

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-3809	1	11
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33264.1.1	BRSTP - 99 (2)	PE	
33264.2.1	BRSTP - 99 (2)	ROW/UTIL	
33264.3.1	BRSTP - 99 (6)	CONSTRUCTION	

CONTENTS

LINE	STATION	PLAN	PROFILE
-L-	19+80 TO 38+00	4-5	6

ROADWAY
SUBSURFACE INVESTIGATION

CROSS SECTIONS

LINE	STATION	SHEET NO.
-L-	20+00 TO 21+00	7
-L-	22+00	7
-L-	23+00	8
-L-	24+00	8
-L-	24+90	8
-L-	32+50	8
-L-	33+50 TO 34+00	9
-L-	34+50 TO 36+00	10
-L-	36+50	11
-L-	37+50 TO 38+00	11

PROJ. REFERENCE NO. 33264.1.1 (B-3809) F.A. PROJ. BRSTP-99(2)
COUNTY BEAUFORT
PROJECT DESCRIPTION BRIDGE NO. 64 ON NC 99 OVER PUNGO CREEK

INVENTORY



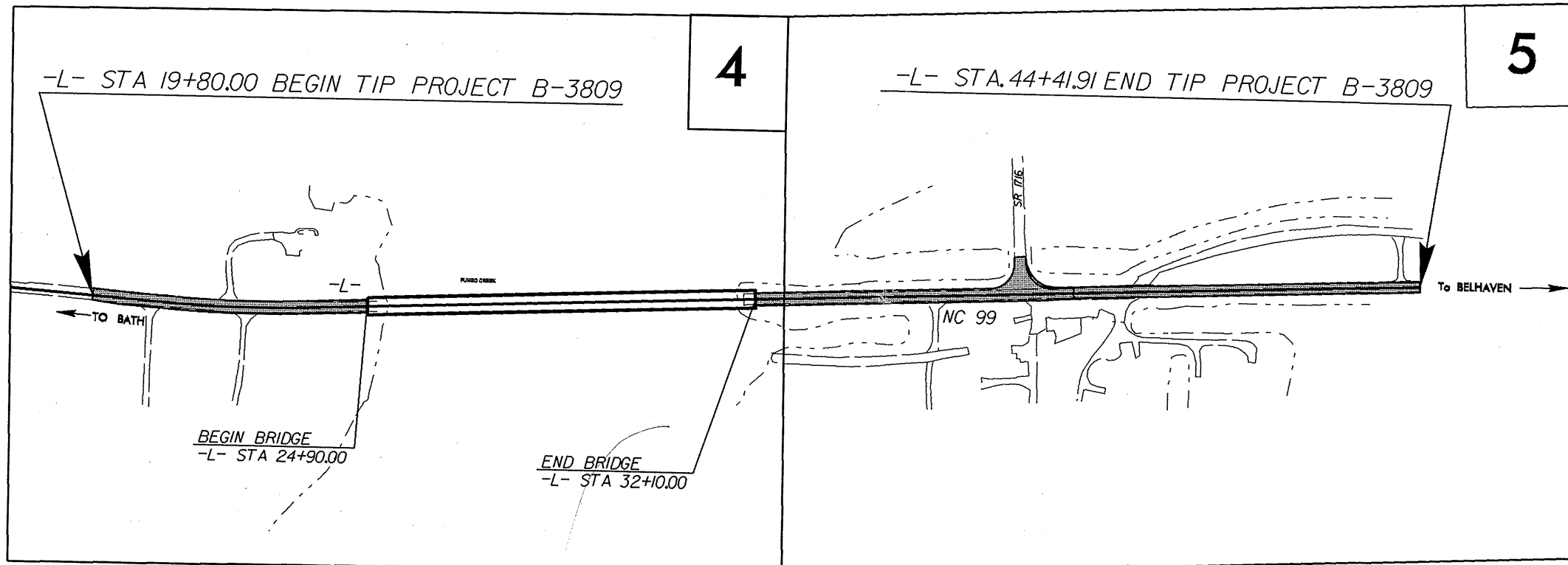
CAUTION NOTICE

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 (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 (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.

