PROJECT: 55041 REFERENCE: B-5541

SEE SHEET 3 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5541	1	

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

ROADWAY SUBSURFACE INVESTIGATION

COUNTY *HAYWOOD*

PROJECT DESCRIPTION *REPLACE BRIDGE NO. 236 ON I-40 OVER SR 1513 IN HAYWOOD COUNTY*

PAVEMENT & SUBGRADE INVESTIGATION

CONTENTS

APPENDIX A

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 (919) 707-6850. 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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS 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:

1. 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.
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

Q. HILL

CG2 EXPLORATION

INVESTIGATED BY *J. HOLLAND*

DRAWN BY *J. HOLLAND*

CHECKED BY *J. CRENSHAW*

SUBMITTED BY *SCHNABEL ENG.*

DATE *AUGUST 2024*

Schnabel ENGINEERING

NORTH CAROLINA LICENSED SEAL 2818 GEOLOGIST JASON A. HOLLAND

Signed by:

DF15142D0C[illegible]

SIGNATURE	DATE
	08/20/2024

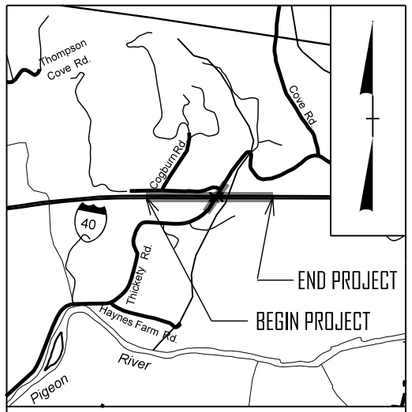
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

09/08/99

TIP PROJECT: B-5541

CONTRACT:

See Sheet 1A For Index of Sheets



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HAYWOOD COUNTY

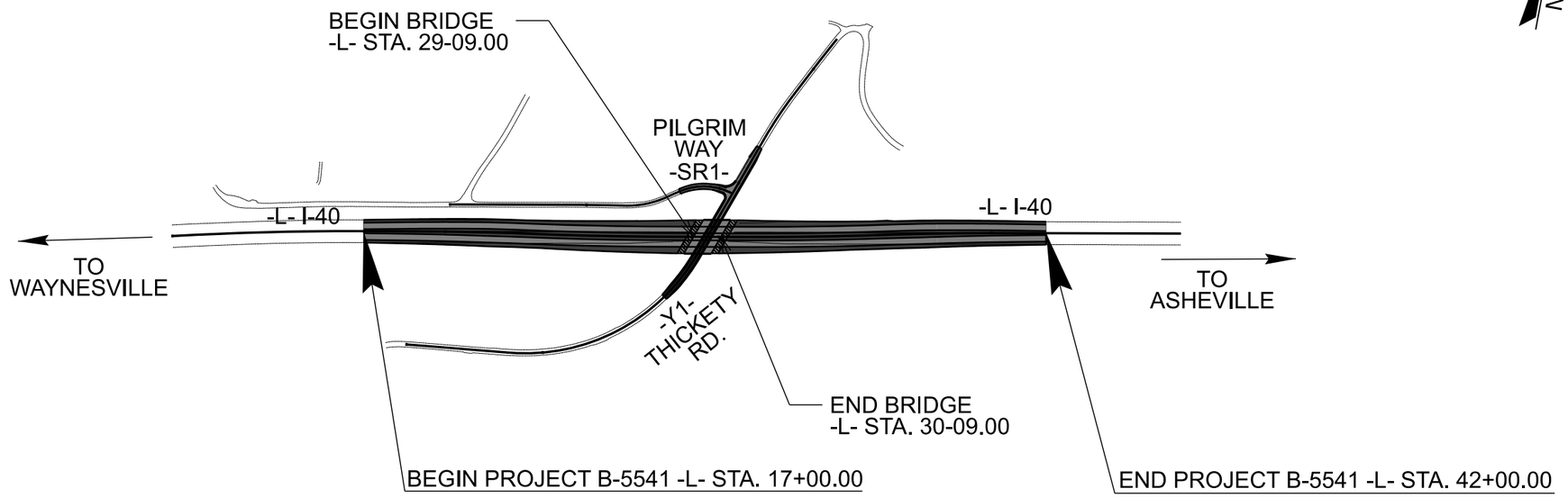
LOCATION: *BRIDGE NO. 236 OVER SR 1513 ON I-40*

TYPE OF WORK: *GRADING, PAVING, DRAINAGE AND STRUCTURES*

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5541		
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
55041.1.1		P.E.	

DESIGN RECOMMENDATION PLAN SET

NAD 83
NA 2011



THERE IS FULL CONTROL OF ACCESS ON THIS PROJECT.
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

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2024 = 60000
ADT 2044 = 77500
K = 8 %
D = 55 %
T = 15 % *
V = 65 MPH
* TTST =12%DUAL 3%
FUNC CLASS =
INTERSTATE
STATE WIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5541 = 0.471 MILES

LENGTH STRUCTURE TIP PROJECT B-5541 = 0.021 MILES

TOTAL LENGTH TIP PROJECT B-5541 = 0.492 MILES

Prepared in the Office of:
NV5 ENGINEERS & CONSULTANTS, INC.
8514 MCALPINE PARK DRIVE, STE 135
CHARLOTTE, NC 28211
Ph: 704.527.7300 www.NV5.com
NC License # F-0333
formerly CALYX Engineers & Consultants

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 15, 2024

LETTING DATE: JUNE 17, 2025

CHRIS ANDERSON, PE
PROJECT ENGINEER

DYLAN MCCANN
PROJECT DESIGN ENGINEER

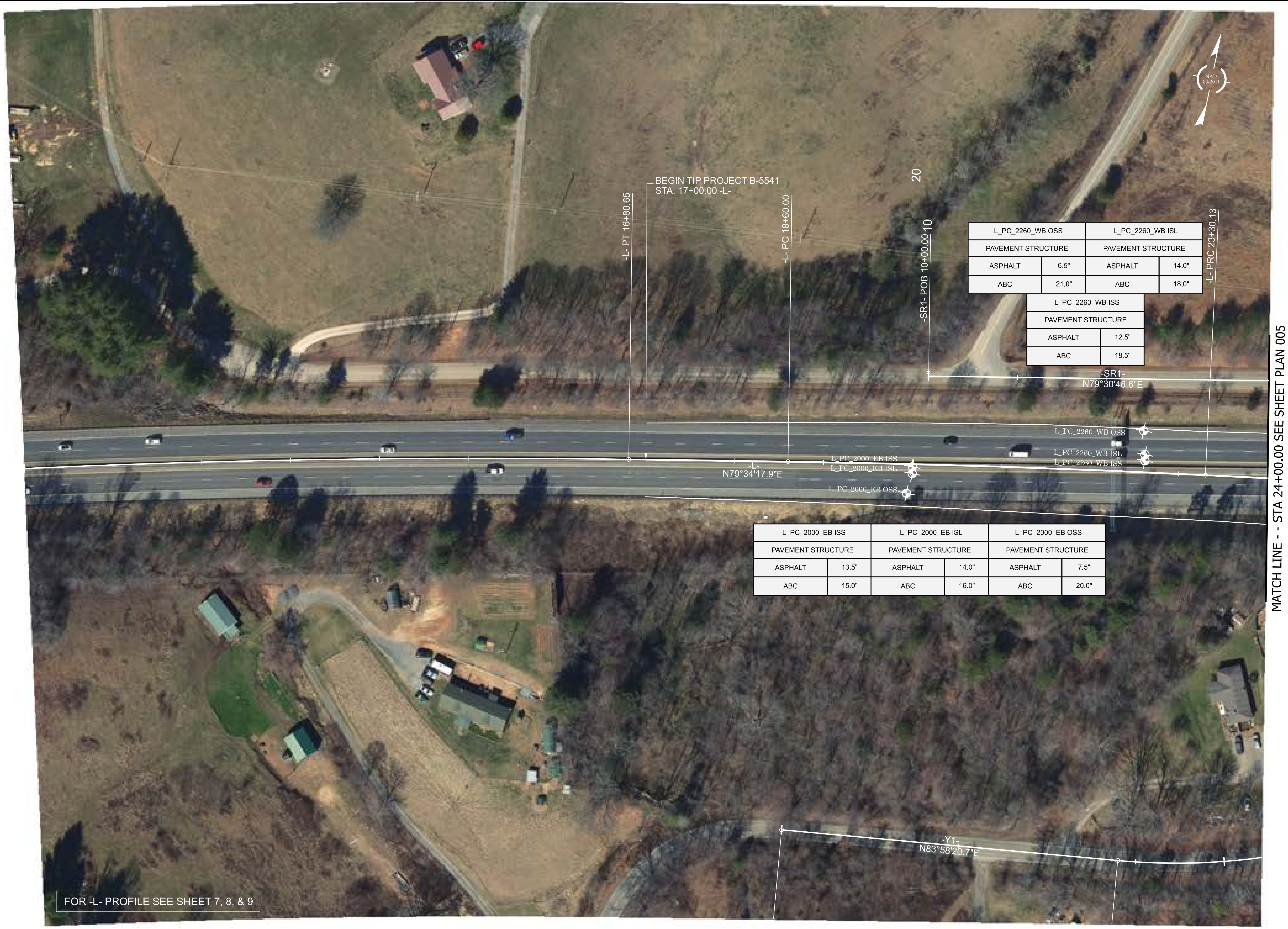
HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •



L_PC_2260_WB OSS	
PAVEMENT STRUCTURE	
ASPHALT	6.5"
ABC	21.0"

L_PC_2260_WB ISL	
PAVEMENT STRUCTURE	
ASPHALT	14.0"
ABC	18.0"

L_PC_2260_WB ISS	
PAVEMENT STRUCTURE	
ASPHALT	12.5"
ABC	18.5"

L_PC_2000_EB ISS	
PAVEMENT STRUCTURE	
ASPHALT	13.5"
ABC	15.0"

L_PC_2000_EB ISL	
PAVEMENT STRUCTURE	
ASPHALT	14.0"
ABC	16.0"

L_PC_2000_EB OSS	
PAVEMENT STRUCTURE	
ASPHALT	7.5"
ABC	20.0"

5/26/20

B-5541

R/W | 4

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HAYWOOD COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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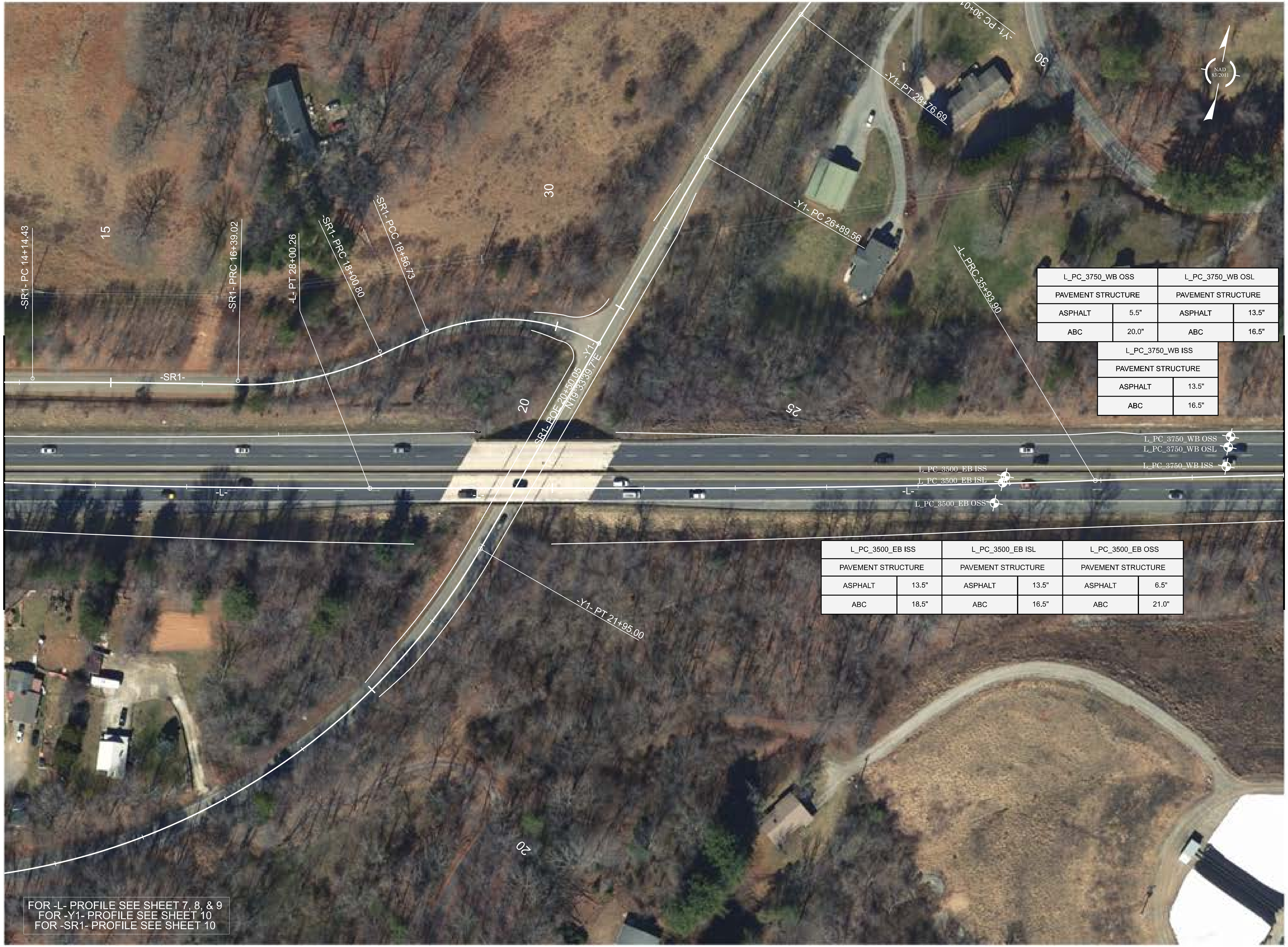
PREPARED BY
NV5

NV5 ENGINEERS & CONSULTANTS, INC.
8514 MCALPINE PARK DRIVE, SUITE 135
CHARLOTTE, NC 28211
P: 704.537.7300 www.NV5.com
NC License # F-1333

REVISIONS



L_PC_3750_WB OSS		L_PC_3750_WB OSL	
PAVEMENT STRUCTURE		PAVEMENT STRUCTURE	
ASPHALT	5.5"	ASPHALT	13.5"
ABC	20.0"	ABC	16.5"

L_PC_3750_WB ISS	
PAVEMENT STRUCTURE	
ASPHALT	13.5"
ABC	16.5"

L_PC_3500_EB ISS		L_PC_3500_EB ISL		L_PC_3500_EB OSS	
PAVEMENT STRUCTURE		PAVEMENT STRUCTURE		PAVEMENT STRUCTURE	
ASPHALT	13.5"	ASPHALT	13.5"	ASPHALT	6.5"
ABC	18.5"	ABC	16.5"	ABC	21.0"

B-5541

R/W | 5

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HAYWOOD COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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REVISIONS

5/26/20

5/26/20

B-5541

R/W | 6

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HAYWOOD COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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REVISIONS

PAVEMENT INVESTIGATION DATA SHEET

Project:	55041.1.1	**Route:**	I-40	**Prepared by:** J. Holland	**Date:** 4/17/2024
TIP:	B-5541	**County:**	Haywood	**Reviewed by:**	**Date:**

