

SEE SHEET 3 FOR PLAN SHEET LAYOUT  
AT TIME OF INVESTIGATION

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5985	1	10

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  2. 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.

PERSONNEL

N.O. MOORE

A.N. JONES

D.G. PINTER

INVESTIGATED BY N.O. MOORE

DRAWN BY N.O. MOORE

CHECKED BY N.T. ROBERSON

SUBMITTED BY N.O. MOORE

DATE JANUARY 2022

**ROADWAY  
SUBSURFACE INVESTIGATION**

COUNTY ROBESON

PROJECT DESCRIPTION APPROACHES TO BRIDGE NO.

770125 OVER LUMBER RIVER ON NC 41/72 AND

BRIDGE NO. 770175 OVER LUMBER RIVER ON SR 1600

**INVENTORY**

CONTENTS

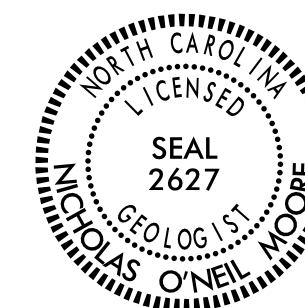
LINE	STATION	PLAN
-LI-	15+70 TO 27+79	4
-L-	17+88 TO 24+32	5

CROSS SECTIONS

LINE	STATION	SHEETS
-L-	18+00 TO 20+00	6, 7
-LI-	16+00 TO 21+50	8, 9

REFERENCE: B-5985

PROJECT: 47749



DocuSigned by:

*Nicholas O'Neil Moore*

01/31/2022

8636AEA785111111

SIGNATURE

DATE

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 209, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

Table with columns for General Class, Group Class, Symbol, % Passing, Material Passing, Group Index, Usual Types of Major Materials, Gen. Rating as Subgrade, and Soil Legend symbols for Granular, Silty-clay, and Organic materials.

CONSISTENCY OR DENSENESS

Table mapping Primary Soil Type (e.g., Generally Granular, Silty-clay) to Consistency (e.g., Very Loose, Medium Dense) and Range of Standard Penetration Resistance (N-value).

TEXTURE OR GRAIN SIZE

Table showing U.S. Std. Sieve Size (mm and in) and corresponding percentages for Boulders, Cobbles, Gravel, Coarse Sand, Fine Sand, Silt, and Clay.

SOIL MOISTURE - CORRELATION OF TERMS

Table correlating Soil Moisture Scale (Atterberg Limits), Field Moisture Description (Saturated, Wet, Moist, Dry), and Guide for Field Moisture Description (Liquid Limit, Plastic Limit, Optimum Moisture Shrinkage Limit).

PLASTICITY

Table showing Plasticity Index (PI) ranges (0-5 to 26 or more) and corresponding Dry Strength (Very Low, Slight, Medium, High).

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

Slightly Compressible (LL < 31), Moderately Compressible (LL = 31 - 50), Highly Compressible (LL > 50).

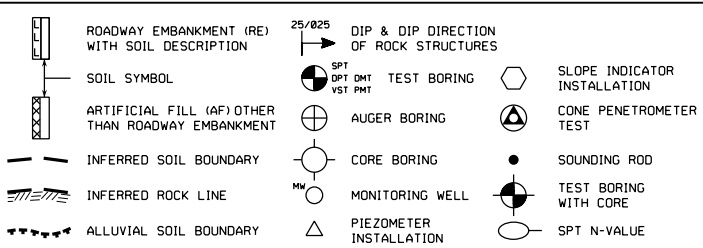
PERCENTAGE OF MATERIAL

Table showing percentages for Organic Material, Granular Soils, Silty-clay Soils, and Other Material (Trace, Little, Moderately, Highly Organic).

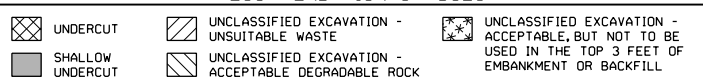
GROUND WATER

Water level in bore hole immediately after drilling, Static water level after 24 hours, Perched water, saturated zone, or water bearing strata, Spring or seep.

MISCELLANEOUS SYMBOLS



RECOMMENDATION SYMBOLS



ABBREVIATIONS

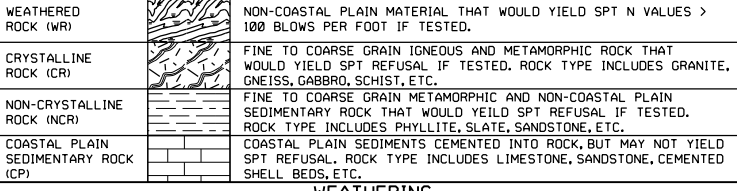
- AR - AUGER REFUSAL, BT - BORING TERMINATED, CL - CLAY, CPT - CONE PENETRATION TEST, CSE - COARSE, DMT - DILATOMETER TEST, DPT - DYNAMIC PENETRATION TEST, e - VOID RATIO, F - FINE, FOSS. - FOSSILIFEROUS, FRAC. - FRACTURED, FRAGMENTS, HI. - HIGHLY, MED. - MEDIUM, MICA - MICACEOUS, MOD. - MODERATELY, NP - NON PLASTIC, ORG. - ORGANIC, PMT - PRESSUREMETER TEST, SAP. - SAPROLITIC, SD. - SAND, SANDY, SL. - SILTY, SILTY, SLI. - SLIGHTLY, TCR - TRICONE REFUSAL, w - MOISTURE CONTENT, V - VERY, VST - VANE SHEAR TEST, WEA. - WEATHERED, UNIT WEIGHT, DRY UNIT WEIGHT, SAMPLE ABBREVIATIONS: S - BULK, SS - SPLIT SPOON, ST - SHELBY TUBE, RS - ROCK, RT - RECOMPACTED TRIAXIAL, CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

- DRILL UNITS: CME-45C, CME-55, CME-550, VANE SHEAR TEST, PORTABLE HOIST, 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, HAMMER TYPE: AUTOMATIC, MANUAL, CORE SIZE: B, H, N, HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. 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:



WEATHERING

FRESH: ROCK FRESH, CRYSTALS 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. IF TESTED, WOULD YIELD SPT REFUSAL. SEVERE (SEV.): ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF. VERY SEVERE (V. SEV.): ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF. COMPLETE: ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD: CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD: CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. MODERATELY HARD: CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. MEDIUM HARD: CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT: CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. VERY SOFT: CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

Table mapping Fracture Spacing (Very Wide, Wide, Moderately Close, Close, Very Close) to Spacing (More than 10 feet, 3 to 10 feet, 1 to 3 feet, 0.16 to 1 foot, Less than 0.16 feet).

