CONTRACT: ID: R-3601

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

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LINE	STATION	PLAN	PROFILE
-LMED-	42+00 TO 85+80	4-7	14-15
-LLT-	85+80 TO 127+00	7-10	16-17
-LRT-	85+80 TO 130+50	7-11	18-19
-Y-	18+10 TO 41+95	4,13	20
-Y1-	12+60 TO 14+40	4	21
-Y2-	11+00 TO 24+50	4,13	22
-Y2A-	10+00 TO 12+20	4	23
-Y3-	10+23 TO 13+50	12	24
-RPLLT-	114+80 TO 127+15	10	25
-RPLRT-	115+28 TO 122+75	10	26
-RPLRT-	160+00 TO 166+50	12	27
-RPAYLT-	23+00 TO 28+09	4	28
-RPAYRT-	23+00 TO 29+44	4	28
-RPBY-	14+00 TO 20+59	4	29
-RPBYLT-	18+00 TO 20+73	4	30
-RPBYRT-	18+00 TO 21+70	4	30
-RPCY-	22+00 TO 27+19	4	31
-RPCYLT-	25+15 TO 27+21	4	32
-RPCYRT-	25+15 TO 28+78	4	32
-RPDY-	10+00 TO 27+75	4-5	33
-RPDYLT-	25+60 TO 28+22	4	34
-RPDYRT-	25+60 TO 30+93	4	34

CROSS SECTIONS

LINE	STATION	SHEET
-LMED-	44+00	35
-LMED-	54+00	36
-LMED-	80+00	36
-LLT-	90+00	37
-LLT-	100+00	37
-LLT-	115+50	38
-LLT-	116+00	38
-LLT-	116+50	38

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

ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. *38868.1.1 (R-3601)* F.A. PROJ. *NHS-0017(68)*

COUNTY *BRUNSWICK AND NEW HANOVER*

PROJECT DESCRIPTION *US 17-74-76 FROM NC 133 /SR1472 INTERCHANGE TO US 421 /NC 133 INTERCHANGE*

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	38868.1.1 (R-3601)	1	38

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
38838.1.1	NHS-0017(68)	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.

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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.

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SUBMITTED BY *D.N. ARGENBRIGHT*

DATE *OCTOBER 2011*

NORTH CAROLINA LICENSED SEAL 2240 GEOLOGIST TYLER C. BOTTOMS

10/13/11

DRAWN BY: *C.P. TURNER*

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

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

PROJECT REFERENCE NO.	SHEET NO.
R-3601	2 OF 38

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 #40 #200	50 MX 30 MX 15 MX		50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
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 / OPT 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
- [ ] 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
- [ ] _____

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 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 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:

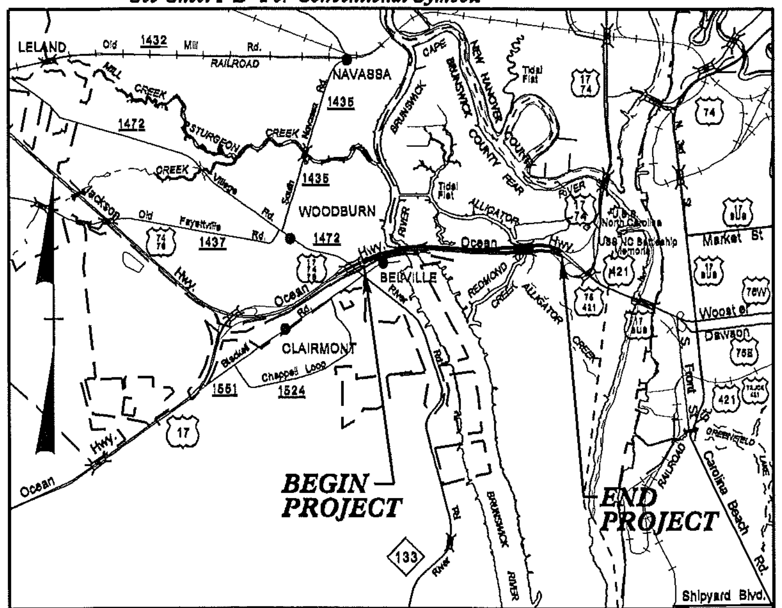
ELEVATION: FT.

NOTES:

APPROXIMATE LIMITS OF ORGANIC SOILS

REVISED 09/23/09

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



VICINITY MAP

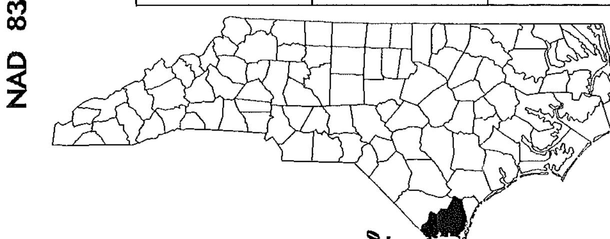
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-3601	2A	38

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
38868.1.1	NHS-0017(68)	P.E.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

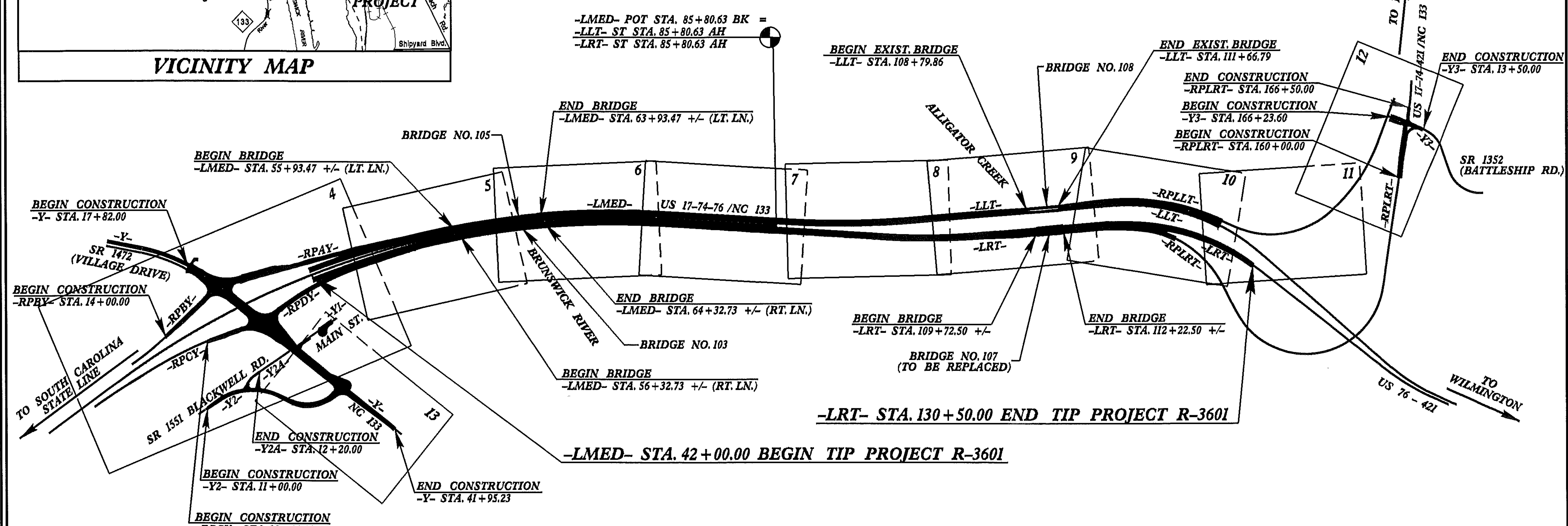
BRUNSWICK AND NEW HANOVER COUNTIES

NAD 83/95



LOCATION: US 17-74-76 FROM NC 133 / SR 1472 INTERCHANGE TO THE US 421 /NC 133 INTERCHANGE

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



A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF LELAND AND BELVILLE.

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD __.

THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

TIP PROJECT: R-3601

CONTRACT:

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 2013 = 78,321 VPD
ADT 2035 = 107,000 VPD
DHV = 11 %
D = 55 %
* T = 6 %
V = 60 MPH
*(TTST 3% + DUALS 3%)

FUNC. CLASS. = FREEWAY
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-3601 = 1.477 MILES
LENGTH STRUCTURE TIP PROJECT R-3601 = 0.199 MILE
TOTAL LENGTH TIP PROJECT R-3601 = 1.676 MILES

(EASTBOUND LANES WERE USED FOR LENGTH OF PROJECT CALCULATION.)

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 13, 2012

LETTING DATE:
JULY 16, 2013

RON McCOLLUM, PE
PROJECT ENGINEER

JEFFREY L. TEAGUE, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

P.E.
STATE HIGHWAY DESIGN ENGINEER

09/08/99

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

October 13, 2011

STATE PROJECT: 38868.1.1 (R-3601)
F.A. PROJECT: NHS-0017(68)
COUNTIES: Brunswick
DESCRIPTION: US 17-74-76 FROM NC 133/ SR 1472 Interchange to the US 421/ NC 133 Interchange

SUBJECT: Geotechnical Inventory

Project Description

This project is located in Brunswick County on US 17-74-76 between the NC 133/ SR 1472 interchange and the US 421/ NC 133 interchange. Proposed construction consists of widening US 17-74-76, a realignment of Blackwell Road, and a diverging diamond interchange at US 17-74-76 and NC 133/ SR 1472. This geotechnical investigation was confined to the areas of proposed construction.

Fieldwork for this project was conducted during August and September of 2007 and May and June of 2011. 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 alignments were investigated. Subsurface profiles and selected cross sections of these alignments are included in this report.

Line	Station(±)
-LMED-	42+00 to 85+80
-LLT-	85+80 to 127+00
-LRT-	85+80 to 130+50
-Y-	18+10 to 41+95
-Y1-	12+60 to 14+40
-Y2-	11+00 to 24+50

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

Line	Station(±)
-Y2A-	10+00 to 12+20
-Y3-	10+23 to 13+50
-RPLLT-	114+80 to 127+15
-RPLRT-	115+28 to 122+75
-RPLRT-	160+00 to 166+50
-RPAYLT-	23+00 to 28+09
-RPAYRT-	23+00 to 29+44
-RPBY-	14+00 to 20+59
-RPBYLT-	18+00 to 20+73
-RPBYRT-	18+00 to 21+70
-RPCY-	22+00 to 27+19
-RPCYLT-	25+15 to 27+21
-RPCYRT-	25+15 to 28+78
-RPDY-	10+00 to 27+75
-RPDYLT-	25+60 to 28+22
-RPDYRT-	25+60 to 30+93

Areas of Special Geotechnical Interest

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

Line	Station(±)
-LMED-	43+75 to 44+25
-LMED-	53+75 to 54+25
-LLT-	89+30 to 90+70
-LLT-	99+30 to 100+70
-LRT-	89+25 to 90+75
-Y-	34+90 to 36+10
-Y2-	11+70 to 18+35
-Y2-	23+25 to 23+95
-Y2A-	10+00 to 10+40
-RPDY-	19+25 to 21+95

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

Line	Station(±)
-LLT-	99+65 to 100+70
-LLT-	113+05 to 114+10
-LLT-	115+75 to 116+25
-LRT-	99+25 to 100+70
-LRT-	111+90 to 122+60
-RPLRT-	116+85 to 121+00

3) The entire project was found to exhibit seasonal high ground water.

4) Artificial Fill was encountered along the following line and consists of sand and clay.

Line	Station(±)
-Y2-	20+60 to 24+05

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 44± feet below sea level along the bed of the Brunswick River to 59± feet above sea level along the existing US 17-74-76 embankment.

Surficial soils in this area are generally classified as alluvial sediments.

Ground Water

Ground water data was collected in August and September of 2007 and May and June of 2011, during a time of normal precipitation. Ground water elevations ranged from sea level to 56± feet above sea level.

Soils

Soils within this project area have been divided into four categories: roadway embankment, artificial fill, and alluvial, and formational.

Roadway Embankment soils were encountered along the existing US 17-74-76, NC 133, and associated intersecting roads. These soils are comprised of 1± to 15 or more feet of very loose to medium dense sand (A-2-4, A-3, A-1-b).

Soils classified as artificial fill are comprised of 10 or more feet of loose to medium dense sand (A-2-4) and soft sandy clay (A-7-6). This artificial fill was encountered near the proposed interchange of -Y- and -Y2-.

Alluvial soils were encountered beneath the embankment and within the floodplain of the Brunswick and Alligator Rivers. They are comprised of 1± to 20± feet of loose to medium dense sand (A-2-4, A-3), 1± to 3± feet of soft sandy silt and sandy clay (A-4, A-6), and 1± to 15± feet of muck, sandy and silty clay with little to moderate organic material, and sand with trace to moderate organic material.

Laboratory analysis of these soils show organic percentages ranging from 2% to 95% and moisture contents ranging from 28% to 197%.

Respectfully Submitted,

Tyler C. Bottoms, L.G.
Project Engineering Geologist

PROJECT REFERENCE NO.	SHEET NO.
R-3601	3B

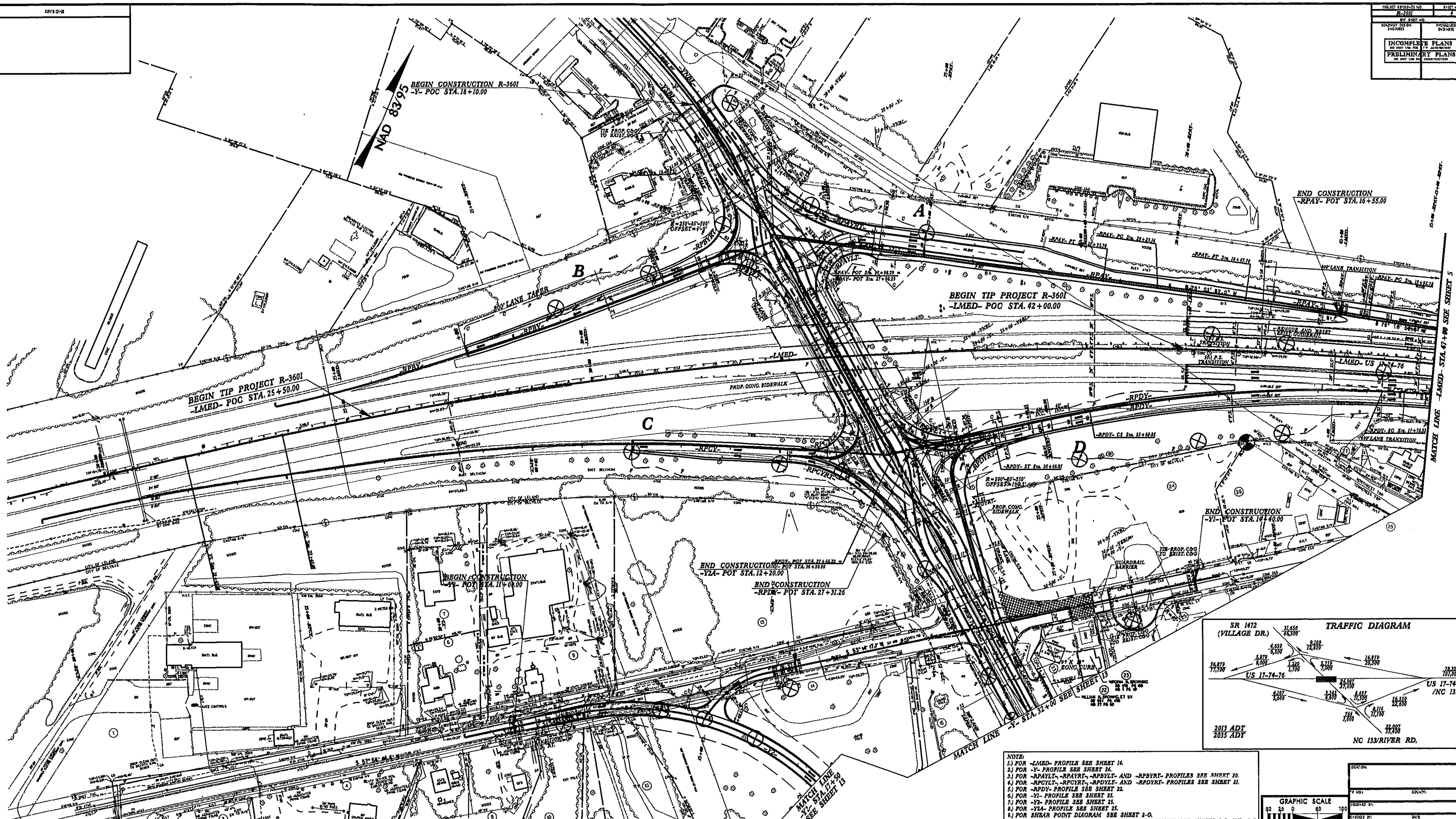
EARTHWORK BALANCE SHEET

PROJECT REFERENCE NO. R-3601 | SHEET NO. 4

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION



NOTE:
1.) FOR -LMED- PROFILE SEE SHEET 14.
2.) FOR -Y- PROFILE SEE SHEET 24.
3.) FOR -RPAYLT-, -RPAYRT-, -RPBYLT- AND -RPBYRT- PROFILES SEE SHEET 20.
4.) FOR -RPCYLT-, -RPCYRT-, -RPDYLT- AND -RPDYRT- PROFILES SEE SHEET 21.
5.) FOR -RPDY- PROFILE SEE SHEET 22.
6.) FOR -Y1- PROFILE SEE SHEET 25.
7.) FOR -Y2- PROFILE SEE SHEET 25.
8.) FOR -Y2A- PROFILE SEE SHEET 25.
9.) FOR SHEAR POINT DIAGRAM SEE SHEET 2-O.
10.) FOR DETAIL OF DIVERGING DIAMOND INTERCHANGE SEE SHEETS 2-P AND 2-Q.