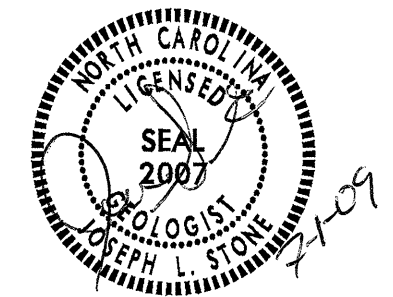
CONTRACT: C202325 ID: B-3809



PERSONNEL

TCB
JRS
WNC
RES

INVESTIGATED BY TC BOTTOMS
CHECKED BY DN ARGENBRIGHT
SUBMITTED BY DN ARGENBRIGHT
DATE JULY 2009



DRAWN BY: C.P. TURNER, T.C. BOTTOMS

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION				GRADATION				ROCK DESCRIPTION				TERMS AND DEFINITIONS			
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (ASHTO 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, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6				WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.				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:				ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. ADUIFIER - 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 (ROD) - 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 (SROD) - 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 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 SYMBOL [Diagrams showing soil patterns for various groups] % PASSING: 10, 40, 200 (with diagrams for 50, 30, 15, 10, 5, 2, 1, 0.75, 0.425, 0.25, 0.15, 0.075, 0.05, 0.025, 0.015, 0.0075, 0.005, 0.0025, 0.0015, 0.00075, 0.0005, 0.00025, 0.00015, 0.000075, 0.00005) LIQUID LIMIT, PLASTIC INDEX, GROUP INDEX, USUAL TYPES OF MAJOR MATERIALS, GEN. RATING AS A SUBGRADE				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, MODERATELY COMPRESSIBLE, HIGHLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31, EQUAL TO 31-50, GREATER THAN 50 PERCENTAGE OF MATERIAL ORGANIC MATERIAL, GRANULAR SOILS, SILT-CLAY SOILS, OTHER MATERIAL, TRACE OF ORGANIC MATTER, LITTLE ORGANIC MATTER, MODERATELY ORGANIC, HIGHLY ORGANIC				WEATHERING FRESH, VERY SLIGHT (V SL.), SLIGHT (SL.), MODERATE (MOD.), MODERATELY SEVERE (MOD. SEV.), SEVERE (SEV.), VERY SEVERE (V SEV.), COMPLETE ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. 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. 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. 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. 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. 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. 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. 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.							
GROUND WATER 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				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 DIP & DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD SPT DMT VST TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION SPT N-VALUE SPT REFUSAL SAMPLE DESIGNATIONS: S - BULK SAMPLE, SS - SPLIT SPOON SAMPLE, ST - SHELBY TUBE SAMPLE, RS - ROCK SAMPLE, RT - RECOMPACTED TRIAXIAL SAMPLE, CBR - CALIFORNIA BEARING RATIO SAMPLE				ROCK HARDNESS VERY HARD, HARD, MODERATELY HARD, MEDIUM HARD, SOFT, VERY SOFT CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. CAN BE CARVED WITH KNIFE, CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.							
TEXTURE OR GRAIN SIZE U.S. STD. SIEVE SIZE OPENING (MM): 4, 10, 40, 60, 200, 270 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, 0.075, 0.01, 0.002, 0.0002				ABBREVIATIONS AR - AUGER REFUSAL, BT - BORING TERMINATED, CL - CLAY, CPT - CONE PENETRATION TEST, CSE - COARSE, DMT - DILATOMETER TEST, DPT - DYNAMIC PENETRATION TEST, 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, SLL. - SLIGHTLY, TCR - TRICONE REFUSAL, W - MOISTURE CONTENT, V - VERY, VST - VANE SHEAR TEST, WEA. - WEATHERED, Wt - UNIT WEIGHT, Wd - DRY UNIT WEIGHT				EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: MOBILE B-51, BK-51, CME-45B, CME-550, PORTABLE HOIST ADVANCING TOOLS: CLAY BITS, 6" CONTINUOUS FLIGHT AUGER, 6" HOLLOW AUGERS, HARD FACED FINGER BITS, TUNG-CARBIDE INSERTS, CASING W/ ADVANCER, TRICONE * STEEL TEETH, TRICONE * TUNG-CARB., CORE BIT HAMMER TYPE: AUTOMATIC, MANUAL CORE SIZE: B, N, H HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST							
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE (ATTERBERG LIMITS), FIELD MOISTURE DESCRIPTION, GUIDE FOR FIELD MOISTURE DESCRIPTION LL - LIQUID LIMIT, PL - PLASTIC LIMIT, OM - OPTIMUM MOISTURE, SL - SHRINKAGE LIMIT - SATURATED - (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE				PLASTICITY PLASTICITY INDEX (PI), DRY STRENGTH NONPLASTIC, LOW PLASTICITY, MED. PLASTICITY, HIGH PLASTICITY 0-5, 6-15, 16-25, 26 OR MORE VERY LOW, SLIGHT, MEDIUM, HIGH				INDURATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE, MODERATELY INDURATED, INDURATED, EXTREMELY INDURATED 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.							
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.				FRACTURE SPACING TERM, SPACING VERY WIDE, WIDE, MODERATELY CLOSE, CLOSE, VERY CLOSE MORE THAN 10 FEET, 3 TO 10 FEET, 1 TO 3 FEET, 0.16 TO 1 FEET, LESS THAN 0.16 FEET				BEDDING TERM, THICKNESS VERY THICKLY BEDDED, THICKLY BEDDED, THINLY BEDDED, VERY THINLY BEDDED, THICKLY LAMINATED, THINLY LAMINATED > 4 FEET, 1.5 - 4 FEET, 0.16 - 1.5 FEET, 0.03 - 0.16 FEET, 0.008 - 0.03 FEET, < 0.008 FEET							
PLASTICITY (continued)				FRACTURE SPACING (continued)				BEDDING (continued)				BENCH MARK: _____ ELEVATION: _____ FT. NOTES: APPROXIMATE LIMITS OF ORGANIC DEPOSITS			

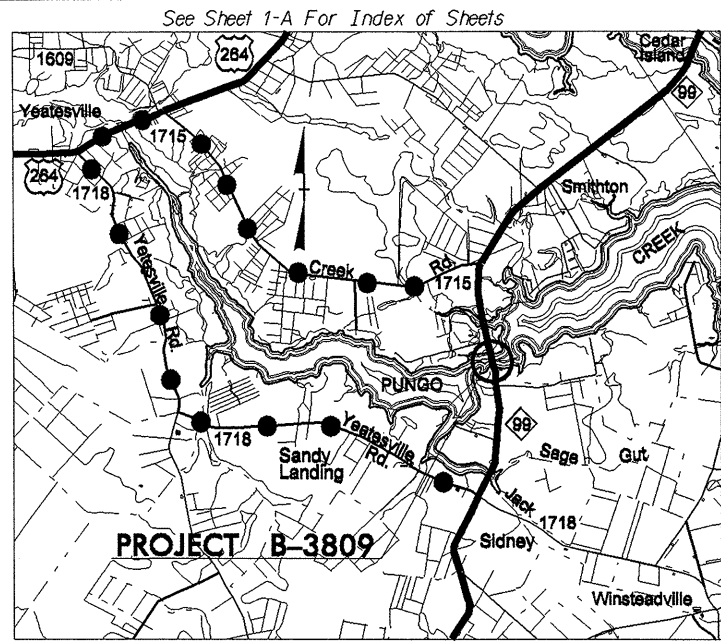
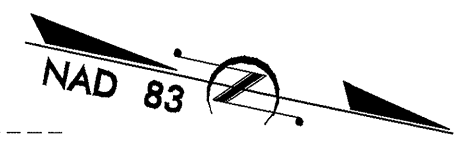
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3809	2A	15
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
33264.1.1	BRSTP - 99 (2)	PE	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BEAUFORT COUNTY

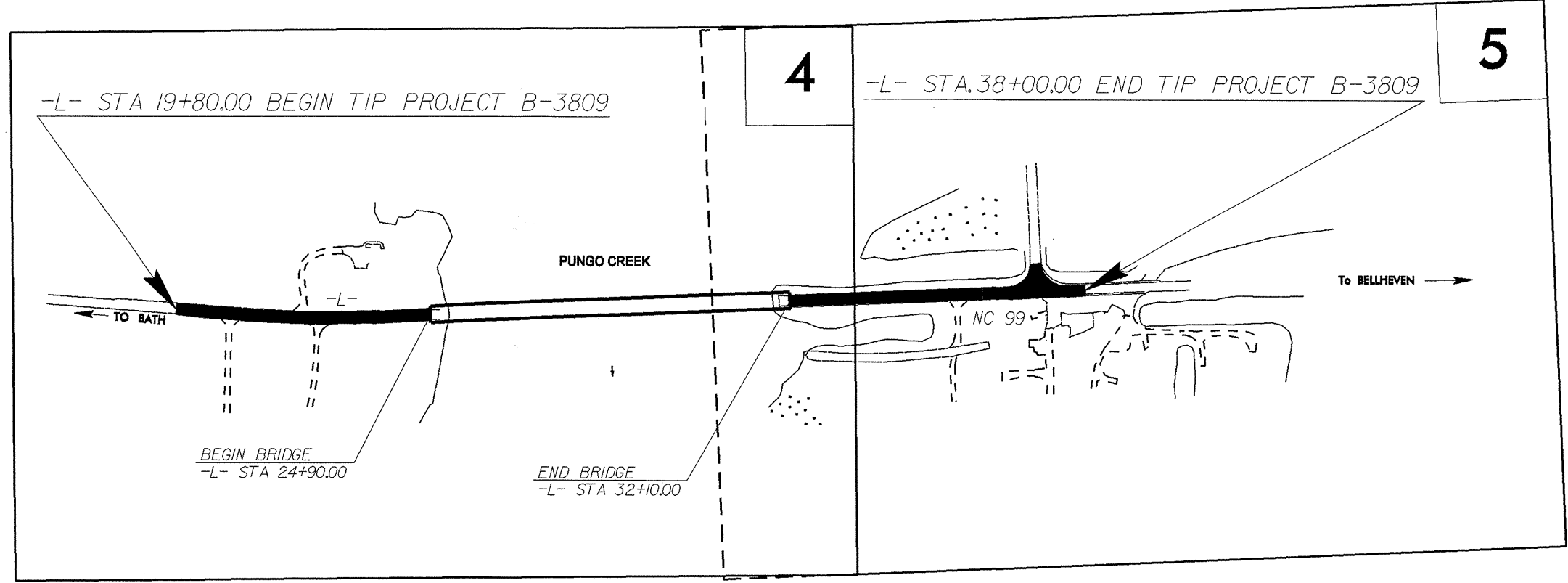
LOCATION: BRIDGE 64 OVER PUNGO CREEK ON NC 99