BEDDING

Table mapping Bedding (Very Thickly Bedded, Thickly Bedded, Thinly Bedded, Very Thinly Bedded, Thickly Laminated, Thinly Laminated) to Thickness (4 feet, 1.5 - 4 feet, 0.16 - 1.5 feet, 0.03 - 0.16 feet, < 0.03 feet).

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE: RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED: GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED: GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED: SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

- ALLUVIUM (ALLUV.): SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

ELEVATION: FEET

NOTES: ROADWAY BORING ELEVATIONS WERE TAKEN FROM TIN FILE b5985\_ls.tin.tin DATED 11/5/2018

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**ROBESON COUNTY**

LOCATION: BRIDGE NO. 770125 OVER LUMBER RIVER ON NC 41/72  
& BRIDGE NO. 770175 OVER LUMBER RIVER ON SR 1600

TYPE OF WORK: GRADING, DRAINAGE, SIGNALS, PAVING & STRUCTURES

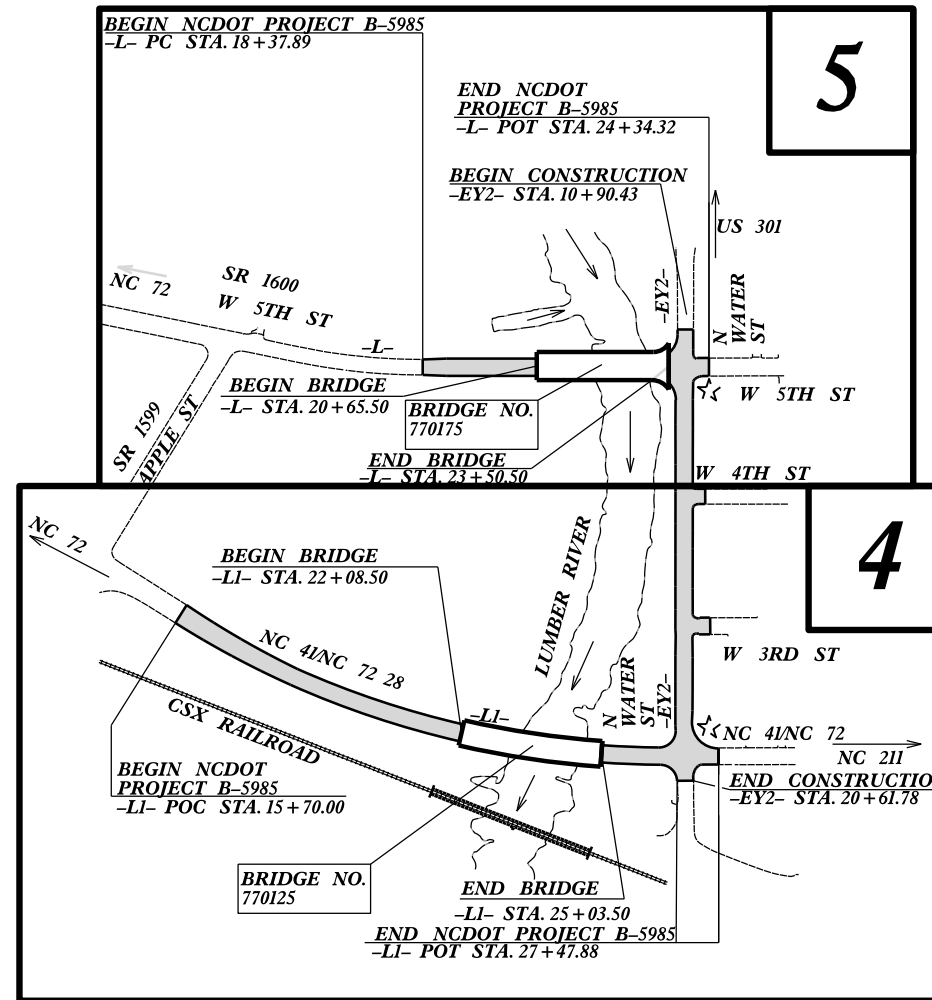
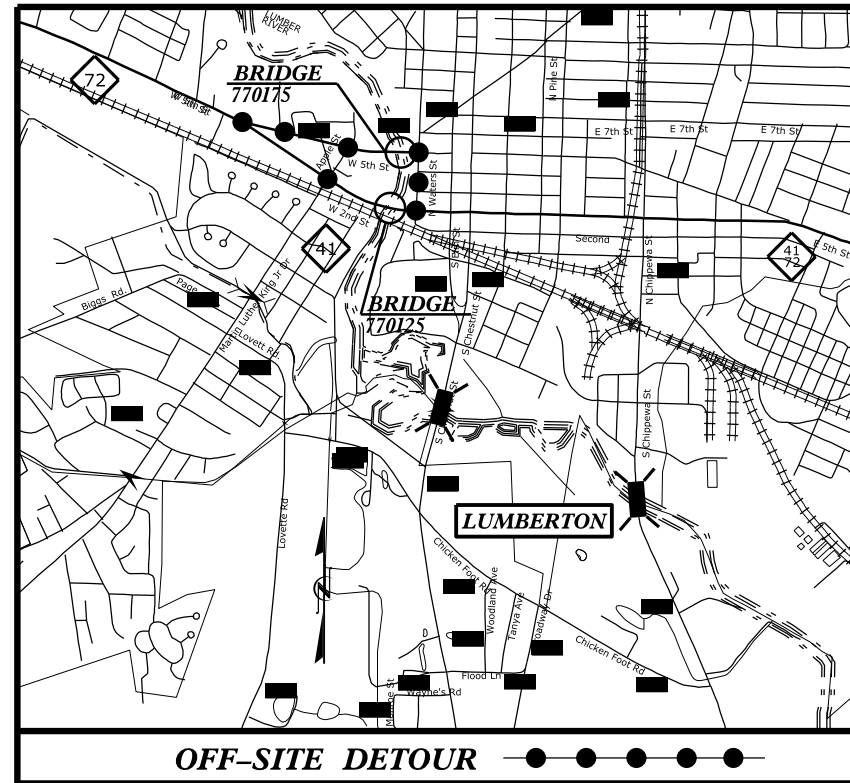
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5985	3	10
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
47749.1.1		PE	