PROJECT REFERENCE NO.	SHEET NO.
R-3601	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

8/17/99

REVISIONS

-RPAY-

PI Sta 12+95.05	PI Sta 17+21.76	PI Sta 20+80.43
Δ = 0° 45' 02.0" (LT)	Δ = 1° 12' 11.0" (LT)	Δ = 0° 31' 39.9" (LT)
D = 0° 28' 38.9"	D = 0° 28' 38.9"	D = 0° 28' 38.9"
L = 157.20'	L = 251.97'	L = 110.53'
T = 78.60'	T = 125.99'	T = 55.27'
R = 12,000.00'	R = 12,000.00'	R = 12,000.00'

-LMED-

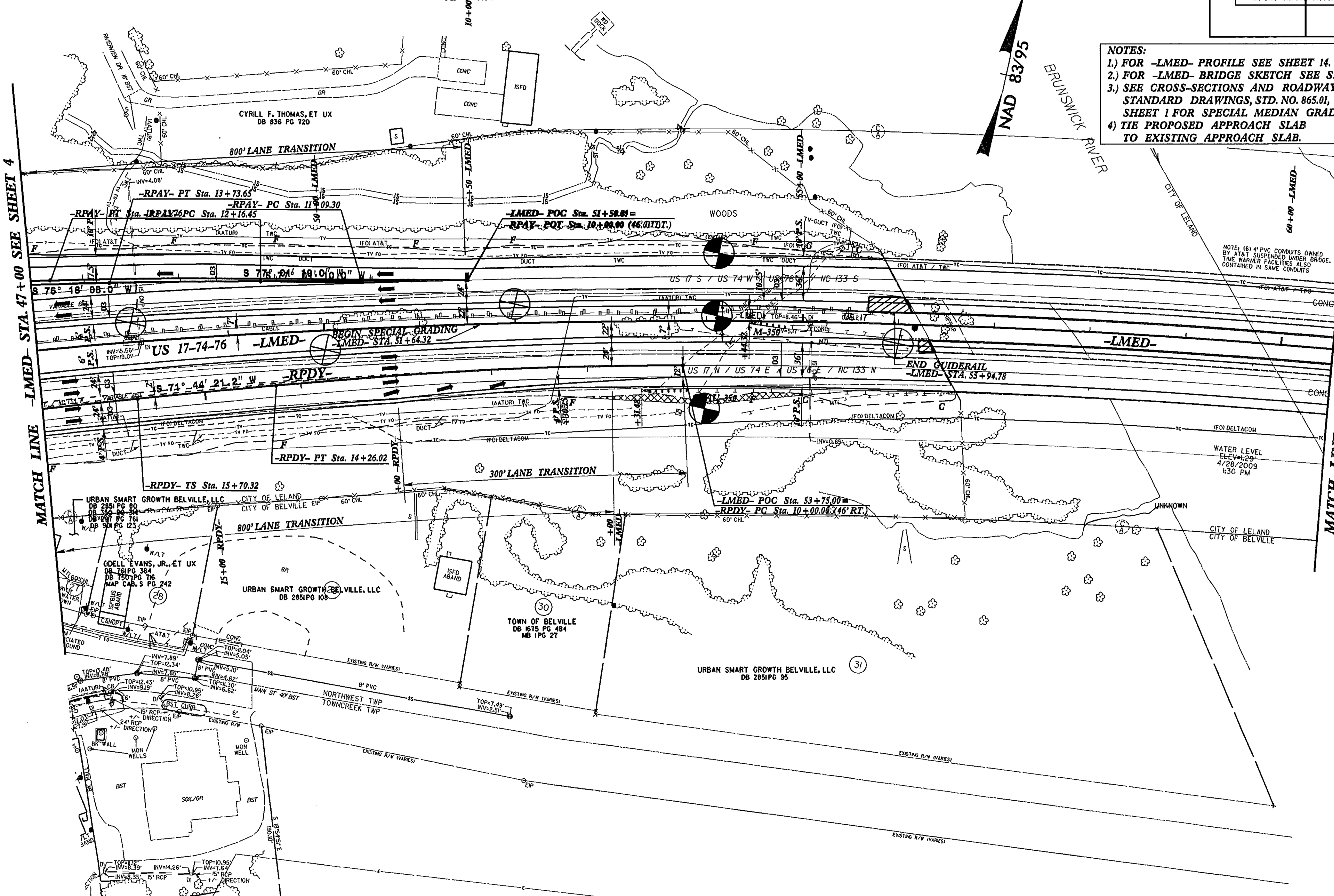
PIs Sta 22+98.34	PI Sta 49+95.48	PIs Sta 74+98.35
Θs = 0° 45' 00.0"	Δ = 38° 00' 00.0" (RT)	Θs = 0° 45' 00.0"
Ls = 200.00'	D = 0° 45' 00.0"	Ls = 200.00'
LT = 133.33'	L = 5,066.67'	LT = 133.33'
ST = 66.67'	T = 2,630.47'	ST = 66.67'
N 53° 59' 13.8" E (BACK)	R = 7,639.44'	
	SE = 0.03	

-RPDY-

PI Sta 12+59.51	PIs Sta 16+33.49	PI Sta 20+11.50	PIs Sta 23+68.76
Δ = 4° 07' 42.6" (LT)	Θs = 0° 47' 44.4"	Δ = 11° 56' 07.9" (LT)	Θs = 2° 02' 46.6"
D = 0° 47' 44.8"	Θs = 2° 02' 47.0"	D = 2° 02' 46.6"	Ls = 200.00'
L = 518.80'	Ls = 200.00'	L = 583.28'	LT = 133.34'
T = 259.51'	LT = 114.69'	T = 292.70'	ST = 66.67'
R = 7,200.00'	ST = 85.35'	R = 2,800.00'	
		SE = 0.05	

NOTES:

1.) FOR -LMED- PROFILE SEE SHEET 14.
2.) FOR -LMED- BRIDGE SKETCH SEE SHEET 2-M.
3.) SEE CROSS-SECTIONS AND ROADWAY STANDARD DRAWINGS, STD. NO. 865.01, SHEET 1 FOR SPECIAL MEDIAN GRADING.
4) TIE PROPOSED APPROACH SLAB TO EXISTING APPROACH SLAB.



MATCH LINE -LMED- STA. 47+00 SEE SHEET 4
MATCH LINE -LMED- STA. 60+50 SEE SHEET 6
NAD 83/95
BRUNSWICK RIVER
CYRILL F. THOMAS, ET UX
DB 836 PG 720
800' LANE TRANSITION
-RPAY- PT Sta. 13+73.65
-RPAY- PC Sta. 11+09.30
-LMED- POC Sta. 51+50.00 =
-RPAY- POT Sta. 10+00.00 (46' LT.)
WOODS
US 17 S / US 74 W / US 76 W / NC 133 S
US 17-74-76
-LMED-
BEGIN SPECIAL GRADING
-LMED- STA. 51+64.32
-RPDY-
S 71° 44' 21.2" W
US 17 N / US 74 E / US 76 E / NC 133 N
END GUIDERAIL
-LMED- STA. 55+94.78
-RPDY- PT Sta. 14+26.02
-RPDY- TS Sta. 15+70.32
300' LANE TRANSITION
-LMED- POC Sta. 53+75.00 =
-RPDY- PC Sta. 10+00.00 (46' RT.)
NOTE: (6) 4" PVC CONDUITS OWNED BY AT&T SUSPENDED UNDER BRIDGE. TIME WARNER FACILITIES ALSO CONTAINED IN SAME CONDUITS
WATER LEVEL
ELEV=1.29'
4/28/2009
1:30 PM
CITY OF LELAND
CITY OF BELVILLE
URBAN SMART GROWTH BELVILLE, LLC
DB 2851 PG 80
ODELL EVANS, JR., ET UX
DB 761 PG 384
DB 750 PG 716
MAP CAB. S PG 242
URBAN SMART GROWTH BELVILLE, LLC
DB 2851 PG 108
TOWN OF BELVILLE
DB 1675 PG 484
MB 1 PG 27
URBAN SMART GROWTH BELVILLE, LLC
DB 2851 PG 95
NORTHWEST TWP
TOWNCREEK TWP
EXISTING R/W (VARIES)
ISFD ABAND
MON WELLS
MON WELL

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PROJECT REFERENCE NO.	SHEET NO.
R-3601	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

-LMED-

PIs Sta 22+98.34	PI Sta 49+95.48	PIs Sta 74+98.35
Θs = 0° 45' 00.0"	Δ = 38° 00' 00.0" (RT)	Θs = 0° 45' 00.0"
Ls = 200.00'	D = 0° 45' 00.0"	Ls = 200.00'
LT = 133.33'	L = 5,066.67'	LT = 133.33'
ST = 66.67'	T = 2,630.47'	ST = 66.67'
N 53° 59' 13.8" E (BACK)	R = 7,639.44'	
	SE = 0.03	

NAD 83/95

65+00 -LMED-

70+00 -LMED-

NOTES:
1.) FOR -LMED- PROFILE SEE SHEETS 14 AND 15.
2.) FOR -LMED- BRIDGE SKETCH SEE SHEET 2-M.
3.) SEE CROSS-SECTIONS AND ROADWAY STANDARD DRAWINGS, STD. NO. 865.01, SHEET 1 FOR SPECIAL MEDIAN GRADING.
4.) TIE PROPOSED APPROACH SLAB TO EXISTING APPROACH SLAB.

NEW HANOVER SOIL & WATER CONSERV DIST
DB 1722 PG 776

MATCH LINE -LMED- STA. 60+50 SEE SHEET 5

MATCH LINE -LMED- STA. 74+00 SEE SHEET 7

EXISTING R/W

(AATUR) TWC

(FO) AT&T

GRAU 350

DUCT TWC

WOODS

REMOVE AND RESET EXIST. GUIDERAIL

END SPECIAL GRADING -LMED- STA. 68+63.02

M-350 + CABLE TV

CABLE

VARIABLE BST

BEGIN GUIDERAIL -LMED- STA. 64+33.12

(FO) DELTACOM

(2) EXPOSED EMPTY CONDUITS ASSOCIATED WITH DELTACOM FACILITIES

UNKNOWN

EXISTING EVE TANKS

NORTHWEST TWP
TOWNCREEK TWP

REVISIONS 8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
R-3601	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

-LMED-

PIs Sta 22+98.34	PI Sta 49+95.48	PIs Sta 74+98.35
θs = 0° 45' 00.0"	Δ = 38° 00' 00.0" (RT)	θs = 0° 45' 00.0"
Ls = 200.00'	D = 0° 45' 00.0"	Ls = 200.00'
LT = 133.33'	L = 5,066.67'	LT = 133.33'
ST = 66.67'	T = 2,630.47'	ST = 66.67'
N 53° 59' 13.8" E (BACK)	R = 7,639.44'	
	SE = 0.03	

-LLT-

PIs Sta 87+13.96	PI Sta 92+45.65	PIs Sta 97+76.19
θs = 0° 45' 00.0"	Δ = 6° 58' 00.0" (LT)	θs = 0° 45' 00.0"
Ls = 200.00'	D = 0° 45' 00.0"	Ls = 200.00'
LT = 133.33'	L = 928.89'	LT = 133.33'
ST = 66.67'	T = 465.02'	ST = 66.67'
S 86° 30' 46.2" E (BACK)	R = 7,639.44'	
	SE = 0.05	

NAD 83/95

75+00 -LMED-

80+00 -LMED-

85+00 -LMED-

MATCH LINE -LMED- STA. 74+00 SEE SHEET 6

MATCH LINE -LLT- STA. 87+50 SEE SHEET 8

EXISTING R/W

-LLT- TS Sta. 85+80.63

-LMED- POT STA. 85+80.63 BK =
-LLT- TS STA. 85+80.63 AH (46' LT.) =
-LRT- POT STA. 85+80.63 AH (46' RT.)

END GUIDERAIL
-LLT- STA. 87+37.00

REMOVE AND RESET EXIST. GUIDERAIL

-LMED- CS Sta. 74+31.68

(2) EXPOSED EMPTY CONDUITS ASSOCIATED WITH DELTACOM FACILITIES

-LMED- ST Sta. 76+31.68

EXPOSED 2" EMPTY CONDUIT

-LRT- POT Sta. 85+80.63

REMOVE EXIST. GUARDRAIL

-LMED-

-LLT-

-LRT-

-US17-

S 86° 30' 46.2" E

NOTE: AT&T TELEPHONE FEED TO NCDOT DYNAMIC HIGHWAY SIGN.

CITY OF BELVILLE

UNKNOWN

WOODS

MARSH

NOTES:
1.) FOR -LMED- PROFILE SEE SHEET 15.
2.) FOR -LLT- PROFILE SEE SHEET 16.
3.) FOR -LRT- PROFILE SEE SHEET 18.

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
R-3601	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

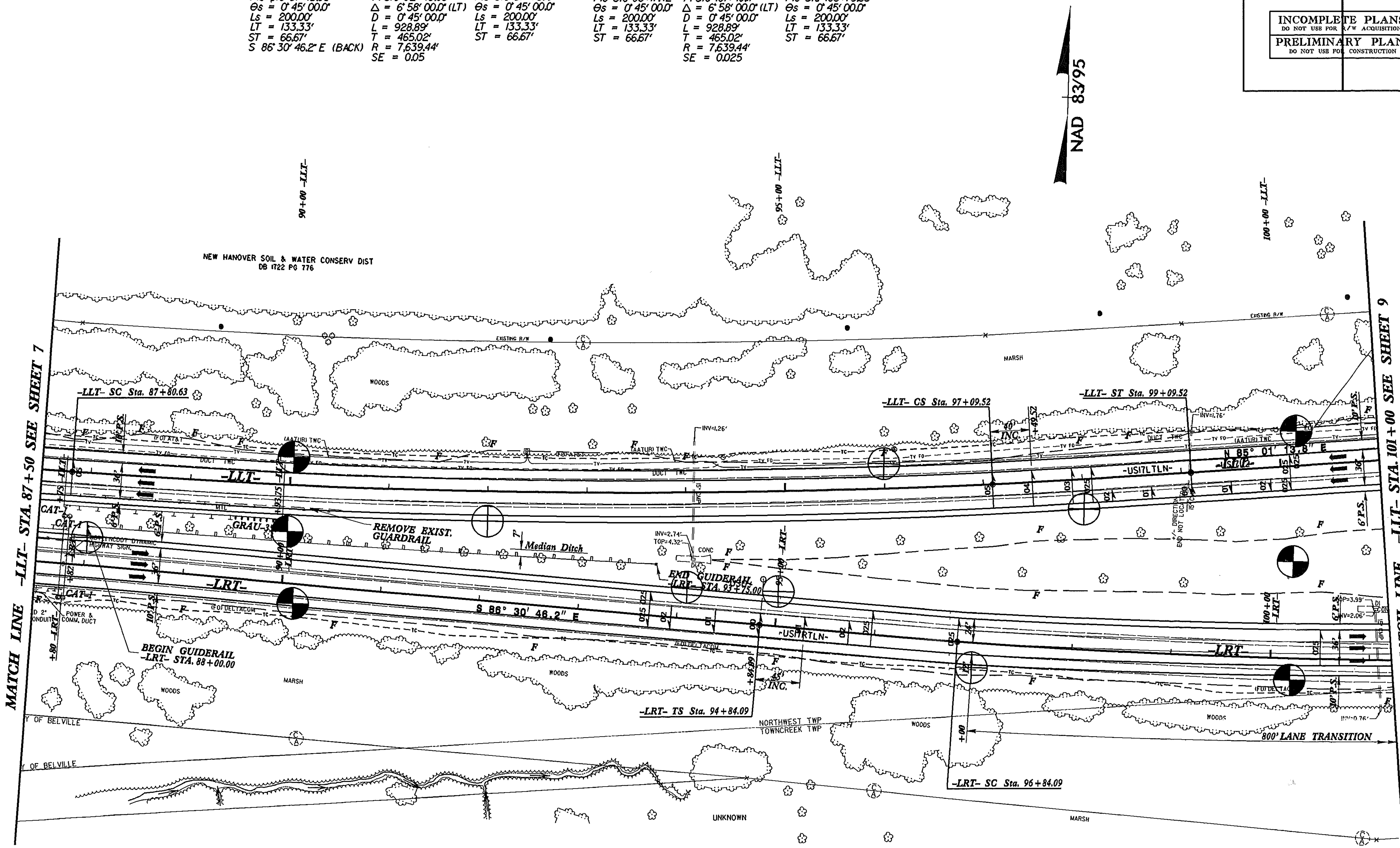
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-LLT-

PIs Sta 87+13.96	PI Sta 92+45.65	PIs Sta 97+76.19
Θs = 0° 45′ 00.0″	Δ = 6° 58′ 00.0″ (LT)	Θs = 0° 45′ 00.0″
Ls = 200.00′	D = 0° 45′ 00.0″	Ls = 200.00′
LT = 133.33′	L = 928.89′	LT = 133.33′
ST = 66.67′	T = 465.02′	ST = 66.67′
S 86° 30′ 46.2″ E (BACK)	R = 7,639.44′	
	SE = 0.05	

-LRT-

PIs Sta 96+17.42	PI Sta 101+49.11	PIs Sta 106+79.65
Θs = 0° 45′ 00.0″	Δ = 6° 58′ 00.0″ (LT)	Θs = 0° 45′ 00.0″
Ls = 200.00′	D = 0° 45′ 00.0″	Ls = 200.00′
LT = 133.33′	L = 928.89′	LT = 133.33′
ST = 66.67′	T = 465.02′	ST = 66.67′
	R = 7,639.44′	
	SE = 0.025	



NOTES:

1.) FOR -LLT- PROFILE SEE SHEET 16.

2.) FOR -LRT- PROFILE SEE SHEET 18.

8/17/99

REVISIONS

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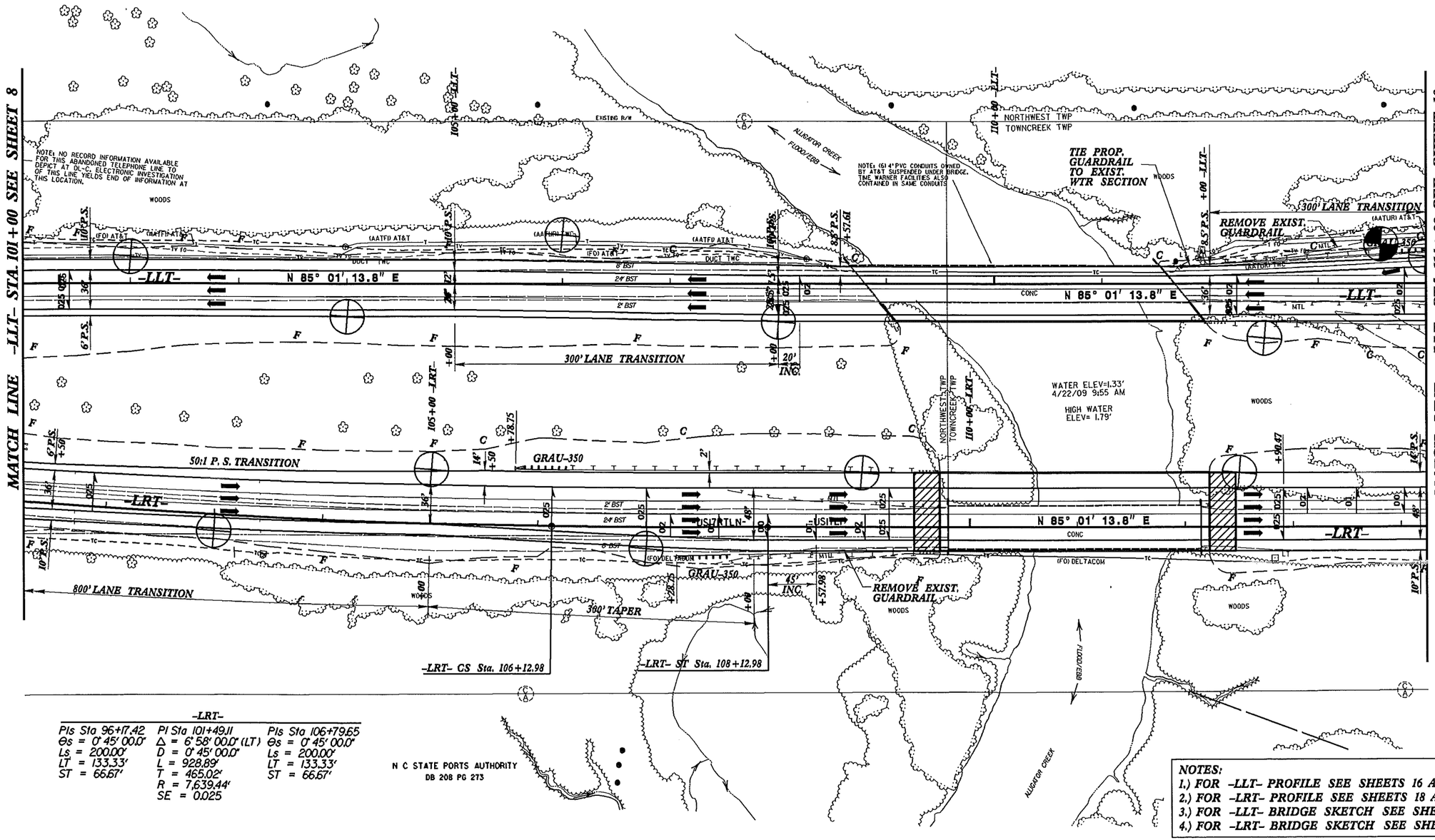
PROJECT REFERENCE NO.	SHEET NO.
R-3601	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95

REVISIONS 8/17/99



-LRT-

PIs Sta 96+17.42	PI Sta 101+49.11	PIs Sta 106+79.65
Θs = 0° 45' 00.0"	Δ = 6° 58' 00.0" (LT)	Θs = 0° 45' 00.0"
Ls = 200.00'	D = 0° 45' 00.0"	Ls = 200.00'
LT = 133.33'	L = 928.89'	LT = 133.33'
ST = 66.67'	T = 465.02'	ST = 66.67'
	R = 7,639.44'	
	SE = 0.025	

NOTES:
1.) FOR -LLT- PROFILE SEE SHEETS 16 AND 17.
2.) FOR -LRT- PROFILE SEE SHEETS 18 AND 19.
3.) FOR -LLT- BRIDGE SKETCH SEE SHEET 2-M.
4.) FOR -LRT- BRIDGE SKETCH SEE SHEET 2-M.

