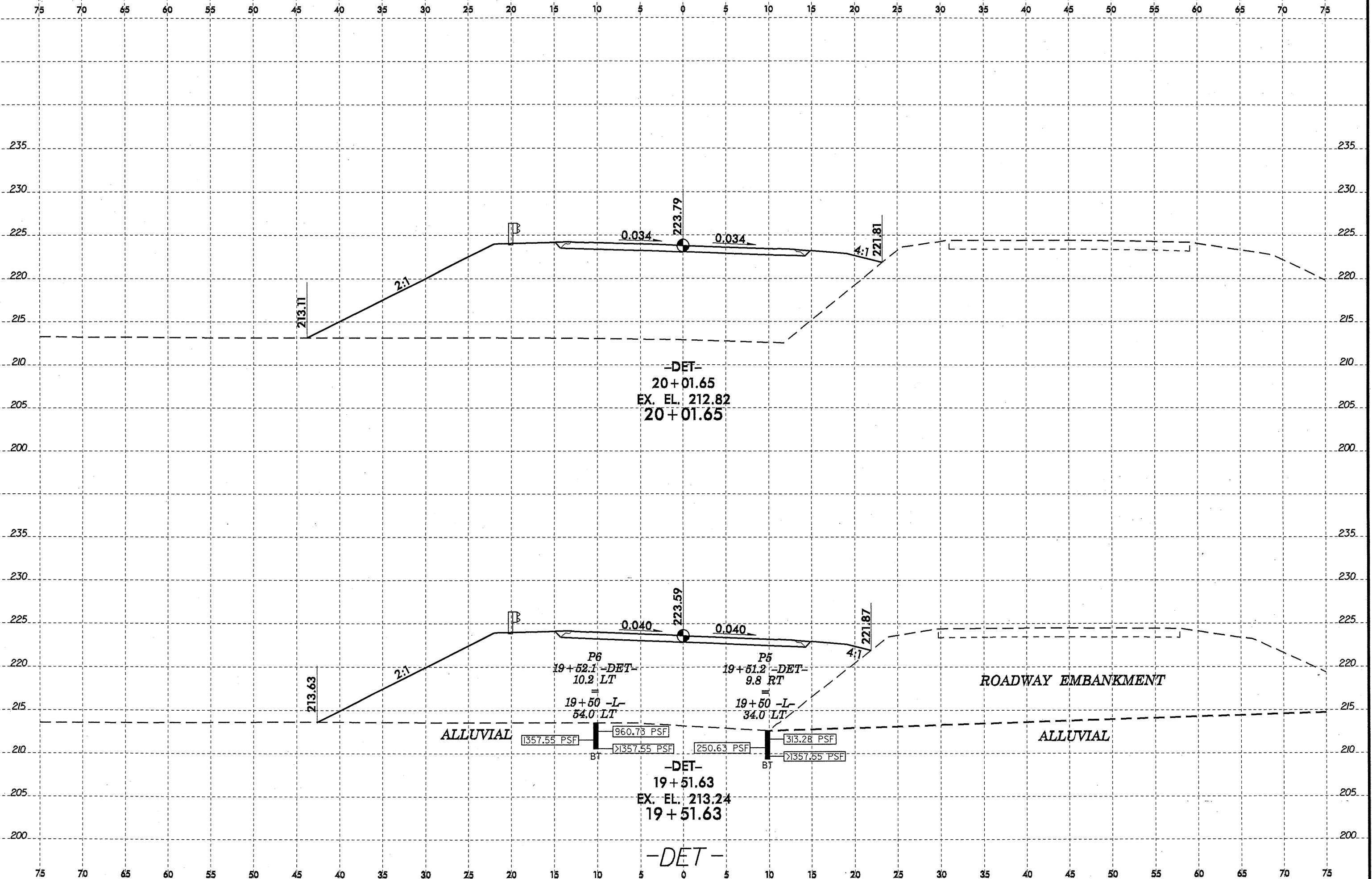
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SCOTLAND & HOKE

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21-APR-2010 09:02
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8/23/99
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Sourc: 21-DET-19-13



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC	Line or Boring ID
							C.SAND	F.SAND	SILT	CLAY	10	40	200			
S-1	75 LT	25+00	0.00-1.00	A-4(0)	23	NP	27.5	36.4	24.0	12.1	99	87	44	-	3.8	L
S-2	75 LT	25+00	1.00-2.00	A-2-4(0)	20	3	36.8	38.6	12.5	12.1	98	77	30	-	-	L
S-3	75 LT	25+00	2.00-3.00	A-3(0)	18	NP	71.1	22.4	1.4	5.1	100	59	9	-	-	L
S-4	100 LT	24+20	0.00-1.00	A-4(0)	35	8	41.4	20.8	29.7	8.1	91	65	37	-	7.0	L
S-5	100 LT	24+20	1.00-2.00	A-2-4(0)	25	6	40.0	30.1	15.8	14.1	99	77	32	-	3.5	L
S-6	100 LT	24+20	2.00-4.00	A-4(0)	26	4	36.8	29.1	24.0	10.1	100	80	36	-	4.8	L
MS-4	100 LT	24+20	0.00-1.00				0.0	0.0	0.0	0.0		0	0	39.4	-	L
MS-5	100 LT	24+20	1.00-2.00				0.0	0.0	0.0	0.0		0	0	26.2	-	L
MS-6	100 LT	24+20	2.00-4.00				0.0	0.0	0.0	0.0		0	0	26.3	-	L
SS-1	63 LT	24+23	10.70-11.70	NOT ENOUGH MAT.			79.7	8.9	1.4	10.1	57	21	7	-	-	L
SS-2	63 LT	24+23	20.70-21.70	A-6(13)	39	17	12.1	29.4	18.3	40.2	100	89	78	-	-	L
SS-3	63 LT	24+23	25.70-26.70	A-2-4(0)	25	1	10.9	67.0	2.0	20.1	100	94	25	-	-	L
SS-4	63 LT	24+23	35.70-36.70	A-4(5)	27	9	1.2	34.8	31.8	32.2	100	99	77	-	-	L
SS-5	63 LT	24+23	40.70-41.70	A-3(0)	21	NP	68.8	25.4	1.8	4.0	100	74	6	-	-	L
SS-6	63 LT	24+23	45.70-46.70	NOT ENOUGH MAT.			73.6	9.1	1.2	16.1	96	44	17	-	-	L