**WETHERILL ENGINEERING**  
1223 Jones Franklin Rd.  
Raleigh, N.C. 27606  
License No. F-0377  
Bus: 919 851 8077  
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN  
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

**BRIDGE #770125  
& BRIDGE # 770175**

**PRELIMINARY PLANS**



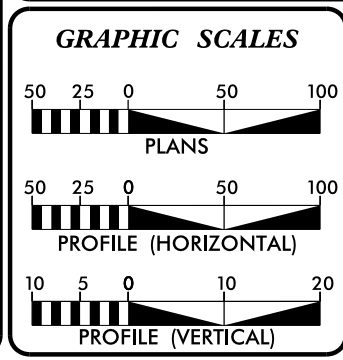
☆ - EXISTING SIGNAL

**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION  
**INCOMPLETE PLANS**  
DO NOT USE FOR R/W ACQUISITION  
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD  
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARY OF LUMBERTON.

**PROJECT: B-5985**

**CONTRACT:**



DESIGN DATA	
BRIDGE # 770125	BRIDGE # 770175
ADT 2022 = 15,200	ADT 2022 = 10,500
ADT 2042 = 17,000	ADT 2042 = 14,200
K = 9 %	K = 11 %
D = 55 %	D = 55 %
T = 6 % *	T = 3 % *
V = 40 MPH	V = 40 MPH
(TTST = 2% + DUAL = 4%)	*(TTST = 1% + DUAL = 2%)
FUNC CLASS = PRINCIPAL ARTERIAL REGIONAL TIER	FUNC CLASS = MAJOR COLLECTOR SUB-REGIONAL TIER

PROJECT LENGTH	
BRIDGE # 770125	
LENGTH ROADWAY PROJECT B-5985 =	0.167 MILES
LENGTH STRUCTURE PROJECT B-5985 =	0.056 MILES
TOTAL LENGTH PROJECT B-5985 =	0.206 MILES
BRIDGE # 770175	
LENGTH ROADWAY PROJECT B-5985 =	0.059 MILES
LENGTH STRUCTURE PROJECT B-5985 =	0.054 MILES
TOTAL LENGTH PROJECT B-5985 =	0.113 MILES
NCDOT CONTACT:	DAVID STUTTS, PE PROJECT ENGINEER - PEP/PROGRAM MGT.

Prepared for:  
**DIVISION OF HIGHWAYS**  
STRUCTURES MANAGEMENT UNIT  
1000 BIRCH RIDGE DRIVE RALEIGH NC, 27610

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: **EDWARD G. WETHERILL, PE**  
DECEMBER 21, 2021  
PROJECT ENGINEER

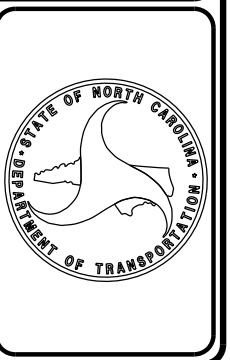
LETTING DATE: **GREG S. PURVIS, PE**  
DECEMBER 20, 2022  
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**ROADWAY DESIGN ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.



22-DEC-2021 09:28 S:\EPD\Projects\Investigation\TIP\B5985\GEO\_RDWY\CADD\_GEO\RDWY\PlanProj\B-5985\_GEO\_RDWY\_TSH.dgn \$\$\$USERNAME\$\$\$



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

ROY COOPER  
GOVERNOR

J. ERIC BOYETTE  
SECRETARY

January 5, 2022

STATE PROJECT: 47749.1.1 (B-5985)  
FEDERAL PROJECT: N/A  
COUNTY: ROBESON

DESCRIPTION: Approaches to Bridge 770125 over Lumber River on NC 41/NC 72 and  
Bridge 770175 over Lumber River on SR 1600

SUBJECT: Geotechnical Report – Inventory

The Geotechnical Engineering Unit has completed a subsurface investigation for this project and presents the following inventory.

**Project Description**

This project consists of widening NC 41/NC 72 and SR 1600 (West Fifth Street).

A geotechnical investigation was conducted during November of 2021. Seven hand-auger borings were performed by the Geotechnical Engineering Unit. Representative soil samples were collected for visual classification in the field and selected samples were submitted for laboratory analysis by the Materials and Tests Unit.

The following alignments, totaling 0.167 miles, were investigated. Subsurface plans and cross sections of these alignments are included in this report.

<u>Line</u>	<u>Stations</u>
-L-	17+88 to 24+32
-L1-	15+70 to 27+79

**Physiography and Geology**

The project is located within the city limits of the town of Lumberton and within the Coastal Plain province of North Carolina. The project area is comprised of a mixture of sands and silts of the Duplin Formation. The topography is mostly flat. The widening project consists of a mixture of residential, commercial, and wooded areas.

**Soils Properties**

Soils encountered during this investigation are Roadway Embankment and Undivided Coastal Plain.

*Mailing Address:*  
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GEOTECHNICAL ENGINEERING UNIT  
1589 MAIL SERVICE CENTER  
RALEIGH NC 27699-1589

*Telephone:* 919-707-6850  
*Fax:* 919-250-4237  
*Customer Service:* 1-877-368-4968

*Website:* [www.ncdot.gov](http://www.ncdot.gov)


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

Roadway Embankment soils are present throughout the entire project. These soils primarily consist of brown and gray, moist, medium dense to dense, silty sand with trace gravel (A-2-4).