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PROJECT REFERENCE NO.	SHEET NO.
R-3601	10
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

8/17/99

REVISIONS

NAD 83/95

-LLT-

PIs Sta 116+66.09	PI Sta 124+10.16	PIs Sta 131+08.59
Θs = 4° 30' 00.0"	Δ = 37° 16' 30.0" (RT)	Θs = 4° 30' 00.0"
Ls = 300.00'	D = 3° 00' 00.0"	Ls = 300.00'
LT = 200.06'	L = 1,242.50'	LT = 200.06'
ST = 100.06'	T = 644.13'	ST = 100.06'
	R = 1,909.86'	
	SE = 0.07	

-RPLLT-

PIs Sta 116+80.05	PI Sta 122+08.59	PIs Sta 126+73.90
Θs = 4° 05' 33.2"	Δ = 23° 04' 12.5" (RT)	Θs = 1° 58' 41.0"
Ls = 300.00'	D = 2° 43' 42.1"	Ls = 145.00'
LT = 200.05'	L = 845.56'	LT = 96.67'
ST = 100.05'	T = 428.59'	ST = 48.34'
	R = 2,100.00'	
	SE = 0.07	

-LLT- 115+00 -LLT-

-LLT- TS Sta. 114+66.03

-LLT- SC Sta. 117+66.03

-RPLLT- SC Sta. 117+80.00

-LLT- POS Sta. 114+80.00 =
-RPLLT- ST Sta. 114+80.00 (12' LT.)

-RPLLT- 115+00 -LLT-

-LLT- 120+00 -RPLLT-

-RPLLT- 120+00 -LLT-

-LLT- 125+00 -RPLLT-

-RPLLT- 125+00 -LLT-

NEW HANOVER SOIL & WATER CONSERV DISTR
DB 1584 PG 716

EXISTING R/W

WOODS

END CONSTRUCTION
-RPLLT- POC STA. 127+15.00

-RPLLT- CS Sta. 126+25.56

400' LANE TRANSITION

300' LANE TRANSITION

1200' LANE TRANSITION

1450' LANE TRANSITION

100' TRANSITION LT. & RT.

30:1 P.S. TRANSITION

APPROXIMATE LIMIT OF ORGANIC SOILS

END CONSTRUCTION
-LLT- POC STA. 127+00.00

-RPLRT- CS Sta. 118+39.77

-LRT- SC Sta. 118+37.97

-RPLRT- SC Sta. 120+39.77

-LRT- TS Sta. 115+37.97

-LRT- PT Sta. 115+28.00 =
-RPLRT- PC Sta. 115+28.00

UNKNOWN

END CONSTRUCTION
-RPLRT- POC STA. 122+75.00

MATCH LINE -LLT- STA. 114+00 SEE SHEET 9

MATCH LINE -LLT- STA. 127+50 SEE SHEET 11

-LRT-

PIs Sta 117+38.03	PI Sta 124+26.89	PIs Sta 130+80.53
Θs = 4° 30' 00.0"	Δ = 34° 16' 30.0" (RT)	Θs = 4° 30' 00.0"
Ls = 300.00'	D = 3° 00' 00.0"	Ls = 300.00'
LT = 200.06'	L = 1,142.50'	LT = 200.06'
ST = 100.06'	T = 588.92'	ST = 100.06'
	R = 1,909.86'	
	SE = 0.08	

-RPLRT-

PI Sta 116+84.16	PIs Sta 119+52.69	PI Sta 124+32.66	PIs Sta 128+51.97
Δ = 8° 22' 00.0" (RT)	Θs = 2° 40' 57.2"	Δ = 44° 43' 30.0" (RT)	Θs = 5° 59' 58.4"
D = 2° 41' 01.1"	Θs = 6° 00' 02.3"	D = 5° 59' 58.4"	Ls = 200.00'
L = 311.77'	Ls = 200.00'	L = 745.47'	LT = 133.41'
T = 156.16'	LT = 112.92'	T = 392.89'	ST = 66.74'
R = 2,135.00'	ST = 87.45'	R = 955.00'	
SE = 0.08			

NOTES:
1.) FOR -LLT- PROFILE SEE SHEET 17.
2.) FOR -LRT- PROFILE SEE SHEET 19.
3.) FOR -RPLRT- PROFILE SEE SHEETS 22 AND 23.
4.) FOR -RPLLT- PROFILE SEE SHEET 23.

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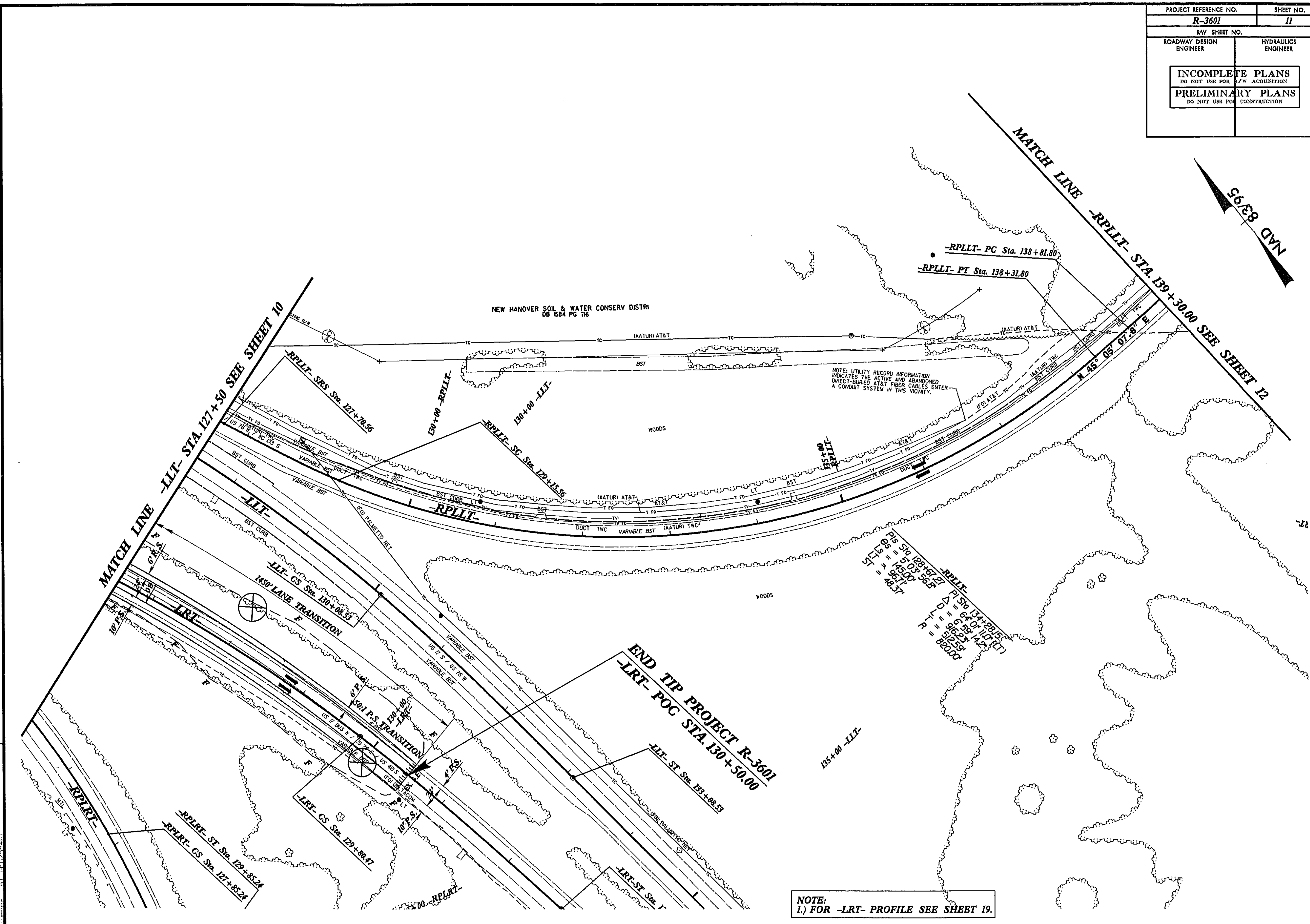
PROJECT REFERENCE NO.	SHEET NO.
R-3601	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

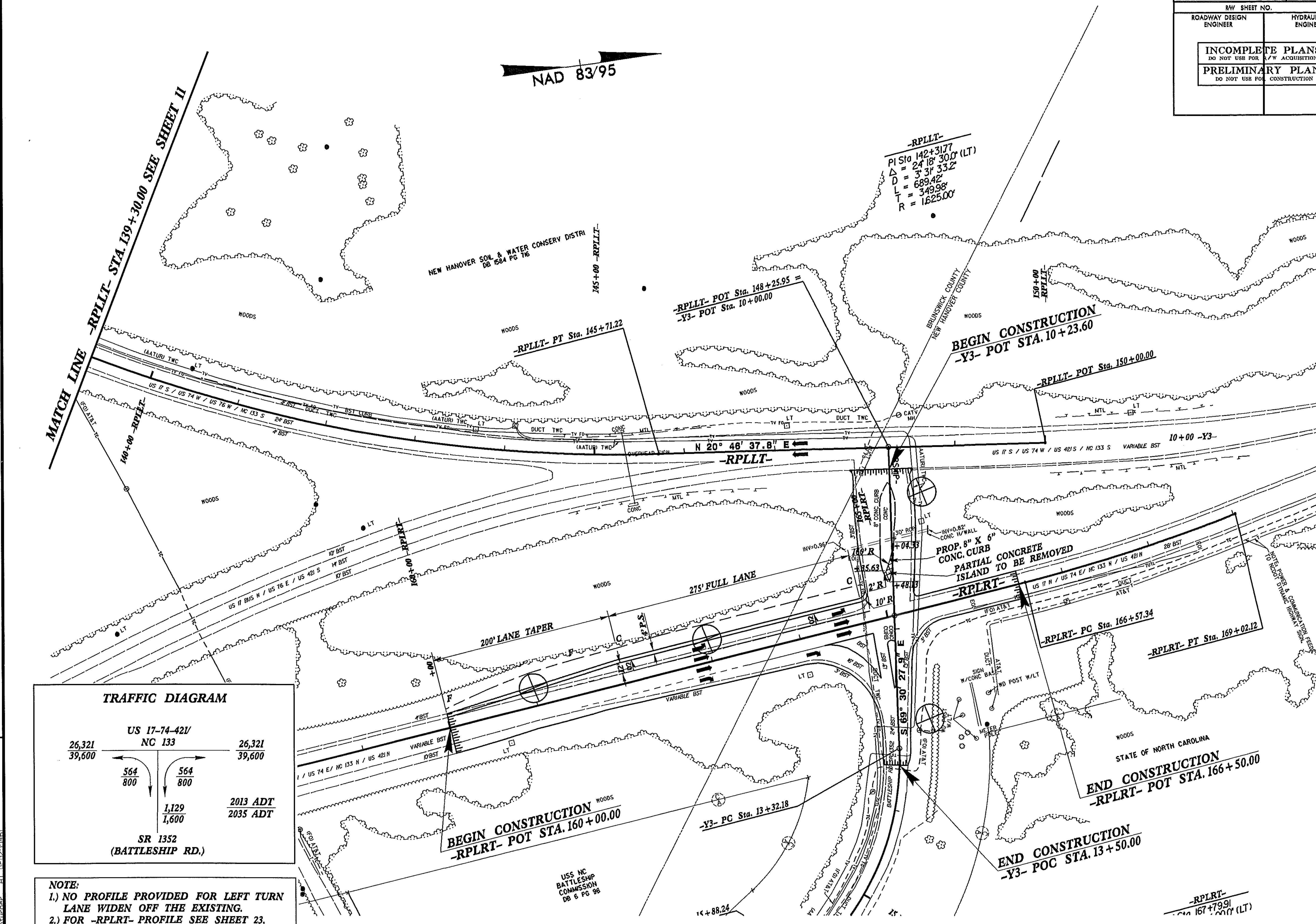
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PROJECT REFERENCE NO.	SHEET NO.
R-3601	12
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 83/95
MATCH LINE -RPLLT- STA. 139+30.00 SEE SHEET 11
-RPLLT-
PI Sta 142+31.77
Δ = 24° 18' 30.0" (LT)
D = 3° 31' 33.2"
L = 689.42'
T = 349.98'
R = 1,625.00'
NEW HANOVER SOIL & WATER CONSERV DISTRI
DB 1584 PG 716
WOODS
-RPLLT- PT Sta. 145+71.22
-RPLLT- POT Sta. 148+25.95 =
-Y3- POT Sta. 10+00.00
BEGIN CONSTRUCTION
-Y3- POT STA. 10+23.60
-RPLLT- POT Sta. 150+00.00
BRUNSWICK COUNTY
NEW HANOVER COUNTY
N 20° 46' 37.8" E
-RPLLT-
US 17 S / US 74 W / US 421 S / NC 133 S
US 17 S / US 74 W / US 76 W / NC 133 S
US 17 BUS N / US 76 E / US 421 S
10+00 -Y3-
PROP. 8" X 6" CONC. CURB
PARTIAL CONCRETE ISLAND TO BE REMOVED
275' FULL LANE
200' LANE TAPER
-RPLRT-
US 17 N / US 74 E/ NC 133 N / US 421 N
-RPLRT- PC Sta. 166+57.34
-RPLRT- PT Sta. 169+02.12
S 69° 30' 27.9" E
BEGIN CONSTRUCTION
-RPLRT- POT STA. 160+00.00
-Y3- PC Sta. 13+32.18
END CONSTRUCTION
-RPLRT- POT STA. 166+50.00
END CONSTRUCTION
-Y3- POC STA. 13+50.00
STATE OF NORTH CAROLINA
USS NC BATTLESHIP COMMISSION
DB 6 PG 98
BATTLESHIP RD

TRAFFIC DIAGRAM

	US 17-74-421/ NC 133	
26,321 / 39,600	564 / 800 (turn) — 564 / 800 (turn)	26,321 / 39,600
	1,129 / 1,600	2013 ADT / 2035 ADT
	SR 1352 (BATTLESHIP RD.)	

NOTE:
1.) NO PROFILE PROVIDED FOR LEFT TURN LANE WIDEN OFF THE EXISTING.
2.) FOR -RPLRT- PROFILE SEE SHEET 23.

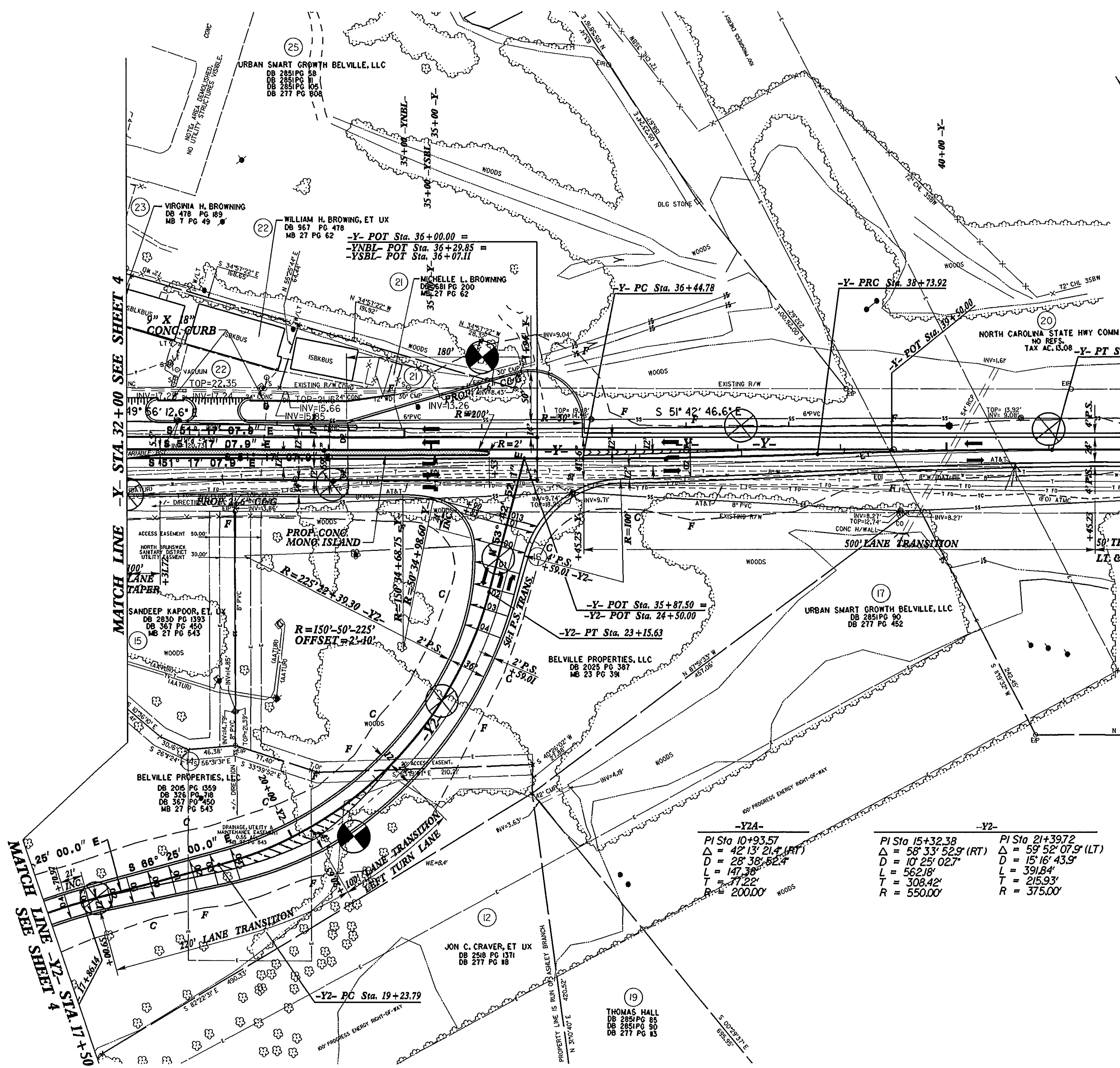
8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-3601	13
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



TRAFFIC DIAGRAM

NC 133/RIVER RD.

22,007 / 33,400 — 19,829 / 30,200

3,814 / 5,700 — 1,636 / 2,500

5,450 / 8,200

2013 ADT / 2035 ADT

SR 1551
(BLACKWELL RD.)

NOTE:
1.) FOR -Y- PROFILE SEE SHEET 24.
2.) FOR -Y2- PROFILE SEE SHEET 25.

