

NOTE: SEE SHEET 2A 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-4185	1	6
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33532.1.1	BRSTP-171(14)	PE	
33532.2.1	BRSTP-171(14)	RAW & UTIL	
33532.3.1	BRSTP-171(14)	CONST.	

CONTENTS

LINE	STATION	PLAN	PROFILE
-L-	12+00 TO 23+75	4	5
-DRI-	10+00 TO 11+40	4	6
-DR2-	10+00 TO 11+11	4	6

ROADWAY  
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33532.1.1 (B-4185) F.A. PROJ. BRSTP-171 (14)  
COUNTY MARTIN  
PROJECT DESCRIPTION BRIDGE NO. 16 ON NC 171 OVER  
HARDISON MILL CREEK

INVENTORY - REVISED

CAUTION NOTICE

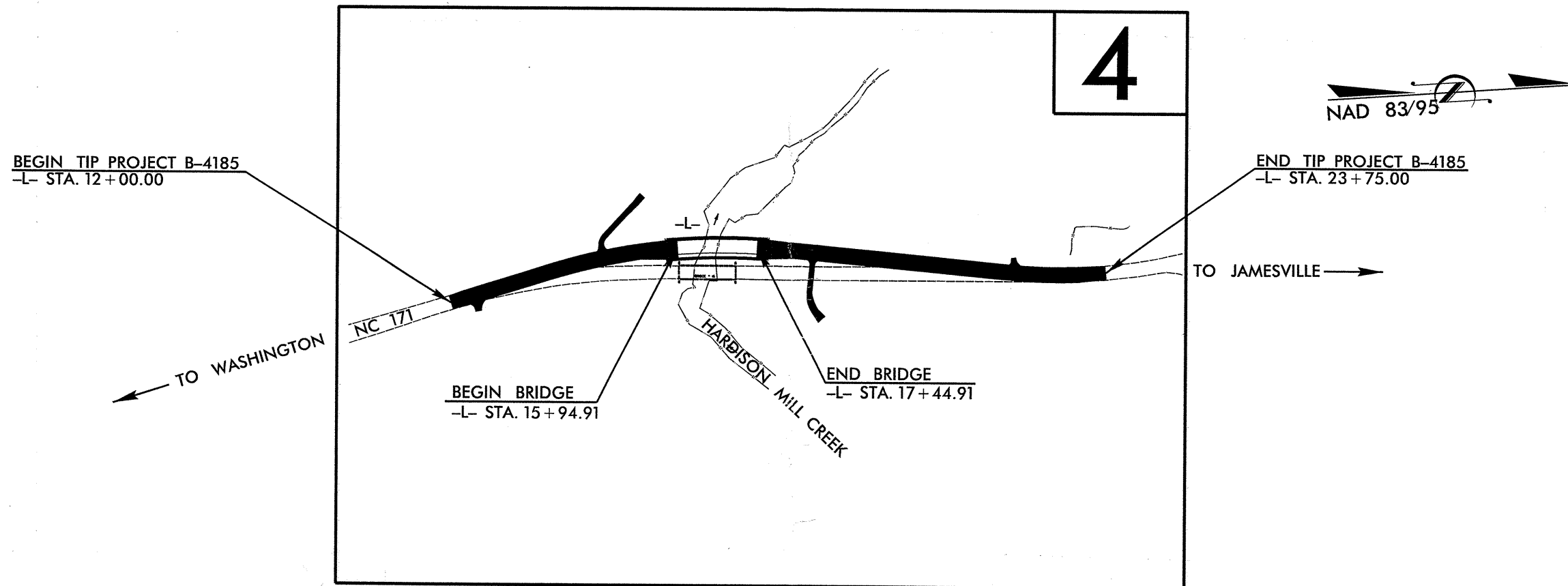
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1919 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

