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PROJECT: 34437.1.1 ID. R-2501C

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

**ROADWAY
SUBSURFACE INVESTIGATION**

STATE PROJECT 34437.1.1 I.D. NO. R-2501C
F.A. PROJECT NHF-1(1)
COUNTY RICHMOND
DESCRIPTION US 1 From North of Fox Road (SR 1606)
to Marston Road (SR 1001)

INVENTORY

CONTENTS:

LINE	STATION	SHEET NUMBERS		
		PLAN	PROFILE	X-SECTS.
-L-	1141+50.00 to 1329+67.03	4-18	21-27	
-DETOUR-	10+00.00 to 35+15.70	19-20	28	
-Y-	10+00.00 to 14+50.00	6	30	
-Y1-	10+00.00 to 15+40.00	7	29	
-Y2-	10+00.00 to 12+75.00	12	29	
-Y3-	10+00.00 to 17+60.00	14	29	
-Y3 SPUR-	5+00.00 to 7+39.73	14	29	
-Y4-	10+00.00 to 13+70.00	15	30	
-RP D-	10+00.00 to 14+73.97	14	30	

"Refer to Sheet 2A for plan sheet layout at the time of investigation"

DRAWN BY: J.K. McCLURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NR.	TOTAL SHEETS
N.C.	R-2501C	1	30
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34437.1.1	NHF-1(1)	P.E.	
		CONST.	

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS 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 UNIT @ (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS PART OF THE CONTRACT.

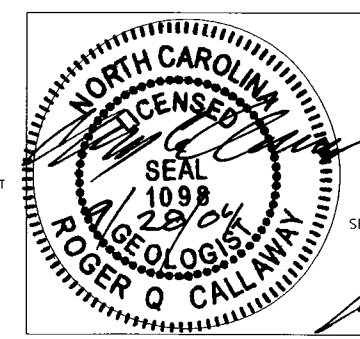
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND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

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

INVESTIGATED BY R.Q. CALLAWAY PERSONNEL C.C. MURRAY
CHECKED BY C.B. LITTLE C.E. BURRIS
SUBMITTED BY C.B. LITTLE J.E. ESTEP
DATE JUNE 2004 J.W. VANDERBURG

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IS IT 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.



SEAL
SIGNATURE Roger Q. Callaway

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2501C	34437.1.1	2	

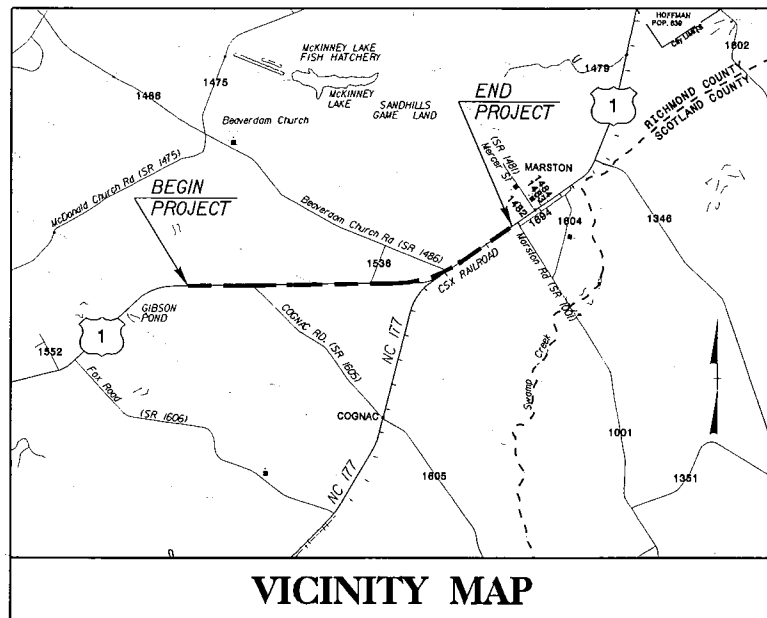
SUBSURFACE INVESTIGATION

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 WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: <i>VERY STIFF, GRAY SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>				WELL GRADED: INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE UNIFORM. INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED: INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED. MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.				HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN 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) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CPI) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC. FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.				ALLUVIUM (ALLUV.) - SOILS WHICH 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 IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE CALCAREOUS (CALC.) - SOILS WHICH 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 (F.P.) - 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 (MOD) - 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 SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (R.Q.D.) - 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 WHICH 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, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS IN OR B.P.F. 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 LESS THAN 0.1 FOOT PENETRATION WITH 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 (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.											
SOIL LEGEND AND AASHTO CLASSIFICATION				MINERALOGICAL COMPOSITION				WEATHERING				GROUND WATER											
GENERAL CLASS. GRANULAR MATERIALS (< 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS				MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.				FRESH ROCK FRESH, CRYSTALLINE BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V. SIL) 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 (SL) 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. SEVERE (SEV) ALL ROCKS 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.				TRACE OF ORGANIC MATTER 2 - 3% LITTLE ORGANIC MATTER 3 - 5% MODERATELY ORGANIC 5 - 10% HIGHLY ORGANIC > 10%				OTHER MATERIAL 1 - 10% LITTLE 10 - 20% SOME 20 - 35% HIGHLY 35% AND ABOVE				WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING. STATIC WATER LEVEL AFTER 24 HOURS. PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA SPRING OR SEEPAGE			
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				SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE				LIQUID LIMIT LESS THAN 30 LIQUID LIMIT 31-50 LIQUID LIMIT GREATER THAN 50				ROADWAY EMBANKMENT WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS INFERRED SOIL BOUNDARIES INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP/DIP DIRECTION OF ROCK STRUCTURES											
SYMBOL				ORGANIC MATERIAL				SAMPLE DESIGNATIONS				SOUNDING ROD											
% PASSING #10 #40 #200				GRANULAR SOILS				S- BULK SAMPLE SS- SPLIT SPOON SAMPLE ST- SHELBY TUBE SAMPLE RS- ROCK SAMPLE RT- RECOMPACTED TRIAXIAL SAMPLE CBR - CBR SAMPLE				SOUNDING ROD											
LIQUID LIMIT PLASTIC INDEX				GROUP INDEX				GROUND WATER				SOUNDING ROD											
USUAL TYPES OF MAJOR MATERIALS				SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER				SOUNDING ROD				SOUNDING ROD											
GENERAL RATING AS A SUBGRADE				HIGHLY ORGANIC SOILS				SOUNDING ROD				SOUNDING ROD											
P.I. OF A-7-5 ≤ L.L. - 30 ; P.I. OF A-7-6 > L.L. - 30				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
CONSISTENCY OR DENSENESS				MISCELLANEOUS SYMBOLS				SOUNDING ROD				SOUNDING ROD											
PRIMARY SOIL TYPE				ROADWAY EMBANKMENT WITH SOIL DESCRIPTION				SOUNDING ROD				SOUNDING ROD											
COMPACTNESS OR CONSISTENCY				SOIL SYMBOL				SOUNDING ROD				SOUNDING ROD											
RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)				ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS				SOUNDING ROD				SOUNDING ROD											
RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)				INFERRED SOIL BOUNDARIES				SOUNDING ROD				SOUNDING ROD											
GENERAL GRANULAR MATERIAL (NON-COHESIVE)				INFERRED ROCK LINE				SOUNDING ROD				SOUNDING ROD											
GENERAL SILT-CLAY MATERIAL (COHESIVE)				ALLUVIAL SOIL BOUNDARY				SOUNDING ROD				SOUNDING ROD											
VERY LOOSE				DIP/DIP DIRECTION OF ROCK STRUCTURES				SOUNDING ROD				SOUNDING ROD											
LOOSE				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
MEDIUM DENSE				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
DENSE				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
VERY DENSE				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
VERY SOFT				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
SOFT				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
MEDIUM STIFF				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
STIFF				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
VERY STIFF				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
HARD				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
TEXTURE OR GRAIN SIZE				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
U.S. STD. SIEVE SIZE OPENING (MM)				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
BOULDER (BLDR.)				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
COBBLE (COB.)				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
GRAVEL (GRV.)				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
COARSE SAND (CSE. SD.)				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
FINE SAND (F. SD.)				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
SILT (SL)				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
CLAY (CL)				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
GRAIN SIZE				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
SOIL MOISTURE - CORRELATION OF TERMS				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
SOIL MOISTURE SCALE (ATTERBERG LIMITS)				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
FIELD MOISTURE DESCRIPTION				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
GUIDE FOR FIELD MOISTURE DESCRIPTION				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
LL - LIQUID LIMIT				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
PL - PLASTIC LIMIT				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
OM - OPTIMUM MOISTURE				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
SL - SHRINKAGE LIMIT				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
PLASTICITY				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
PLASTICITY INDEX (PI)				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
DRY STRENGTH				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
NONPLASTIC				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
LOW PLASTICITY				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
MED. PLASTICITY				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
HIGH PLASTICITY				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
COLOR				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
EQUIPMENT USED ON SUBJECT PROJECT				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
DRILL UNITS:				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
ADVANCING TOOLS:				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
HAMMER TYPE:				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
CORE SIZE:				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
HAND TOOLS:				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
FRACTURE SPACING				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
BEDDING				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
INDURATION				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
BENCH MARK:				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
ELEVATION:				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											
NOTES:				SOUNDING ROD				SOUNDING ROD				SOUNDING ROD											

R-2501C

See Sheet I-A For Index of Sheets



25% SUBMITTAL

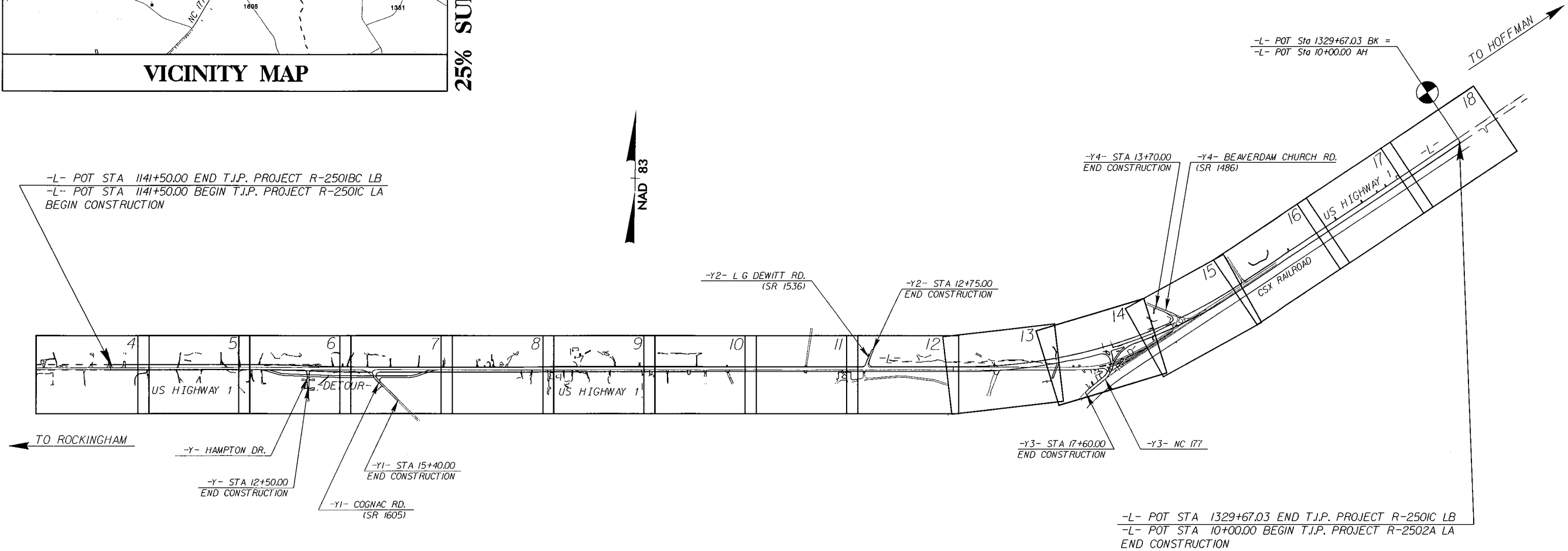
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RICHMOND COUNTY

LOCATION: US 1 from North of Fox Road (SR 1606) to Marston Road (SR 1001)

TYPE OF WORK: Grading, Drainage, Paving, Structures, Signing & Signals

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2501C	2A	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34437.1.1	NHF-1(1)	P.E.	

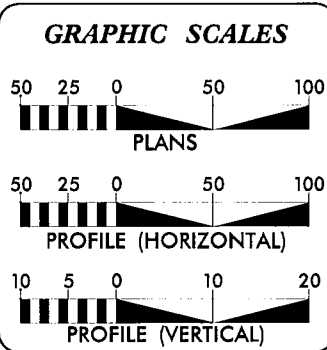


INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

PROJECT:



DESIGN DATA

ADT 2003 =	10,000
ADT 2025 =	17,300
DHV =	11 %
D =	60 %
T =	5 % *
V =	45 MPH
* TTST 5%	DUAL 5%

PROJECT LENGTH

LENGTH OF ROADWAY T.I.P. PROJECT R-2501C =	3.56 mi.
TOTAL LENGTH OF T.I.P. PROJECT R-2501C =	3.56 mi.

Prepared in the Office of:

HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUNE 17, 2005

LETTING DATE:

ENRICO A. ROQUE, P.E.
PROJECT ENGINEER

JEFFREY R. HEXT
PROJECT DESIGN ENGINEER

CATHY S. HOUSER, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED DIVISION ADMINISTRATOR

DATE



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

P.O. BOX 25201, RALEIGH, N.C. 27611-5201

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

August 11, 2004

State Project: 34437.1.1 (R-2501C)
Federal Project: NHF-1(1)
County: Richmond
Description: US 1 From North of Fox Road (SR 1606) to Marston Road (SR 1001) in Marston.
Subject: Geotechnical Report - Inventory

Project Description

This is a report of an English-units geotechnical investigation for a project that will upgrade a 3.5-mile section of Highway US 1 east of Rockingham in Richmond County. The CSX rail line runs parallel to -L- for the final mile of the project. US-1 will be widened to four or 5 lanes with the US 1 - NC 177 intersection on new alignment. A temporary detour is planned from -L- 1160+00 to -L- 1185+00 as part of a grade change for improved sight distance.

The following lines were investigated:

-L- Line: 1141+50+00 to 1329+67.03+49 27,949ft
Detour: 10+00 to 35+15.70 50ft
-Y-: 10+00 to 14+50 50ft
-Y1-: 10+32 to 15+40 118ft
-Y2-: 10+00 to 12+75 125ft
-Y3SPUR-: 5+00 to 7+39.73 118ft
-Y4-: 10+00 to 13+70 168ft
-RP D-: 10+00 to 14+73.97 650ft

Areas of Special Geotechnical Interest

Highly Plastic Soil

Scattered occurrences of high PI soil within 5 feet of finished grade are indicated on the profile sheets and are listed below.

Intervals of Highly Plastic Soil Within 5' of Finished Grade.

Boring	PI of Sample	AASHTO	SPT (N)	Water
1149+75 -L-, 50 Lt	28	A-2-7	5	Moist
1168+83 -L- 95 Rt	30	A-7-6	14	Moist
1170+82 -L- 96 Rt	33	A-7-6	21	Below Water Table
1172+56 -L- 96 Rt	41	A-7-6	23	Below Water
1192+50 -L- 60 Rt	30	A-7-6	30	Moist
1194+00 -L- 60 Rt	32	A-2-7	8	Moist
1210+75 -L- 60 Rt	24	A-7-6	11	Moist
1212+75 -L- 40 Rt	29	A-7-6	20	Moist

High Groundwater

Water was found on the surface at two locations and within 5' of finished grade as listed below

Intervals of Groundwater Within 5' of Finished Grade

1170 +82 -L- and 1172+56 -L-, both 95 Rt.
1202+35 -L- 45' Rt., near present surface under 10' of fill below finished grade
1205 -L-, Water was seen in the ditch on right.
1226+75-L-, Wet area noted on Lt.
1315+00-L-, A pond lies just to the left of the right of way.

Physiography and Geology

The project is within the Piedmont physiographic province in the Carolina Slate Belt litho-tectonic province. Coastal plain sediments cover the area.

Topographic Setting

The roadway travels east along a divide, for about 2.2 miles, then traverses a broad turn to the northeast at the intersection with NC 177. After the turn, the road bears N55E 1.2 miles to Marston and the project end. The profiles show that the road gains elevation climbing slopes followed by benches, listed below in a table:

Table 1, Slopes and Benches of Profile

From -L-	To -L-	Slope or Bench	Elev. From	Elev. To	Run to Rise
1 1 4 1 + 0 0	1 1 6 7 + 0 0	Bench	3 2 5	3 3 5	2 6 0 to 1
1 1 6 7 + 0 0	1 1 7 5 + 0 0	Slope	3 3 5	3 6 5	2 7 to 1
1 1 7 5 + 0 0	1 2 0 8 + 0 0	Bench	3 6 5	3 5 8	4 7 1 to 1
1 2 0 8 + 0 0	1 2 3 3 + 5 0	Slope	3 5 8	4 4 0	3 1 to 1
1 2 3 3 + 5 0	1 2 5 0 + 0 0	Bench	4 4 0	4 4 5	3 3 0 to 1
1 2 5 0 + 0 0	1 2 7 2 + 0 0	Slope	4 4 5	4 0 5	5 5 to 1
1 2 7 2 + 0 0	1 3 2 8 + 5 5	Bench	4 0 5	4 2 5	2 8 2 to 1

Surface Drainage and Geomorphology

The road travels the drainage divide between Gum Swamp Creek to the south, and Hitchcock Creek to the north, both west flowing tributaries of the Pee Dee River. Because the surface sand has such high porosity, the development of runoff features is modified by the tendency of precipitation to immediately become groundwater.

Geology

A traverse across this area will find sand. The loose sand at the surface covers sand with greater or lesser amounts of clay, and in places, clay lenses or clay beds that have essentially no sand.

Soils Properties

A general description follows immediately below, and a detailed description of the subsurface may be found under the segment descriptions in the **Geotechnical Descriptive Analysis** section, farther along in the report.

Pinehurst Formation:

The soil assigned to this unit is non-plastic A-3, A-2-4 or A-1 sand, found at land surface. The Pinehurst is a named formation that occurs on ridge-tops in Richmond, Hoke, Scotland and Moore Counties. It is white or red unconsolidated, highly porous, usually with more than 70% coarse sand grains, almost no silt, and very little clay content. The accepted interpretation is that the unit was deposited in dunes from windblown sand during the Eocene Epoch of the Tertiary Period, (50 to 30 million years ago).

