

CONTRACT: C202066 ID: U-2810A

CONTENTS:

LINE	STATION	PLAN	PROFILE	XSECTS
-L-	15+00 to 15+50	4	23	
	15+50 to 17+00	4	23	
	17+00 to 93+00	4-10	23-25	
	93+00 to 98+00	10	25,26	40-42
	98+00 to 244+84	10-21	26-31	
-Y1-	11+22 to 12+67	5	32	
-Y4-	10+37 to 12+35	10	33	
-Y6-	10+00 to 16+62	11	34	
-Y7-	10+55 to 19+20	12,22	35	
-Y9-	10+79 to 12+31	14	36	
-Y14-	8+00 to 18+32	19	37	
-RET.WALL-	15+00 to 17+10	4	38	39

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

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

**ROADWAY
SUBSURFACE INVESTIGATION**

STATE PROJ. 34866.1.1 I.D. U-2810 F.A. PROJ. STP-1003(22)

COUNTY CUMBERLAND

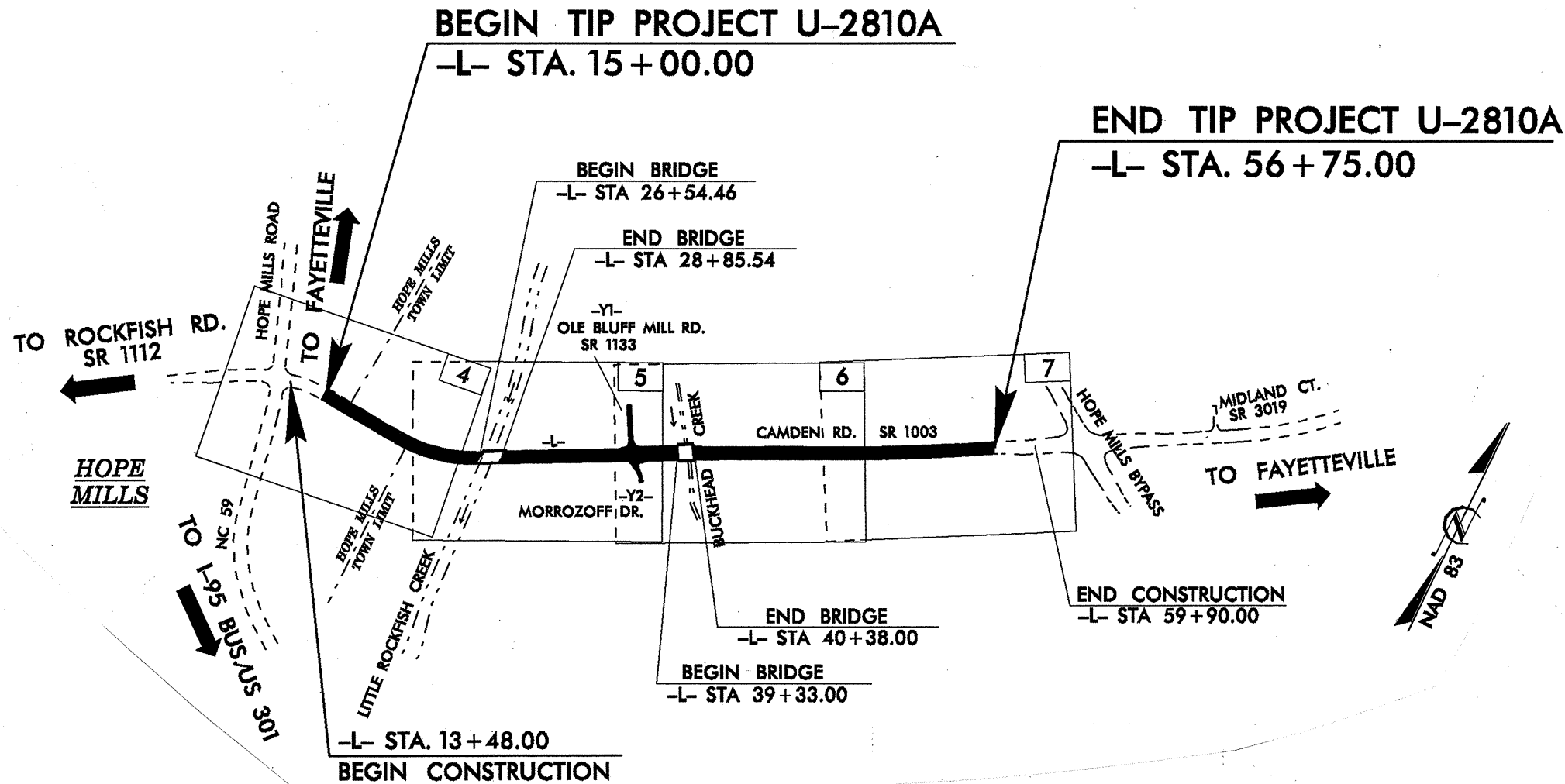
PROJECT DESCRIPTION FAYETTEVILLE - SR 1003 (CAMDEN RD.)

FROM NC 59 (HOPE MILLS RD.) TO NORTH OF

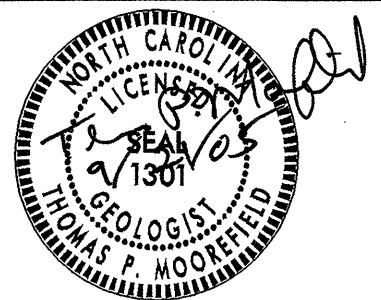
SR 1007 (OWEN DRIVE.)

INVENTORY

Note: This Inventory is for U-2810, which includes U-2810A, U-2810B, and U-2810C sections. Please refer to the respective portions for your needs.



INVESTIGATED BY T.P. MOOREFIELD PERSONNEL J.L. PEDRO
 CHECKED BY N.T. ROBERSON N.D. MOHS
 SUBMITTED BY N.T. ROBERSON M.L. REEDER
 DATE SEPTEMBER 2005 CONSULTANT: SG&ME
J. WHITE
G. PAYNTER



DRAWN BY: T.T. WALKER, J.L. PEDRO

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.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2810A	1	42
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34866.1.1	STP-1003(22)	P.E.	
34866.2.2	STP-1003(22)	R/W & UTIL.	
34866.3.1	STP-1003(68)	CONSTR.	

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-PLACED) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.


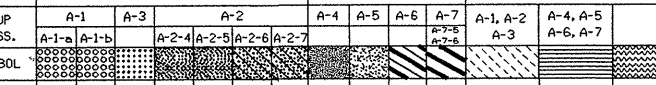
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT

ID	STATE PROJECT NO.	SHEET NO.
U-2810	34866.1.1	2

SUBSURFACE INVESTIGATION

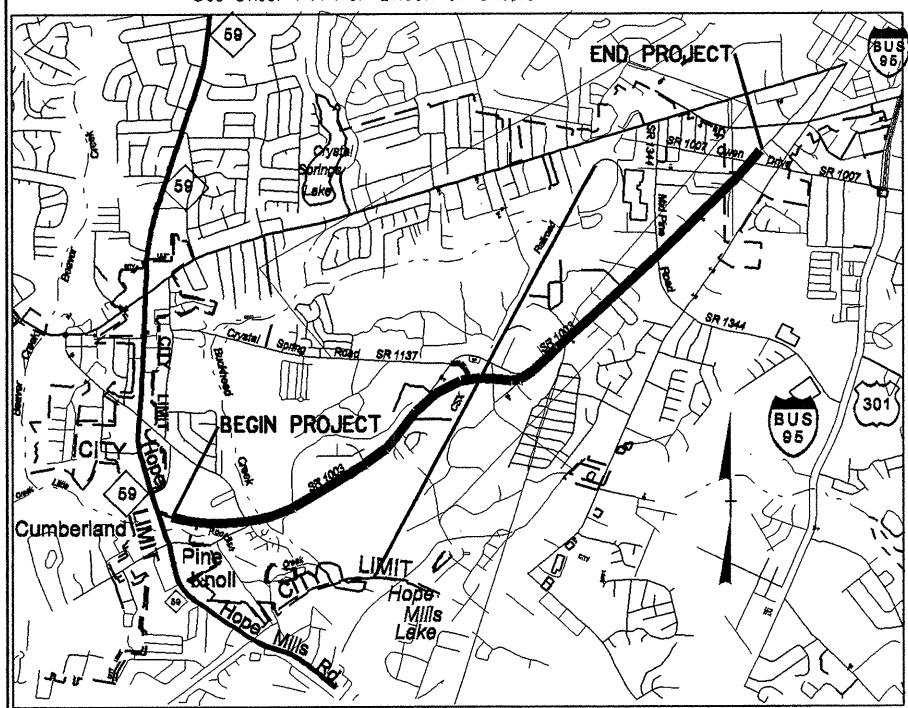
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

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, SAND 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. MINERALOGICAL COMPOSITION 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 (CP) 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 IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. 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 DISLOGGED 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 (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 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 INTRODUCED 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 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 (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
SOIL LEGEND AND AASHTO CLASSIFICATION GENERAL CLASS. GRANULAR MATERIALS (<35% PASSING #200) SILT-CLAY MATERIALS (>35% PASSING #200) ORGANIC MATERIALS GROUP CLASS. A-1, A-1-b, A-3, A-2, A-2-4, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7, A-1, A-2, A-3, A-4, A-5, A-6, A-7 SYMBOL  % PASSING: 10, 40, 200 LIQUID LIMIT, PLASTIC INDEX, GROUP INDEX USUAL TYPES: STONE FRAGS, SAND, SILTY 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 P.I. OF A-7-5 ≤ L.L. - 30; P.I. OF A-7-6 > L.L. - 30	COMPRESSIBILITY SLIGHTLY COMPRESSIBLE: LIQUID LIMIT LESS THAN 30 MODERATELY COMPRESSIBLE: LIQUID LIMIT 31-50 HIGHLY COMPRESSIBLE: LIQUID LIMIT GREATER THAN 50 PERCENTAGE OF MATERIAL ORGANIC MATERIAL: TRACE OF ORGANIC MATTER (2-3%), LITTLE ORGANIC MATTER (3-5%), MODERATELY ORGANIC (5-10%), HIGHLY ORGANIC (>10%) GRANULAR SOILS: 2-3%, 3-5%, 5-10%, >10% SILT-CLAY SOILS: 3-5%, 5-12%, 12-20%, >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. PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA SPRING OR SEEPAGE	WEATHERING FRESH: ROCK FRESH, CRYSTALLINE BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V. SL.): 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. 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. 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.	MISCELLANEOUS SYMBOLS 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 SOUNDING ROD SPT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION SPT N-VALUE SPT REFUSAL SAMPLE DESIGNATIONS: S- BULK SAMPLE, SS- SPLIT SPOON SAMPLE, ST- SHELBY TUBE SAMPLE, RS- ROCK SAMPLE, RT- RECOMPACTED TRIAXIAL SAMPLE, CBR - CBR SAMPLE
CONSISTENCY OR DENSENESS PRIMARY SOIL TYPE: GENERALLY GRANULAR MATERIAL (NON-COHESIVE), GENERALLY SILT-CLAY MATERIAL (COHESIVE) COMPACTNESS OR CONSISTENCY: VERY LOOSE, LOOSE, MEDIUM DENSE, DENSE, VERY DENSE RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE): <4, 4 TO 10, 10 TO 30, 30 TO 50, >50 RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²): N/A, <0.25, 0.25 TO 0.5, 0.5 TO 1, 1 TO 2, 2 TO 4, >4	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, FRAGS - FRAGMENTS, MED - MEDIUM, PMT - PRESSUREMETER TEST, SD - SAND, SANDY, SL - SILT, SILTY, SLI - SLIGHTLY, TCR - TRICONE REFUSAL, u - UNIT WEIGHT, u _d - DRY UNIT WEIGHT, w - MOISTURE CONTENT, V - VERY, VST - VANE SHEAR TEST	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 GROVED 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 FINGER NAIL.	TEXTURE OR GRAIN SIZE U.S. STD. SIEVE SIZE OPENING (MM): 4, 10, 40, 60, 200, 270 OPENING (MM): 4.76, 2.0, 0.42, 0.25, 0.075, 0.053 BOULDER (BLDR.), COBBLE (COB.), GRAVEL (GR.), COARSE SAND (CSE, SD.), FINE SAND (F, SD.), SILT (SL.), CLAY (CL.) GRAIN SIZE: MM 305, 75, 2.0, 0.25, 0.05, 0.005; IN. 12", 3", 0.25, 0.1, 0.02, 0.002
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE (ATTERBERG LIMITS), FIELD MOISTURE DESCRIPTION, GUIDE FOR FIELD MOISTURE DESCRIPTION LL - LIQUID LIMIT, PL - PLASTIC LIMIT, OM - OPTIMUM MOISTURE, SL - SHRINKAGE LIMIT SATURATED - (SAT.), WET - (W), MOIST - (M), DRY - (D)	EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: MOBILE B-, BK-51, CME-45C, CME-550, PORTABLE HOIST, OTHER CME-750, TRUCK MOUNTED, OTHER D-50 ADVANCING TOOLS: CLAY BITS, 6" CONTINUOUS FLIGHT AUGER, 8" HOLLOW AUGERS, HARD FACED FINGER BITS, TUNG-CARBIDE INSERTS, CASING W/ ADVANCER, TRICONE STEEL TEETH, TRICONE TUNG-CARB., CORE BIT, OTHER HAMMER TYPE: AUTOMATIC, MANUAL CORE SIZE: B, N, H HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST, OTHER	FRACTURE SPACING TERM: VERY WIDE, WIDE, MODERATELY CLOSE, CLOSE, VERY CLOSE SPACING: MORE THAN 10 FEET, 3 TO 10 FEET, 1 TO 3 FEET, 0.16 TO 1 FEET, LESS THAN 0.16 FEET BEDDING TERM: VERY THICKLY BEDDED, THICKLY BEDDED, THINLY BEDDED, VERY THINLY BEDDED, THICKLY LAMINATED, THINLY LAMINATED THICKNESS: > 4 FEET, 1.5 - 4 FEET, 0.16 - 1.5 FEET, 0.03 - 0.16 FEET, 0.008 - 0.03 FEET, < 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.	SOIL MOISTURE - CORRELATION OF TERMS BENCH MARK: N/A ELEVATION: N/A NOTES:
PLASTICITY PLASTICITY INDEX (PI), DRY STRENGTH NONPLASTIC, LOW PLASTICITY, MED. PLASTICITY, HIGH PLASTICITY			
COLOR 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.			

TIP PROJECT: U-2810

CONTRACT:

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

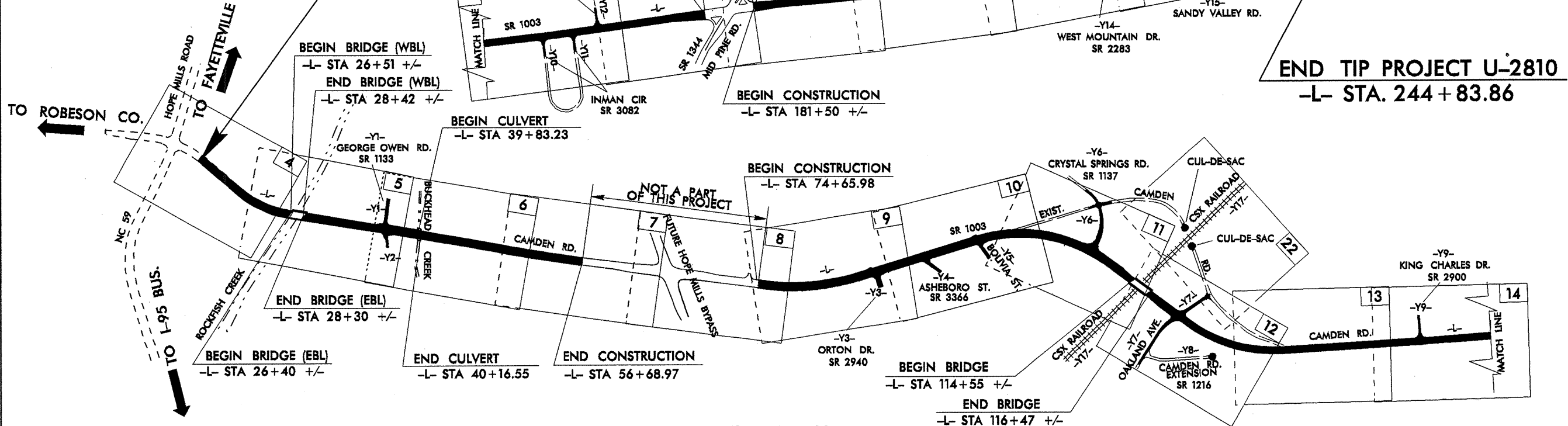
**LOCATION: FAYETTEVILLE - SR 1003 (CAMDEN RD.) FROM
NC 59 (HOPE MILLS RD.) TO NORTH OF SR 1007 (OWEN DR.)**

**TYPE OF WORK: GRADING, DRAINAGE, WIDENING, RESURFACING
CURB & GUTTER, SIGNALS, GUARDRAIL,
CULVERT, STRUCTURES & RETAINING WALL**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.
N.C.	U-2810	2A
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION
34866.1.1	STP-1003(22)	

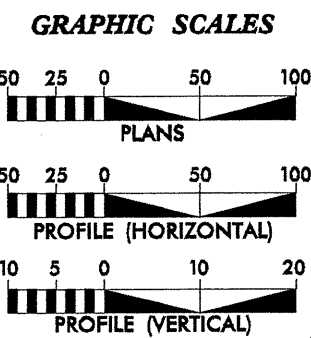
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BEGIN TIP PROJECT U-2810
-L- STA. 15+00.00



END TIP PROJECT U-2810
-L- STA. 244+83.86

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



DESIGN DATA

ADT 2004 =	15,400
ADT 2030 =	26,800
DHV =	10 %
D =	60 %
T =	5 % *
V =	50 MPH
* TTST =	1 %
DUAL =	4 %

PROJECT LENGTH

LENGTH ROADWAY TIP PROJ. U-2810 =	3.787 MILES
LENGTH STRUCTURES TIP PROJ. U-2810 =	0.098 MILES
TOTAL LENGTH OF TIP PROJ. U-2810 =	3.885 MILES

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: **ROGER D. THOMAS, P.E.**
PROJECT ENGINEER

LETTING DATE: **SAMUEL L. ST. CLAIR**
PROJECT DESIGN ENGINEER
October 2007

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED DIVISION ADMINISTRATOR

DATE



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Michael F. Easley
GOVERNOR

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

Lyndo Tippet
SECRETARY

September 7, 2005

STATE PROJECT: 34866.1.1 (U-2810)
FEDERAL PROJECT: STP-1003(22)
COUNTY: Cumberland
DESCRIPTION: Fayetteville – SR 1003 (Camden Rd.) from NC 59 (Hope Mills Rd.) to north of SR 1007 (Owen Dr.)
SUBJECT: Geotechnical Report – Inventory

Project Description

This project consists of widening the existing Camden Road (-L-, SR 1003) from two lanes to four lanes with medians and turn lanes. The project begins just north of the intersection of Camden Road and Hope Mills Road (NC 59), and ends just east of the Owen Drive (SR 1007) intersection. The interval -L- Sta. 56+69 to Sta. 74+66 is currently being constructed as part of U-620 (Hope Mills Bypass). Another interval, -L- Sta. 176+51 to 181+50, was recently constructed during the widening of SR 1344 (Mid Pine Rd.). A 3,000-foot section of the roadway is being shifted eastward approximately 600 feet from -L- Sta. 100+00 to Sta. 130+00. The widening generally occurs to the left of the existing roadway. Bridges are to be constructed over Little Rockfish Creek (see Plan Sheet No. 5) and the CSX railroad (see Plan Sheet Nos. 11 and 12). A culvert is to be constructed along Buckhead Creek at -L- Sta. 40+00. A retaining wall will be constructed left of -L- Sta. 15+00 to 17+10.

The geotechnical field investigation was conducted during the period of February and March, 2005. A truck-mounted D-50 drill with a manual hammer, and an ATV-mounted CME-750 drill machine with an automatic hammer, were used during the investigation. Standard Penetration Tests were performed in selected borings and additional borings were advanced using continuous flight augers. Representative soil samples were collected for visual classification in the field and for laboratory analysis by the Materials and Tests Unit.

The following alignments, totaling 4.4 miles, were investigated. Subsurface soil profiles, or cross-sections, of these alignments are included in this report.

<u>Line</u>	<u>Station</u>
-L-	15+00 to 56+69

-L-	74+66 to 176+51
-L-	181+50 to 244+84
-Y1-	11+22 to 12+67
-Y4-	10+37 to 12+35
-Y6-	10+00 to 16+62
-Y7-	10+12 to 19+20
-Y9-	10+79 to 12+31
-Y14-	8+00 to 18+32

Areas of Special Geotechnical Interest

- 1) Highly Plastic Clay Soils: Areas containing highly plastic clay soils are noted below:

<u>Alignment</u>	<u>Station</u>	<u>Offset</u>
-L-	17+00	55 LT
-L-	19+00	CL
-L-	40+25	45 RT
-L-	51+50	25 RT
-L-	88+00	3 RT
-L-	90+50	50 LT
-L-	95+50	5 RT
-L-	96+00	45 RT
-L-	97+00	45 RT
-L-	114+42	CL
-Y4-	11+00	20 RT

A discussion of these highly plastic clay soils is located below in the section titled: "Soil Properties".

- 2) Organic Soils: The following area contains soils with organic contents ranging from 23.1 to 40.8%:

<u>Alignment</u>	<u>Station</u>	<u>Offset</u>
-L-	95+95 to 97+95	LT

- 3) Groundwater: The following areas exhibit a high water table, seasonal high groundwater, or the potential for groundwater related construction problems:

<u>Alignment</u>	<u>Station</u>
-L-	24+50 to 33+00
-L-	46+50 to 55+00
-L-	96+00 to 97+95

- 4) Water Wells: Water wells were noted within the construction limits at the following locations:

<u>Alignment</u>	<u>Station</u>	<u>Offset</u>
-L-	80+09	20 LT
-L-	83+05	24 LT
-L-	92+20	21 LT
-L-	92+50	21 LT
-L-	94+90	47 LT
-L-	103+20	31 RT
-L-	105+37	17 LT
-L-	117+98	16 LT
-L-	131+51	21 LT
-L-	133+33	31 LT
-L-	147+01	32 LT
-L-	159+28	46 LT

Physiography and Geology

The project is located between the city of Fayetteville and the town of Hope Mills, within the Coastal Plain Province. The area is underlain by Cretaceous-age sands and clays of the Black Creek Formation. Undifferentiated Quaternary-age sands occur at the ground surface. Recent alluvial sand is present in the Little Rockfish Creek floodplain. Numerous homes, churches, and businesses occur along Camden Road. The Little Rockfish Creek floodplain is wooded, as well as the areas left and right of -L- Sta. 43+00 to 60+00.

Soil Properties

Roadway Embankment Soils: Roadway embankment soil occurs in several locations on the project. Three to five feet of embankment soil, consisting of loose to medium dense sand (AASHTO classification of A-2-4), overlies alluvial sand within the Little Rockfish Creek floodplain. Roadway embankment soil is also present from -L- Sta. 43+50 to 55+50 and -L- Sta. 74+66 to 103+00. The embankment soil in these areas primarily consists of loose sand (A-2-4 and A-3).

Artificial Fill Soils: An area of artificial fill soil occurs at the beginning of the project, left of -L- Sta. 15+00 to 18+40 (see Plan Sheet No. 4 and Cross-section Sheet No. 38). A parking lot and the adjacent building have been constructed on the fill. The fill soils consists of loose to medium dense, sand (A-2-4 and A-3).

Alluvial Soils: Alluvial soils are present in the floodplain of Little Rockfish Creek and in the channels of several other streams which cross the project corridor. Alluvial soils in the Little Rockfish Creek floodplain are generally 5 to 8 feet thick, consisting of loose to medium dense, silty sand (A-2-4 and A-1-b) with gravel (see Plan Sheet Nos. 4 and 5, and Profile Sheet No. 23).

Another area of alluvial soil occurs left of -L- Sta. 96+00 to 97+95 (see Plan Sheet No. 10, Profile Sheet No. 26, and Cross-section Sheet Nos. 40 to 42). Approximately 2 to 5 feet of very soft, saturated muck occurs in this area. Organic content of the muck ranges from 23.1 to 40.8%, with a moisture content as high as 305%. The muck overlies 3 to 5 feet of gray, dense, saturated alluvial sand (A-2-4).

embankment fill soil. The existing roadway embankment has been placed over a portion of this area of highly organic soil (-L- Sta. 97+10 to 98+10). The boring at -L- Sta. 98+00/3RT suggests that the very soft muck was undercut and backfilled with sand. The remaining underlying alluvial soil consists of five feet of loose sand with traces of organic material (A-2-4 with 3.3% organic content).

Coastal Plain Soils: These soils are derived from the Tertiary-age sedimentary deposits which occur at the ground surface. These soils are multicolored, with hues of tan, orange, and gray being most common. Sandy soil is the most common Coastal Plain soil in the project area. These sandy soils are generally loose to medium dense sands and silty sands (A-1-b, A-3, and A-2-4). Loose to medium dense, clayey sand (A-2-6) is also present in minor amounts. Areas containing highly plastic (plasticity indices of greater than 25) soils are listed above in Section 1 of "Areas of Special Geotechnical Interest".

Culverts

-L- Sta. 40+00: This proposed culvert consists of a 137-foot long triple box culvert on Buckhead Creek (see Plan Sheet No. 6). Approximately 4 to 5 feet of fill will overlie the culvert. The culvert will be underlain by 5 feet of loose, coarse, alluvial sand (A-1-a). The alluvial sand is underlain by medium dense, Coastal Plain sand (A-3).

