

PROJECT: 17BP.3.R.81 REFERENCE: B-5540

SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION

CONTENTS

<u>LINE</u>	<u>STATION</u>	<u>PLAN</u>
-L-	10+85 TO 19+58	4-5
-LDET-	10+85 TO 19+57	4-5

CROSS SECTIONS

<u>LINE</u>	<u>STATION</u>	<u>SHEETS</u>
-L-	11+75 TO 18+00	6-9

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

ROADWAY

SUBSURFACE INVESTIGATION

COUNTY BRUNSWICK
PROJECT DESCRIPTION BRIDGE NO. 202 ON -L- (SR 1357)
OVER MULBERRY BRANCH AT STA. 14 + 60.00

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5540	1	9

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1919 TOT-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT 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 THE 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.

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

C.J. CORNETTE

R.E. SMITH

J.M. EDMONDSON

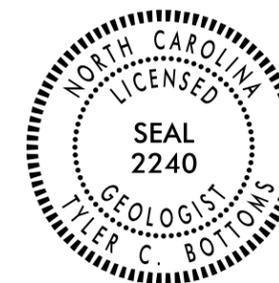
INVESTIGATED BY T.C. BOTTOMS

DRAWN BY C.J. CORNETTE

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE SEPTEMBER 2018



DocuSigned by:
Tyler Bottoms 10/25/2018
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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

Table with 4 main columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, and TERMS AND DEFINITIONS. It contains detailed technical specifications, classification tables, and symbols for soil and rock analysis.

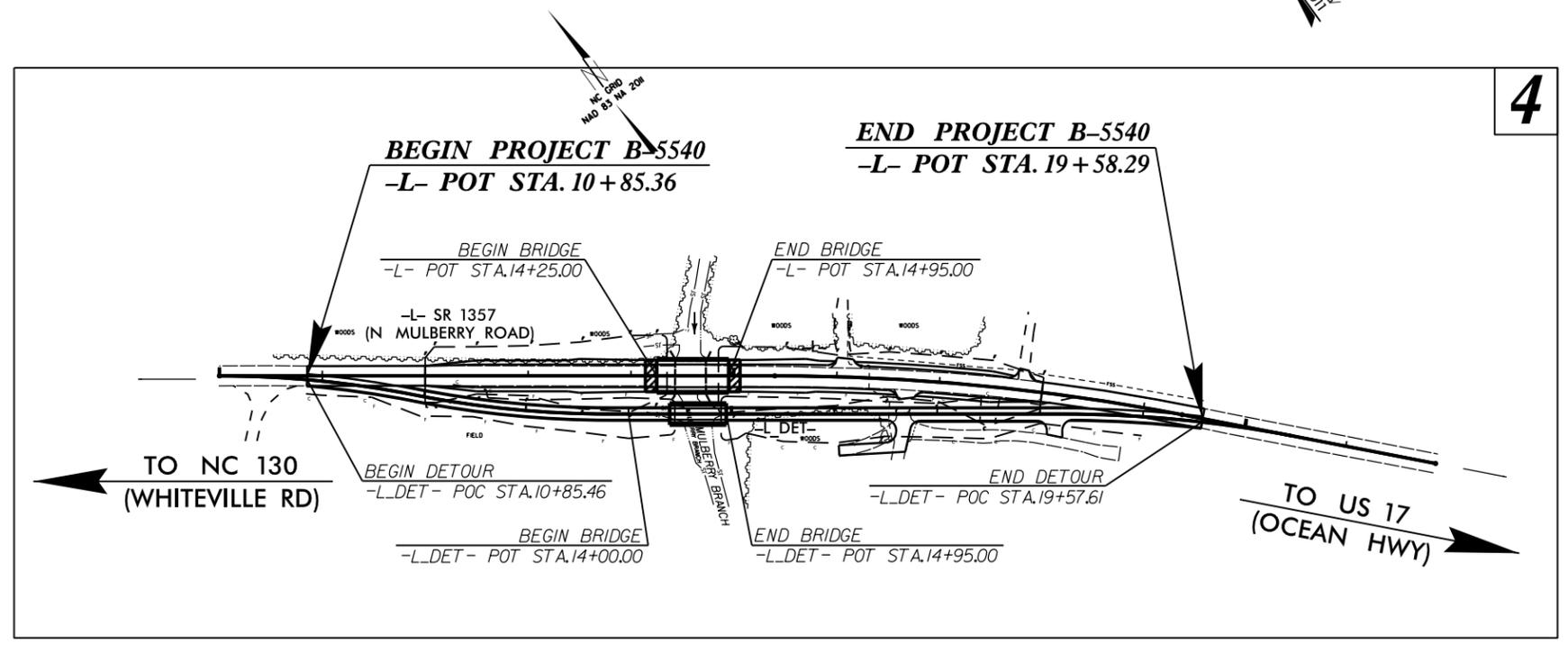
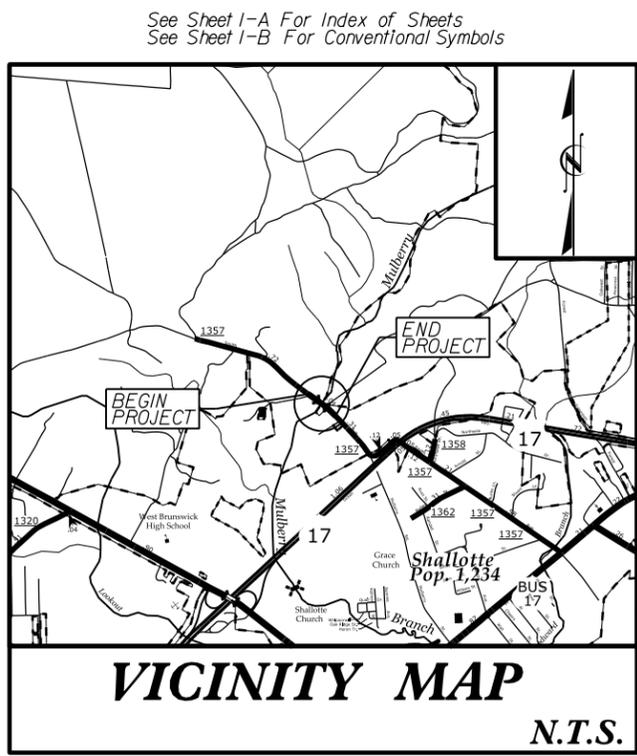
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5540	3	9
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.3.R.81	BRZ-1357(8)	PE	