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



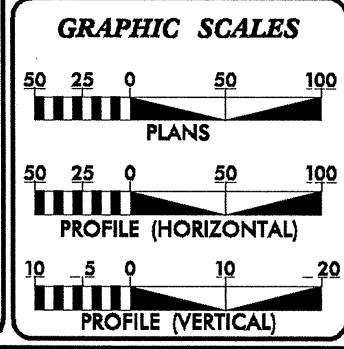
VICINITY MAP

DETOUR ROUTE —●—●—●—



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



DESIGN DATA

ADT 2007	=	3,370
ADT 2025	=	5,100
DHV	=	10 %
D	=	60 %
T	=	9 % *
V	=	60 MPH
* TTST	3	DUAL 6

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-3809	=	0.209 MILES
LENGTH OF STRUCTURE TIP PROJECT B-3809	=	0.136 MILES
TOTAL LENGTH OF STATE PROJECT B-3809	=	0.345 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 20, 2009

LETTING DATE:
FEBRUARY 16, 2010

TED S. WALLS
PROJECT ENGINEER

ALLISON K. WHITE
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.

CONTRACT: TIP PROJECT: B-3809
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

July 1, 2009

STATE PROJECT: 33264.1.1 B-3809
F.A. PROJECT: BRSTP-99(2)
COUNTY: Beaufort
DESCRIPTION: Bridge No. 64 on NC 99 over Pungo Creek
SUBJECT: Geotechnical Report – Inventory

Project Description

The proposed project is located in Beaufort County along the existing NC 99 crossing over Pungo Creek. Based on the current plans, proposed construction consists of a replacement of the existing bridge.

<u>Line</u>	<u>Station (±)</u>
-L-	19+80 to 38+00

Areas of Special Geotechnical Interest

- 1) The entire project area was found to exhibit seasonal high ground water, or the potential for ground water related construction problems.
- 2) The following section contains organic alluvial soils, which have the potential to cause embankment stability and or long term settlement problems.

<u>Line</u>	<u>Station (±)</u>
-L-	19+80 to 20+27
-L-	35+23 to 36+24

Physiography and Geology

This project is located in Beaufort County within the Coastal Plain Physiographic Province. Topography along the project is flat with very poor surface drainage. Ground elevations along the project range from -16± feet below sea level along the bed of Pungo Creek to 11± feet above sea level along the existing NC 99 embankment. Surface water along the project flows directly into Pungo Creek.

This area is underlain by recent alluvial sediments.

Ground Water

Ground water data was collected during April 2007 during which period the area experienced much below normal precipitation conditions. Ground water elevations ranged from 0 to 2 feet above sea level. This area is characterized by significant variations in surface water elevations due to wind induced tides.

Soils

Soils encountered during this investigation are classified as alluvial soils and roadway embankment soils.

Alluvial soils are comprised of 2 to 18 or more feet of very soft to stiff sandy and clayey silt and silty clay (A-4, A-6, A-7-6) with 2 to 7 or more feet of loose to medium dense sand (A-2-4, A-3). Representative samples collected within these cohesive alluvial deposits returned natural moisture contents ranging from 15.1 to 71.7 percent. Also found within these alluvial deposits were 1 to 3 feet of very loose sand with little amounts of organic matter and very soft highly organic silty clay. Laboratory analysis of representative samples taken from within these deposits returned organic contents ranging from 3.1 to 20.5 percent and a natural moisture content of 48.6 percent. Vane Shear analysis shows shear strength values ranging from 63 psf to 543 psf.

Soils classified as roadway embankment are composed of 1 to 13 feet of loose sand (A-2-4).

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.DOH.DOT.STATE.NC.US

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

Undisturbed Samples

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

<u>Sample No.</u>	<u>-L- Station</u>	<u>Depth</u>	<u>Test</u>
ST-1	20+00, 32' LT	0.5-1.5	Consolidation

Prepared by,



Tyler Bottoms
Project Geologist

EARTHWORK BALANCE SHEET

Volumes in Cubic Yards

3B/11

PROJECT **B-3809**

COUNTY Beaufort

DATE 11/3/2009

SHEET 1 OF 1 SHEETS

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	UNDERCUT EMB.	30 EARTH EMB.	EMBANK. 30%	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
L	19+80.00	24+90.00	47				47	2071			2071	2692	2645			
L	32+10.00	44+41.91	100				100	3851			3851	5006	4906			
PROJECT SUBTOTAL			147				147	5922			5922	7698	7551			
PROJECT TOTAL			147				147	5922			5922	7698	7551			
EST 5% TO REPLACE TOP SOIL ON BORROW PIT													378			
GRAND TOTAL			147										7929			
SAY			150										7950			