		Width [3]				Pavement Structure / Thickness [3]						Subgrade [4]						State Plane Coordinates	
Position [1] (Sta._Direction_Lane,Shldr.)	Cut/Fill [2] (Est. of Amount)	Lane(s)	Shoulder(s)	Offset Distance	Crown "C" or Super "S"	Pavement Layering	Total to Subgrade (in.)	Asphalt (in.)	Concrete (in.)	ABC (in.)	CTBC (in.)	Description	Sample ID	AASHTO Classification	Soil Moisture	Probe Depth	Asphalt Notes	Northing	Easting
-L- STA 20+00																			
L_PC_2000_EB_ISS	CUT ± 5.0'	ISL 12.0'	ISS 6.0'	1.5' FY	C	Asphalt ABC	28.5	13.5	-	15.0	-	RES: Reddish-brown, silty SAND, little mica (2.4' - 5.0')	-	A-2-4	M	5.0'	No pavement distress observed	677,165	843,489
L_PC_2000_EB_ISL	CUT ± 5.0'	ISL 12.0'	ISS 6.0'	4.0' FY	C	Asphalt ABC	30.0	14.0	-	16.0	-	RES: Brown, orange, silty SAND, little mica (2.5' - 5.0')	S-3	A-2-4(0)	13%	5.0'	Recent overlay. No pavement distress observed	677,158	843,490
L_PC_2000_EB_OSS	CUT ± 5.0'	OSL 12.0'	OSS 11.5'	3.5' FW	C	Asphalt ABC	27.5	7.5	-	20.0	-	RES: Brown, orange, silty SAND, little mica (2.3' - 5.0')	-	A-2-4	M	5.0'	No pavement distress observed	677,135	843,488
-L- STA 22+60																			
L_PC_2260_WB_OSS	CUT ± 12.0'	OSL 12.0'	OSS 11.0'	5.0' FW	C	Asphalt ABC	27.5	6.5	-	21.0	-	RES: White, tan, silty SAND, some mica (2.3' - 5.0')	S-13	A-2-4(0)	18%	5.0'	No pavement distress observed	677,256	843,737
L_PC_2260_WB_ISL	CUT ± 13.0'	ISL 12.5'	ISS 6.0'	4.0' FY	C	Asphalt ABC	32.0	14.0	-	18.0	-	RES: Tan, brown, silty SAND, little mica (2.7' - 5.0')	S-9	A-2-4(0)	8%	5.0'	Recent overlay. No pavement distress observed	677,230	843,743
L_PC_2260_WB_ISS	CUT ± 14.0'	ISL 12.5'	ISS 6.0'	1.5' FY	C	Asphalt ABC	31.0	12.5	-	18.5	-	RES: Tan, white, silty SAND, some mica (2.6' - 5.0')	-	A-2-4	M	5.0'	No pavement distress observed	677,223	843,744
-L- STA 35+00																			
L_PC_3500_EB_ISS	CUT ± 12.0'	ISL 11.5'	ISS 6.0'	1.5' FY	C	Asphalt ABC	32.0	13.5	-	18.5	-	RES: Tan, sandy SILT, trace mica (2.7' - 5.0')	S-6	A-4(0)	10%	5.0'	No pavement distress observed	677,436	844,960
L_PC_3500_EB_ISL	CUT ± 12.0'	ISL 11.5'	ISS 6.0'	4.0' FY	C	Asphalt ABC	30.0	13.5	-	16.5	-	RES: Tan, sandy SILT, trace mica (2.5' - 5.0')	-	A-4	M	5.0'	Recent overlay. No pavement distress observed	677,428	844,958
L_PC_3500_EB_OSS	CUT ± 12.0'	OSL 12.0'	OSS 12.5'	3.5' FW	C	Asphalt ABC	27.5	6.5	-	21.0	-	RES: Brown, orange, silty CLAY, little mica (2.3' - 5.0')	S-2	A-7-6(4)	77%	5.0'	No pavement distress observed	677,405	844,953
-L- STA 37+50																			
L_PC_3750_WB_OSS	CUT ± 15.0'	OSL 12.0'	OSS 11.0'	7.0' FW	C	Asphalt ABC	25.5	5.5	-	20.0	-	RES: White, tan, silty SAND, some mica (2.1' - 5.0')	S-10 S-11	A-2-4(0) A-2-4(0)	4% 13%	5.0'	No pavement distress observed	677,523	845,194
L_PC_3750_WB_OSL	CUT ± 13.0'	OSL 12.0'	OSS 11.0'	2.5' FW	C	Asphalt ABC	30.0	13.5	-	16.5	-	RES: Tan, brown, sandy SILT, little mica (2.5' - 5.0')	-	A-4	M	5.0'	Recent overlay. No pavement distress observed	677,511	845,194
L_PC_3750_WB_ISS	CUT ± 10.0'	ISL 12.0'	ISS 6.0'	0.5' FY	C	Asphalt ABC	30.0	13.5	-	16.5	-	RES: Tan, sandy CLAY, trace mica (2.5' - 5.0')	S-7	A-6(1)	15%	5.0'	No pavement distress observed	677,490	845,195

Notes:

1. Refer to plan sheets for pavement investigation locations.
2. Cut/Fill are rough estimates based on a review of existing topographic features and are for reference only.
3. Values are based on field measurements at time of investigation.
4. Soil descriptions, classifications, and moisture are based on visual-manual methods, unless otherwise noted.

Abbrevations:

OSL = Outside Lane
ISL = Inside Lane
CL = Center Lane
LTL = Left Turn Lane
CTL = Center Turn Lane
RTL = Right Turn Lane
DECEL = Deceleration Lane
ACCEL = Acceleration Lane
OSS = Outside Shoulder
ISS = Inside Shoulder
GM = Grass Median
OGS = Outside Grass Shoulder
PS = Paved Shoulder
RT LN = Right Lane
LT LN = Left Lane
COL = Collector Lane
D = Dry Soil
RT = Right
LT = Left
(I) = Inside
(O) = Outside
M = Moist Soil
NB = Northbound
SB = Southbound
FW = From White
FY = From Yellow
W = Wet Soil
ABC = Aggregate Base Course
CTBC = Cement-Treated Base Course
RES = Residual Soil
R.E. = Roadway Embankment

Schnabel ENGINEERING

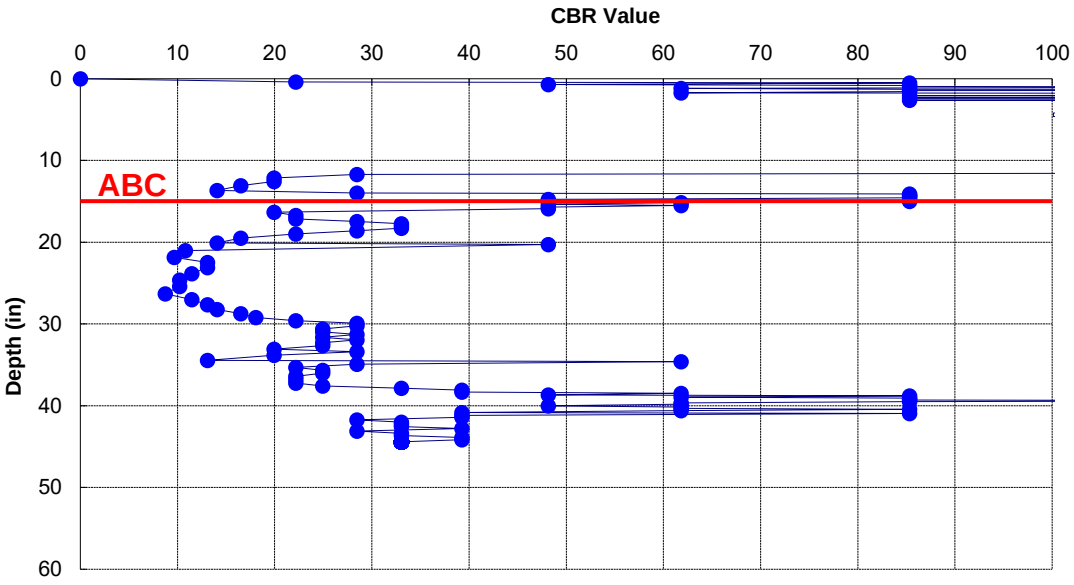
CONE PENETROMETER RESULTS

PROJECT NO.	B-5541
PROJECT NAME	2-Lane Extension of SR 1630
ROUTE	Replace Bridge No. 236 on I-40
COUNTY	Haywood

GEOLOGIST	Quinton Hill
GEOTECH(S)	C. Odom
	Z. Taylor
	N/A

L_PC_2000_EB ISS 1

Datum = Top of subbase 3/12/2024

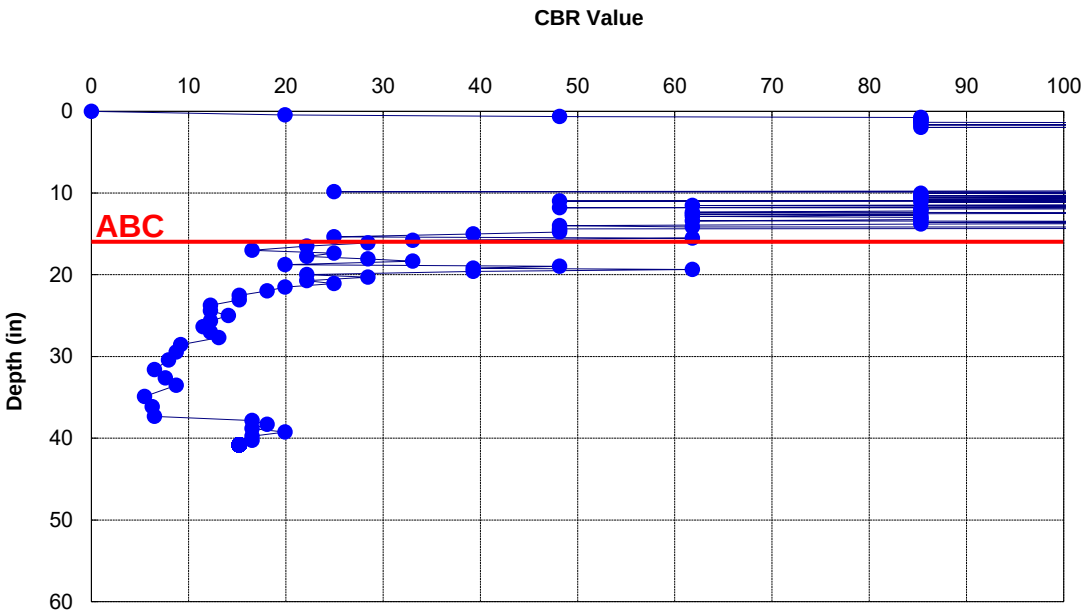


Interval 0.0 to 15.0	
# of Values	246
Avg CBR	100+
Wghtd Avg.	-
Max CBR	100+
Min CBR	14.1

Interval 15.0 to 44.4	
# of Values	86
Avg CBR	36.6
Wghtd Avg.	-
Max CBR	100+
Min CBR	8.7

L_PC_2000_EB ISL 2

Datum = Top of subbase 3/12/2024



Interval 0.0 to 16.0	
# of Values	274
Avg CBR	100+
Wghtd Avg.	-
Max CBR	100+
Min CBR	19.9

Interval 16.0 to 40.8	
# of Values	42
Avg CBR	18.9
Wghtd Avg.	-
Max CBR	61.8
Min CBR	5.4

CONE PENETROMETER RESULTS

PROJECT NO.	B-5541
PROJECT NAME	2-Lane Extension of SR 1630
ROUTE	Replace Bridge No. 236 on I-40
COUNTY	Haywood

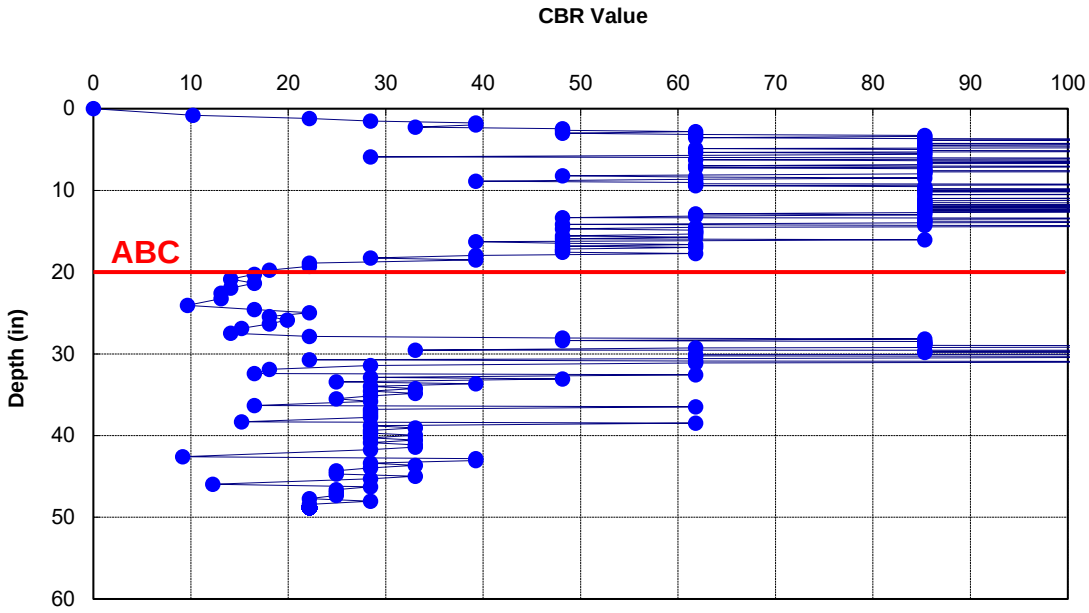
GEOLOGIST	Quinton Hill
GEOTECH(S)	C. Odom
	Z. Taylor
	N/A

L_PC_2000_EB OSS 3

Datum = Top of subbase 3/12/2024

Interval 0.0 to 20.0	
# of Values	137
Avg CBR	89.8
Wghtd Avg.	-
Max CBR	100+
Min CBR	10.2

Interval 20.0 to 48.8	
# of Values	91
Avg CBR	47.9
Wghtd Avg.	-
Max CBR	100+
Min CBR	9.2

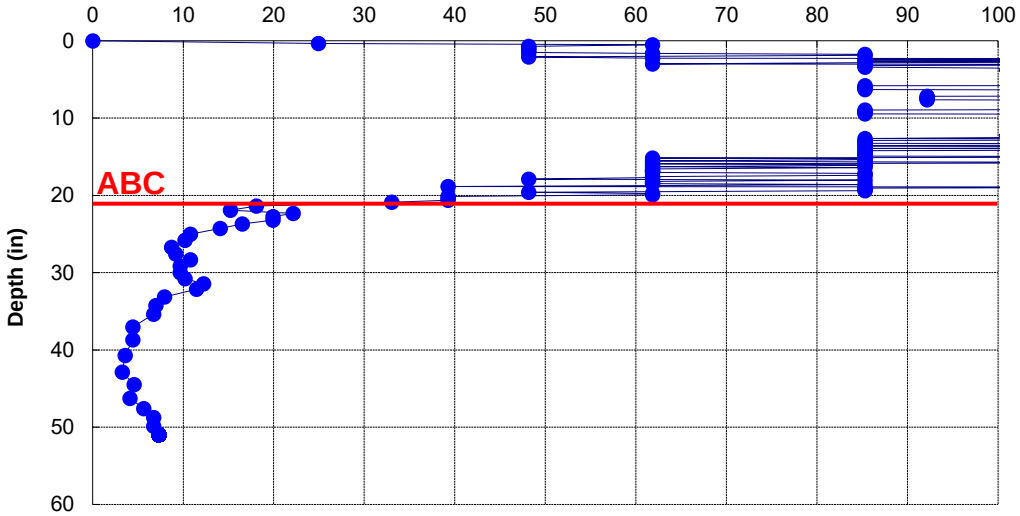


L_PC_2260_WB OSS 4

Datum = Top of subbase 3/14/2024

Interval 0.0 to 21.0	
# of Values	202
Avg CBR	100+
Wghtd Avg	-
Max CBR	100+
Min CBR	18.1

Interval 21.0 to 50.9	
# of Values	29
Avg CBR	9.8
Wghtd Avg	-
Max CBR	22.2
Min CBR	3.3



CONE PENETROMETER RESULTS

PROJECT NO.	B-5541
PROJECT NAME	2-Lane Extension of SR 1630
ROUTE	Replace Bridge No. 236 on I-40
COUNTY	Haywood