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-3601	14

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

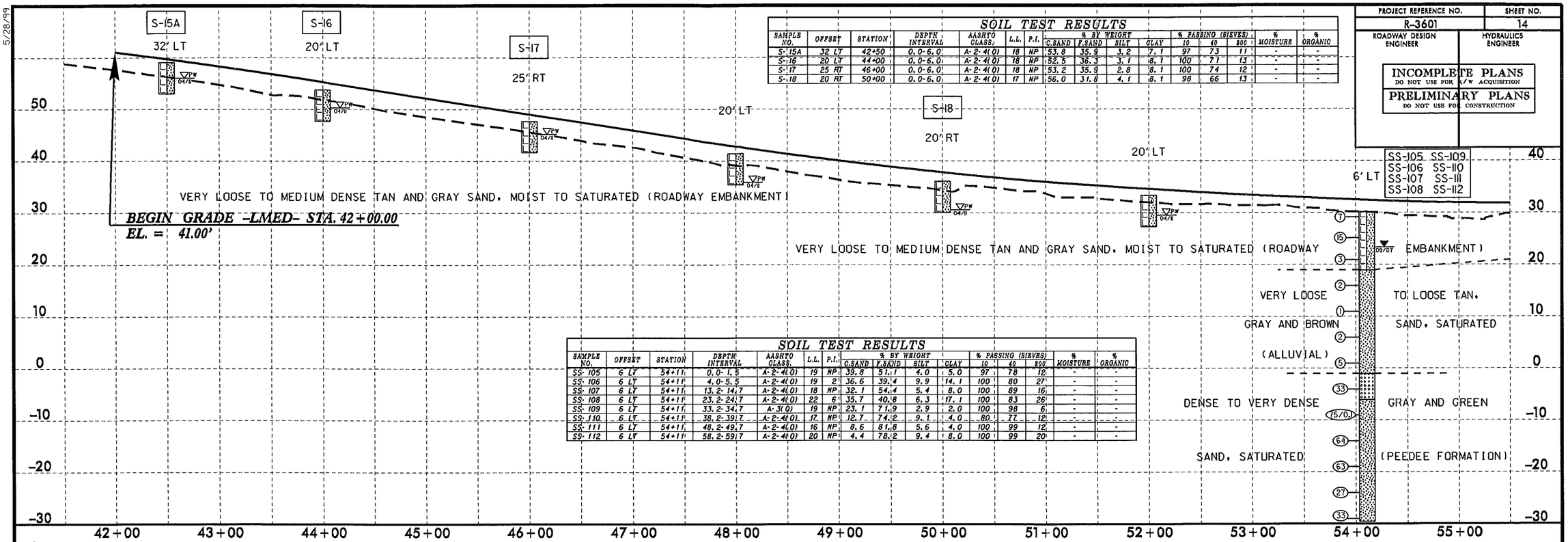
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SS-105 SS-109
SS-106 SS-110
SS-107 SS-111
SS-108 SS-112

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-15A	32' LT	42+50	0.0-6.0'	A-2-4(0)	18	NP	53.8	35.9	3.2	7.1	97	73	11	-	-
S-16	20' LT	44+00	0.0-6.0	A-2-4(0)	18	NP	52.5	36.3	3.1	8.1	100	77	13	-	-
S-17	25' RT	46+00	0.0-6.0'	A-2-4(0)	18	NP	53.2	35.9	2.8	8.1	100	74	12	-	-
S-18	20' RT	50+00	0.0-6.0	A-2-4(0)	17	NP	56.0	31.8	4.1	8.1	98	66	13	-	-

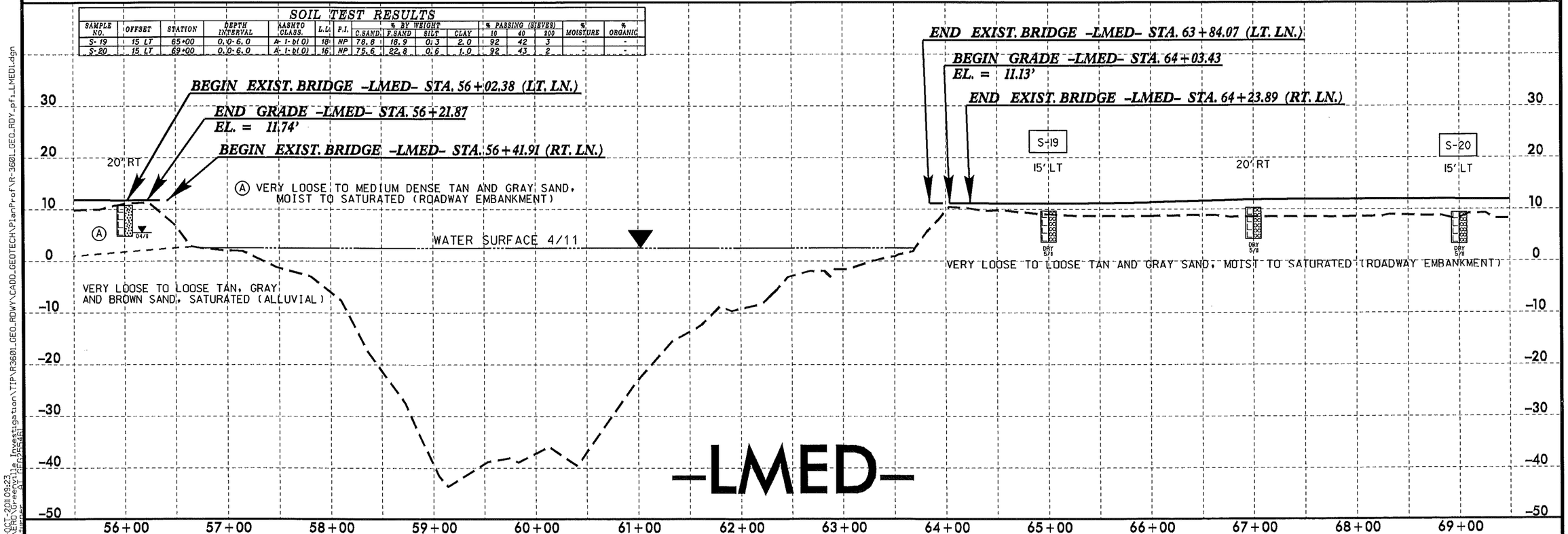


SOIL TEST RESULTS

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-105	6 LT	54+11	0.0-1.5	A-2-4(0)	19	NP	39.8	51.1	4.0	5.0	97	78	12	-	-
SS-106	6 LT	54+11	4.0-5.5	A-2-4(0)	19	2	36.6	39.4	9.9	14.1	100	80	27	-	-
SS-107	6 LT	54+11	13.2-14.7	A-2-4(0)	18	NP	32.1	54.4	5.4	8.0	100	89	16	-	-
SS-108	6 LT	54+11	23.2-24.7	A-2-4(0)	22	6	35.7	40.8	6.3	17.1	100	83	26	-	-
SS-109	6 LT	54+11	33.2-34.7	A-3(0)	19	NP	23.1	71.9	2.9	2.0	100	98	6	-	-
SS-110	6 LT	54+11	38.2-39.7	A-2-4(0)	17	NP	12.7	74.2	9.1	4.0	80	77	12	-	-
SS-111	6 LT	54+11	48.2-49.7	A-2-4(0)	16	NP	8.6	81.8	5.6	4.0	100	99	12	-	-
SS-112	6 LT	54+11	58.2-59.7	A-2-4(0)	20	NP	4.4	78.2	9.4	8.0	100	99	20	-	-

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-19	15 LT	65+00	0.0-6.0	A-1-b(0)	18	NP	78.8	18.9	0.3	2.0	92	42	3	-	-
S-20	15 LT	69+00	0.0-6.0	A-1-b(0)	16	NP	75.6	22.8	0.6	1.0	92	43	2	-	-



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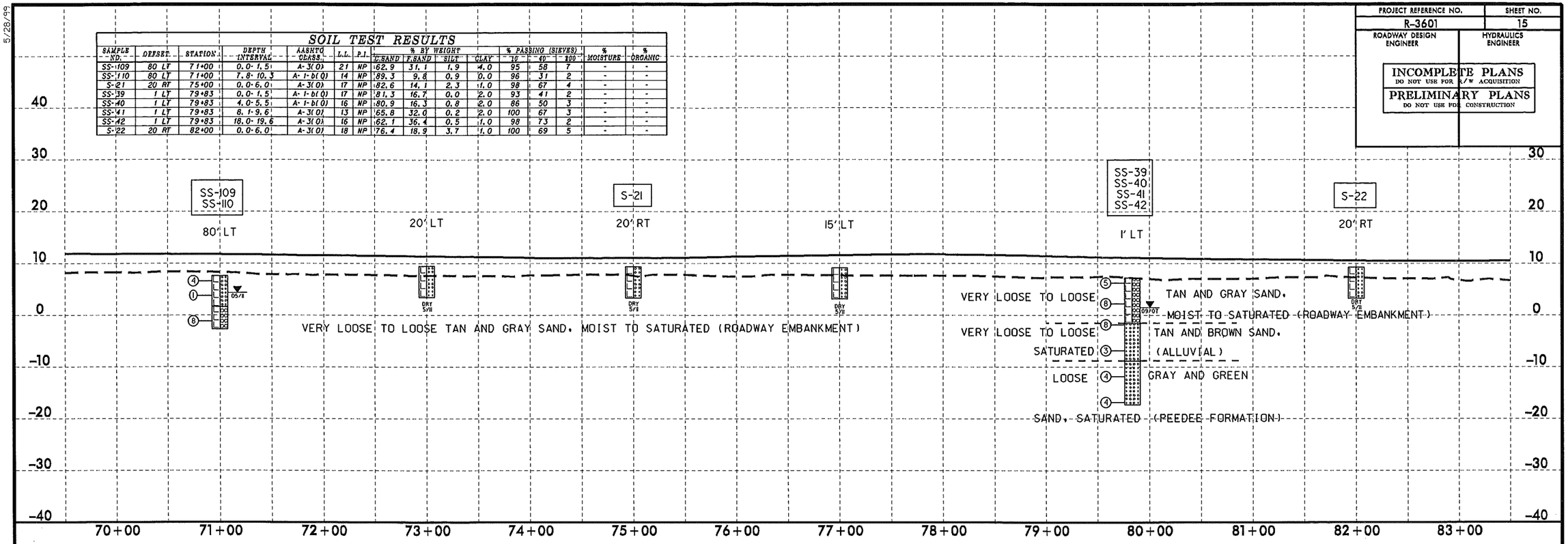
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-3601	15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

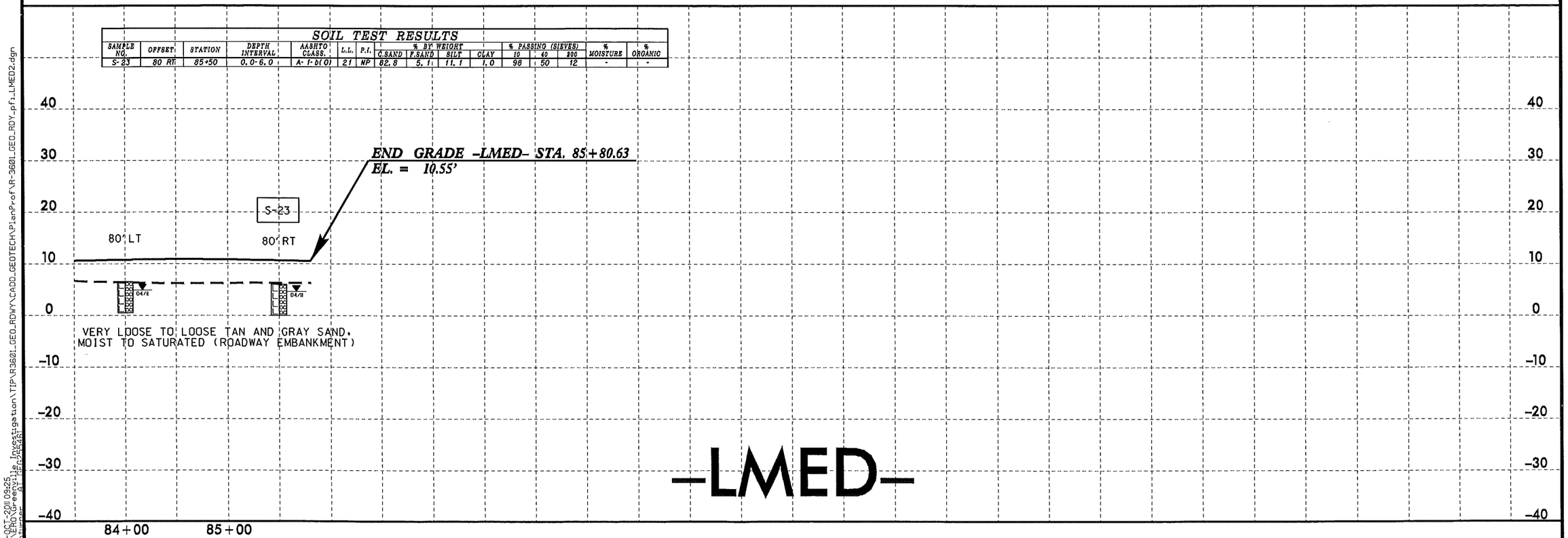
SOIL TEST RESULTS

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-109	80 LT	71+00	0.0- 1.5	A-3(0)	21	NP	62.9	31.1	1.9	4.0	95	58	7	-	-
SS-110	80 LT	71+00	7.8- 10.3	A-1-b(0)	14	NP	89.3	9.8	0.9	0.0	96	31	2	-	-
S-21	20 RT	75+00	0.0- 6.0	A-3(0)	17	NP	82.6	14.1	2.3	1.0	98	67	4	-	-
SS-39	1 LT	79+83	0.0- 1.5	A-1-b(0)	17	NP	81.3	16.7	0.0	2.0	93	41	2	-	-
SS-40	1 LT	79+83	4.0- 5.5	A-1-b(0)	16	NP	80.9	16.3	0.8	2.0	86	50	3	-	-
SS-41	1 LT	79+83	8.1- 9.6	A-3(0)	13	NP	65.8	32.0	0.2	2.0	100	67	3	-	-
SS-42	1 LT	79+83	18.0- 19.6	A-3(0)	16	NP	62.1	36.4	0.5	1.0	98	73	2	-	-
S-22	20 RT	82+00	0.0- 6.0	A-3(0)	18	NP	76.4	18.9	3.7	1.0	100	69	5	-	-



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-23	80 RT	85+50	0.0-6.0	A-1-b(0)	21	NP	82.8	5.1	11.1	1.0	98	50	12	-	-



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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-3601	16

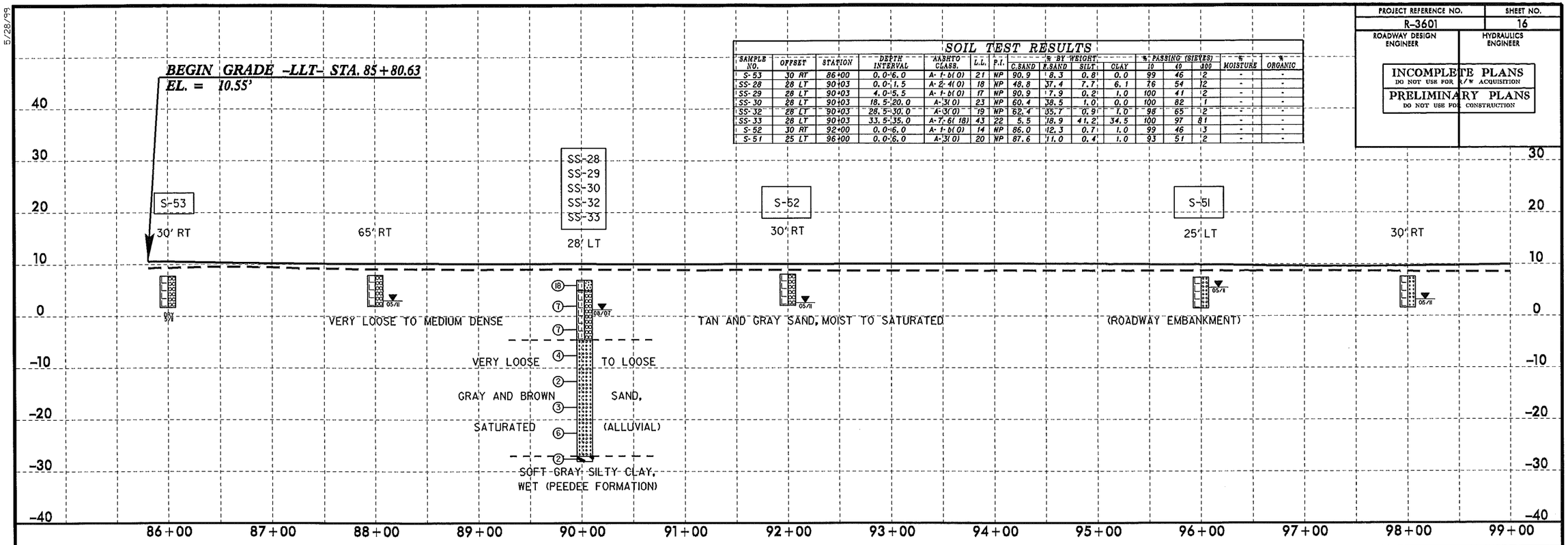
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

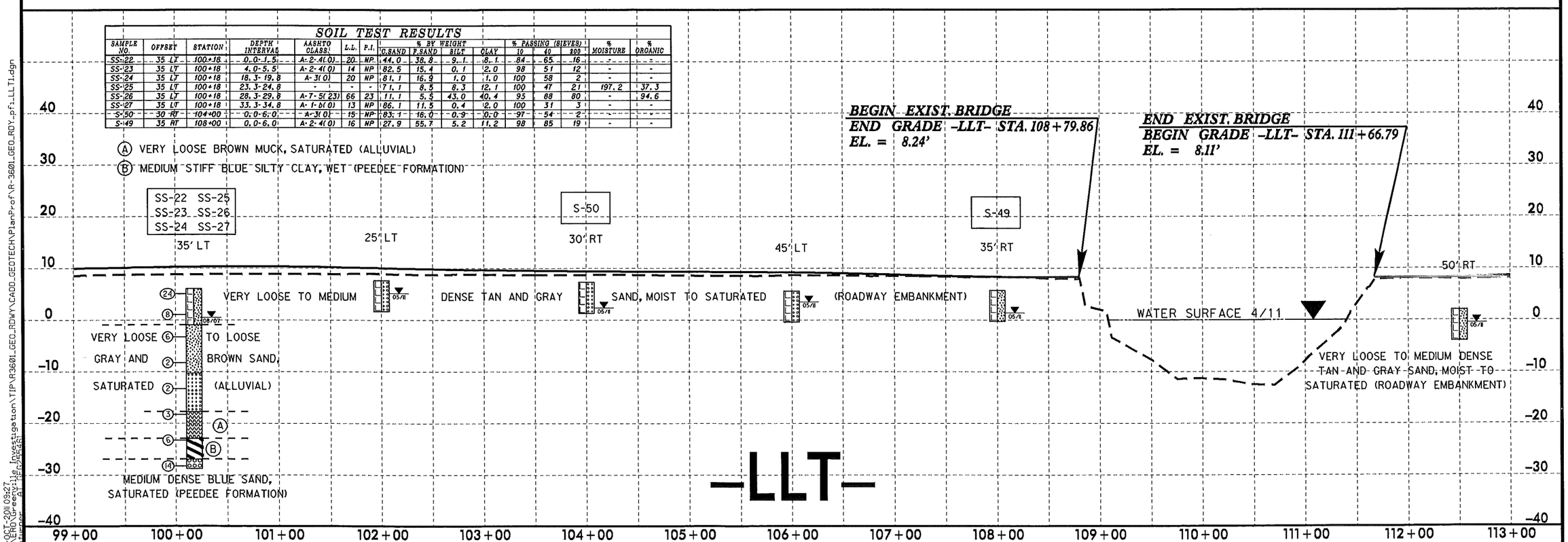
SOIL TEST RESULTS

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-53	30 RT	86+00	0.0-6.0	A-1-b(0)	21	NP	90.9	8.3	0.8	0.0	99	46	12	-	-
SS-28	28 LT	90+03	0.0-1.5	A-2-4(0)	18	NP	48.8	37.4	7.7	6.1	76	54	12	-	-
SS-29	28 LT	90+03	4.0-5.5	A-1-b(0)	17	NP	90.9	7.9	0.2	1.0	100	41	12	-	-
SS-30	28 LT	90+03	18.5-20.0	A-3(0)	23	NP	60.4	38.5	1.0	0.0	100	82	11	-	-
SS-32	28 LT	90+03	28.5-30.0	A-3(0)	19	NP	62.4	35.7	0.9	1.0	98	65	12	-	-
SS-33	28 LT	90+03	33.5-35.0	A-7-6(18)	43	22	5.5	18.9	41.2	34.5	100	97	81	-	-
S-52	30 RT	92+00	0.0-6.0	A-1-b(0)	14	NP	86.0	12.3	0.7	1.0	99	46	13	-	-
S-51	25 LT	96+00	0.0-6.0	A-3(0)	20	NP	87.6	11.0	0.4	1.0	93	51	12	-	-



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-22	35 LT	100+18	0.0-1.5	A-2-4(0)	20	NP	44.0	38.8	9.1	8.1	84	65	16	-	-
SS-23	35 LT	100+18	4.0-5.5	A-2-4(0)	14	NP	82.5	15.4	0.1	2.0	98	51	12	-	-
SS-24	35 LT	100+18	18.3-19.8	A-3(0)	20	NP	81.1	16.9	1.0	1.0	100	58	2	-	-
SS-25	35 LT	100+18	23.3-24.8	-	-	-	71.1	8.5	8.3	12.1	100	47	21	197.2	37.3
SS-26	35 LT	100+18	28.3-29.8	A-7-5(23)	66	23	11.1	5.5	43.0	40.4	95	88	80	-	94.6
SS-27	35 LT	100+18	33.3-34.8	A-1-b(0)	13	NP	86.1	11.5	0.4	2.0	100	31	3	-	-
S-50	30 RT	104+00	0.0-6.0	A-3(0)	15	NP	83.1	16.0	0.9	0.0	97	54	2	-	-
S-49	35 RT	108+00	0.0-6.0	A-2-4(0)	16	NP	27.9	55.7	5.2	11.2	98	85	19	-	-