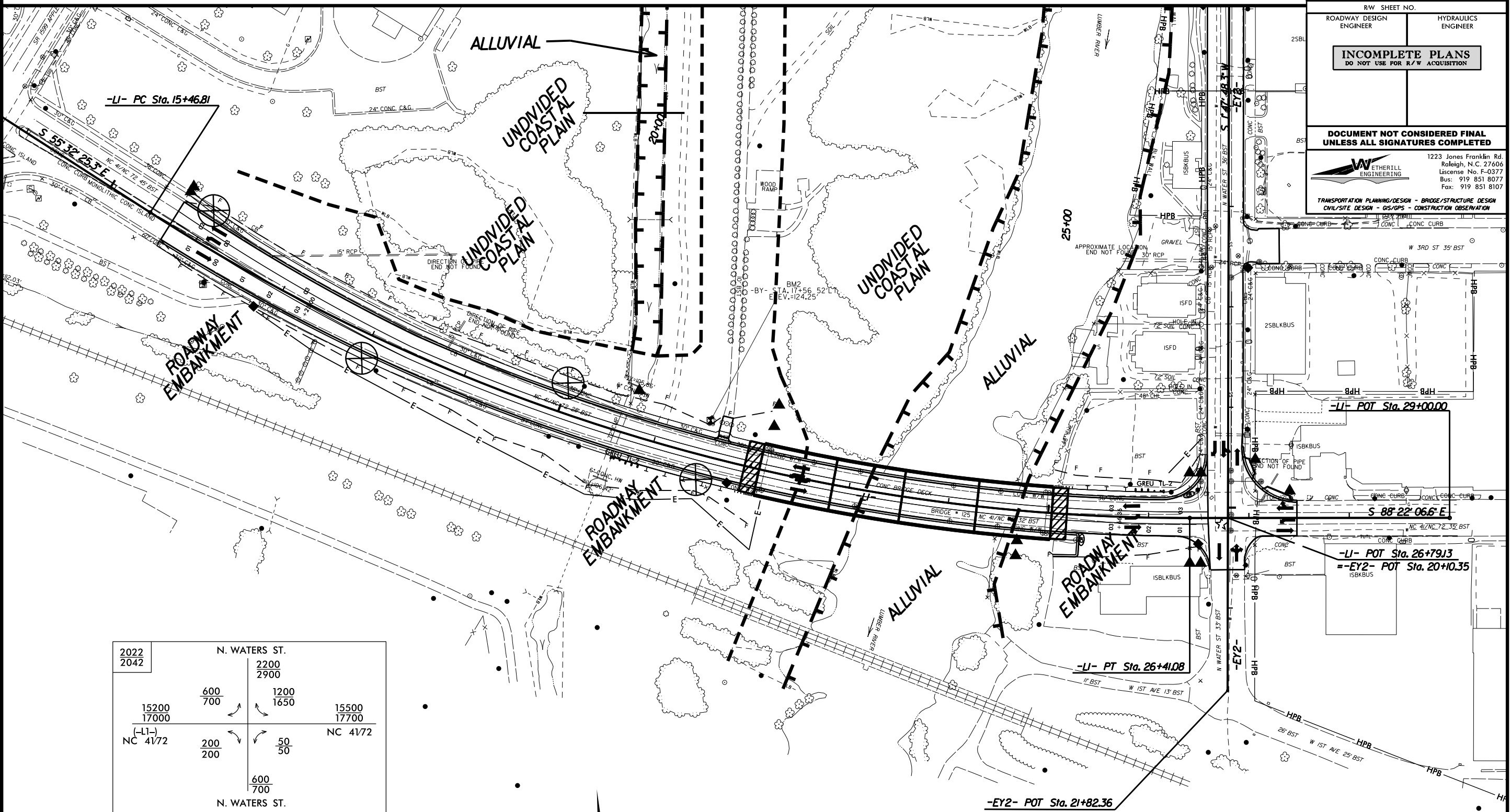
Undivided Coastal Plain soils are also present throughout the entire project. These soils are characterized by orange and gray, mottled, moist, loose to medium dense, silty sand (A-2-4) and orange and gray, mottled, moist, stiff to very stiff, sandy silt (A-4). These soils are non-plastic.

**Groundwater**

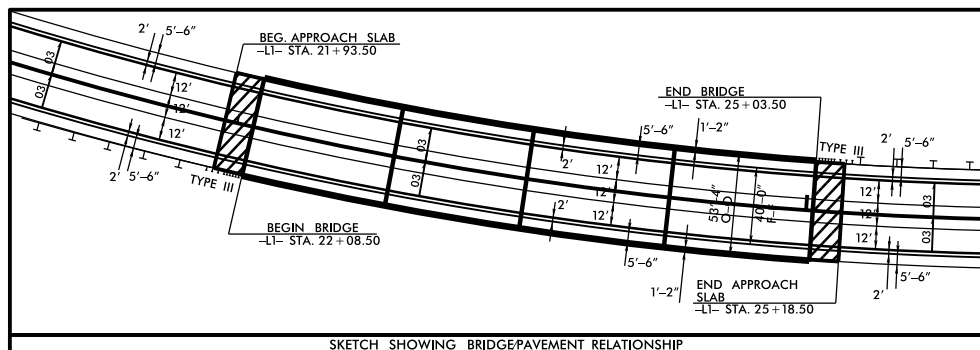
Groundwater measurements were taken during November of 2021 during moderate drought conditions. Groundwater was not present in any borings during the time of this investigation.

PROJECT REFERENCE NO. <b>B-5985</b>	SHEET NO. <b>4</b>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL</b> UNLESS ALL SIGNATURES COMPLETED	
 WETHERILL ENGINEERING 1223 Jones Franklin Rd. Raleigh, N.C. 27606 License No. F-0377 Bus: 919 851 8077 Fax: 919 851 8107	
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION	

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 8/17/99  
 REVISIONS



2022	N. WATERS ST.			
2042	600	1200	15500	
	700	1650	17700	
	15200			
	17000			
	(-LI-)			
	NC 41/72	50	NC 41/72	
	200	50		
	200			
		600		
		700		
	N. WATERS ST.			