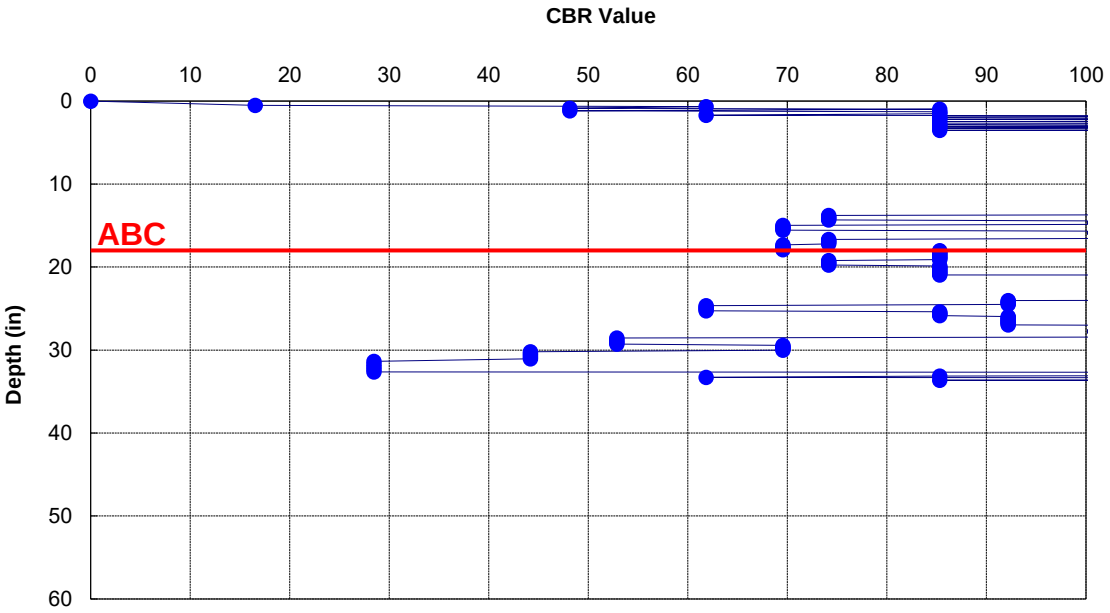
GEOLOGIST	Quinton Hill
GEOTECH(S)	C. Odom
	Z. Taylor
	N/A

L_PC_2260_WB ISL 5

Datum = Top of subbase 3/14/2024

Interval 0.0 to 18.0	
# of Values	241
Avg CBR	100+
Wghtd Avg.	-
Max CBR	100+
Min CBR	16.5

Interval 18.0 to 36.9	
# of Values	216
Avg CBR	100+
Wghtd Avg.	-
Max CBR	100+
Min CBR	28.4

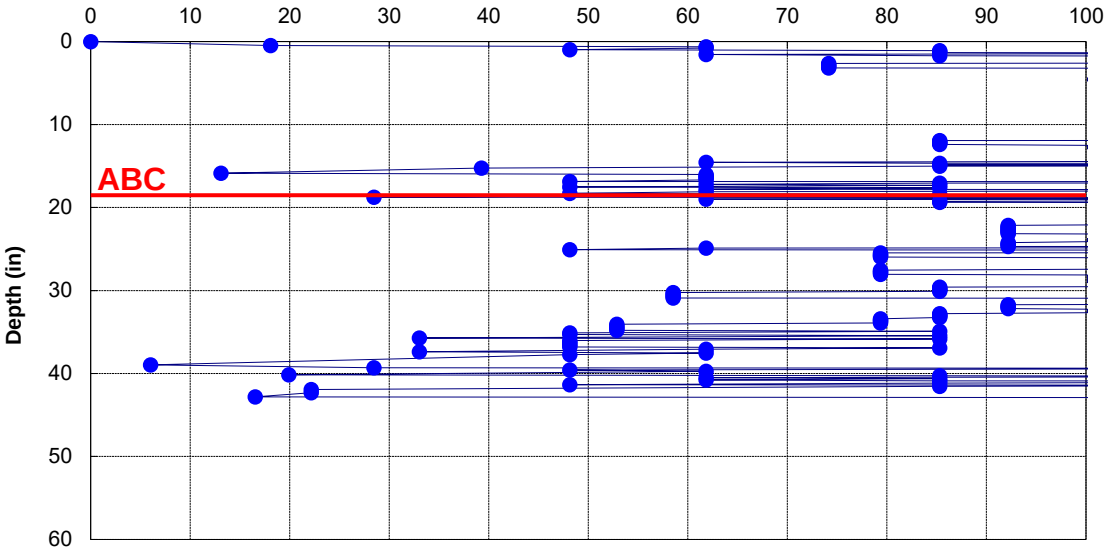


L_PC_2260_WB ISS 6

Datum = Top of subbase 3/14/2024

Interval 0.0 to 18.5	
# of Values	265
Avg CBR	100+
Wghtd Avg.	-
Max CBR	100+
Min CBR	13.1

Interval 18.5 to 45.0	
# of Values	222
Avg CBR	100+
Wghtd Avg.	-
Max CBR	100+
Min CBR	6.0



CONE PENETROMETER RESULTS

PROJECT NO.	B-5541
PROJECT NAME	2-Lane Extension of SR 1630
ROUTE	Replace Bridge No. 236 on I-40
COUNTY	Haywood

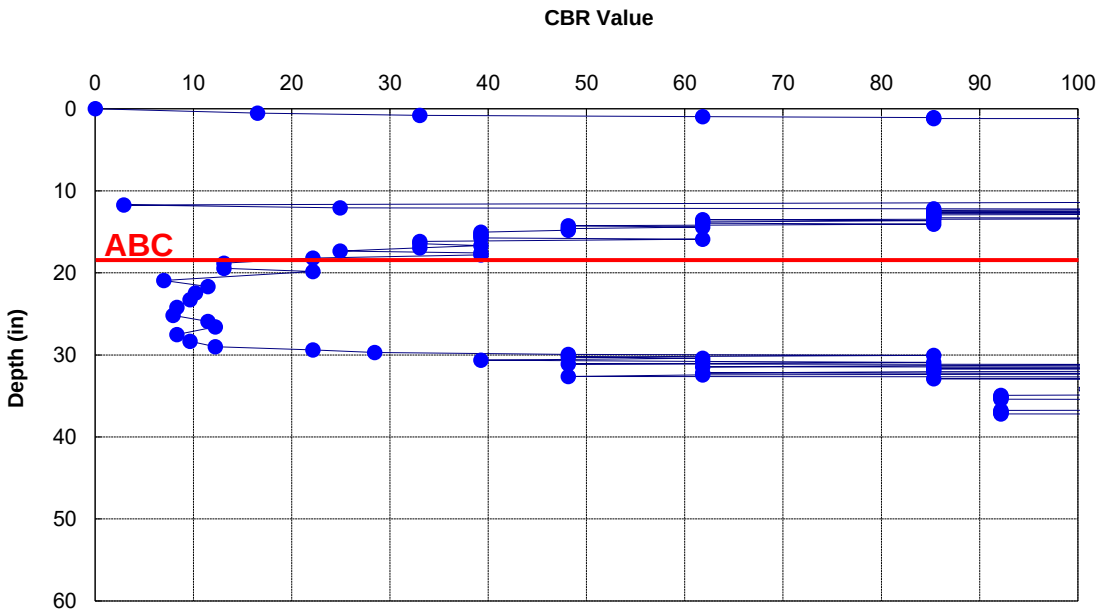
GEOLOGIST	Quinton Hill
GEOTECH(S)	C. Odom
	Z. Taylor
	N/A

L_PC_3500_EB ISS 7

Datum = Top of subbase 3/12/2024

Interval 0.0 to 18.5	
# of Values	278
Avg CBR	100+
Wghtd Avg.	-
Max CBR	100+
Min CBR	2.9

Interval 18.5 to 41.8	
# of Values	200
Avg CBR	100+
Wghtd Avg.	-
Max CBR	100+
Min CBR	7.0

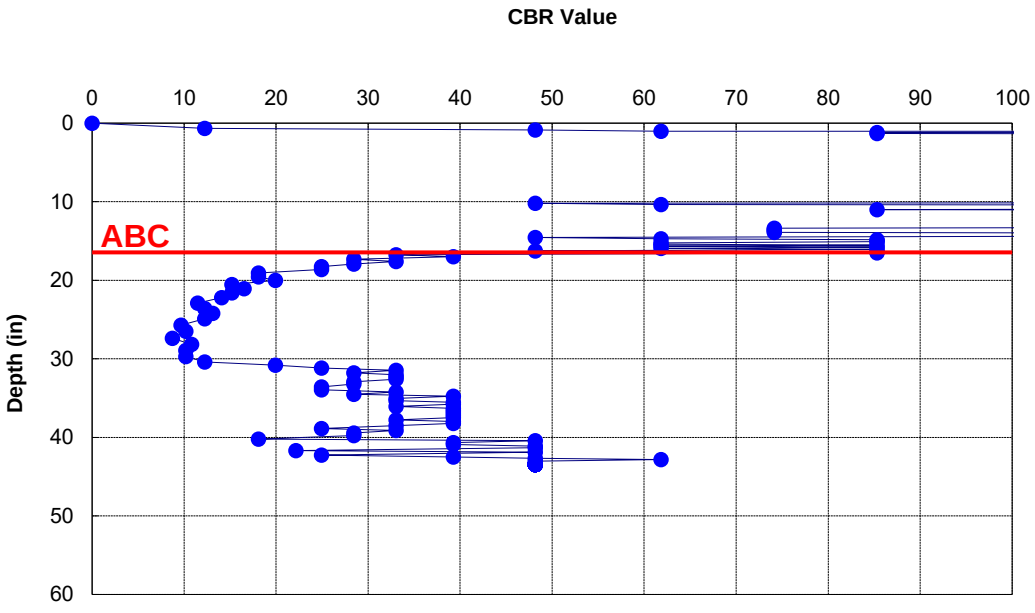


L_PC_3500_EB ISL 8

Datum = Top of subbase 3/12/2024

Interval 0.0 to 16.5	
# of Values	347
Avg CBR	100+
Wghtd Avg.	-
Max CBR	100+
Min CBR	12.2

Interval 16.5 to 43.4	
# of Values	72
Avg CBR	29.6
Wghtd Avg.	-
Max CBR	61.8
Min CBR	8.7



CONE PENETROMETER RESULTS

PROJECT NO.	B-5541
PROJECT NAME	2-Lane Extension of SR 1630
ROUTE	Replace Bridge No. 236 on I-40
COUNTY	Haywood

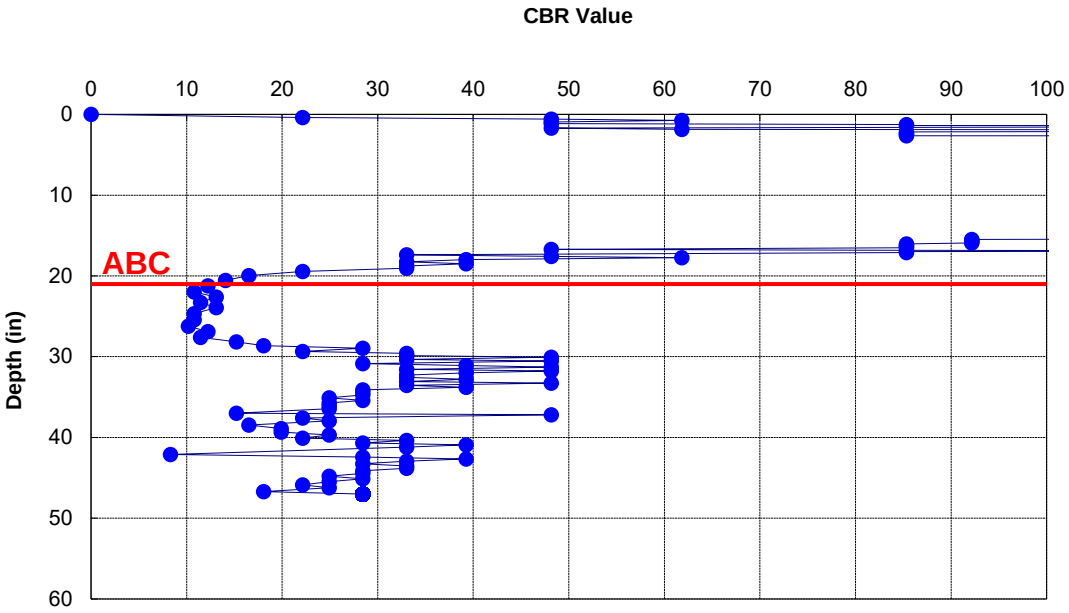
GEOLOGIST	Quinton Hill
GEOTECH(S)	C. Odom
	Z. Taylor
	N/A

L_PC_3500_EB OSS 9

Datum = Top of subbase 3/12/2024

Interval 0.0 to 21.0	
# of Values	266
Avg CBR	100+
Wghtd Avg.	-
Max CBR	100+
Min CBR	12.2

Interval 21.0 to 47.0	
# of Values	68
Avg CBR	27.5
Wghtd Avg.	-
Max CBR	48.1
Min CBR	8.3

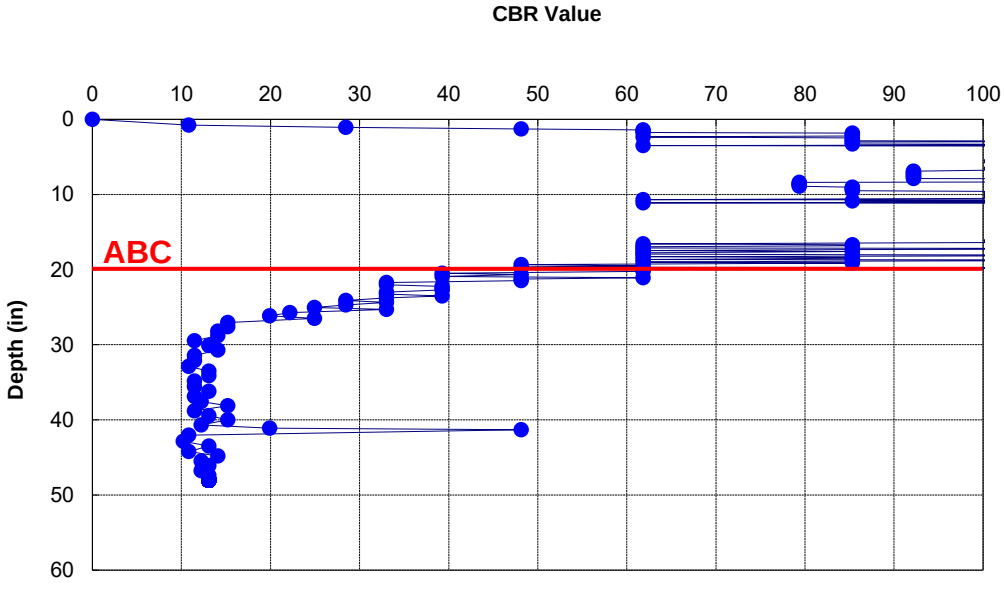


L_PC_3750_WB OSS 10

Datum = Top of subbase 3/14/2024

Interval 0.0 to 20.0	
# of Values	202
Avg CBR	100+
Wghtd Avg.	-
Max CBR	100+
Min CBR	10.8

Interval 20.0 to 48.0	
# of Values	58
Avg CBR	23.4
Wghtd Avg.	-
Max CBR	61.8
Min CBR	10.2



CONE PENETROMETER RESULTS

PROJECT NO.	B-5541
PROJECT NAME	2-Lane Extension of SR 1630
ROUTE	Replace Bridge No. 236 on I-40
COUNTY	Haywood