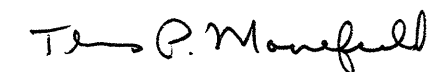
Retaining Wall

A retaining wall is to be constructed left of -L- Sta. 15+00 to 17+13 (see Plan Sheet No. 4, Profile Sheet No. 38, and Cross-section Sheet No. 39). Eleven to thirteen feet of artificial fill was encountered at the location of the wall. The fill was constructed for the adjacent buildings and parking lot. The fill consists of red-brown to tan, loose to medium dense, dry to moist sand (A-3 and A-2-4). The fill soil is underlain by Coastal Plain soils, consisting of either medium dense sand (A-3), stiff, sandy silt (A-4), or stiff to hard, silty clay (A-6) and highly plastic clay (A-7-6). Groundwater was not encountered in the retaining wall borings.

Groundwater

Groundwater generally occurs within one to three feet of the ground surface in the alluvial soils of the Little Rockfish Creek floodplain. Groundwater occurs at, or very near, the ground surface in the alluvial area left of -L- Sta. 96+00 to 98+10. Groundwater, where present, occurs at depths of 10 to 15 feet on the remainder of the project.

Prepared by,



Thomas P. Moorefield, LG
Project Geologist

Bulk Samples

The following bulk sample was taken for tests to determine the engineering properties of the soil.

<u>Sample No.</u>	<u>Location</u>	<u>Depth (feet)</u>	<u>Test</u>
CBR-1	-L- Sta. 203+50/35RT	0.0 - 5.0	California Bearing Ratio

EARTHWORK BALANCE SHEET

Volumes in Cubic Yards

PROJECT: U-2810A

COUNTY: Cumberland

DATE: Nov. 05, 2008

SHEET 1 OF 1 SHEETS

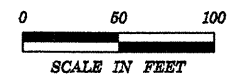
RD10S01C

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	EARTH EMB.	EMBANK. +25%	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
-L-	15+00.00	26+54.46	1642				1642	19543			24429	22787			
		Begin Bridge													
		SUBTOTAL	1642				1642	19543			24429	22787			
-L-	28+85.54	39+33.00	459				459	24661			30826	30367			
	End Bridge	Begin Bridge													
-Y1-	11+40.00	12+79.26	108				108	321			401	293			
-Y2-	10+37.22	11+77.62	215				215	117			146		69		69
		SUBTOTAL	782				782	25099			31373	30660	69		69
-L-	40+38.00	56+75.00	696				696	11814			14768	14072			
	End Bridge														
		SUBTOTAL	696				696	11814			14768	14072			
TOTAL			3120				3120	56456			70570	67519	69		69
Loss due to clearing & grubbing			-150				-150					150			
Earth waste to replace borrow												-69	-69		-69
PROJECT TOTAL			2970				2970					67600	0		0
Estimated for replacing topsoil on borrow pit												3380			
GRAND TOTAL			2970									70980			
SAY			3000									71200			

Note: Earthwork quantities are calculated by the Roadway Design Unit. These quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

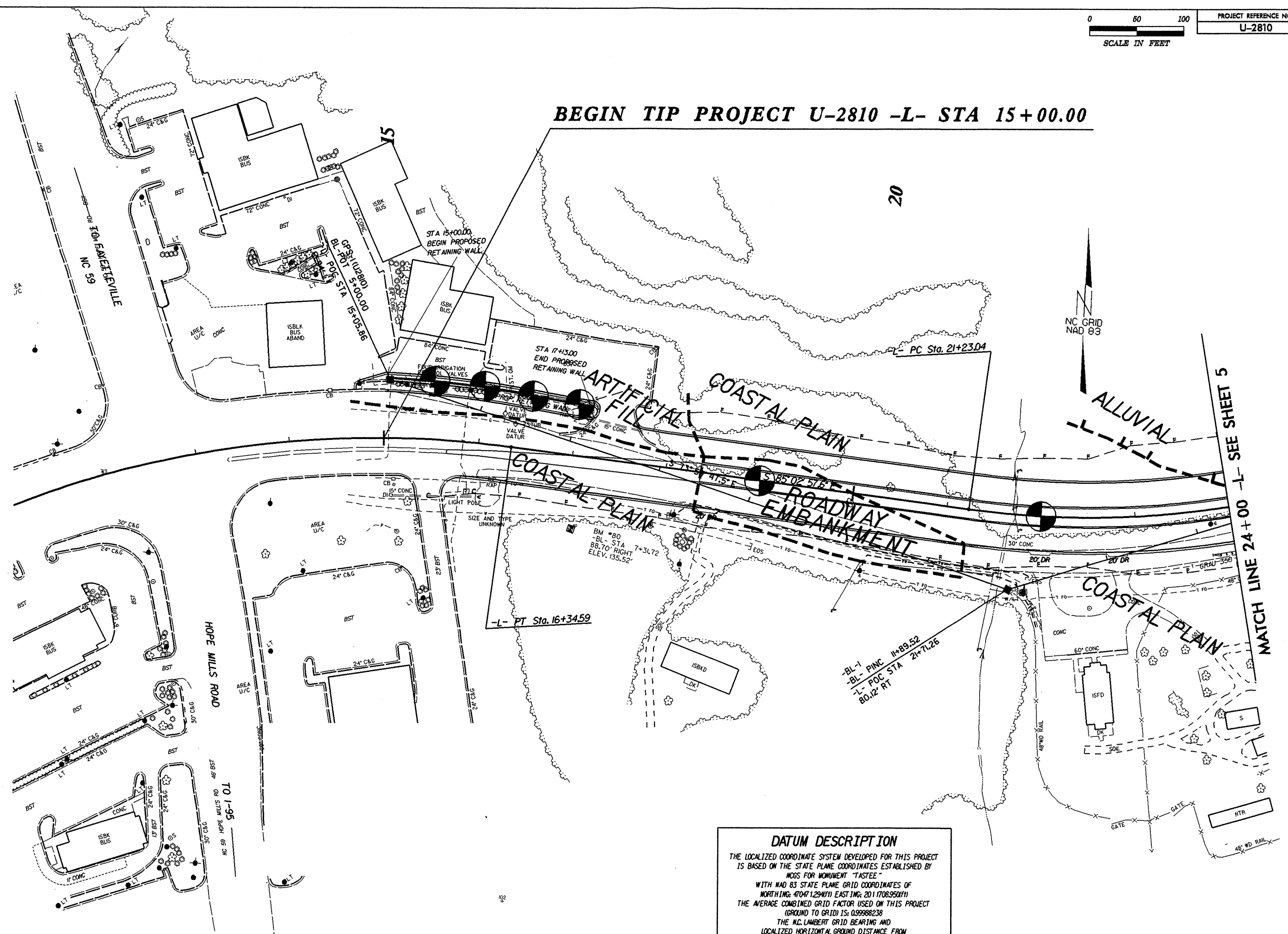
Note: This Inventory is for U-2810, which includes U-2810A, U-2810B, and U-2810C sections. Please refer to the respective portions for your needs.

Note: This Earthwork Balance Sheet is only for U-2810A.



PROJECT REFERENCE NO.	SHEET NO.
U-2810	4

BEGIN TIP PROJECT U-2810 -L- STA 15+00.00



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY MGS FOR MONUMENT "TASSEE"

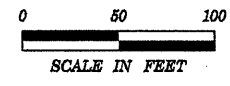
WITH NAD 83 STATE PLANE GRID COORDINATES OF
 NORTHING: 470471294(1) EASTING: 2011708950(1)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99988238

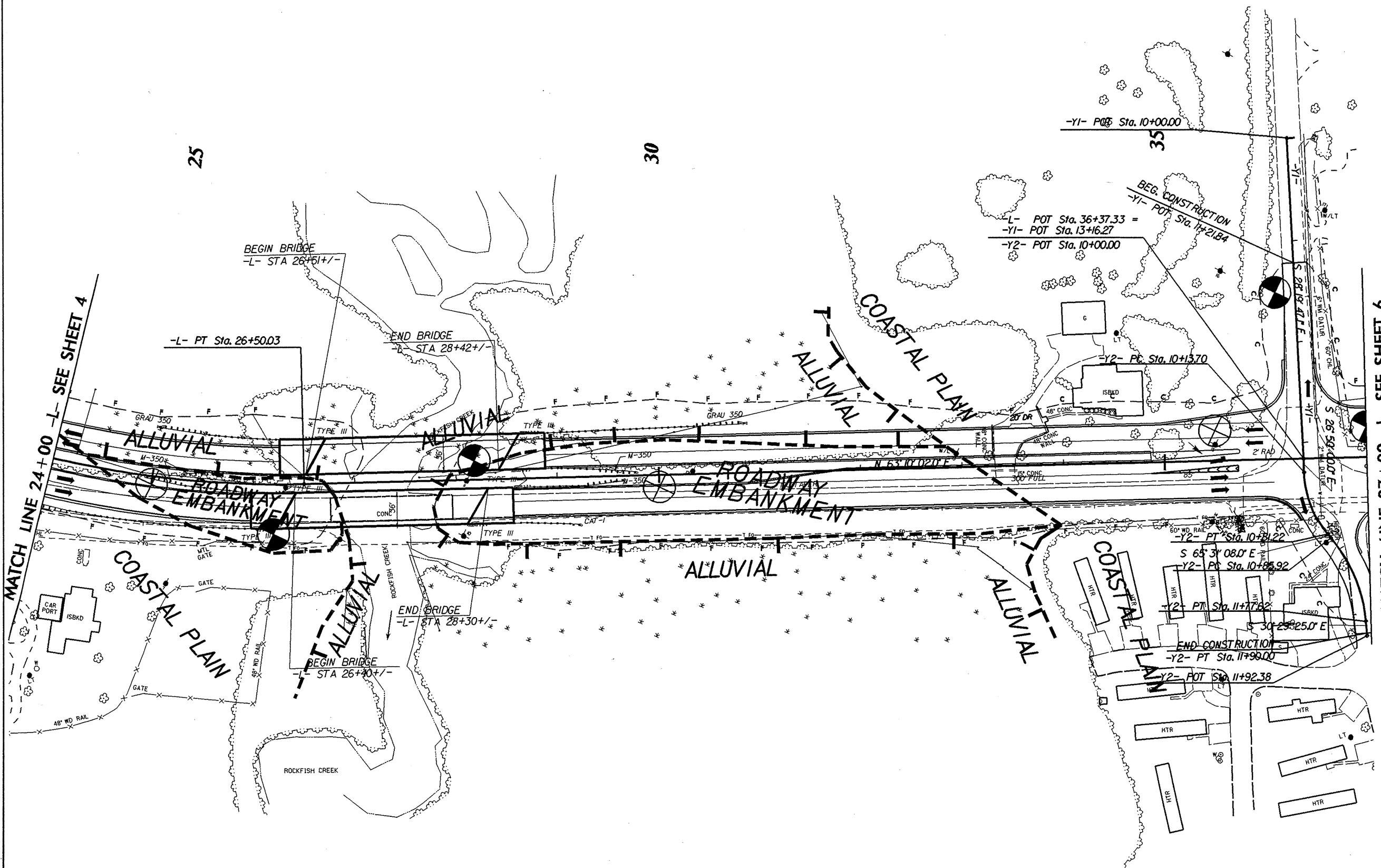
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "TASSEE" TO -L- STATION (supplied by roadway) IS

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS MVD 29

MATCH LINE 24+00 -L- SEE SHEET 5



PROJECT REFERENCE NO.	SHEET NO.
U-2810	5



MATCH LINE 24+00 -L- SEE SHEET 4

MATCH LINE 37+00 -L- SEE SHEET 6

25

30

35

BEGIN BRIDGE
-L- STA 26+51+/-

END BRIDGE
-L- STA 28+42+/-

-L- PT Sta. 26+50.03

END BRIDGE
-L- STA 28+30+/-

BEGIN BRIDGE
-L- STA 26+40+/-

-Y1- POT Sta. 10+00.00

-L- POT Sta. 36+37.33 =
-Y1- POT Sta. 13+16.27
-Y2- POT Sta. 10+00.00

BEG. CONSTRUCTION
-Y1- POT Sta. 11+21.84

-Y2- PC Sta. 10+13.70

-Y2- PT Sta. 10+81.22

-Y2- PC Sta. 10+85.92

-Y2- PT Sta. 11+71.82

END CONSTRUCTION
-Y2- PT Sta. 11+99.00

-Y2- POT Sta. 11+92.38

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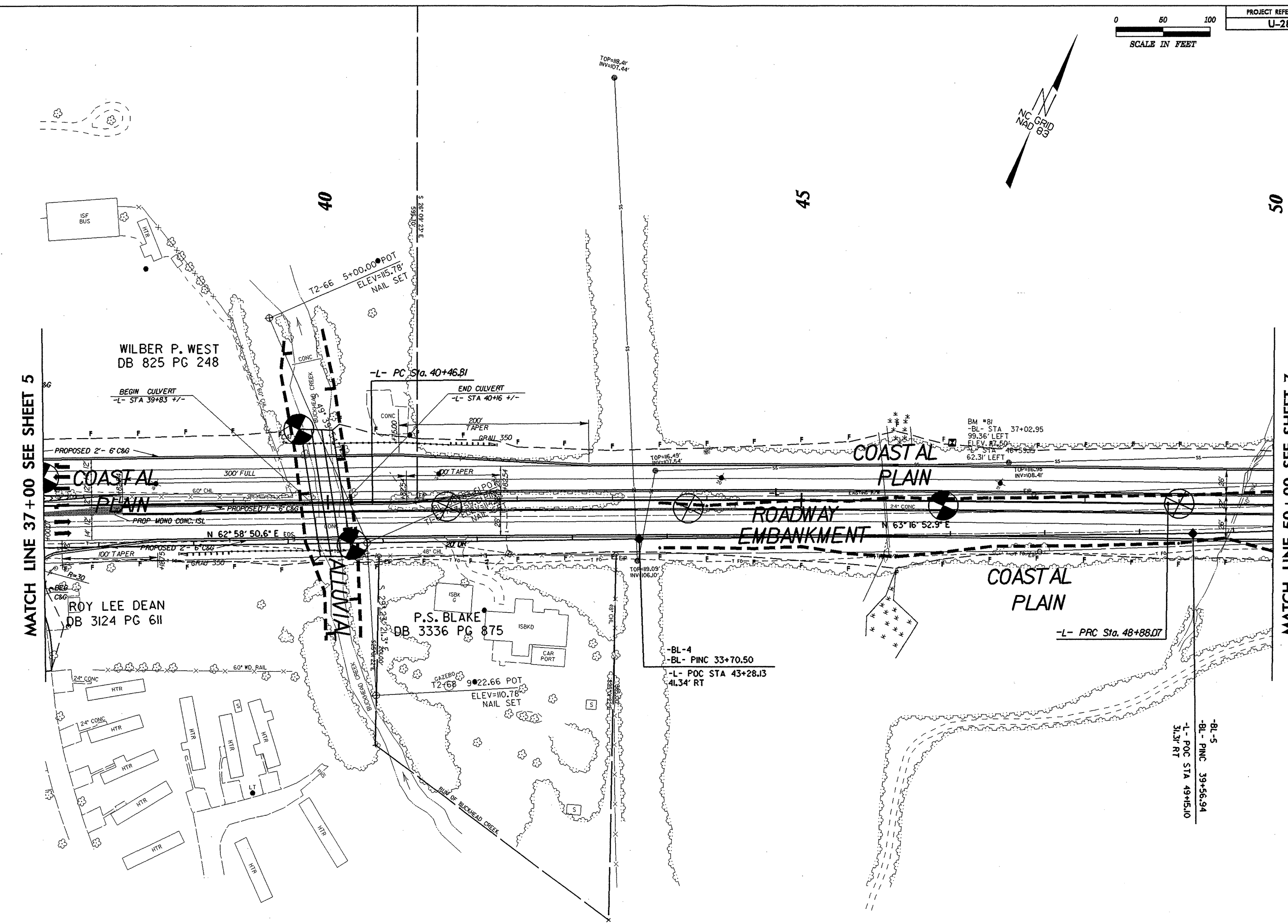
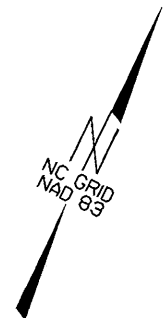
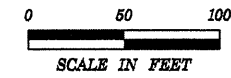
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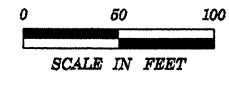
HTR



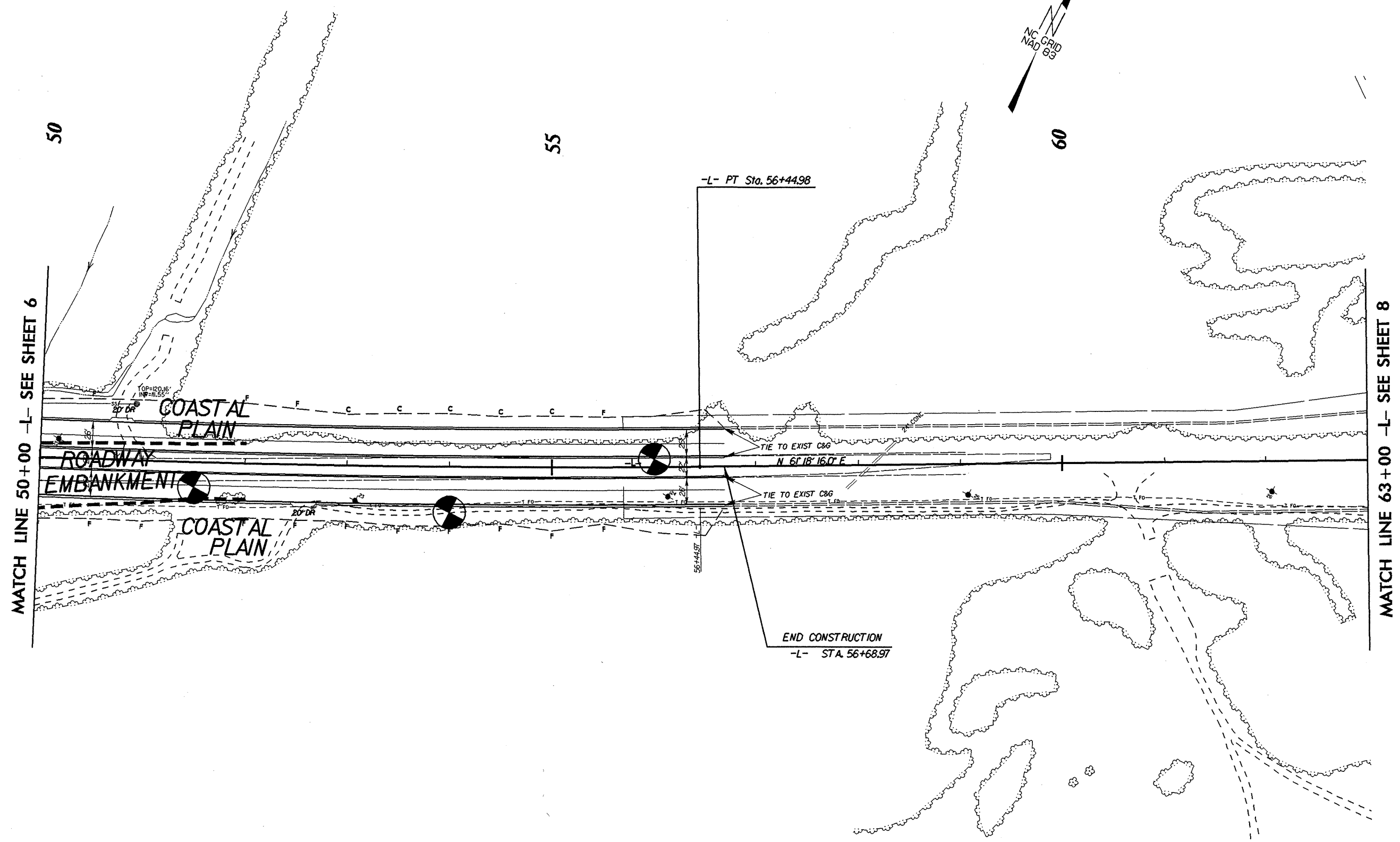
MATCH LINE 37+00 SEE SHEET 5

MATCH LINE 50+00 SEE SHEET 7

SEE SHT 24 FOR -L- PROFILE
SEE SHT C- FOR CULVERT PLANS



PROJECT REFERENCE NO.	SHEET NO.
U-2810	7



50

55

60

MATCH LINE 50+00 -L- SEE SHEET 6

MATCH LINE 63+00 -L- SEE SHEET 8

-L- PT Sta. 56+44.98

END CONSTRUCTION
-L- STA. 56+68.97

SCALE IN FEET
0 80 100



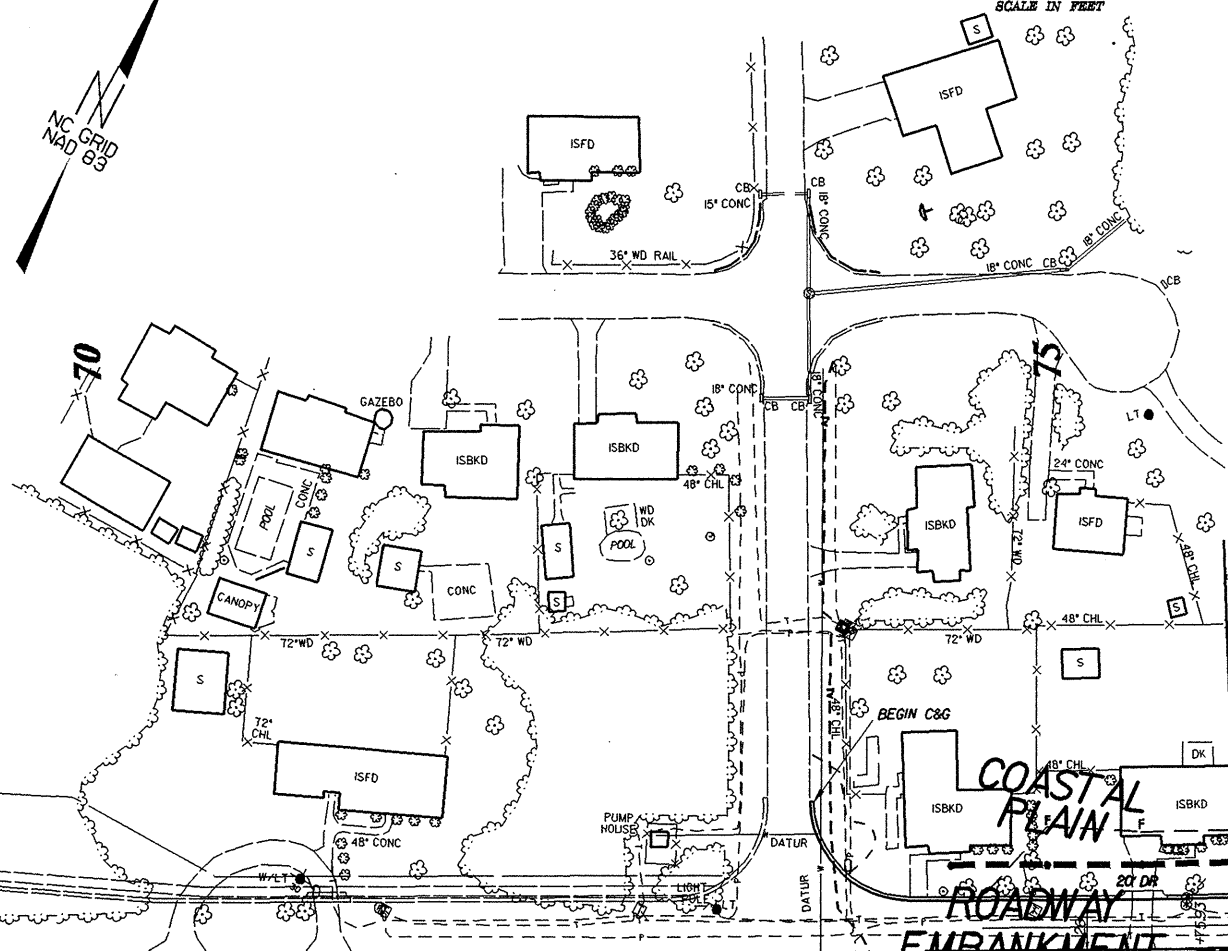
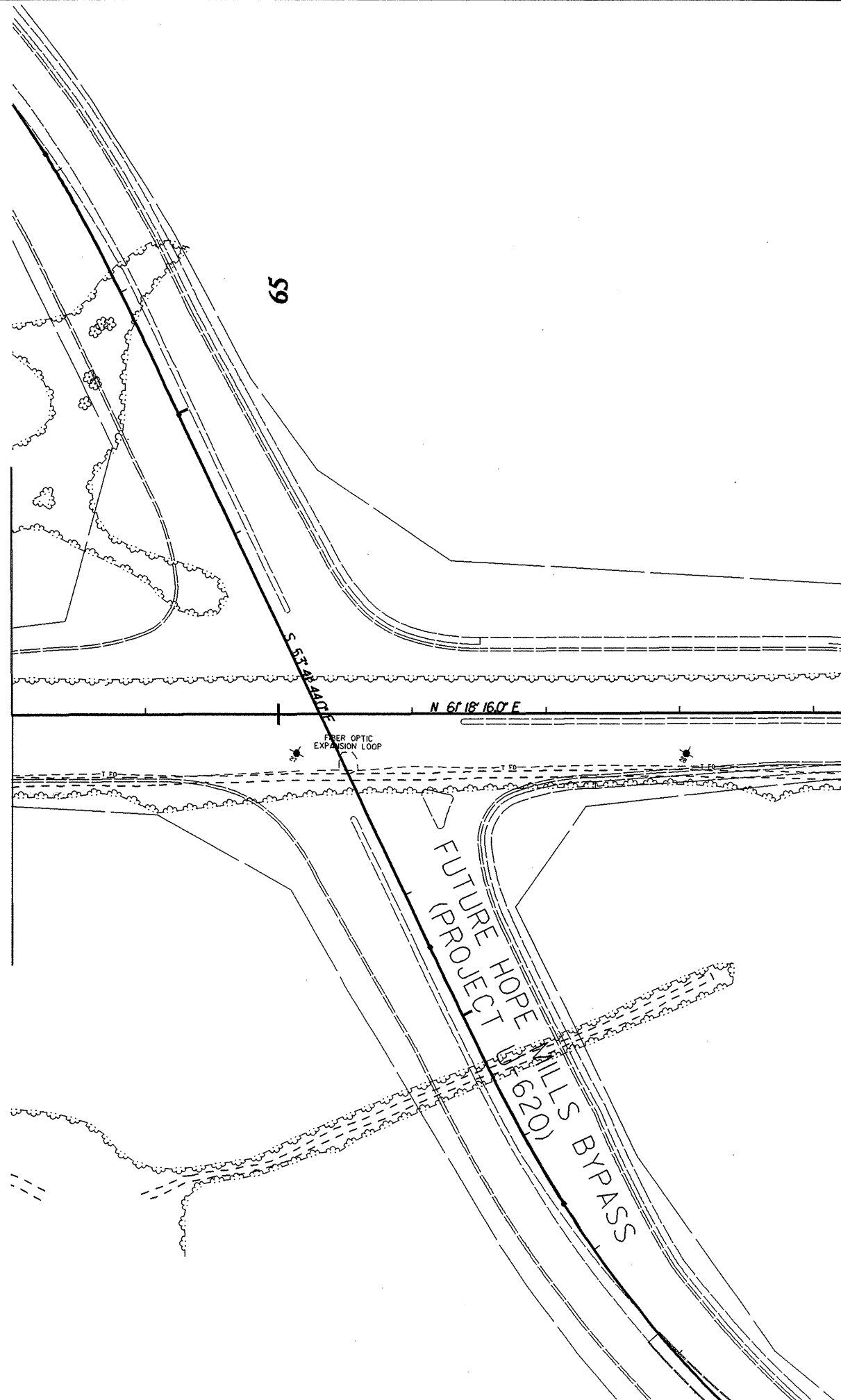
MATCH LINE 63+00 -L- SEE SHEET 7