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS
BRUNSWICK COUNTY

**LOCATION: REPLACE BRIDGE 202 OVER MULBERRY BRANCH
 ON SR 1357 (N MULBERRY ROAD)**

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

25% PLANS

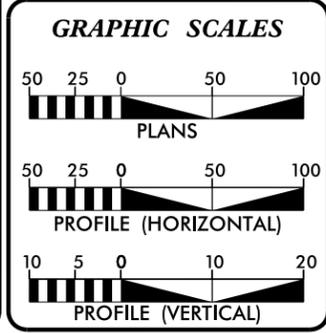


TIP PROJECT: B-5540

CONTRACT:

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

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



DESIGN DATA

ADT 2018 =	436 VPD
ADT 2040 =	700 VPD
DHV =	
D =	
T =	9%
V =	60 MPH
* TTST =	1% DUAL 8%
FUNC CLASS =	
LOCAL	
SUB-REGIONAL TIER	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5540	=	0.152 MILES
LENGTH BRIDGE TIP PROJECT B-5540	=	0.013 MILES
TOTAL LENGTH TIP PROJECT B-5540	=	0.165 MILES

Prepared in the Office of:
CDM Smith
 5400 Glenwood Avenue
 Suite 400
 Raleigh, NC 27612-3228
 NC CDA No. F-1255

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
 JULY 27, 2018

LETTING DATE:
 NOVEMBER 20, 2018

DAVID Z. KEISER, PE
 PROJECT ENGINEER

ADAM M. CONRAD, PE
 PROJECT DESIGN ENGINEER

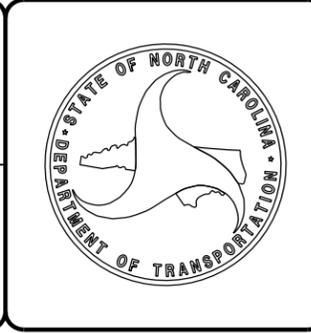
ALTON R. EDGERTON, PE
 NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

September 18, 2018

State Project: 17BP.3.R.81 (B-5540)
F.A. Project: BRZ-1357(8)
County: Brunswick
Description: Bridge No. 202 on -L- (SR 1357) over Mulberry Branch

Subject: Geotechnical Inventory Report

Project Description

This project begins in the town of Shallotte in Brunswick County, 2050 feet north of the intersection of US 17 and SR 1357 (N. Mulberry Road) and extends south along N. Mulberry Road (-L-) for approximately 873 feet across Mulberry Branch. This geotechnical investigation was confined to the areas of proposed construction.