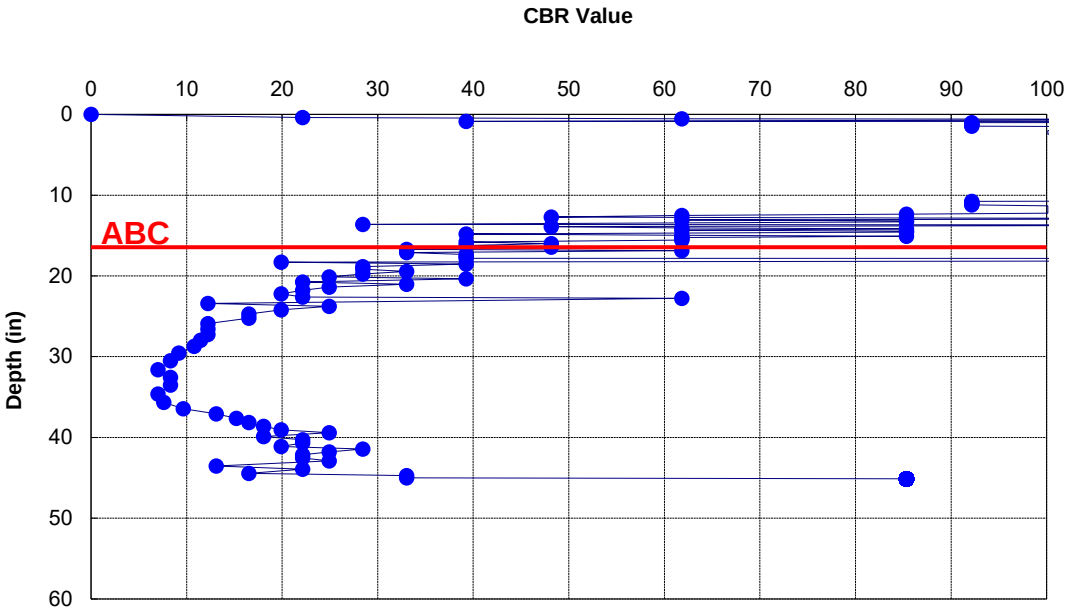
GEOLOGIST	Quinton Hill
GEOTECH(S)	C. Odom
	Z. Taylor
	N/A

L_PC_3750_WB OSL 11

Datum = Top of subbase 3/14/2024

Interval 0.0 to 16.5	
# of Values	202
Avg CBR	100+
Wghtd Avg.	-
Max CBR	100+
Min CBR	22.2

Interval 16.5 to 45.1	
# of Values	60
Avg CBR	28.0
Wghtd Avg.	-
Max CBR	100+
Min CBR	7.0

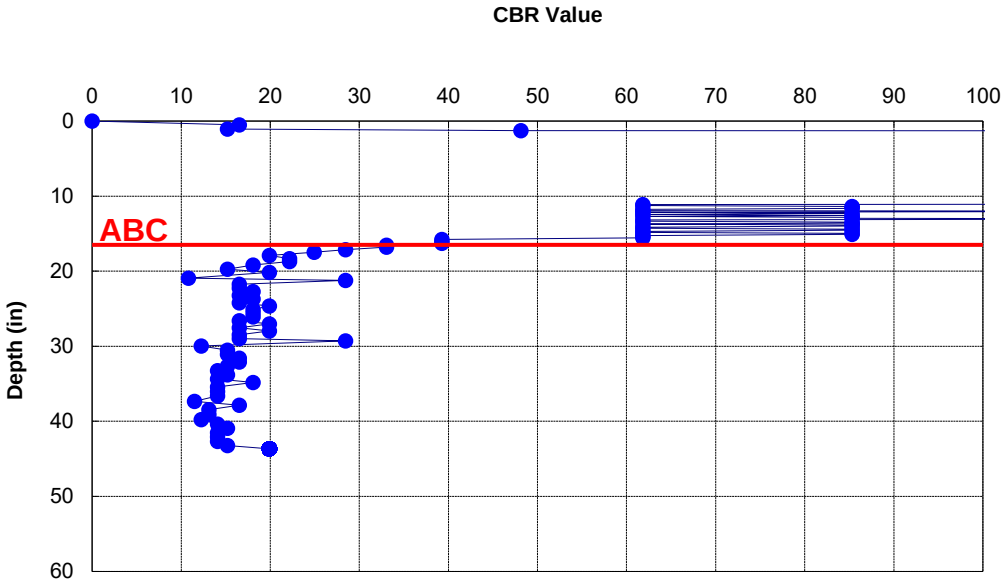


L_PC_3750_WB ISS 12

Datum = Top of subbase 3/13/2024

Interval 0.0 to 16.5	
# of Values	295
Avg CBR	100+
Wghtd Avg.	-
Max CBR	100+
Min CBR	15.2

Interval 16.5 to 43.7	
# of Values	53
Avg CBR	17.4
Wghtd Avg.	-
Max CBR	33.0
Min CBR	10.8



PAVEMENT CORE PHOTOGRAPHS
TIP No. B-5541|Haywood County, NC

L_PC_2000_EB_ISS

TOP

BOTTOM

TOP

BOTTOM

L_PC_2000_EB_ISL

L_PC_2000_EB_OSS

TOP

BOTTOM

TOP

BOTTOM

L_PC_2260_WB_OSS

PAVEMENT CORE PHOTOGRAPHS
TIP No. B-5541|Haywood County, NC

L_PC_2260_WB_ISL

TOP

BOTTOM

TOP

BOTTOM

L_PC_2260_WB_ISS

L_PC_3500_EB_ISS

TOP

BOTTOM

TOP

BOTTOM

L_PC_3500_EB_ISL

PAVEMENT CORE PHOTOGRAPHS
TIP No. B-5541|Haywood County, NC

L_PC_3500_EB_OSS

TOP

BOTTOM

TOP

BOTTOM

L_PC_3750_WB_OSS

L_PC_3750_WB_OSL

TOP

BOTTOM

TOP

BOTTOM

L_PC_3750_WB_ISS

Project: 55041.1.1
TIP: B-5541

PAVEMENT CORE EVALUATION FOR I-40
HAYWOOD COUNTY, NC

Prepared by: J. Jenkins
Reviewed by: J. Crenshaw

CORE LOCATION				SUBBASE		PAVEMENT CORE EVALUATION			
Line	Station Total Pavement (in.)	Lane Direction	Lane Location	Layer Type	Layer Thick-ness (in.)	Layer Type	Layer Thick-ness (in.)	# of Lifts	REMARKS
-L-	20+00	EB	ISS	ABC	15.0	S	5.00	3	Low severity oxidation and stripping in 1st two lifts.
						B	8.50	3	Low severity stripping at boundary of 2nd/3rd lift.
	13.50								
-L-	20+00	EB	ISL	ABC	16.0	OGFC	1.00	1	
						S	1.50	1	
						I	4.00	1	
						S	3.75	3	Mechanical break at lift interface.
	14.00					B	3.75	1	Low severity stripping.
-L-	20+00	EB	OSS	ABC	20.0	S	7.50	4	Aggregate size ≤12.5mm. Bottom 1" is larger bound aggregate.
								0	
	7.50							0	
-L-	22+60	WB	OSS	ABC	21.0	S	6.50	3	Aggregate size ≤12.5mm. Bottom 1" is larger bound aggregate.
								0	
	6.50							0	
-L-	22+60	WB	ISL	ABC	18.0	OGFC	1.00	1	
						S	1.50	1	
						I	4.00	1	Mechanical break at lift interface.
						S	3.75	3	
	14.00					B	3.75	1	
-L-	22+60	WB	ISS	ABC	18.5	S	5.00	3	Aggregate size ≤12.5mm. Delamination 2.5" from top.
						B	7.50	3	
	12.50							0	
-L-	35+00	EB	ISS	ABC	18.5	S	5.50	3	Aggregate size ≤12.5mm. Low severity stripping near bottom of 3rd lift.
						I	5.00	2	Mechanical break within 1st lift.
	13.50					B	3.00	1	
-L-	35+00	EB	ISL	ABC	16.5	OGFC	1.00	1	
						S	9.00	6	Aggregate size ≤12.5mm. 4th lift 0.5", possible OGFC.
	13.50					B	3.50	1	
-L-	35+00	EB	OSS	ABC	21.0	S	6.50	3	Aggregate size ≤12.5mm.
								0	
	6.50							0	
-L-	37+50	WB	OSS	ABC	20.0	S	6.00	3	Aggregate size ≤12.5mm.
								0	
	6.00							0	
-L-	37+50	WB	OSL	ABC	16.5	OGFC	1.00	1	
						S	4.00	2	Aggregate size ≤12.5mm.
	13.50					I	8.50	4	3rd lift is 1" of surface mix.
-L-	37+50	WB	ISS	ABC	16.5	S	5.50	3	Aggregate size ≤12.5mm.
						I	5.00	2	
	13.50					B	3.00	1	

Abbrevations:

OSL = Outside Lane CTL = Center Turn Lane OSS = Outside Shoulder PS = Paved Shoulder RT = Right NB = Northbound ABC = Aggregate Base Course
ISL = Inside Lane RTL = Right Turn Lane ISS = Inside Shoulder RT LN = Right Lane LT = Left SB = Southbound RES = Residual Soil
CL = Center Lane DECEL = Deceleration Lane GM = Grass Median LT LN = Left Lane (I) = Inside FW = From White R.E. = Roadway Embankment
LTL = Left Turn Lane ACCEL = Acceleration Lane OGS = Outside Grass Shoulder COL = Collector Lane (O) = Outside FY = From Yellow

Pavement Layer Types:

(S) = Surface (I) = Intermediate (B) = Base SD = Sand Asphalt C = Concrete MS/CS = Mat Seal or Chip Seal OGFC = Open Graded Friction Course UT = Ultra-thin Bonded Wearing Cours
PADC = Permeable Asphalt Drainage Course DS = Drainage Sand CTBC = Cement Treated Base Course PC = Prime Coat S-C = Soil Cement S-L = Soil Lime
N.E. = Not Encountered FEA = Flat and Elongated Aggregate

Note: Core evaluation provided for information only.

Schnabel ENGINEERING

REPLACE BRIDGE NO. 236 ON I-40 OVER SR 1513 IN HAYWOOD COUNTY

PAVEMENT INVESTIGATION SOIL TEST RESULTS -L-

SAMPLE NO.	BORING ID	OFFSET DISTANCE	DEPTH INTERVAL (ft)	AASHTO CLASS.	L.L	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-3	L_PC_2000_EB ISL	4' FY	4.0-5.0	A-2-4 (0)	31	8	37.6	30.3	6.5	25.6	87.2	62.5	33.1	13	-
S-13	L_PC_2260_WB OSS	5' FW	4.0-5.0	A-2-4 (0)	NP	NP	41.6	29.3	7.5	21.6	84	55.3	28.9	18	-
S-9	L_PC_2260_WB ISL	4' FY	4.0-5.0	A-2-4 (0)	NP	NP	39.2	38	3.5	19.4	90.6	68.7	25.4	8	-
S-2	L_PC_3500_EB OSS	3.5' FW	4.0-5.0	A-7-6 (4)	45	18	27.5	31.7	18.1	22.6	93.9	75.1	43.8	77	-
S-6	L_PC_3500 EB ISS	1.5' FW	4.0-5.0	A-4 (0)	29	6	31.8	35.5	12.8	19.9	90.8	70.2	36.1	10	-
S-10	L_PC_3750_WB OSS	7' FW	2.1-3.0	A-2-4 (0)	NP	NP	50.2	26.2	11	12.6	80.2	50.8	24.1	4	-
S-11	L_PC_3750_WB OSS	7' FW	4.0-5.0	A-2-4 (0)	NP	NP	41.2	32.1	5.7	21	84.4	55.9	27.7	13	-
S-7	L_PC_3750_WB ISS	0.5' FY	4.0-5.0	A-6 (1)	39	11	30.2	33.2	14.3	22.2	92.7	72.2	40	15	-

Notes:

1. Refer to Pavement Investigation Data Sheet for station abbreviations

BULK SAMPLE SOIL TESTS SUMMARY FOR -L-

Station	Offset (ft)	Sample ID	Depth Interval (ft)	AASHTO Soil Class. (Group Index)	L.L.	P.I.	% Passing (Sieves)			Max. Dry Density (pcf)	Optimum Moisture Content (%)	CBR Value		CBR Swell (%)
							10	40	200			0.1"	0.2"	
25+00	80' RT	BS-2	0.0 - 10.0	A-6 (5)	40	16	89.3	67.3	50.3	107.1	17.3	3.4	3.8	2.5
34+50	80' RT	BS-1	0.0 -10.0	A-7-5 (4)	52	15	96.2	75.7	46	107.2	18.8	2.7	3.4	4.7

Notes: 1. Refer to laboratory transmittal for additional information

BULK SAMPLE SOIL TESTS SUMMARY FOR -Y1-

Station	Offset (ft)	Sample ID	Depth Interval (ft)	AASHTO Soil Class. (Group Index)	L.L.	P.I.	% Passing (Sieves)			Max. Dry Density (pcf)	Optimum Moisture Content (%)	CBR Value (Corrected)		CBR Swell (%)
							10	40	200			0.1"	0.2"	
26+00	15' LT	BS-3	0.0 - 10.0	A-2-6 (0)	37	12	64.9	40.3	20.5	119.6	14	12	13.3	4.1

Notes: 1. Refer to laboratory transmittal for additional information

REFERENCE: B-5541

PROJECT: 55041

SEE SHEET 3 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

CONTENTS

APPENDIX A

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

ROADWAY SUBSURFACE INVESTIGATION

COUNTY *HAYWOOD*

PROJECT DESCRIPTION *REPLACE BRIDGE NO. 236 ON I-40 OVER SR 1513 IN HAYWOOD COUNTY*

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5541	1	

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 (919) 707-6850. 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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS 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:
1. 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.
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

Q. HILL

CG2 EXPLORATION

INVESTIGATED BY *J. HOLLAND*

DRAWN BY *J. HOLLAND*

CHECKED BY *J. CRENSHAW*

SUBMITTED BY *SCHNABEL ENG.*

DATE *APRIL 2024*

Schnabel ENGINEERING

NORTH CAROLINA LICENSED SEAL 2818 GEOLOGIST JASON A. HOLLAND

Jason A. Holland 05/23/2024

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
B–5541	2

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 206, 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

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	— 6 MX		— NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	NO MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	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				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE SL — SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	26 OR MORE	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

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	20 - 35%
HIGHLY ORGANIC	> 10%	> 20%	HIGHLY	35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW — PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT, DPT, DMT, VST, PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT
- SHALLOW UNDERCUT
- UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
- UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK
- UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

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, FRACTURES
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - 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
- [ ] _____
- [X] DIEDRICH D-50

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [ ] TRICONE _____" TUNG.-CARB.
- [ ] 10cm CONE PENETROMETER
- [X] 4" THIN-WALL CORE BARREL

HAMMER TYPE:
- [X] AUTOMATIC
- [ ] MANUAL

CORE SIZE:
- [ ] -B _____
- [ ] -H _____
- [ ] -N _____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [X] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST

- [X] K-100 KESSLER DCP

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:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SLI.)	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 (SLI.)	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 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 FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FOOT
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 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 DISLODGED 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 (RQD) - 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 (SRQD) - 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.

BENCH MARK: N/A

ELEVATION: N/A FEET

NOTES:

FIAD - FILLED IMMEDIATELY AFTER DRILLING

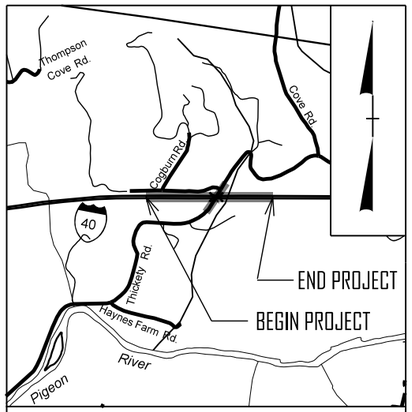
DATE: 8-15-14

09/08/99

TIP PROJECT: B-5541

CONTRACT:

See Sheet 1A For Index of Sheets



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HAYWOOD COUNTY

LOCATION: *BRIDGE NO. 236 OVER SR 1513 ON I-40*

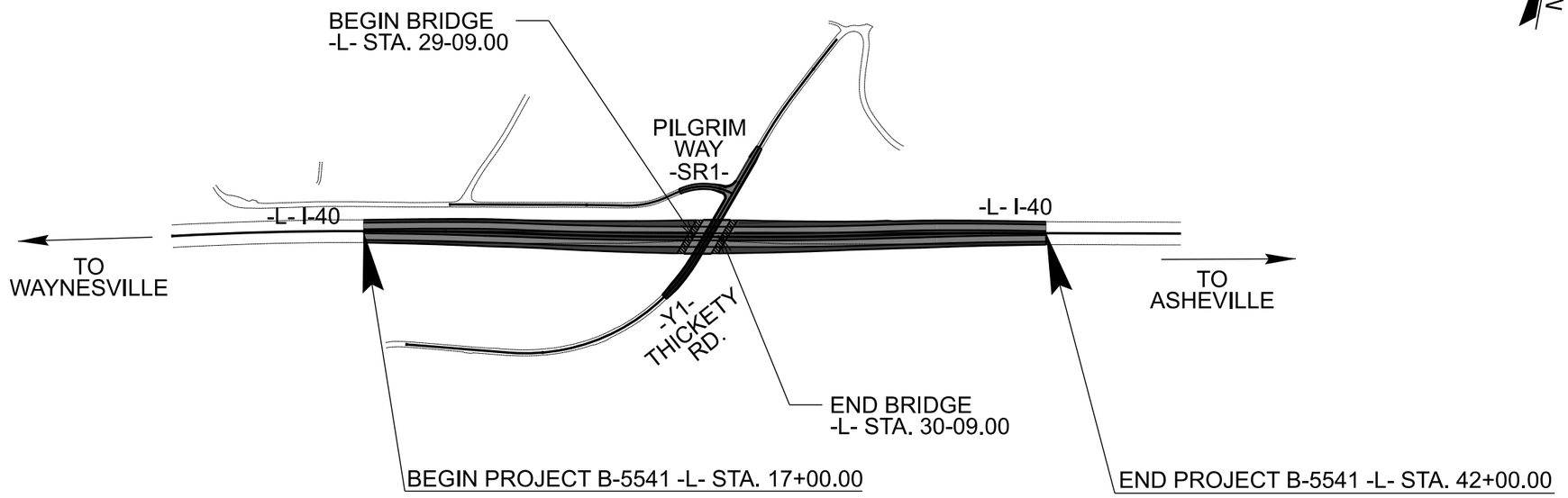
TYPE OF WORK: *GRADING, PAVING, DRAINAGE AND STRUCTURES*

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5541	3	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
55041.1.1		P.E.