MATCH LINE 76+00 -L- SEE SHEET 9

65

70

75



N 61° 18' 16.0" E

TIE TO ISLAND 6" DATUM MONO. CONC. ISLAND

TIE TO EXIST C&G 48" W/COR

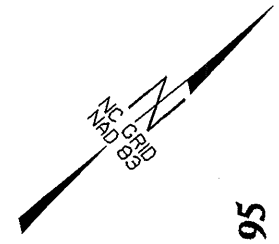
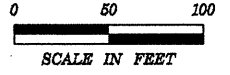
COASTAL PLAIN
ROADWAY
EMBANKMENT

COASTAL PLAIN

BEGIN CONSTRUCTION
-L- STA. 74+65.98

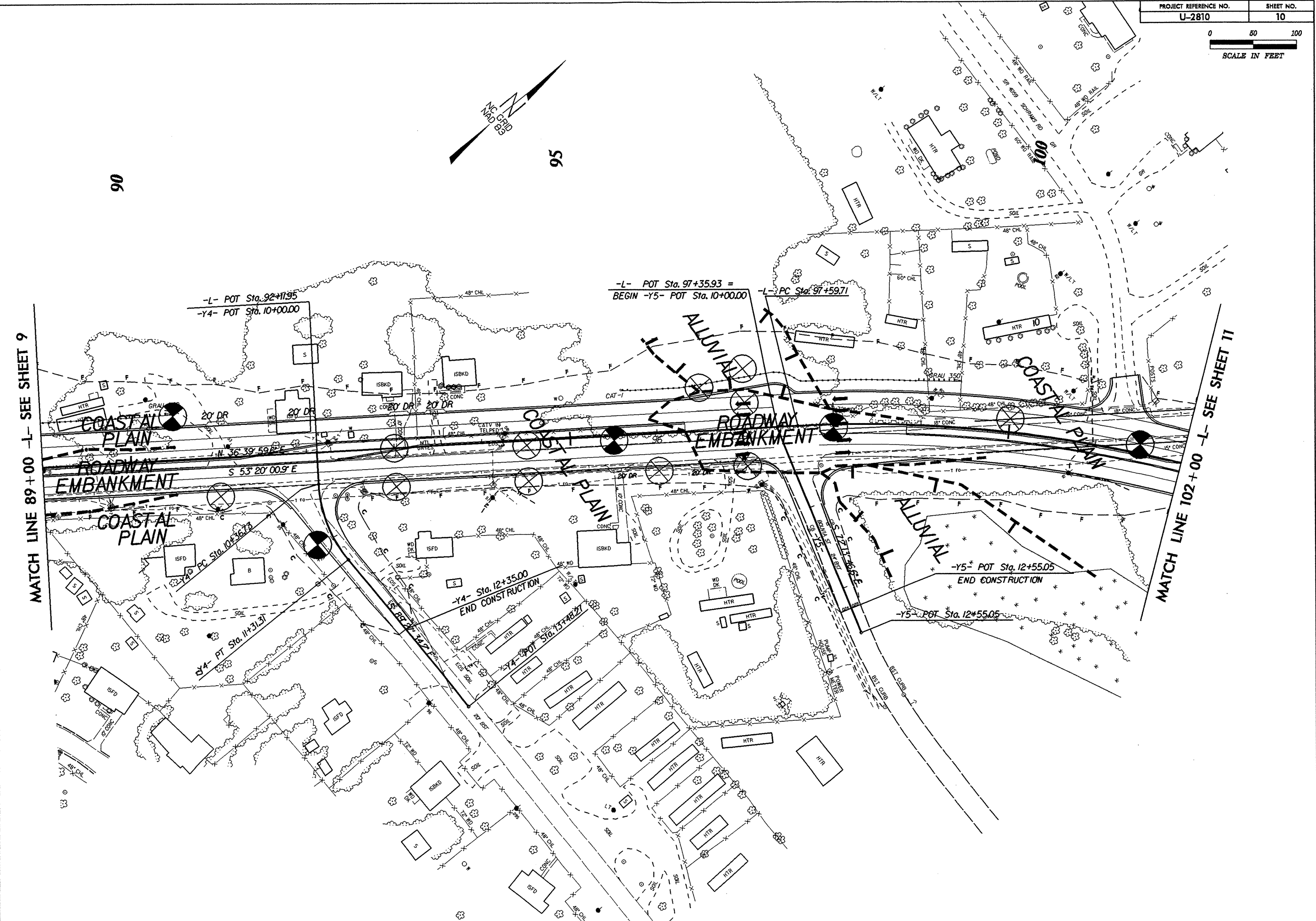
BEGIN CONSTRUCTION
-L- STA. 74+35.93

-L- PC Sta. 75+27.93



MATCH LINE 89+00 -L- SEE SHEET 9

MATCH LINE 102+00 -L- SEE SHEET 11



90

95

COASTAL PLAIN
ROADWAY EMBANKMENT

COASTAL PLAIN

ALLUVIAL PLAIN

ROADWAY EMBANKMENT

ALLUVIAL PLAIN

COASTAL PLAIN

-Y5- POT Sta. 12+55.05
END CONSTRUCTION

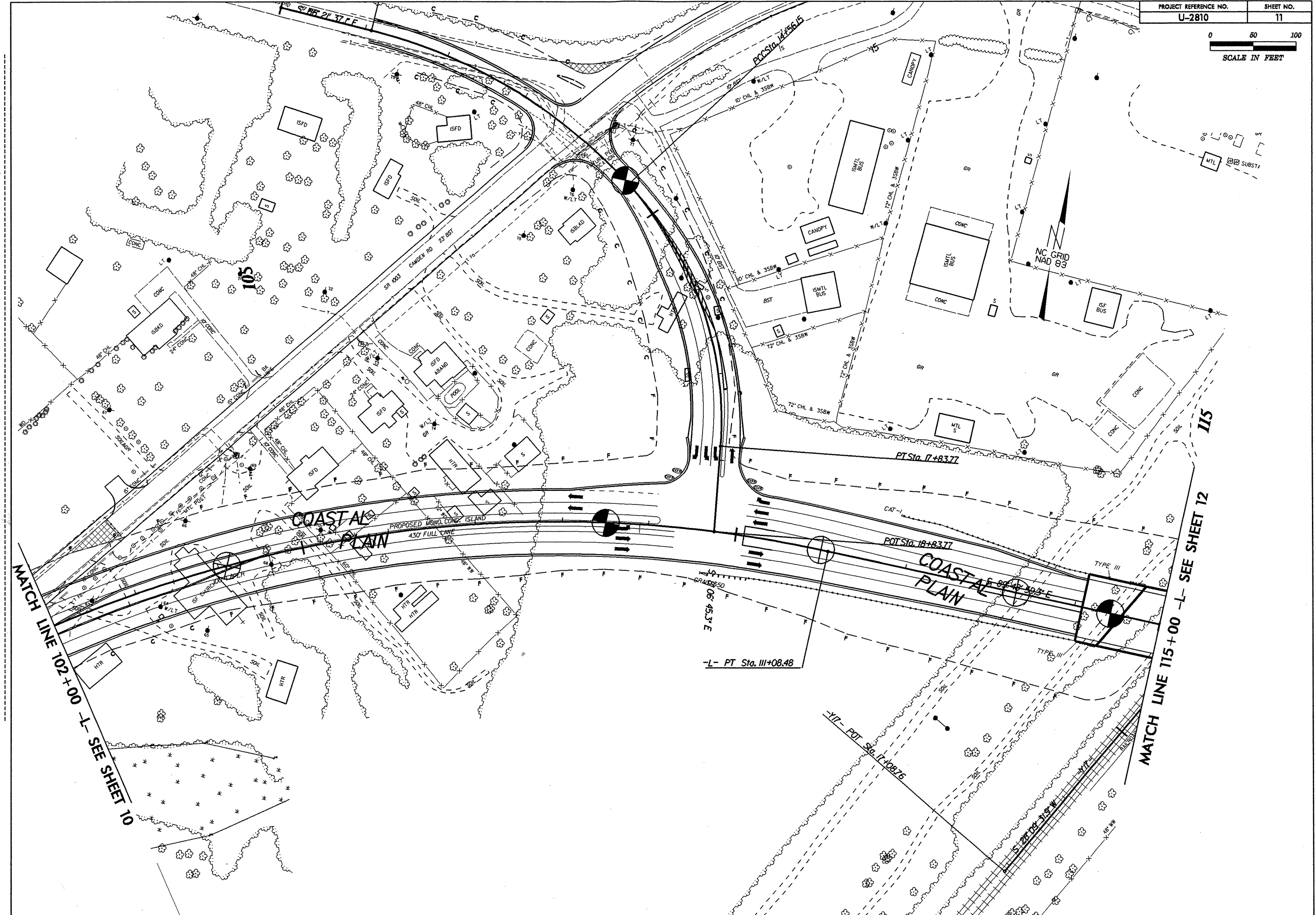
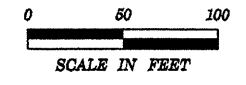
-Y5- POT Sta. 12+55.05

-L- POT Sta. 92+11.95
-Y4- POT Sta. 10+00.00

-L- POT Sta. 97+35.93 =
BEGIN -Y5- POT Sta. 10+00.00
-L- PC Sta. 97+59.71

-Y4- STA. 12+35.00
END CONSTRUCTION

-Y4- POT Sta. 13+48.27



MATCH LINE 102+00 -L- SEE SHEET 10

MATCH LINE 115+00 -L- SEE SHEET 12

COASTAL PLAIN

COASTAL PLAIN

PROPOSED MONO. CONC ISLAND

430' FULL LANE

POT. Sta. 18+83.77

-L- PT Sta. 11+08.48

-L- POT. Sta. 17+08.75

TYPE III

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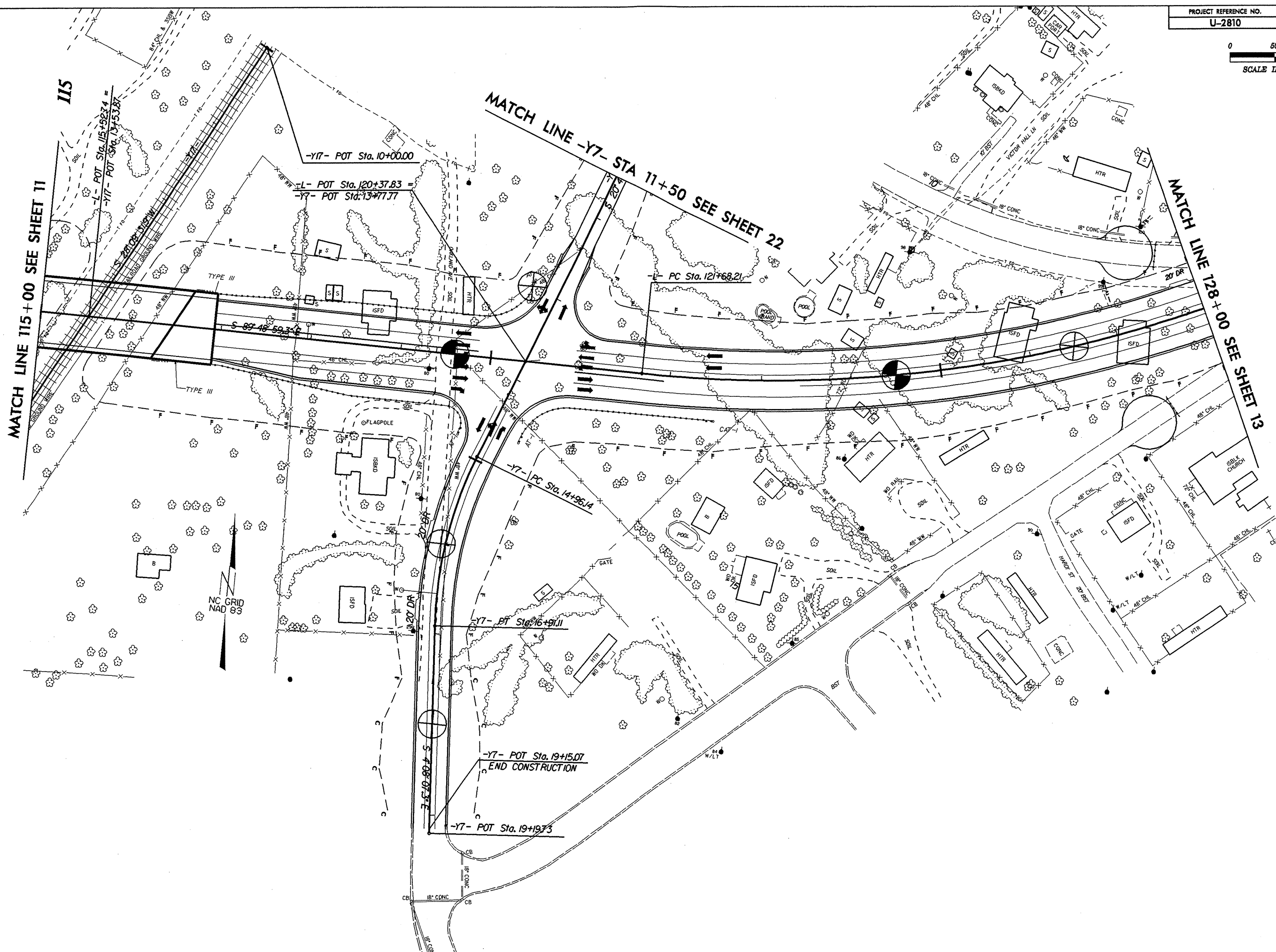
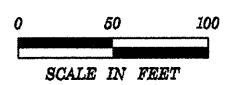
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MATCH LINE 115+00 SEE SHEET 11

MATCH LINE -Y7- STA 11+50 SEE SHEET 22

MATCH LINE 128+00 SEE SHEET 13

-Y7- POT Sta. 10+00.00

L- POT Sta. 120+37.83
-Y7- POT Sta. 13+77.77

PC Sta. 121+68.21

-Y7- PC Sta. 14+96.14

-Y7- PT Sta. 16+91.11

-Y7- POT Sta. 19+15.07
END CONSTRUCTION

-Y7- POT Sta. 19+19.73

NC GRID
NAD 83

IIS

L- POT Sta. 115+92.14
-Y7- POT Sta. 13+53.87

TYPE III

TYPE III

FLAGPOLE

ISFD

20" DA

S 74° 08' 03" E

18" CONC

CB

18" CONC

CB

18" CONC

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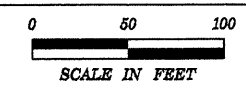
CB

18" CONC

CB

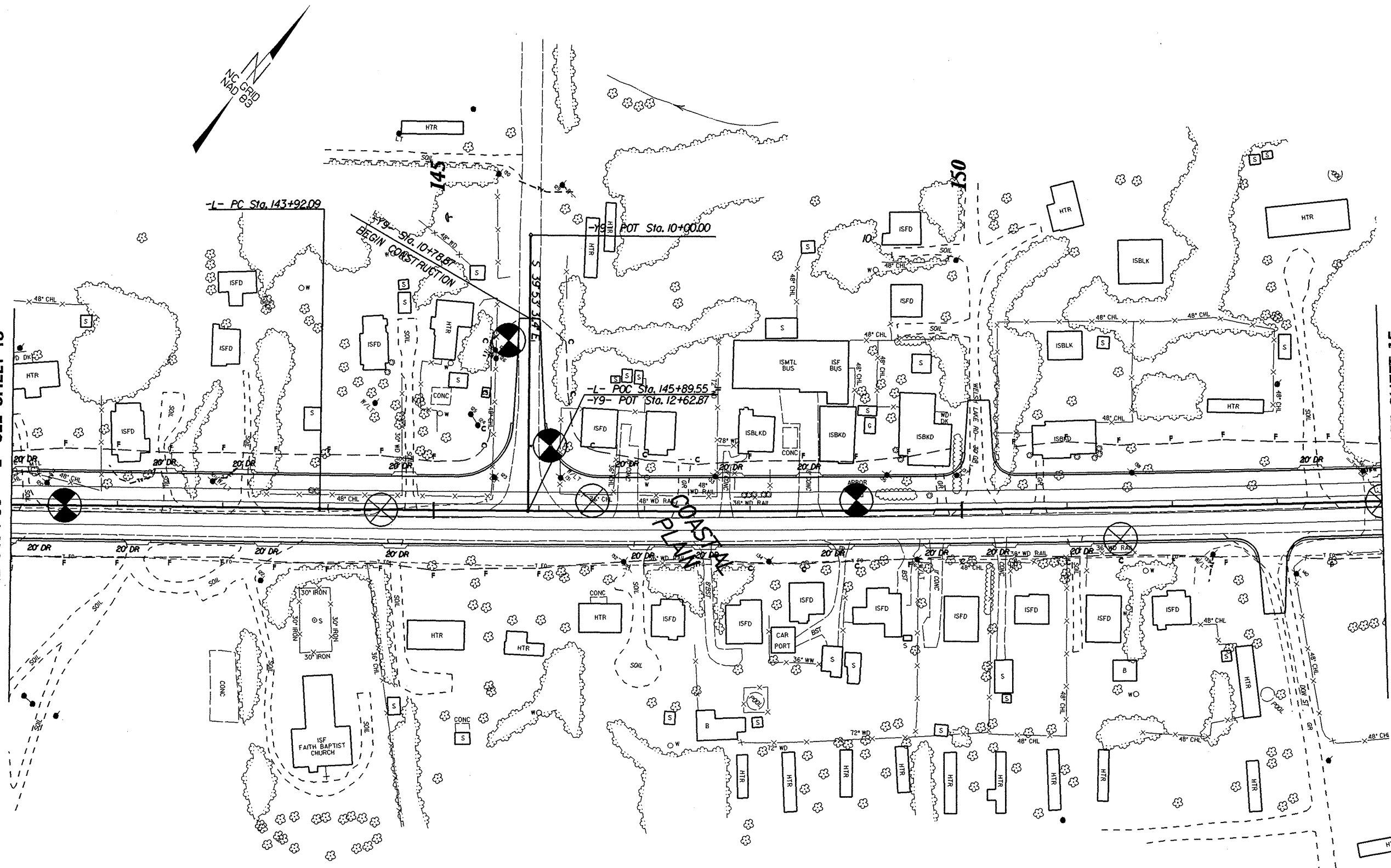
18" CONC

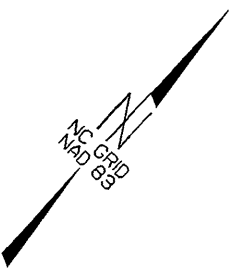
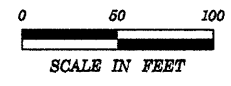
CB



MATCH LINE 141+00 -L- SEE SHEET 13

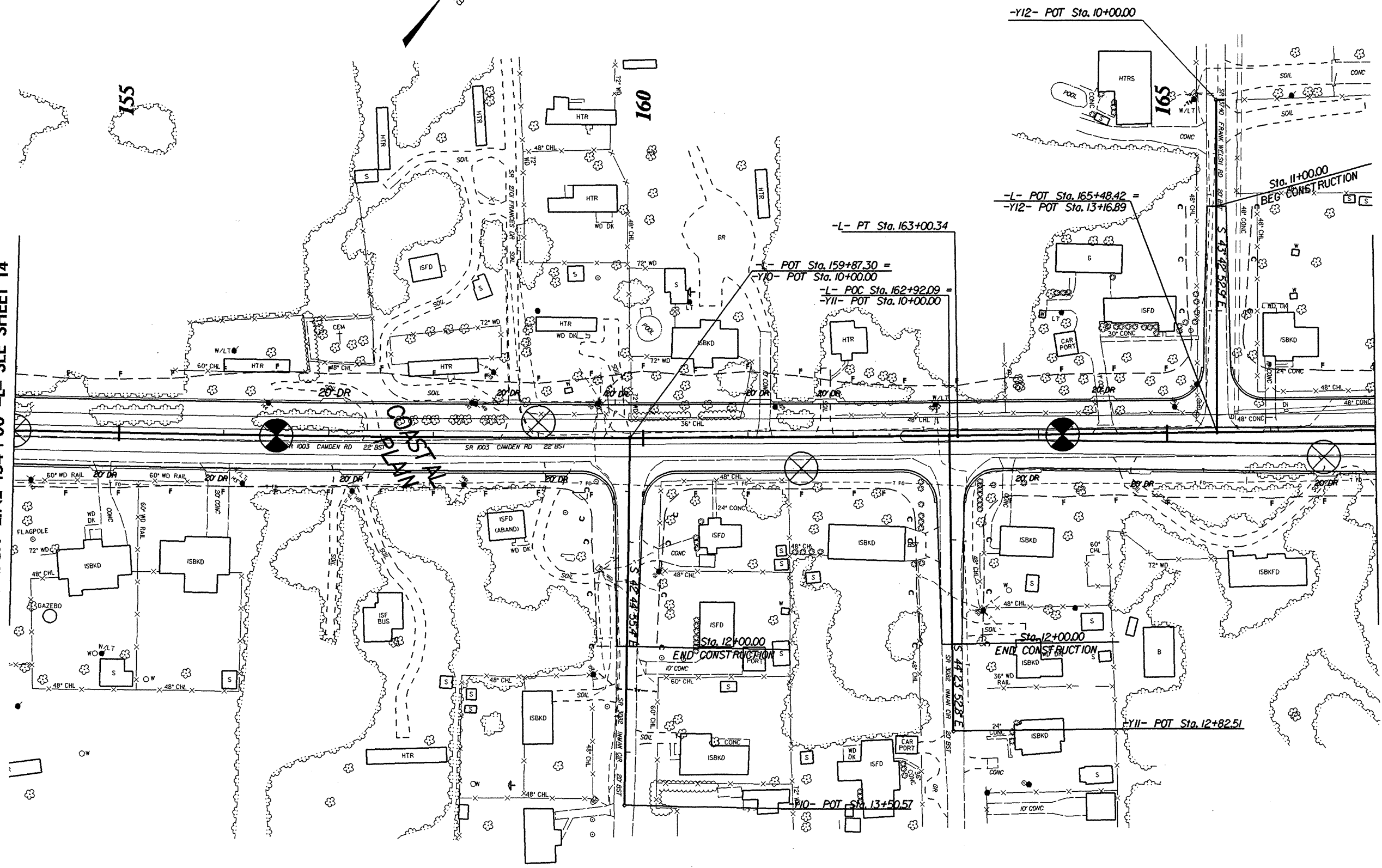
MATCH LINE 154+00 -L- SEE SHEET 15





MATCH LINE 154+00 -L- SEE SHEET 14

MATCH LINE 167+00 -L- SEE SHEET 16



155

160

165

-L- POT Sta. 159+87.30 =
 -Y10- POT Sta. 10+00.00
 -L- POC Sta. 162+92.09 =
 -Y11- POT Sta. 10+00.00