**-LI-**  
 PI Sta 21+09.42  
 $\Delta = 32^\circ 49' 41.4''$  (LT)  
 $D = 3' 00'' 00.0''$   
 $L = 1,094.27'$   
 $T = 562.61'$   
 $R = 1,909.86'$   
 $SE = 03$   
 $RO = \text{SEE PLANS}$   
 $DS = 40\text{MPH}$

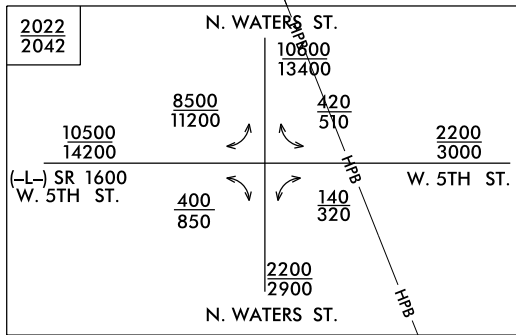
⚡ - EXISTING SIGNAL  
 SEE SHEET 6 FOR -LI- PROFILE  
 SEE SHEET 7 FOR -EY2- PROFILE  
 SEE SHEETS S-1 THRU S-??  
 FOR STRUCTURE PLANS

8/17/99

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 Raleigh, N.C. 27606  
 License No. F-0377  
 Bus: 919 851 8077  
 Fax: 919 851 8107

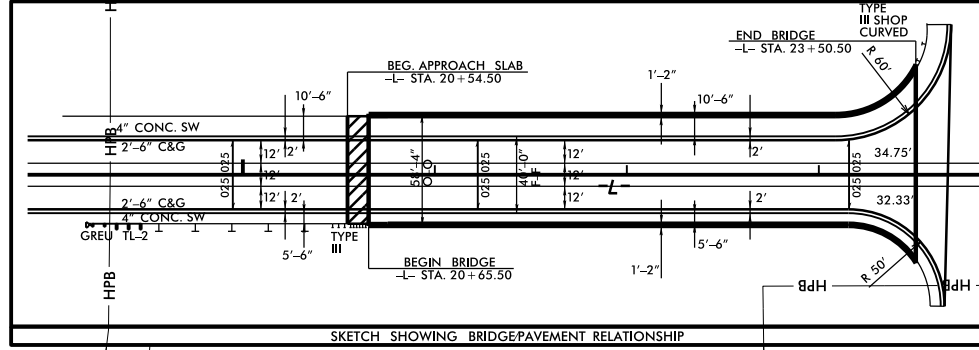
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN  
 CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO. <b>B-5985</b>	SHEET NO. <b>5</b>
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL</b> UNLESS ALL SIGNATURES COMPLETED	