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

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

ID: B-4185

CONTRACT: C203081



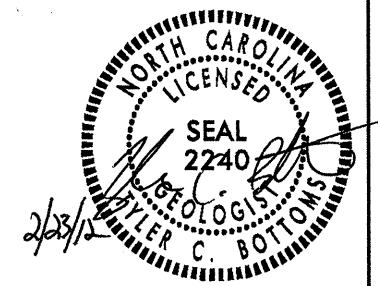
- PERSONNEL
- K.B. QUICK**
  - W.N. CHERRY**
  - R.E. SMITH**
  - J.R. SWARTLEY**
  - J.M. EDMONDSON**

INVESTIGATED BY **T.C. BOTTOMS**  
CHECKED BY **D.N. ARGENBRIGHT**  
SUBMITTED BY **D.N. ARGENBRIGHT**  
DATE **FEBRUARY 2012**

DRAWN BY: **C.P. TURNER**

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

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





STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4185	2A	6
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33532.1.1	BRSTP-171(14)	PE	

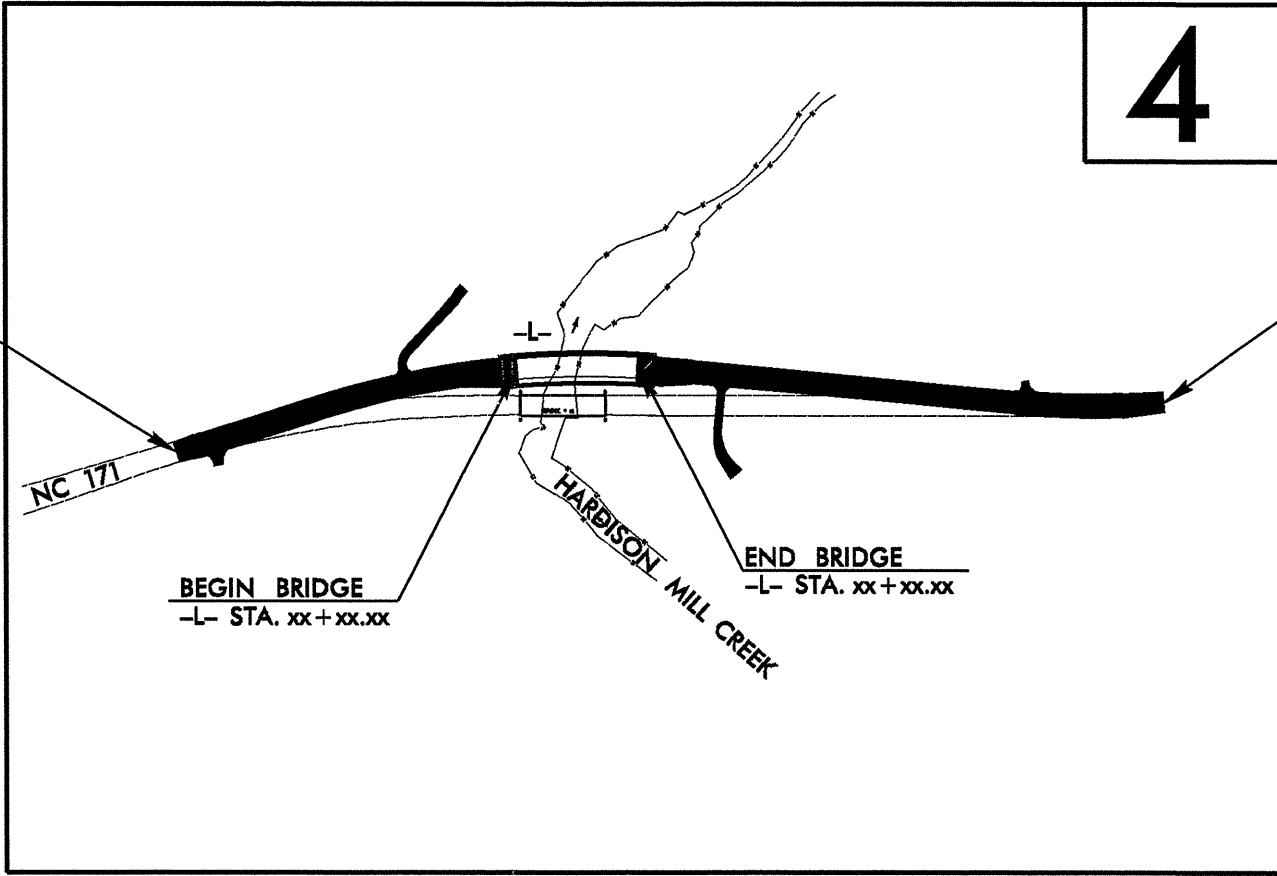
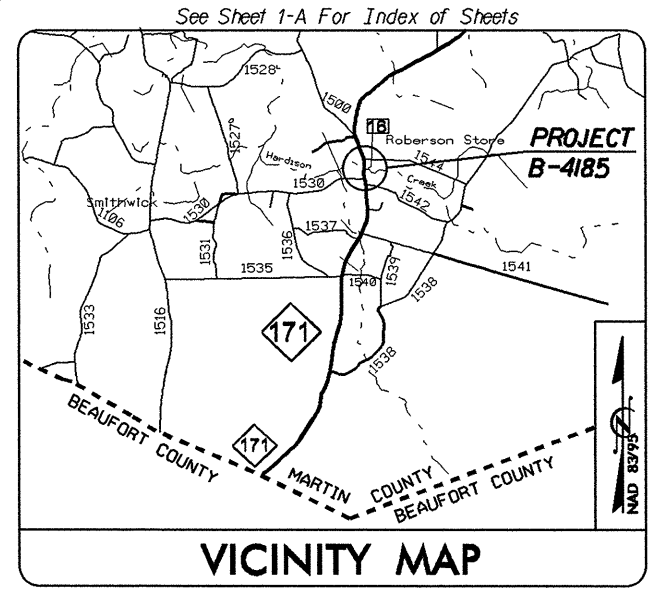


STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# MARTIN COUNTY

LOCATION: BRIDGE NO. 16 OVER HARDISON MILL CREEK ON NC 171

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE



STATEWIDE TIER DESIGN GUIDELINES WERE USED ON THIS PROJECT

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES

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

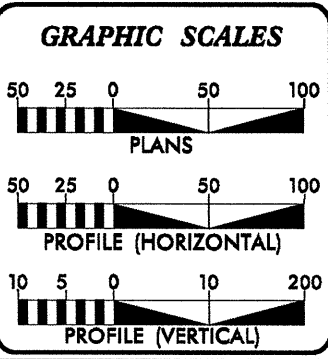
THERE IS NO CONTROL OF ACCESS ON THIS PROJECT

INCOMPLETE PLANS  
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION

TIP PROJECT: B-4185

CONTRACT:



**DESIGN DATA**

ADT 2011	=	2600
ADT 2035	=	3700
DHV	=	12 %
D	=	55 %
T	=	14 % *
V	=	50 MPH
FUNC	=	COLLECTOR
* TTST	=	DUAL 5

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4185	=	0.223 mi.
LENGTH STRUCTURE TIP PROJECT B-4185	=	0.000 mi.
TOTAL LENGTH TIP PROJECT B-4185	=	0.223 mi.

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: **DECEMBER 23, 2011**

LETTING DATE: **JANUARY 15, 2013**

**JIMMY GOODNIGHT, P.E.**  
PROJECT ENGINEER

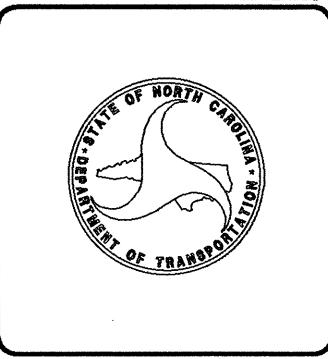
**MARK HUSSEY**  
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

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

**ROADWAY DESIGN ENGINEER**

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



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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE  
GOVERNOR

EUGENE A. CONTI, JR.  
SECRETARY

February 23, 2012

STATE PROJECT: 33532.1.1 (B-4185)  
F.A. PROJECT: BRSTP-171(14)  
COUNTY: Martin  
DESCRIPTION: Bridge No. 16 on NC 171 over Hardison Mill Creek  
SUBJECT: Geotechnical Inventory - Revised

**Project Description**

This project is located in Martin County, approximately 7 miles south of Jamesville on NC 171. Proposed construction consists of relocating NC 171 to the west of the existing site. This geotechnical investigation was confined to the areas of proposed construction.