Fieldwork was conducted in August of 2018. Hand auger borings were completed at various offsets along the project corridor. SPT borings from the structure subsurface inventory report are included. Representative soil samples were collected for visual classification in the field and for laboratory analysis by the Materials and Tests unit.

The following alignment was investigated:

<u>Line</u>	<u>Station(±)</u>
-L-	10+85 to 19+58

Areas of Special Geotechnical Interest

- 1) The entire project was found to exhibit seasonal high ground water.
- 2) The following sections contain cohesive soils which have the potential to cause embankment/subgrade and or slope stability problems during construction:

<u>Line</u>	<u>Station(±)</u>
-L-	11+80 to 14+62
-L-	16+75 to 17+25

- 3) The following section contains organic soils which have the potential to cause embankment/subgrade and or slope stability problems during construction:

<u>Line</u>	<u>Station(±)</u>
-L-	14+12 to 14+43

Physiography and Geology

This project corridor is located within the Coastal Plain Physiographic Province. Topography along the project is nearly flat to gently sloping. Natural ground elevations range from 10± to 27± feet above sea level.

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

Ground Water

Ground water data was collected in August of 2018 while investigating the bridge approach. Ground water elevations ranged from 17± to 22± feet above sea level.

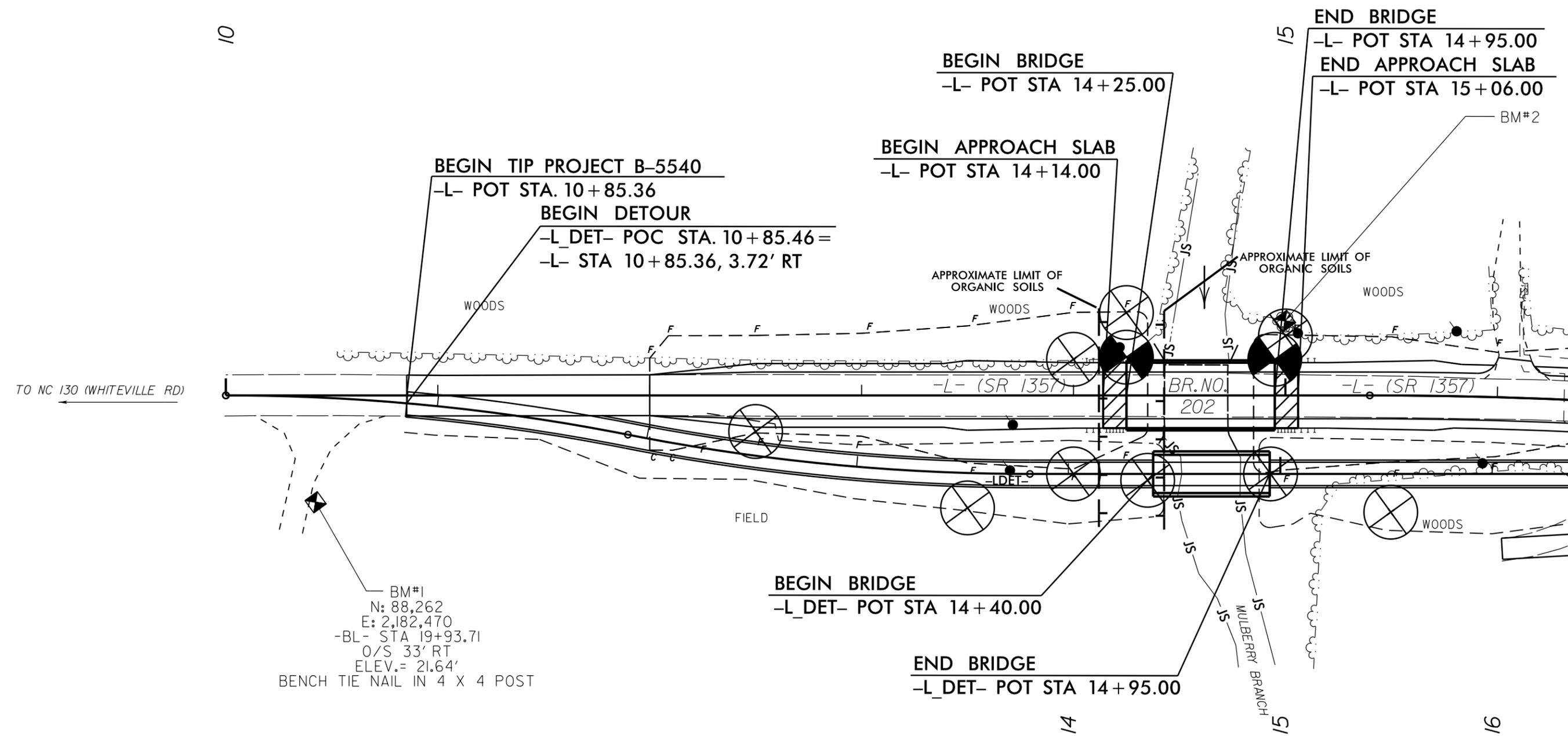
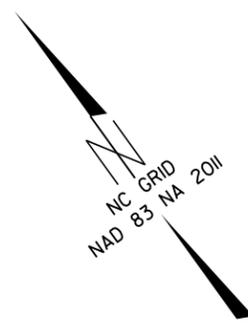
Soils