-L- PT Sta. 163+00.34

-L- POT Sta. 165+48.42 =
 -Y12- POT Sta. 13+16.89

-Y12- POT Sta. 10+00.00

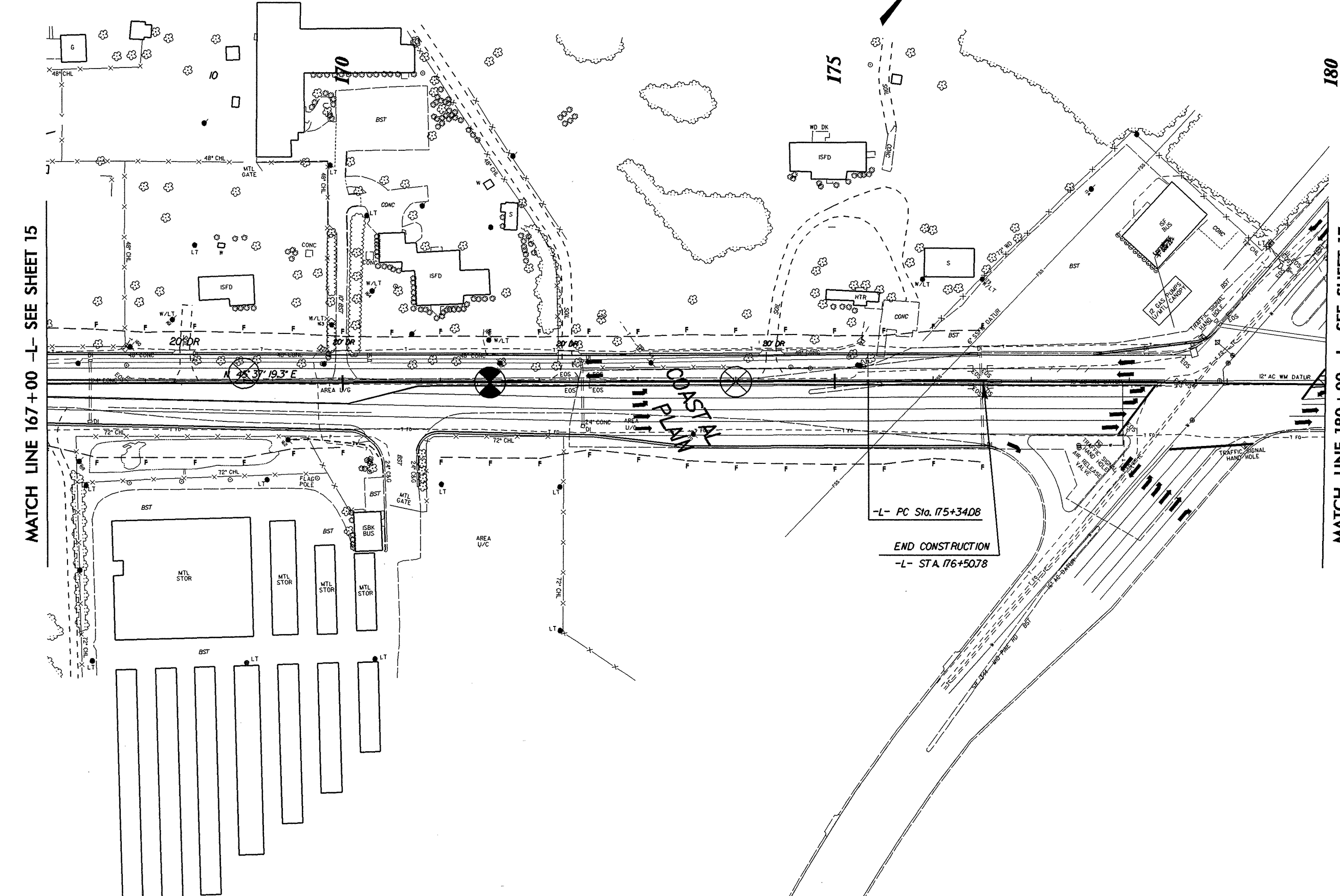
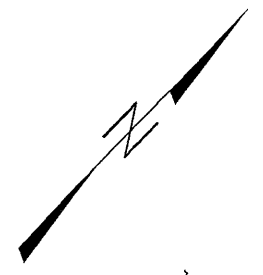
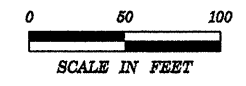
Sta. 11+00.00
 BEG. CONSTRUCTION

Sta. 12+00.00
 END CONSTRUCTION

Sta. 12+00.00
 END CONSTRUCTION

-Y11- POT Sta. 12+82.51

-Y10- POT Sta. 13+50.57

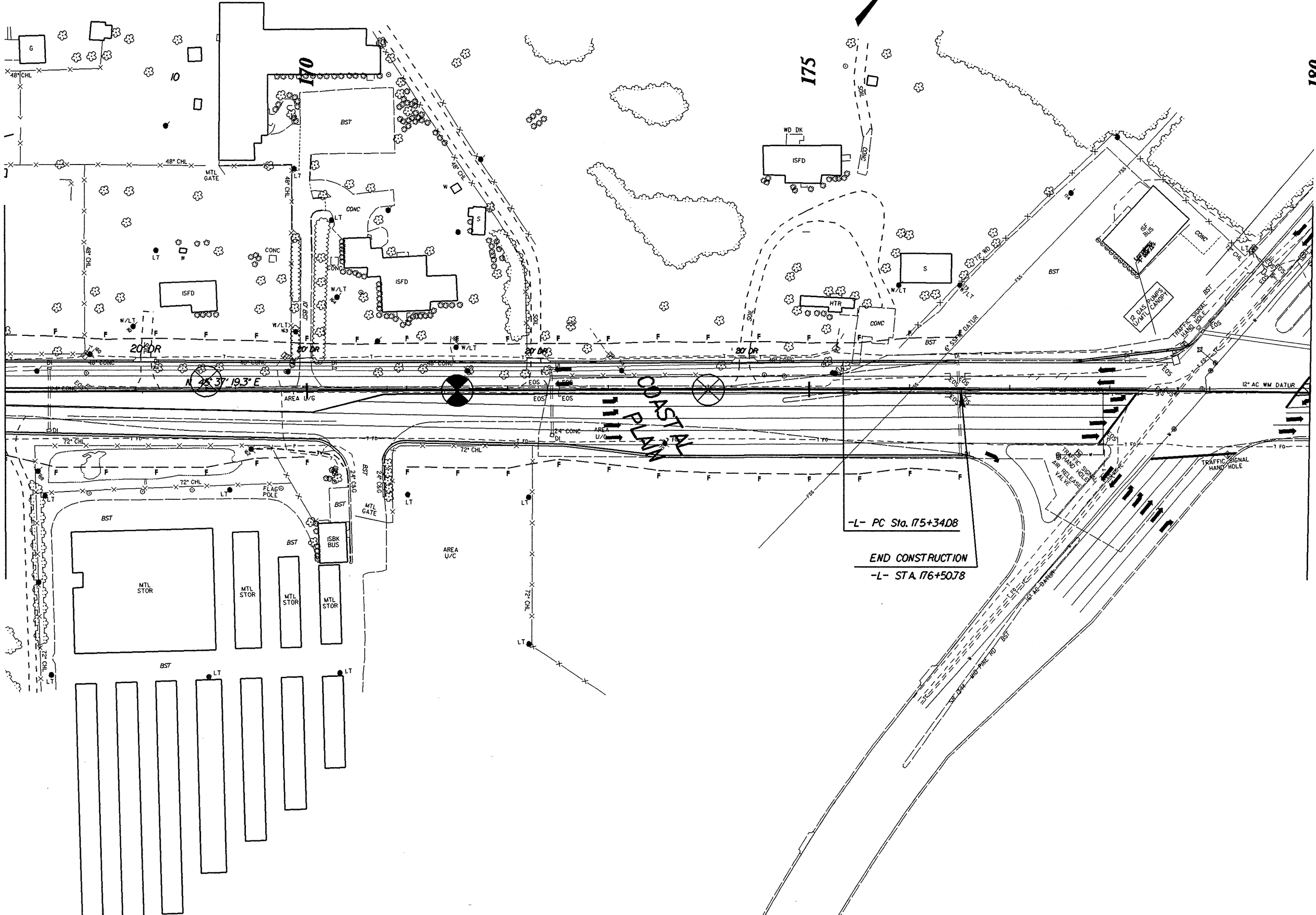


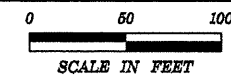
MATCH LINE 167+00 -L- SEE SHEET 15

MATCH LINE 180+00 -L- SEE SHEET 17

COASTAL PLAIN

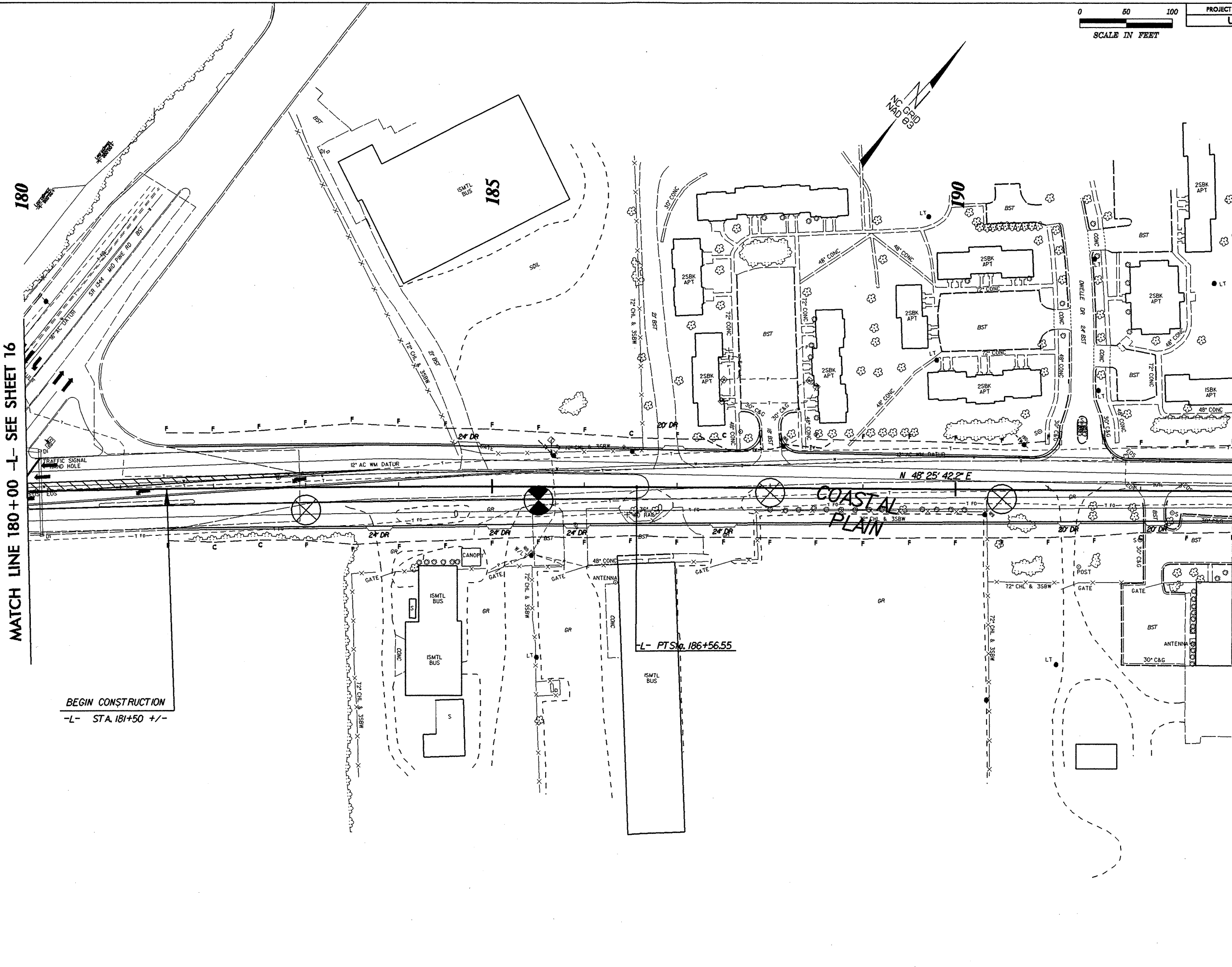
-L- PC Sta. 175+34.08
 END CONSTRUCTION
 -L- STA. 176+50.78





MATCH LINE 180+00 -L- SEE SHEET 16

MATCH LINE 193+00 -L- SEE SHEET 18



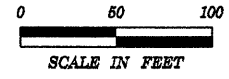
BEGIN CONSTRUCTION
-L- STA. 181+50 +/-

-L- PTS. 186+56.55

COASTAL
PLAIN

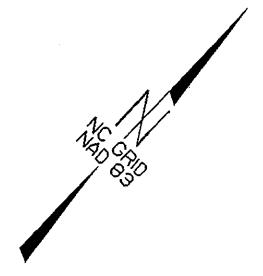
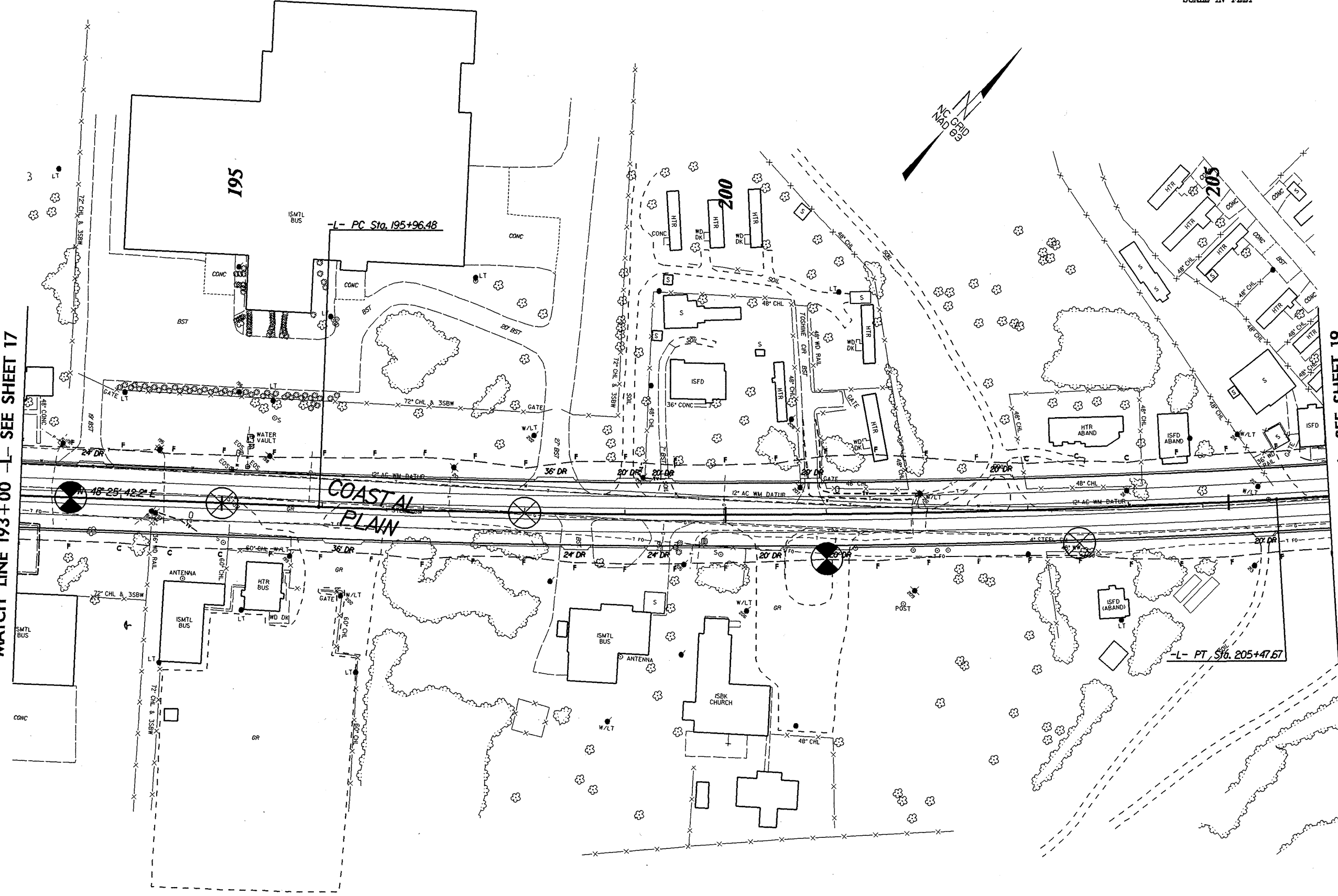
N 48° 25' 42.2" E

8/17/99



MATCH LINE 193+00 -L- SEE SHEET 17

MATCH LINE 206+00 -L- SEE SHEET 19



COASTAL PLAIN

195

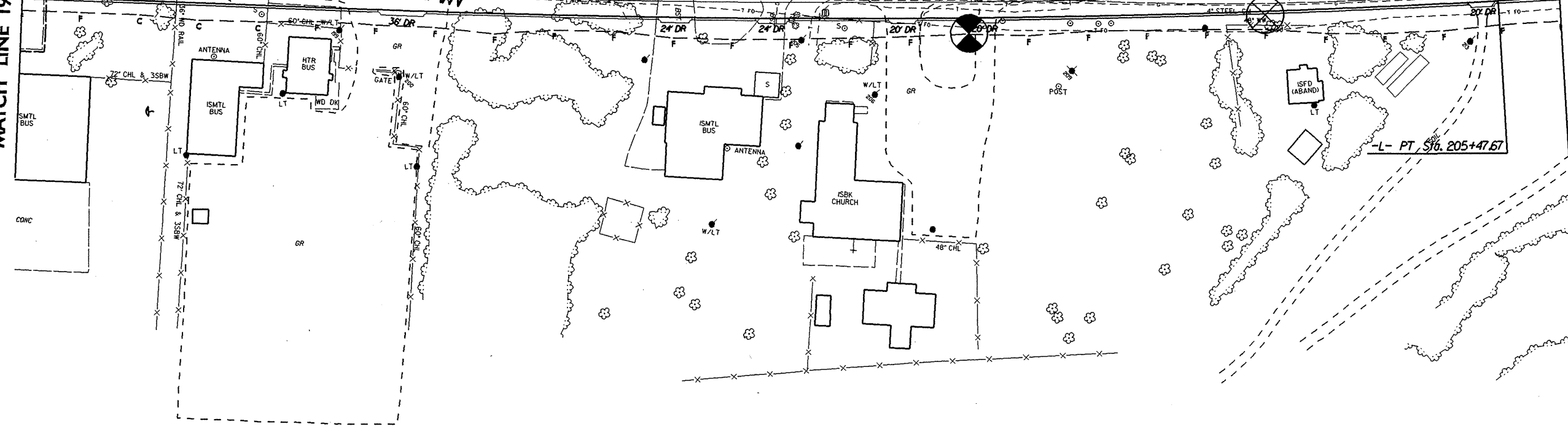
200

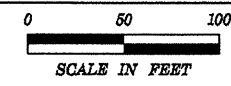
205

-L- PC Sta. 195+96.48

-L- PT Sta. 205+47.67

N 18° 25' 42.2" E

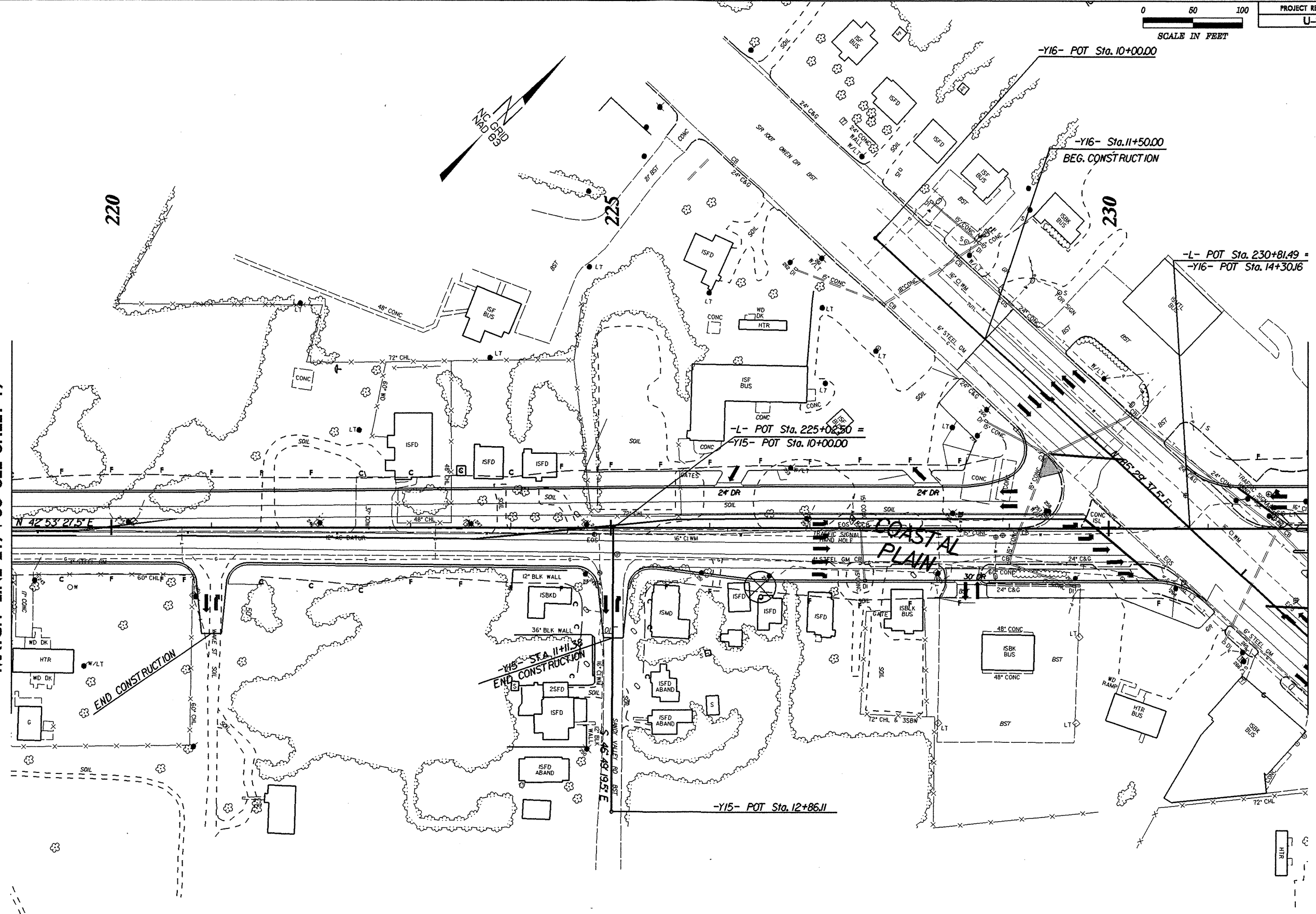


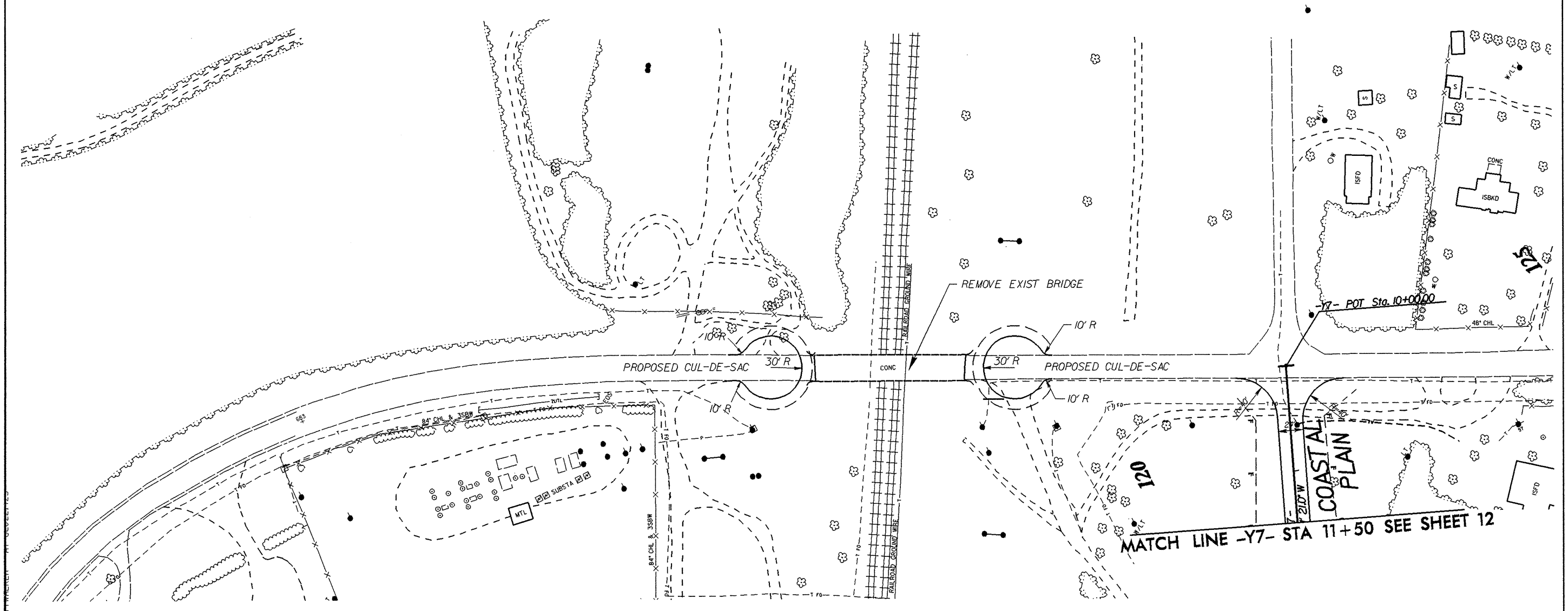
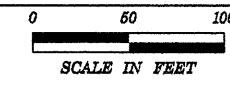