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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-3601	17
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

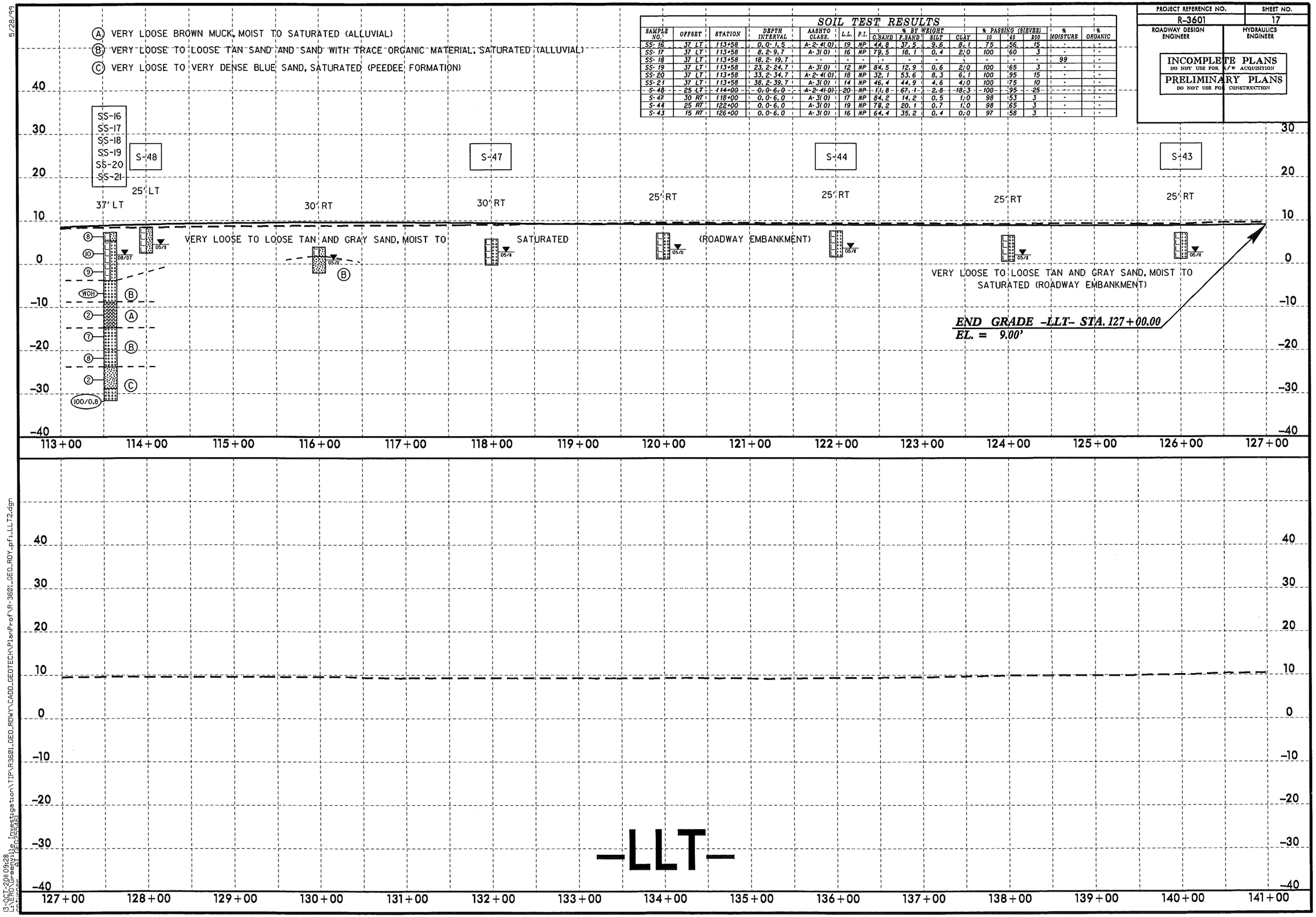
Ⓐ VERY LOOSE BROWN MUCK, MOIST TO SATURATED (ALLUVIAL)

Ⓑ VERY LOOSE TO LOOSE TAN SAND AND SAND WITH TRACE ORGANIC MATERIAL, SATURATED (ALLUVIAL)

Ⓒ VERY LOOSE TO VERY DENSE BLUE SAND, SATURATED (PEEDEE FORMATION)

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-16	37 LT	113+58	0.0-1.5	A-2-4(0)	19	NP	44.8	37.5	9.6	8.1	75	56	15	-	-
SS-17	37 LT	113+58	8.2-9.7	A-3(0)	16	NP	79.5	18.1	0.4	2.0	100	60	3	-	-
SS-18	37 LT	113+58	18.2-19.7	-	-	-	-	-	-	-	-	-	-	99	-
SS-19	37 LT	113+58	23.2-24.7	A-3(0)	12	NP	84.5	12.9	0.6	2.0	100	65	3	-	-
SS-20	37 LT	113+58	33.2-34.7	A-2-4(0)	18	NP	32.1	53.6	8.3	6.1	100	95	15	-	-
SS-21	37 LT	113+58	38.2-39.7	A-3(0)	14	NP	46.4	44.9	4.6	4.0	100	75	10	-	-
S-48	25 LT	114+00	0.0-6.0	A-2-4(0)	20	NP	11.8	67.1	2.8	18.3	100	95	25	-	-
S-47	30 RT	118+00	0.0-6.0	A-3(0)	17	NP	84.2	14.2	0.5	1.0	98	53	3	-	-
S-44	25 RT	122+00	0.0-6.0	A-3(0)	19	NP	78.2	20.1	0.7	1.0	98	65	3	-	-
S-43	15 RT	126+00	0.0-6.0	A-3(0)	16	NP	64.4	35.2	0.4	0.0	97	58	3	-	-



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5/28/99

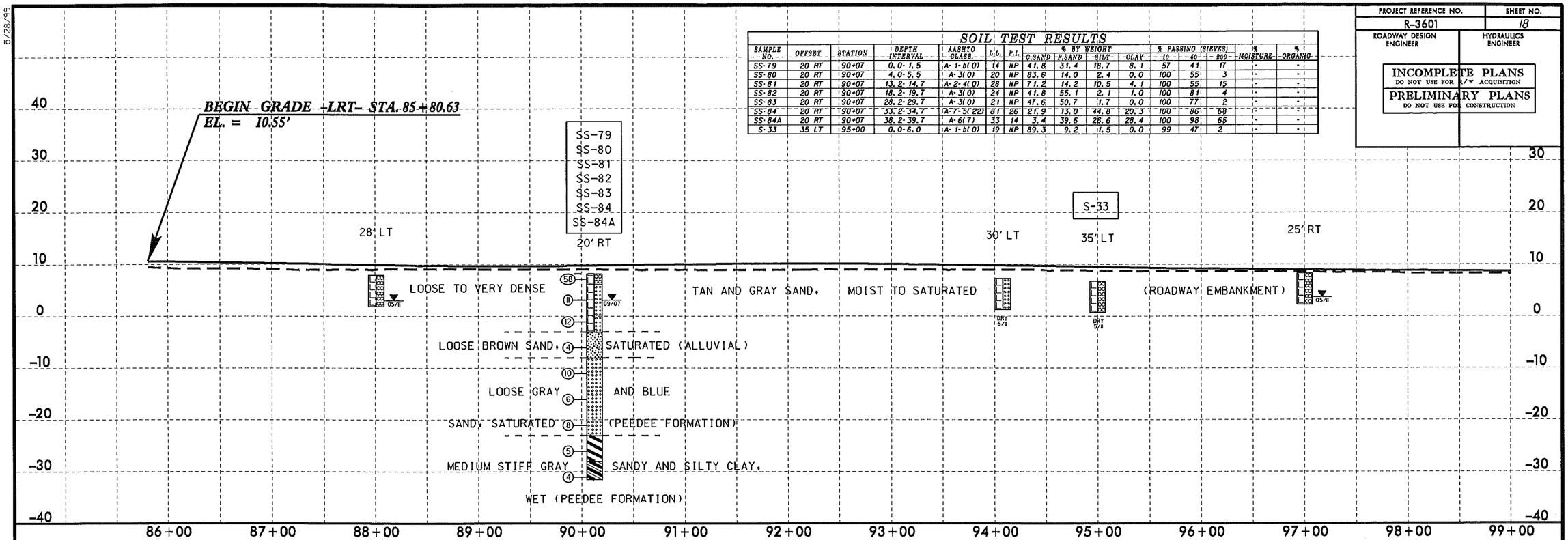
PROJECT REFERENCE NO.	SHEET NO.
R-3601	18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SOIL TEST RESULTS

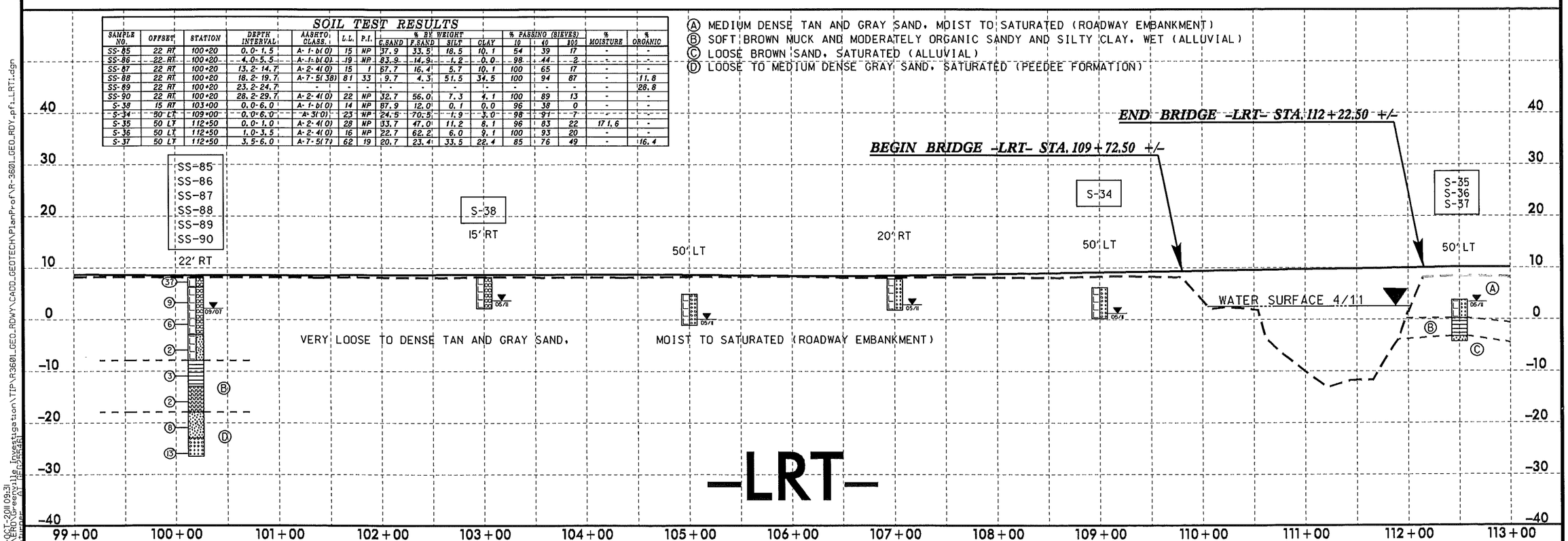
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) #10	#40	#200	% MOISTURE	% ORGANIC
SS-79	20 RT	90+07	0.0- 1.5	A- 1-b(0)	14	NP	41.8	31.4	18.7	8.1	57	41	17	-	-
SS-80	20 RT	90+07	4.0-5.5	A-3(0)	20	NP	83.6	14.0	2.4	0.0	100	55	3	-	-
SS-81	20 RT	90+07	13.2- 14.7	A-2-4(0)	28	NP	71.2	14.2	10.5	4.1	100	55	15	-	-
SS-82	20 RT	90+07	18.2- 19.7	A-3(0)	24	NP	41.8	55.1	2.1	1.0	100	81	4	-	-
SS-83	20 RT	90+07	28.2- 29.7	A-3(0)	21	NP	47.6	50.7	1.7	0.0	100	77	2	-	-
SS-84	20 RT	90+07	33.2- 34.7	A-7-5(22)	81	26	21.9	13.0	44.8	20.3	100	86	68	-	-
SS-84A	20 RT	90+07	38.2- 39.7	A-6(17)	33	14	3.4	39.6	28.6	28.4	100	98	65	-	-
S-33	35 LT	95+00	0.0-6.0	A-1-b(0)	19	NP	89.3	9.2	1.5	0.0	99	47	2	-	-



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-85	22 RT	100+20	0.0- 1.5	A- 1-b(0)	15	NP	37.9	33.5	18.5	10.1	54	39	17	-	-
SS-86	22 RT	100+20	4.0-5.5	A-1-b(0)	19	NP	83.9	14.9	1.2	0.0	98	44	2	-	-
SS-87	22 RT	100+20	13.2- 14.7	A-2-4(0)	15	1	67.7	16.4	5.7	10.1	100	65	17	-	-
SS-88	22 RT	100+20	18.2- 19.7	A-7-5(38)	81	33	9.7	4.3	51.5	34.5	100	94	87	-	11.8
SS-89	22 RT	100+20	23.2- 24.7	-	-	-	-	-	-	-	-	-	-	-	28.8
SS-90	22 RT	100+20	28.2- 29.7	A-2-4(0)	22	NP	32.7	56.0	7.3	4.1	100	89	13	-	-
S-38	15 RT	103+00	0.0-6.0	A-1-b(0)	14	NP	87.9	12.0	0.1	0.0	96	38	0	-	-
S-34	50 LT	109+00	0.0-6.0	A-3(0)	23	NP	24.5	70.5	1.9	3.0	98	91	7	-	-
S-35	50 LT	112+50	0.0- 1.0	A-2-4(0)	28	NP	33.7	47.0	11.2	8.1	96	83	22	17.6	-
S-36	50 LT	112+50	1.0-3.5	A-2-4(0)	16	NP	22.7	62.2	6.0	9.1	100	93	20	-	-
S-37	50 LT	112+50	3.5-6.0	A-7-5(7)	62	19	20.7	23.4	33.5	22.4	85	76	49	-	16.4

Ⓐ MEDIUM DENSE TAN AND GRAY SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)
Ⓑ SOFT BROWN MUCK AND MODERATELY ORGANIC SANDY AND SILTY CLAY, WET (ALLUVIAL)
Ⓒ LOOSE BROWN SAND, SATURATED (ALLUVIAL)
Ⓓ LOOSE TO MEDIUM DENSE GRAY SAND, SATURATED (PEEDEE FORMATION)



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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-3601	19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

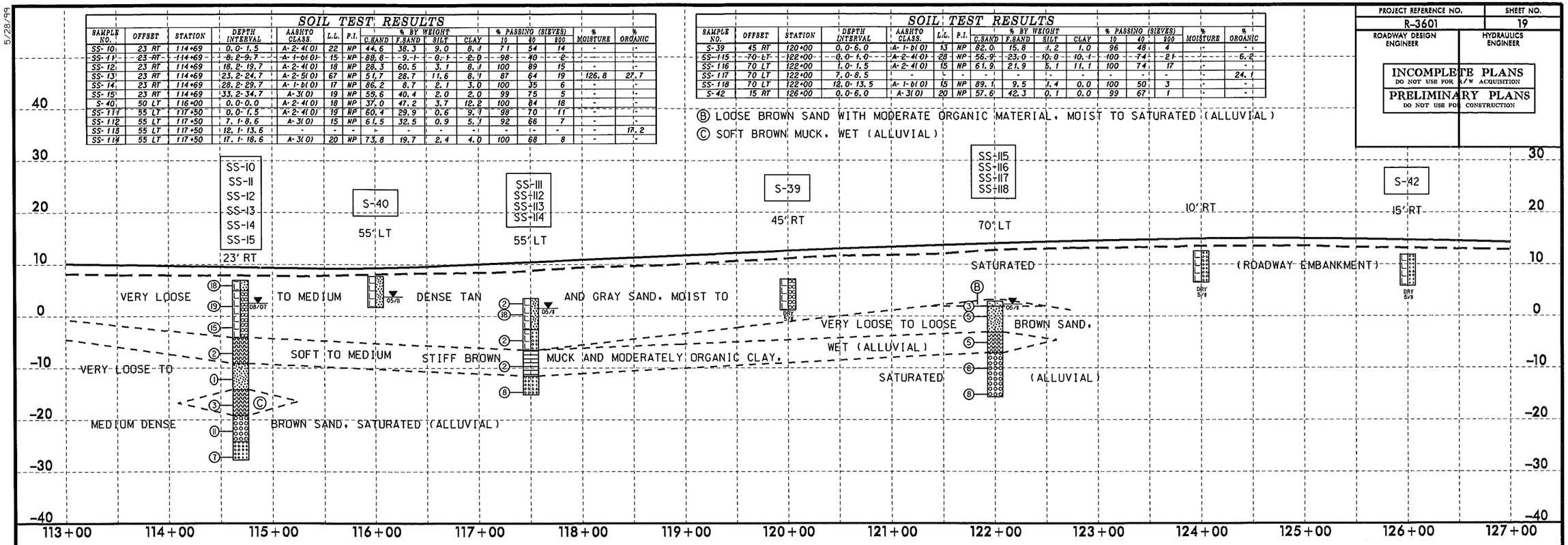
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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-10	23 RT	114+69	0.0- 1.5	A-2-4(0)	22	NP	44.6	38.3	9.0	8.1	71	54	14	-	-
SS-11	23 RT	114+69	8.2-9.7	A-1-b(0)	15	NP	88.8	9.1	0.1	2.0	98	40	2	-	-
SS-12	23 RT	114+69	18.2- 19.7	A-2-4(0)	18	NP	28.3	60.5	3.1	8.1	100	89	15	-	-
SS-13	23 RT	114+69	23.2- 24.7	A-2-5(0)	67	NP	51.7	28.7	11.6	8.1	87	64	19	126.8	27.7
SS-14	23 RT	114+69	28.2- 29.7	A-1-b(0)	17	NP	86.2	8.7	2.1	3.0	100	35	6	-	-
SS-15	23 RT	114+69	33.2- 34.7	A-3(0)	19	NP	55.6	40.4	2.0	2.0	99	75	5	-	-
S-40	50 LT	116+00	0.0- 0.0	A-2-4(0)	18	NP	37.0	47.2	3.7	12.2	100	84	18	-	-
SS-111	55 LT	117+50	0.0- 1.5	A-2-4(0)	19	NP	60.4	29.9	0.6	9.1	98	70	11	-	-
SS-112	55 LT	117+50	7.1- 8.6	A-3(0)	15	NP	61.5	32.5	0.9	5.1	92	66	7	-	-
SS-113	55 LT	117+50	12.1- 13.6	-	-	-	-	-	-	-	-	-	-	-	17.2
SS-114	55 LT	117+50	17.1- 18.6	A-3(0)	20	NP	73.8	19.7	2.4	4.0	100	68	8	-	-