*** 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.**

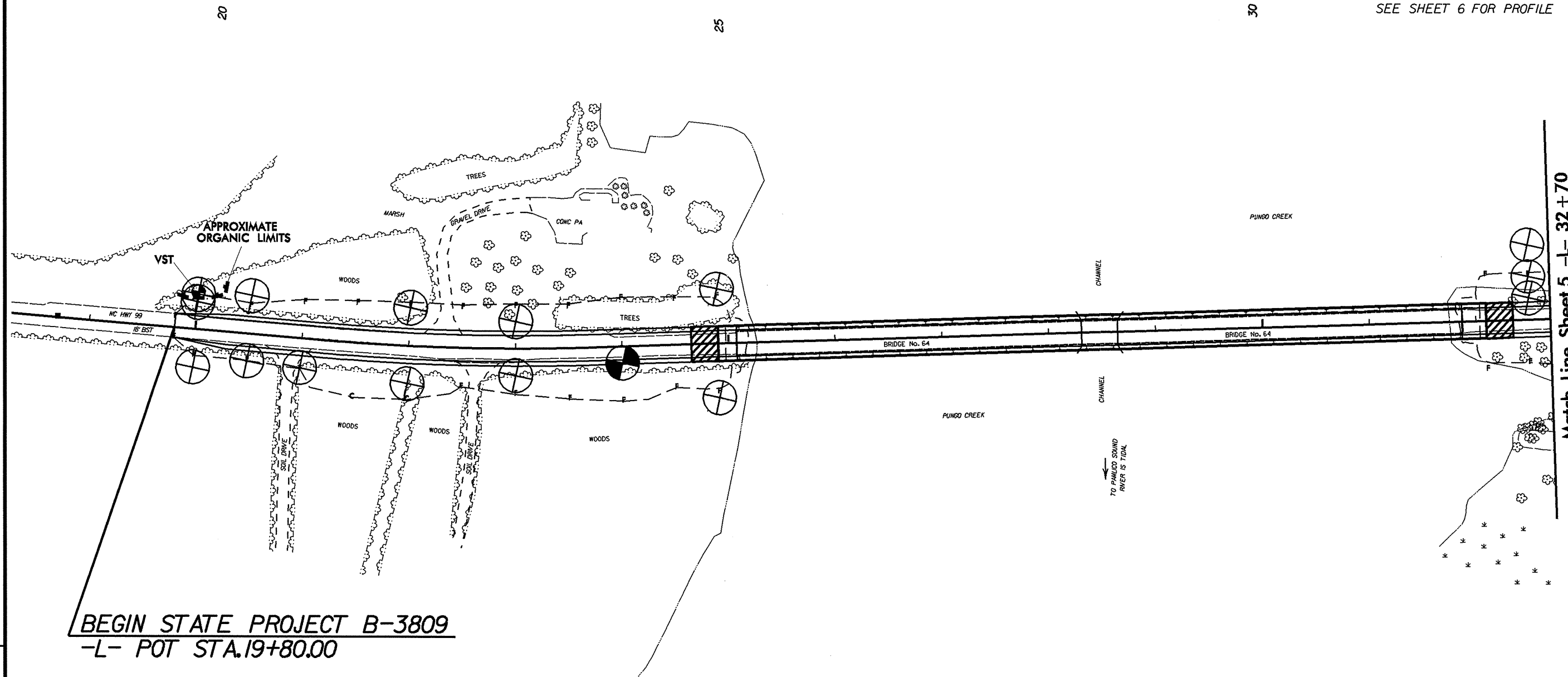
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 REVISIONS

SITE PLAN



PROJECT REFERENCE NO. B-3809	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	

SEE SHEET 6 FOR PROFILE



BEGIN STATE PROJECT B-3809
-L- POT STA. 19+80.00

Match Line Sheet 5 -L- 32+70

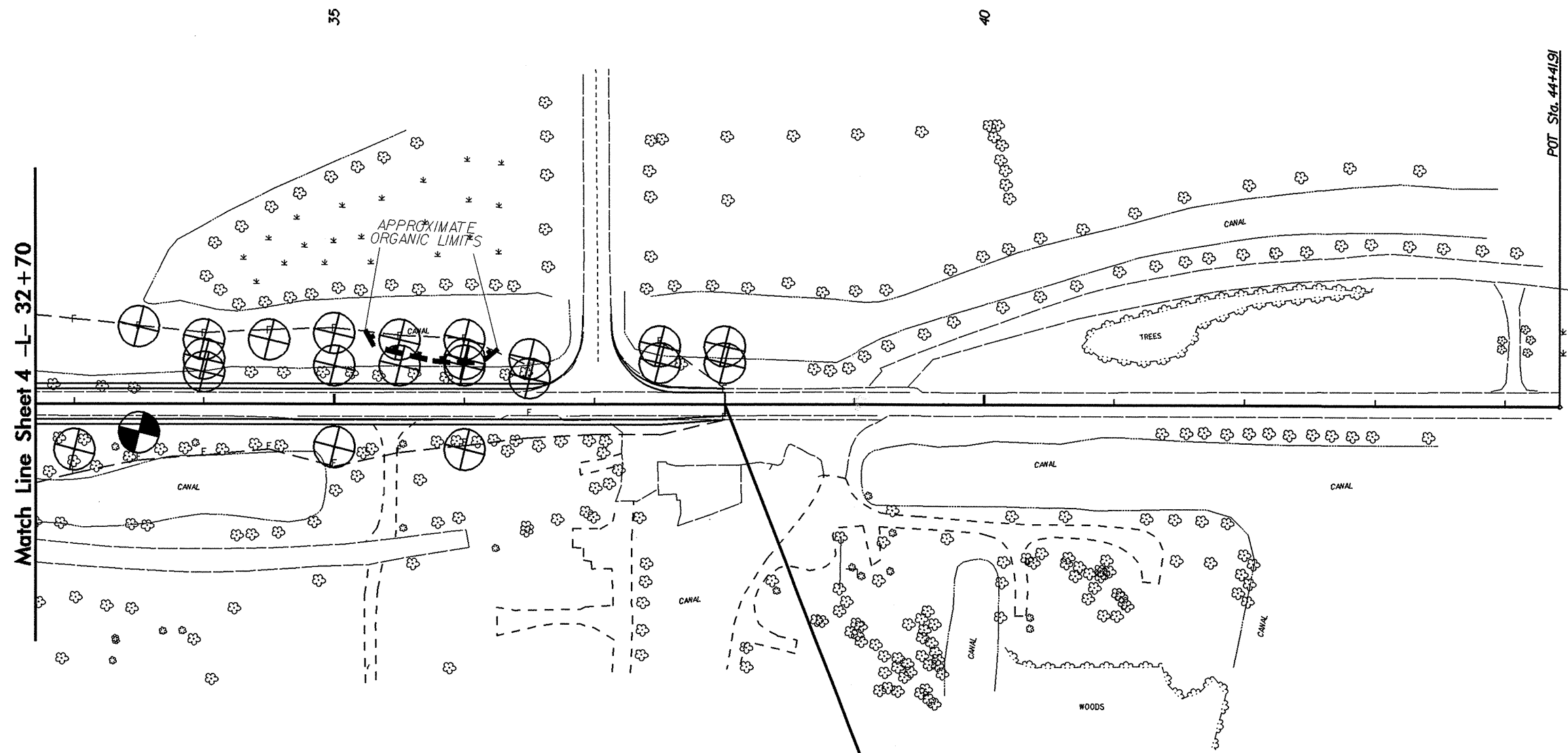
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REVISIONS

SITE PLAN



PROJECT REFERENCE NO. B-3809	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



END STATE PROJECT B-3809
-L- POT STA. 38+00.00

SEE SHEET 7 FOR PROFILE

POT STA. 44+41.91

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SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-8	27 RT	21+00	3.00-5.00	A-7-6(31)	59	38	0.6	20.7	27.9	50.8	100	100	80	33.6	-
S-7	25 RT	23+00	0.60-6.00	A-2-4(0)	18	NP	7.3	74.6	4.9	13.2	100	100	19	-	-