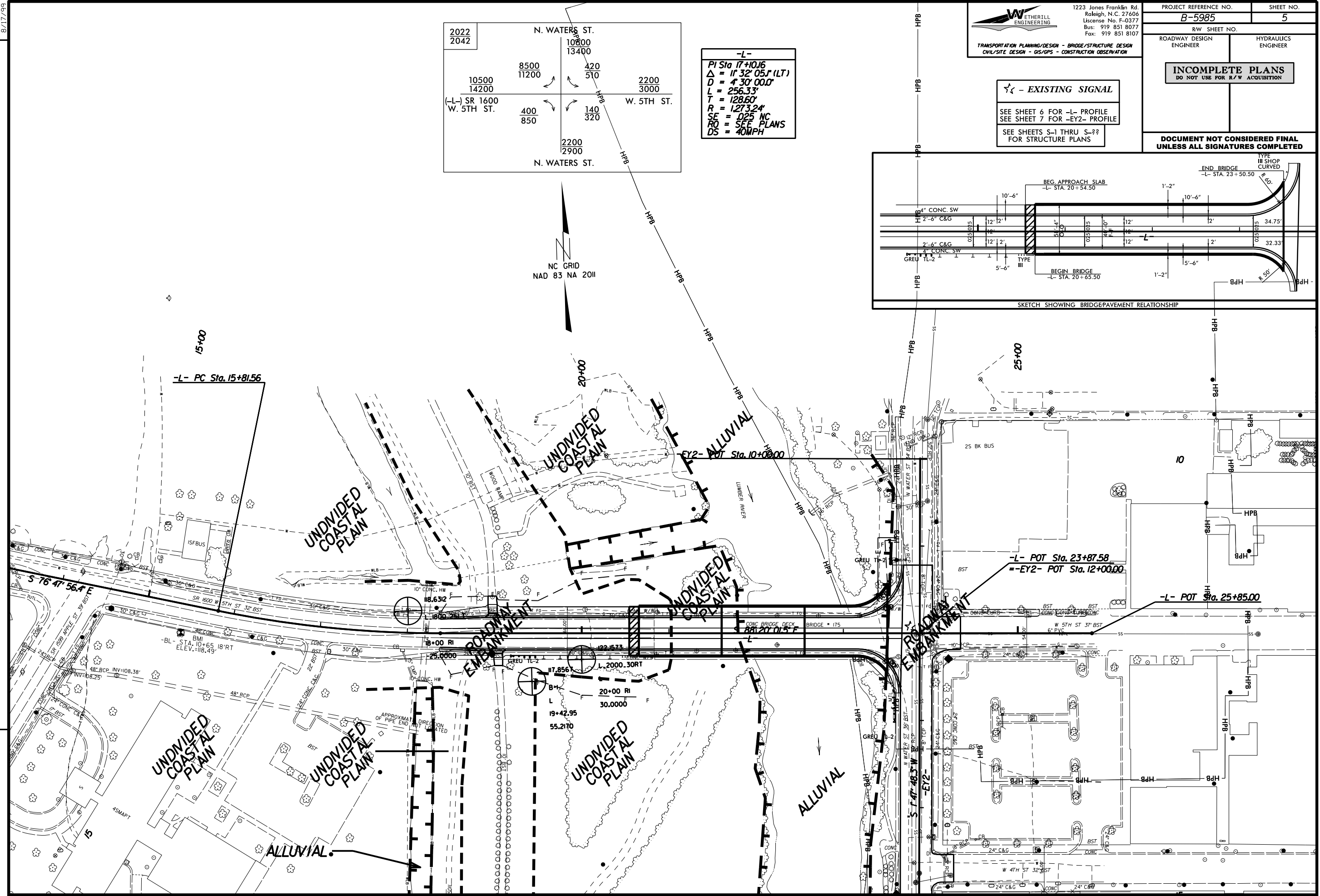


**-L-**  
 PI Sta 17+10.16  
 $\Delta = 1^\circ 32' 05.1'' (LT)$   
 $D = 4^\circ 30' 00.0''$   
 $L = 256.33'$   
 $T = 128.60'$   
 $R = 1273.24'$   
 $SE = 0.25\% NC$   
 $RO = SEE PLANS$   
 $DS = 40MPH$

**EXISTING SIGNAL**  
 SEE SHEET 6 FOR -L- PROFILE  
 SEE SHEET 7 FOR -EY2- PROFILE  
 SEE SHEETS S-1 THRU S-?? FOR STRUCTURE PLANS

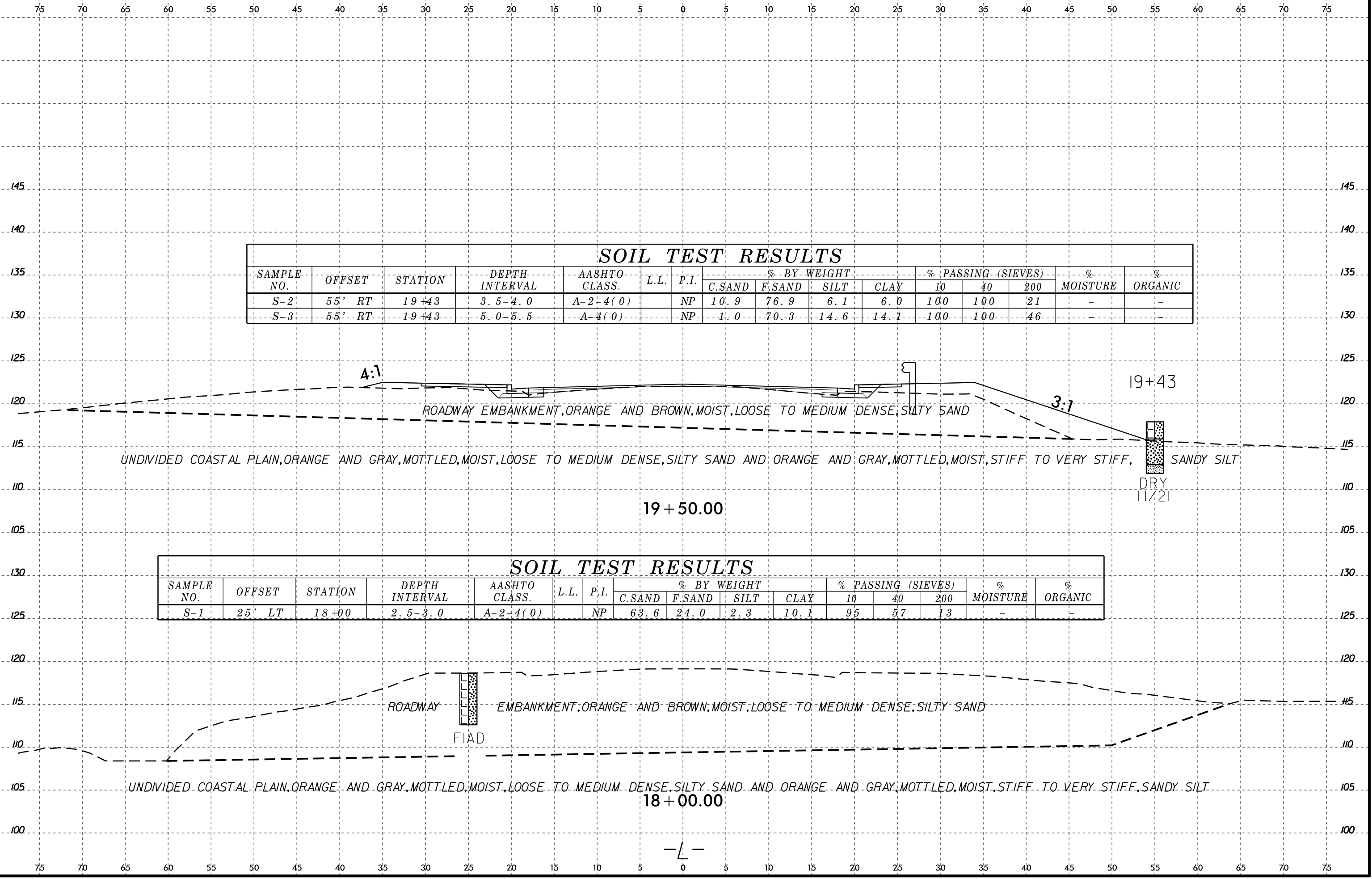


REVISIONS



MATCHLINE SHEET 4 -EY2- STA. 15 + 00.00

6/23/16  
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 \$\$\$SUBERRNAME\$\$\$