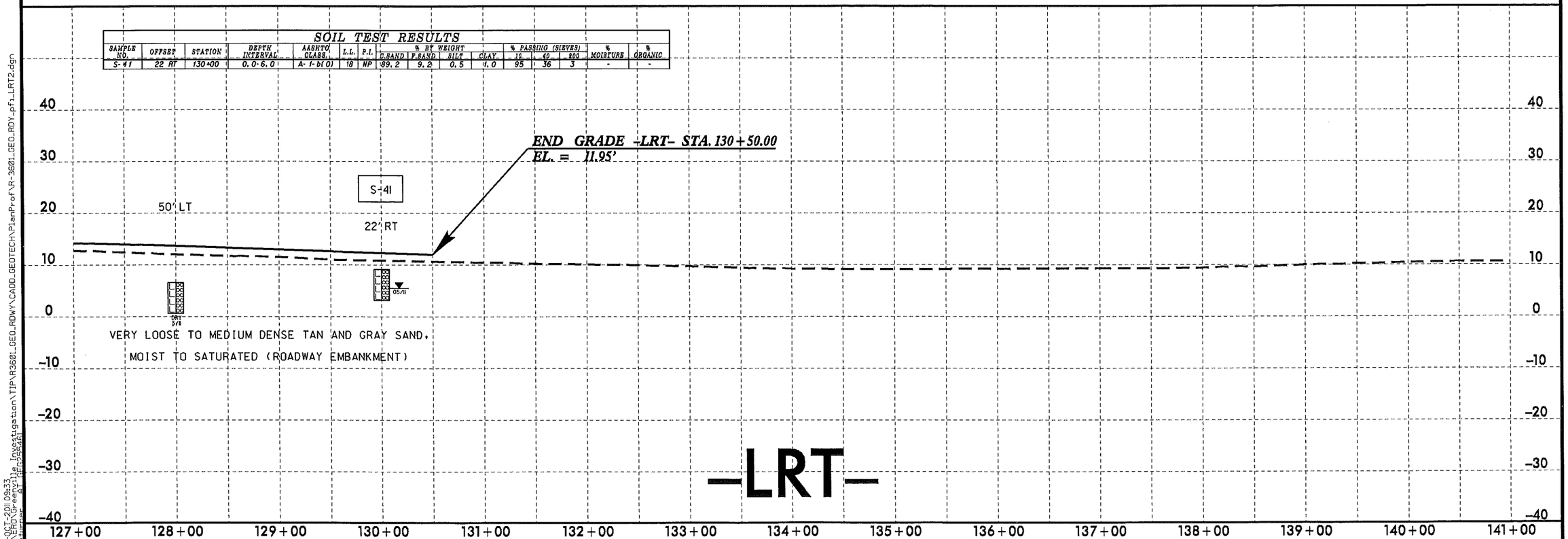
SOIL TEST RESULTS

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	45 RT	120+00	0.0-6.0	A-1-b(0)	13	NP	82.0	15.8	1.2	1.0	96	48	4	-	-
SS-115	70 LT	122+00	0.0- 1.0	A-2-4(0)	28	NP	56.9	23.0	10.0	10.1	100	74	21	-	6.2
SS-116	70 LT	122+00	1.0- 1.5	A-2-4(0)	15	NP	61.9	21.9	5.1	11.1	100	74	17	-	-
SS-117	70 LT	122+00	7.0-8.5	-	-	-	-	-	-	-	-	-	-	-	24.1
SS-118	70 LT	122+00	12.0- 13.5	A-1-b(0)	15	NP	89.1	9.5	1.4	0.0	100	50	3	-	-
S-42	15 RT	126+00	0.0-6.0	A-3(0)	20	NP	57.6	42.3	0.1	0.0	99	67	1	-	-



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-41	22 RT	130+00	0.0-6.0	A-1-b(0)	16	NP	89.2	9.2	0.5	1.0	95	36	3	-	-



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5/28/99

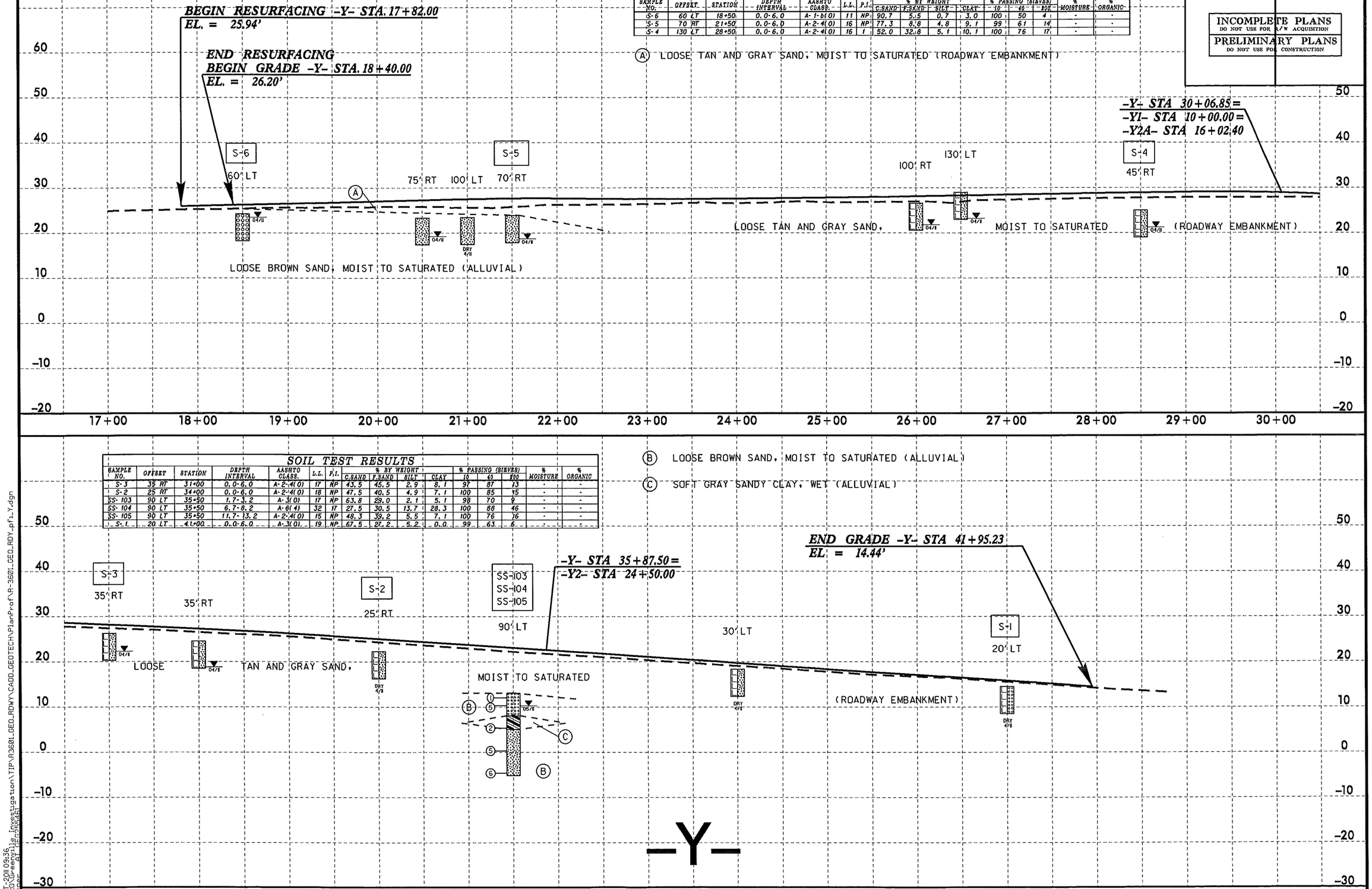
PROJECT REFERENCE NO.	SHEET NO.
R-3601	20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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-6	60 LT	18+50	0.0-6.0	A-1-b(0)	11	NP	90.7	5.5	0.7	3.0	100	50	4	-	-
S-5	70 RT	21+50	0.0-6.0	A-2-4(0)	16	NP	77.3	8.8	4.8	9.1	99	61	14	-	-
S-4	130 LT	28+50	0.0-6.0	A-2-4(0)	16	1	52.0	32.8	5.1	10.1	100	76	17	-	-



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-3	35 RT	31+00	0.0-6.0	A-2-4(0)	17	NP	43.5	45.5	2.9	8.1	97	87	13	-	-
S-2	25 RT	34+00	0.0-6.0	A-2-4(0)	18	NP	47.5	40.5	4.9	7.1	100	85	15	-	-
SS-103	90 LT	35+50	1.7-3.2	A-3(0)	17	NP	63.8	29.0	2.1	5.1	98	70	9	-	-
SS-104	90 LT	35+50	6.7-8.2	A-6(1)	32	17	27.5	30.5	13.7	28.3	100	88	46	-	-
SS-105	90 LT	35+50	11.7-13.2	A-2-4(0)	15	NP	48.3	39.2	5.5	7.1	100	76	16	-	-
S-1	20 LT	41+00	0.0-6.0	A-3(0)	19	NP	67.5	27.2	5.2	0.0	99	63	6	-	-

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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-3601	21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

50' RT

LOOSE TAN AND GRAY SAND.

DRY 4/8

MOIST (ROADWAY EMBANKMENT)

-Y1-

10+00 11+00 12+00 13+00 14+00 15+00

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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-3601	22
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-23A	15' RT	12+00	0.0-3.5	A-2-4(0)	15	NP	57.5	27.6	7.9	7.0	100	75	19	-	-
S-24	15' RT	12+00	3.5-4.5	A-4(2)	25	6	8.2	49.8	18.9	23.0	100	98	64	23.0	-
S-25	15' RT	12+00	4.5-6.0	A-3(0)	19	NP	37.7	58.2	1.1	3.0	100	90	6	-	-
S-26	℄	16+00	0.0-3.0	A-2-4(0)	16	NP	40.8	42.0	6.2	11.0	100	85	19	-	-
S-27	℄	16+00	3.0-4.0	A-4(1)	23	6	18.8	44.2	17.9	19.0	100	96	55	28.4	-
S-28	℄	16+00	4.0-6.0	A-3(0)	16	NP	59.4	32.9	3.7	4.0	100	91	10	-	-
SS-100	30' RT	20+50	2.3-3.8	A-3(0)	18	NP	65.7	29.1	1.2	4.1	100	84	7	-	-
SS-101	30' RT	20+50	7.3-8.8	A-2-4(0)	16	NP	51.9	35.8	5.2	7.1	100	86	16	-	-
SS-102	30' RT	20+50	12.3-13.8	A-2-4(0)	18	NP	62.9	27.5	3.5	6.1	97	60	11	-	-
S-57	℄	28+00	0.0-6.0	A-2-4(0)	18	NP	45.9	40.0	4.9	9.1	97	77	14	-	-
S-58	℄	23+50	0.0-1.5	A-7-6(15)	42	28	24.2	14.4	20.7	40.7	100	85	63	-	-
S-59	℄	23+50	1.5-6.0	A-2-4(0)	19	NP	67.4	20.4	6.1	6.1	90	52	12	-	-

(A) LOOSE BROWN SAND, MOIST TO SATURATED (ALLUVIAL)

(B) SOFT BROWN SANDY SILT, MOIST TO WET (ALLUVIAL)

(C) SOFT BROWN SANDY CLAY, MOIST (ARTIFICIAL FILL)

(D) LOOSE TAN AND GRAY SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)

BEGIN GRADE -Y2- STA. 11+00.00
EL. = 24.55'

S-23A
S-24
S-25
15' RT

-Y2- STA. 14+90.00 =
-Y2A- STA. 10+00.00

S-26
S-27
S-28

SS-100
SS-101
SS-102
30' RT

END GRADE -Y2- STA. 24+28.52
EL. = 22.22'

S-57

S-58
S-59

LOOSE TO MEDIUM DENSE BROWN SAND, MOIST TO SATURATED

LOOSE TO MEDIUM DENSE BROWN SAND, MOIST (ARTIFICIAL FILL)

LOOSE TO MEDIUM DENSE BROWN SAND, MOIST TO SATURATED (ALLUVIAL)

-Y2-

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

11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00

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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-3601	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

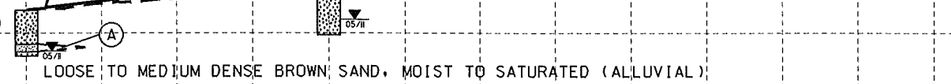
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80

Ⓐ SOFT BROWN SILT, MOIST TO WET (ALLUVIAL)

BEGIN GRADE -Y2A- STA. 10+12.75
EL. = 23.36'

END GRADE -Y2A- STA. 12+20.00
EL. = 26.15'

40' RT



LOOSE TO MEDIUM DENSE BROWN SAND, MOIST TO SATURATED (ALLUVIAL)

10+00 11+00 12+00 13+00 14+00 15+00 16+00

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5/14/99

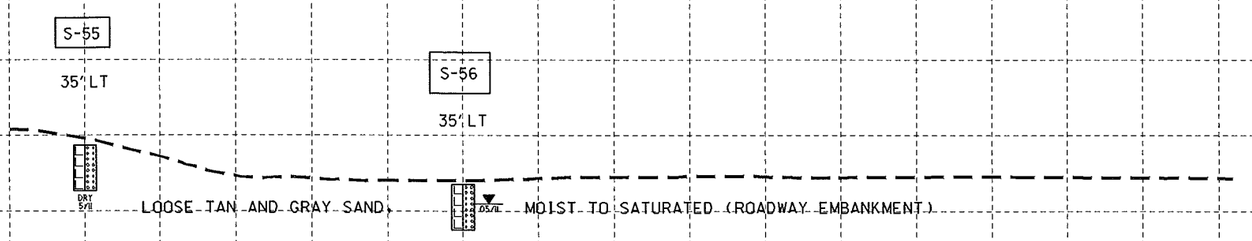
PROJECT REFERENCE NO.	SHEET NO.
R-3601	24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							G.SAND	F.SAND	SILT	CLAY	10	40	200		
S-55	35' LT	10+50	0.0-6.0	A-3(00)	21	NP	84.6	14.9	0.3	0.0	99	53	2	-	-
S-56	35' LT	13+00	0.0-6.0	A-3(01)	20	NP	55.7	43.8	0.5	0.0	100	67	2	-	-



-Y3-

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

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00

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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-3601	25

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-47	44 RT	118+01	0.0-6.0	A-3(0)	17	NP	84.2	14.2	0.5	1.0	98	53	3	-	-
S-44	48 RT	122+04	0.0-6.0	A-3(0)	19	NP	78.2	20.1	0.7	1.0	98	65	3	-	-
S-43	65 RT	126+09	0.0-6.0	A-3(0)	16	NP	64.4	35.2	0.4	0.0	97	58	3	-	-

BEGIN GRADE -RPLLT- STA. 114+80.00
EL. = 9.41'

END GRADE -RPLLT- STA. 127+15.00
EL. = 12.01'

S-47 44' RT

S-44 48' RT

S-43 65' RT

30' RT

43' RT

56' RT

VERY LOOSE TO LOOSE TAN SAND AND SAND WITH LITTLE ORGANIC MATERIAL, MOIST TO SATURATED (ALLUVIAL)

VERY LOOSE TO LOOSE TAN AND GRAY SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)

-RPLLT-

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

115+00 116+00 117+00 118+00 119+00 120+00 121+00 122+00 123+00 124+00 125+00 126+00 127+00 128+00

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5/28/99

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-110	50 LT	116+00	0.0-0.0	A-2-4(0)	18	NP	37.0	47.2	3.7	12.2	100	84	18	-	-
SS-111	55 LT	117+50	0.0-4.5	A-2-4(0)	19	NP	60.4	29.9	0.6	9.1	98	70	11	-	-
SS-112	55 LT	117+50	7.1-8.6	A-3(0)	15	NP	61.5	32.5	0.9	5.1	92	66	7	-	-
SS-113	55 LT	117+50	12.1-13.6	-	-	-	-	-	-	-	-	-	-	-	17.2
SS-114	55 LT	117+50	17.1-18.6	A-3(0)	20	NP	73.8	19.7	2.4	4.0	100	68	8	-	-
S-39	45 RT	120+00	0.0-6.0	A-1-b(0)	13	NP	82.0	15.8	1.2	1.0	96	48	4	-	-

PROJECT REFERENCE NO.	SHEET NO.
R-3601	26
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

Ⓐ VERY LOOSE MODERATELY ORGANIC SAND, MOIST TO SATURATED (ALLUVIAL)

BEGIN GRADE -RPLRT- STA. 115+28.00
EL. = 8.90'

END GRADE -RPLRT- STA. 122+75.00
EL. = 9.20'

S-110
51' LT

SS-111
SS-112
SS-113
SS-114
64' LT

S-39
18' RT

VERY LOOSE TO MEDIUM DENSE TAN AND GRAY SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)

VERY LOOSE TO LOOSE BROWN MUCK, SATURATED (ALLUVIAL)

LOOSE BROWN SAND, SATURATED (ALLUVIAL)

40 30 20 10 0 -10 -20 -30 -40

116+00 117+00 118+00 119+00 120+00 121+00 122+00 123+00 124+00 125+00 126+00 127+00 128+00 129+00

129+00 130+00 131+00 132+00 133+00 134+00 135+00 136+00 137+00 138+00 139+00 140+00 141+00 142+00 143+00

-RPLRT-

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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-3601	27
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

40 30 20 10 0 -10 -20 -30 -40

143+00 144+00 145+00 146+00 147+00 148+00 149+00 150+00 151+00 152+00 153+00 154+00 155+00 156+00 157+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-54	20 LT	161+00	0.0-6.0	A-3(0)	18	NP	49.5	49.2	1.3	0.0	100	76	3	-	-

BEGIN OVERLAY -RPLRT- STA. 160+00.00
EL. = 5.06'

END OVERLAY -RPLRT- STA. 166+50.00
EL. = 5.09'

S-54
20' LT

25' LT

05/11

05/6

LOOSE BROWN SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)

-RPLRT-

157+00 158+00 159+00 160+00 161+00 162+00 163+00 164+00 165+00 166+00 167+00 168+00 169+00

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5/28/99

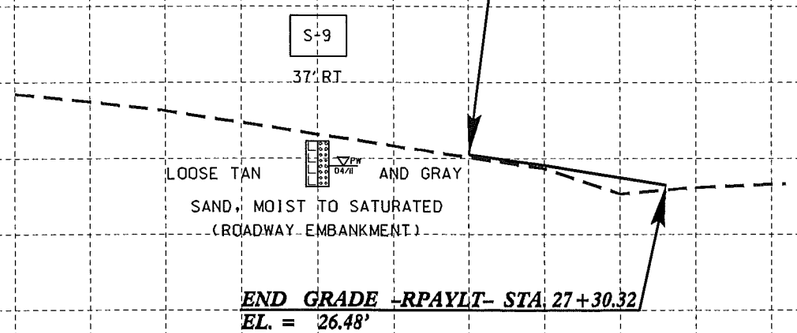
PROJECT REFERENCE NO.	SHEET NO.
R-3601	28

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	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
S-9	45 RT	25+00	0.0-6.0	A-3(0)	15	NP	14.1	81.3	1.5	3.0	99	91	7	-	-

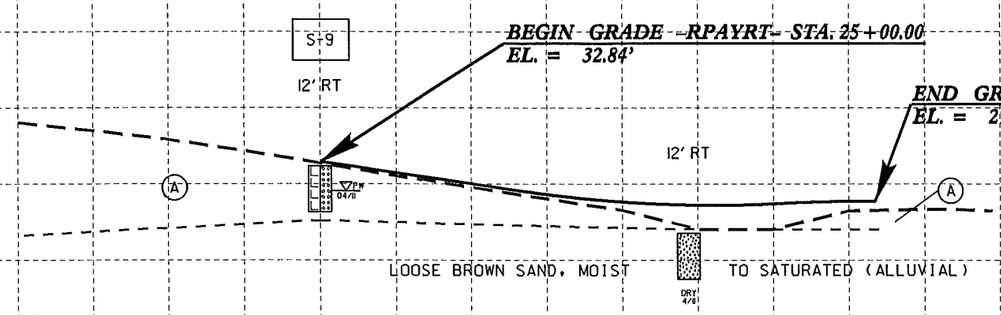


-RPAYLT-

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-9	45 RT	25+00	0.0-6.0	A-3(0)	15	NP	14.1	81.3	1.5	3.0	99	91	7	-	-

(A) LOOSE TAN AND GRAY SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)



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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-3601	29

ROADWAY DESIGN ENGINEER

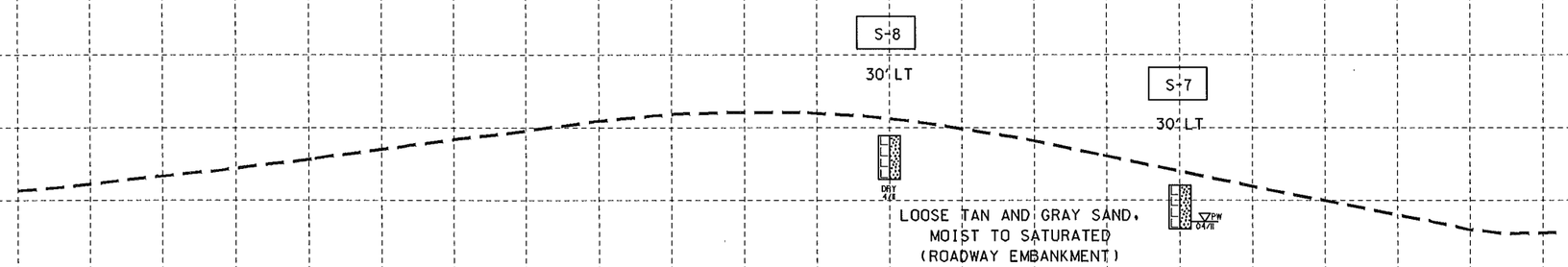
HYDRAULICS ENGINEER

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-8	30 LT	16+00	0.0-6.0	A-3(0)	18	NP	64.8	25.6	1.5	8.1	99	65	10	-	-
S-7	30 LT	18+00	0.0-6.0	A-2-4(0)	18	NP	53.2	34.4	3.3	9.1	99	73	13	-	-