DESIGN RECOMMENDATION PLAN SET

NAD 83
NA 2011



THERE IS FULL CONTROL OF ACCESS ON THIS PROJECT.
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

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2024 = 60000
ADT 2044 = 77500
K = 8 %
D = 55 %
T = 15 % *
V = 65 MPH
* TTST =12%DUAL 3%
FUNC CLASS =
INTERSTATE
STATE WIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5541 = 0.471 MILES

LENGTH STRUCTURE TIP PROJECT B-5541 = 0.021 MILES

TOTAL LENGTH TIP PROJECT B-5541 = 0.492 MILES

Prepared in the Office of:
NV5 ENGINEERS & CONSULTANTS, INC.
8514 MCALPINE PARK DRIVE, STE 135
CHARLOTTE, NC 28211
Ph: 704.537.7300 www.NV5.com
NC License # F-0333
formerly CALYX Engineers & Consultants

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 15, 2024

LETTING DATE: JUNE 17, 2025

CHRIS ANDERSON, PE
PROJECT ENGINEER

DYLAN MCCANN
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

Schnabel Engineering South, P.C.
1133 Military Cutoff Road, Suite 210 / Wilmington, NC 28405
T 910.769.1621
schnabel-eng.com

April 23, 2024

STATE PROJECT: 55041.1.1

TIP NUMBER: B-5541

COUNTY: HAYWOOD

DESCRIPTION: REPLACE BRIDGE NO. 236 ON I-40 OVER SR 1513 IN HAYWOOD COUNTY

SUBJECT: Geotechnical Roadway Inventory Report

Project Description

The project consists of the replacement of the existing four span Bridge (No. 236) over SR-1513 (Thickety Rd.) and widening improvements to the 0.45-mile roadway bridge approach along I-40 in the town of Clyde, North Carolina. The newly constructed bridge will be replaced on the existing alignment, with symmetrical widening to the outside, and accommodate two lanes of traffic in each direction during construction. We also investigated an existing 72-inch diameter corrugated metal pipe (CMP) culvert, located about 100 feet from the end of the new bridge, at approximately -L- STA. 31+00, which drains surface waters from a tributary of Pigeon River. The provided plans showed anticipated cut excavations as deep as 20± feet and proposed embankment construction with fill heights up to 23± feet max fill over the culvert. Slope inclinations are 2:1 or flatter, except at culvert steepened fill slopes up to 1.35:1 are proposed. Boring logs associated with the existing culvert are included in this report.

The field investigation was conducted in February and March of 2024 utilizing a track-mounted Diedrich D-50 drill machine with an automatic hammer, and hand tools. Standard Penetration Tests (SPT) were performed at selected locations. Borings were advanced with hollow stem augers, polycrystalline diamond compact bit (PDC) for mud rotary methods, and hand tools along the project corridor. Hand augers were performed at locations the drill rig could not access, or where concentrated underground utilities warranted. Dynamic Cone Penetration Tests (DCP) were conducted at all hand auger locations. Representative soil samples were collected and forwarded to an approved testing facility for soil quality analysis, moisture content, California Bearing Ratio, specific gravity, unconsolidated undrained triaxial shear, one-dimensional consolidation, and AASHTO classification.

The Following Alignments were Investigated

Line	Station			Length (ft)
-L-	17+00	to	42+00	2,500
-Y1-	20+00	to	26+50	650
-SR1-	18+50	to	20+50	200
			Total=	3,350 feet (~0.634 miles)

Physiography and Geology

Based on a review of the Geologic map of North Carolina (1985) and the Geologic map of the Western Half of the Asheville 1:100,000-Scale 30 x 60 minute quadrangle, North Carolina and Tennessee (2008), the project is located in the Blue Ridge Physiographic Province. According to the 30 x 60 quadrangle map, the Hot Springs thrust fault appears to intersect the project corridor, trending from northeast to southwest, exposing Grenville-aged granulite facies metamorphic rocks of Earlies Gap (Ye). Soils in the area generally consist of residual sands, silts, and clays. Weathered rock and Late Proterozoic crystalline rock of the Ashe Metamorphic Suite Complex (Zas) and Earlies Gap (Ye) primarily consisted of schist and biotite gneiss. Topography along the project corridor is undulating, traversing along I-40 and bounded by some heavily wooded areas, a few residences, and a paper processing facility to the southeast. Natural ground surface elevations range from 2617± feet above sea level at the beginning of the -Y1- alignment to 2724± feet above sea level at the end of the -L- alignment construction limits.

Soil Properties

Soil and rock encountered along the project corridor are divided into five categories based on origin: roadway embankment soils, alluvial soils, residual soils, weathered rock, and crystalline rock.

Roadway embankment soils consisting of medium dense SAND and GRAVEL (A-1-b), very loose to loose silty and clayey SAND (A-2-7), and soft to medium stiff, sandy SILT (A-4) were encountered along the -L- alignment. Soils moistures were typically moist and varied in thickness from the ground surface to a maximum of 16 feet. Within the cohesive roadway embankment soil, moisture contents were reported at 21%. The plasticity index (PI) within the cohesive soil was 8.

Alluvial soils consisting of very loose SAND and GRAVEL (A-1-b), very loose to medium dense silty SAND and clayey SAND (A-2-4, A-2-6), medium stiff sandy SILT (A-4), and very soft to soft silty CLAY (A-7-6) were encountered along the -L- and -Y1- alignments near the Culvert Outfall. Soils moistures were typically moist to wet, and varied in thickness from 3 to 12 feet. Within the cohesive alluvial soils, moisture contents ranged from 27.0% to 35.0%. Plasticity indices (PI) within the cohesive sediments range from 15 to 16.

Residual soils consisting of very loose to very dense silty SAND and clayey SAND (A-2-4, A-2-6, A-2-7), soft to hard, sandy SILT and clayey SILT (A-4, A-5), and very soft to hard, sandy CLAY, silty CLAY, and sandy and silty CLAY (A-6, A-7-5, A-7-6) were encountered throughout the project corridor. Soil moistures were typically moist to saturated and varied in thickness from the ground surface to a maximum of 79.4 feet. Within the cohesive residual soils, moisture contents ranged from 4.0% to 77.0%. Plasticity indices (PI) within the cohesive sediments range from 5 to 20.

Weathered rock consisting of tan, orange, brown, and white, INJECTION GNEISS, was encountered interlaid and underlying residual soils at several locations along the project corridor. Weathered rock elevations in these borings varied from 2579± feet above sea level to 2655± feet above sea level. Auger and split spoon refusal were noted beneath some of these layers on crystalline rock (INJECTION GNEISS).

Crystalline rock was identified by split spoon refusal, underlying residual soils and weathered rock at several locations along the corridor. USGS geologic maps and the historical Structure Subsurface Investigation confirm bedrock consists of INJECTION GNEISS. Top of rock elevations in these borings varied from 2567± feet above sea level to 2609± feet above sea level. No rock core samples were collected as part of this investigation.

Groundwater

Borings were left open for a minimum of 24 hours to equilibrate with the surrounding conditions, when conditions permitted. Groundwater data was collected in February and March of 2024. Groundwater elevations generally varied with topography and ranged from 2614± to 2674± feet above sea level.

Areas of Special Geotechnical Interest

A. Alluvial Soils were encountered in the following sections.

Alignment	Begin Station	End Station	Offset
-L-	30+00	30+75	± 117 RT
-L-	31+25	31+50	± 170 LT
-Y1-	20+25	20+75	± 75 RT

In addition to the alluvial soils found in the areas listed above, a culvert was identified at approximately -L- Sta. 30+50. The plans that were available did not indicate any proposed construction related to this culvert, however, after discussing with NCDOT we were granted authorization to investigate both north and south outfall locations.

B. Fill soils were encountered in the following sections.

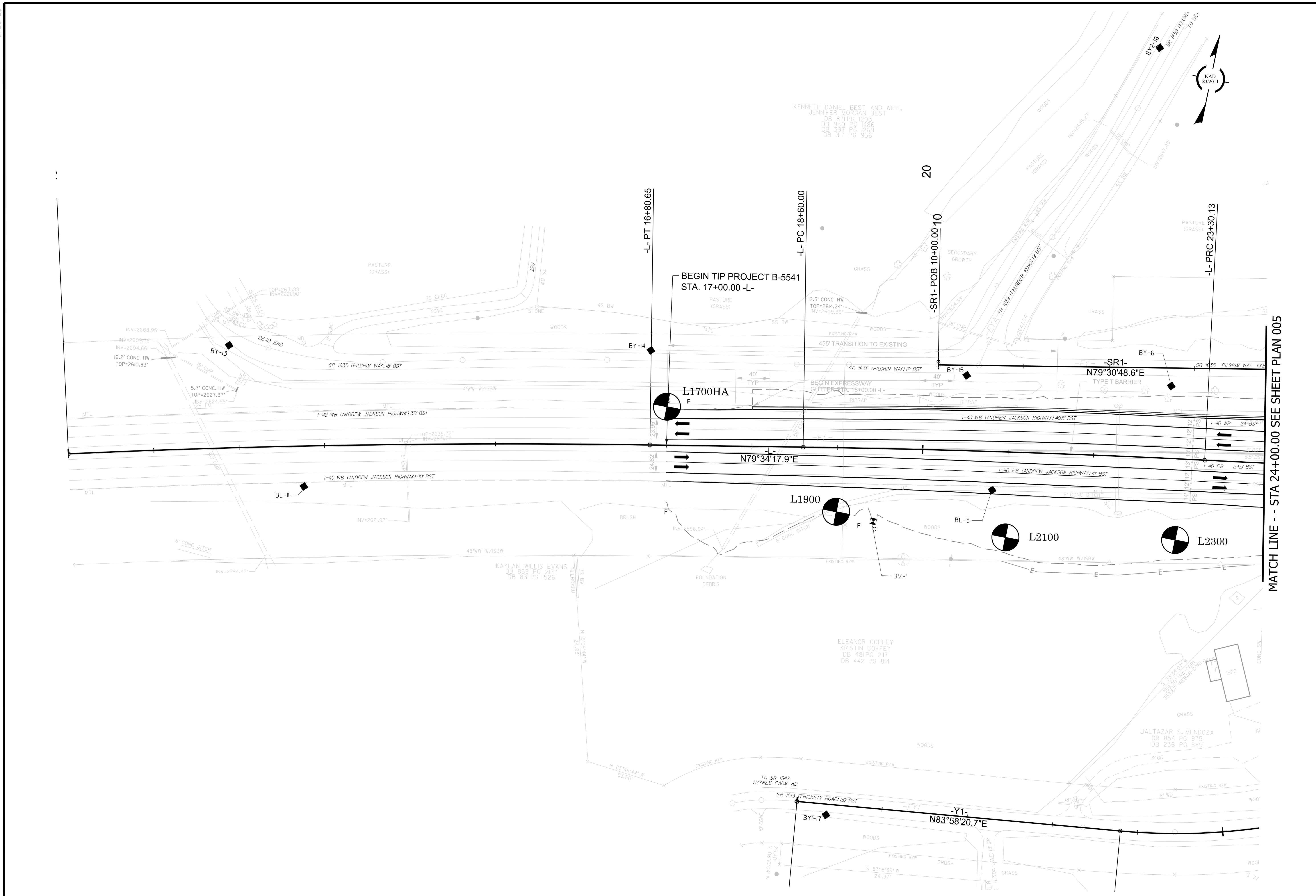
Alignment	Begin Station	End Station
-L-	28+25	31+00

Jason A. Holland

Jason A. Holland, LG
Project Geologist
Schnabel Engineering

Schnabel Engineering
1133 Military Cutoff Road, Suite 210
Wilmington, NC 28405

5/26/20


BEGIN TIP PROJECT B-5541
STA. 17+00.00 -L-
-L- PT 16+80.65
-L- PC 18+60.00
-SR1- POB 10+00.00
-L- PRC 23+30.13
L1700HA
L1900
L2100
L2300
-L-
N79°34'17.9"E
-SR1-
N79°30'48.6"E
-Y1-
N83°58'20.7"E
MATCH LINE - - STA 24+00.00 SEE SHEET PLAN 005
455' TRANSITION TO EXISTING
BEGIN EXPRESSWAY GUTTER STA. 18+00.00 -L-
TYPE T BARRIER
SR 1635 (PILGRIM WAY) 18' BST
I-40 WB (ANDREW JACKSON HIGHWAY) 39' BST
I-40 WB (ANDREW JACKSON HIGHWAY) 40.5' BST
I-40 EB (ANDREW JACKSON HIGHWAY) 41' BST
I-40 WB (ANDREW JACKSON HIGHWAY) 40' BST
SR 1513 (THICKETY ROAD) 20' BST
TO SR 1542 HAYNES FARM RD
SR 1659 (THUNDER ROAD) 19' BST
BY-13
BY-14
BY-15
BY-6
BY2-16
BYI-17
BL-11
BL-3
BM-1
KENNETH DANIEL BEST AND WIFE, JENNIFER MORGAN BEST
KAYLAN WILLIS EVANS
ELEANOR COFFEY KRISTIN COFFEY
BALTAZAR S. MENDOZA
FOUNDATION DEBRIS
NAD 83/2011

B-5541

R/W	4

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HAYWOOD COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