Middendorf, sand:

The uppermost mapped Cretaceous formation is the Middendorf sand. Recent work has established that the unit mapped as Middendorf does not meet the requirements for a geologic formation. The Middendorf outcrop is probably actually Cape Fear and Black Creek formations.

Black Creek sand:

In areas where the Black Creek formation is proposed as a replacement for the Middendorf formation, the unit is interpreted to be fluvial deposits on a coastal plain environment. This environment produces a rapidly changing succession of clay or sand beds, cutting across each other, without having much lateral continuity.

Cape Fear sand:

The Cape Fear formation is a marine unit that overlies the eroded basement rock surface and represents the original transgression of the Cretaceous sea. It usually features laterally continuous beds of cross bedded sandstone or mudstone typical of delta front and shallow marine deposition. It is doubtful that it was encountered in this segment.

Rock Properties

No rock was found within the limits of this investigation.

Groundwater Properties

The groundwater on this project occurs within porosity of the sedimentary stratigraphy. In one type of occurrence, groundwater is found in a sandy unit above a clayey unit, and can be considered to be "perched" groundwater, controlled by stratigraphy. In the other type of occurrence on this property, water seems to be found a fairly consistent distance below the surface on a slope, and may represent a piezometric surface. Location of shallow groundwater is listed in the Areas of Special Geotechnical Interest section above, this report.

Geotechnical Descriptive Analysis of the Project

The project was divided into 7 segments based on the grade of the roadway. These intervals were identified above in the Geomorphology section.

From -L-	To -L-	Segment	Elev. From	Elev. To	Run to Rise
1141+00	1167+00	1	325	335	260 to 1
1167+00	1175+00	2	335	365	27 to 1
1175+00	1208+00	3	365	358	471 to 1
1208+00	1233+50	4	358	440	31 to 1
1233+50	1250+00	5	440	445	330 to 1
1250+00	1272+00	6	445	405	55 to 1
1272+00	1328+55	7	405	425	282 to 1

Segment 1. Station -L-1141+00 to -L- 1167+00, (Including Detour).

This segment begins east of Gibson Pond, about 2.5 miles west of the intersection of US1 and NC 177 on US-1. The segment is 2600 feet long, and travels east-west. A detour diverges at -L-1160+89 then runs parallel to the end of the segment.

Physical Description

In profile, this segment is nearly flat, rising from 325' elevation to 335' elevation, but it runs along a flat-topped divide, possibly a remnant of a broader plain with the topography breaking to a slope, within a half mile to the north and south. The design shows cut from a borrow ditch on the left, and fill under the roadbed. Towards the end of the segment more or less in the area of the detour, the alignment runs along the break in slope, and requires cut on the right and fill on the left.

Cuts and Fills

The significant (more than 5' thick) cuts and fills of this segment, are listed in the table below. Most of the segment will be built on or near existing grade with little fill or cut.

Cut			Fill	
From	To		From	To
1144+00	1146+00	Left		
1151+00	1152+50	Left & Right		
1161+00	1167+00	Right	1161+00 to 1167+00	Left

Soil

Two formations are represented in this segment, Pinehurst at the surface and Middendorf, (Black Creek) in the deeper levels.

Pinehurst Formation

The uppermost material is A-2-4, loose, well-graded non-plastic sand 3' to over 10' thick. Coarse sand accounts for about 65% of this material, with clay usually around 5%.

Middendorf, (Black Creek)

The sediments within the Black Creek formation appear to be from two different depositional events. There is a lower unit that is clayey, including A-2-6, A-2-7, A-6 soil types, often with P.I. (Plasticity Index), values ranging from 15 to 30, and SPT "N" values of 15 to 60. This older unit appears to have been eroded and back filled by clayey A-2-4 and A-1-B sand, with N values less than 10 and low plasticity. This would help explain why a traverse along the segment at a depth of 8' would find: A-6, A-1b, A-6, A-2-7, A-1-b, A-2-7, A-4, A-7-6, A-2-7.

Soil Plasticity

The variation in soil type at a depth of 8', (pointed out above), is reflected in the plasticity index, (P.I.). On this segment, a traverse of samples collected near eight feet, (300' spacing), would yield the following string of N values: 16, NP, 16, 28, NP, 26, 9, 18, NP, 23, NP, 22.

Fill Soil

The existing road was built slightly above grade with fill supplied from the borrow ditches on each side. No evidence of failure was seen in the existing roadbed.

Groundwater

No groundwater was found on this segment.

Segment 2. Station-L- 1167+00 to 1177+00(Including Detour and -Y-).

This segment begins just west of -Y-, (Hampton Dr), and continues to just west of Cognac Road. It is 800 feet long, and travels east west. Hampton Drive is a dead end road that serves a small housing development. The detour on segment 1 continues parallel to -L-.

Physical Description

The elevation on this segment rises from 335' elevation to 365' elevation. The slope of the land changes so that rather than the roadway running along a side sloping hill, in this segment the road runs up a slope. A detour is required in this area because the grade of the road is being lowered.

Cuts and Fills

The significant (more than 5' thick) cuts and fills of this segment, are listed in the table below. Most of the segment will be built on or near existing grade with little fill or cut.

Cut			Fill		
From	To		From	To	
1168+00	1169+50	Left	1167+00	1168+00	Left
1169+50	1175+00	Left, Right & Grade			

Soil

Two formations are represented in this segment, Pinehurst at the surface and Middendorf, (Black Creek) in the deeper levels.

Pinehurst Formation

As above, the uppermost material is A-2-4, loose, well-graded non-plastic sand 3' to over 10' thick. Coarse sand accounts for about 65% of this material, with clay usually around 5%.

Middendorf, (Black Creek)

In this segment, as in segment 1, we may be seeing two Black Creek sub units. A lower unit that is clayey, mostly A-7, with P.I. values ranging from 15 to 30, and N values of 20 to 45. This older unit appears to have been eroded and back filled by clayey A-2-4, A-1-B, A-2-6 and A-2-7 sand, with low plasticity values and N less than 10.

Soil Plasticity

The soil below -L- appears to not have P.I. values above 20 near the proposed grade. The borings for the detour, 150' south of -L- did find high PI clay at the grade elevation. The soil appears to change between the -L- line and the -Det-line.

Fill Soil

The existing road is on as much as 6' of fill, but the planned construction will remove this material. No evidence of failure was seen in the existing roadbed.

Groundwater

Groundwater was found in the borings from 1170+00 to 1178+00. It was around 10' below the surface on this sloping segment, and may represent the piezometric surface. The static water level is in several different soil types on the segment, rather than sitting on an impermeable bed.

Segment 3. Station-L- 1177+00 to 1208+00(Including Detour and -Y1-).

This segment begins just west of (Y1), Cognac Road. It is 3100 feet long, and travels east west. The detour continues past Cognac Road, but comes back into -L- before the end of this segment.

Physical Description

This segment crosses a bench beginning at 365' elevation, and ending at 358' elevation. The topo map shows that this entire segment traverses a headwater basin that drains to the north. The stream is crossed at 1202+35, where the ground surface drops briefly to 346'.

Cuts and Fills

The significant (more than 5' thick) cuts and fills of this segment, are listed in the table below.

Cut			Fill		
From	To		From	To	
			1178+00	1183+00	(Detour)
1184+00	1186+00	Left			
1188+00	1196+00	Right			
			1196+50	1196+50	left and right
1198+00	1201+50	Right	1198+00	1201+50	left
			1202+00	1203+00	left and right
1204+00	1208+00	Right			

Soil

Two formations are represented in this segment, Pinehurst at the surface and Middendorf, (Black Creek) in the deeper levels.

Pinehurst Formation

The Pinehurst in this segment appears to be quite thin. Of the 13 samples collected at the first drive, no deeper than 4' below land surface, two had less than 10% clay, typical of Pinehurst formation. The others had clay content from 11 to 54%.

Middendorf, (Black Creek)

In this segment, the soil below the surface sand is most commonly A-2-6 or A-2-7. Occasionally, in this upper horizon clay content pushes the classification to A-7. An A-2-4 sand that is not Pinehurst formation is often below the A-2-6 at 10' or more below the surface.

Soil Plasticity

From 1192+00 to 1195+00 the soil within 5' of the planned grade has PI values above 20. N values are 16, 8 and 6. At 1202+00 an interval of A-7 with PI of 20 is at the water table but below 10' to 15' of planned fill.

Fill Soil

The existing road is on as much as 6' of fill, but no evidence of failure was seen in the existing roadbed.

Groundwater

At depths of 15' below land surface, groundwater was seen in scattered occurrences, mostly at around 350' elevation in the deepest holes. There was water at the surface in a stream channel at 1202+00 and 350' elevation.

Segment 4. Station-L- 1208+00 to 1233+50(Including Detour and -Y1-).

This segment begins just west of a small private campground on the left and continues east 2550' to the entrance road to the Rockingham Dragway Racetrack on the left.

Physical Description

In profile, this segment climbs from 358' elevation to 440' elevation, up the face of the slope. All drainage is to the west, collecting at an unnamed stream at the west end of the segment.

Cuts and Fills

The significant (more than 5' thick) cuts and fills of this segment, are listed in the table below.

Cut			Fill		
From	To		From	To	
1215+00	1218+00	Left			

Soil

The soil types of this segment have boundaries that generally follow the slope of the hill. Tan sand is reported at the surface, but was lightly sampled. It is followed at 0 to 5' by A-2-6 or A-2-7 clayey sand, and then often A-7 or A-6 clay or sandy clay, and then, at the first of the segment by A-2-4 sand below the clay. The Pinehurst formation would be the tan sand at the surface and the Middendorf, (Black Creek) has to contain the other units.

Pinehurst Formation

As in the last segment, the Pinehurst formation in this segment appears to be quite thin. Of the 7 samples collected from within the top 5' of the segment, 1 reported clay less than 10% typical of the Pinehurst formation. The others had clay content from 13 to 34%.

Middendorf, (Black Creek)

In this segment, the soil below the surface sand is most commonly A-2-6 or A-2-7. Sandy clay,

A-7 or A-6 may follow, and the clay may be underlain by sand. The A-6 or A-7 is usually found within 10' of the surface, and usually has SPT N values of 20 or more.

Soil Plasticity

From 1210+00 to 1213+00 the soil within 5' of the planned grade has PI values above 20 and N values of 11 and 39. From 1226+50 to 1228+50 soil within 10' of the surface has PI values above 25, and N values of 30 and 27.

Fill Soil

The existing road is on less than 5' of fill, and no evidence of failure was seen in the existing roadbed.

Groundwater

Groundwater was seen in scattered occurrences, mostly around 10' below the land surface, but not confined or above a unique soil type. This may be a piezometric surface somewhat modified by the clay soil layers.

Segment 5. Station-L- 1233+50 to 1250+00, (Including-Y2-).

This segment begins at the entrance road to the Rockingham Dragway Racetrack on the left, and continues 1650' to the east, ending in front of the Rockingham speedway on the right.

Physical Description

In profile, this segment begins at 440' elevation and ends at 445' elevation, staying essentially level throughout.

Cuts and Fills

No cuts or fills of 5' thickness or greater occur on this segment.

Soil

The soil on this segment was all sandy with very little clay.

Pinehurst Formation

The Pinehurst formation is described as wind blown sand that has been deposited on an existing topography. The soil sampled in this segment is consistent with this description.

Soil Plasticity

The soil is non plastic

Fill Soil

The existing road is on less than 5' of fill, and no evidence of failure was seen in the existing roadbed.

Groundwater

No groundwater was detected in this segment.

Segment 6. Station-L- 1250+00+00 to 1272+00(Including-Y1-).

This segment begins in front of the Rockingham Speedway, east of the main entrance.

Physical Description

In profile, this segment covers the descent of the road down the face of the slope, from 445' elevation to 405' elevation, along a drainage divide, with runoff being split to the north and the south. About halfway along this segment, the roadway diverges north to a new alignment that will replace the current US#1-NC 177 "y" intersection. The road goes into the curve on an east-west bearing, and comes out at a N55W bearing. This change in direction currently takes place at the "y".

Cuts and Fills

No significant cuts or fills, (greater than 5'), occur on this segment.

Soil

This segment covers the descent of the roadway from a hill, so it would be reasonable to expect that the soil would be similar to the ascending segment, (segment 4.) This is not the case. The

soil here is almost all sand, as in segment 5.

Pinehurst Formation

The Pinehurst formation in this segment is no less than 5' thick and near the top of the grade, is greater than 10' thick. Up to the last two borings of the segment no clay greater than 10% was described or sampled. In those last borings, sand was found in the upper 5' of the hole. The Pinehurst formation is typically thickest on the hilltops or the lee side of hills.

Middendorf, (Black Creek)

In this segment, the final two borings show clayey sand, at a depth of about 5'. In those two borings, A-4, A-2-6 or A-2-7 was sampled below the Pinehurst formation.

Soil Plasticity

No highly plastic soil was found in this segment. The majority of samples are non-plastic sand.

Fill Soil

No fill soil was found on this segment. There could be disturbed soil in the part of the interval on new alignment. This area once had a school and currently is a campground.

Groundwater

One isolated occurrence of groundwater was noted at 8' below grade in fine sand at -L-1261+00

Segment7:-L-1272+00 to -L-1328+55, (Including RpD, Y3 spur, Y3, and Y4)

This segment finishes the curve on the new alignment at the US#1 - NC 177 intersection, and includes the new intersection.

Physical Description

This segment of the project continues from just west of the NC 177 intersection and continues to the end at Marston Road. The elevation climbs from 405' at the beginning to 425' at the end. The new intersection will include: a turn lane from westbound US 1 to south bound NC 177, an exit spur from east bound US 1 to NC 177, a ramp from north bound NC 177 to east bound US 1, and an unprotected left turn from northbound NC 177 to westbound US 1.

Soil

The subsurface of this flat segment exhibits a two-layer stratigraphy. There is loose non-plastic sand at the surface, and 5 to 10 feet down, clayey sand to sandy clay.

Pinehurst Formation

The loose sand at the surface is Pinehurst formation, either A-2-4 or A-1-b, with less than 10% clay.

Middendorf, (Black Creek)

The soil below the loose sand is sandy clay to clayey sand with intervals of A-2-4, A-2-7, A-4, A-2-6, A-7-6, A-6, and A-7-5. SPT N values hover around 10.

Soil Plasticity

No highly plastic soil was found within 10' of the proposed grade, though there is some highly plastic clayey sand at deeper levels.

Cuts and Fills

The significant (more than 5' thick) cuts and fills of this segment, are listed in the table below.

Cut			Fill	
From	To		From	To
1272+00	1288+00	Left		
1299+00	13+00	Left & Right		
1311+00	1313+50	Left & Right		
1328+00	1329+00	Right		

No fill soil was found on this segment. There could be disturbed soil in the part of the interval on new alignment. This area currently has several dwellings, presumably with sewer systems of some sort.

Groundwater

From -L-1280+00 to -L-1300+00 there is a semi-continuous water table sitting on top of the clayey soils at about 10' depth.

CLOSING STATEMENT

If any significant changes are made in the design or location of the proposed roadway, the subsurface information and interpretations will have to be reviewed and modified as necessary.

Respectfully Submitted,

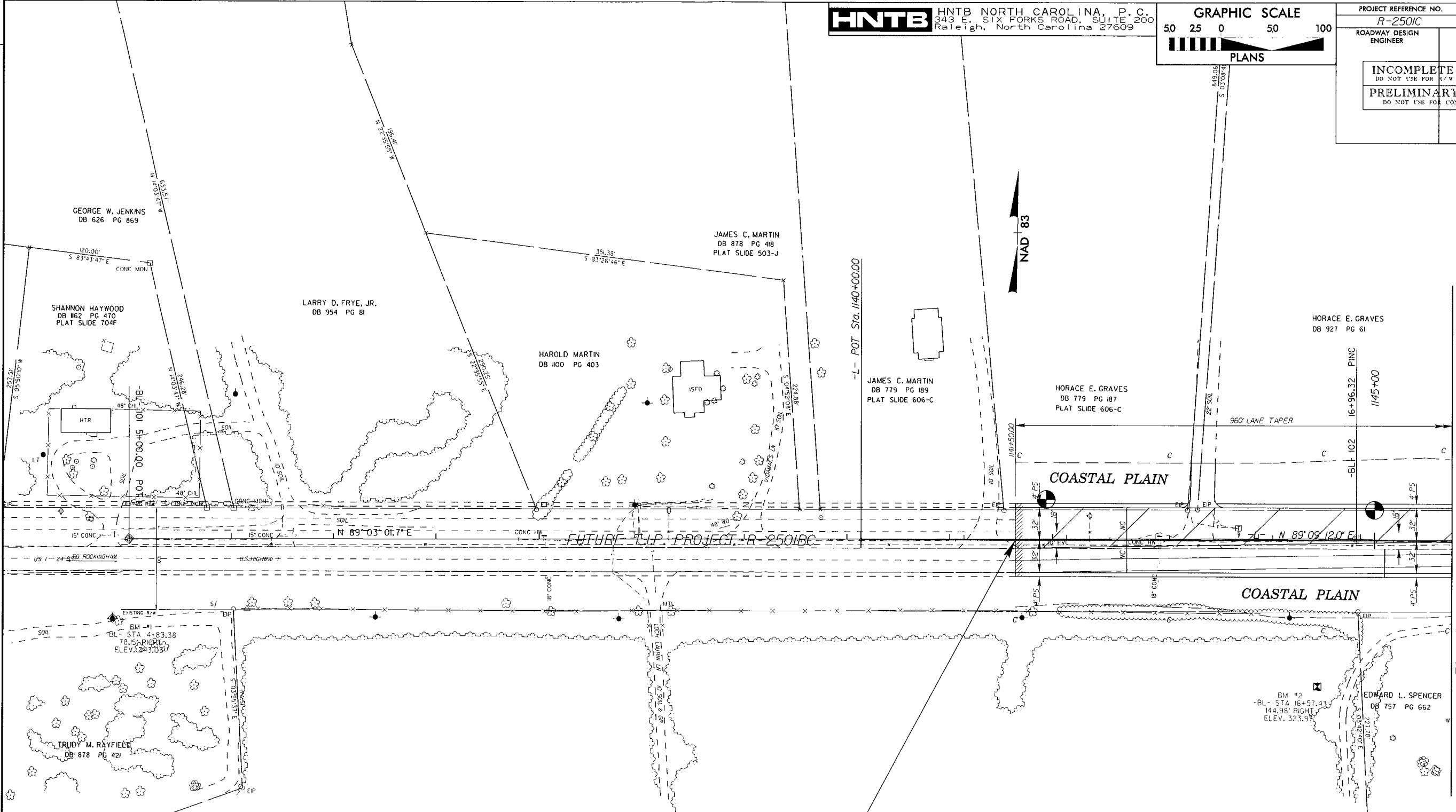
R.Q. Callaway, LG
Project Geologist

PROJECT REFERENCE NO.	SHEET NO.
<i>R-2501C</i>	<i>3...P</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

EARTHWORK SUMMARY

PROJECT REFERENCE NO. <i>R-250IC</i>	SHEET NO. 4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

REVISIONS



END T.I.P. PROJECT R-250IBC (JUNE, 2009 LETTING) -L- Sta. 1141+50.00 LB
 BEGIN T.I.P. PROJECT R-250IC -L- POT Sta. 1141+50.00 LA
 BEGIN CONSTRUCTION

DATUM DESCRIPTION
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "FRUITLAND" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 427332.4984(11) EASTING: 1804014.1183(11) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999866920 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "FRUITLAND" TO -L- STATION 1140+00.00 IS N 6°51'06.90" E @ 19746.36 FT. ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAD 88

SEAN S. RYAN
 DB 1038 PG 484

J. B. DAWKINS
 DB 333 PG 329

NOTE:
 ALL DRIVEWAY RADII ARE 10', UNLESS OTHERWISE NOTED.
 FOR -L- PROFILE SEE SHEET No. 21.