PROJECT REFERENCE NO.	SHEET NO.
U-2810	20

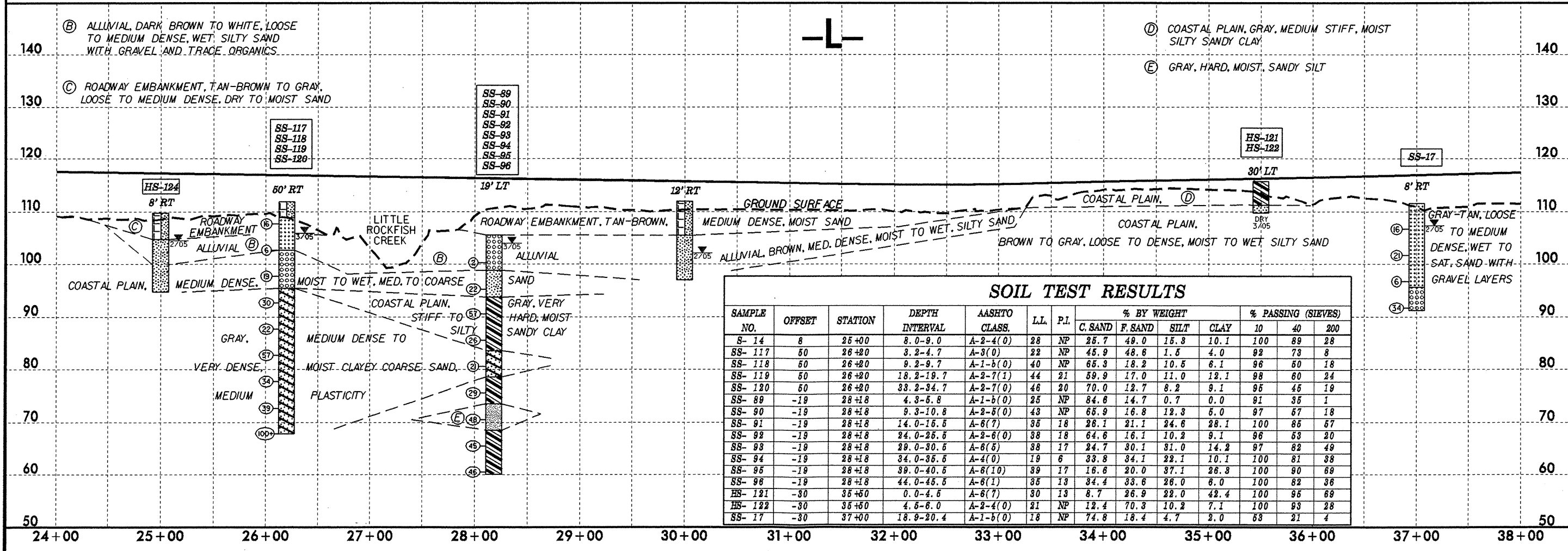
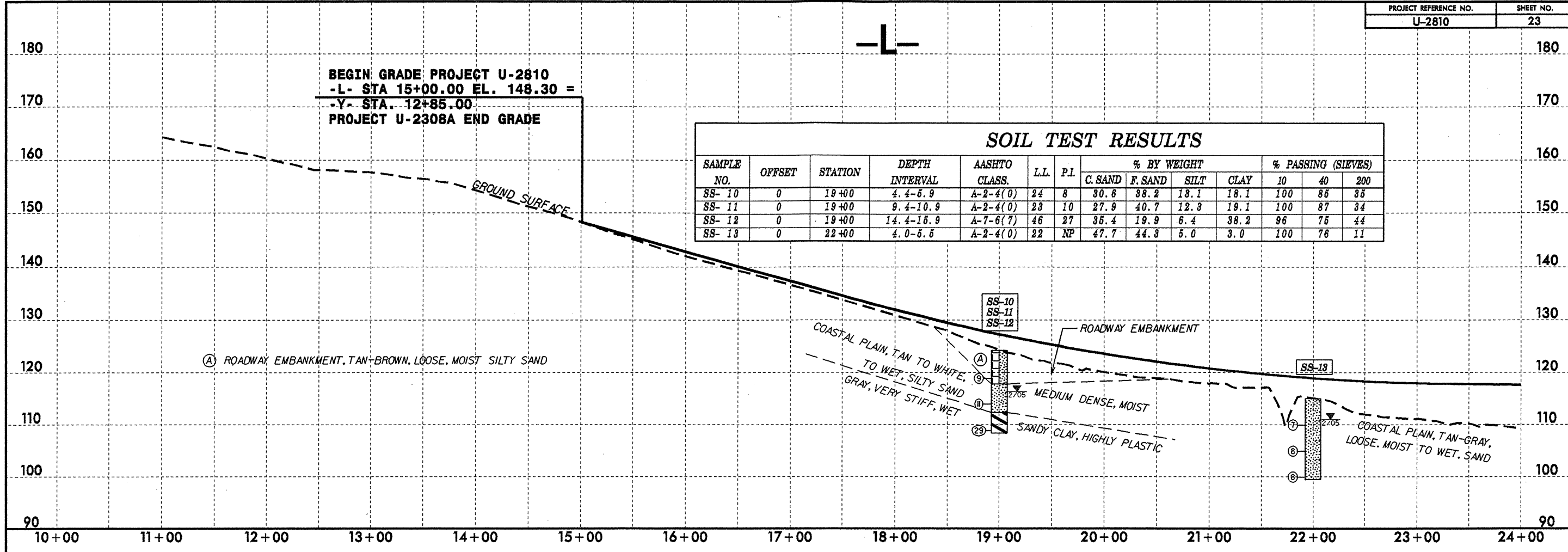
MATCH LINE 219 + 00 SEE SHEET 19

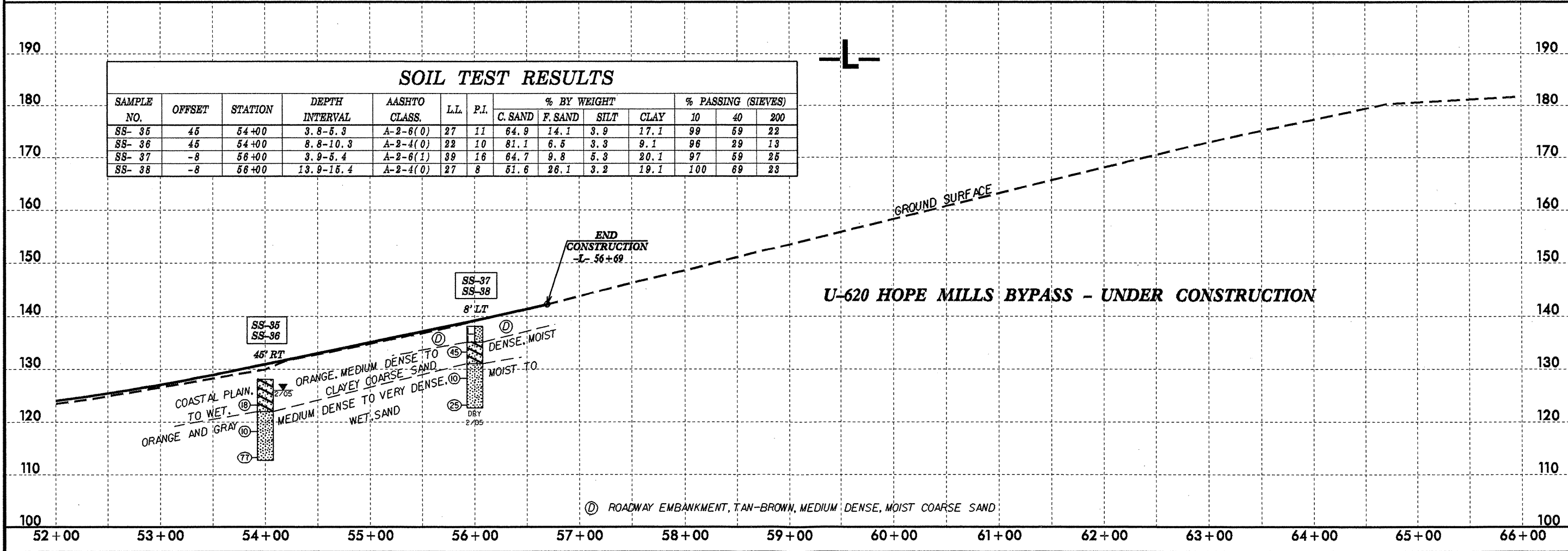
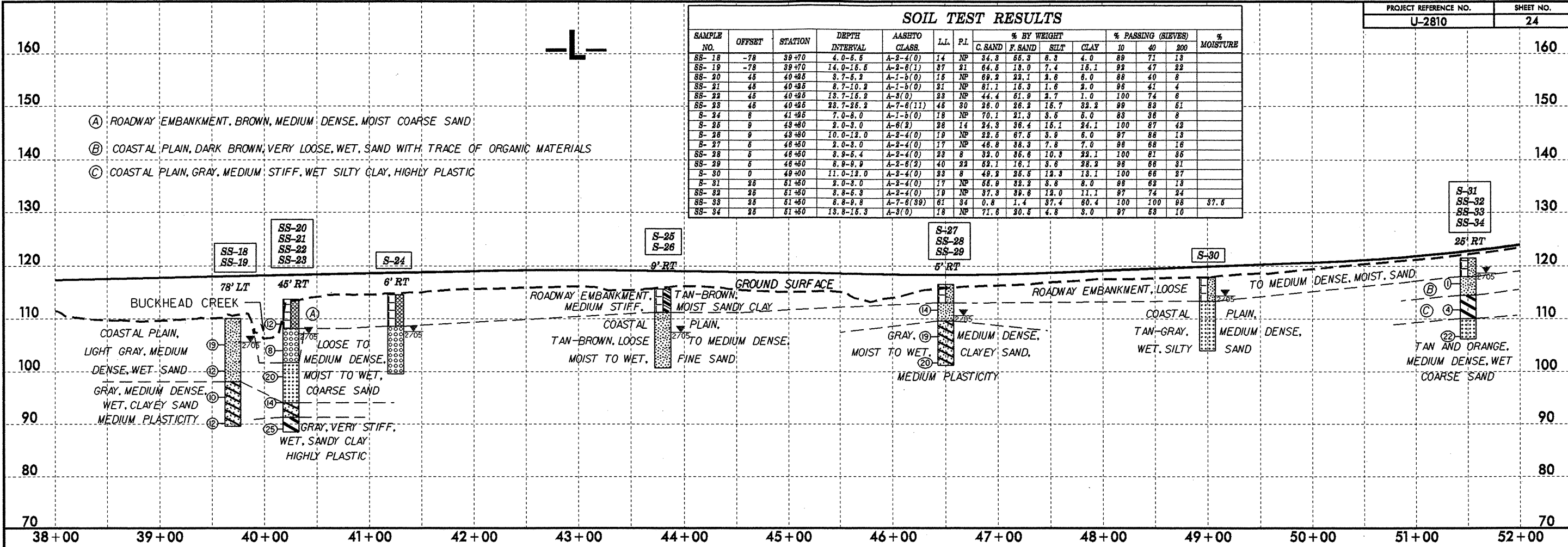
MATCH LINE 232 + 00 SEE SHEET 21





MATCH LINE -Y7- STA 11+50 SEE SHEET 12



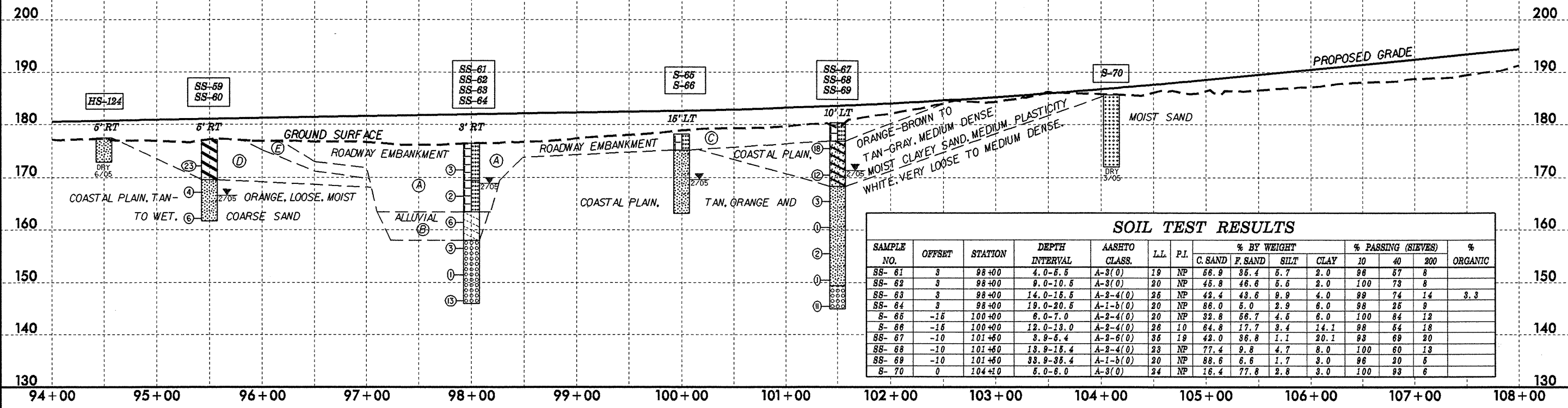


Ⓐ ROADWAY EMBANKMENT, TAN-BROWN, MEDIUM DENSE, MOIST COARSE SAND

- (A) ROADWAY EMBANKMENT, ORANGE-BROWN TO TAN-GRAY, VERY LOOSE, DRY TO WET SAND
- (B) ALLUVIAL, DARK BROWN, LOOSE ORGANIC SAND WITH WOOD DEBRIS
- (C) ROADWAY EMBANKMENT, TAN-BROWN TO ORANGE, MEDIUM DENSE, MOIST SAND
- (D) COASTAL PLAIN, GRAY AND ORANGE, VERY STIFF, MOIST, HIGHLY PLASTIC CLAY
- (E) COASTAL PLAIN, TAN, LOOSE, MOIST SAND

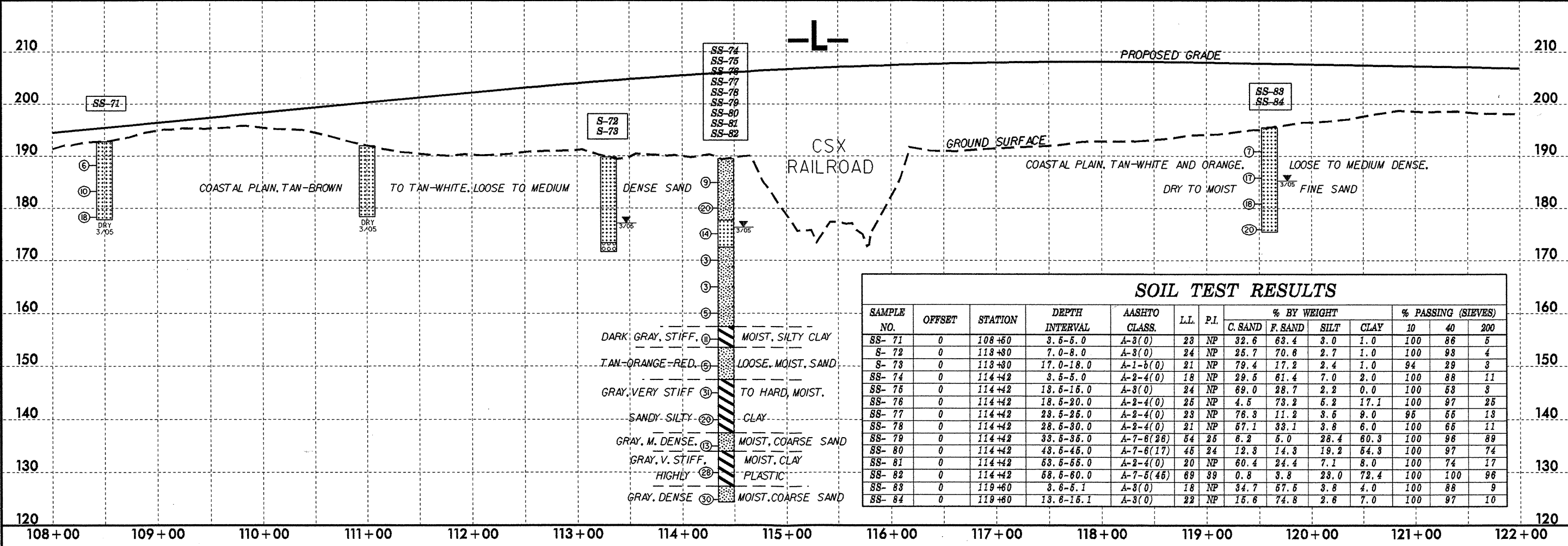
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
HS-124	5	94+50	3.0-4.5	A-2-4(0)	23	3	52.0	32.1	1.7	14.1	96	68	16
SS-59	5	95+50	3.9-4.9	A-7-6(48)	68	42	1.0	0.8	21.8	76.4	100	99	98
SS-60	5	95+50	8.9-10.4	A-2-4(0)	24	NP	63.1	24.1	4.7	8.0	100	70	13



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200	
SS-61	3	98+00	4.0-5.5	A-3(0)	19	NP	56.9	35.4	5.7	2.0	96	57	8	
SS-62	3	98+00	9.0-10.5	A-3(0)	20	NP	45.8	46.6	5.6	2.0	100	73	8	
SS-63	3	98+00	14.0-16.5	A-2-4(0)	26	NP	42.4	43.6	9.9	4.0	99	74	14	3.3
SS-64	3	98+00	19.0-20.5	A-1-b(0)	20	NP	66.0	5.0	2.9	6.0	98	25	9	
S-65	-15	100+00	6.0-7.0	A-2-4(0)	20	NP	32.8	56.7	4.6	6.0	100	84	12	
S-66	-15	100+00	12.0-13.0	A-2-4(0)	26	10	64.8	17.7	3.4	14.1	98	54	18	
SS-67	-10	101+50	3.9-5.4	A-2-6(0)	36	19	42.0	36.8	1.1	20.1	98	69	20	
SS-68	-10	101+50	13.9-16.4	A-2-4(0)	23	NP	77.4	9.8	4.7	8.0	100	60	13	
SS-69	-10	101+50	33.9-35.4	A-1-b(0)	20	NP	88.6	6.6	1.7	3.0	96	20	5	
S-70	0	104+10	5.0-6.0	A-3(0)	24	NP	16.4	77.8	2.8	3.0	100	93	6	

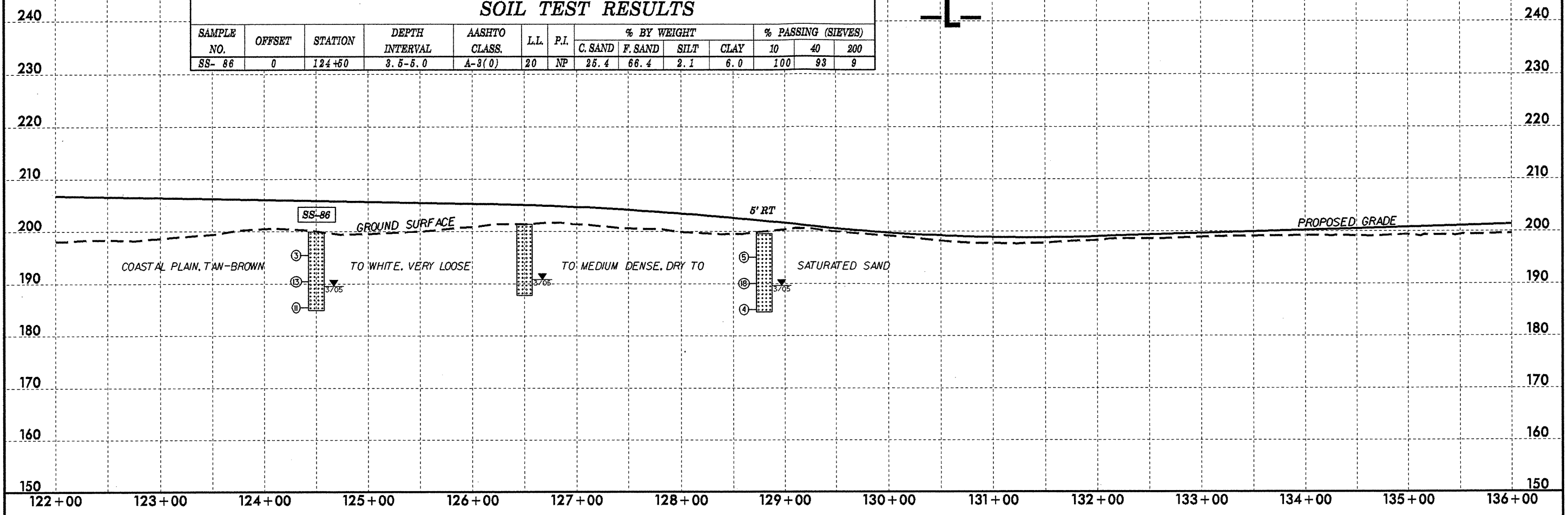


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
SS-71	0	108+50	3.5-5.0	A-3(0)	23	NP	32.6	63.4	3.0	1.0	100	86	5
S-72	0	113+30	7.0-8.0	A-3(0)	24	NP	25.7	70.6	2.7	1.0	100	98	4
S-73	0	113+30	17.0-18.0	A-1-b(0)	21	NP	79.4	17.2	2.4	1.0	94	29	3
SS-74	0	114+42	3.5-5.0	A-2-4(0)	18	NP	29.5	61.4	7.0	2.0	100	88	11
SS-75	0	114+42	18.5-19.0	A-3(0)	24	NP	69.0	28.7	2.2	0.0	100	53	3
SS-76	0	114+42	18.5-20.0	A-2-4(0)	25	NP	4.5	73.2	5.2	17.1	100	97	25
SS-77	0	114+42	23.5-25.0	A-2-4(0)	23	NP	78.3	11.2	3.6	9.0	95	55	13
SS-78	0	114+42	28.5-30.0	A-2-4(0)	21	NP	57.1	33.1	3.8	6.0	100	65	11
SS-79	0	114+42	33.5-35.0	A-7-6(28)	54	25	8.2	5.0	28.4	60.3	100	98	89
SS-80	0	114+42	43.5-45.0	A-7-6(17)	45	24	12.3	14.3	19.2	64.3	100	97	74
SS-81	0	114+42	53.5-55.0	A-2-4(0)	20	NP	60.4	24.4	7.1	8.0	100	74	17
SS-82	0	114+42	58.5-60.0	A-7-5(45)	69	39	0.8	3.8	23.0	72.4	100	100	96
SS-83	0	119+50	3.5-5.1	A-3(0)	18	NP	34.7	57.5	3.8	4.0	100	88	9
SS-84	0	119+50	13.5-15.1	A-3(0)	22	NP	15.6	74.8	2.6	7.0	100	97	10