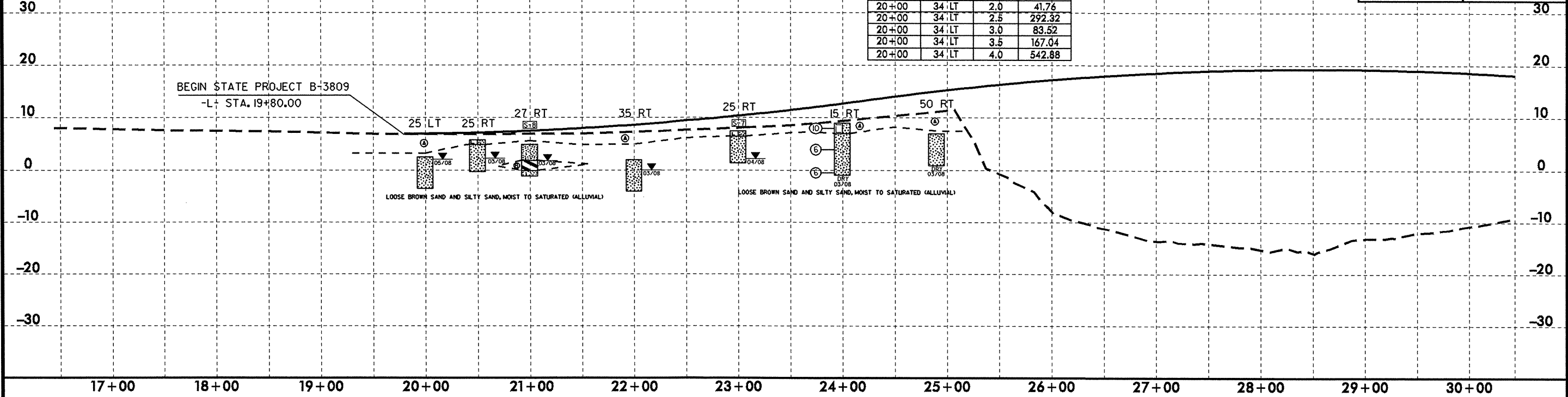
- (A) LOOSE TAN SILTY SAND, MOIST (ROADWAY EMBANKMENT)
- (B) STIFF GRAY SILTY CLAY, MOIST TO WET (ALLUVIAL)

NOTE: GROUNDLINE PROFILE AT CL OF -L- TAKEN FROM ROADWAY DESIGN PLANS AS OF 5/20/08
 NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO PROFILE.

VANE SHEAR TESTS

STATION	OFFSET	DEPTH	S (psf)
20+00	34 LT	0.5	250.56
20+00	34 LT	1.0	167.04
20+00	34 LT	1.5	62.64
20+00	34 LT	2.0	41.76
20+00	34 LT	2.5	292.32
20+00	34 LT	3.0	83.52
20+00	34 LT	3.5	167.04
20+00	34 LT	4.0	542.88

PROJECT REFERENCE NO. B3809	SHEET NO. 6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

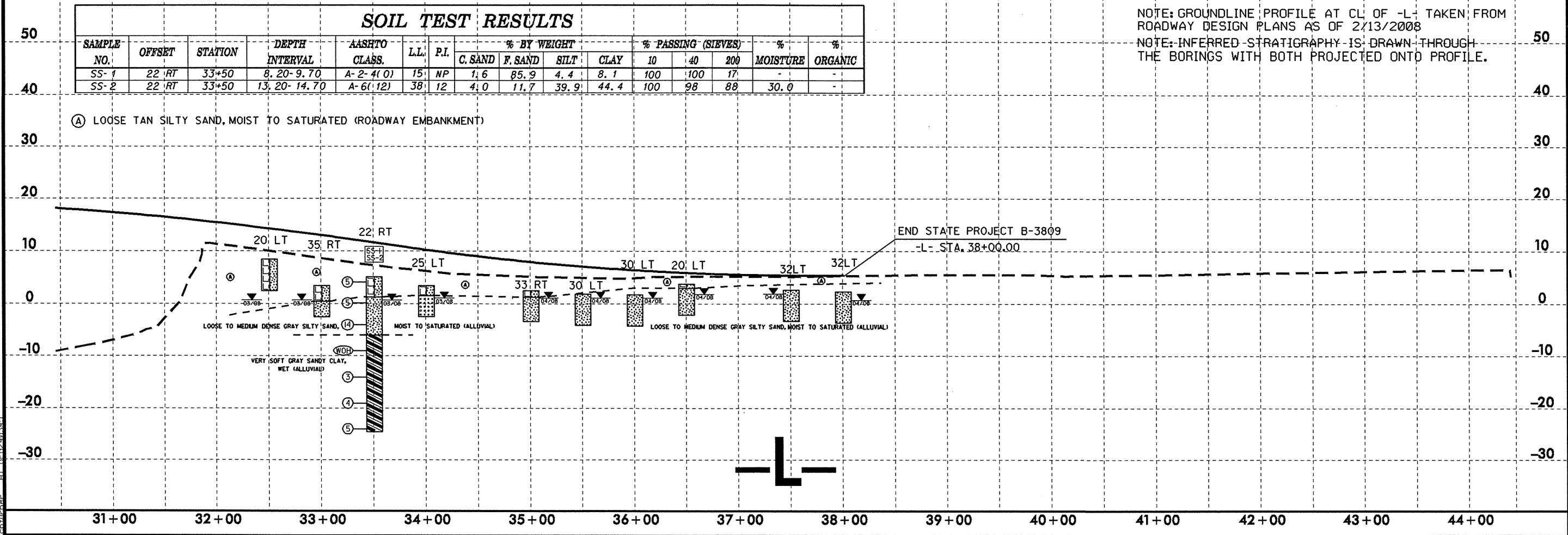


SOIL TEST RESULTS

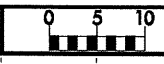
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1	22 RT	33+50	8.20-9.70	A-2-4(0)	15	NP	1.6	85.9	4.4	8.1	100	100	17	-	-
SS-2	22 RT	33+50	13.20-14.70	A-6(12)	38	12	4.0	11.7	39.9	44.4	100	98	88	30.0	-

- (A) LOOSE TAN SILTY SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)