Fieldwork for this project was conducted during January of 2006 and January of 2012. Standard Penetration Test borings were advanced with a CME 45-B drill machine with an automatic hammer. Hand auger borings were also completed. Representative soil samples were collected for visual classification in the field and for laboratory analysis by the Materials and Tests Unit.

The following alignments were investigated. Subsurface profiles of these alignments are included in this report.

<u>Line</u>	<u>Station(±)</u>
-L-	12+00 to 23+75
-DR1-	10+00 to 11+40
-DR2-	10+00 to 11+11

**Areas of Special Geotechnical Interest**

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

<u>Line</u>	<u>Station(±)</u>
-L-	12+00 to 13+50
-DR1-	10+00 to 11+40
-DR2-	10+00 to 10+85

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

<u>Line</u>	<u>Station(±)</u>
-L-	15+40 to 23+75
-DR2-	10+00 to 10+40

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

<u>Line</u>	<u>Station(±)</u>
-L-	17+15 to 17+44

**Physiography and Geology**

This project corridor is located within the Coastal Plain Physiographic Province. Topography along the project is nearly flat to gently sloping. Ground elevations range from 16± feet below sea level along the bed of Hardison Mill Creek to 35± feet above sea level along the existing NC 171 embankment. Surface water along the project flows directly into Hardison Mill Creek.

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

**Ground Water**

Ground water data was collected in January of 2006 and January of 2012, during times of normal precipitation. Ground water elevations ranged from 17 to 22± feet above sea level.

**Soils**

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

Roadway Embankment soils were encountered along existing NC 171 and associated intersecting roads. These soils are comprised of 1± to 10 or more feet of loose sand (A-2-4) and medium stiff sandy and clayey silt (A-4).

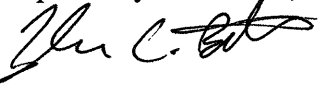
Soils classified as artificial fill are comprised of 3 feet of soft sandy silt (A-4). This artificial fill was encountered within the floodplain of Hardison Mill Creek.

Alluvial soils were encountered beneath the embankment and within the floodplain of the Hardison Mill Creek. They are comprised of 1± to 13± feet of loose to medium dense sand (A-2-4, A-1-b), 5 or more feet of sandy silt (A-4) and 1± to 6± feet of muck and sandy silt with little organic material.

Laboratory analysis of these soils show organic percentages ranging from 7% to 22% and moisture contents ranging from 15% to 201%. Vane Shear tests indicate shear strength values ranging from 210 psf to 2478 psf.

Undivided coastal plain soils within the project area are composed of 6 or more feet of medium stiff sandy silt and stiff silty clay.

Formational soils encountered beneath the alluvial soils during the bridge investigation were limited to the Yorktown Formation consisting of sand and clay soils as well as limestone of the Castle Hayne Formation.

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

PROJECT: B-4185 COUNTY: Martin Volumes in Cubic Yards DATE: 4/20/2011 COMPILED BY: J JOHNSON SHEET\_\_ OF \_\_ SHEETS

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNCLASS. UNSUIT.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. +30%		ROCK	SUITABLE	UNCLASS. UNSUIT.	TOTAL
-L- -L- 13+75.00	-L- 15+91.20	143				143	1,617		1,617	2,102	1,959				
-DR1- -DR1- 10+14.00	-DR1- 11+40.00	3				3	430		430	559	556				
<b>SUMMARY SUBTOTAL #1</b>		146				146	2,047		2,047	2,661	2,515				
-L- -L- 17+01.20	-L- 19+75.00	18				18	5,171		5,171	6,722	6,704				
-DR2- -DR2- 10+14.00	-DR2- 11+25.00	51				51	179		179	232	181				
<b>SUMMARY SUBTOTAL #2</b>		69				69	5,350		5,350	6,954	6,885				
<b>SUMMARY TOTALS</b>		215				215	7,397		7,397	9,615	9,400				
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT											470				
<b>PROJECT TOTAL</b>		215				215	7,397		7,397	9,615	9,870				
<b>EXISTING ROAD REMOVAL</b>															
-L- 12+22.82	-L- 16+12.19	1,997				1,997	12		12	15			1,982		1,982
-L- 17+26.79	-L- 22+91.72	3,041				3,041	487		487	634			2,407		2,407
<b>REMOVAL TOTAL</b>		5,038				5,038	499			649			4,389		4,389
<b>GRAND TOTAL</b>		5,253									9,870		4,389		4,389
<b>SAY</b>		5,300									9,900				
<b>GEOTECH RECOMMENDATIONS</b>															
UNDERCUT 2,700 SY															
GEOTEXTILE FOR SOIL STABILIZATION 2,700 CY															
CL. II OR III SELECT MATERIAL 2,700 CY															
6" PERFORATED SUBDRAIN PIPE 1,000 LF															
EST. DDE = 50 CUBIC YARDS															