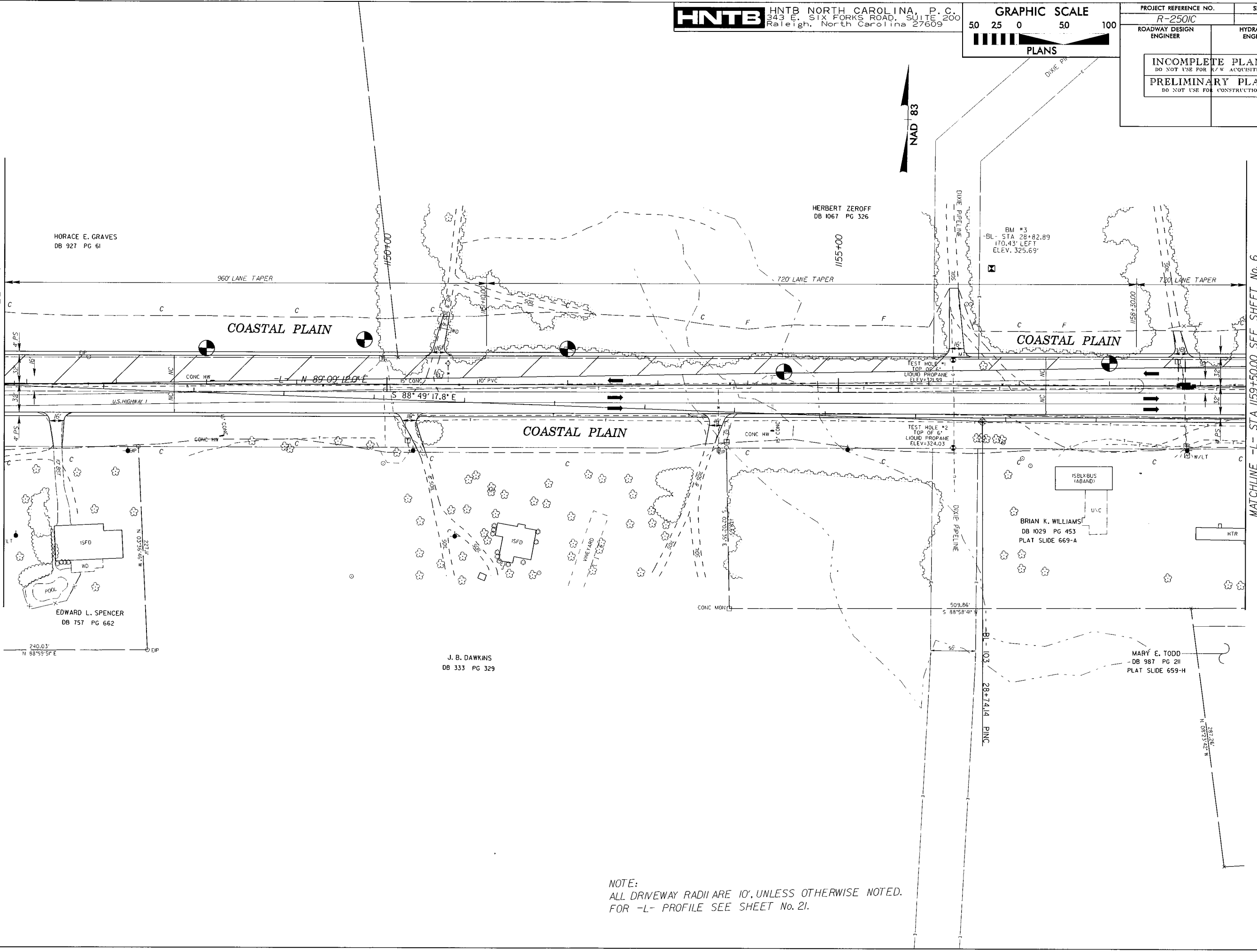
MATCHLINE -L- STA 1145+75.00 SEE SHEET No. 5

PROJECT REFERENCE NO. <i>R-2501C</i>	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

REVISIONS

MATCHLINE -L- STA 1145+75.00 SEE SHEET No. 4

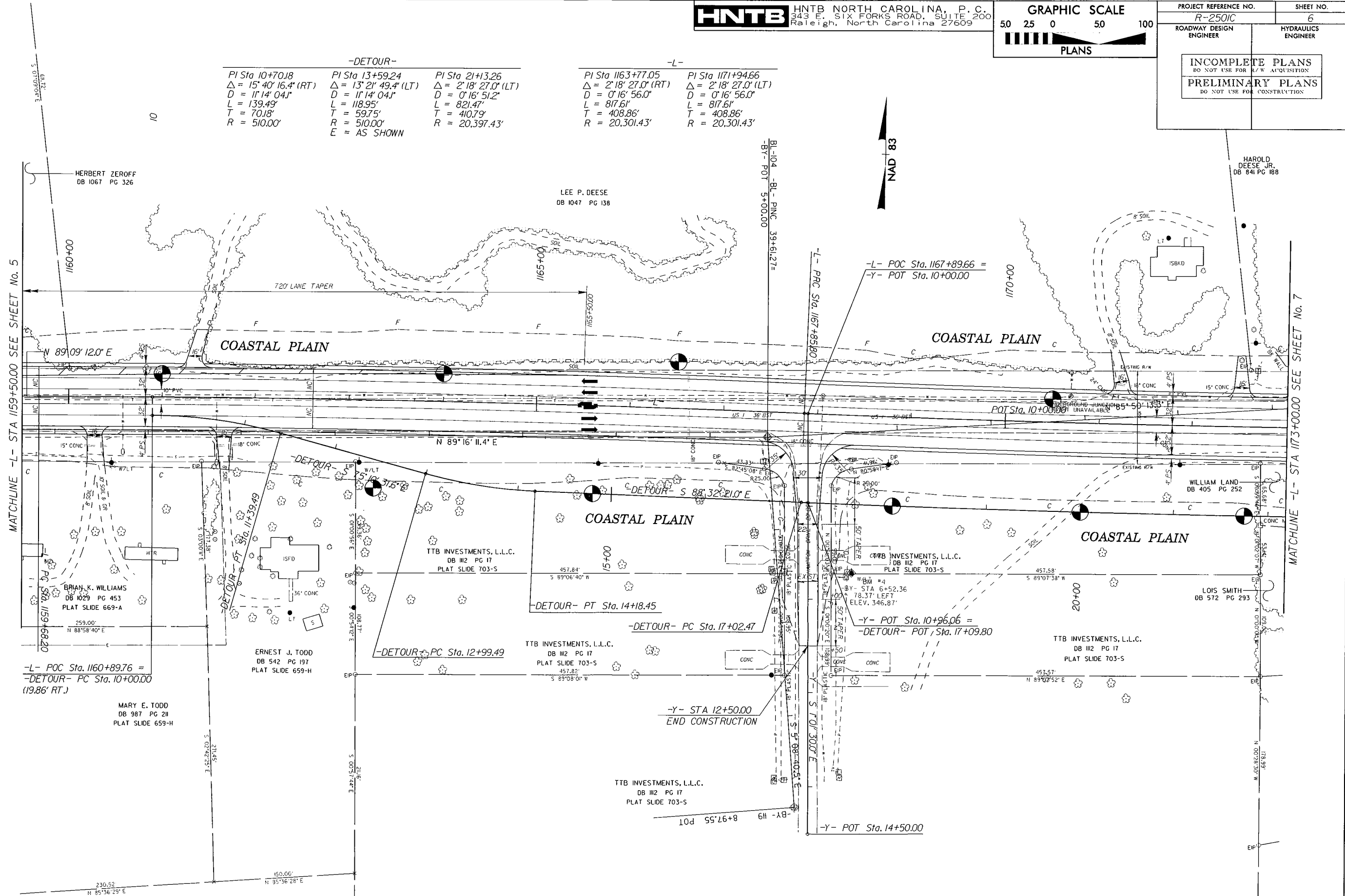
MATCHLINE -L- STA 1159+50.00 SEE SHEET No. 6



NOTE:
 ALL DRIVEWAY RADII ARE 10', UNLESS OTHERWISE NOTED.
 FOR -L- PROFILE SEE SHEET No. 21.

-DETOUR-			-L-	
PI Sta 10+70.18	PI Sta 13+59.24	PI Sta 21+13.26	PI Sta 1163+77.05	PI Sta 1171+94.66
$\Delta = 15^{\circ} 40' 16.4" (RT)$	$\Delta = 13^{\circ} 21' 49.4" (LT)$	$\Delta = 2^{\circ} 18' 27.0" (LT)$	$\Delta = 2^{\circ} 18' 27.0" (RT)$	$\Delta = 2^{\circ} 18' 27.0" (LT)$
$D = 11^{\circ} 14' 04.1"$	$D = 11^{\circ} 14' 04.1"$	$D = 0^{\circ} 16' 51.2"$	$D = 0^{\circ} 16' 56.0"$	$D = 0^{\circ} 16' 56.0"$
$L = 139.49'$	$L = 118.95'$	$L = 821.47'$	$L = 817.61'$	$L = 817.61'$
$T = 70.18'$	$T = 59.75'$	$T = 410.79'$	$T = 408.86'$	$T = 408.86'$
$R = 510.00'$	$R = 510.00'$	$R = 20,397.43'$	$R = 20,301.43'$	$R = 20,301.43'$
	$E = AS SHOWN$			

REVISIONS



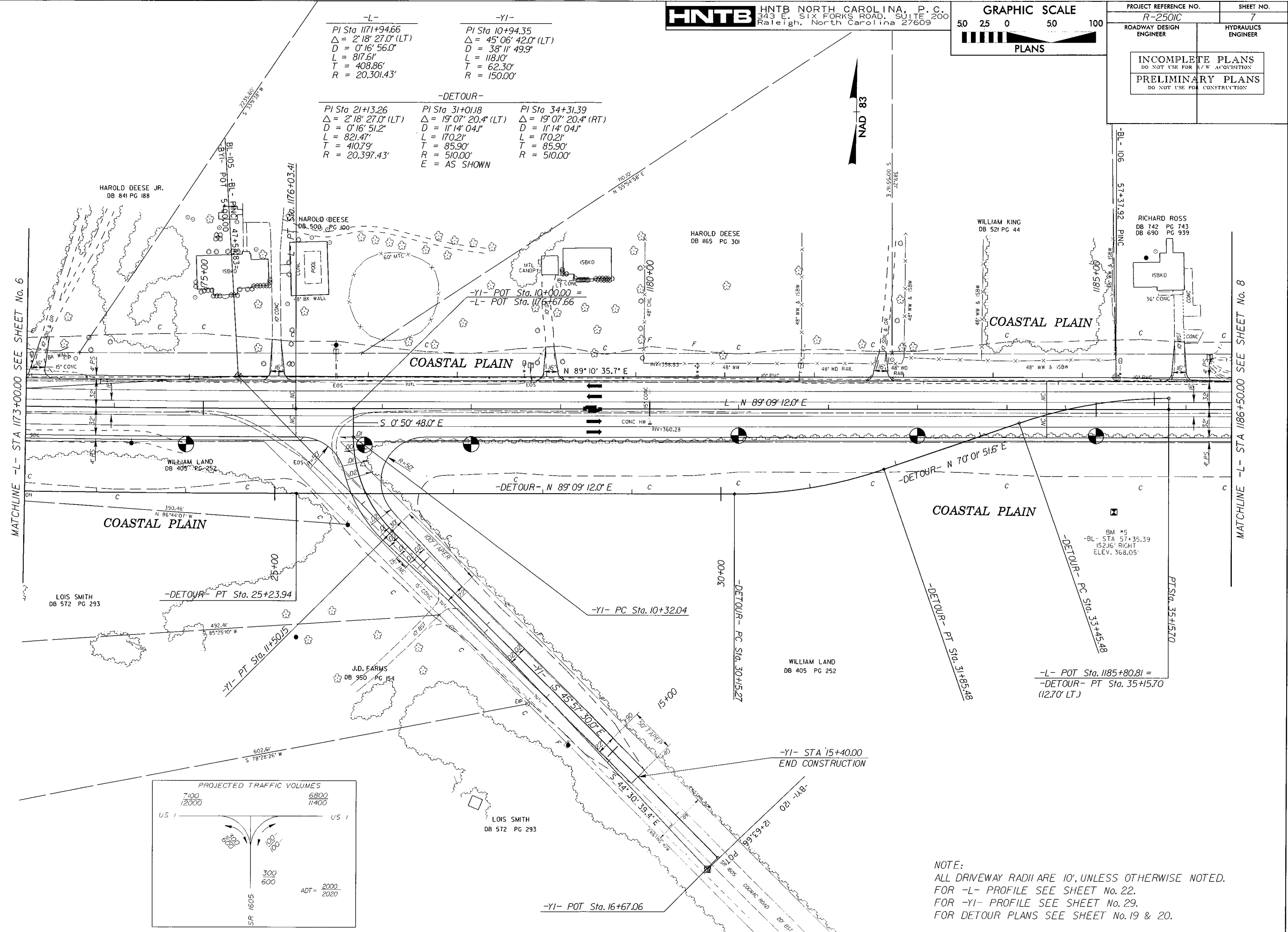
NOTE:
 ALL DRIVEWAY RADII ARE 10', UNLESS OTHERWISE NOTED.
 FOR -L- PROFILE SEE SHEET No. 21 & 22.
 FOR -Y- PROFILE SEE SHEET No. 30.
 FOR DETOUR PLANS SEE SHEET No. 19 & 20.

-L-
PI Sta 1171+94.66
 $\Delta = 2' 18" 27.0" (LT)$
D = 0' 16' 56.0"
L = 817.61'
T = 408.86'
R = 20,301.43'

-YI-
PI Sta 10+94.35
 $\Delta = 45' 06" 42.0" (LT)$
D = 38' 11' 49.9"
L = 118.10'
T = 62.30'
R = 150.00'

-DETOUR-

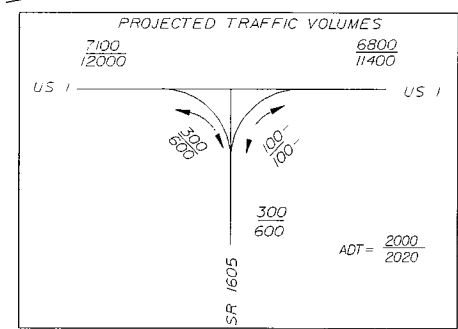
PI Sta 21+13.26 $\Delta = 2' 18" 27.0" (LT)$ D = 0' 16' 51.2" L = 821.47' T = 410.79' R = 20,397.43'	PI Sta 31+01.18 $\Delta = 19' 07" 20.4" (LT)$ D = 11' 14' 04.1" L = 170.21' T = 85.90' R = 510.00' E = AS SHOWN	PI Sta 34+31.39 $\Delta = 19' 07" 20.4" (RT)$ D = 11' 14' 04.1" L = 170.21' T = 85.90' R = 510.00'
---	---	---



REVISIONS

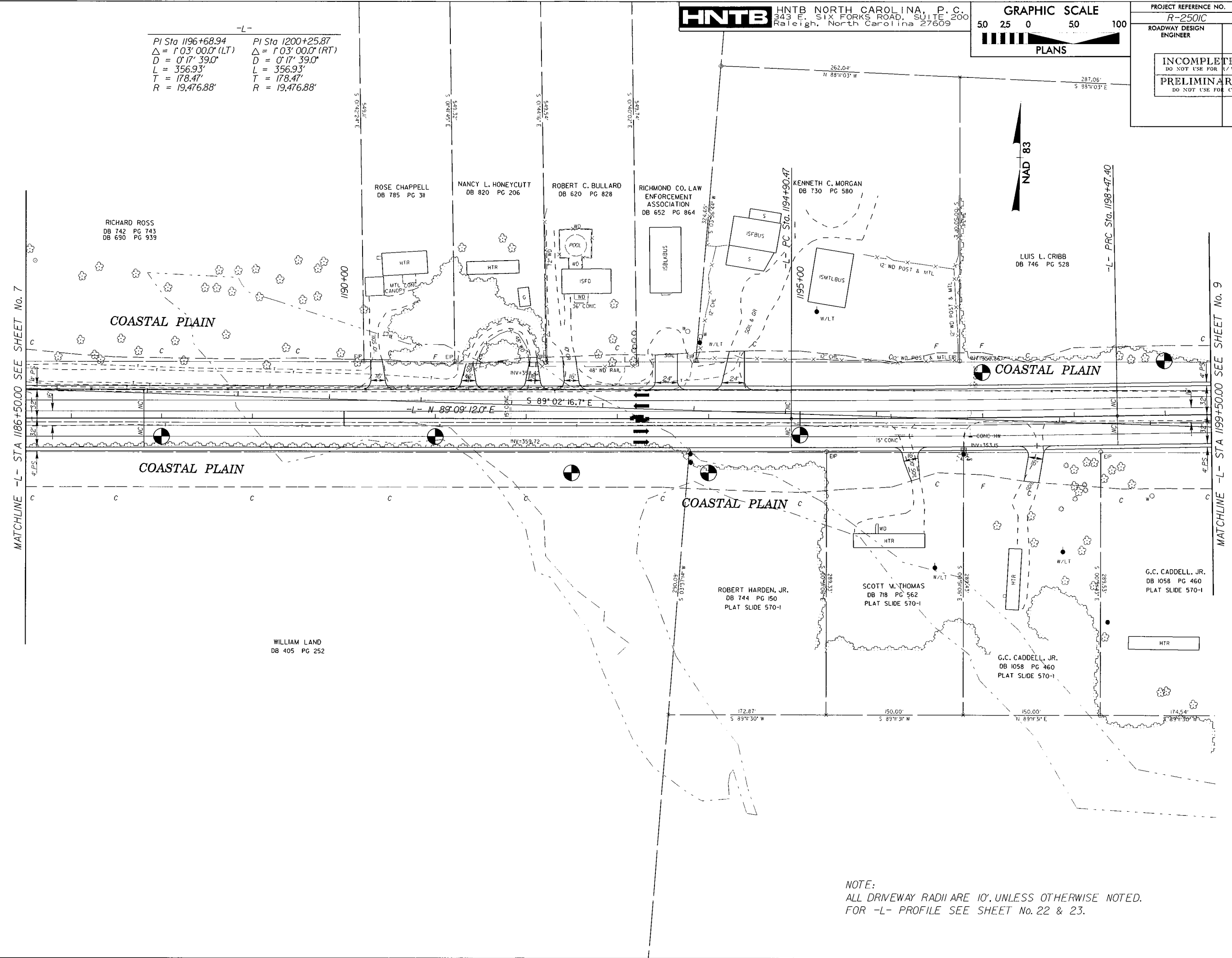
MATCHLINE -L- STA 1173+00.00 SEE SHEET No. 6

MATCHLINE -L- STA 1186+50.00 SEE SHEET No. 8



NOTE:
ALL DRIVEWAY RADII ARE 10', UNLESS OTHERWISE NOTED.
FOR -L- PROFILE SEE SHEET No. 22.
FOR -YI- PROFILE SEE SHEET No. 29.
FOR DETOUR PLANS SEE SHEET No. 19 & 20.