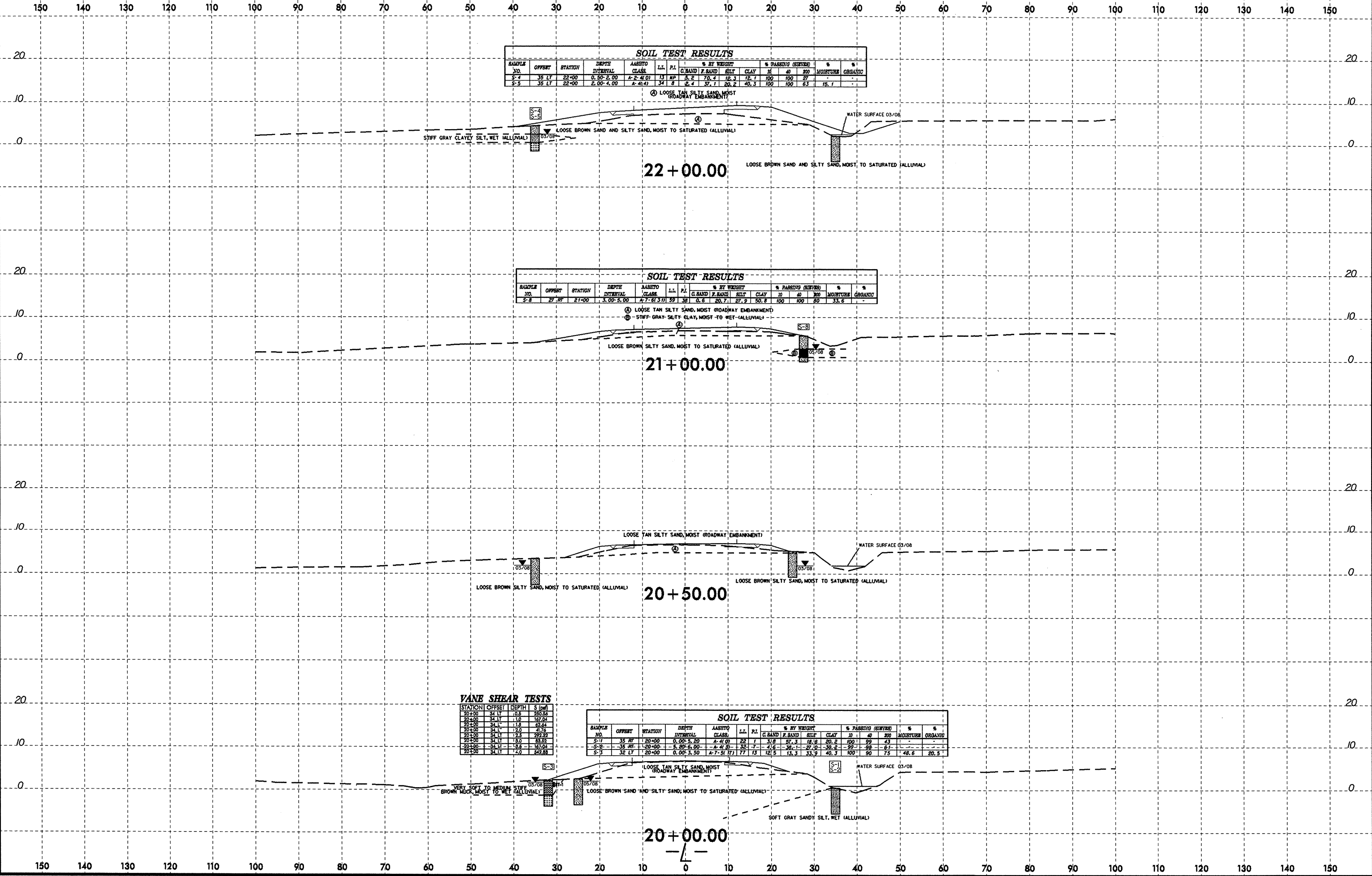
NOTE: GROUNDLINE PROFILE AT CL OF -L- TAKEN FROM ROADWAY DESIGN PLANS AS OF 2/13/2008
 NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO PROFILE.



8/23/99



PROJ. REFERENCE NO.	SHEET NO.
B-3809	7



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASBESTO CLASS	L.L.	P.L.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							G.BAND	F.BAND	SILT	CLAY	#10	#40	#200		
S-4	35 LT	22+00	0.50-2.00	A-2-4(1)	13	NP	5.2	20.4	12.3	12.1	100	100	27	-	-
S-5	35 LT	22+00	2.00-4.00	A-4(4)	34	8	2.4	37.1	20.2	40.3	100	100	63	15.1	-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASBESTO CLASS	L.L.	P.L.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							G.BAND	F.BAND	SILT	CLAY	#10	#40	#200		
S-6	27 RP	21+00	3.00-5.00	A-7-8(3/1)	39	32	0.6	20.7	27.9	50.8	100	100	80	33.8	-

VANE SHEAR TESTS

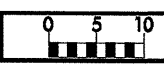
STATION	OFFSET	DEPTH	S (pcf)
20+00	34 LT	0.6	250.64
20+00	34 LT	1.0	167.94
20+00	34 LT	1.5	63.44
20+00	34 LT	2.0	49.74
20+00	34 LT	12.5	292.32
20+00	34 LT	13.0	63.52
20+00	34 LT	13.6	123.04
20+00	34 LT	2.0	642.88

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASBESTO CLASS	L.L.	P.L.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							G.BAND	F.BAND	SILT	CLAY	#10	#40	#200		
S-7	35 RP	20+00	0.00-3.20	A-4(0)	22	1	31.8	57.3	18.8	20.2	100	99	43	-	-
S-8	35 RP	20+00	5.00-6.00	A-4(0)	23	7	14.6	38.1	22.0	30.8	99	98	61	-	-
S-3	32 LT	20+00	0.00-3.50	A-7-8(1/1)	77	13	12.5	13.3	33.9	40.3	100	90	75	48.6	20.5