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

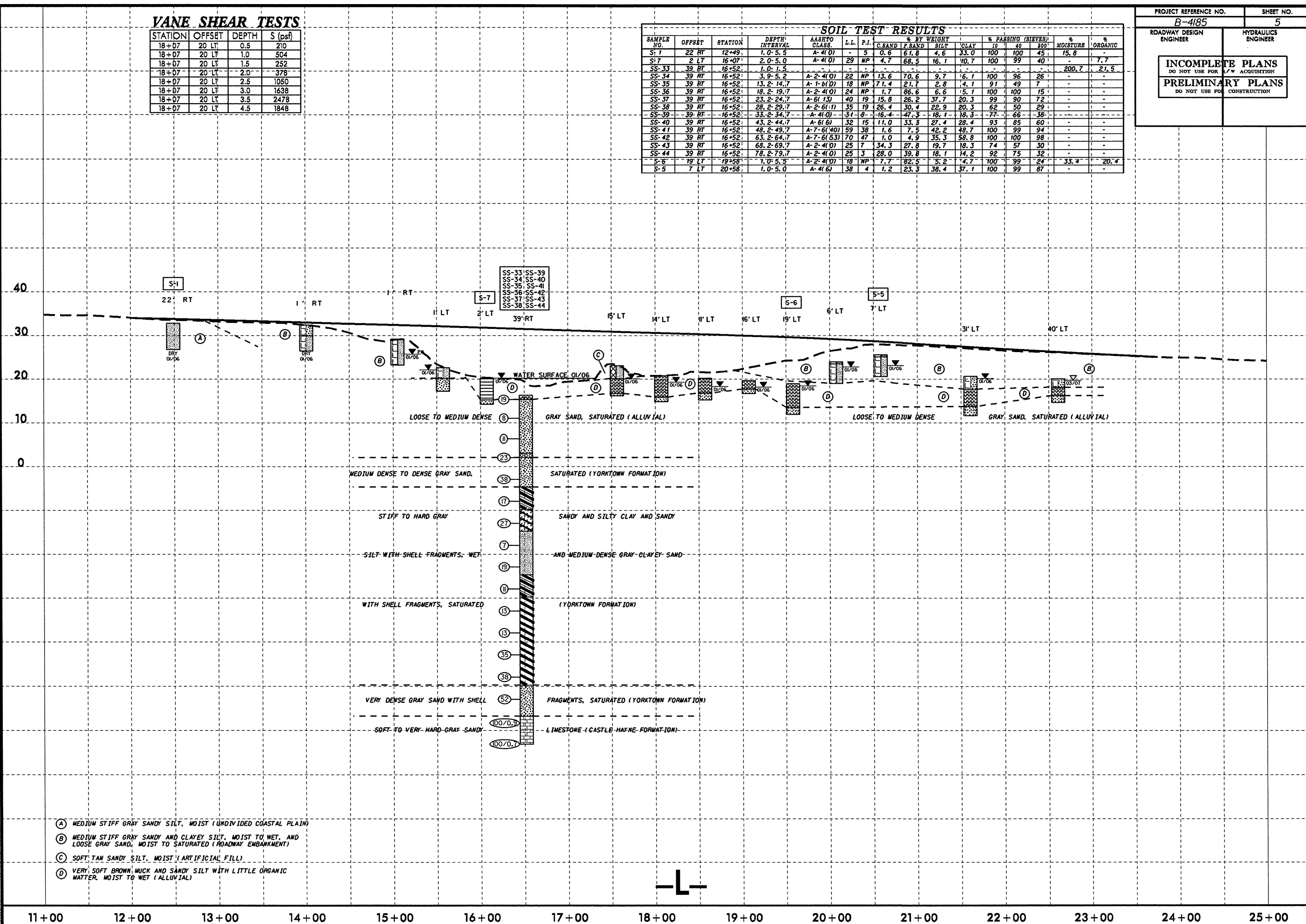


**VANE SHEAR TESTS**

STATION	OFFSET	DEPTH	S (psf)
18+07	20 LT	0.5	210
18+07	20 LT	1.0	504
18+07	20 LT	1.5	252
18+07	20 LT	2.0	378
18+07	20 LT	2.5	1050
18+07	20 LT	3.0	1638
18+07	20 LT	3.5	2478
18+07	20 LT	4.5	1848

**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	10	40	200		
S-1	22 RT	12+49	1.0-5.5	A-4(0)	5	0.6	67.8	4.6	33.0	100	100	45	15.8	-
S-7	2 LT	16+07	2.0-5.0	A-4(0)	29	NP	4.7	68.5	16.1	100	99	40	-	7.7
SS-33	39 RT	16+52	1.0-1.5	-	-	-	-	-	-	-	-	-	200.7	21.5
SS-34	39 RT	16+52	3.9-5.2	A-2-4(0)	22	NP	13.6	70.6	9.7	16.1	100	96	26	-
SS-35	39 RT	16+52	13.2-14.7	A-1-0(0)	18	NP	71.4	21.7	2.8	4.1	91	49	7	-
SS-36	39 RT	16+52	18.2-19.7	A-2-4(0)	24	NP	1.7	86.6	6.6	15.1	100	100	15	-
SS-37	39 RT	16+52	23.2-24.7	A-6(13)	40	19	15.8	26.2	37.7	20.3	99	90	72	-
SS-38	39 RT	16+52	28.2-29.7	A-2-6(11)	35	19	26.4	30.4	22.9	20.3	62	50	29	-
SS-39	39 RT	16+52	33.2-34.7	A-4(0)	31	8	16.4	47.3	16.1	18.3	77	66	36	-