-L-
 PI Sta 1196+68.94 PI Sta 1200+25.87
 $\Delta = 1^{\circ}03'00.0''$ (LT) $\Delta = 1^{\circ}03'00.0''$ (RT)
 $D = 0^{\circ}17'39.0''$ $D = 0^{\circ}17'39.0''$
 $L = 356.93'$ $L = 356.93'$
 $T = 178.47'$ $T = 178.47'$
 $R = 19,476.88'$ $R = 19,476.88'$

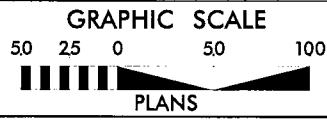


REVISIONS

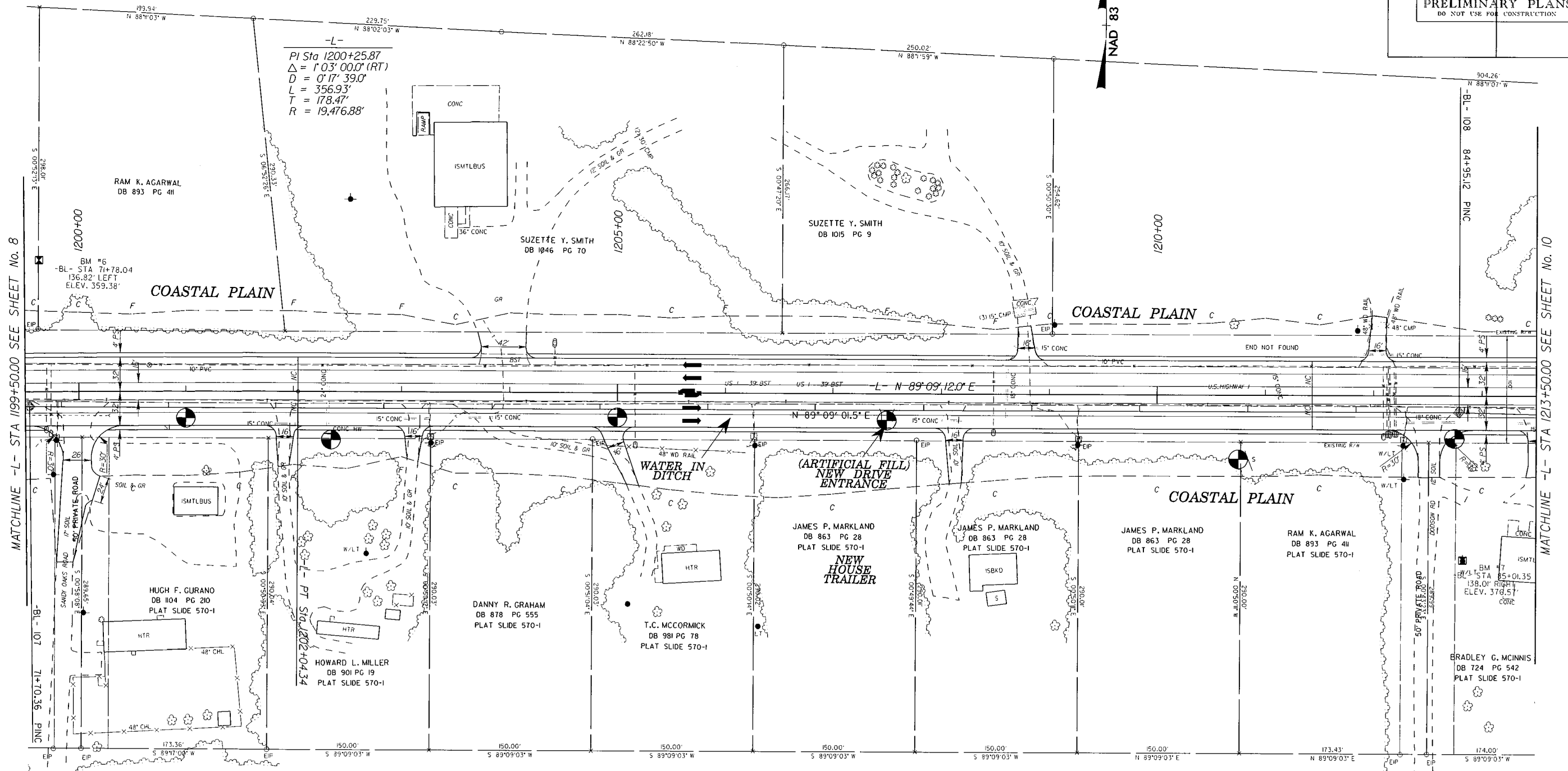
MATCHLINE -L- STA 1186+50.00 SEE SHEET No. 7

MATCHLINE -L- STA 1199+50.00 SEE SHEET No. 9

NOTE:
 ALL DRIVEWAY RADII ARE 10'. UNLESS OTHERWISE NOTED.
 FOR -L- PROFILE SEE SHEET No. 22 & 23.



PROJECT REFERENCE NO. R-2501C	SHEET NO. 9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR E/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



REVISIONS

MATCHLINE -L- STA 1199+50.00 SEE SHEET No. 8

MATCHLINE -L- STA 1213+50.00 SEE SHEET No. 10

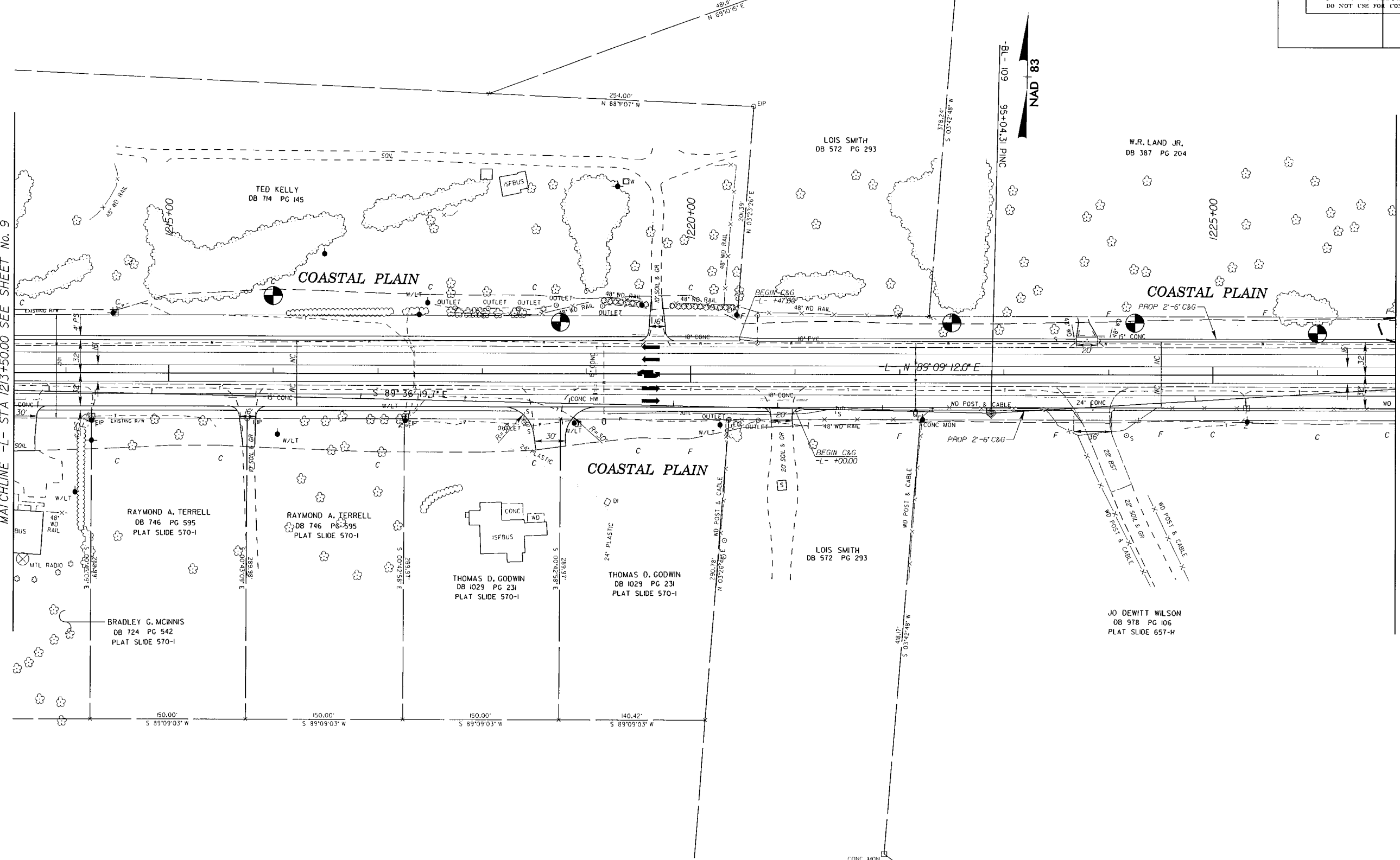
NOTE:
 ALL DRIVEWAY RADII ARE 10', UNLESS OTHERWISE NOTED.
 FOR -L- PROFILE SEE SHEET No. 23.

PROJECT REFERENCE NO. <i>R-2501C</i>	SHEET NO. <i>10</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

REVISIONS

MATCHLINE -L- STA 123+50.00 SEE SHEET No. 9

MATCHLINE -L- STA 1226+75.00 SEE SHEET No. 11

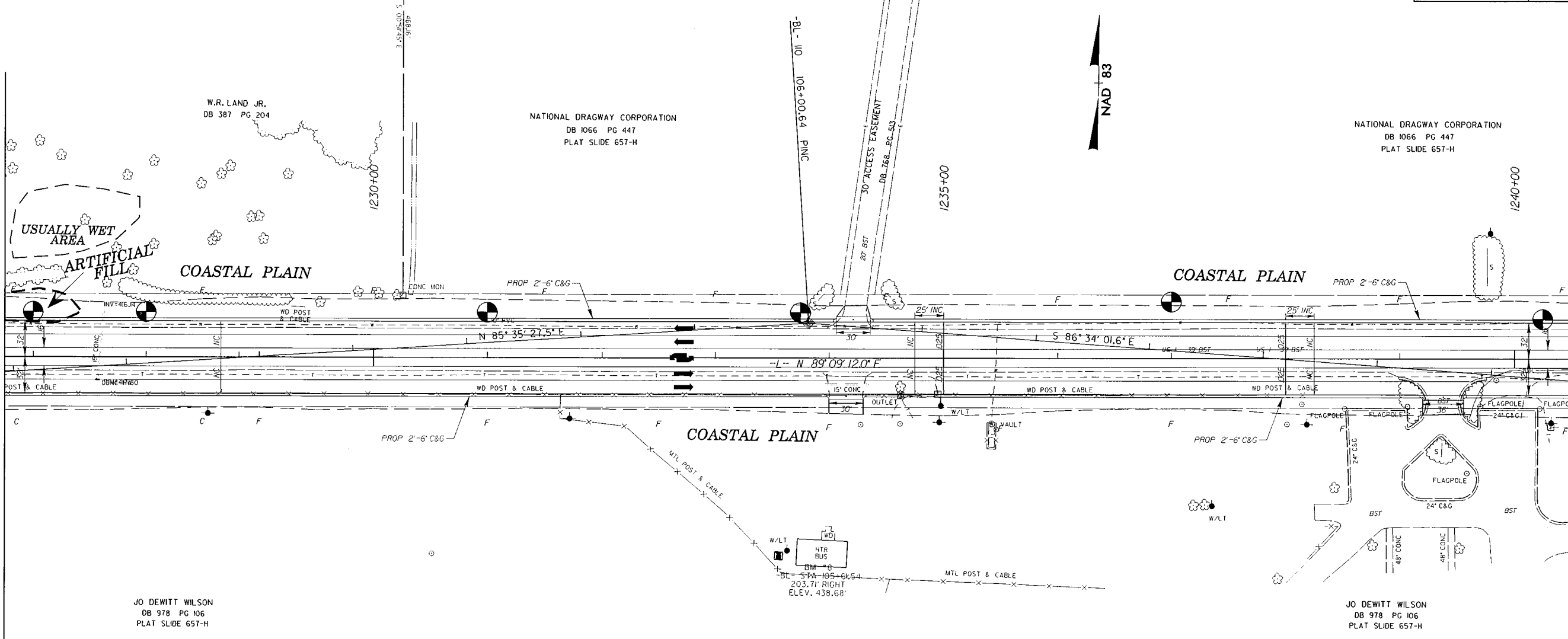


NOTE:
 ALL DRIVEWAY RADII ARE 10', UNLESS OTHERWISE NOTED.
 FOR -L- PROFILE SEE SHEET No. 23 & 24.

REVISIONS

MATCHLINE -L- STA 1226+7500 SEE SHEET No. 10

MATCHLINE -L- STA 1240+5000 SEE SHEET No. 12



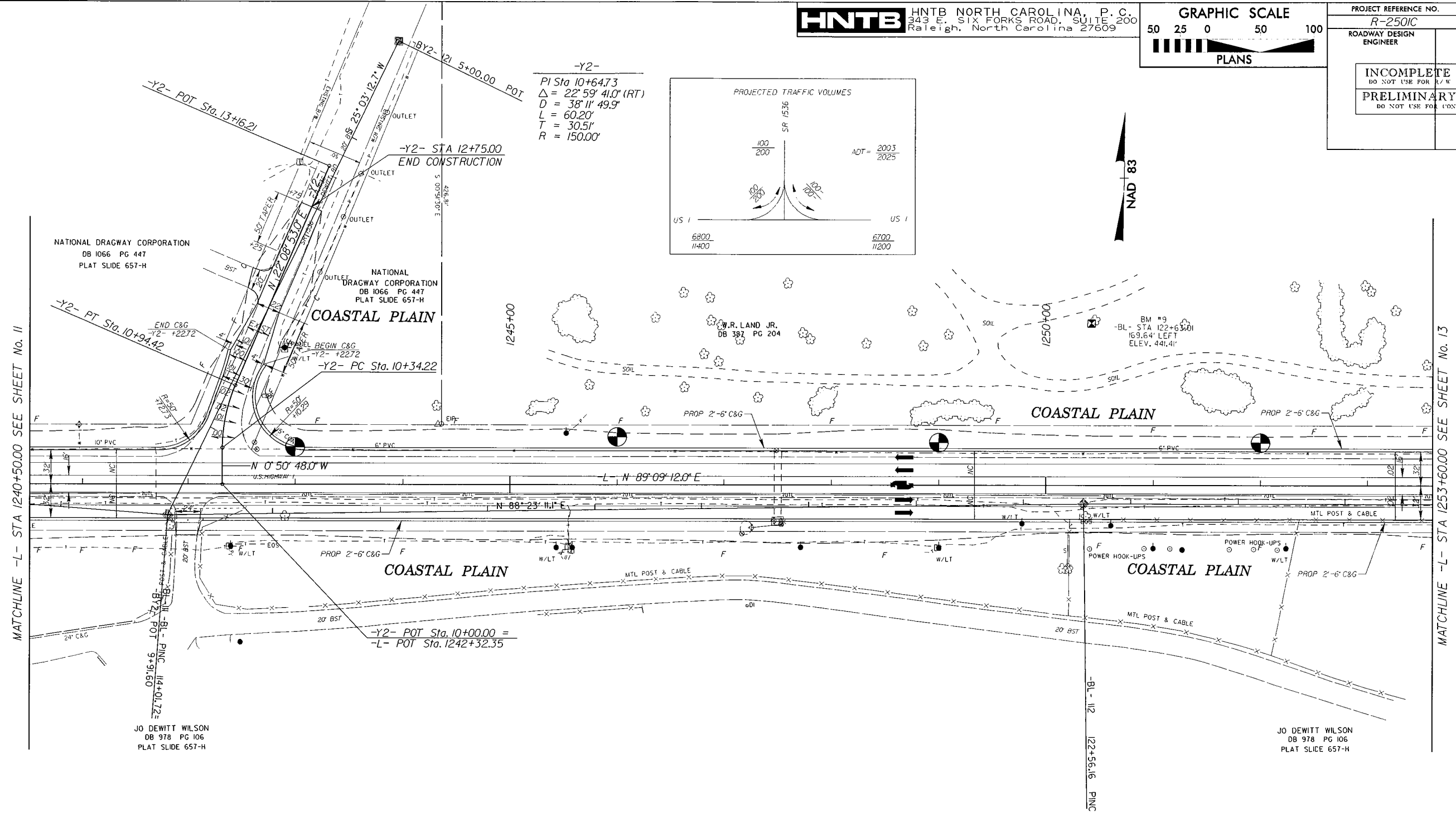
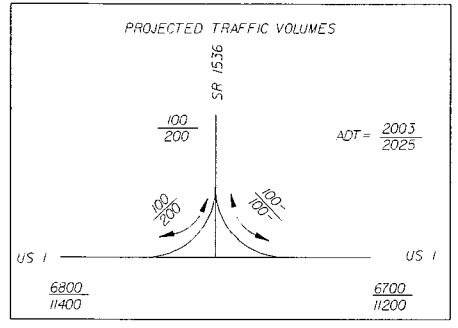
JO DEWITT WILSON
 DB 978 PG 106
 PLAT SLIDE 657-H

JO DEWITT WILSON
 DB 978 PG 106
 PLAT SLIDE 657-H

NOTE:
 FOR -L- PROFILE SEE SHEET No. 24.