Soils encountered within this project area have been divided into two categories: Roadway Embankment and alluvial.

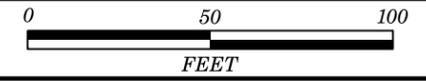
Roadway embankment soils were found along the existing N. Mulberry Road corridor. Where encountered it was composed of 1± to 7± feet of very loose to loose sand (A-2-4).

Soils identified as alluvial are composed of 2± feet of loose sand with little organic content (A-2-4), 2± feet of soft sandy silt with trace organic content (A-4), 1± to 10± feet of very loose to loose sand (A-2-4, A-3), and 1± to 4± feet of very soft to soft sandy clay (A-6). Organic samples taken within the silt and sand returned organic contents ranging from 4.1% to 4.3%.

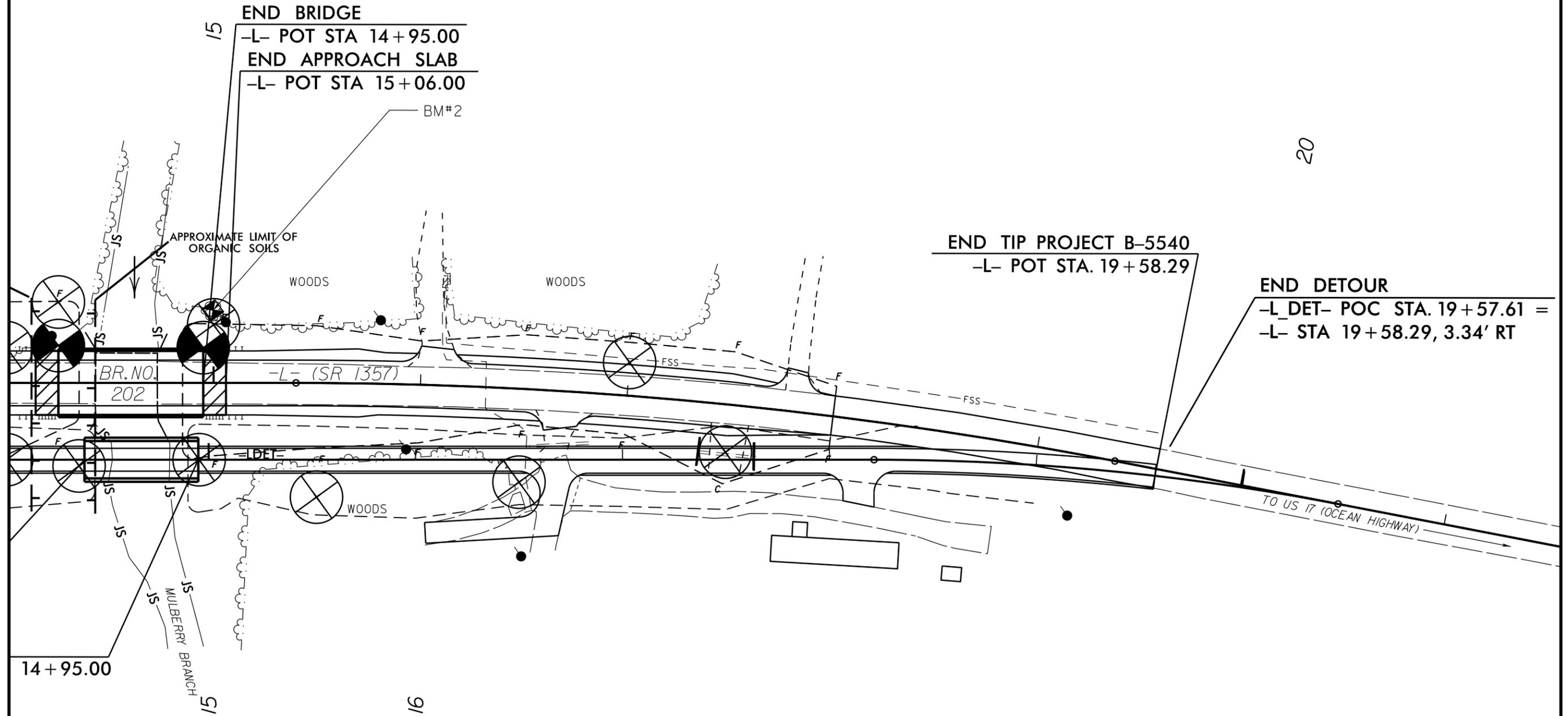
PROJECT REFERENCE NO.	SHEET NO.
B-5540	4
SITE PLAN	