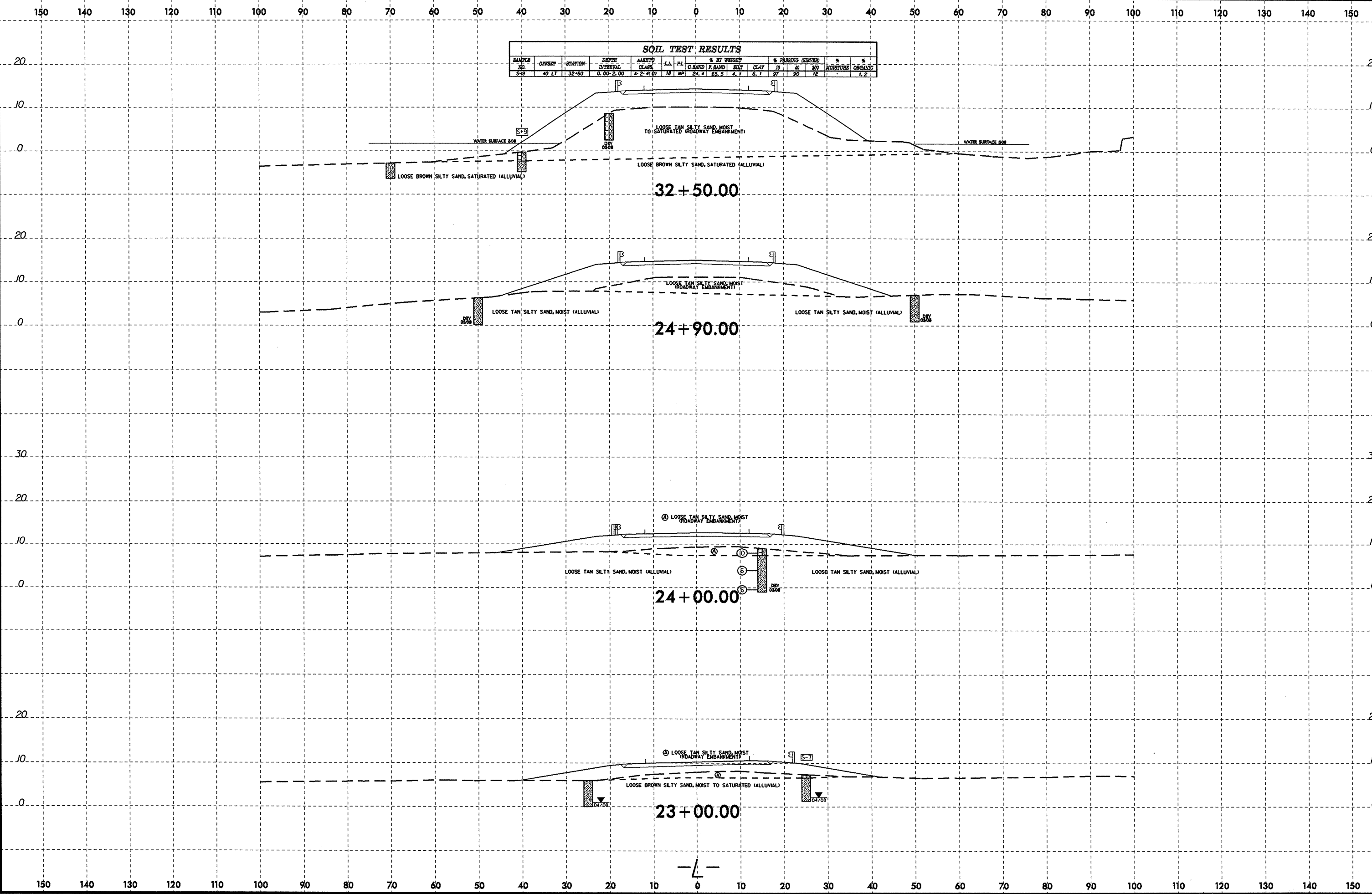
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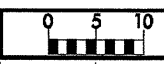
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SOIL TEST RESULTS													
SAMPLE NO.	OFFSPRT	SECTION	DEPTH INTERVAL	ASBTD CLASS	L.L. - P.L.	C. SAND	F. SAND	SILT	CLAY	% PASSING (SIZES)	% MOISTURE	% ORGANIC	
1	2	3	4	5	6	7	8	9	10	11	12	13	14
S-9	40 LY	32+50	0.00-2.00	A-2-4 (U)	18	NP	24.4	65.5	4.1	6.1	97	90	12

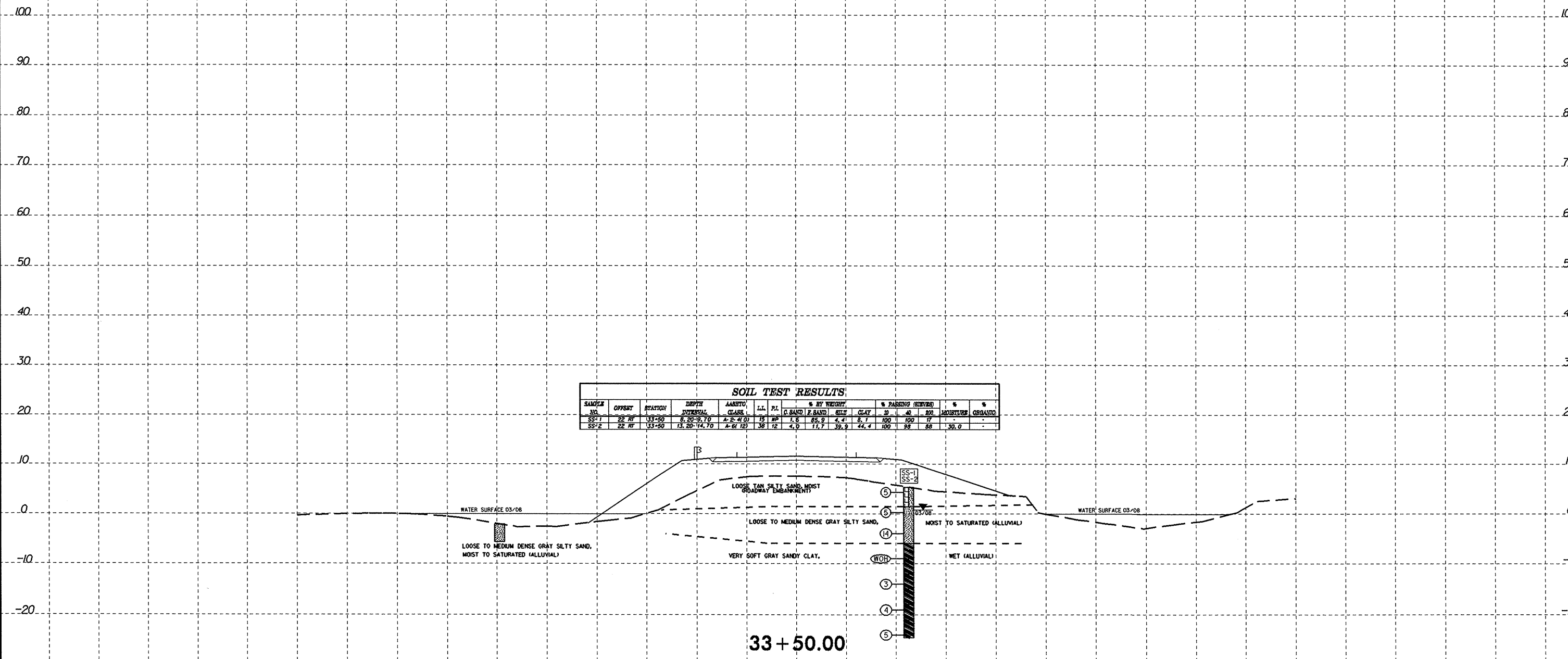
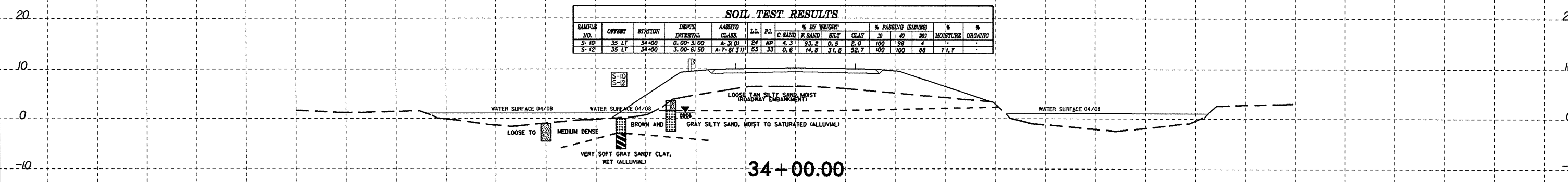