PROJECT REFERENCE NO. <i>R-2501C</i>	SHEET NO. <i>12</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

-Y2-
PI Sta 10+64.73
 $\Delta = 22^\circ 59' 41.0''$ (RT)
D = 38' 11" 49.9"
L = 60.20'
T = 30.51'
R = 150.00'



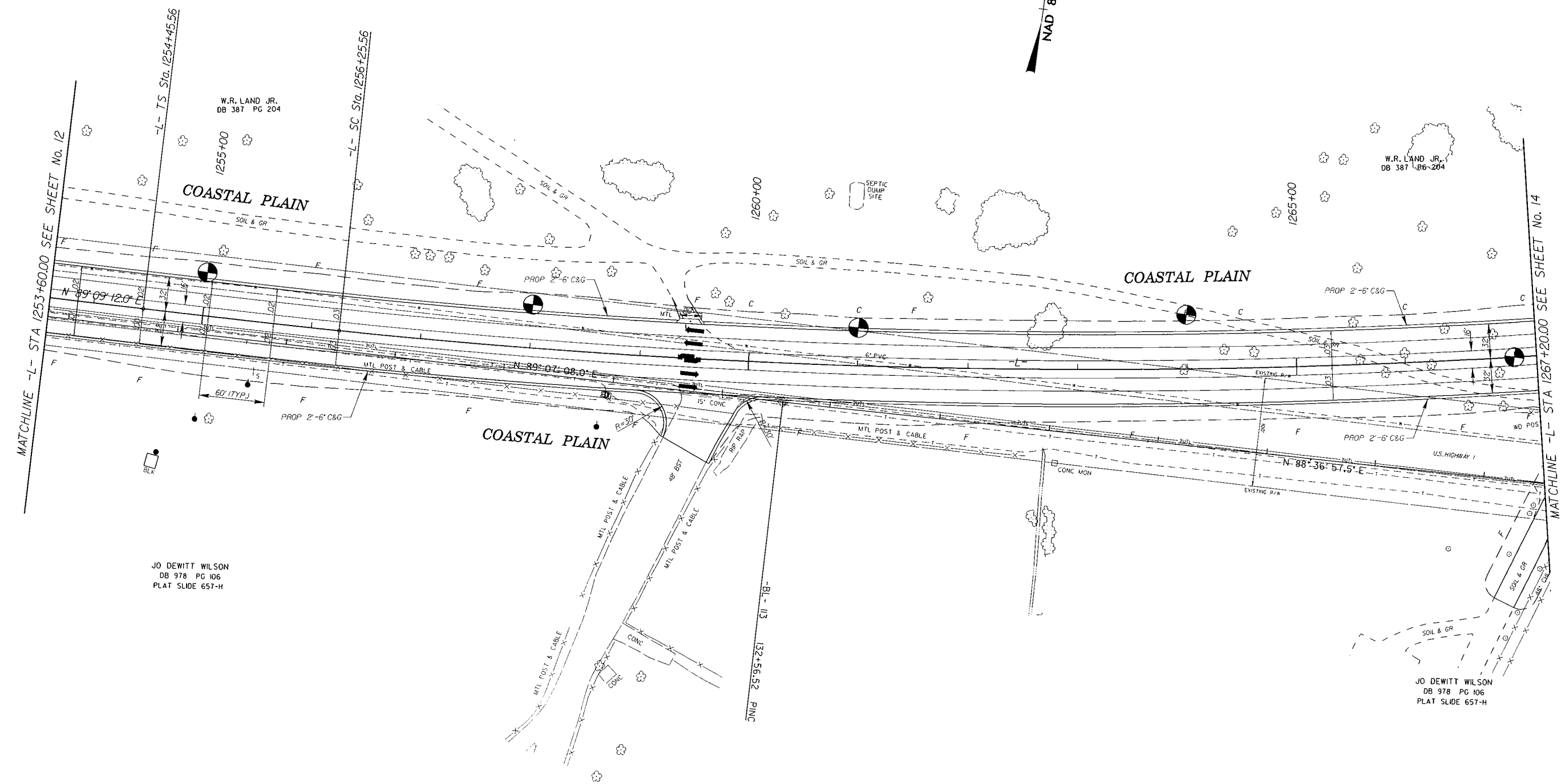
REVISIONS

MATCHLINE -L- STA 1240+50.00 SEE SHEET No. 11

MATCHLINE -L- STA 1253+60.00 SEE SHEET No. 13

NOTE:
FOR -L- PROFILE SEE SHEET No. 24 & 25.
FOR -Y2- PROFILE SEE SHEET No. 29.

-L-
 PIs Sta 1255+65.56 PI Sta 1275+42.89
 $\theta_s = 0^\circ 46' 31.6"$ $\Delta = 32^\circ 10' 00.0"$ (LT)
 $L_s = 180.00'$ $D = 0^\circ 51' 41.7"$
 $LT = 120.00'$ $L = 3.733.40$
 $ST = 60.00'$ $T = 1.917.33'$
 $R = 6,650.00'$



REVISIONS

MATCHLINE -L- STA 1253+60.00 SEE SHEET No. 12

MATCHLINE -L- STA 1267+20.00 SEE SHEET No. 14

JO DEWITT WILSON
 DB 978 PG 106
 PLAT SLIDE 657-H

JO DEWITT WILSON
 DB 978 PG 106
 PLAT SLIDE 657-H

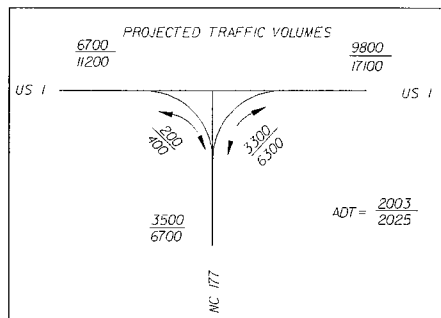
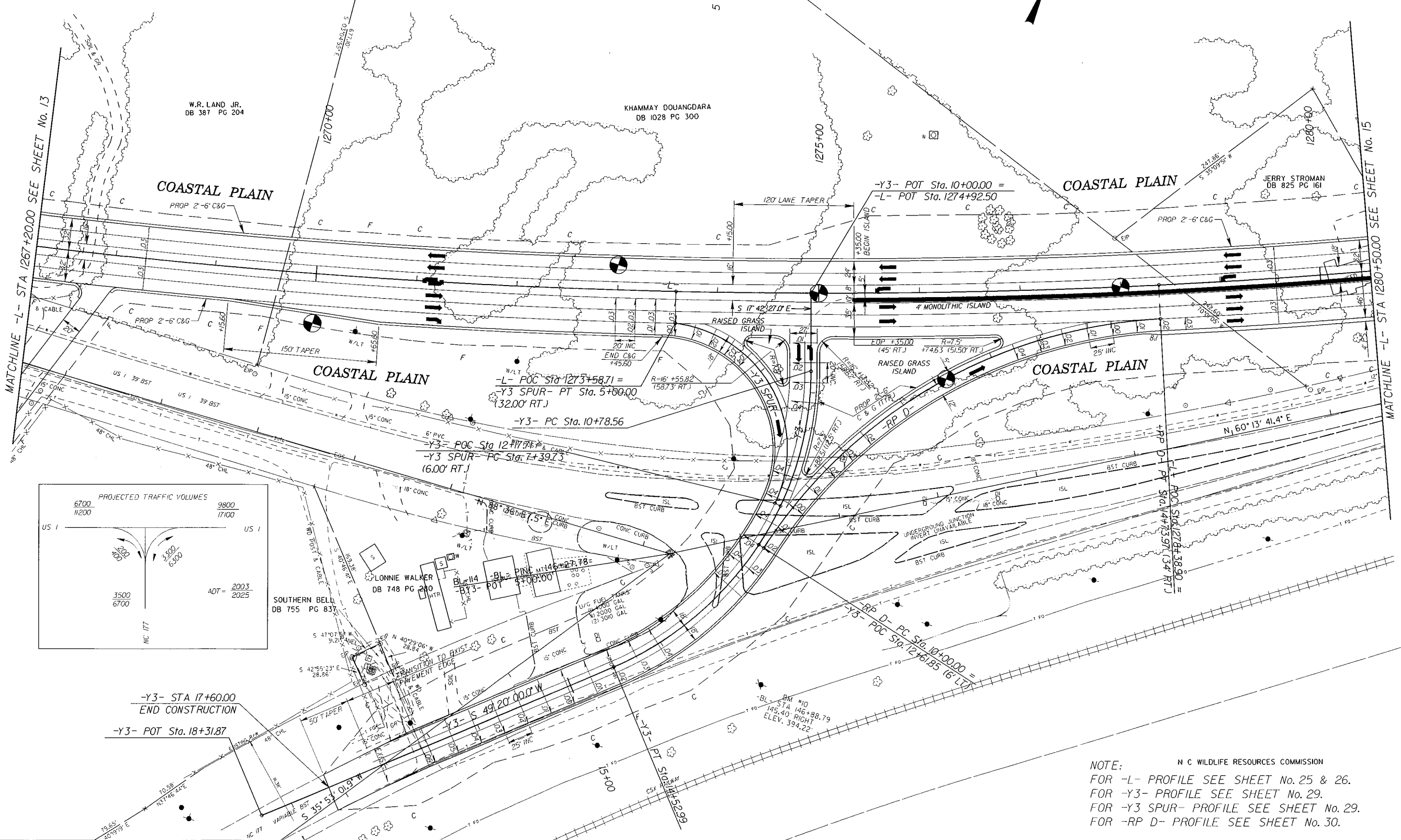
NOTE:
 FOR -L- PROFILE SEE SHEET No. 25.

-L-
 PI Sta 1275+42.89
 $\Delta = 32^{\circ} 10' 00.0''$ (LT)
 D = 0' 51' 41.7"
 L = 3,733.40
 T = 1,917.33'
 R = 6,650.00'

-Y3-
 PI Sta 12+90.53
 $\Delta = 67^{\circ} 02' 27.0''$ (RT)
 D = 17' 54' 17.8"
 L = 374.43'
 T = 211.97'
 R = 320.00'

-RP D-
 PI Sta 12+56.49
 $\Delta = 54^{\circ} 18' 46.9''$ (RT)
 D = 11' 27' 33.0"
 L = 473.97'
 T = 256.49'
 R = 500.00'

-Y3 SPUR-
 PI Sta 6+75.30
 $\Delta = 108^{\circ} 09' 21.0''$ (RT)
 D = 45' 06' 53.2"
 L = 239.73'
 T = 175.30'
 R = 127.00'



NOTE:
 N C WILDLIFE RESOURCES COMMISSION
 FOR -L- PROFILE SEE SHEET No. 25 & 26.
 FOR -Y3- PROFILE SEE SHEET No. 29.
 FOR -Y3 SPUR- PROFILE SEE SHEET No. 29.
 FOR -RP D- PROFILE SEE SHEET No. 30.

REVISIONS

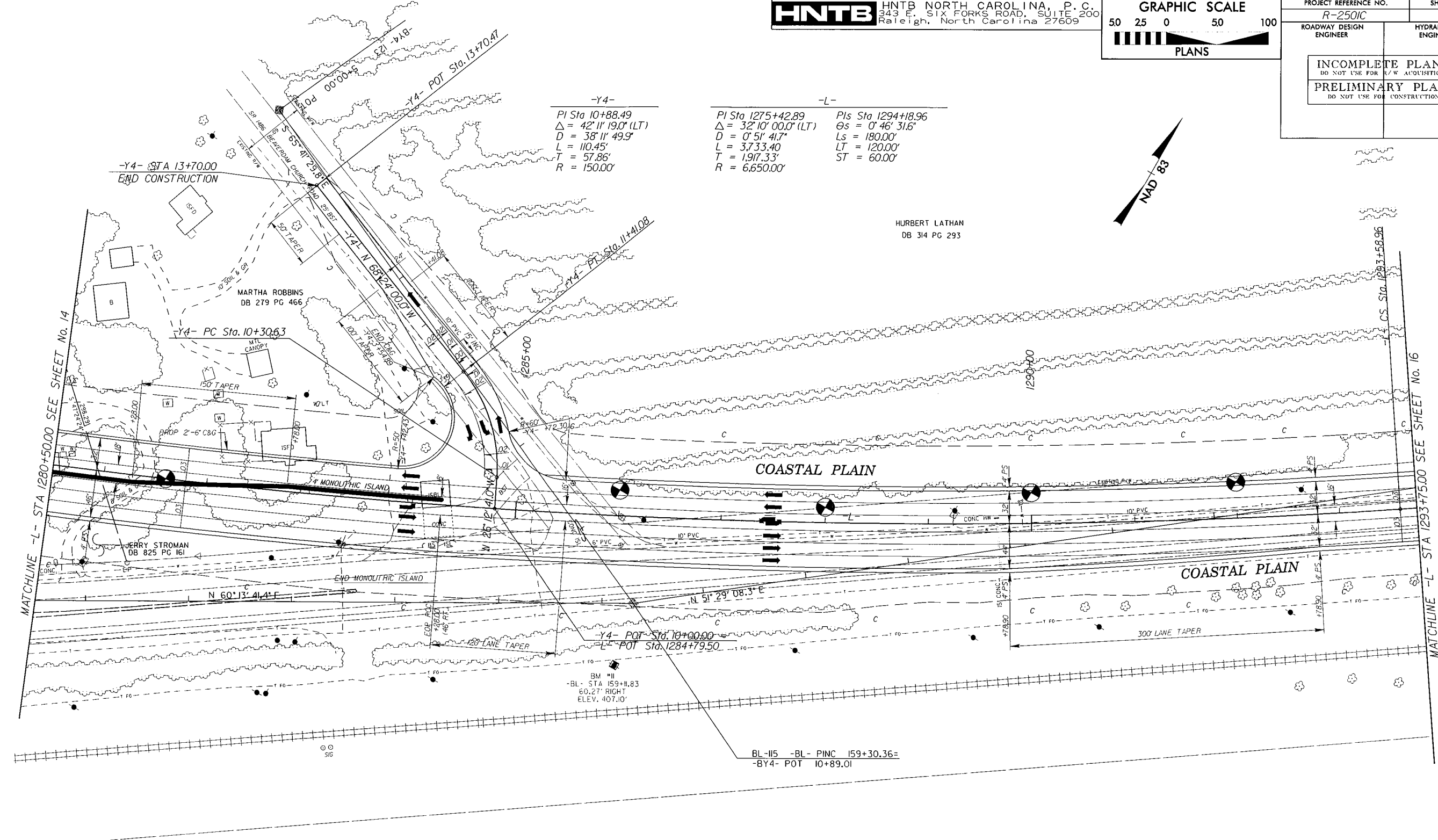
MATCHLINE -L- STA 1267+20.00 SEE SHEET No. 13

MATCHLINE -L- STA 1280+50.00 SEE SHEET No. 15

-Y4-
 PI Sta 10+88.49
 $\Delta = 42^\circ 11' 19.0''$ (LT)
 $D = 38^\circ 11' 49.9''$
 $L = 110.45'$
 $T = 57.86'$
 $R = 150.00'$

-L-
 PI Sta 1275+42.89
 $\Delta = 32^\circ 10' 00.0''$ (LT)
 $D = 0^\circ 51' 41.7''$
 $L = 3,733.40'$
 $T = 1,917.33'$
 $R = 6,650.00'$

PIs Sta 1294+18.96
 $\Theta_s = 0^\circ 46' 31.6''$
 $L_s = 180.00'$
 $LT = 120.00'$
 $ST = 60.00'$