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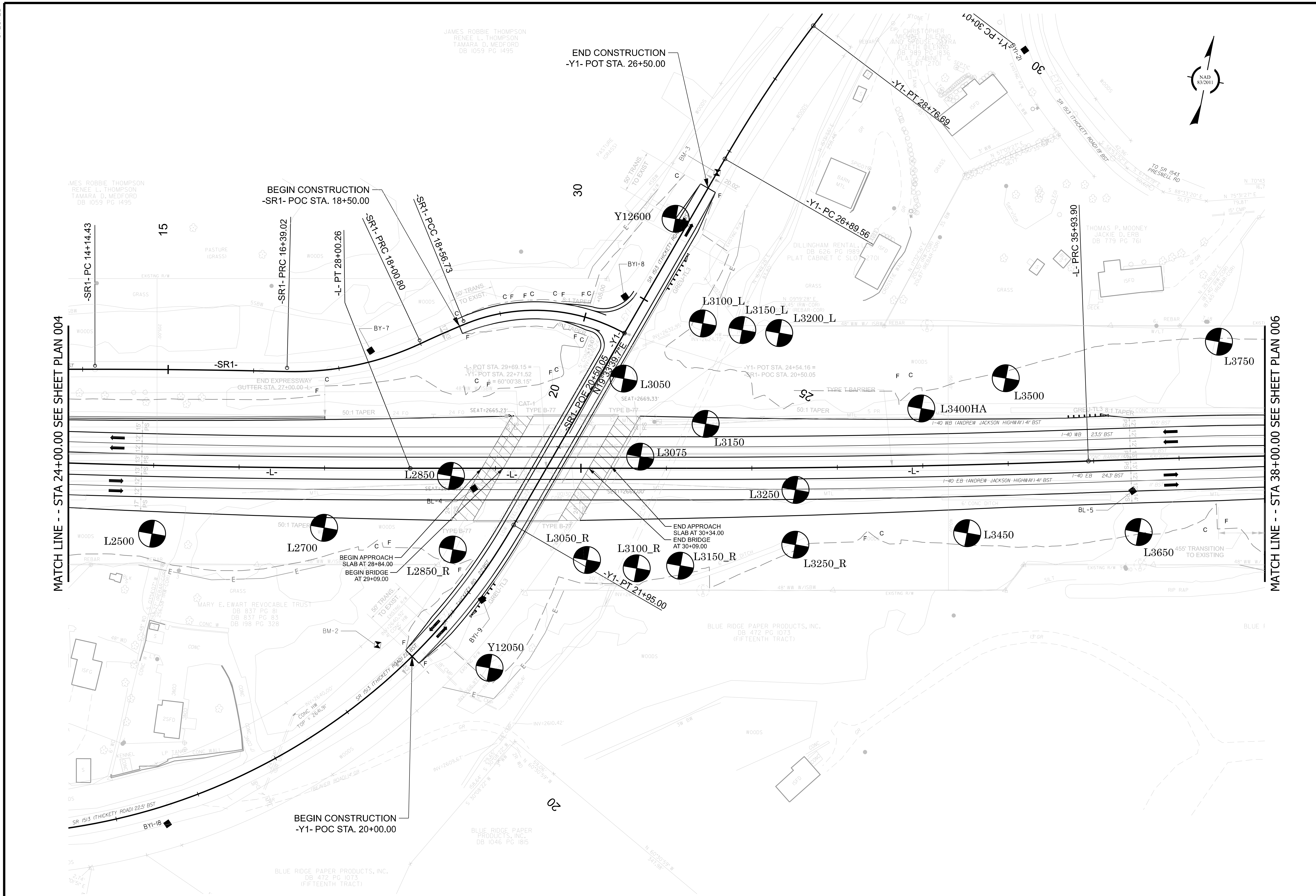
REVISIONS


MATCH LINE - - STA 24+00.00 SEE SHEET PLAN 004
MATCH LINE - - STA 38+00.00 SEE SHEET PLAN 006
END CONSTRUCTION
-Y1- POT STA. 26+50.00
BEGIN CONSTRUCTION
-SR1- POC STA. 18+50.00
BEGIN CONSTRUCTION
-Y1- POC STA. 20+00.00
-SR1- PC 14+14.43
-SR1- PRC 16+39.02
-L- PT 28+00.26
-SR1- PRC 18+00.80
-SR1- PCC 18+56.73
-SR1- POE 20+50.05
N19°33'39.7"E
-Y1- PT 28+76.69
-Y1- PC 26+89.56
-Y1- PC 30+01
-Y1- PT 21+95.00
-L- PRC 35+93.90
BEGIN APPROACH
SLAB AT 28+84.00
BEGIN BRIDGE
AT 29+09.00
END APPROACH
SLAB AT 30+34.00
END BRIDGE
AT 30+09.00
Y12600
Y12050
L2500
L2700
L2850
L2850_R
L3050
L3050_R
L3075
L3100_L
L3100_R
L3150
L3150_L
L3150_R
L3200_L
L3250
L3250_R
L3400HA
L3450
L3500
L3650
L3750
-SR1-
-L-
-Y1-
BM-2
BM-3
BY-7
BYI-8
BYI-9
BYI-18
BL-4
BL-5
455' TRANSITION
TO EXISTING
SR 1513 (THICKETY ROAD) 22.5' BST
I-40 WB (ANDREW JACKSON HIGHWAY) 41' BST
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JAMES ROBBIE THOMPSON
RENEE L. THOMPSON
TAMARA D. MEDFORD
DB 1059 PG 1495
THOMAS P. MOONEY
JACKIE D. ERB
DB 779 PG 761
DILLINGHAM RENTAL
DB 626 PG 1983
MARY E. EWART REVOCABLE TRUST
BLUE RIDGE PAPER PRODUCTS, INC.
DB 472 PG 1073
(FIFTEENTH TRACT)
NAD 83/2011

B-5541

R/W	5

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HAYWOOD COUNTY

ROADWAY DESIGN UNIT

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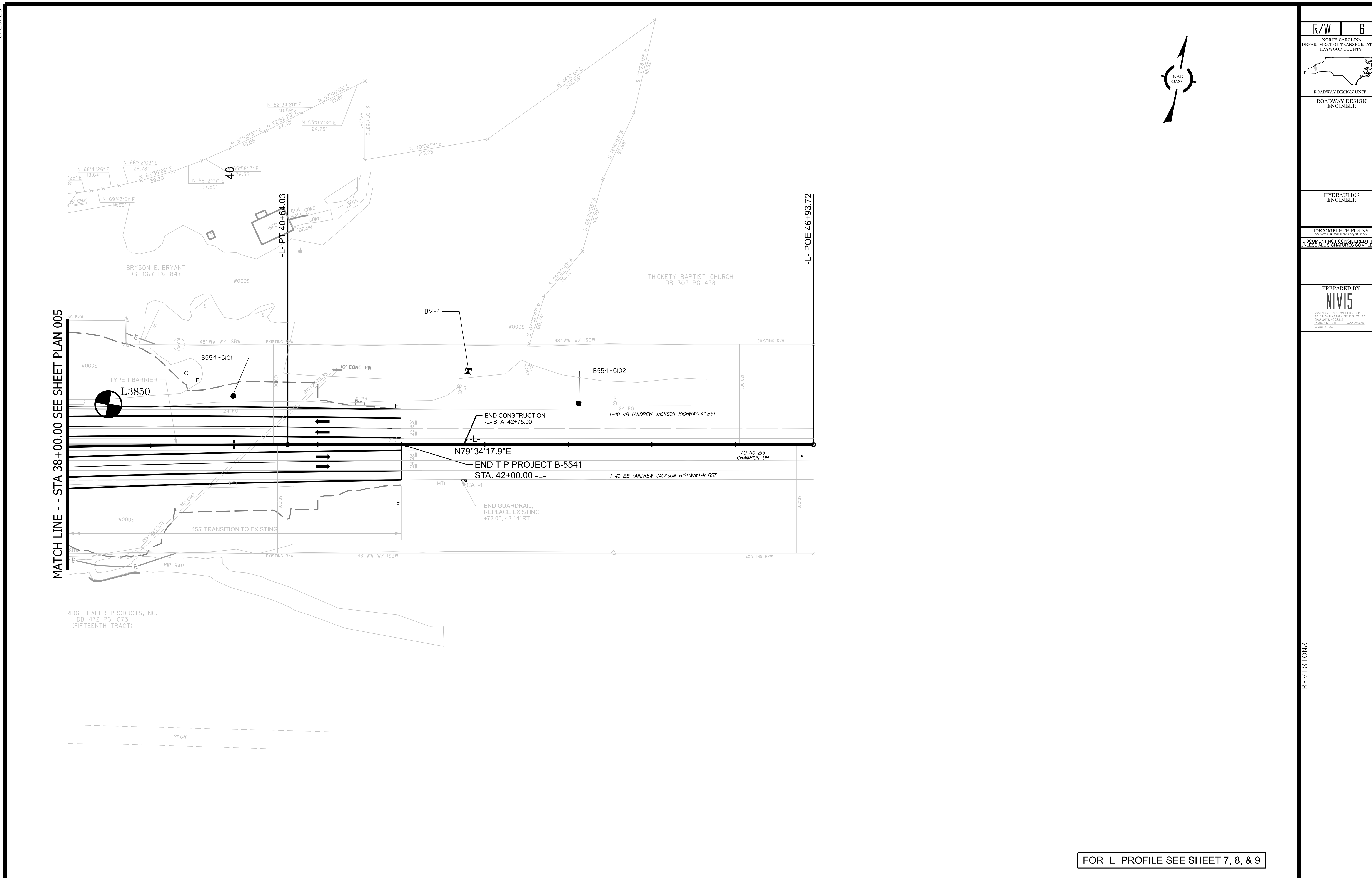
REVISIONS

5/26/20



R/W 6
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
HAYWOOD COUNTY
ROADWAY DESIGN UNIT
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
PREPARED BY
NV5
REVISIONS
MATCH LINE - - STA 38+00.00 SEE SHEET PLAN 005
-L- PT 40+64.03
-L- POE 46+93.72
L3850
END CONSTRUCTION
-L- STA. 42+75.00
-L-
N79°34'17.9"E
END TIP PROJECT B-5541
STA. 42+00.00 -L-
I-40 WB (ANDREW JACKSON HIGHWAY) 41' BST
I-40 EB (ANDREW JACKSON HIGHWAY) 41' BST
TO NC 215 CHAMPION DR
BM-4
B5541-GI01
B5541-GI02
TYPE T BARRIER
455' TRANSITION TO EXISTING
END GUARDRAIL, REPLACE EXISTING
+72.00, 42.14' RT
BRYSON E. BRYANT
DB 1067 PG 847
THICKETY BAPTIST CHURCH
DB 307 PG 478
RIDGE PAPER PRODUCTS, INC.
DB 472 PG 1073
(FIFTEENTH TRACT)
WOODS
EXISTING R/W
48" WW W/ ISBW
RIP RAP
NAD 83/2011
FOR -L- PROFILE SEE SHEET 7, 8, & 9
5/26/20

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L1700HA	**STATION** 17+00	**OFFSET** 45 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,636.9 ft	**TOTAL DEPTH** 10.0 ft	**NORTHING** 677,159	**EASTING** 843,185	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER Q. Hill	**START DATE** 03/14/24	**COMP. DATE** 03/14/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2640											
										2,636.9 GROUND SURFACE	0.0
										2,636.6 TOPSOIL 4-INCHES	0.3
2635										**RESIDUAL** Medium stiff, brown and orange, silty CLAY (A-7-5(7)), micaceous, low plasticity	
							S-15	21%			
										2,630.9	6.0
2630										Medium stiff, orange and brown, sandy SILT (A-4(0)), with trace rock fragments and little clay, micaceous	
							S-16	15%			
										2,626.9	10.0
										Boring Terminated at Elevation 2,626.9 ft in sandy SILT (RESIDUAL)	

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L1900	**STATION** 19+00	**OFFSET** 75 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,630.3 ft	**TOTAL DEPTH** 15.0 ft	**NORTHING** 677,077	**EASTING** 843,403	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 02/29/24	**COMP. DATE** 03/01/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2635										
2630	2,630.3	0.0	1	1	2	3	SS-57	22%		2,630.3 GROUND SURFACE 0.0
	2,626.8	3.5	5	4	5	9		M		**RESIDUAL** Orange and tan, clayey SAND (A-2-6(0)), with some rock fragments, micaceous 2,627.3 3.0
2625	2,624.3	6.0	14	29	41	70		M		Tan and white, sandy SILT (A-4), micaceous, low plasticity
	2,621.8	8.5	68	32/0.3		100/0.8				2,622.3 8.0
2620										**WEATHERED ROCK** Tan, and orange, INJECTION GNEISS
	2,616.8	13.5	3	3	7	10		M		2,618.3 12.0
										RESIDUAL Tan, orange, and white, sandy SILT (A-4), micaceous, saprolitic 2,615.3 15.0
										Boring Terminated at Elevation 2,615.3 ft in sandy SILT (RESIDUAL)
										2-inches Topsoil

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L2100	**STATION** 21+00	**OFFSET** 100 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,660.7 ft	**TOTAL DEPTH** 29.8 ft	**NORTHING** 677,086	**EASTING** 843,603	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 02/29/24	**COMP. DATE** 03/01/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)
2665										
2660	2,660.7	0.0	1	2	4	6		M		2,660.7 GROUND SURFACE 0.0 **RESIDUAL** Brown and orange, clayey SAND (A-2-6), micaceous
	2,657.2	3.5	6	9	15	24		M		2,657.7 3.0 Red, brown, orange, and white, sandy SILT (A-4(0)), contains root fragments and manganese oxides, micaceous, saprolitic
2655	2,654.7	6.0	10	11	20	31		M		
	2,652.2	8.5	14	10	11	21	SS-65	14%		
2650	2,647.2	13.5	7	10	13	23		M		
2645	2,642.2	18.5	3	6	8	14		M		
2640	2,637.2	23.5	5	5	7	12	SS-68	25%		2,638.7 22.0 White, sandy and silty CLAY (A-7-6(10)), micaceous, saprolitic, moderate plasticity
2635	2,632.2	28.5	29	62	38/0.3	100/0.8				2,631.7 29.0 2,630.9 29.8 **WEATHERED ROCK** Orange and brown, INJECTION GNEISS Boring Terminated at Elevation 2,630.9 ft in WEATHERED ROCK (INJECTION GNEISS)

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L2300	**STATION** 23+00	**OFFSET** 95 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,669.9 ft	**TOTAL DEPTH** 35.0 ft	**NORTHING** 677,122	**EASTING** 843,799	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 02/29/24	**COMP. DATE** 03/01/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2670										
	2,669.9	0.0	1	4	4	8		M		2,669.9 GROUND SURFACE 0.0
	2,666.4	3.5	5	7	8	15		M		2,669.6 TOPSOIL 4-inches 0.3 **RESIDUAL** 2,666.9 Orange, sandy CLAY (A-6), micaceous, moderate plasticity 3.0
2665	2,663.9	6.0	5	6	9	15		M		2,663.9 Orange and white, sandy SILT (A-4), with some clay, micaceous, low plasticity 6.0
	2,661.4	8.5	4	7	9	16		M		2,661.9 Orange, white, and brown, silty SAND (A-2-4), micaceous 8.0 Orange, brown, and white, clayey SAND (A-2-6(0)), with some rock fragments, micaceous
2660	2,656.4	13.5	7	10	11	21	SS-74	11%		
	2,651.4	18.5	4	6	8	14		M		2,647.9 22.0 White and orange, sandy CLAY (A-6(2)), contains manganese oxides, micaceous, low plasticity
2650	2,646.4	23.5	5	8	10	18	SS-76	18%		
2645	2,641.4	28.5	9	11	13	24		M		
2640	2,636.4	33.5	6	4	6	10		M		2,634.9 35.0 Boring Terminated at Elevation 2,634.9 ft in sandy CLAY (RESIDUAL)
2635										

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L2500	**STATION** 25+00	**OFFSET** 80 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,668.3 ft	**TOTAL DEPTH** 25.0 ft	**NORTHING** 677,167	**EASTING** 843,995	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 02/28/24	**COMP. DATE** 02/29/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2670											
	2,668.3	0.0	1	2	2	4		M		2,668.3 GROUND SURFACE	0.0
2665	2,664.8	3.5	5	6	9	15		M		**RESIDUAL** Red, brown, white, orange, and tan, sandy CLAY (A-6(5,6)), micaceous, saprolitic, low to moderate plasticity	
	2,662.3	6.0	4	6	9	15		M			
2660	2,659.8	8.5	6	8	11	19		M			
2655	2,654.8	13.5	5	7	9	16	SS-54	19%			
2650	2,649.8	18.5	6	11	13	24		M			
2645	2,644.8	23.5	2	5	7	12		M		2,643.3 Boring Terminated at Elevation 2,643.3 ft in sandy CLAY (RESIDUAL)	25.0
										Other Samples: BS-2 (0.0 - 10.0)	

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L2700	**STATION** 27+00	**OFFSET** 70 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,674.2 ft	**TOTAL DEPTH** 25.0 ft	**NORTHING** 677,210	**EASTING** 844,192	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 02/28/24	**COMP. DATE** 02/29/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2675										
	2,674.2	0.0	1	2	3	5		M		2,674.2 GROUND SURFACE 0.0
2670	2,670.7	3.5	5	5	6	11		M		**RESIDUAL** Orange and brown, sandy CLAY (A-6), micaceous, moderate plasticity 3.0
	2,668.2	6.0	5	6	8	14		M		2,671.2 Red, brown, orange, and white, sandy SILT (A-4(0)), with trace rock fragments and little clay, contains manganese oxides, micaceous, saprolitic
2665	2,665.7	8.5	5	7	12	19		M		
2660	2,660.7	13.5	9	11	11	22	SS-47	12%		
2655	2,655.7	18.5	4	7	8	15		M		
2650	2,650.7	23.5	11	11	15	26		M		2,649.2 Boring Terminated at Elevation 2,649.2 ft in sandy SILT (RESIDUAL) 25.0