SS-40	39 RT	16+52	43.2-44.7	A-6(6)	32	15	11.0	33.3	27.4	28.4	93	85	60	-
SS-41	39 RT	16+52	48.2-49.7	A-7-6(40)	59	38	1.6	7.5	42.2	48.7	100	99	94	-
SS-42	39 RT	16+52	63.2-64.7	A-7-6(53)	70	47	1.0	4.9	35.3	58.8	100	100	98	-
SS-43	39 RT	16+52	68.2-69.7	A-2-4(0)	25	7	34.3	27.8	19.7	18.3	74	57	30	-
SS-44	39 RT	16+52	78.2-79.7	A-2-4(0)	25	3	28.0	39.8	18.1	14.2	92	75	32	-
S-6	19 LT	19+58	1.0-5.5	A-2-4(0)	18	NP	7.7	82.5	5.2	4.7	100	99	24	33.4
S-5	7 LT	20+58	1.0-5.0	A-4(6)	38	4	1.2	23.3	38.4	37.1	100	99	87	-



- (A) MEDIUM STIFF GRAY SANDY SILT, MOIST (UNDIVIDED COASTAL PLAIN)
- (B) MEDIUM STIFF GRAY SANDY AND CLAYEY SILT, MOIST TO WET, AND LOOSE GRAY SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)
- (C) SOFT TAN SANDY SILT, MOIST (ARTIFICIAL FILL)
- (D) VERY SOFT BROWN MUCK AND SANDY SILT WITH LITTLE ORGANIC MATTER, MOIST TO WET (ALLUVIAL)

5/14/99  
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 Author: AT (2/25/11)