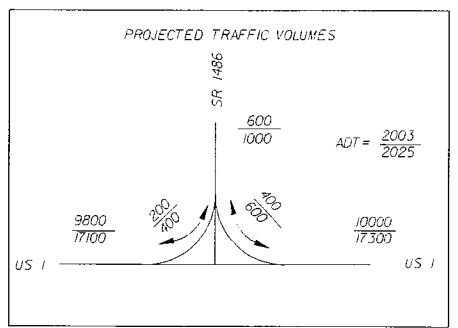


REVISIONS

MATCHLINE -L- STA 1280+50.00 SEE SHEET No. 14

MATCHLINE -L- STA 1293+75.00 SEE SHEET No. 16

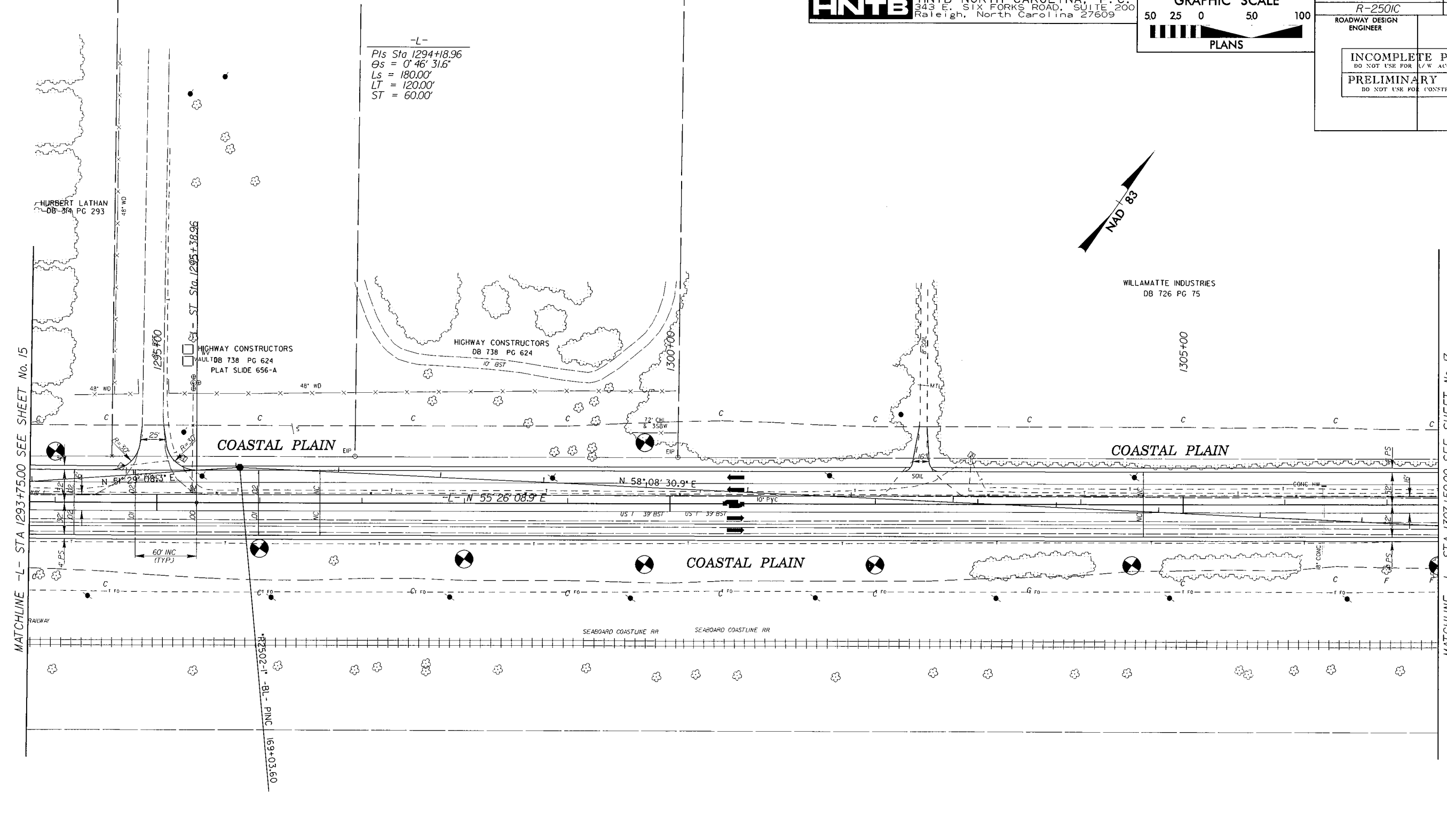
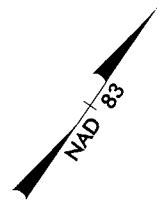
N C WILDLIFE RESOURCES COMMISSION



N C WILDLIFE RESOURCES COMMISSION

NOTE:
 FOR -L- PROFILE SEE SHEET No. 26.
 FOR -Y4- PROFILE SEE SHEET No. .

-L-
 PIs Sta 1294+18.96
 $\theta_s = 0^\circ 46' 31.6''$
 $L_s = 180.00'$
 $LT = 120.00'$
 $ST = 60.00'$



REVISIONS

MATCHLINE -L- STA 1293+75.00 SEE SHEET No. 15

MATCHLINE -L- STA 1307+50.00 SEE SHEET No. 17

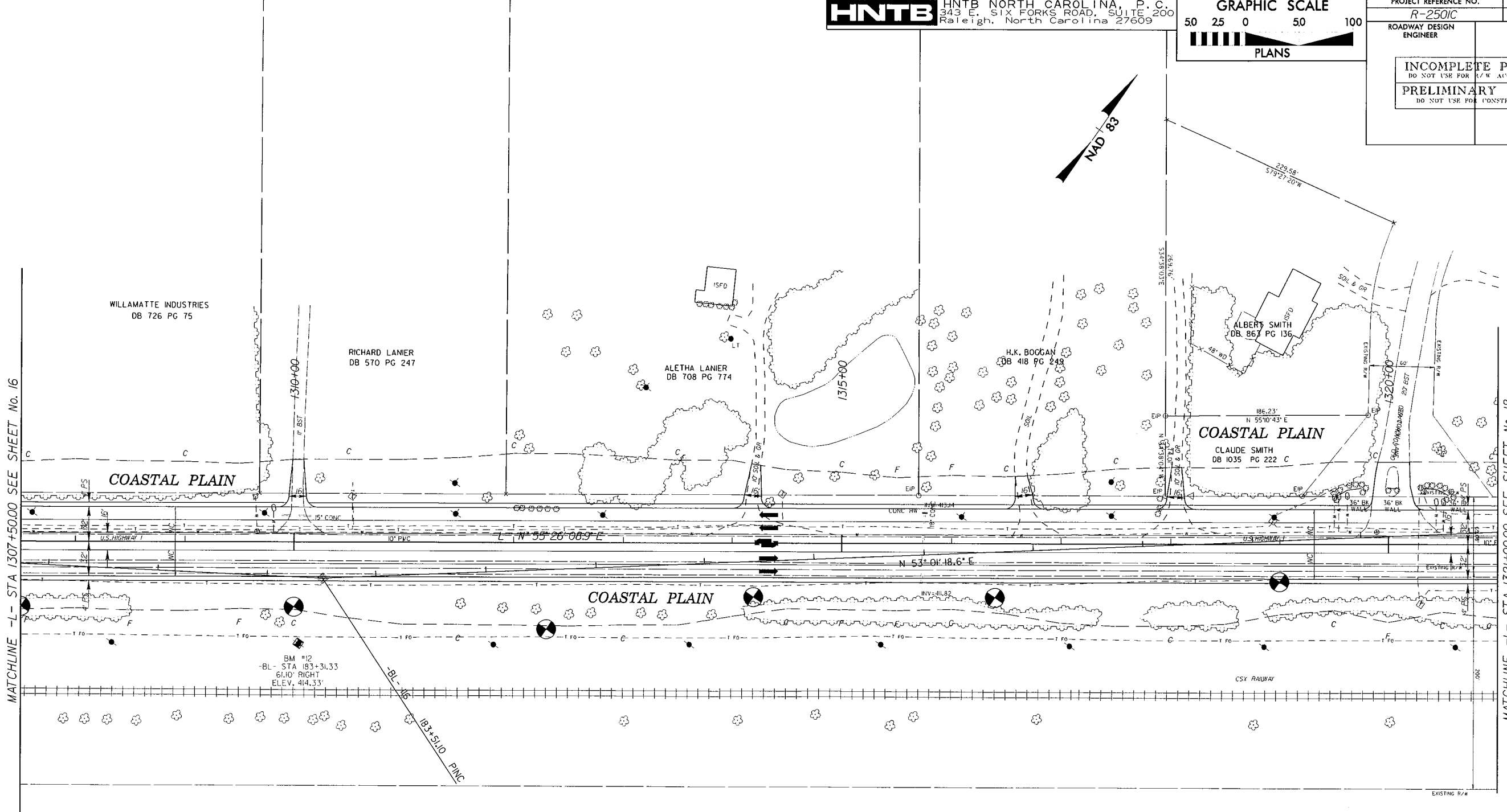
N C WILDLIFE RESOURCES COMMISSION

N C WILDLIFE RESOURCES COMMISSION

NOTE:
 ALL DRIVEWAY RADII ARE 10', UNLESS OTHERWISE NOTED.
 FOR -L- PROFILE SEE SHEET No. 26.

REVISIONS

MATCHLINE -L- STA 1307+50.00 SEE SHEET No. 16

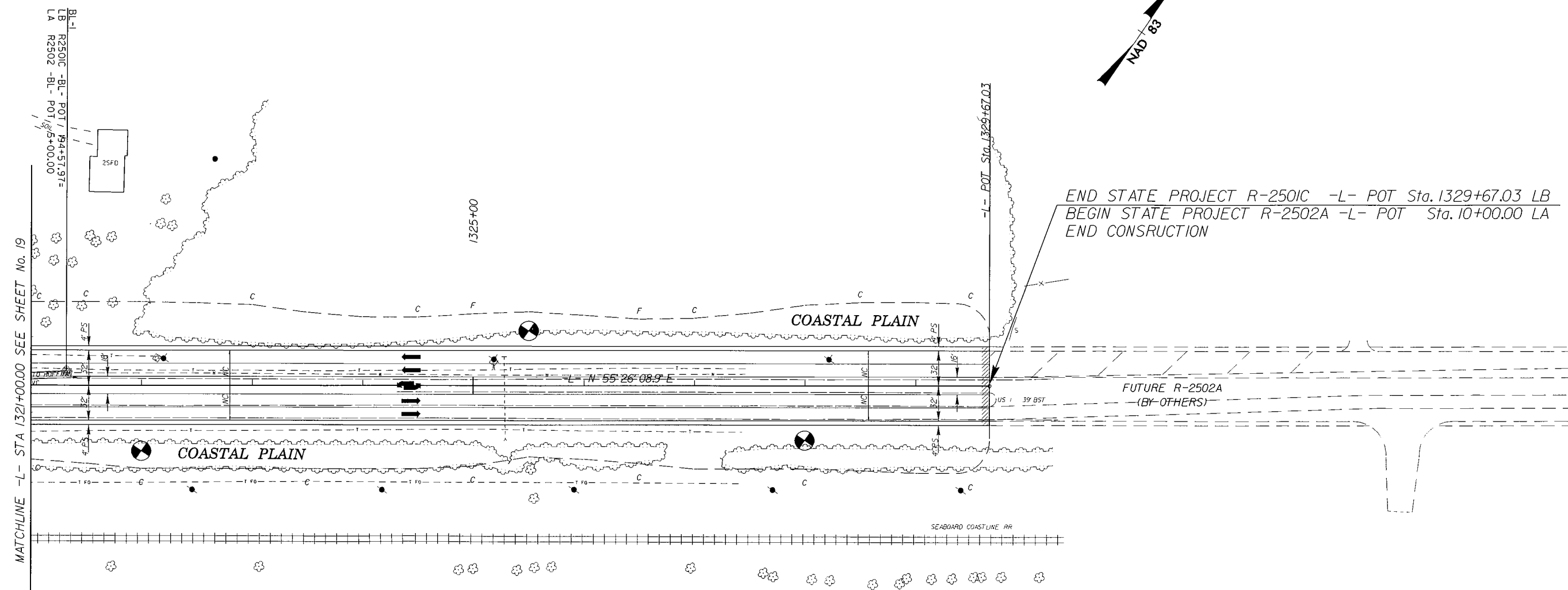


MATCHLINE -L- STA 1321+00.00 SEE SHEET No. 18

N C WILDLIFE RESOURCES COMMISSION

NOTE:
 ALL DRIVEWAY RADII ARE 10', UNLESS OTHERWISE NOTED.
 FOR -L- PROFILE SEE SHEET No. 26 & 27.

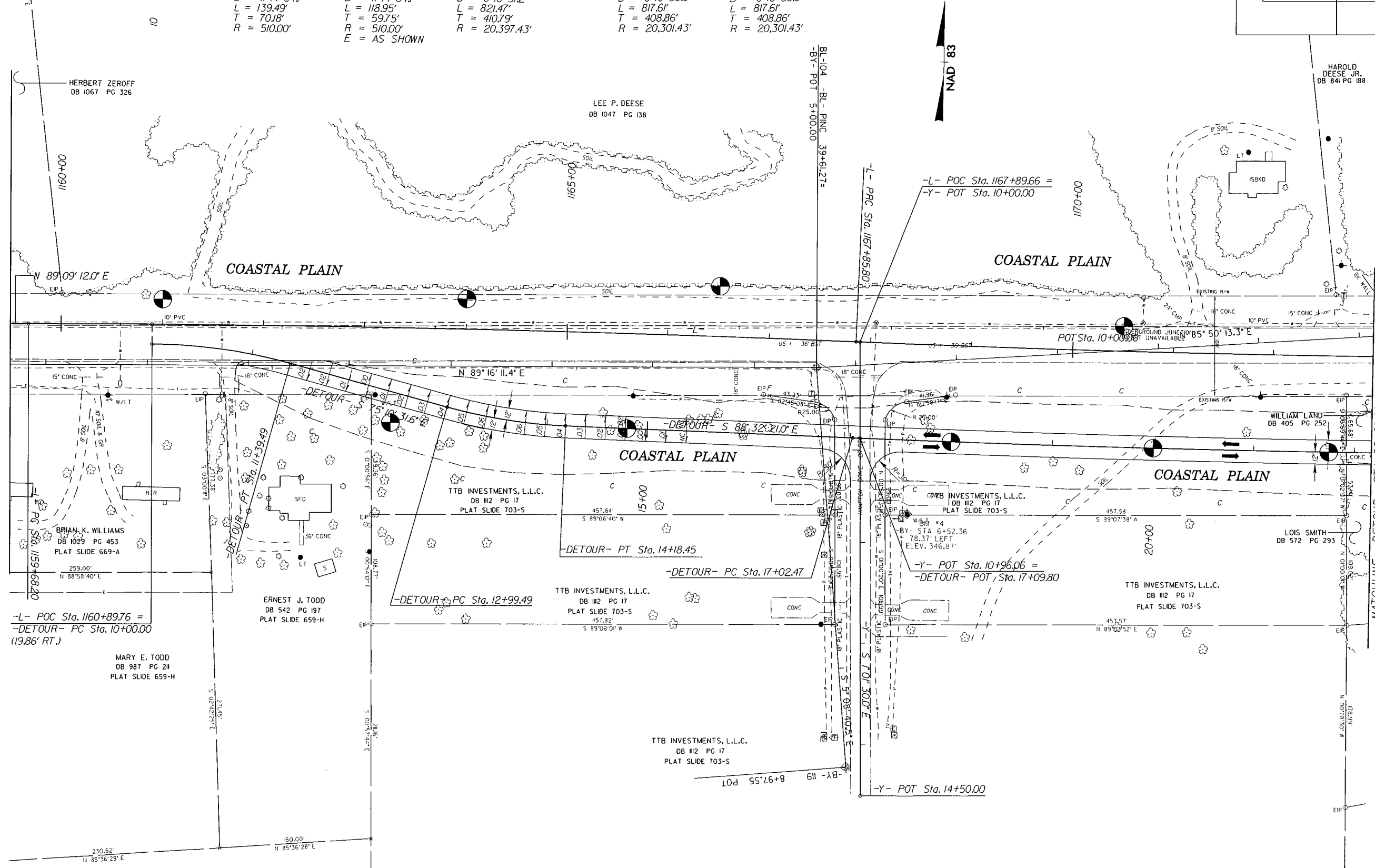
REVISIONS



NOTE:
 FOR -L- PROFILE SEE SHEET No. 27.

-DETOUR-			-L-	
PI Sta 10+70.18	PI Sta 13+59.24	PI Sta 21+13.26	PI Sta 1163+77.05	PI Sta 1171+94.66
$\Delta = 15^{\circ} 40' 16.4" (RT)$	$\Delta = 13^{\circ} 21' 49.4" (LT)$	$\Delta = 2^{\circ} 18' 27.0" (LT)$	$\Delta = 2^{\circ} 18' 27.0" (RT)$	$\Delta = 2^{\circ} 18' 27.0" (LT)$
$D = 11^{\circ} 14' 04.1"$	$D = 11^{\circ} 14' 04.1"$	$D = 0^{\circ} 16' 51.2"$	$D = 0^{\circ} 16' 56.0"$	$D = 0^{\circ} 16' 56.0"$
$L = 139.49'$	$L = 118.95'$	$L = 821.47'$	$L = 817.61'$	$L = 817.61'$
$T = 70.18'$	$T = 59.75'$	$T = 410.79'$	$T = 408.86'$	$T = 408.86'$
$R = 510.00'$	$R = 510.00'$	$R = 20,397.43'$	$R = 20,301.43'$	$R = 20,301.43'$
	$E = AS SHOWN$			

REVISIONS



--L- POC Sta. 1160+89.76 =
 -DETOUR- PC Sta. 10+00.00
 (19.86' RT.)

MARY E. TODD
 DB 987 PG 211
 PLAT SLIDE 659-H

ERNEST J. TODD
 DB 542 PG 197
 PLAT SLIDE 659-H

-DETOUR- PC Sta. 12+99.49

TTB INVESTMENTS, L.L.C.
 DB 112 PG 17
 PLAT SLIDE 703-S

TTB INVESTMENTS, L.L.C.
 DB 112 PG 17
 PLAT SLIDE 703-S

-DETOUR- PT Sta. 14+18.45

-DETOUR- PC Sta. 17+02.47

-Y- POT Sta. 10+96.06 =
 -DETOUR- POT Sta. 17+09.80

-Y- POT Sta. 14+50.00

NOTE:
 ALL DRIVEWAY RADII ARE 10', UNLESS OTHERWISE NOTED.
 FOR -DETOUR- PROFILE SEE SHEET No. 28.