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L2850	**STATION** 28+48	**OFFSET** 11 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,666.8 ft	**TOTAL DEPTH** 35.0 ft	**NORTHING** 677,297	**EASTING** 844,327	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 03/11/24	**COMP. DATE** 03/11/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2670											
										2,666.8	0.0
										GROUND SURFACE	
2665	2,665.7	1.1								2,665.7	1.1
			4	8	4	12		M		**ROADWAY EMBANKMENT**	
	2,663.3	3.5								PAVEMENT 13-inches	
			3	2	2	4		M		2,663.8	3.0
2660	2,660.8	6.0								ABC STONE 23-inches	
			2	2	3	5	SS-167	21%		Orange and brown, sandy SILT (A-4(0)), with trace rock fragments and some clay, micaceous, low plasticity	
	2,658.3	8.5									
			2	2	2	4		M			
2655										2,654.8	12.0
	2,653.3	13.5								**RESIDUAL**	
			4	4	5	9		M		Brown and orange, sandy CLAY (A-7-6(11)), with little silt, micaceous, moderate plasticity	
2650	2,648.3	18.5									
			3	3	4	7	SS-170	19%			
2645										2,644.8	22.0
	2,643.3	23.5								Orange and brown, sandy SILT (A-4), micaceous, low plasticity	
			4	5	5	10		M			
2640	2,638.3	28.5									
			4	8	8	16		M			
2635	2,633.3	33.5									
			8	7	8	15		M		2,631.8	35.0
										Boring Terminated at Elevation 2,631.8 ft in sandy SILT (RESIDUAL)	

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L2850_R	**STATION** 28+50	**OFFSET** 95 ft RT	**ALIGNMENT** -L-	**0 HR.** 30.5
COLLAR ELEV. 2,646.7 ft	**TOTAL DEPTH** 35.0 ft	**NORTHING** 677,212	**EASTING** 844,344	**24 HR.** 26.0
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 02/28/24	**COMP. DATE** 02/29/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2650										
	2,646.7	0.0								2,646.7 GROUND SURFACE 0.0
2645			1	1	2	3	SS-34	17%		**ROADWAY EMBANKMENT**
	2,643.2	3.5								Brown and orange, silty and clayey SAND (A-2-7(0)), with trace rock fragments, contains root fragments, micaceous
			2	3	5	8		M		
2640	2,640.7	6.0								2,641.2 5.5
			9	12	12	24		M		**RESIDUAL**
	2,638.2	8.5								Orange, brown, and red, sandy SILT (A-4(0)), contains manganese oxides, micaceous, saprolitic
			9	12	13	25		M		
2635										
	2,633.2	13.5								
			4	5	7	12		M		
2630	2,628.2	18.5								
			5	5	7	12		M		
2625										
	2,623.2	23.5								
			3	2	3	5	SS-40	29%		
2620	2,618.2	28.5								
			3	5	7	12		M		
2615	2,613.2	33.5								
			4	6	6	12		M		2,611.7 35.0
										Boring Terminated at Elevation 2,611.7 ft in sandy SILT (RESIDUAL)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L3050	**STATION** 30+50	**OFFSET** 105 ft LT	**ALIGNMENT** -L-	**0 HR.** 24.1
COLLAR ELEV. 2,650.9 ft	**TOTAL DEPTH** 52.0 ft	**NORTHING** 677,445	**EASTING** 844,505	**24 HR.** 14.3
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 02/29/24	**COMP. DATE** 03/01/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2655											
2650	2,650.9	0.0	1	1	3	4	SS-84	23%		2,650.9 GROUND SURFACE	0.0
	2,647.4	3.5	3	3	5	8	SS-85	22%		**RESIDUAL** Brown, sandy SILT (A-5(4)), contains root fragments, micaceous, low plasticity	
2645	2,644.9	6.0	2	5	5	10		M		2,647.9 Brown, red, and white, sandy SILT (A-4(2)), with some clay, micaceous, low plasticity	3.0
	2,642.4	8.5	4	5	5	10		M			
2640										2,638.9 Red, brown, and white, silty and clayey SAND (A-2-7(1)), contains manganese oxides	12.0
	2,637.4	13.5	2	2	3	5		21%		2,633.9 Brown, red, gray, and orange, sandy SILT (A-4(2)), with some clay, micaceous, saprolitic, low plasticity	17.0
2635	2,632.4	18.5	4	5	6	11	SS-89	18%			
2630	2,627.4	23.5	5	7	10	17		M			
2625	2,622.4	28.5	7	8	10	18		M			
2620	2,617.4	33.5	6	9	12	21		W		2,613.9 Brown, white, and orange, silty SAND (A-2-4), micaceous, saprolitic	37.0
2615	2,612.4	38.5	5	7	8	15		W		2,609.9 Brown, sandy SILT (A-4), micaceous, saprolitic, low plasticity	41.0
2610	2,607.4	43.5	7	10	14	24		W			
2605	2,602.4	48.5	12	88/0.3		100/0.8				2,602.4 **WEATHERED ROCK** Brown, INJECTION GNEISS	48.5
2600	2,598.9	52.0	60/0.0			60/0.0				2,598.9 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 2,598.9 ft on CRYSTALLINE ROCK (INJECTION GNEISS)	52.0

2-inches Topsoil
Hard drilling from 49.0 to 50.0 ft BGS

Other Samples:
ST-1 (13.0 - 15.0)

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L3050_R	**STATION** 30+07	**OFFSET** 107 ft RT	**ALIGNMENT** -L-	**0 HR.** 9.1
COLLAR ELEV. 2,632.3 ft	**TOTAL DEPTH** 30.0 ft	**NORTHING** 677,229	**EASTING** 844,501	**24 HR.** 5.5
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 03/04/24	**COMP. DATE** 03/05/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2635										
	2,632.3	0.0	1	0	1	1	SS-97	35%		2,632.3 GROUND SURFACE 0.0
2630	2,628.8	3.5	8	4	3	7				**ALLUVIAL** Brown, silty CLAY (A-7-5(8)), micaceous, moderate plasticity
	2,626.3	6.0	1	1	3	4		M		2,629.3 3.0
2625	2,623.8	8.5	1	1	2	3		23%		**RESIDUAL** Tan, brown, and orange, sandy SILT (A-4(0)), with trace rock fragments and little clay, micaceous, saprolitic
2620	2,618.8	13.5	6	4	9	13	SS-101	26%		
2615	2,613.8	18.5	4	5	8	13		M		
2610	2,608.8	23.5	10	9	4	13		M		
2605	2,603.8	28.5	5	7	10	17		M		2,602.3 Boring Terminated at Elevation 2,602.3 ft in sandy SILT (RESIDUAL) 30.0

Other Samples:
ST-2 (8.0 - 10.0)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L3075	**STATION** 30+69	**OFFSET** 14 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 2,673.7 ft	**TOTAL DEPTH** 79.4 ft	**NORTHING** 677,359	**EASTING** 844,540	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 03/12/24	**COMP. DATE** 03/13/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)
2675										
	2,673.7	0.0								2,673.7 GROUND SURFACE 0.0
	2,672.6	1.1								2,672.6 **ROADWAY EMBANKMENT** 1.1 PAVEMENT 13.5-inches ABC STONE 34.5-inches
2670	2,669.3	4.4	14	14	9	23		M		2,669.7 4.0 Brown and orange, sandy SILT (A-4(0)), with some clay, micaceous, low plasticity
	2,665.8	7.9	2	3	4	7		M		
2665			2	3	5	8		M		
2660	2,660.8	12.9	3	3	5	8		M		
	2,655.8	17.9	2	3	6	9		M		2,657.7 16.0 **RESIDUAL** Orange, white, red, and brown, sandy SILT (A-4(0)), with little to some clay, micaceous, low plasticity
2650	2,650.8	22.9	3	5	7	12		M		
2645	2,645.8	27.9	3	4	3	7		M		
2640	2,640.8	32.9	3	4	5	9		M		
2635	2,635.8	37.9	2	3	3	6		M		
2630	2,630.8	42.9	2	3	3	6	SS-190	33%		
2625	2,625.8	47.9	4	4	7	11	SS-191	23%		2,627.7 46.0 Gray, sandy CLAY (A-7-6(9)), with some silt, moderate plasticity
2620	2,620.8	52.9	3	2	4	6		M		
2615	2,615.8	57.9	7	10	12	22		M		2,617.7 56.0 Tan, brown, and orange, sandy SILT (A-4), micaceous, low plasticity
2610	2,610.8	62.9	3	4	10	14		M		
2605	2,605.8	67.9	26	41	53	94		M		2,607.7 66.0 Orange and brown, silty SAND (A-2-4), micaceous, saprolitic
2600	2,600.8	72.9	17	28	35	63		M		
2595	2,595.8	77.9	16	18	26	44		M		2,597.7 76.0 Brown, tan, and orange, sandy SILT (A-4), mciaceous, saprolitic, low plasticity 2,594.3 79.4 Boring Terminated at Elevation 2,594.3 ft in sandy SILT (RESIDUAL)

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L3100_L	**STATION** 31+43	**OFFSET** 170 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,631.7 ft	**TOTAL DEPTH** 30.0 ft	**NORTHING** 677,526	**EASTING** 844,584	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 03/05/24	**COMP. DATE** 03/06/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2635										
	2,631.7	0.0								2,631.7 GROUND SURFACE 0.0
2630	2,628.2	3.5	2	1	3	4		M		**ALLUVIAL** Brown and orange, clayey SAND (A-2-6), micaceous
2625	2,625.7	6.0	WOH	1	1	2		M		2,626.2 5.5 Tan and brown, silty SAND (A-2-4(0)), with some gravel, micaceous
	2,623.2	8.5	12	17	8	25		W		
2620	2,618.2	13.5	2	2	4	6		W		2,619.7 12.0 **RESIDUAL** Orange and brown, sandy SILT (A-4), with trace rock fragments, micaceous, saprolitic, low plasticity
2615	2,613.2	18.5	3	4	6	10		W		
2610	2,608.2	23.5	7	10	12	22		W		
2605	2,603.2	28.5	8	11	11	22		W		2,604.7 27.0 Brown, sandy CLAY (A-6), micaceous, saprolitic, moderate plasticity
			4	4	8	12		W		2,601.7 30.0 Boring Terminated at Elevation 2,601.7 ft in sandy CLAY (RESIDUAL) Other Samples: ST-3 (8.6 - 10.6)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L3100_R	**STATION** 30+65	**OFFSET** 117 ft RT	**ALIGNMENT** -L-	**0 HR.** 8.0
COLLAR ELEV. 2,630.7 ft	**TOTAL DEPTH** 33.5 ft	**NORTHING** 677,230	**EASTING** 844,560	**24 HR.** 6.7
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 03/04/24	**COMP. DATE** 03/05/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2635											
2630	2,630.7	0.0	1	1	2	3 16	SS-105	27%		2,630.7 GROUND SURFACE	0.0
										ALLUVIAL Brown, silty CLAY (A-7-5(7)), with trace sand, micaceous, low plasticity	
	2,627.2	3.5	2	4	12	23		M		2,627.7	3.0
2625										**RESIDUAL** Brown, silty CLAY (A-7-5), with trace sand, micaceous, low plasticity	
	2,624.7	6.0	9	10	13					2,625.2	5.5
	2,622.2	8.5				23				Brown, silty SAND (A-2-4), micaceous	
2620			6	9	14			M		2,622.7 Brown, sandy SILT (A-4), micaceous, saprolitic, low plasticity	8.0
	2,617.2	13.5				14				2,618.7	12.0
2615			4	6	8			W		Black and brown, silty SAND (A-2-4), micaceous, saprolitic	
	2,612.2	18.5								2,613.7	17.0
2610			2	5	7	12		M		Brown and tan, clayey SILT (A-5), micaceous, low plasticity	
	2,607.2	23.5								2,608.7	22.0
2605			58	42/0.2		100/0.7				**WEATHERED ROCK** Brown, orange, and tan, INJECTION GNEISS	
	2,602.2	28.5	48	52/0.2							
2600											
	2,597.2	33.5	60/0.0			60/0.0				2,597.2 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 2,597.2 ft on CRYSTALLINE ROCK (INJECTION GNEISS)	33.5

Hard drilling from 22.0 to 23.0 ft BGS

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L3150	**STATION** 31+46	**OFFSET** 52 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 2,675.5 ft	**TOTAL DEPTH** 79.0 ft	**NORTHING** 677,411	**EASTING** 844,609	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 03/14/24	**COMP. DATE** 03/15/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
2680											
2675										2,675.5 GROUND SURFACE	0.0
	2,673.5	2.0								2,674.5 **ROADWAY EMBANKMENT**	1.0
	2,672.0	3.5	7	4	3	7 6		M		2,673.5 PAVEMENT 12-inches	2.0
2670			3	3	3		SS-212	23%		ABC STONE 12-inches	
	2,668.0	7.5								**RESIDUAL** Orange, tan, and brown, sandy SILT (A-4(0)), with trace to some clay, micaceous	
			3	4	5	9		M			
2665	2,663.0	12.5									
			4	4	9	13		M			
2660	2,658.0	17.5									
			6	7	7	14		M			
2655	2,653.0	22.5									
			4	5	7	12		M			
2650	2,648.0	27.5									
			3	5	8	13		M			
2645	2,643.0	32.5									
			3	3	5	8		M			
2640	2,638.0	37.5									
			3	4	4	8		M			
2635	2,633.0	42.5									
			6	4	5	9		M			
2630	2,628.0	47.5									
			4	5	5	10	SS-221	22%			
2625	2,623.0	52.5									
			3	4	15	19		M			
2620	2,618.0	57.5									
			12	20	26	46		M			
2615	2,613.0	62.5									
			12	15	26	41		M			
2610	2,608.0	67.5									
			6	8	12	20		M			
2605	2,603.0	72.5									
			5	12	15	27		M			
2600	2,598.0	77.5									
			11	24	50	74		M		2,639.5 Orange, brown, and gray, sandy CLAY (A-6), with trace rock fragments, micaceous, low plasticity	36.0
										2,629.5 Tan, gray, and brown, sandy SILT (A-4(1)), with trace rock fragments and some clay, micaceous, saprolitic, low plasticity	46.0
										2,599.5 Orange and brown, silty SAND (A-2-4), micaceous, saprolitic	76.0
										2,596.5 Boring Terminated at Elevation 2,596.5 ft in silty SAND (RESIDUAL)	79.0

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L3150_L	**STATION** 31+90	**OFFSET** 202 ft LT	**ALIGNMENT** -L-	**0 HR.** 8.5
COLLAR ELEV. 2,626.3 ft	**TOTAL DEPTH** 16.7 ft	**NORTHING** 677,526	**EASTING** 844,631	**24 HR.** 8.0
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 03/05/24	**COMP. DATE** 03/06/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2630										ELEV. (ft) DEPTH (ft)
	2,626.3	0.0	2	2	3	5		M		2,626.3 0.0 GROUND SURFACE
2625	2,625.8	0.5								2,625.8 0.5 TOPSOIL 6-inches
	2,622.8	3.5	4	4	3	7	SS-129	20%		**RESIDUAL** Brown and tan, silty SAND (A-2-4(0)), with little clay and trace rock fragments, micaceous
2620	2,620.3	6.0	1	1	4	5	SS-130			2,620.3 6.0 Brown and orange, sandy SILT (A-4(0)), with some clay, micaceous
	2,617.8	8.5	3	5	7	12		46%		
2615										
	2,612.8	13.5	3	5	11	16		M		
2610	2,610.3	16.0								2,610.3 16.0
	2,609.6	16.7	60/0.0			60/0.0				2,609.6 16.7 **WEATHERED ROCK** Brown, INJECTION GNEISS Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 2,609.6 ft on CRYSTALLINE ROCK (INJECTION GNEISS)