-RPBY-

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

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00

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5/28/99

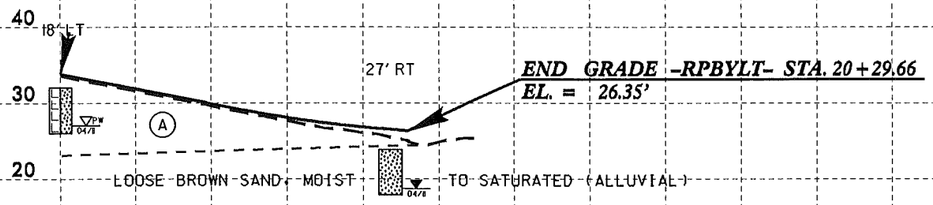
PROJECT REFERENCE NO.	SHEET NO.
R-3601	30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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-7	30 LT	18+00	0.0-6.0	A-2-4(0)	18	NP	53.2	34.4	3.3	9.1	99	73	13	-	-

(A) LOOSE TAN AND GRAY SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)

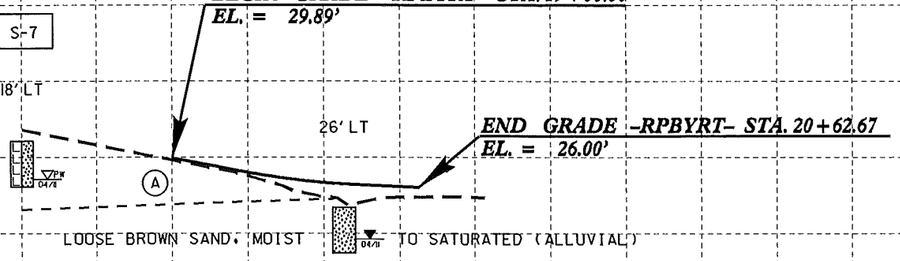


-RPBYLT-

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-7	30 LT	18+00	0.0-6.0	A-2-4(0)	18	NP	53.2	34.4	3.3	9.1	99	73	13	-	-

(A) LOOSE TAN AND GRAY SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)



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5/28/99

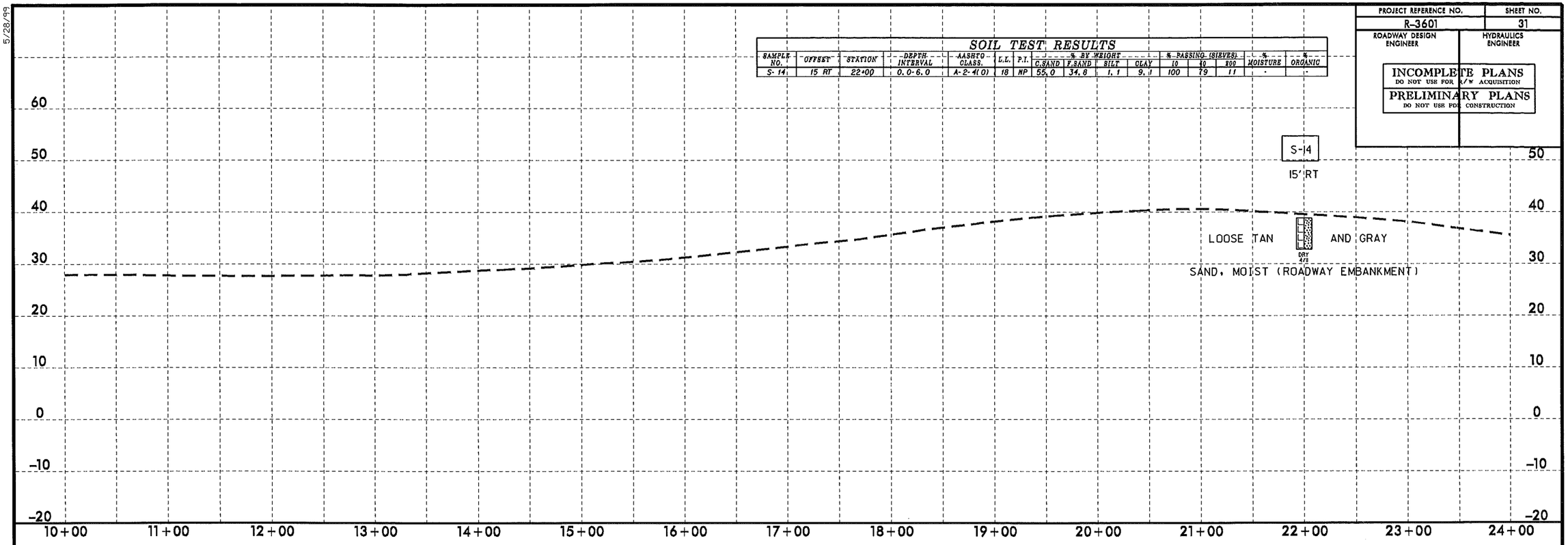
PROJECT REFERENCE NO.	SHEET NO.
R-3601	31
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

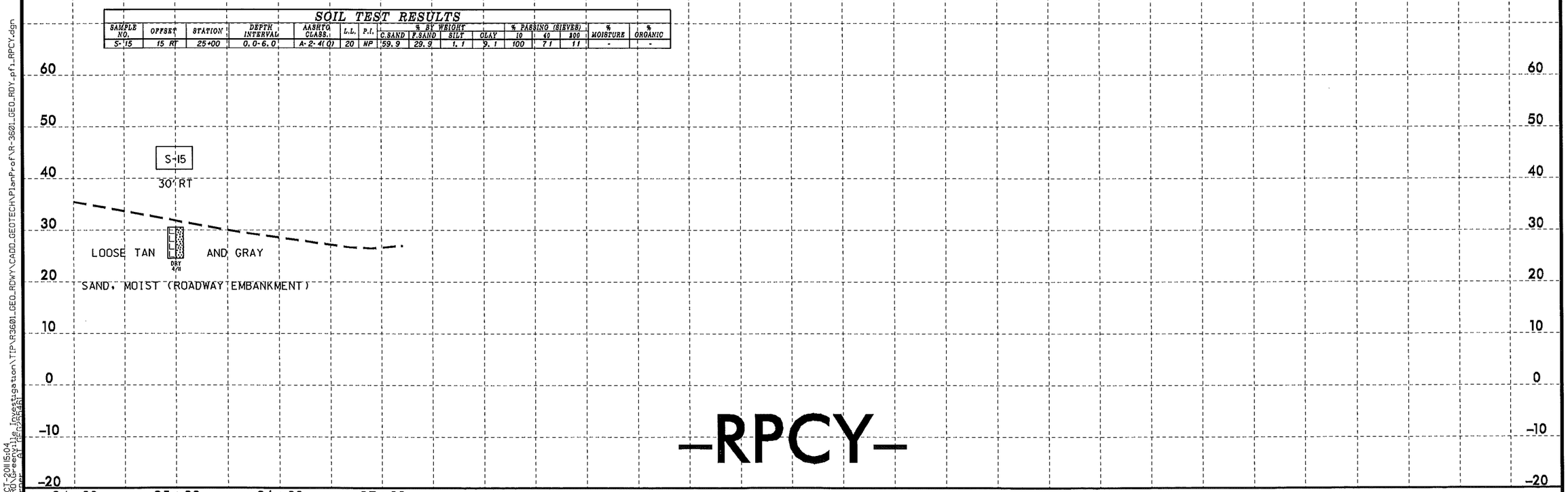
SOIL TEST RESULTS

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-14	15 RT	22+00	0.0-6.0	A-2-4(0)	18	NP	55.0	34.8	1.1	9.1	100	79	11	-	-



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-15	15 RT	25+00	0.0-6.0	A-2-4(0)	20	NP	59.9	29.9	1.1	9.1	100	71	11	-	-



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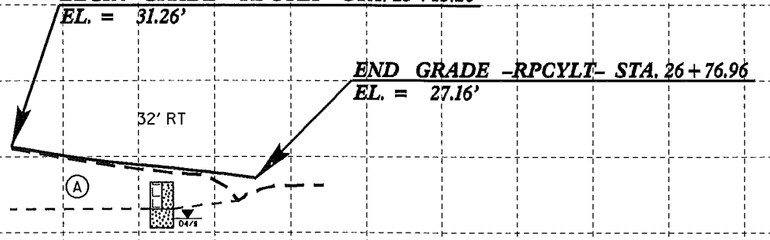
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-3601	32
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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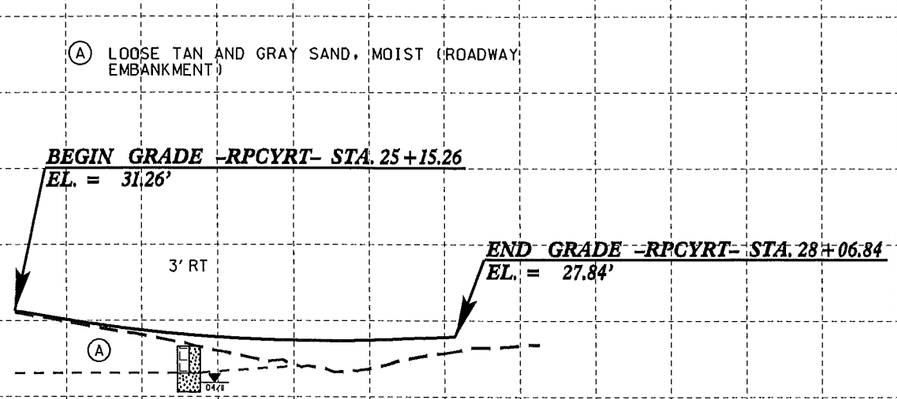

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5/28/99

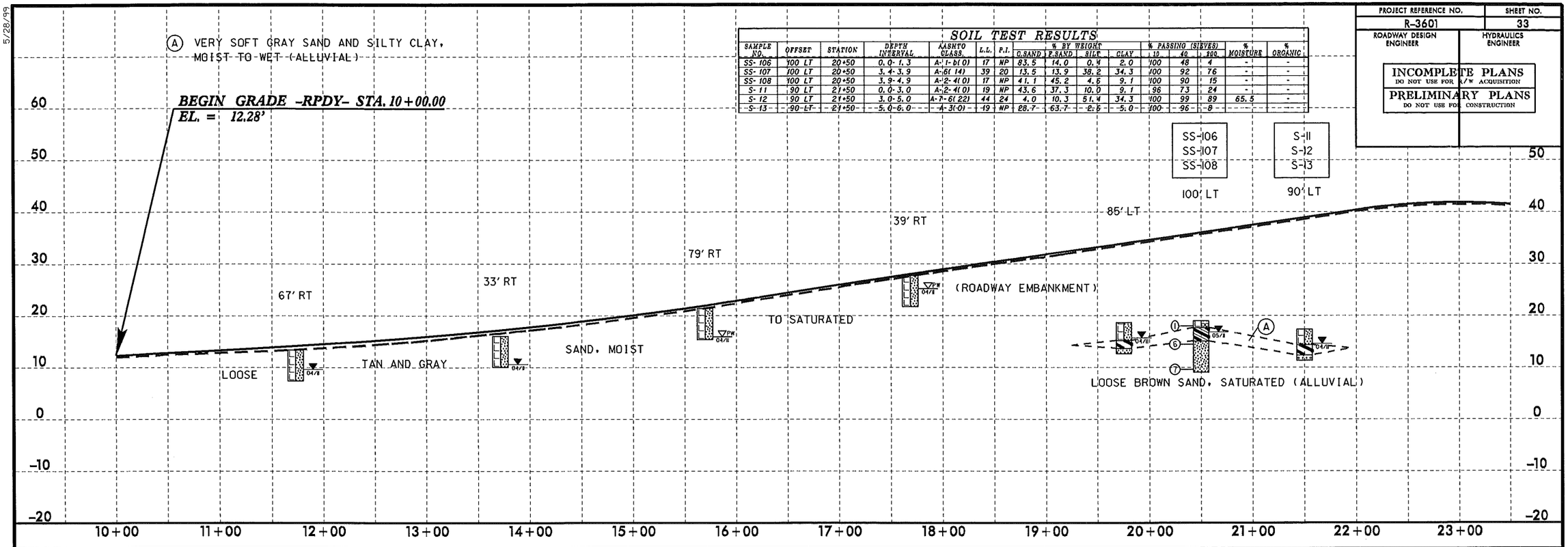
PROJECT REFERENCE NO.	SHEET NO.
R-3601	33

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

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

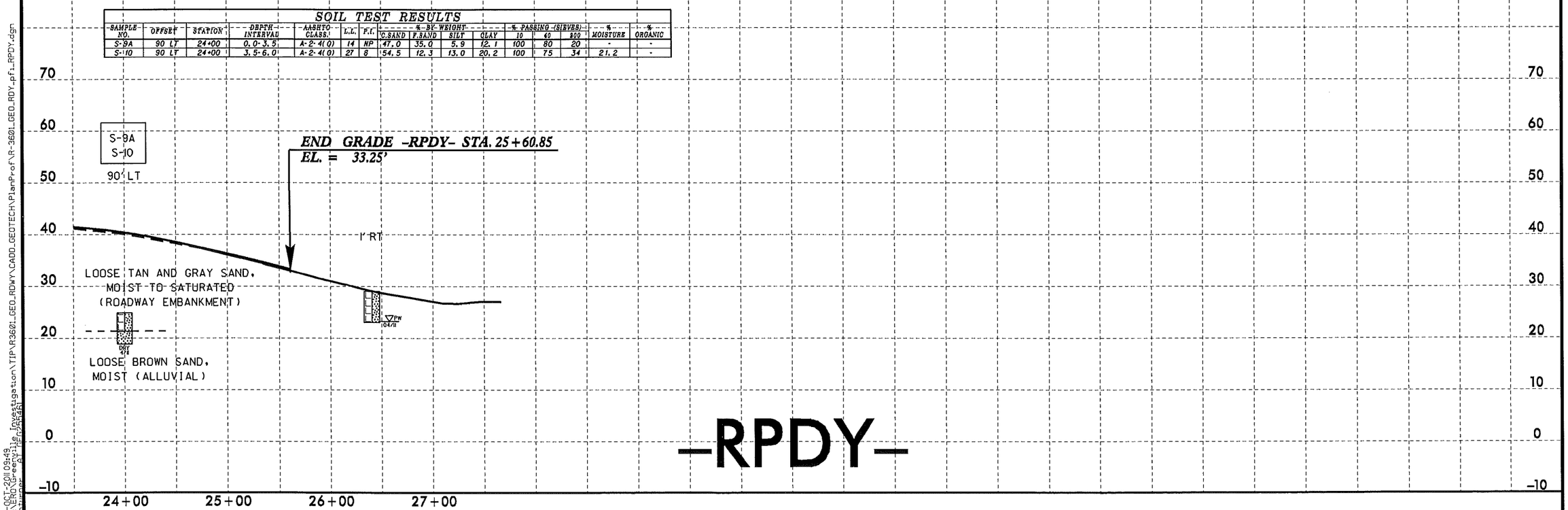
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT G.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-106	100 LT	20+50	0.0-1.3	A-1-b(0)	17	NP	83.5	14.0	0.4	2.0	100	48	4	-	-
SS-107	100 LT	20+50	3.4-3.9	A-6(14)	39	20	13.5	13.9	38.2	34.3	100	92	76	-	-
SS-108	100 LT	20+50	3.9-4.9	A-2-4(0)	17	NP	41.1	45.2	4.6	9.1	100	90	15	-	-
S-11	90 LT	21+50	0.0-3.0	A-2-4(0)	19	NP	43.6	37.3	10.0	9.1	96	73	24	-	-
S-12	90 LT	21+50	3.0-5.0	A-7-6(22)	44	24	4.0	10.3	51.4	34.3	100	99	89	65.5	-
S-13	90 LT	21+50	5.0-6.0	A-3(0)	19	NP	28.7	63.7	2.6	5.0	100	96	8	-	-



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT G.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-9A	90 LT	24+00	0.0-3.5	A-2-4(0)	14	NP	47.0	35.0	5.9	12.1	100	80	20	-	-
S-10	90 LT	24+00	3.5-6.0	A-2-4(0)	27	8	54.5	12.3	13.0	20.2	100	75	34	21.2	-



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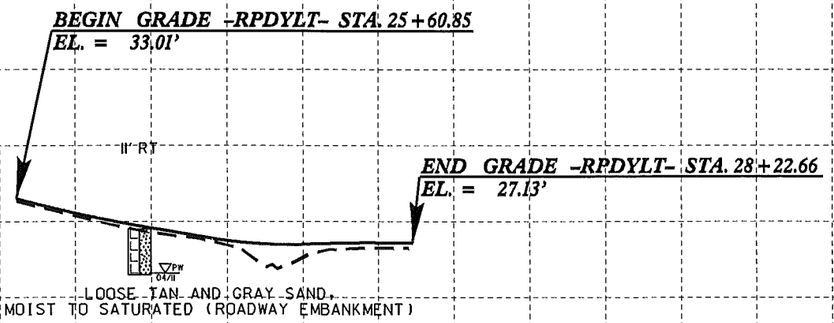
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-3601	34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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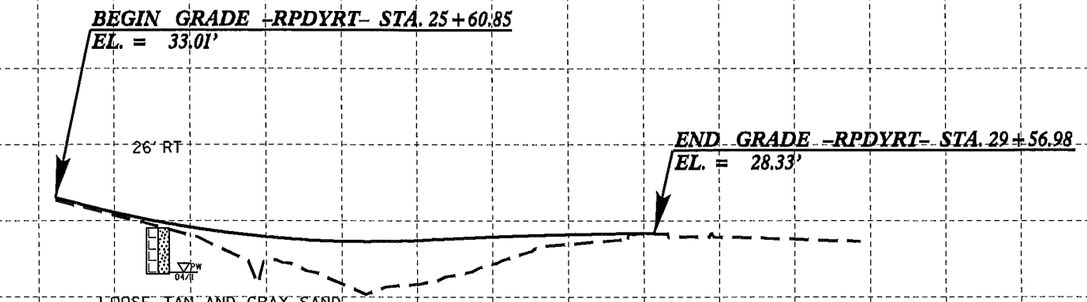