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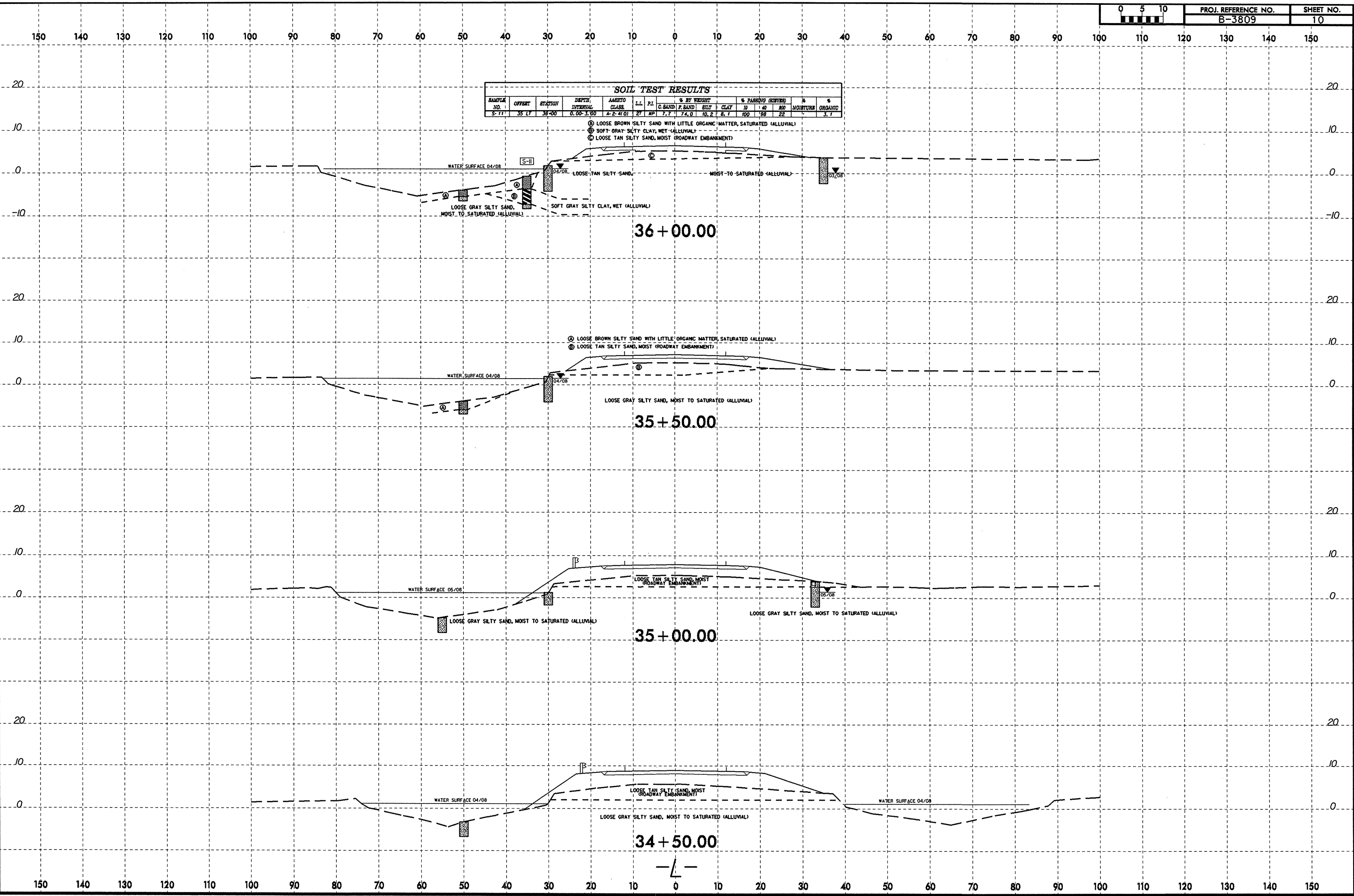


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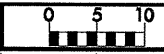
SOIL TEST RESULTS														
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	LL	PI	% BY WEIGHT			% PASSING (SIZES)		MOISTURE	% ORGANIC	
							C. SAND	F. SAND	SILT	CLAY	10	40	200	
S-11	35 LF	36+00	0.00-3.00	A-2-4(0)	27	10	7.7	74.0	10.2	8.1	100	98	22	3.7

- ① LOOSE BROWN SILTY SAND WITH LITTLE ORGANIC MATTER, SATURATED (ALLUVIAL)
- ② SOFT GRAY SILTY CLAY, WET (ALLUVIAL)
- ③ LOOSE TAN SILTY SAND, MOIST (ROADWAY EMBANKMENT)



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PROJ. REFERENCE NO. B-3809 SHEET NO. 11

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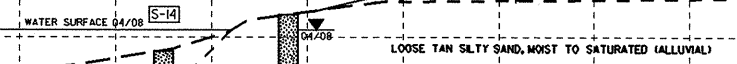
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SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASTM CLASS	LL	PI	% BY WEIGHT			% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							G. SAND	F. SAND	SILT	CLAY	10	40		
S-14	45 LY	38+00	0.00-4.00	A-2-4(0)	25	NP	2.2	87.5	4.2	6.1	100	99	13	2.1

- Ⓐ LOOSE BROWN SILTY SAND WITH A TRACE OF ORGANICS, SATURATED (ALLUVIAL)
- Ⓑ LOOSE TAN SILTY SAND, MOIST (ROADWAY EMBANKMENT)



38+00.00

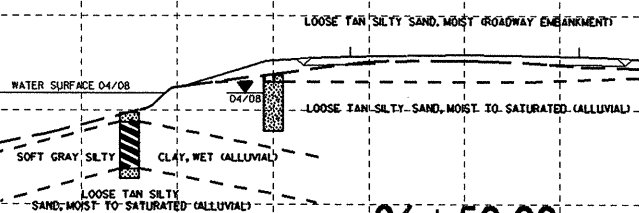
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASTM CLASS	LL	PI	% BY WEIGHT			% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							G. SAND	F. SAND	SILT	CLAY	10	40		
S-13	45 LY	37+50	0.00-3.00	A-2-4(0)	28	NP	2.2	79.1	10.5	8.1	100	100	22	3.4

- Ⓐ LOOSE BROWN SILTY SAND WITH LITTLE ORGANIC MATTER, SATURATED (ALLUVIAL)
- Ⓑ LOOSE TAN SILTY SAND, MOIST (ROADWAY EMBANKMENT)



37+50.00



36+50.00

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