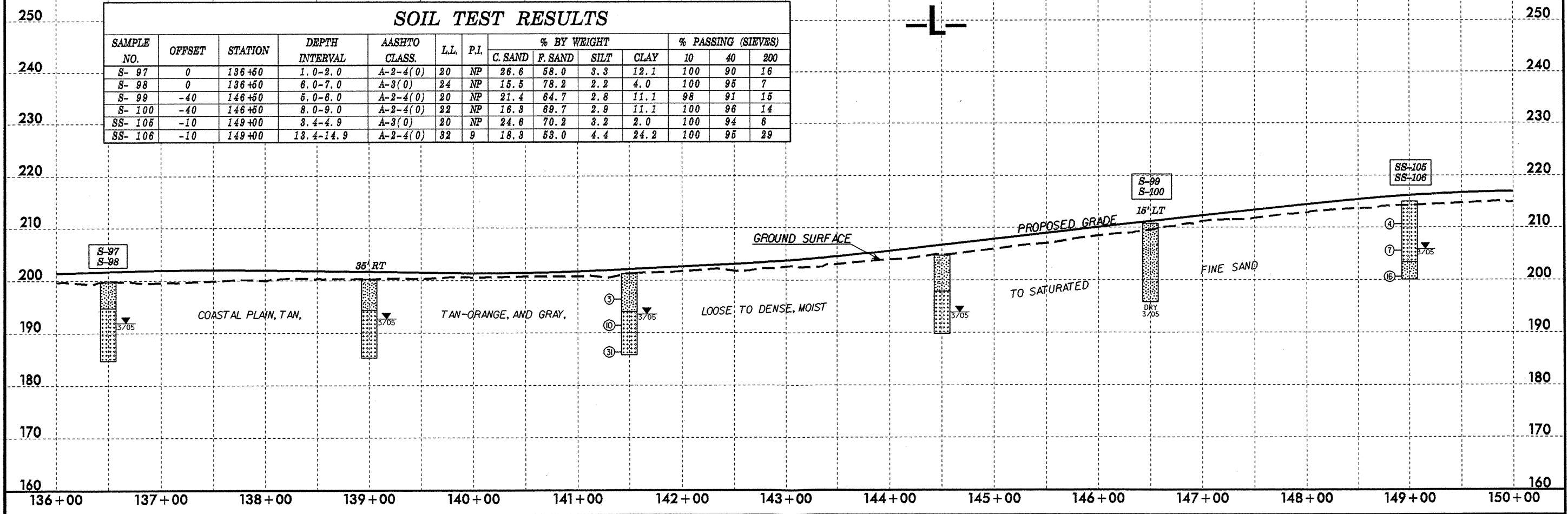
SOIL TEST RESULTS

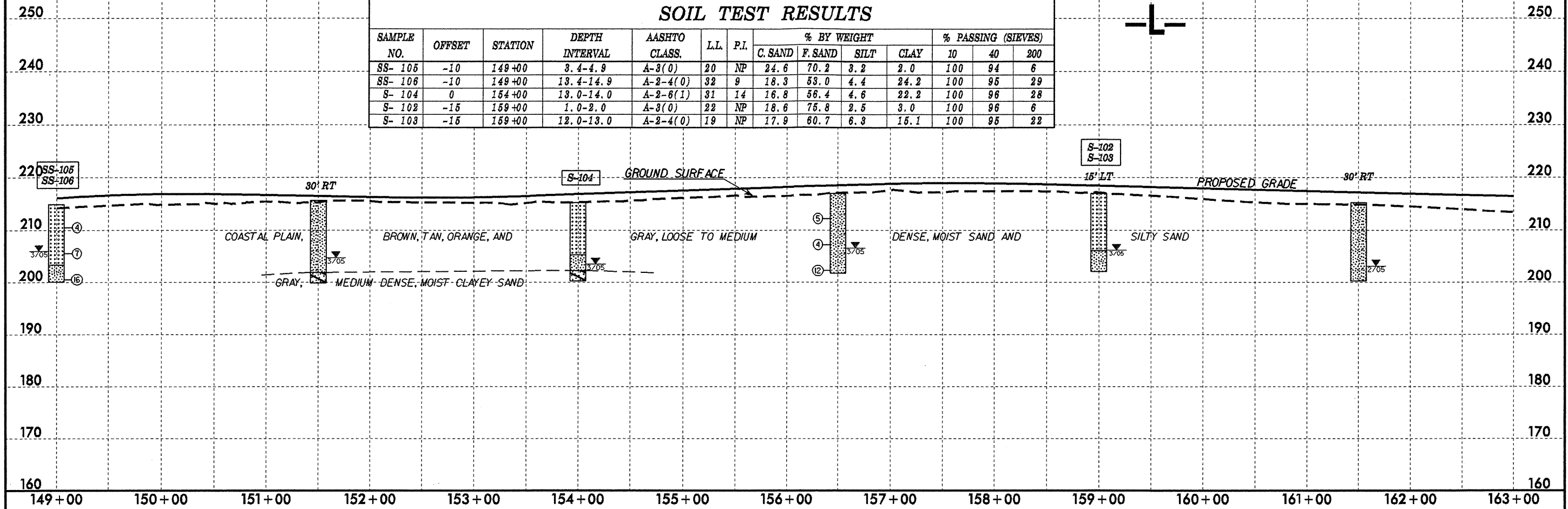
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
SS-86	0	124+50	3.5-5.0	A-3(0)	20	NP	25.4	66.4	2.1	6.0	100	93	9



SOIL TEST RESULTS

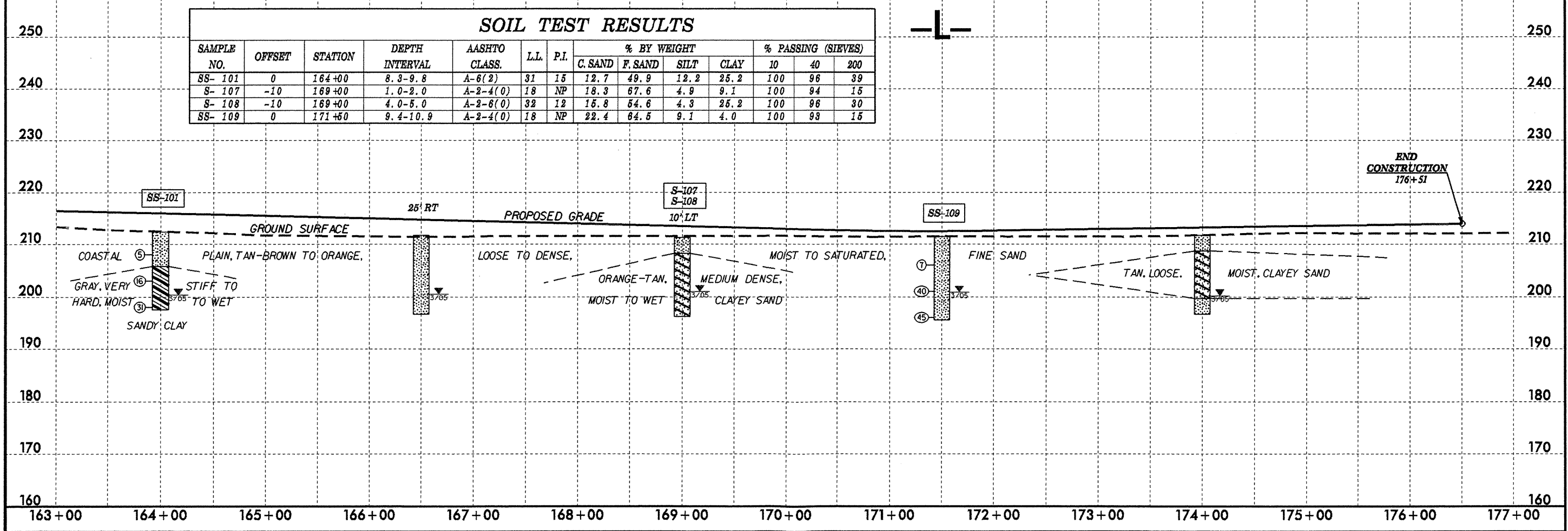
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
S-97	0	136+50	1.0-2.0	A-2-4(0)	20	NP	26.6	58.0	3.3	12.1	100	90	16
S-98	0	136+50	6.0-7.0	A-3(0)	24	NP	15.5	78.2	2.2	4.0	100	95	7
S-99	-40	146+50	5.0-6.0	A-2-4(0)	20	NP	21.4	64.7	2.8	11.1	98	91	15
S-100	-40	146+50	8.0-9.0	A-2-4(0)	22	NP	16.3	69.7	2.9	11.1	100	96	14
SS-105	-10	149+00	3.4-4.9	A-3(0)	20	NP	24.6	70.2	3.2	2.0	100	94	6
SS-106	-10	149+00	13.4-14.9	A-2-4(0)	32	9	18.3	53.0	4.4	24.2	100	95	29





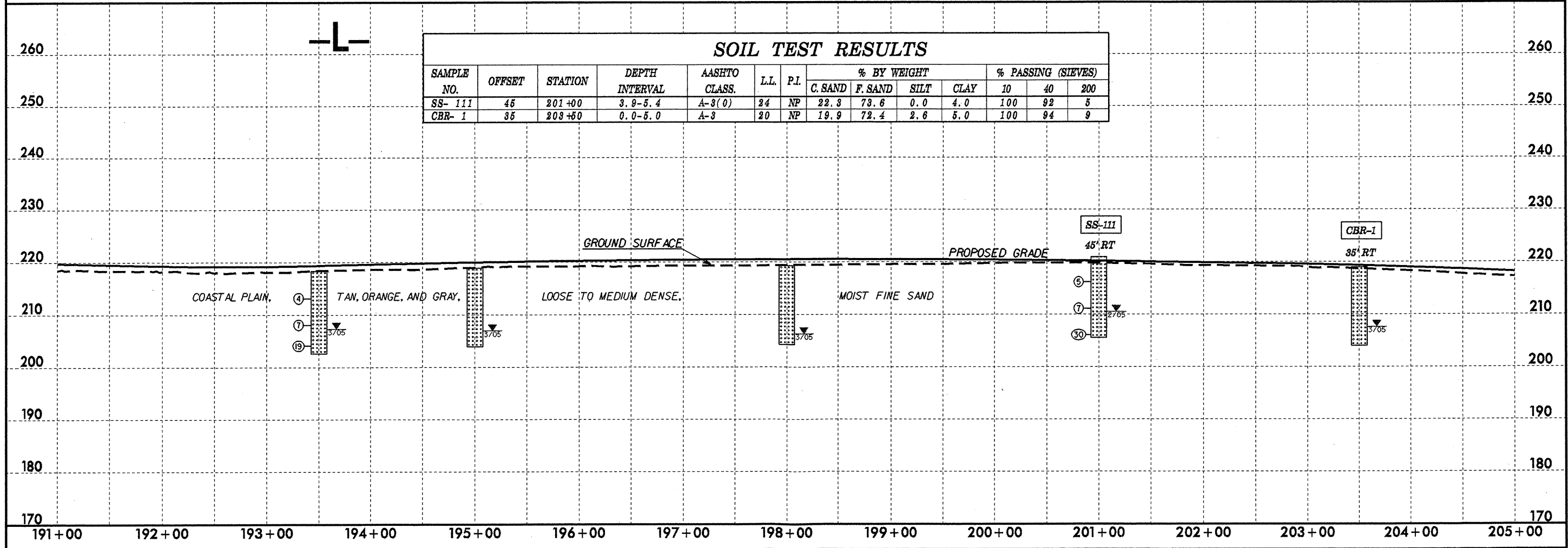
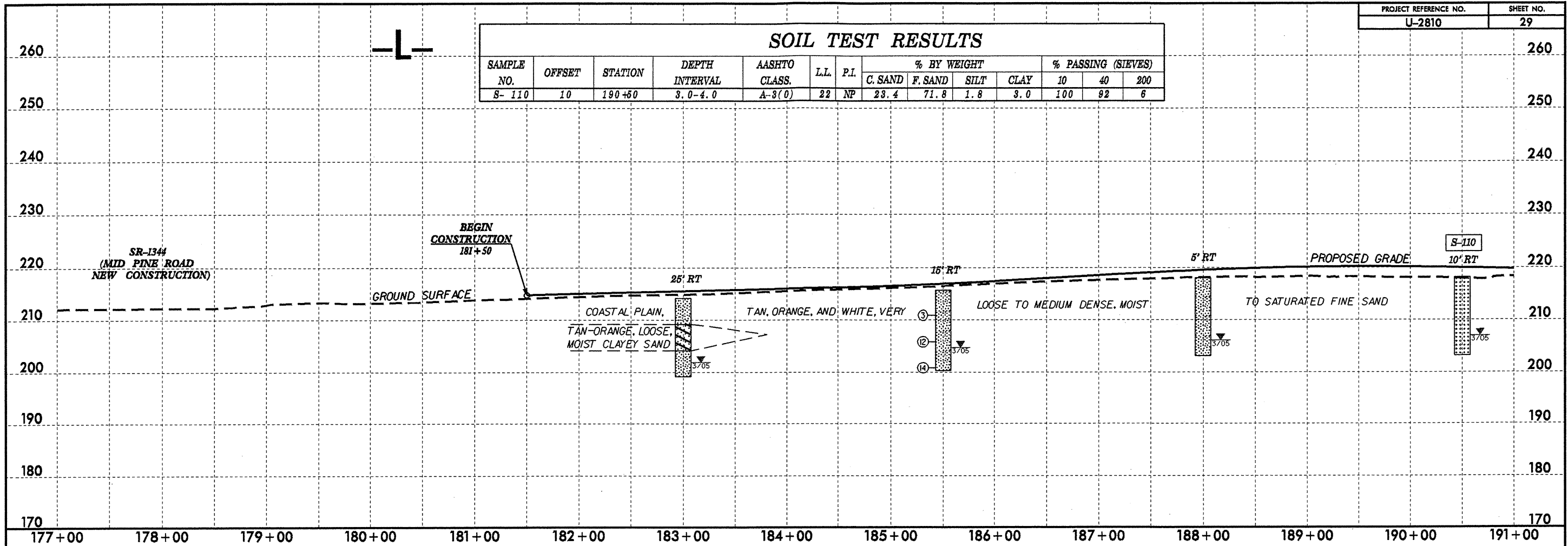
SOIL TEST RESULTS

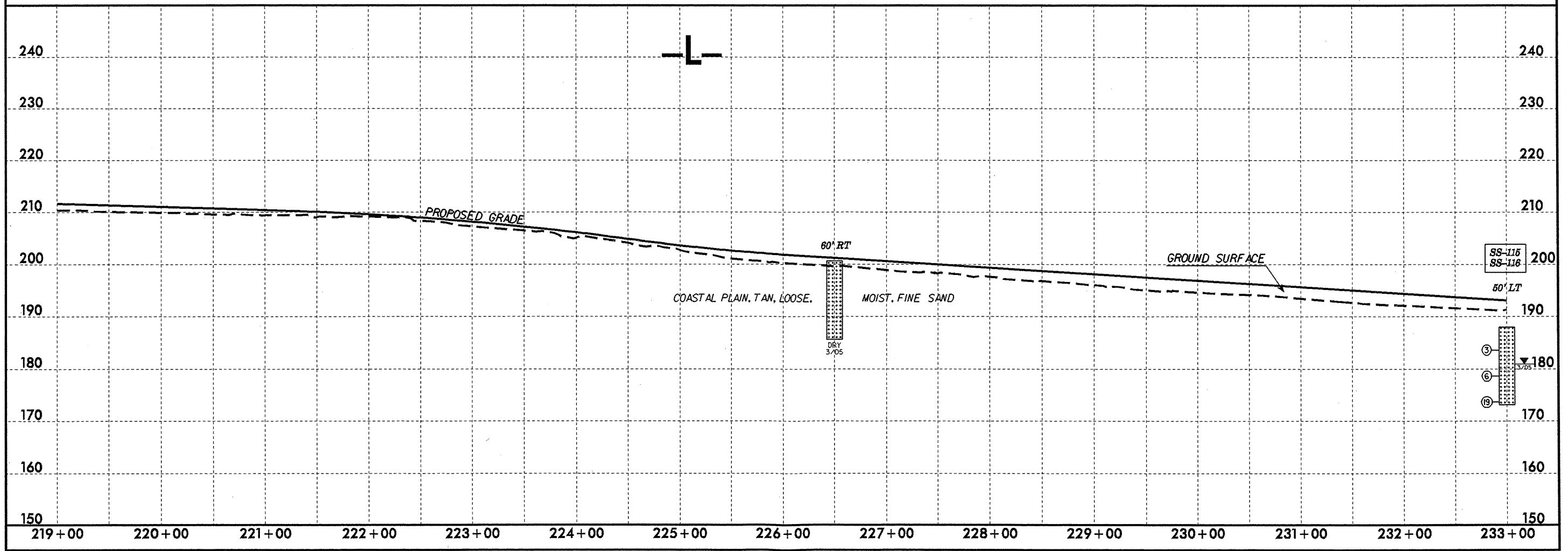
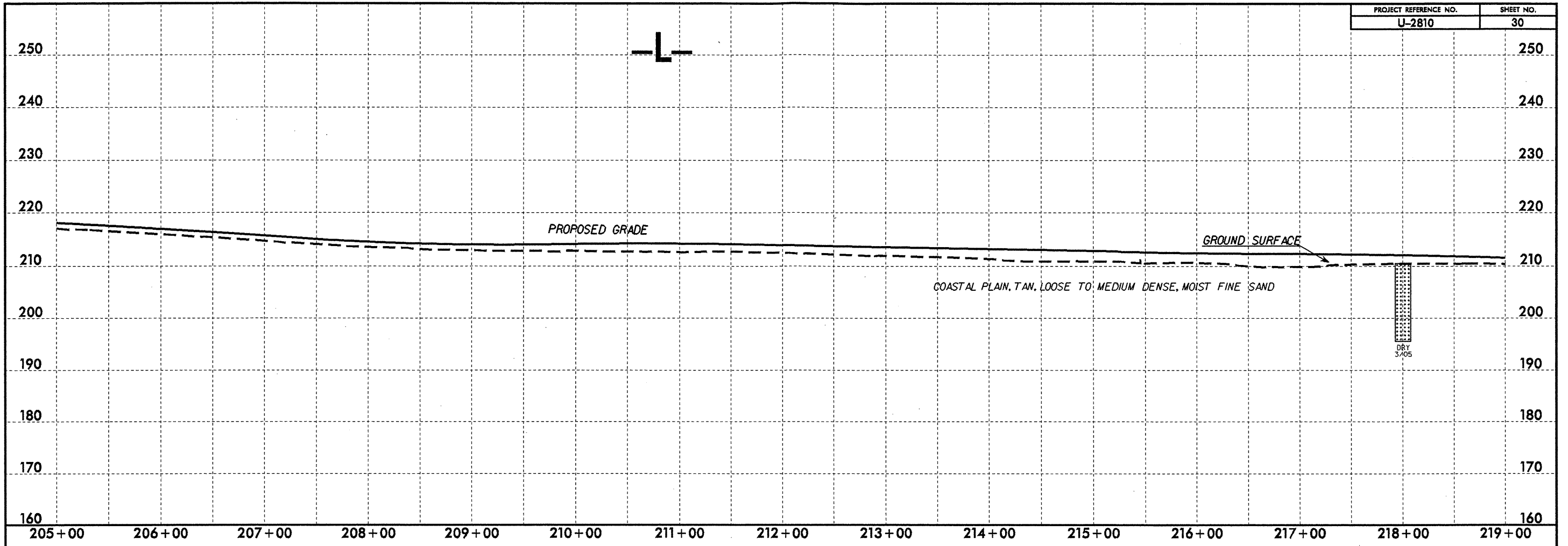
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL.	P.I.	% BY WEIGHT				% PASSING (SIEVES)		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
SS-105	-10	149+00	3.4-4.9	A-3(0)	20	NP	24.6	70.2	3.2	2.0	100	94	6
SS-106	-10	149+00	13.4-14.9	A-2-4(0)	32	9	18.3	53.0	4.4	24.2	100	95	29
S-104	0	154+00	13.0-14.0	A-2-6(1)	31	14	16.8	56.4	4.6	22.2	100	96	28
S-102	-15	159+00	1.0-2.0	A-3(0)	22	NP	18.6	75.8	2.5	3.0	100	96	6
S-103	-15	159+00	12.0-13.0	A-2-4(0)	19	NP	17.9	60.7	6.3	16.1	100	95	22



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL.	P.I.	% BY WEIGHT				% PASSING (SIEVES)		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
SS-101	0	164+00	8.3-9.8	A-6(2)	31	15	12.7	49.9	12.2	25.2	100	96	39
S-107	-10	169+00	1.0-2.0	A-2-4(0)	18	NP	18.3	67.6	4.9	9.1	100	94	15
S-108	-10	169+00	4.0-5.0	A-2-6(0)	32	12	15.8	54.6	4.3	25.2	100	96	30
SS-109	0	171+50	9.4-10.9	A-2-4(0)	18	NP	22.4	64.5	9.1	4.0	100	93	15





SOIL TEST RESULTS

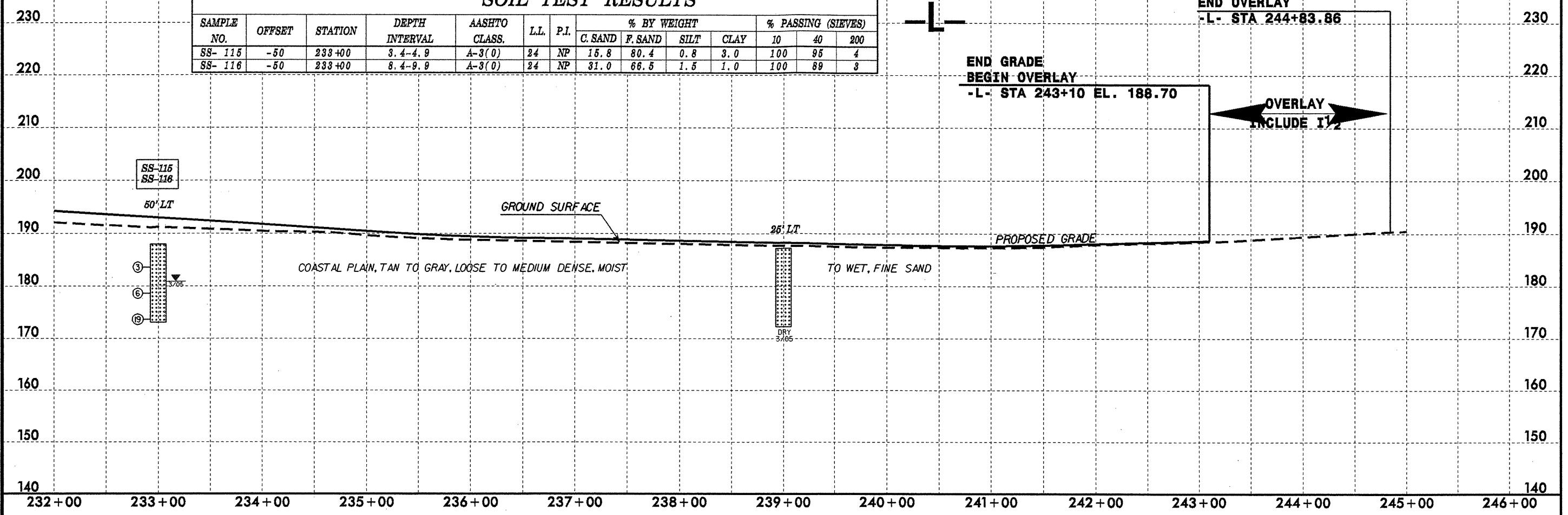
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
SS- 115	-50	233+00	3.4-4.9	A-3(0)	24	NP	15.8	80.4	0.8	3.0	100	95	4
SS- 116	-50	233+00	8.4-9.9	A-3(0)	24	NP	31.0	66.5	1.5	1.0	100	89	8

END PROJECT U-2810
 END OVERLAY
 -L- STA 244+83.86

PROJECT REFERENCE NO. U-2810	SHEET NO. 31
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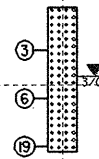
END GRADE
 BEGIN OVERLAY
 -L- STA 243+10 EL. 188.70

OVERLAY
 INCLUDE 1 1/2



SS-115
 SS-116

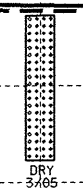
50' LT



GROUND SURFACE

COASTAL PLAIN, TAN TO GRAY, LOOSE TO MEDIUM DENSE, MOIST

26' LT



TO WET, FINE SAND

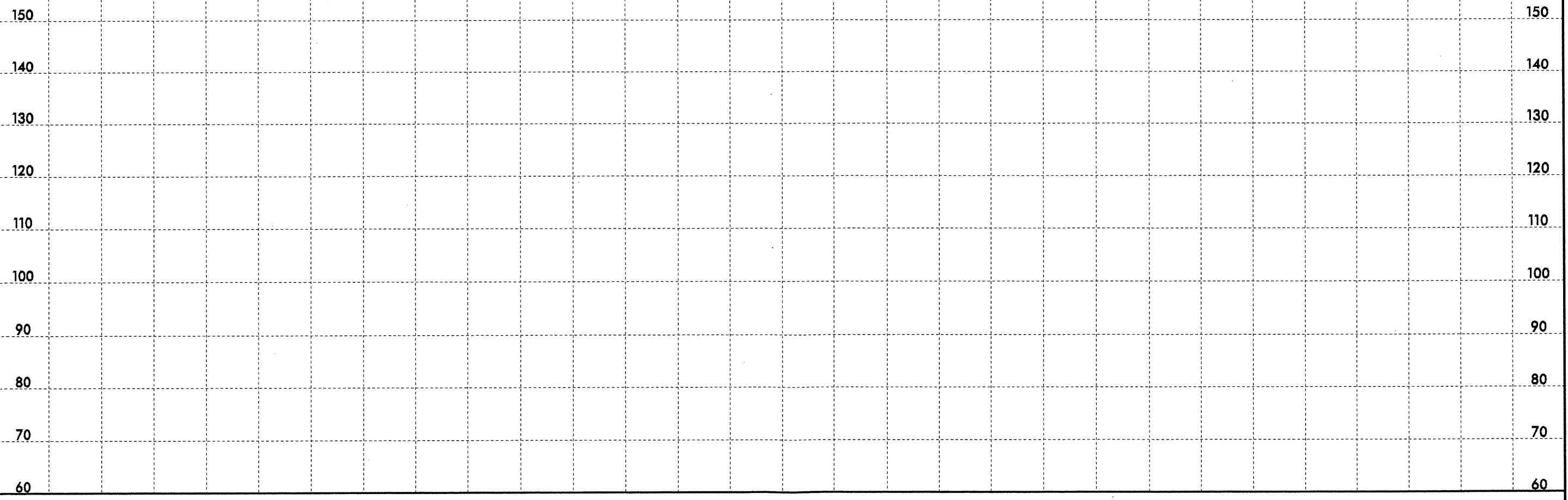
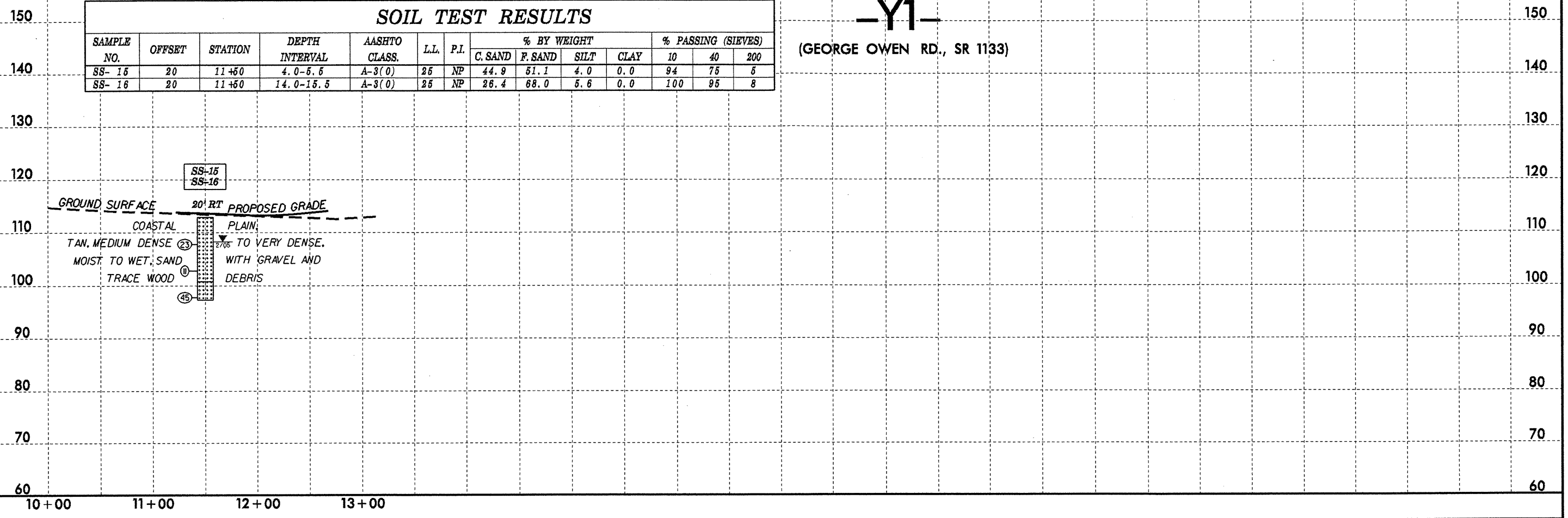
PROPOSED GRADE