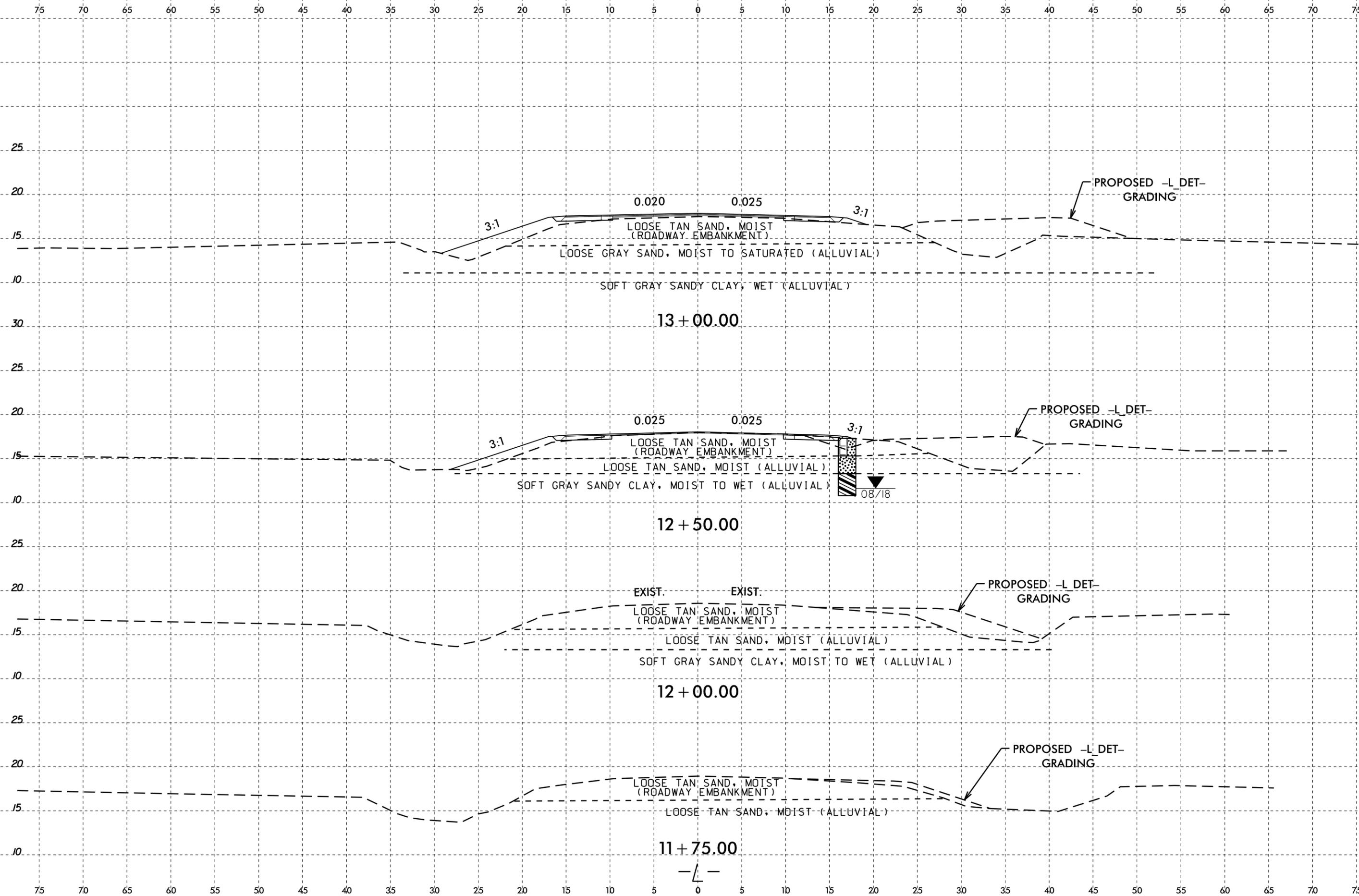


SITE PLAN



NC GRID
NAD 83 NA 2011

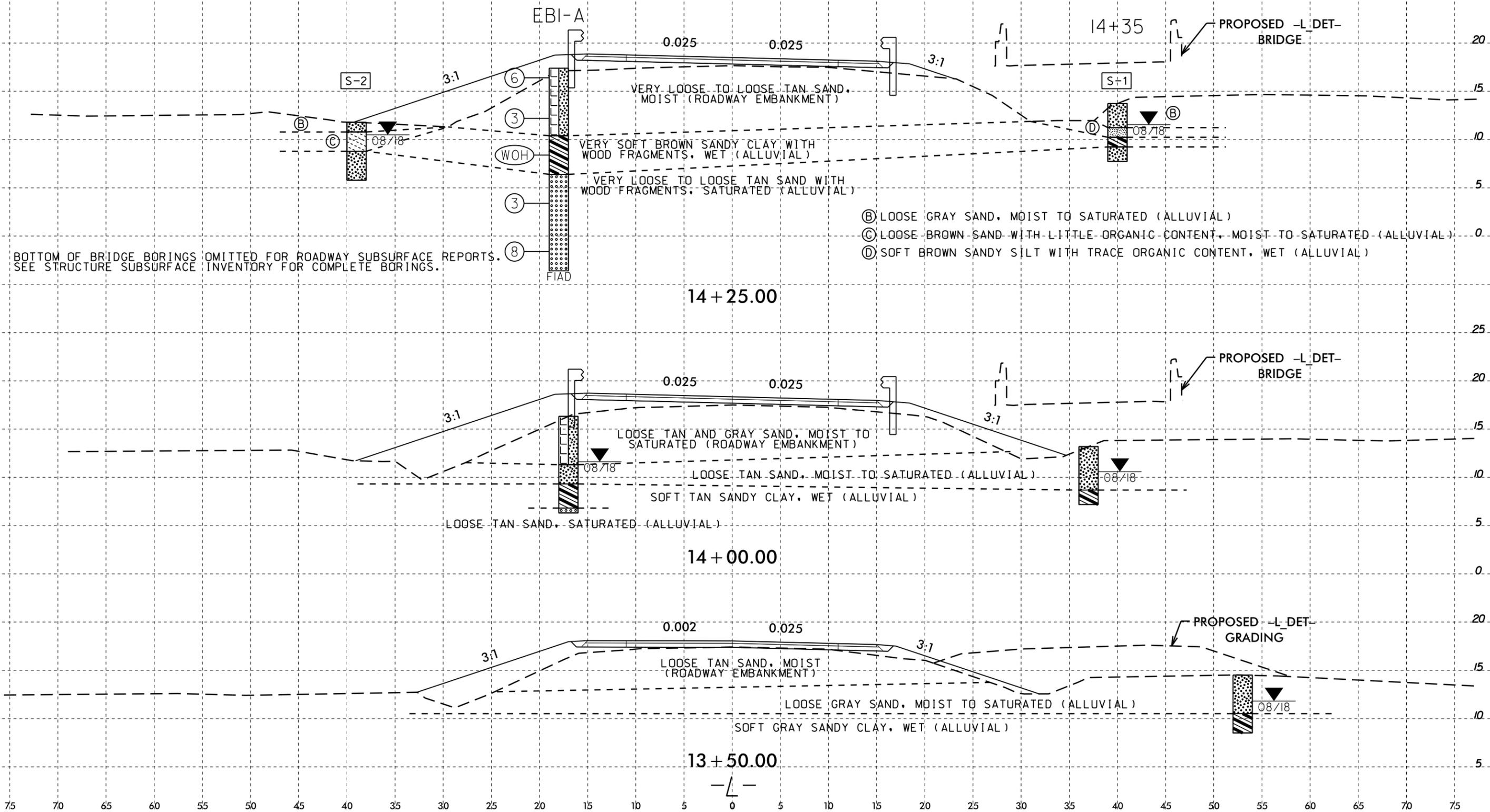


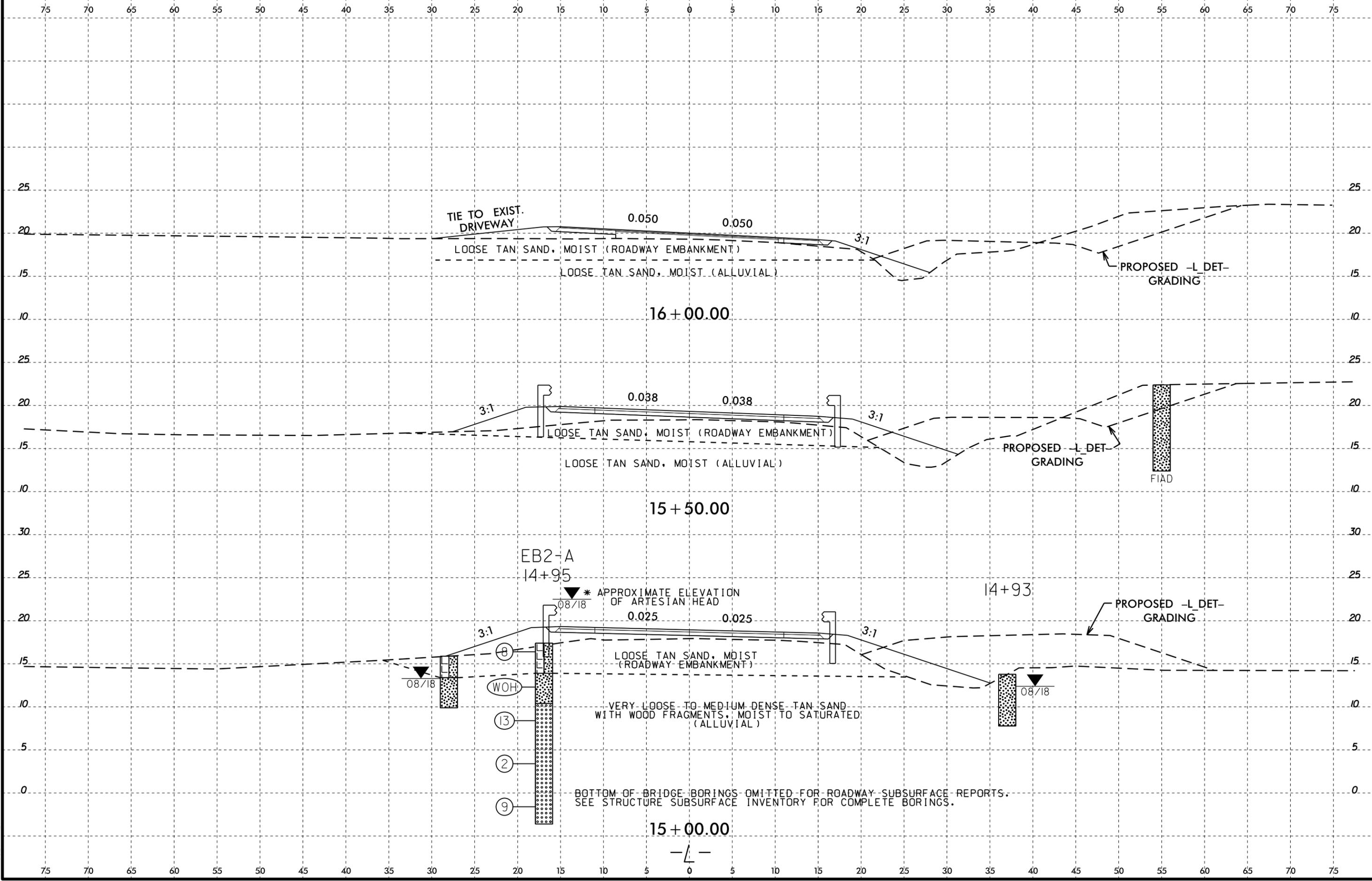


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SOIL TEST RESULTS

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	40' RT	14+35	2.5-3.5	A-4(0)	21	2	7.4	49.4	29.0	14.1	100	99	44	29.3	4.1
S-2	39' LT	14+25	1.0-3.0	A-2-4(0)		NP	11.1	61.5	17.4	10.1	99	98	28	38.4	4.3