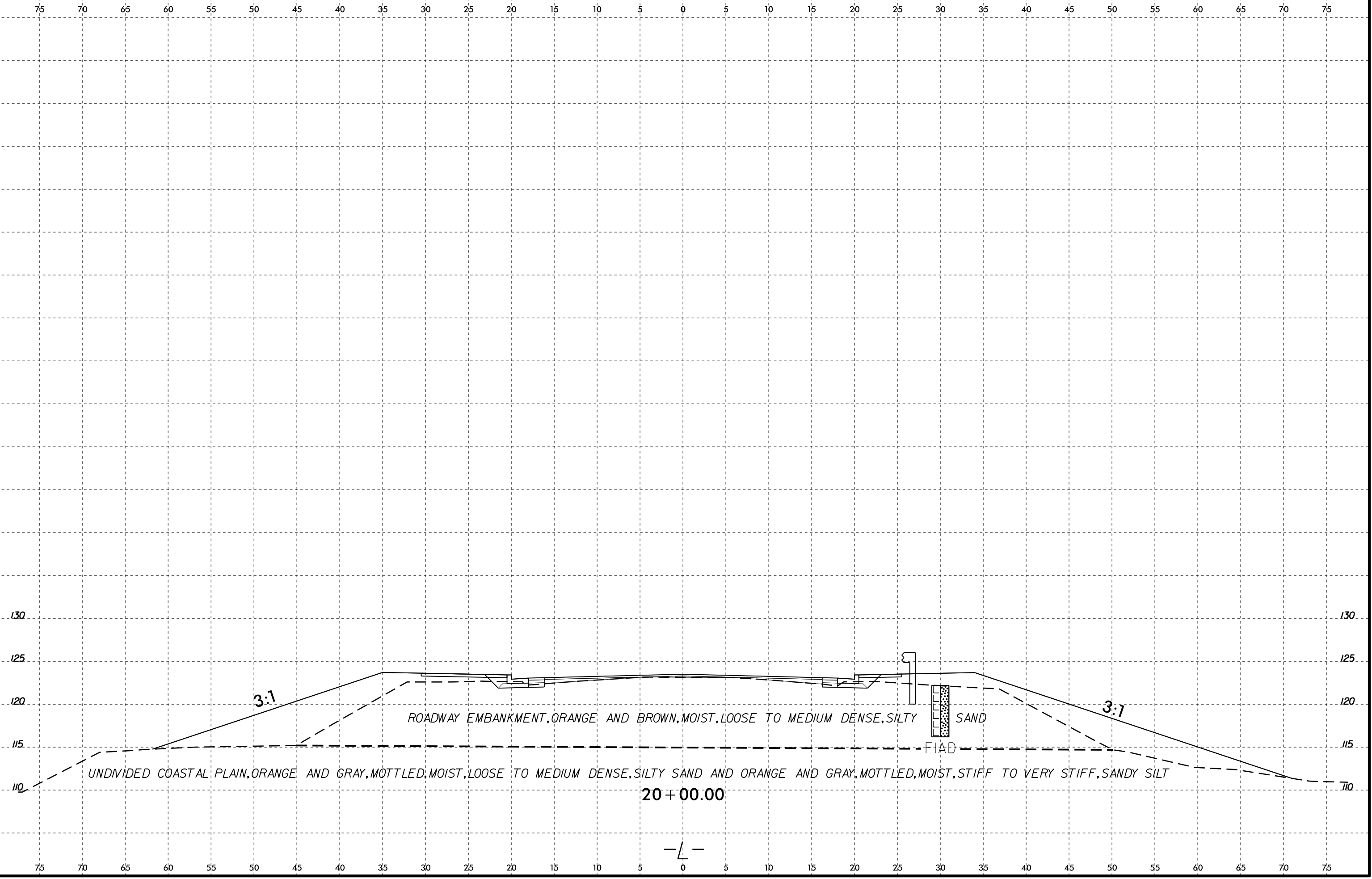
### SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-2	55' RT	19+43	3.5-4.0	A-2-4(0)		NP	10.9	76.9	6.1	6.0	100	100	21	-	-
S-3	55' RT	19+43	5.0-5.5	A-4(0)		NP	1.0	70.3	14.6	14.1	100	100	46	-	-

### SOIL TEST RESULTS

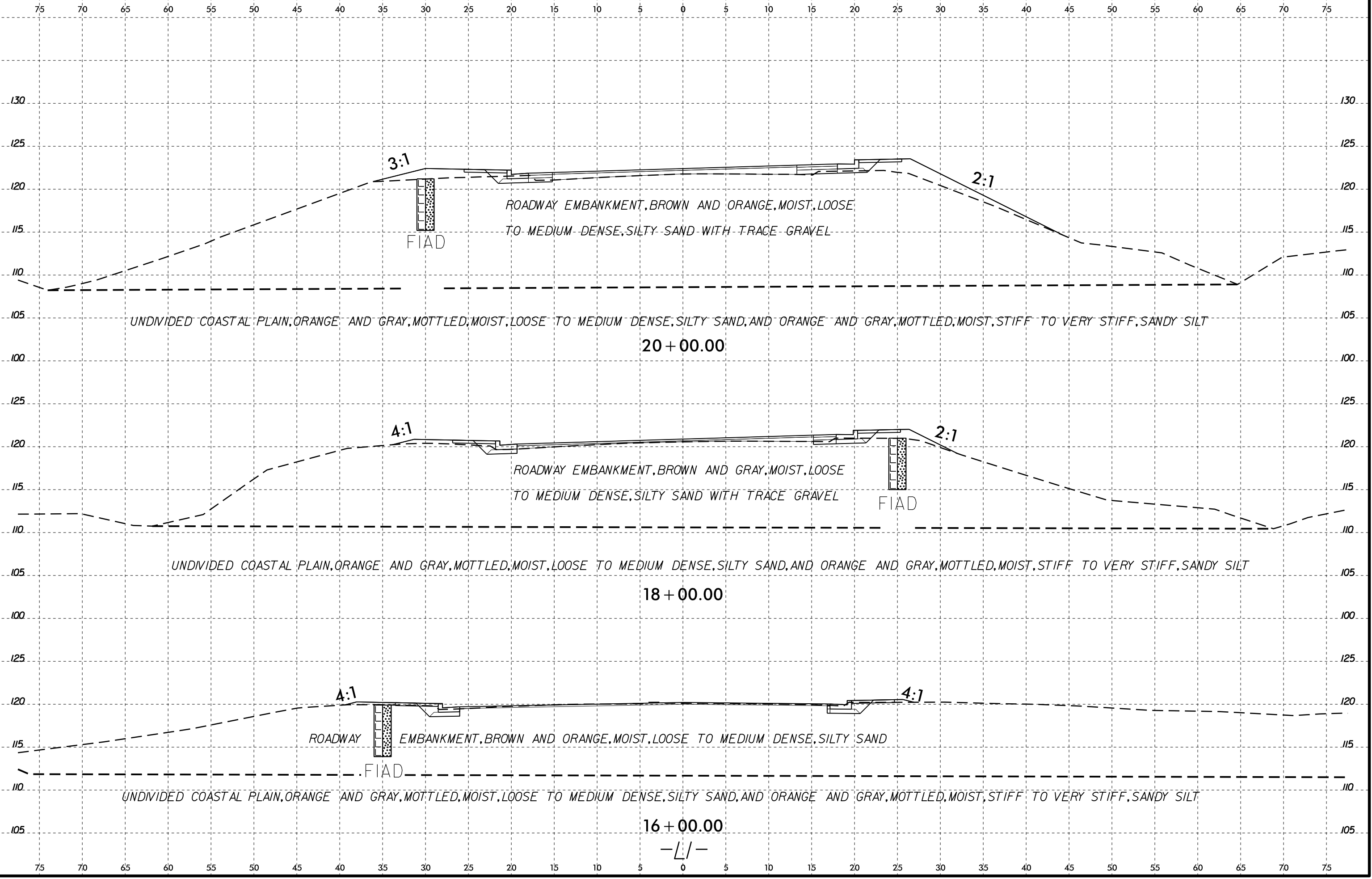
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-1	25' LT	18+00	2.5-3.0	A-2-4(0)		NP	63.6	24.0	2.3	10.1	95	57	13	-	-