232+00 233+00 234+00 235+00 236+00 237+00 238+00 239+00 240+00 241+00 242+00 243+00 244+00 245+00 246+00

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
SS- 15	20	11+50	4.0-5.5	A-3(0)	25	NP	44.9	51.1	4.0	0.0	94	75	5
SS- 16	20	11+50	14.0-15.5	A-3(0)	25	NP	28.4	68.0	5.6	0.0	100	95	8

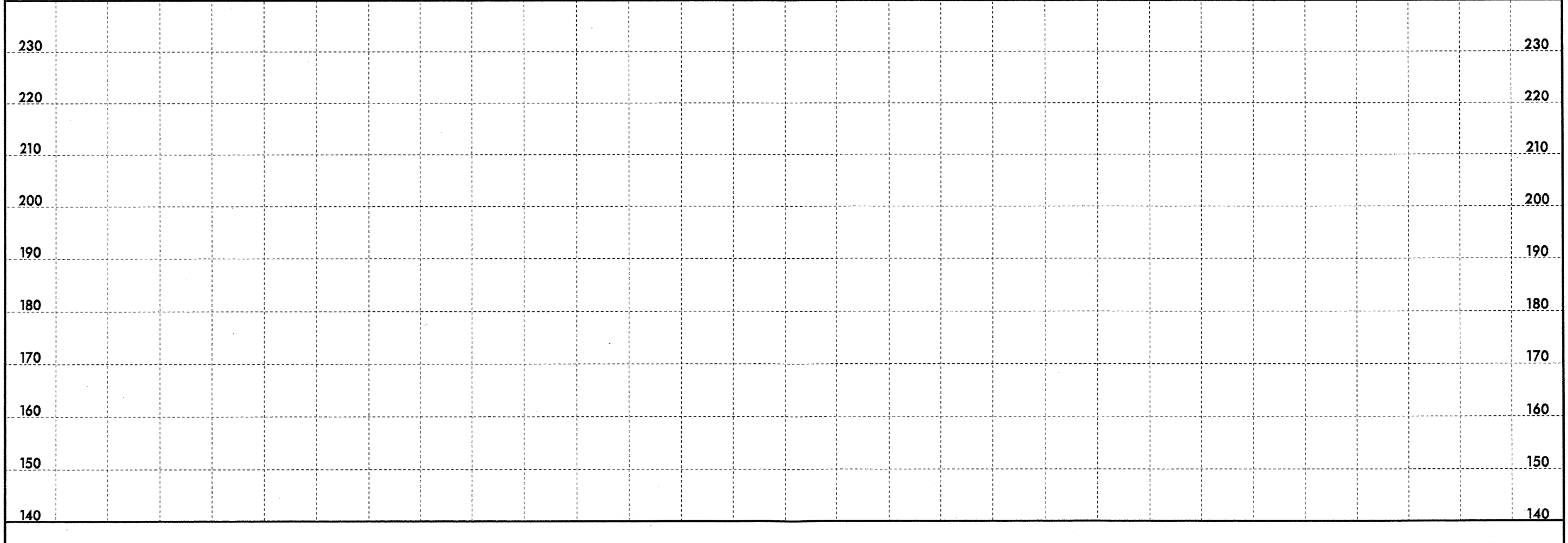
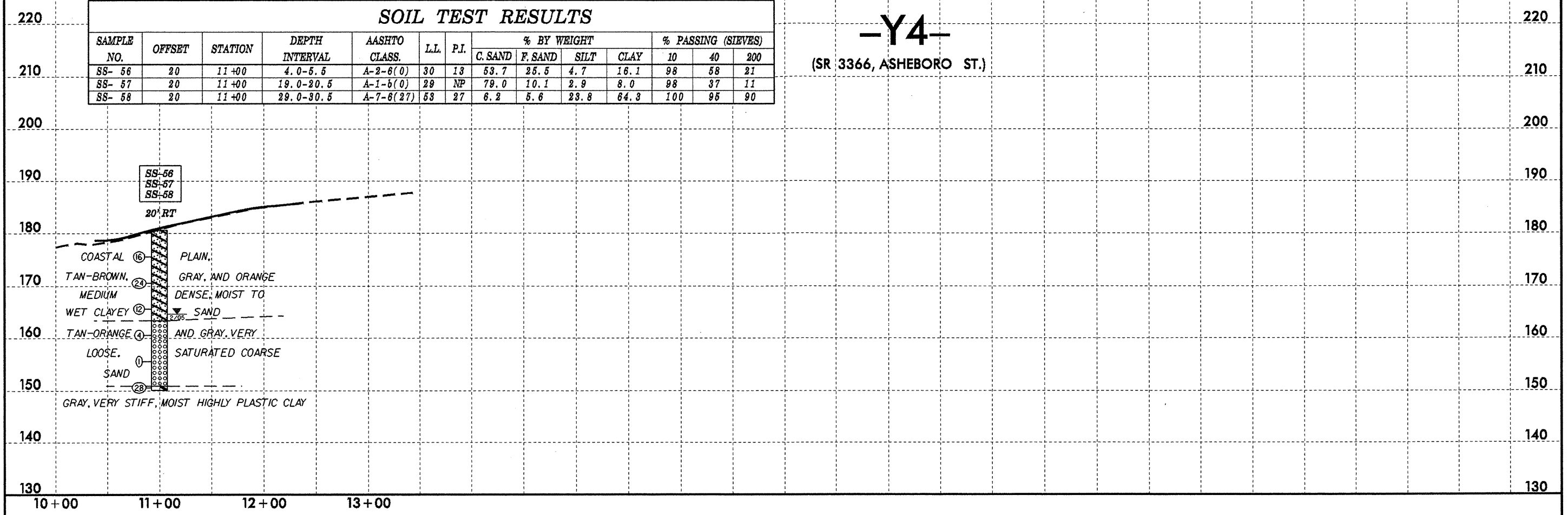
-Y1-
(GEORGE OWEN RD., SR 1133)



SOIL TEST RESULTS

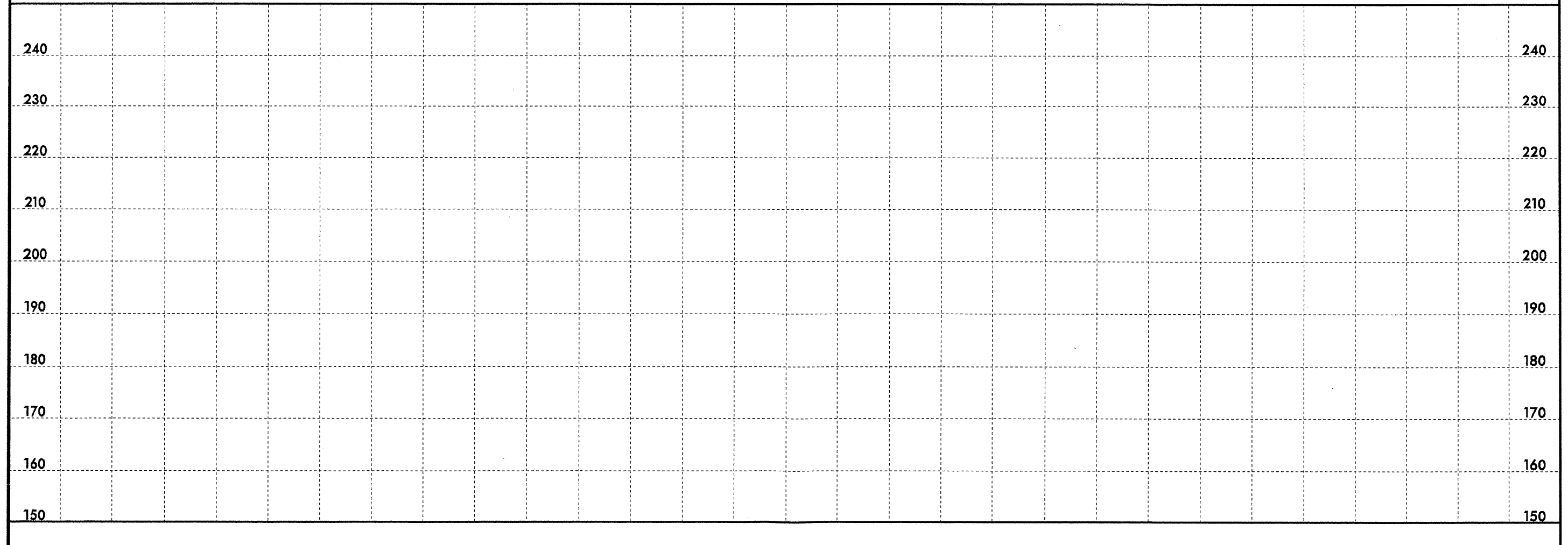
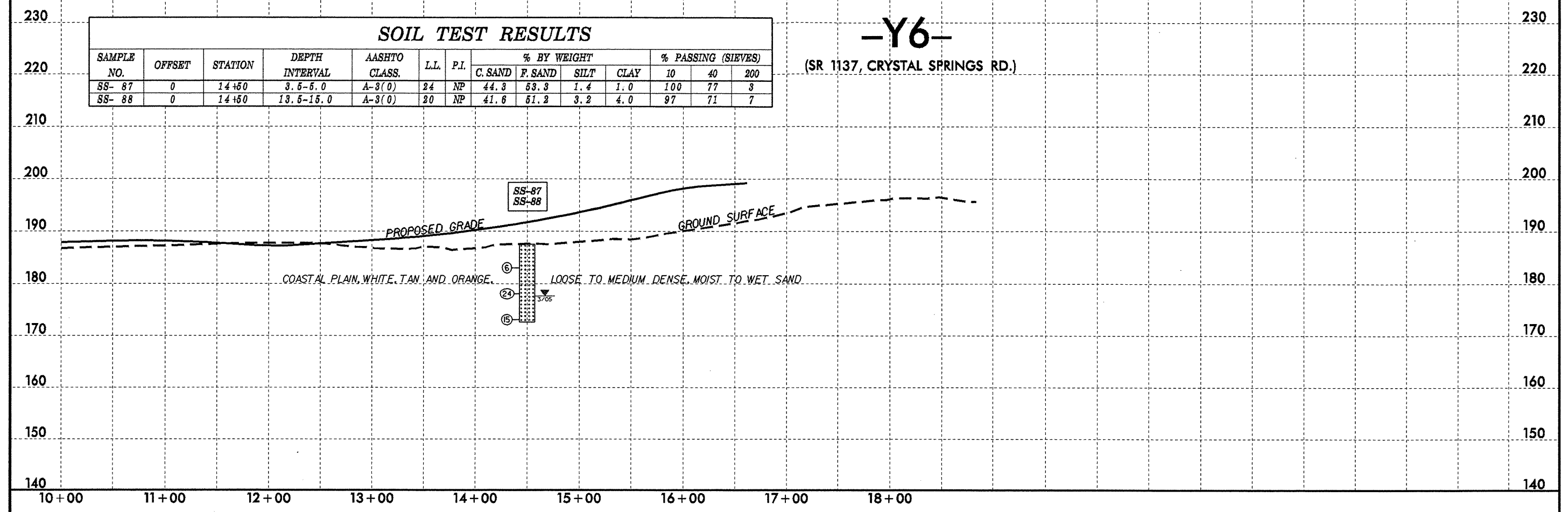
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
SS- 56	20	11+00	4.0-5.5	A-2-6(0)	30	13	53.7	25.5	4.7	16.1	98	58	21
SS- 57	20	11+00	19.0-20.5	A-1-5(0)	29	NP	79.0	10.1	2.9	8.0	98	37	11
SS- 58	20	11+00	29.0-30.5	A-7-6(27)	53	27	6.2	5.6	23.8	64.3	100	95	90

-Y4-
(SR 3366, ASHEBORO ST.)



SOIL TEST RESULTS													
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
SS- 87	0	14+50	3.5-5.0	A-3(0)	24	NP	44.3	53.3	1.4	1.0	100	77	3
SS- 88	0	14+50	13.5-15.0	A-3(0)	20	NP	41.6	51.2	3.2	4.0	97	71	7

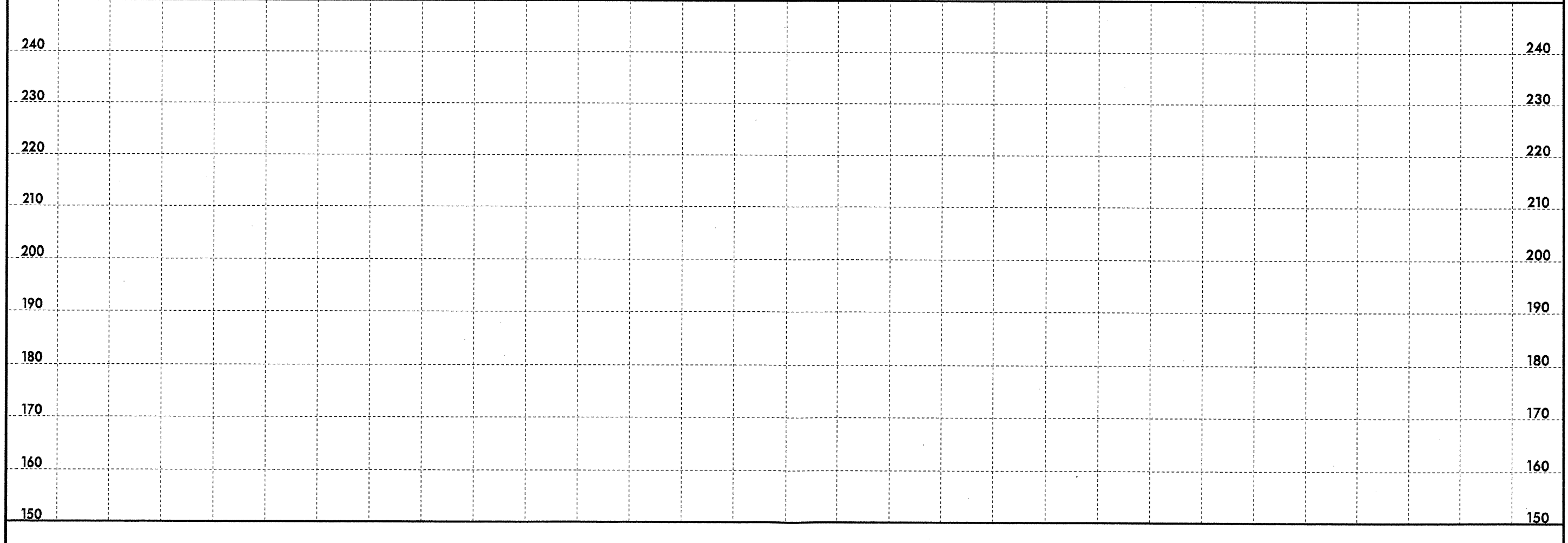
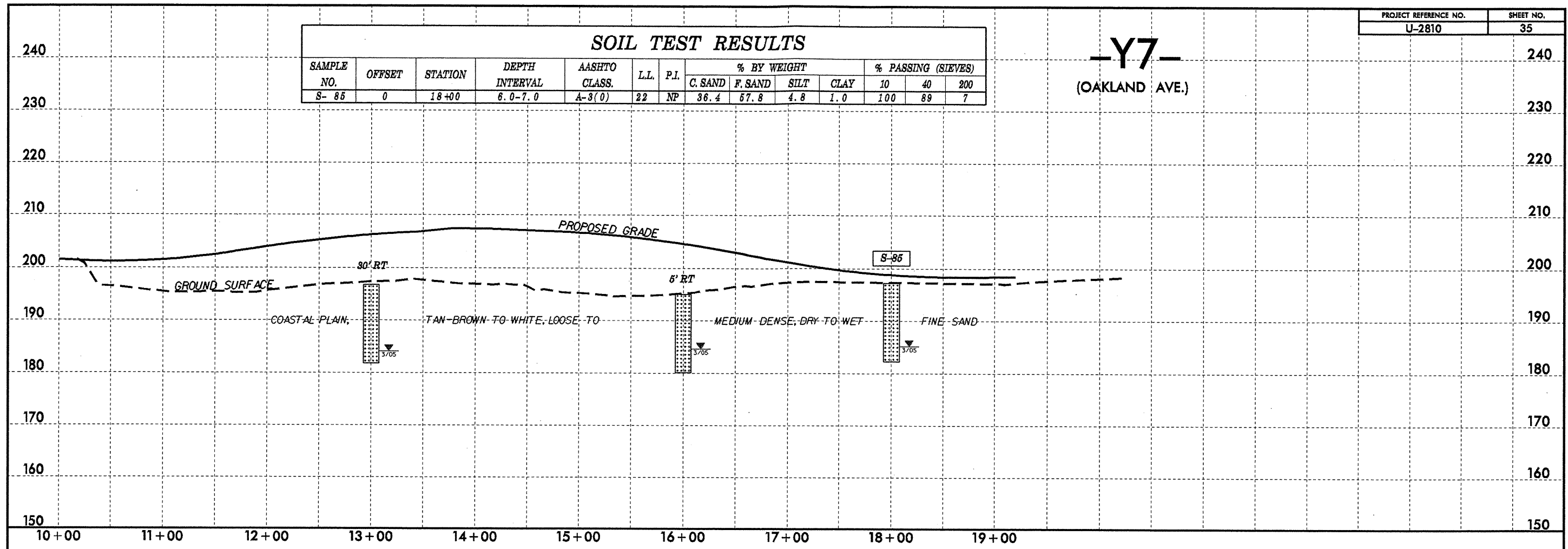
-Y6-
(SR 1137, CRYSTAL SPRINGS RD.)



SOIL TEST RESULTS

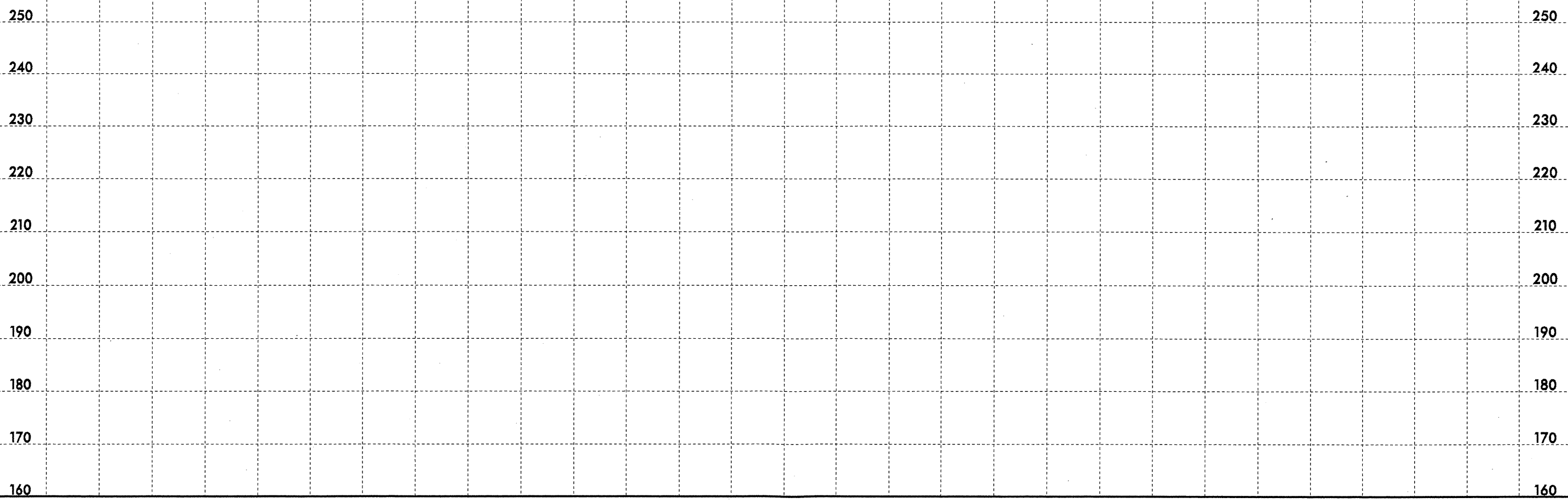
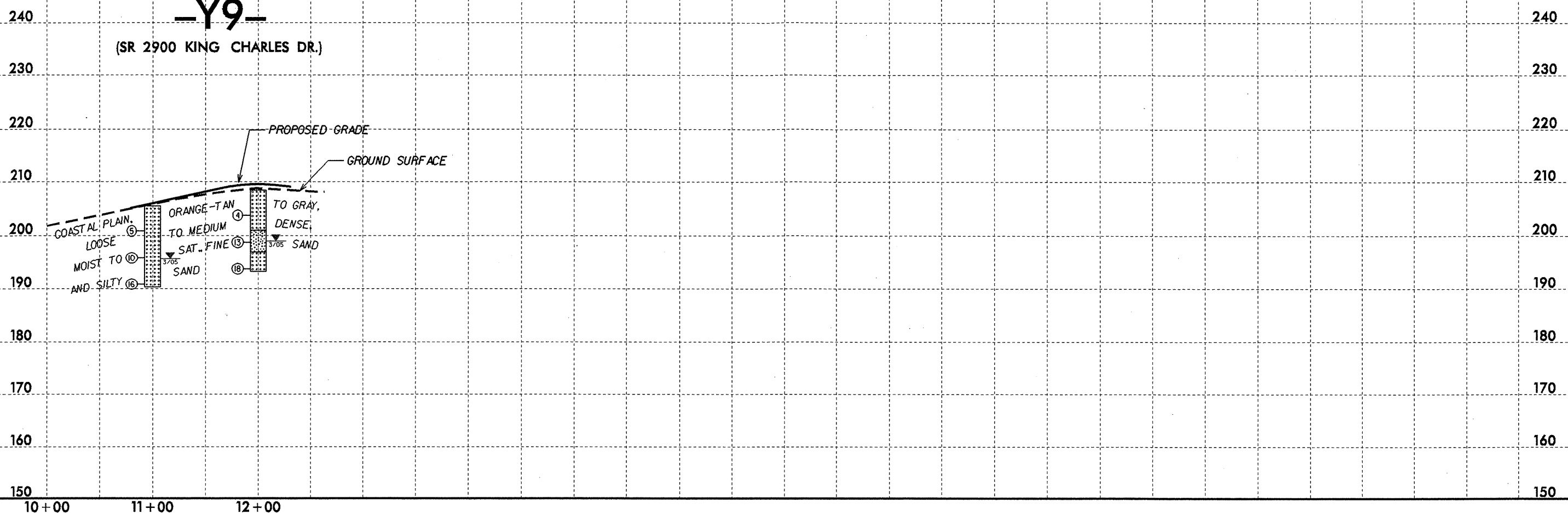
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
S- 85	0	18+00	6.0-7.0	A-3(0)	22	NP	36.4	57.8	4.8	1.0	100	89	7

-Y7-
(OAKLAND AVE.)