MATCHLINE -DETOUR- STA 22+60.00 SEE SHEET No. 20

HAROLD DEESE JR.
 DB 841 PG 188

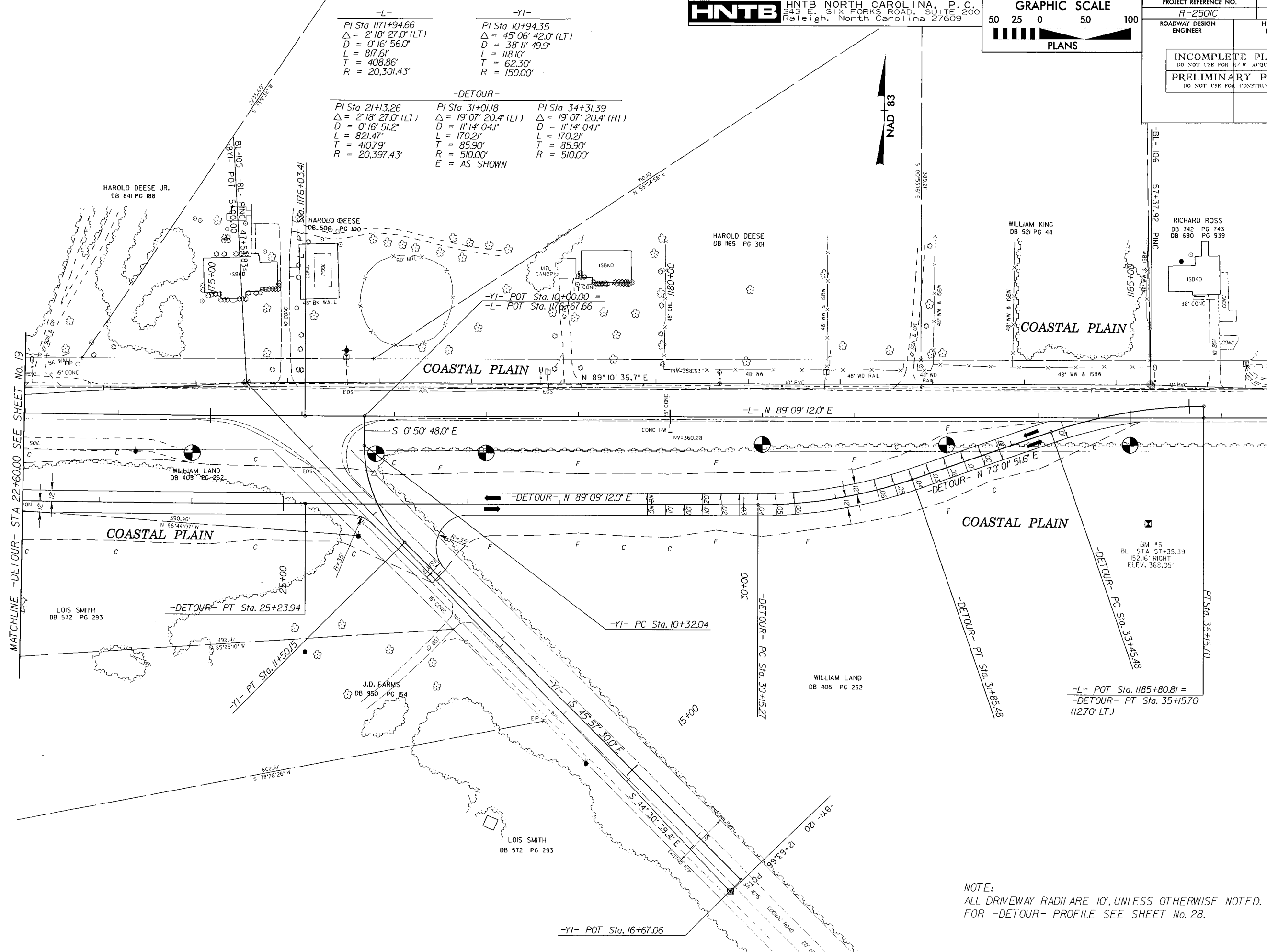
LOIS SMITH
 DB 572 PG 293

WILLIAM LAND
 DB 405 PG 252

LEE P. DEESE
 DB 1047 PG 138

HERBERT ZEROFF
 DB 1067 PG 326

-L-	-YI-	
PI Sta 1171+94.66 Δ = 2° 18' 27.0" (LT) D = 0° 16' 56.0" L = 817.61' T = 408.86' R = 20,301.43'	PI Sta 10+94.35 Δ = 45° 06' 42.0" (LT) D = 38° 11' 49.9" L = 118.10' T = 62.30' R = 150.00'	
-DETOUR-		
PI Sta 21+13.26 Δ = 2° 18' 27.0" (LT) D = 0° 16' 51.2" L = 821.47' T = 410.79' R = 20,397.43'	PI Sta 31+01.18 Δ = 19° 07' 20.4" (LT) D = 11° 14' 04.1" L = 170.21' T = 85.90' R = 510.00'	PI Sta 34+31.39 Δ = 19° 07' 20.4" (RT) D = 11° 14' 04.1" L = 170.21' T = 85.90' R = 510.00'
	E = AS SHOWN	



REVISIONS

MATCHLINE -DETOUR- STA 22+60.00 SEE SHEET No. 19

PT STA. 35+15.70

NOTE:
 ALL DRIVEWAY RADII ARE 10', UNLESS OTHERWISE NOTED.
 FOR -DETOUR- PROFILE SEE SHEET No. 28.

SOIL TEST RESULTS

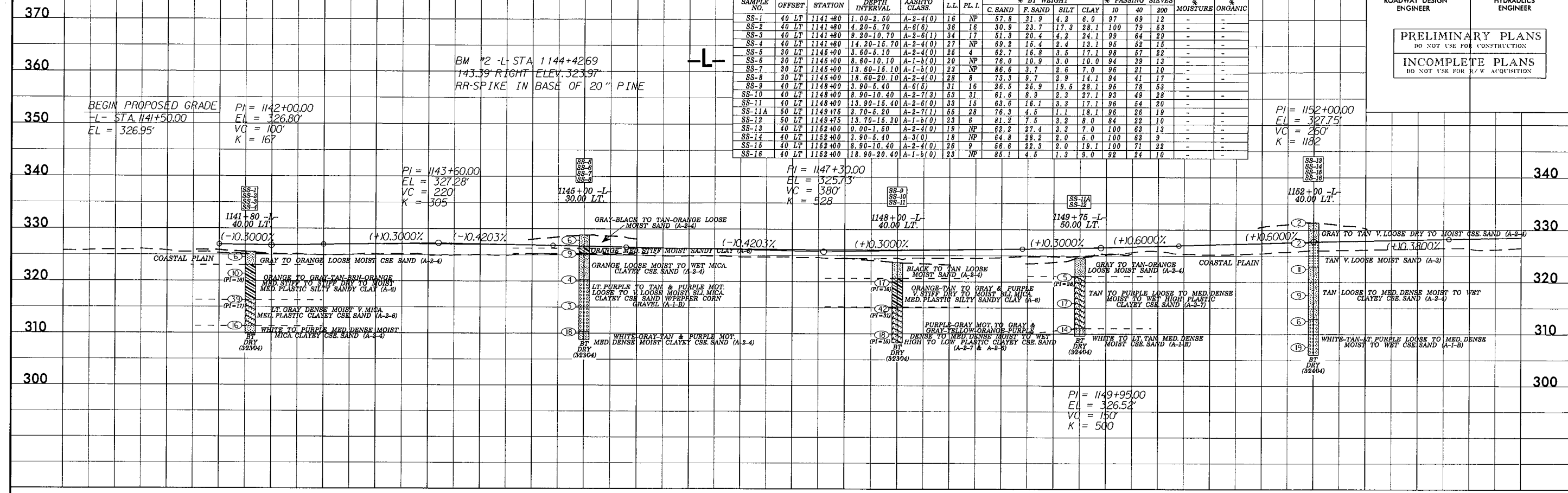
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PL I.	% BY WEIGHT			% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	10	40	200		
SS-1	40 LT	1141+80	1.00-2.50	A-2-4(0)	16	NP	57.8	31.9	4.2	6.0	97	69	12	-
SS-2	40 LT	1141+80	4.20-5.70	A-6(6)	36	16	30.9	23.7	17.3	28.1	100	79	63	-
SS-3	40 LT	1141+80	9.20-10.70	A-2-6(1)	34	17	51.3	20.4	4.2	24.1	99	64	29	-
SS-4	40 LT	1141+80	14.20-15.70	A-2-4(0)	27	NP	69.2	15.4	2.4	13.1	95	52	15	-
SS-5	30 LT	1146+00	3.60-5.10	A-2-4(0)	25	4	62.7	16.8	3.5	17.1	98	57	22	-
SS-6	30 LT	1146+00	8.60-10.10	A-1-b(0)	20	NP	76.0	10.9	3.0	10.0	94	39	13	-
SS-7	30 LT	1146+00	13.60-15.10	A-1-b(0)	23	NP	86.6	3.7	2.6	7.0	96	21	10	-
SS-8	30 LT	1146+00	18.60-20.10	A-2-4(0)	28	8	73.9	9.7	2.9	14.1	94	41	17	-
SS-9	40 LT	1148+00	3.90-5.40	A-6(5)	31	16	26.5	25.9	19.5	28.1	95	78	63	-
SS-10	40 LT	1148+00	8.90-10.40	A-2-7(3)	53	31	61.6	8.9	2.3	27.1	93	49	28	-
SS-11	40 LT	1148+00	13.90-15.40	A-2-6(0)	33	15	63.6	16.1	3.3	17.1	96	54	20	-
SS-11A	50 LT	1149+75	3.70-5.20	A-2-7(1)	55	28	76.3	4.5	1.1	18.1	96	26	19	-
SS-12	50 LT	1149+75	13.70-15.20	A-1-b(0)	23	6	81.2	7.5	3.2	8.0	84	22	10	-
SS-13	40 LT	1152+00	0.00-1.50	A-2-4(0)	19	NP	62.2	27.4	3.3	7.0	100	63	13	-
SS-14	40 LT	1152+00	3.90-5.40	A-3(0)	18	NP	64.8	28.2	2.0	5.0	100	63	9	-
SS-15	40 LT	1152+00	8.90-10.40	A-2-4(0)	26	9	56.6	22.3	2.0	19.1	100	71	22	-
SS-16	40 LT	1152+00	18.90-20.40	A-1-b(0)	23	NP	85.1	4.5	1.3	9.0	92	24	10	-

PROJECT REFERENCE NO. R-2501C SHEET NO. 21

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

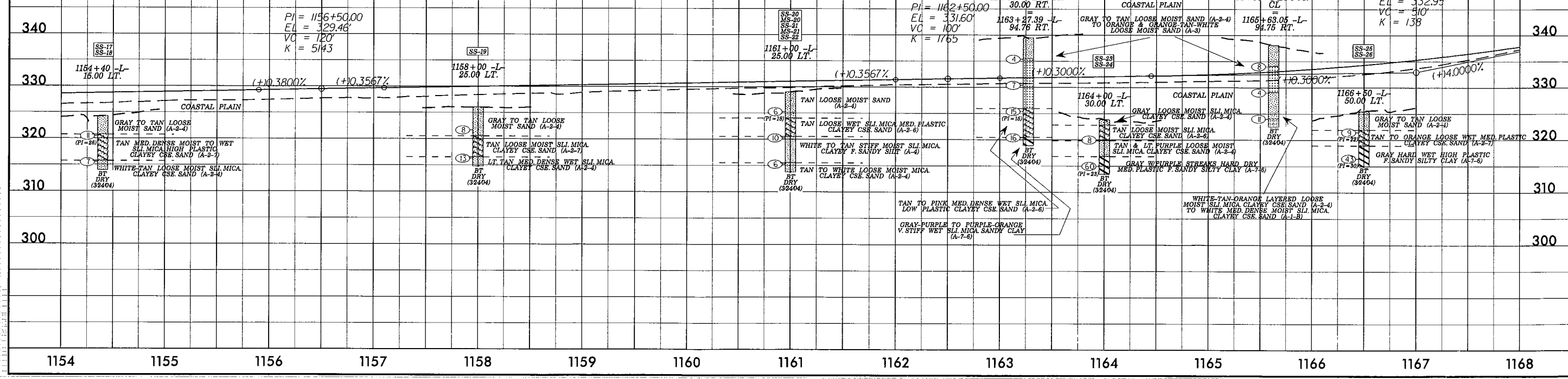
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



SOIL TEST RESULTS

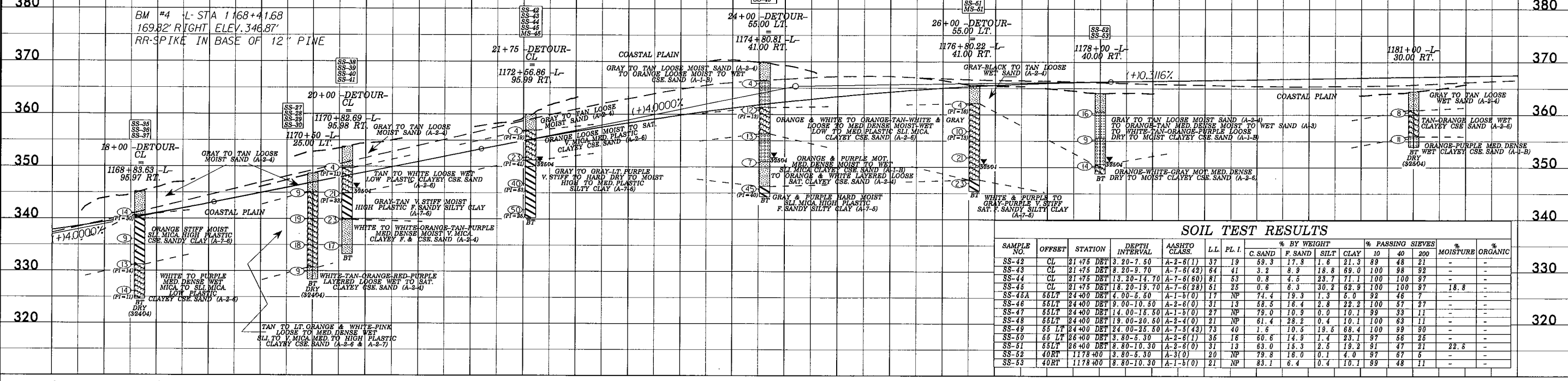
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PL I.	% BY WEIGHT			% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	10	40	200		
SS-17	15 LT	1164+40	3.80-5.30	A-2-7(2)	60	28	63.9	8.7	1.3	26.1	97	49	28	-
SS-18	15 LT	1164+40	8.80-10.30	A-2-4(0)	28	7	67.1	13.7	2.2	17.1	99	59	20	-
SS-19	25 LT	1168+00	9.80-11.30	A-2-4(0)	33	9	67.6	20.6	3.7	18.1	99	64	26	-
SS-20	25 LT	1161+00	3.80-5.30	A-2-6(1)	40	18	61.8	17.5	2.6	28.1	97	61	32	15.7
SS-21	25 LT	1161+00	8.80-10.30	A-4(1)	32	10	10.6	54.6	8.6	26.1	100	98	41	18.2
SS-22	25 LT	1161+00	13.80-15.30	A-2-4(0)	21	NP	68.2	17.1	3.7	11.0	100	70	16	-
SS-31	30 RT	1146+00	4.10-5.60	A-3(0)	20	NP	72.2	22.0	0.8	5.0	100	60	7	-
SS-32	30 RT	1146+00	14.10-15.60	A-2-6(0)	36	15	55.4	17.3	3.2	24.1	83	49	24	-
SS-23	30 LT	1164+00	3.90-5.40	A-2-4(0)	31	10	62.3	22.1	3.5	22.1	100	80	27	-
SS-24	30 LT	1164+00	8.90-10.40	A-7-6(24)	44	23	1.4	10.4	31.9	56.2	100	99	96	-
SS-33	CL	1148+00	9.10-10.60	A-2-4(0)	22	NP	63.6	21.3	1.1	14.1	100	77	16	-
SS-34	CL	1148+00	14.10-15.60	A-1-b(0)	27	4	72.1	10.8	4.0	13.1	93	48	17	-
SS-25	50 LT	1166+50	4.00-5.50	A-2-7(1)	43	22	60.3	11.6	1.9	26.1	94	60	27	-
SS-26	50 LT	1166+50	9.00-10.50	A-7-6(28)	50	30	3.4	16.9	30.5	50.2	100	98	88	-

BM #3 -L- STA 1156+67.5
170.43' LEFT ELEV. 325.69'
RR-SPIKE IN BASE OF 15" PINE



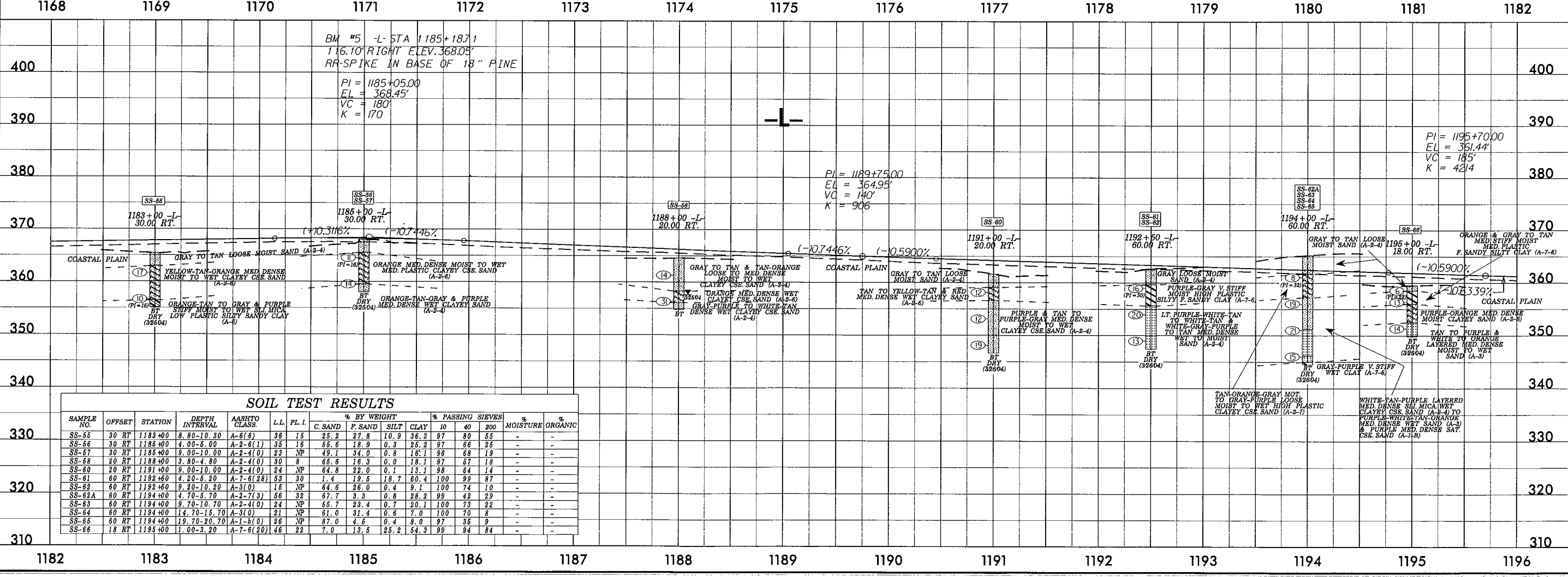
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PL I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-35	CL	18+00 DET	4.10-5.60	A-7-6(7)	54	30	41.2	17.3	3.4	38.2	95	73	41	-	-
SS-36	CL	18+00 DET	14.10-16.60	A-2-6(0)	33	14	62.0	16.6	1.4	20.1	100	61	22	-	-
SS-37	CL	18+00 DET	19.10-20.60	A-2-6(0)	31	11	69.4	11.2	0.3	19.1	93	48	19	-	-
SS-27	25 LT	1170+60	3.80-5.30	A-2-6(2)	38	21	44.5	24.4	6.0	26.1	99	77	33	-	-
SS-28	25 LT	1170+60	8.80-10.30	A-2-7(3)	62	34	69.4	5.9	0.6	24.1	98	47	25	-	-
SS-29	25 LT	1170+60	13.80-15.30	A-2-7(3)	49	28	57.8	13.1	0.0	29.1	98	68	29	-	-
SS-30	25 LT	1170+60	18.80-20.30	A-2-4(0)	30	9	66.9	13.1	4.0	16.1	94	47	20	-	-
SS-38	CL	20+00 DET	4.10-5.60	A-2-6(0)	29	11	51.1	26.8	2.8	19.3	100	76	23	-	-
SS-39	CL	20+00 DET	9.10-10.60	A-7-6(28)	67	33	10.6	13.8	22.8	52.8	100	91	82	-	-
SS-40	CL	20+00 DET	14.10-15.60	A-2-4(0)	22	NP	32.2	47.7	3.8	17.3	100	94	27	-	-
SS-41	CL	20+00 DET	19.10-20.60	A-2-4(0)	21	NP	65.0	24.0	0.9	10.2	100	67	12	-	-