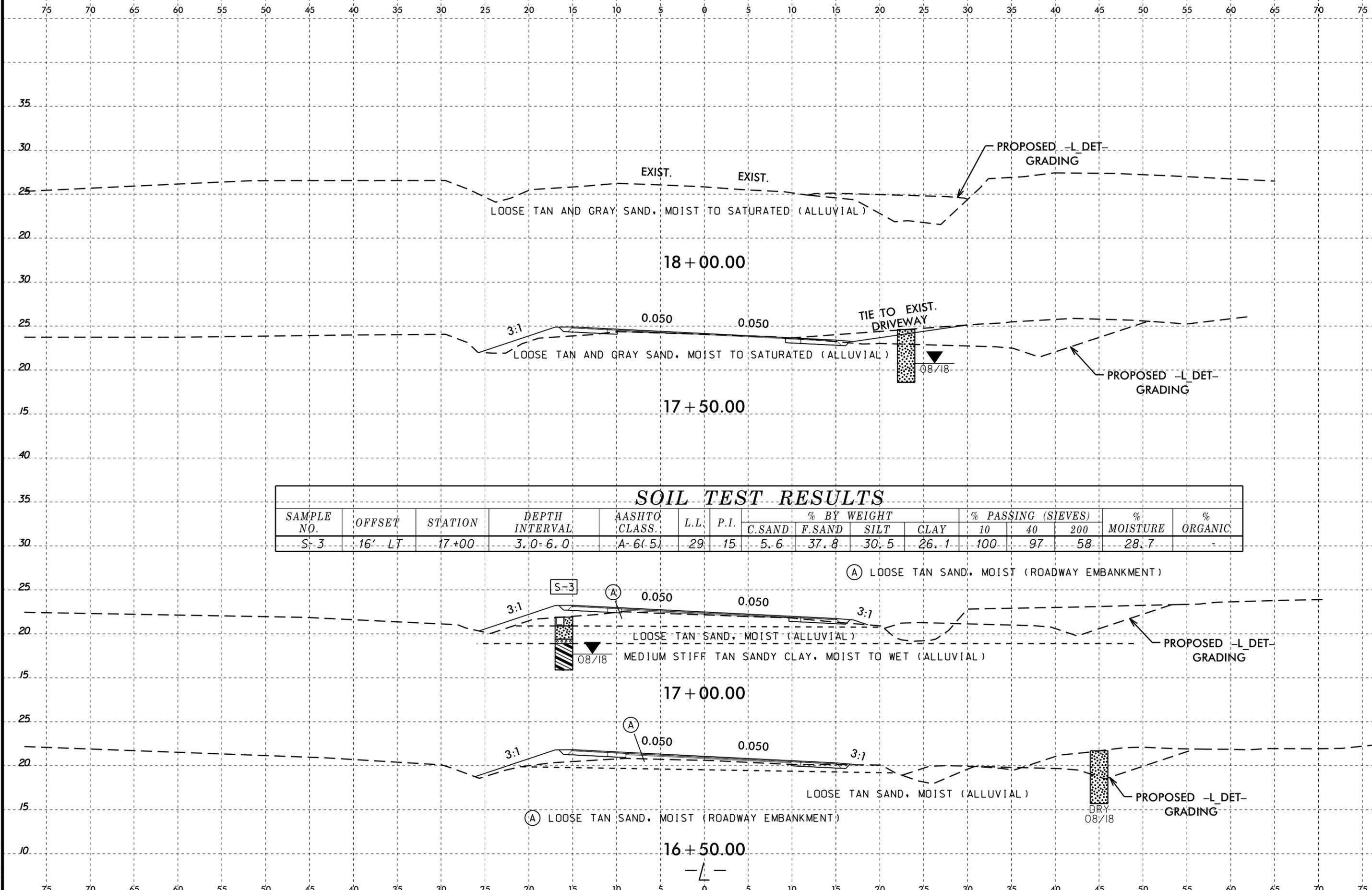




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BOTTOM OF BRIDGE BORINGS OMITTED FOR ROADWAY SUBSURFACE REPORTS.
SEE STRUCTURE SUBSURFACE INVENTORY FOR COMPLETE BORINGS.

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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-3	16' LT	17+00	3.0-6.0	A-6(5)	29	15	5.6	37.8	30.5	26.1	100	97	58	28.7	

(A) LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

LOOSE TAN SAND, MOIST (ALLUVIAL)
 MEDIUM STIFF TAN SANDY CLAY, MOIST TO WET (ALLUVIAL)

(A) LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

LOOSE TAN SAND, MOIST (ALLUVIAL)