-Y9-

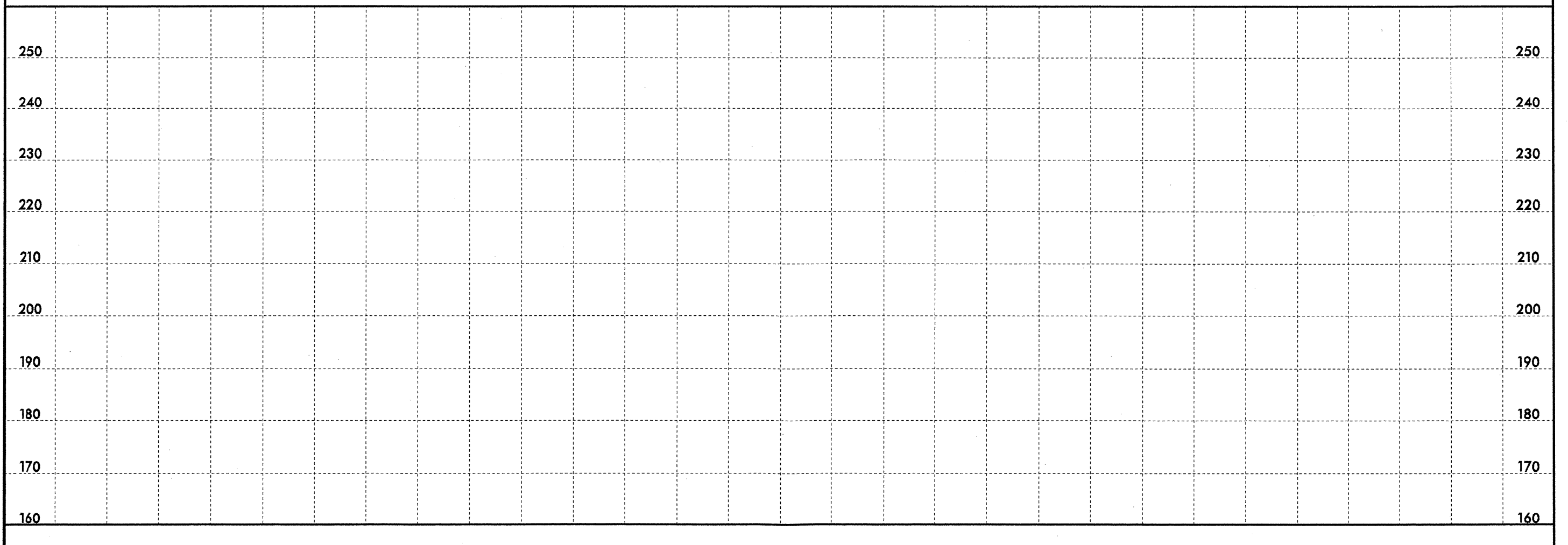
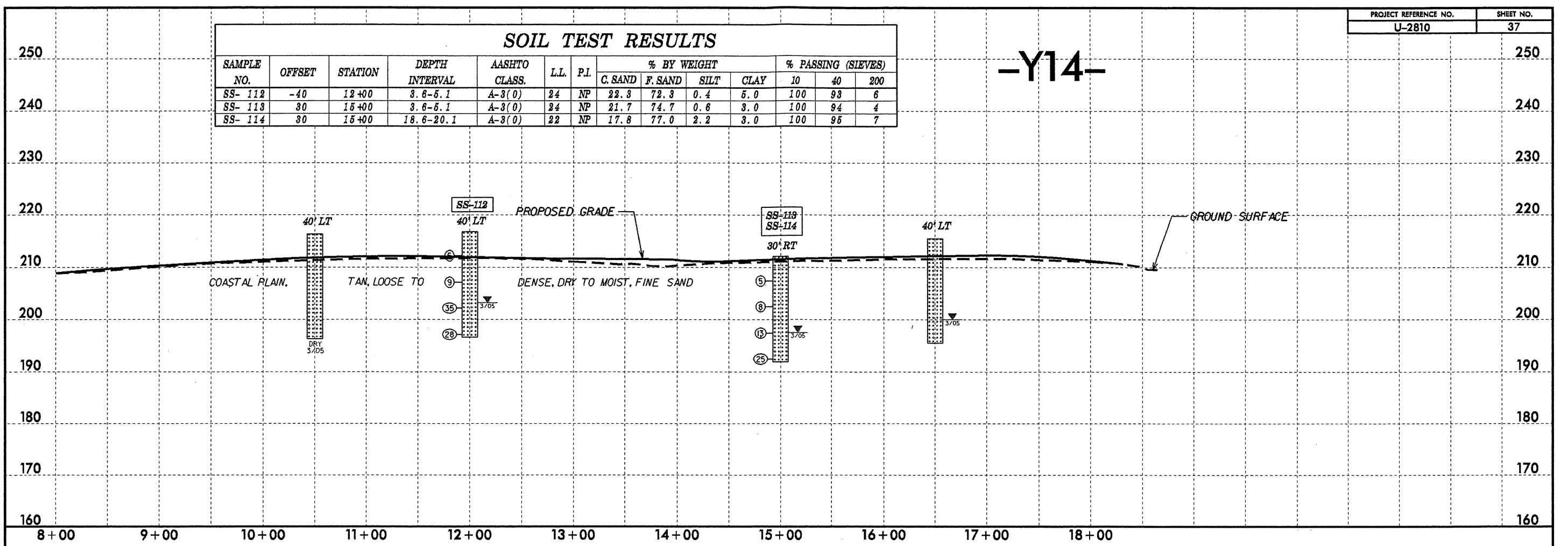
(SR 2900 KING CHARLES DR.)



SOIL TEST RESULTS

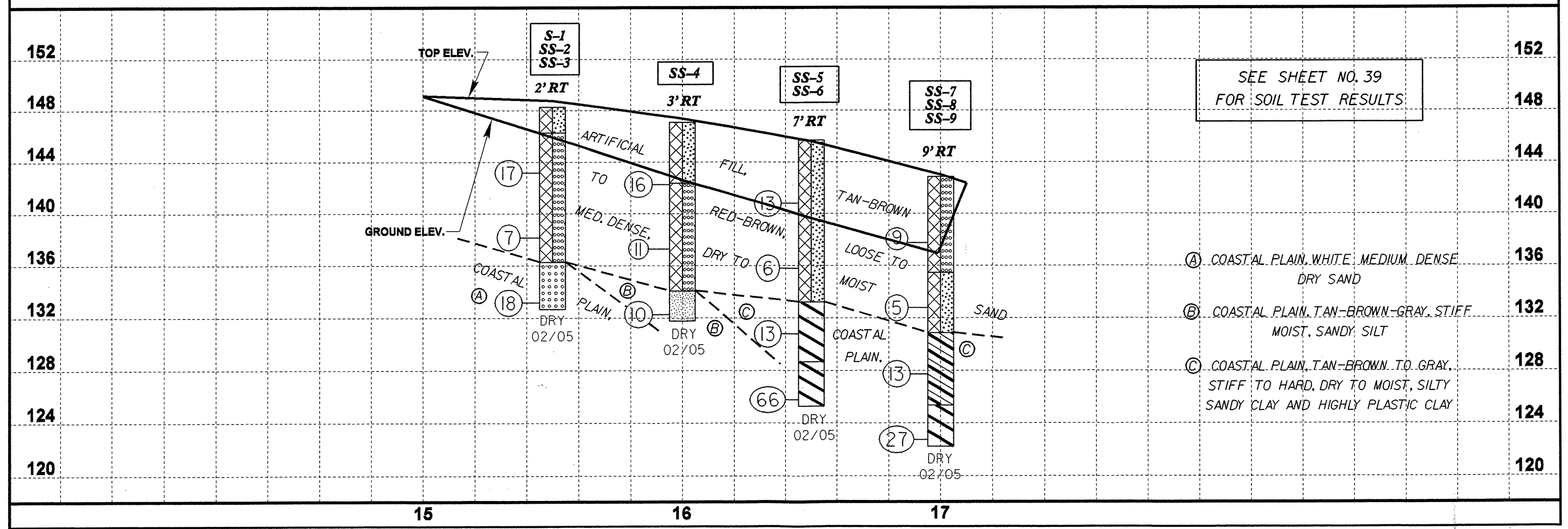
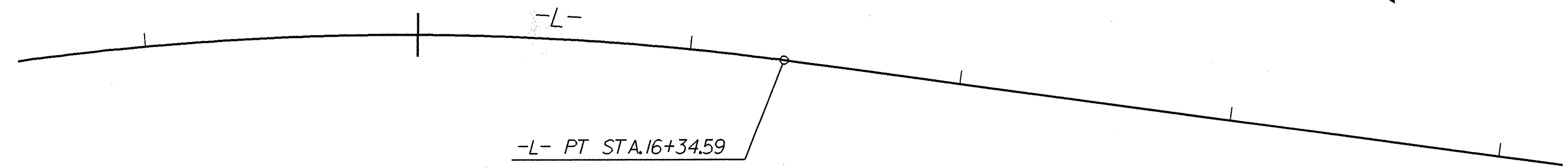
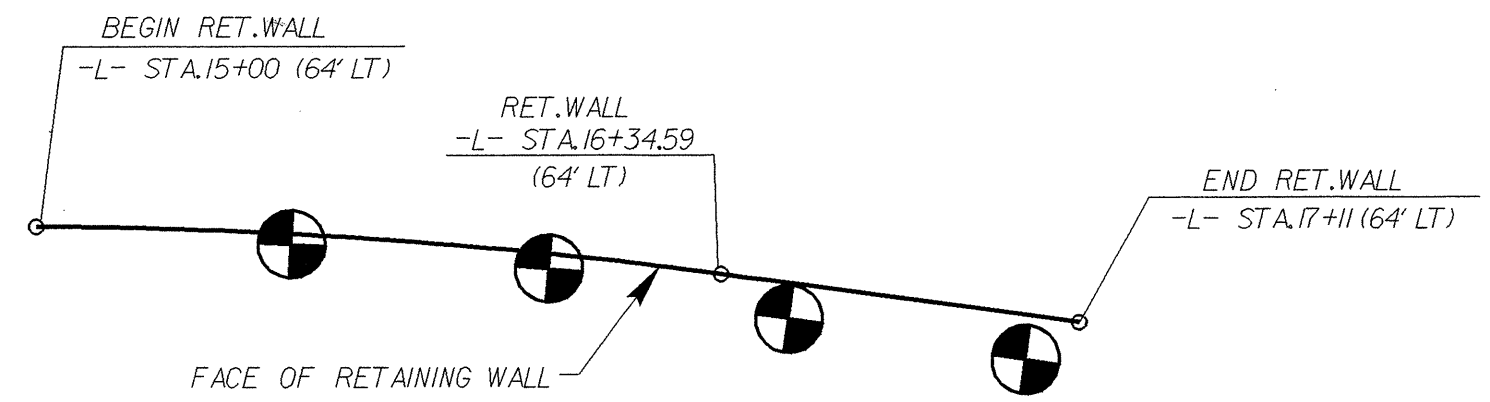
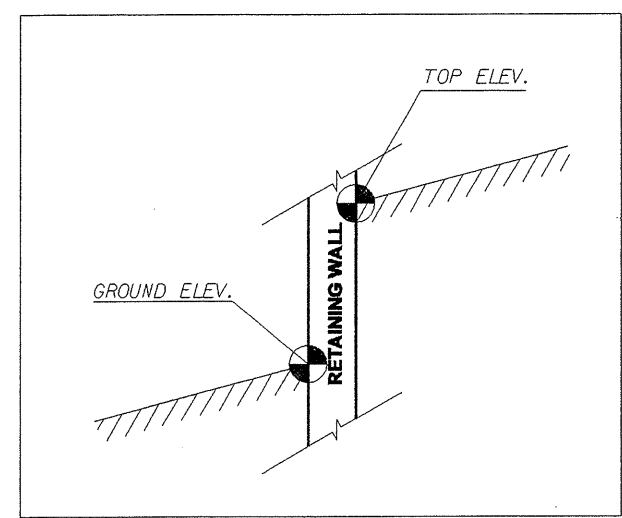
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
SS-112	-40	12+00	3.6-5.1	A-3(0)	24	NP	22.3	72.3	0.4	5.0	100	93	6
SS-113	30	15+00	3.6-5.1	A-3(0)	24	NP	21.7	74.7	0.6	3.0	100	94	4
SS-114	30	15+00	18.6-20.1	A-3(0)	22	NP	17.8	77.0	2.2	3.0	100	95	7

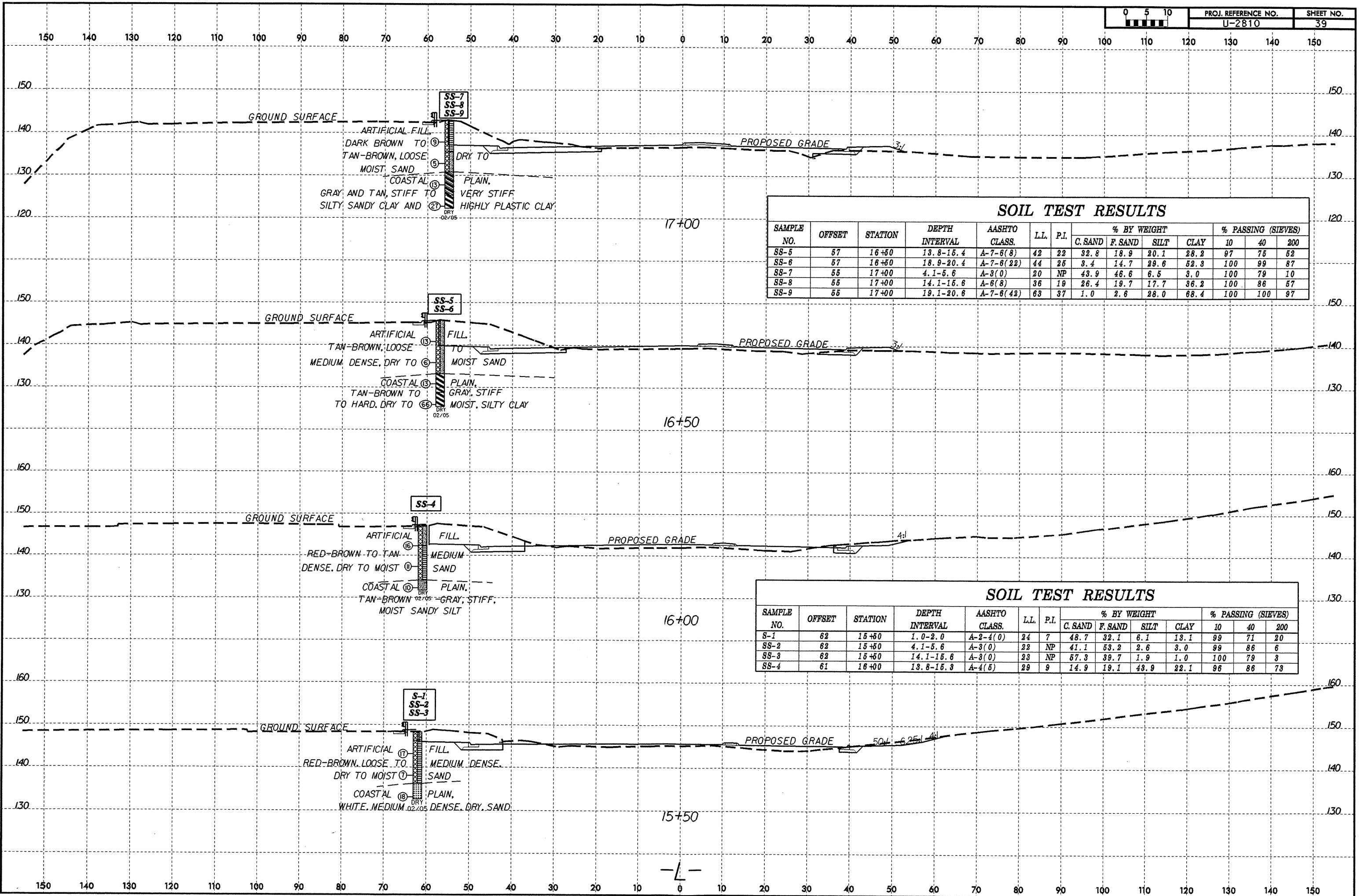
-Y14-



15

RETAINING WALL ENVELOPE





SOIL TEST RESULTS

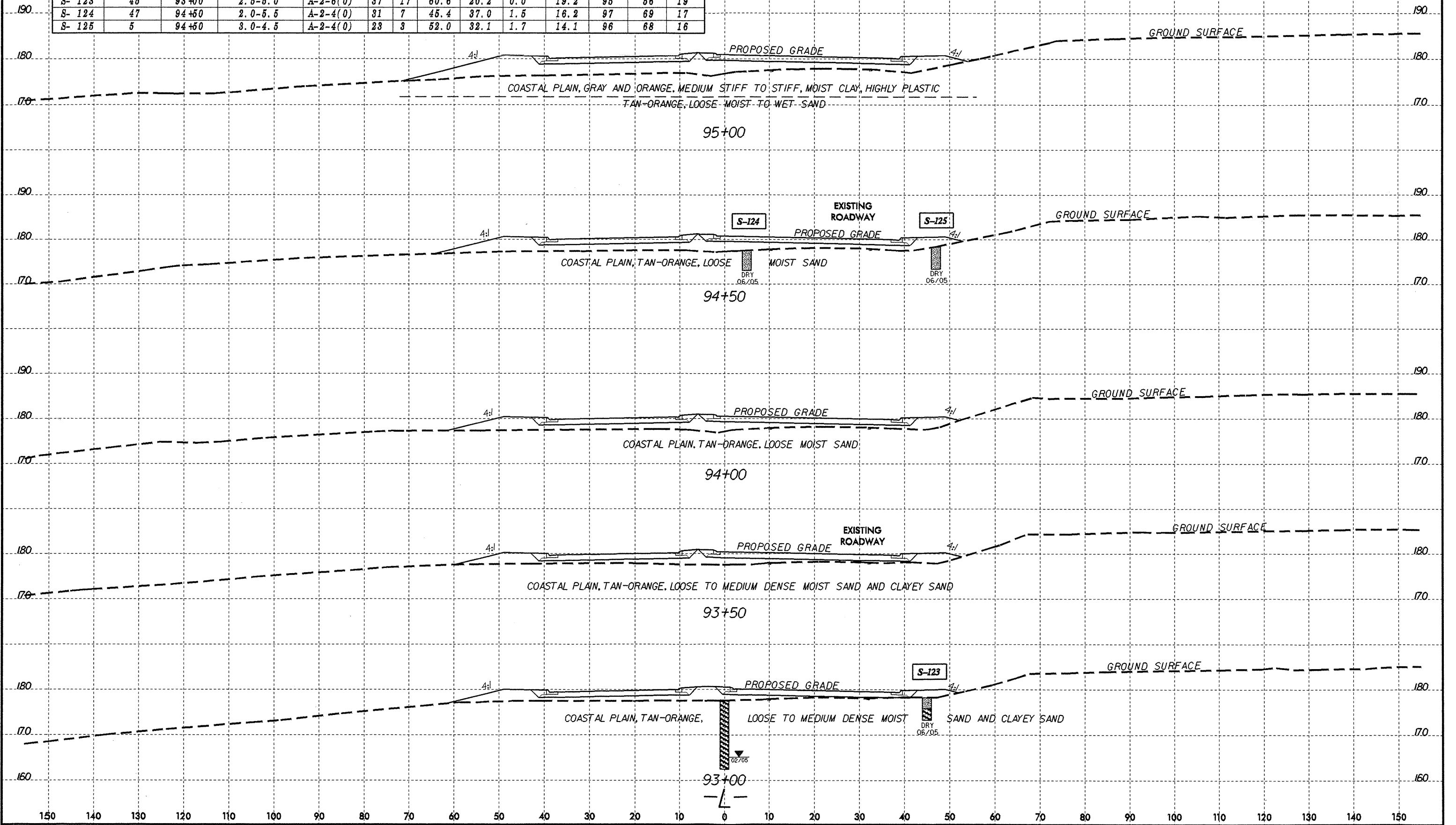
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
SS-5	57	16+50	13.8-15.4	A-7-6(8)	42	22	32.8	18.9	20.1	28.2	97	75	52
SS-6	57	16+50	18.9-20.4	A-7-6(22)	44	25	3.4	14.7	29.6	52.3	100	99	87
SS-7	55	17+00	4.1-5.6	A-3(0)	20	NP	43.9	46.6	6.5	3.0	100	79	10
SS-8	55	17+00	14.1-15.6	A-6(8)	36	19	26.4	19.7	17.7	36.2	100	86	57
SS-9	55	17+00	19.1-20.6	A-7-6(42)	63	37	1.0	2.6	28.0	68.4	100	100	97

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
S-1	62	15+50	1.0-2.0	A-2-4(0)	24	7	48.7	32.1	6.1	13.1	99	71	20
SS-2	62	15+50	4.1-5.6	A-3(0)	22	NP	41.1	53.2	2.6	3.0	99	86	6
SS-3	62	15+50	14.1-15.6	A-3(0)	23	NP	57.3	39.7	1.9	1.0	100	79	3
SS-4	61	16+00	13.8-15.3	A-4(5)	29	9	14.9	19.1	43.9	22.1	96	86	73

SOIL TEST RESULTS

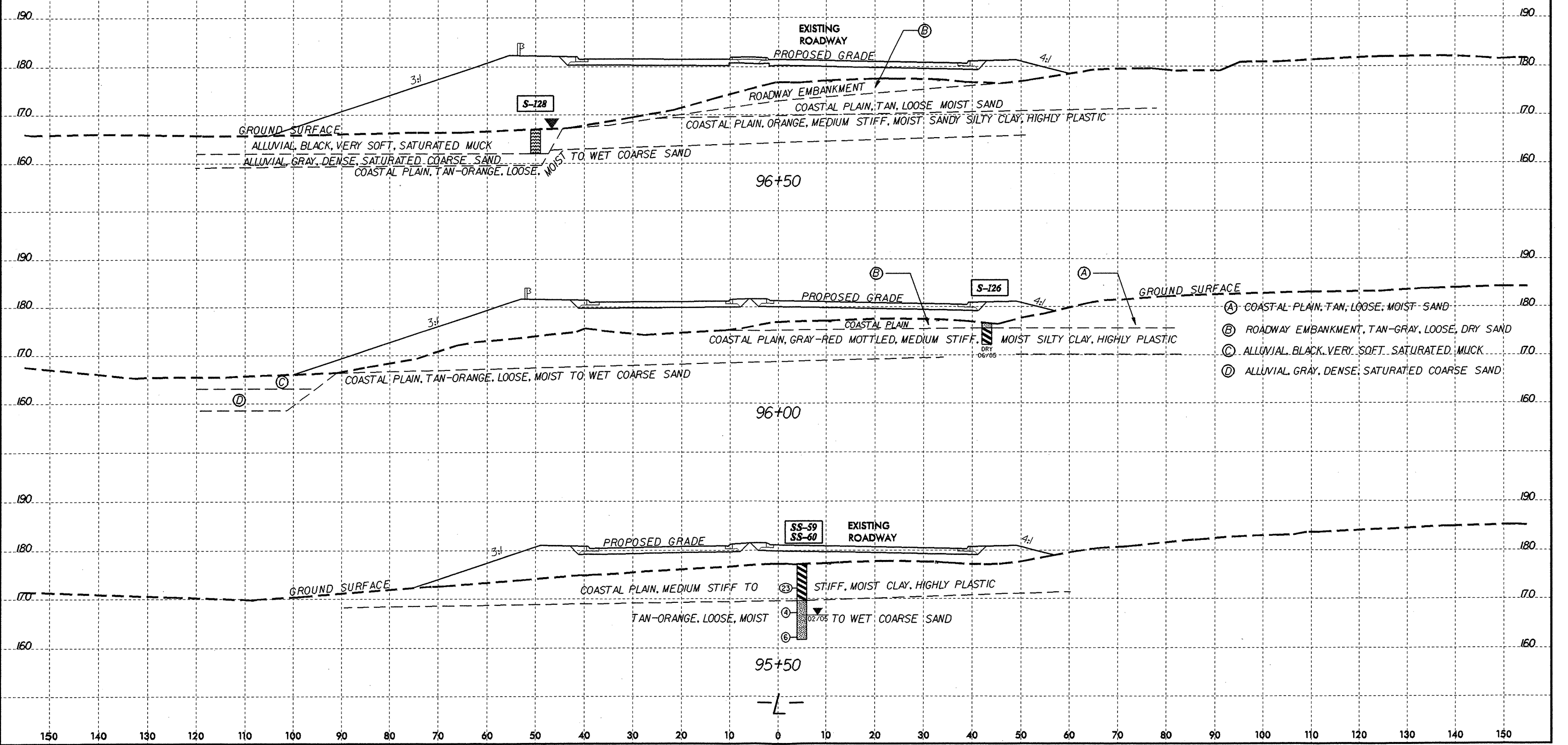
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)		
							C. SAND	F. SAND	SILT	CLAY	10	40	200
S-123	46	93+00	2.5-5.0	A-2-6(0)	37	17	60.6	20.2	0.0	19.2	95	56	19
S-124	47	94+50	2.0-5.5	A-2-4(0)	31	7	45.4	37.0	1.5	16.2	97	69	17
S-125	5	94+50	3.0-4.5	A-2-4(0)	23	3	52.0	32.1	1.7	14.1	96	68	16



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

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANICS
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-59	5	95+50	8.9-4.9	A-7-6(48)	68	42	1.0	0.8	21.8	76.4	100	99	98		
SS-60	5	96+50	8.9-10.4	A-2-4(0)	24	NP	68.1	24.1	4.7	8.0	100	70	13		
S-126	45	96+00	1.0-4.5	A-7-6(43)	66	38	1.9	1.4	62.3	34.3	99	98	96	29.0	
S-128	-50	96+50	1.0-2.0	A-5(22)	123	NP	9.7	9.7	60.3	20.3	99	94	81	305.0	40.8



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

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANICS
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-127	43	97+00	4.0-6.0	A-7-6(21)	51	26	11.6	9.4	56.8	22.2	98	92	79	28.9	
S-129	-69	97+00	1.0-2.0	A-5(2)	86	NP	28.8	24.3	38.8	8.1	98	84	47		23.1
S-130	-69	97+00	3.0-4.0	A-2-4(0)	17	NP	56.9	26.6	6.3	11.1	95	66	16		
SS-61	3	98+00	4.0-6.6	A-3(0)	19	NP	56.9	36.4	6.7	2.0	96	57	8		
SS-62	3	98+00	9.0-10.6	A-3(0)	20	NP	45.8	46.6	6.5	2.0	100	73	8		
SS-63	3	98+00	14.0-15.5	A-2-4(0)	25	NP	42.4	43.6	9.9	4.0	99	74	14		3.3
SS-64	3	98+00	19.0-20.6	A-1-b(0)	20	NP	86.0	5.0	2.9	6.0	99	25	9		