6/23/16  
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\$\$\$\$SUBERRAME\$\$\$\$

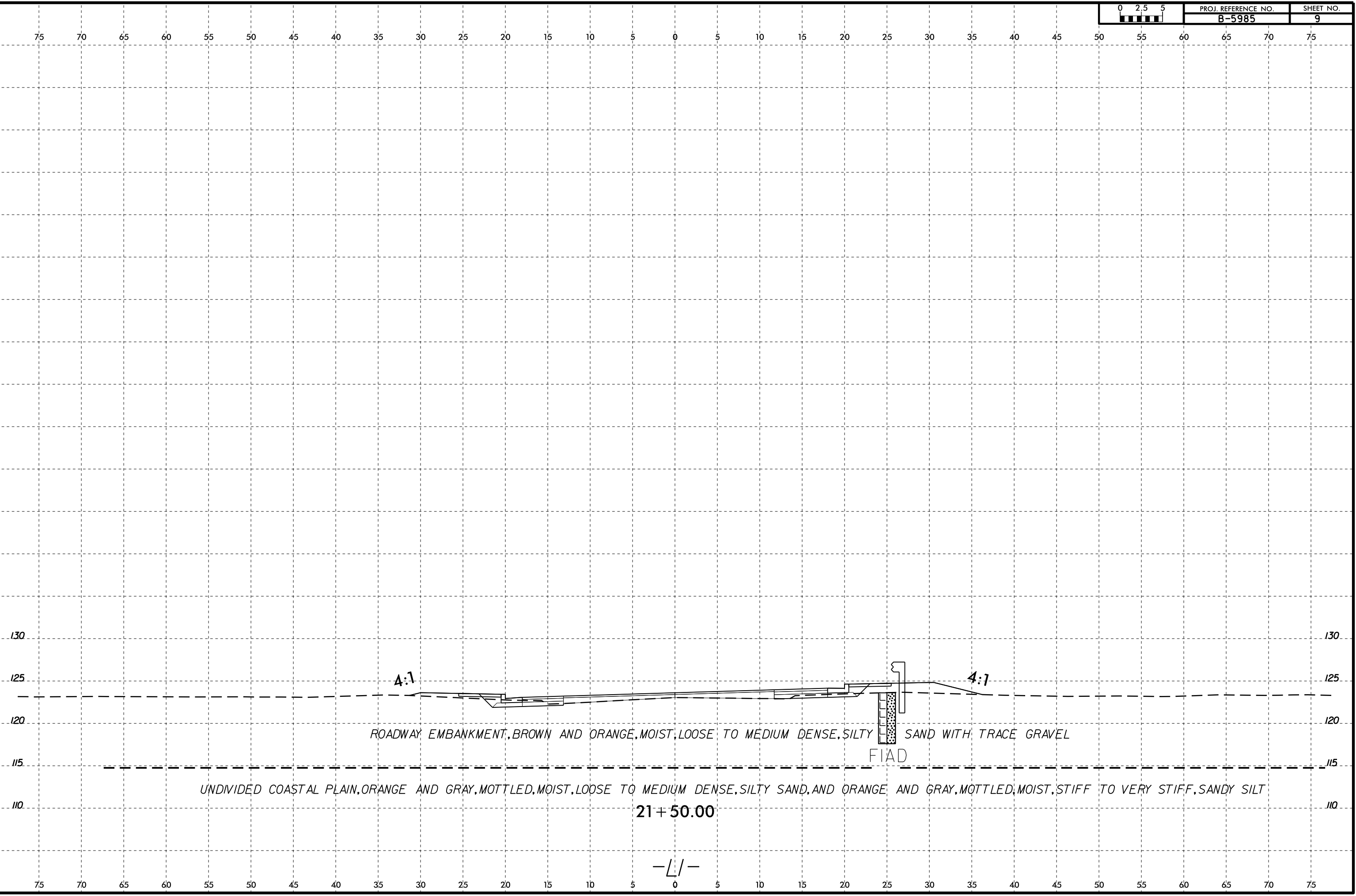




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\$\$\$\$SUBERRAME\$\$\$\$



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\$\$\$\$SUBERRAME\$\$\$\$



4:1

4:1

ROADWAY EMBANKMENT, BROWN AND ORANGE, MOIST, LOOSE TO MEDIUM DENSE, SILTY SAND WITH TRACE GRAVEL

FIAD

UNDIVIDED COASTAL PLAIN, ORANGE AND GRAY, MOTTLED, MOIST, LOOSE TO MEDIUM DENSE, SILTY SAND, AND ORANGE AND GRAY, MOTTLED, MOIST, STIFF TO VERY STIFF, SANDY SILT

21+50.00

-L/-