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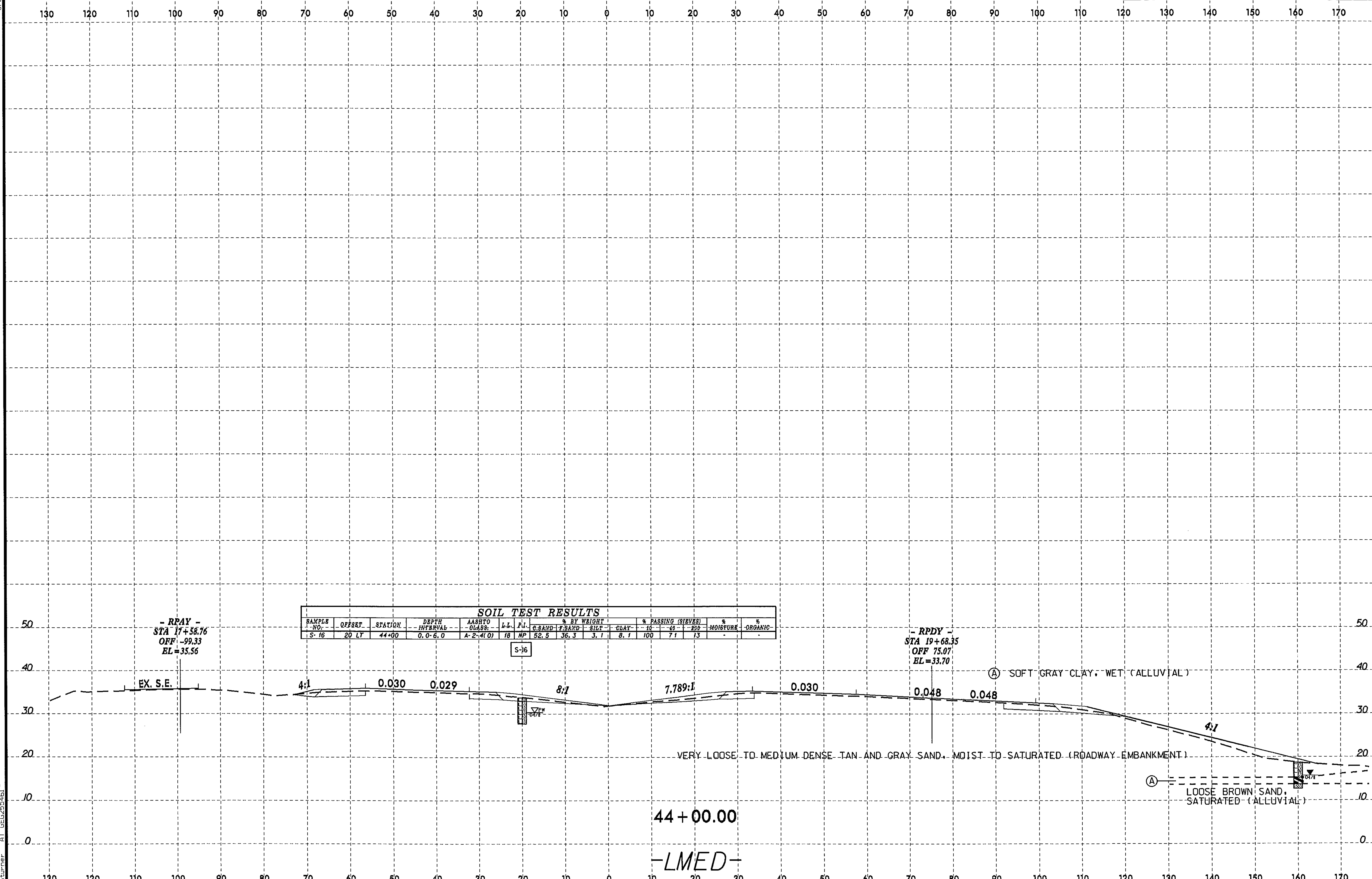
PROJ. REFERENCE NO.	SHEET NO.
R-3601	35



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-16	20 LT	44+00	0.0-6.0	A-2-4(0)	18	NP	52.5	36.3	3.1	8.1	100	71	13	-	-

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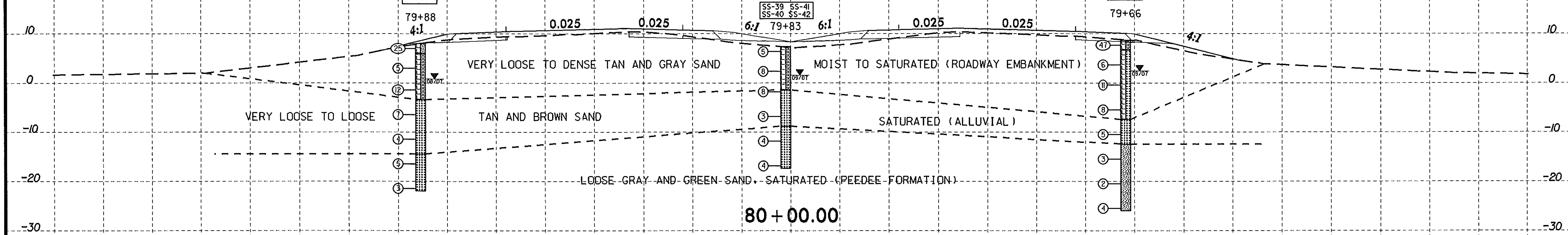
8/23/99

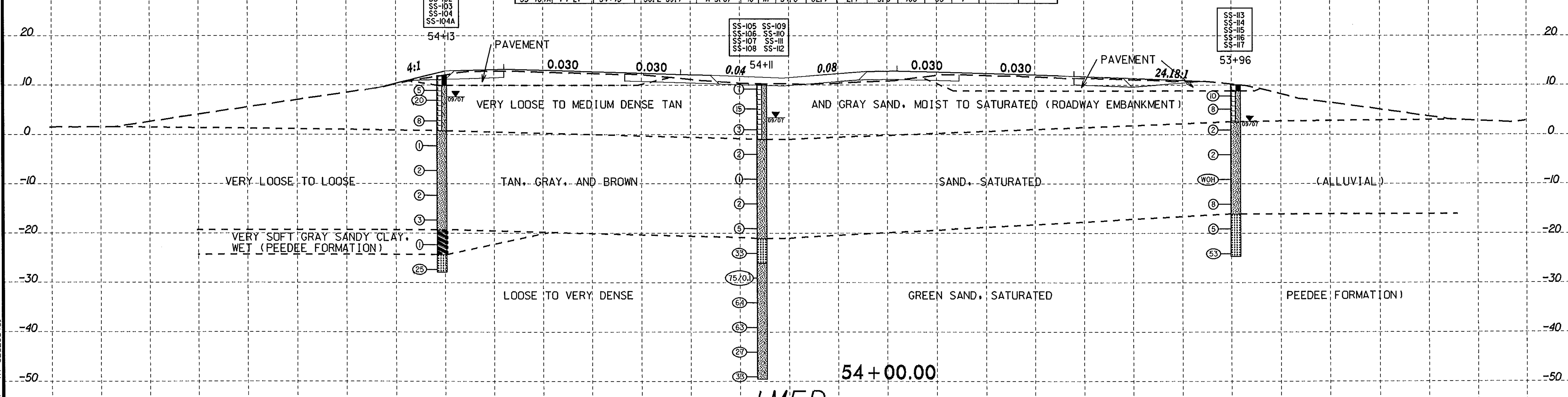
SOIL TEST RESULTS

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-75	68 RT	79+66	0.0-1.5	A-1-b(0)	15	NP	44.8	31.2	15.8	8.1	68	49	18	-	-
SS-76	68 RT	79+66	4.0-5.5	A-3(0)	20	NP	83.2	14.2	0.6	2.0	98	58	3	-	-
SS-77	68 RT	79+66	13.1-14.7	A-3(0)	24	NP	59.6	38.9	1.4	0.0	100	75	2	-	-
SS-78	68 RT	79+83	23.1-24.6	A-2-4(0)	24	NP	28.2	60.0	4.7	7.1	100	90	13	-	-
SS-39	1 LT	79+83	0.0-1.5	A-1-b(0)	17	NP	81.3	16.7	0.0	2.0	93	41	2	-	-
SS-40	1 LT	79+83	4.0-5.5	A-1-b(0)	16	NP	80.9	16.3	0.8	2.0	86	50	3	-	-
SS-41	1 LT	79+83	8.1-9.6	A-3(0)	13	NP	65.8	32.0	0.2	2.0	100	67	3	-	-
SS-42	1 LT	79+83	18.1-19.6	A-3(0)	16	NP	62.1	36.4	0.5	1.0	98	73	2	-	-
SS-34	75 LT	79+88	0.0-1.5	A-2-4(0)	17	NP	45.6	36.1	10.1	8.1	79	61	16	-	-
SS-35	75 LT	79+88	4.0-5.5	A-3(0)	14	NP	72.9	24.8	1.2	1.0	100	64	3	-	-
SS-36	75 LT	79+88	13.4-14.9	A-3(0)	22	NP	73.8	24.6	0.5	1.0	100	76	2	-	-
SS-37	75 LT	79+88	23.4-24.9	A-3(0)	15	NP	66.0	32.8	0.2	1.0	100	71	2	-	-
SS-38	75 LT	79+88	28.4-29.9	A-3(0)	22	NP	51.7	43.1	3.1	2.0	100	75	6	-	-



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-113	91 RT	53+96	1.3-2.8	A-2-4(0)	21	6	38.6	33.0	12.3	16.1	76	59	25	-	-
SS-114	91 RT	53+96	4.0-5.5	A-2-4(0)	24	8	31.2	43.1	7.6	18.1	100	85	29	-	-
SS-115	91 RT	53+96	13.2-14.7	A-2-4(0)	21	4	32.1	46.1	7.7	14.1	100	85	25	-	-
SS-116	91 RT	53+96	23.2-24.7	A-2-4(0)	26	NP	30.2	47.4	10.4	12.1	95	84	24	-	-
SS-117	91 RT	53+96	28.2-29.7	A-3(0)	14	NP	40.7	55.4	1.8	2.0	100	97	4	-	-
SS-105	6 LT	54+11	0.0-1.5	A-2-4(0)	19	NP	39.8	51.1	4.0	5.0	97	78	12	-	-
SS-106	6 LT	54+11	4.0-5.5	A-2-4(0)	19	2	36.6	39.4	9.9	14.1	100	80	27	-	-
SS-107	6 LT	54+11	13.2-14.7	A-2-4(0)	18	NP	32.1	54.4	5.4	8.0	100	89	16	-	-
SS-108	6 LT	54+11	23.2-24.7	A-2-4(0)	22	6	35.7	40.8	6.3	17.1	100	83	26	-	-
SS-109	6 LT	54+11	33.2-34.7	A-3(0)	19	NP	23.1	71.9	2.9	2.0	100	98	6	-	-
SS-110	6 LT	54+11	38.2-39.7	A-2-4(0)	17	NP	12.7	74.2	9.1	4.0	80	77	12	-	-
SS-111	6 LT	54+11	48.2-49.7	A-2-4(0)	16	NP	8.6	81.8	5.6	4.0	100	99	12	-	-
SS-112	6 LT	54+11	58.2-59.7	A-2-4(0)	20	NP	4.4	78.2	9.4	8.0	100	99	20	-	-
SS-101	71 LT	54+13	4.0-5.5	A-2-4(0)	18	NP	43.8	43.5	4.7	8.0	100	79	15	-	-
SS-102	71 LT	54+13	13.2-14.7	A-2-4(0)	21	4	31.7	45.5	6.7	16.1	100	88	26	-	-
SS-103	71 LT	54+13	23.2-24.7	A-2-4(0)	20	3	27.6	46.9	9.5	16.1	100	86	34	-	-
SS-104	71 LT	54+13	33.2-34.7	A-6(5)	31	16	9.1	38.4	16.3	36.2	100	98	54	-	-
SS-104A	71 LT	54+13	38.2-39.7	A-3(0)	18	NP	31.6	62.7	2.7	3.0	100	83	7	-	-



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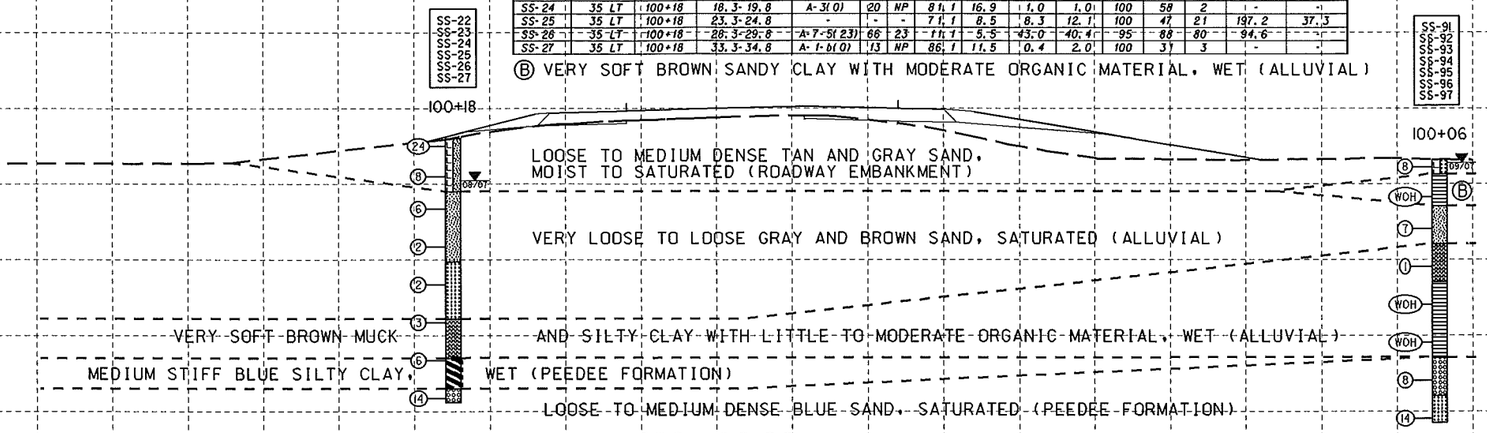
PROJ. REFERENCE NO.	SHEET NO.
R-3601	37

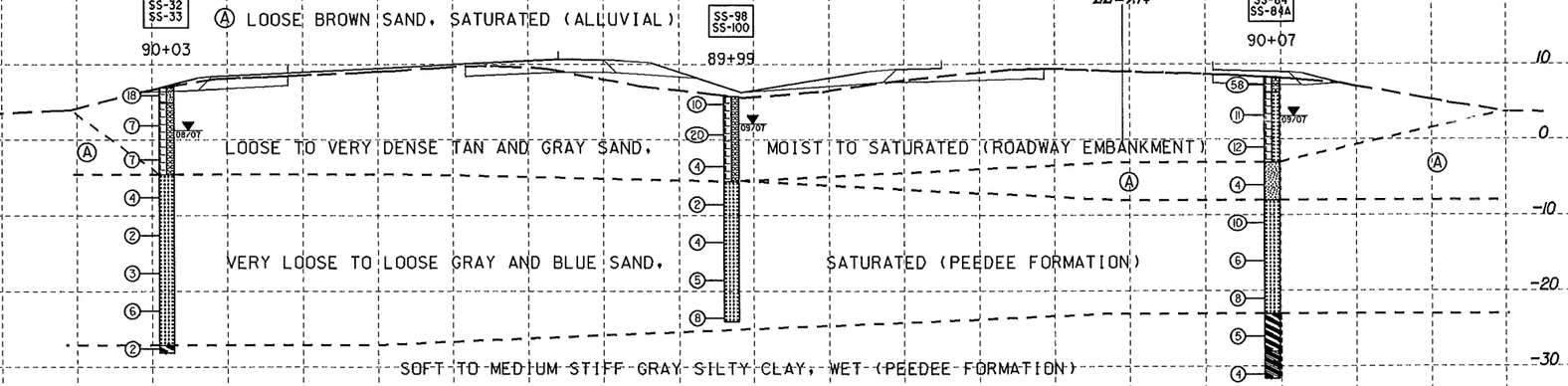
SOIL TEST RESULTS

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
SS-91	96 RT	100+06	0.0- 1.5	A-3(0)	21	NP	76.9	20.5	2.6	0.0	95	61	3	-	-
SS-92	96 RT	100+06	4.0- 5.5	A-7-5(22)	79	34	31.2	7.3	37.1	24.3	100	82	62	174.2	16.3
SS-93	96 RT	100+06	8.2- 9.7	A-2-4(0)	18	NP	68.4	20.3	5.3	6.1	100	65	12	-	-
SS-94	96 RT	100+06	13.2- 14.7	-	-	-	73.8	11.0	15.2	0.0	90	33	15	-	60.7
SS-95	96 RT	100+06	18.2- 19.7	A-7-5(46)	76	40	1.6	8.1	37.5	52.7	100	99	94	121.3	-
SS-96	96 RT	100+06	23.2-24.7	A-7-6(31)	60	35	11.6	20.3	35.5	42.6	100	99	82	-	6.6
SS-97	96 RT	100+06	28.2-29.7	A-1-b(0)	24	NP	70.5	26.3	1.2	2.0	96	45	4	-	-
SS-22	35 LT	100+18	0.0- 1.5	A-2-4(0)	20	NP	44.0	38.8	9.1	8.1	84	65	16	-	-
SS-23	35 LT	100+18	4.0- 5.5	A-2-4(0)	14	NP	82.5	15.4	0.1	2.0	98	57	12	-	-
SS-24	35 LT	100+18	18.3- 19.8	A-3(0)	20	NP	81.1	16.9	1.0	1.0	100	58	2	-	-
SS-25	35 LT	100+18	23.3- 24.8	-	-	-	71.1	8.5	8.3	12.1	100	47	21	197.2	37.3
SS-26	35 LT	100+18	28.3-29.8	A-7-5(23)	66	23	11.1	5.5	43.0	40.4	95	88	80	94.6	-
SS-27	35 LT	100+18	33.3- 34.8	A-1-b(0)	13	NP	86.1	11.5	0.4	2.0	100	31	3	-	-



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
SS-98	47 RT	89+99	0.0- 1.5	A-1-b(0)	21	NP	83.5	15.5	0.0	1.0	98	45	1	-	-
SS-100	47 RT	89+99	23.2- 24.7	A-3(0)	24	NP	23.1	74.0	2.8	0.0	100	90	4	-	-
SS-28	28 LT	90+03	0.0- 1.5	A-2-4(0)	18	NP	48.8	37.4	7.7	6.1	76	54	12	-	-
SS-29	28 LT	90+03	4.0- 5.5	A-1-b(0)	17	NP	90.9	7.9	0.2	1.0	100	41	2	-	-
SS-30	28 LT	90+03	18.5- 20.0	A-3(0)	23	NP	60.4	38.5	1.0	0.0	100	82	1	-	-
SS-32	28 LT	90+03	28.5- 30.0	A-3(0)	19	NP	62.4	35.7	0.9	1.0	98	65	2	-	-
SS-33	28 LT	90+03	33.5- 35.0	A-7-6(18)	43	22	5.5	18.9	41.2	34.5	100	97	81	-	-
SS-79	119 RT	90+07	0.0- 1.5	A-1-b(0)	14	NP	44.8	31.4	18.7	5.1	57	41	11	-	-
SS-80	119 RT	90+07	4.0- 5.5	A-3(0)	20	NP	83.6	14.0	2.4	0.0	100	55	3	-	-
SS-81	119 RT	90+07	13.2- 14.7	A-2-4(0)	28	NP	71.2	14.2	10.5	4.1	100	55	15	-	-
SS-82	119 RT	90+07	18.2- 19.7	A-3(0)	24	NP	41.8	55.1	2.1	1.0	100	81	4	-	-
SS-83	119 RT	90+07	28.2- 29.7	A-3(0)	21	NP	47.6	50.7	1.7	0.0	100	77	2	-	-
SS-84	119 RT	90+07	33.2- 34.7	A-7-5(22)	81	26	21.9	13.0	44.8	20.3	100	86	68	-	21.8
SS-84A	119 RT	90+07	38.2- 39.7	A-6(7)	33	14	3.4	39.6	28.6	28.4	100	98	60	-	-



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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3601	38

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

20 10 0 -10 30 20

- RPLLT -
STA 116+50.36
OFF -12.48
EL=9.35

Ⓐ VERY LOOSE TO LOOSE TAN AND GRAY SAND, MOIST (ROADWAY EMBANKMENT)

Ⓐ

VERY LOOSE TO LOOSE TAN SAND, MOIST TO SATURATED (ALLUVIAL)

05/8

116+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-45	50 RT	116+00	0.0-2.0	A-2-5(0)	54	NP	46.7	19.8	19.4	14.1	86	66	31	-	18.3
S-46	50 RT	116+00	2.0-6.0	A-2-4(0)	18	NP	40.2	43.7	5.9	10.2	96	78	18	-	2.4

Ⓐ VERY LOOSE TO LOOSE TAN AND GRAY SAND, MOIST (ROADWAY EMBANKMENT)
Ⓑ VERY LOOSE BROWN MUCK, MOIST TO SATURATED (ALLUVIAL)

- RPLLT -
STA 116+00.19
OFF -12.22
EL=9.22

S-45
S-46

Ⓐ Ⓑ

VERY LOOSE TO LOOSE TAN SAND AND SAND WITH LITTLE ORGANIC MATERIAL, MOIST TO SATURATED (ALLUVIAL)

05/8 05/8

116+00.00

- RPLLT -
STA 115+50.07
OFF -12.07
EL=9.03

Ⓐ VERY LOOSE TO LOOSE TAN AND GRAY SAND, MOIST (ROADWAY EMBANKMENT)

Ⓐ

VERY LOOSE TO LOOSE TAN SAND, MOIST TO SATURATED (ALLUVIAL)

05/8

115+50.00

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