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PL I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-42	CL	21+75 DET	3.20-7.50	A-2-6(1)	37	19	59.3	17.8	1.6	21.3	89	48	21	-	-
SS-43	CL	21+75 DET	8.20-9.70	A-7-6(42)	64	41	3.2	8.9	18.8	69.0	100	98	92	-	-
SS-44	CL	21+75 DET	13.20-14.70	A-7-6(60)	81	53	0.8	4.5	23.7	71.1	100	100	97	-	-
SS-45	CL	21+75 DET	18.20-19.70	A-7-6(28)	51	25	0.6	6.3	30.2	62.9	100	100	97	18.8	-
SS-45A	55LT	24+00 DET	4.00-5.50	A-1-6(0)	17	NP	74.4	19.3	1.3	6.0	92	46	7	-	-
SS-46	55LT	24+00 DET	9.00-10.50	A-2-6(0)	31	13	58.5	16.4	2.8	22.2	100	57	27	-	-
SS-47	55LT	24+00 DET	14.00-15.50	A-1-6(0)	27	NP	79.0	10.9	0.0	10.1	99	33	11	-	-
SS-48	55LT	24+00 DET	19.00-20.50	A-2-4(0)	21	NP	61.4	28.2	0.4	10.1	100	63	11	-	-
SS-49	55 LT	24+00 DET	24.00-25.50	A-7-5(43)	73	40	1.6	10.5	19.5	68.4	100	99	90	-	-
SS-50	55 LT	26+00 DET	3.80-5.30	A-2-6(1)	35	16	50.6	14.9	1.4	23.1	97	56	25	-	-
SS-51	55LT	26+00 DET	8.80-10.30	A-2-6(0)	31	13	63.0	15.3	2.5	19.2	91	47	21	22.5	-
SS-52	40RT	1178+00	3.80-5.30	A-3(0)	20	NP	79.8	16.0	0.1	4.0	97	67	5	-	-
SS-53	40RT	1178+00	8.80-10.30	A-1-6(0)	21	NP	83.1	6.4	0.4	10.1	99	48	11	-	-



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PL I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-55	30 RT	1183+00	8.80-10.30	A-6(5)	36	15	25.2	27.8	10.9	36.2	97	80	55	-	-
SS-56	30 RT	1185+00	4.00-5.00	A-2-6(1)	35	16	55.6	18.9	0.3	25.2	97	66	26	-	-
SS-57	30 RT	1185+00	9.00-10.00	A-2-4(0)	23	NP	49.1	34.0	0.8	16.1	96	68	19	-	-
SS-58	20 RT	1188+00	3.80-4.80	A-2-4(0)	30	8	65.6	16.3	0.0	18.1	97	67	18	-	-
SS-60	20 RT	1191+00	9.00-10.00	A-2-4(0)	24	NP	64.8	22.0	0.1	13.1	98	64	14	-	-
SS-61	60 RT	1192+60	4.20-5.20	A-7-6(28)	53	30	1.4	19.5	18.7	60.4	100	99	87	-	-
SS-62	60 RT	1192+60	9.20-10.20	A-3(0)	16	NP	64.6	26.0	0.4	9.1	100	74	10	-	-
SS-62A	60 RT	1194+00	4.70-5.70	A-2-7(3)	56	32	67.7	3.3	0.8	28.2	99	42	29	-	-
SS-63	60 RT	1194+00	9.70-10.70	A-2-4(0)	24	NP	55.7	23.4	0.7	20.1	100	73	22	-	-
SS-64	60 RT	1194+00	14.70-15.70	A-3(0)	21	NP	61.0	31.4	0.6	7.0	100	70	8	-	-
SS-65	60 RT	1194+00	19.70-20.70	A-1-6(0)	26	NP	87.0	4.6	0.4	8.0	97	36	9	-	-
SS-66	18 RT	1195+00	1.00-3.20	A-7-6(20)	46	22	7.0	13.5	25.2	54.3	99	94	84	-	-

PI = 1175+10.00
 EL = 365.35'
 VC = 600'
 K = 163

PI = 1189+75.00
 EL = 364.95'
 VC = 140'
 K = 906

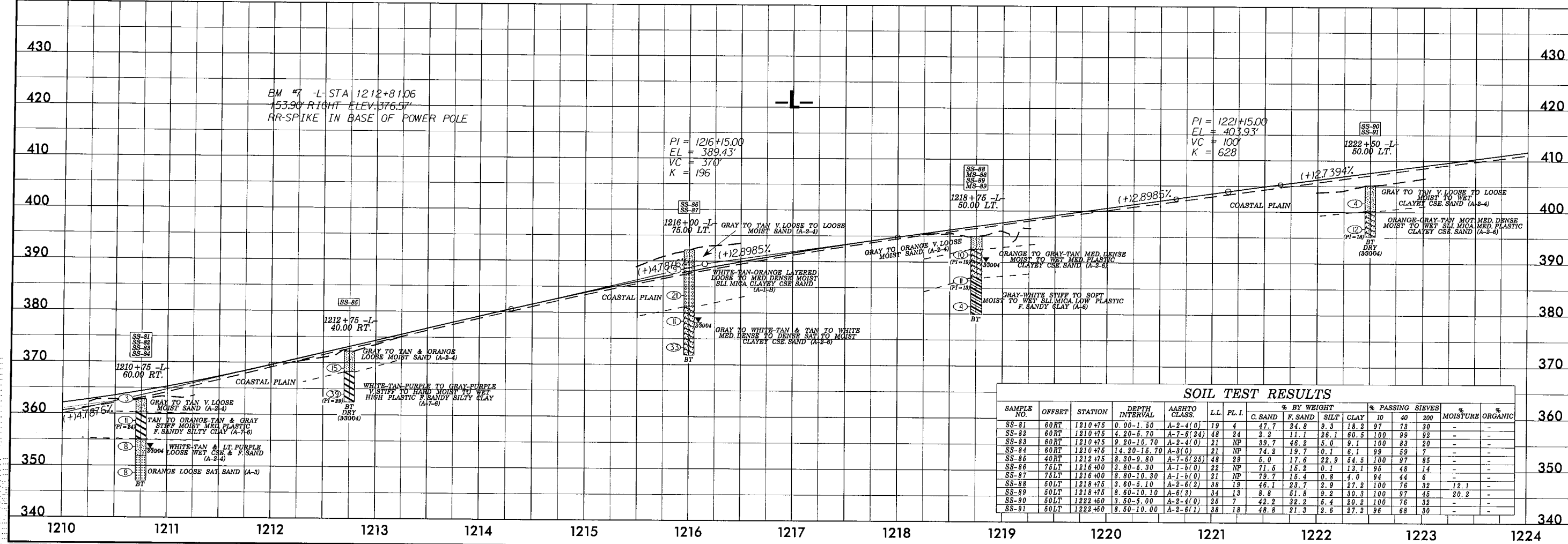
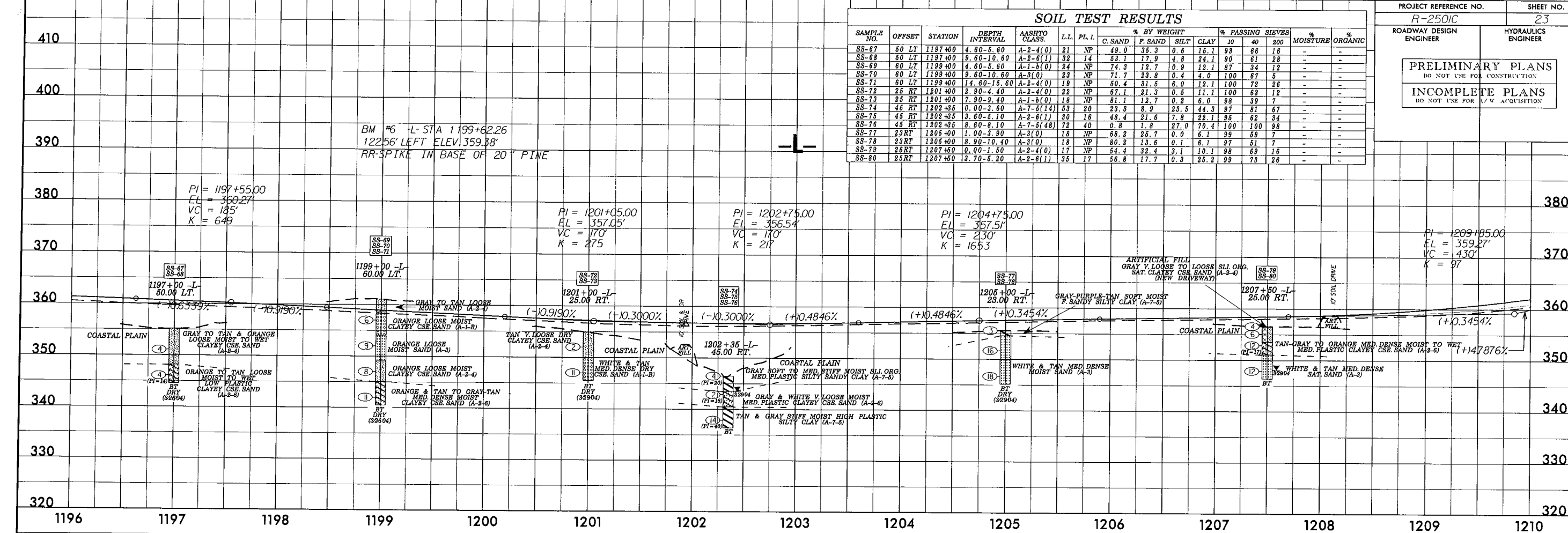
PI = 1195+70.00
 EL = 351.44'
 VC = 185'
 K = 4214

BM #5 -L- STA 1185+18.71
 116.10' RIGHT ELEV. 368.05'
 RR-SPIKE IN BASE OF 18" FINE

BM #4 -L- STA 1168+41.68
 169.82' RIGHT ELEV. 346.87'
 RR-SPIKE IN BASE OF 12" PINE

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT			% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	10	40	200		
SS-67	60 LT	1197+00	4.60-5.60	A-2-4(0)	21	NP	49.0	36.3	0.6	15.1	93	66	16	-
SS-68	60 LT	1197+00	9.60-10.60	A-2-6(1)	32	14	53.1	17.9	4.8	24.1	90	61	28	-
SS-69	60 LT	1199+00	4.60-5.60	A-1-b(0)	24	NP	74.3	12.7	0.9	12.1	87	34	12	-
SS-70	60 LT	1199+00	9.60-10.60	A-3(0)	23	NP	71.7	23.8	0.4	4.0	100	67	5	-
SS-71	60 LT	1199+00	14.60-15.60	A-2-4(0)	19	NP	50.4	31.5	6.0	12.1	100	72	26	-
SS-72	25 RT	1201+00	2.90-4.40	A-2-4(0)	22	NP	67.1	21.3	0.5	11.1	100	63	12	-
SS-73	25 RT	1201+00	7.90-9.40	A-1-b(0)	18	NP	81.1	12.7	0.2	6.0	98	39	7	-
SS-74	46 RT	1202+35	0.00-3.60	A-7-6(14)	53	20	23.3	8.9	23.5	44.3	97	81	67	-
SS-75	46 RT	1202+35	3.60-5.10	A-2-6(1)	30	18	48.4	21.6	7.8	22.1	95	62	34	-
SS-76	45 RT	1202+35	8.60-8.10	A-7-5(48)	72	49	0.8	1.8	27.0	70.4	100	100	98	-
SS-77	23 RT	1205+00	1.00-3.90	A-3(0)	18	NP	69.2	25.7	0.0	6.1	99	69	7	-
SS-78	23 RT	1205+00	8.90-10.40	A-3(0)	18	NP	80.2	13.8	0.1	6.1	97	51	7	-
SS-79	26 RT	1207+50	0.00-1.50	A-2-4(0)	17	NP	64.4	32.4	3.1	10.1	98	69	16	-
SS-80	26 RT	1207+50	3.70-5.20	A-2-6(1)	35	17	56.8	17.7	0.3	26.2	99	73	26	-



SOIL TEST RESULTS

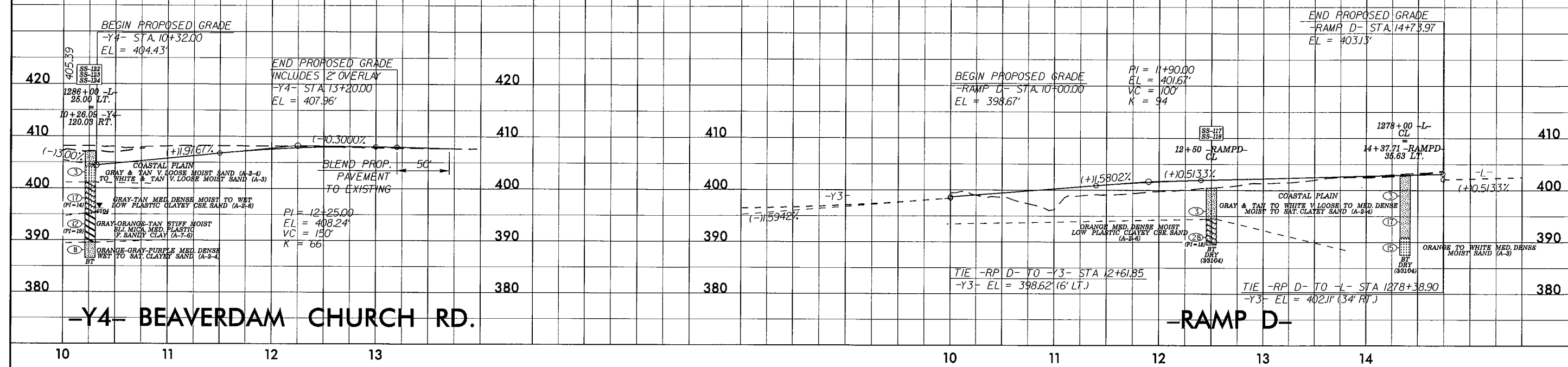
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT			% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	10	40	200		
SS-81	60 RT	1210+75	0.00-1.50	A-2-4(0)	19	4	47.7	24.8	9.3	18.2	97	73	30	-
SS-82	60 RT	1210+75	4.20-5.70	A-7-6(24)	48	24	2.2	11.1	26.1	60.5	100	99	92	-
SS-83	60 RT	1210+75	9.20-10.70	A-2-4(0)	21	NP	39.7	46.2	5.0	9.1	100	83	20	-
SS-84	60 RT	1210+75	14.20-15.70	A-3(0)	21	NP	74.2	19.7	0.1	6.1	99	59	7	-
SS-85	40 RT	1212+75	8.20-9.80	A-7-6(25)	48	29	5.9	17.6	22.9	64.5	100	97	85	-
SS-86	75 LT	1216+00	3.80-5.30	A-1-b(0)	22	NP	71.5	15.2	0.1	13.1	95	48	14	-
SS-87	75 LT	1216+00	8.80-10.30	A-1-b(0)	21	NP	79.7	15.4	0.8	4.0	94	44	6	-
SS-88	60 LT	1218+75	3.60-5.10	A-2-6(2)	38	19	46.1	23.7	2.9	27.2	100	76	32	12.1
SS-89	60 LT	1218+75	8.60-10.10	A-6(3)	34	19	8.8	51.8	9.2	30.3	100	97	45	20.2
SS-90	60 LT	1222+50	3.50-5.00	A-2-4(0)	25	7	42.2	32.2	5.4	20.2	100	76	32	-
SS-91	60 LT	1222+50	8.50-10.00	A-2-6(1)	38	18	48.8	21.3	2.6	27.2	96	68	30	-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-122	25 LT	1286+00	4.10-5.60	A-3(0)	19	NP	56.2	37.4	1.3	6.0	100	74	5	-	-
SS-123	25 LT	1286+00	9.10-10.60	A-2-6(0)	33	14	59.8	16.5	1.6	22.1	92	51	23	-	-
SS-124	25 LT	1286+00	14.10-16.60	A-7-6(6)	41	19	18.9	37.3	9.6	34.1	95	87	48	-	-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-117	CL	12+60	4.50-6.00	A-2-4(0)	17	NP	46.8	39.0	4.2	10.0	100	79	17	-	-
SS-118	CL	12+60	8.50-11.00	A-2-6(0)	31	12	63.8	24.5	3.8	18.1	96	60	24	-	-



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-35	CL	18+00	4.10-5.60	A-7-6(7)	54	30	41.2	17.3	3.4	38.2	95	73	41	-	-
SS-36	CL	18+00	14.10-15.60	A-2-6(0)	33	14	62.0	16.6	1.4	20.1	100	61	22	-	-
SS-37	CL	18+00	19.10-20.60	A-2-6(0)	31	11	69.4	11.2	0.3	19.1	93	48	19	-	-