24hr WL taken 2hrs after completion
Hard drilling at 16.0 ft BGS

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513			**GROUND WTR (ft)**
BORING NO. L3150_R	**STATION** 31+16	**OFFSET** 114 ft RT	**ALIGNMENT** -L-	**0 HR.** 20.3
COLLAR ELEV. 2,635.2 ft	**TOTAL DEPTH** 30.0 ft	**NORTHING** 677,242	**EASTING** 844,609	**24 HR.** 21.0
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 03/05/24	**COMP. DATE** 03/06/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2640										
2635	2,635.2	0.0	1	1	2	3		M		2,635.2 0.0 GROUND SURFACE
	2,631.7	3.5	5	7	9	16		M		**RESIDUAL** Orange and brown, silty CLAY (A-7-5), with little rock fragments, micaceous, low to moderate plasticity
2630	2,629.2	6.0	6	7	9	16	SS-114	49%		2,632.2 3.0 Orange, tan, and brown, silty SAND (A-2-4(0)), with little to some clay and trace rock fragments, micaceous, saprolitic
	2,626.7	8.5	6	9	12	21		Sat.		
2625										
	2,621.7	13.5	6	6	9	15		Sat.		
2620										
	2,616.7	18.5	7	8	9	17		Sat.		
2615										
	2,611.7	23.5	2	2	5	7		Sat.		
2610										
	2,606.7	28.5	7	11	15	26		Sat.		2,605.2 30.0 Boring Terminated at Elevation 2,605.2 ft in silty SAND (RESIDUAL)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L3200_L	**STATION** 32+33	**OFFSET** 158 ft LT	**ALIGNMENT** -L-	**0 HR.** 11.8
COLLAR ELEV. 2,638.4 ft	**TOTAL DEPTH** 29.3 ft	**NORTHING** 677,531	**EASTING** 844,674	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 03/05/24	**COMP. DATE** 03/05/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)
2640										
	2,638.4	0.0								2,638.4 0.0 GROUND SURFACE
	2,637.9	0.5	1	3	2	5		M		2,637.9 0.5 TOPSOIL 6-inches
2635	2,634.9	3.5								**RESIDUAL** Brown, orange, and tan, clayey SAND (A-2-6(0)), with trace rock fragments, micaceous
			3	3	4	7	SS-134	21%		
	2,632.4	6.0								2,632.4 6.0
			2	2	2	4	SS-135	23%		Brown and orange, silty SAND (A-2-4(0)), with little clay and some rock fragments, micaceous, saprolitic
2630	2,629.9	8.5								
			5	10	14	24		M		
2625	2,624.9	13.5								
			16	14	26	40		M		
2620	2,619.9	18.5								
			19	30	25	55		M		
2615	2,614.9	23.5								2,614.9 23.5 **WEATHERED ROCK** Brown and orange, INJECTION GNEISS
			50	50/0.3		100/0.8				
2610	2,609.9	28.5								
			59	41/0.3		100/0.8				2,609.1 29.3 Boring Terminated at Elevation 2,609.1 ft in WEATHERED ROCK (INJECTION GNEISS)

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L3250	**STATION** 32+51	**OFFSET** 26 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,678.8 ft	**TOTAL DEPTH** 25.0 ft	**NORTHING** 677,354	**EASTING** 844,726	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 03/11/24	**COMP. DATE** 03/12/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2680										
	2,678.2	0.6								2,678.8 0.0 GROUND SURFACE
			11	7	6	13		M		2,678.2 0.6 **ROADWAY EMBANKMENT** PAVEMENT 7-inches
2675	2,675.3	3.5								2,675.8 ABC STONE 29-inches 3.0
			3	3	4	7		M		**RESIDUAL** Tan, orange, and brown, sandy SILT (A-4), micaceous
	2,672.8	6.0								
			2	3	4	7		M		
2670	2,670.3	8.5								
			3	3	3	6		M		
2665	2,665.3	13.5								
			4	4	6	10		M		
2660	2,660.3	18.5								
			3	3	5	8		M		
2655	2,655.3	23.5								
			2	3	4	7		M		2,653.8 25.0 Boring Terminated at Elevation 2,653.8 ft in sandy SILT (RESIDUAL)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L3250_R	**STATION** 32+50	**OFFSET** 90 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,660.7 ft	**TOTAL DEPTH** 30.0 ft	**NORTHING** 677,291	**EASTING** 844,738	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 02/28/24	**COMP. DATE** 02/29/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2665										ELEV. (ft) DEPTH (ft)
2660	2,660.7	0.0	1	2	3	5	SS-26	21%		2,660.7 GROUND SURFACE 0.0 **RESIDUAL** Orange, brown, and white, sandy SILT (A-4)(0)), with trace to little rock fragments, micaceous, saprolitic
	2,657.2	3.5	10	12	18	30		M		
2655	2,654.7	6.0	11	17	23	40		M		
	2,652.2	8.5	10	15	18	33		M		
2650	2,647.2	13.5	5	6	11	17		M		
2645	2,642.2	18.5	4	6	12	18		M		
2640	2,637.2	23.5	17	22	35	57		M		
2635	2,632.2	28.5	6	7	16	23		M		2,630.7 30.0 Boring Terminated at Elevation 2,630.7 ft in sandy SILT (RESIDUAL)

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L3400HA	**STATION** 34+00	**OFFSET** 67 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,682.0 ft	**TOTAL DEPTH** 1.0 ft	**NORTHING** 677,474	**EASTING** 844,854	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER Q. Hill	**START DATE** 03/14/24	**COMP. DATE** 03/14/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2685										2,682.0 GROUND SURFACE 0.0
								M		2,681.0 **ROADWAY EMBANKMENT** 1.0 Medium dense, brown, SAND AND GRAVEL (A-1-b) Boring Terminated by Auger Refusal at Elevation 2,681.0 ft in SAND AND GRAVEL (ROADWAY EMBANKMENT)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L3450	**STATION** 34+50	**OFFSET** 80 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,692.7 ft	**TOTAL DEPTH** 25.0 ft	**NORTHING** 677,340	**EASTING** 844,933	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 02/28/24	**COMP. DATE** 02/29/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2695											
	2,692.7	0.0	3	5	8	13		M		2,692.7 GROUND SURFACE	0.0
2690										**RESIDUAL** Brown, black, and orange, sandy CLAY (A-7-5(4)), with trace rock fragments and little silt, contains manganese oxides, micaceous, saprolitic, low plasticity	
	2,689.2	3.5	5	7	8	15		M			
	2,686.7	6.0	5	6	11	17		M			
2685											
	2,684.2	8.5	6	10	12	22		M			
2680										2,681.7	11.0
	2,679.2	13.5	6	9	10	19	SS-23	12%		Brown, orange, and white, sandy SILT (A-4(0)), with trace rock fragments and little clay, micaceous, saprolitic	
2675											
	2,674.2	18.5	10	11	13	24		M			
2670											
	2,669.2	23.5	7	15	15	30		M		2,667.7	25.0
										Boring Terminated at Elevation 2,667.7 ft in sandy SILT (RESIDUAL)	

Other Samples:
BS-1 (0.0 - 10.0)

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L3500	**STATION** 35+00	**OFFSET** 100 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,699.5 ft	**TOTAL DEPTH** 30.0 ft	**NORTHING** 677,527	**EASTING** 844,944	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER D. Underwood	**START DATE** 03/07/24	**COMP. DATE** 03/08/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2700										
	2,699.5	0.0	2	2	2	4		M		2,699.5 GROUND SURFACE 0.0
2695										**RESIDUAL** Orange and brown, silty and clayey SAND (A-2-7(1)), micaceous
	2,696.0	3.5	2	3	5	8	SS-142	20%		
	2,693.5	6.0	8	12	11	23		M		2,693.0 6.5
	2,691.0	8.5	10	10	10	20		M		Orange and brown, sandy SILT (A-4(0)), with trace to little clay and rock fragments, micaceous
2690										
2685	2,686.0	13.5	11	13	15	28	SS-145	12%		
	2,681.0	18.5	12	27	26	53		M		
2680										
2675	2,676.0	23.5	16	20	27	47		M		
	2,671.0	28.5	16	27	41	68		M		2,669.5 30.0
2670										Boring Terminated at Elevation 2,669.5 ft in sandy SILT (RESIDUAL)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L3650	**STATION** 36+50	**OFFSET** 85 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,694.8 ft	**TOTAL DEPTH** 20.0 ft	**NORTHING** 677,378	**EASTING** 845,130	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 02/28/24	**COMP. DATE** 02/29/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2695											
	2,694.8	0.0	1	2	2	4		M		2,694.8 GROUND SURFACE	0.0
										RESIDUAL Orange and brown, sandy CLAY (A-7-5), contains manganese oxides, moderate plasticity	
	2,691.3	3.5	6	7	9	16		M		2,691.8	3.0
2690										Orange, white, and brown, sandy SILT (A-4(0)), with little clay, contains manganese oxides, micaceous, saprolitic	
	2,688.8	6.0	2	5	7	12		M			
	2,686.3	8.5									
2685			4	7	9	16	SS-16	23%			
	2,681.3	13.5									
2680			4	7	8	15		M			
	2,676.3	18.5									
2675			5	7	11	18		M		2,674.8	20.0
										Boring Terminated at Elevation 2,674.8 ft in sandy SILT (RESIDUAL)	

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L3750	**STATION** 37+50	**OFFSET** 135 ft LT	**ALIGNMENT** -L-	**0 HR.** 57.1
COLLAR ELEV. 2,724.5 ft	**TOTAL DEPTH** 70.0 ft	**NORTHING** 677,614	**EASTING** 845,182	**24 HR.** 50.3
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER D. Underwood	**START DATE** 03/07/24	**COMP. DATE** 03/08/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
2725											
	2,724.5	0.0	2	3	5	8		M		2,724.5 GROUND SURFACE	0.0
										RESIDUAL Orange and brown, silty and clayey SAND (A-2-7(0)), micaceous	
	2,721.0	3.5	3	5	8	13		M			
2720										2,718.5	6.0
	2,718.5	6.0	15	18	17	35	SS-151	12%		Orange, tan, white, and brown, sandy SILT (A-4(0)), with trace rock fragments and little clay, micaceous	
	2,716.0	8.5									
2715			17	14	17	31		M			
	2,711.0	13.5									
2710			18	14	16	30		M			
	2,706.0	18.5									
2705			38	25	26	51		M			
	2,701.0	23.5									
2700			10	11	13	24		M			
	2,696.0	28.5									
2695			16	9	12	21		M			
	2,691.0	33.5								2,692.5	32.0
2690			15	16	18	34	SS-157	14%		Tan and brown, silty SAND (A-2-4(0)), with trace rock fragments and little clay, micaceous	
	2,686.0	38.5									
2685			21	11	14	25		M			
	2,681.0	43.5									
2680			3	9	8	17		M			
	2,676.0	48.5								2,677.5	47.0
2675			13	21	24	45				Brown, orange, tan, and white, sandy SILT (A-4), with little clay and rock fragments, micaceous, saprolitic, low plasticity	
	2,671.0	53.5									
2670			7	14	20	34		M			
	2,666.0	58.5									
2665			13	17	19	36		M			
	2,661.0	63.5									
2660			16	27	45	72		M			
	2,656.0	68.5									
2655			18	26	74	100		W		2,654.5	70.0
										Boring Terminated at Elevation 2,654.5 ft in sandy SILT (RESIDUAL)	

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. L3850	**STATION** 38+50	**OFFSET** 50 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 2,694.1 ft	**TOTAL DEPTH** 59.3 ft	**NORTHING** 677,551	**EASTING** 845,298	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 03/13/24	**COMP. DATE** 03/14/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) / DEPTH (ft)
2695										
	2,694.1	0.0								GROUND SURFACE 0.0
	2,693.6	0.5	8	12	9	21		M		**ROADWAY EMBANKMENT** 0.5 PAVEMENT 5.5-inches
2690	2,691.1	3.0								ABC STONE 30.5-inches 3.0
	2,690.2	3.9	6	8	11	19	SS-199	20%		**RESIDUAL** Orange and brown, sandy CLAY (A-7-5(5)), with some silt, micaceous, low plasticity
2685	2,687.1	7.0								Orange, brown, white, and tan, sandy SILT (A-4(0)), with little clay, contains manganese oxides, micaceous, saprolitic, low plasticity
	2,685.3	8.8	9	9	12	21		M		
2680	2,680.3	13.8	5	7	11	18		M		
2675	2,675.3	18.8	5	8	12	20		M		
2670	2,670.3	23.8	5	8	11	19		M		
2665	2,665.3	28.8	6	8	11	19		M		
2660	2,660.3	33.8	3	5	15	20	SS-205	15%		
2655	2,655.3	38.8	8	15	25	40		M		
2650	2,650.3	43.8	8	14	20	34		M		
2645	2,645.3	48.8	19	31	34	65		M		
2640	2,640.3	53.8	21	30	61	91		M		
2635	2,635.3	58.8	96	4/0.0		100/0.5				2,635.3 58.8 2,634.8 **WEATHERED ROCK** 59.3 Brown and tan, INJECTION GNEISS Boring Terminated at Elevation 2,634.8 ft in Weathered Rock (INJECTION GNEISS)

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. Y12050	**STATION** 20+50	**OFFSET** 75 ft RT	**ALIGNMENT** -Y1-	**0 HR.** 12.0
COLLAR ELEV. 2,617.6 ft	**TOTAL DEPTH** 50.5 ft	**NORTHING** 677,084	**EASTING** 844,412	**24 HR.** 2.5
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 02/27/24	**COMP. DATE** 02/28/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2620										
	2,617.6	0.0								GROUND SURFACE 0.0
	2,617.2	0.4	3	3	3	6		M		TOPSOIL 5-inches 0.4
2615	2,614.6	3.0								**ALLUVIAL** Brown, sandy SILT (A-4), low plasticity 3.0
	2,614.1	3.5	1	0	1	1	SS-2	38%		Brown, SAND and GRAVEL (A-1-b(0)), with trace organic matter and some clay, micaceous 5.5
2610	2,612.1	5.5	WOH	2	3	5	SS-3	29%		Brown and orange, silty SAND (A-2-4(0)), with trace organic matter, micaceous, low plasticity
	2,611.6	6.0								
	2,609.1	8.5	7	11	13	24	SS-4	33%		
2605	2,605.6	12.0								**RESIDUAL** 12.0 Brown, orange, and white, sandy SILT (A-4), micaceous, saprolitic, low plasticity
	2,604.1	13.5	5	8	10	18		W		
2600	2,599.1	18.5	11	14	18	32		W		
2595	2,594.1	23.5	16	21	22	43		W		
2590	2,589.1	28.5	6	7	12	19		W		
2585	2,584.1	33.5	6	11	23	34		W		
2580	2,579.1	38.5	49	51/0.3		100/0.8				2,579.1 38.5 **WEATHERED ROCK** Brown, orange, and white, (INJECTION GNEISS)
2575	2,574.1	43.5	28	72/0.3		100/0.8				
2570	2,569.1	48.5	28	47	53/0.1	100/0.6				
	2,567.1	50.5	60/0			60/0.0				2,567.1 50.5 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 2,567.1 ft on Crystalline Rock (INJECTION GNEISS) *Hard drilling at 40.8 ft BGS.*

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55041.1.1	**TIP** B-5541	**COUNTY** HAYWOOD	**GEOLOGIST** Q. Hill	
SITE DESCRIPTION Replace Bridge No. 236 on I-40 over SR 1513				**GROUND WTR (ft)**
BORING NO. Y12600	**STATION** 26+00	**OFFSET** 15 ft LT	**ALIGNMENT** -Y1-	**0 HR.** Dry
COLLAR ELEV. 2,653.5 ft	**TOTAL DEPTH** 15.0 ft	**NORTHING** 677,640	**EASTING** 844,531	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/17/2022		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER C. Odom	**START DATE** 02/29/24	**COMP. DATE** 03/01/24	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2655											
	2,653.5	0.0	2	2	3	5	SS-79	21%		2,653.5 GROUND SURFACE	0.0
2650	2,650.0	3.5	7	16	23	39		M		**RESIDUAL** Orange and brown, silty SAND (A-2-4(0)), micaceous 2,649.6	3.9
	2,647.5	6.0	10	14	30	44		M		Red and brown, clayey SAND (A-2-6(0)), with little rock fragments, micaceous 2,645.5	8.0
2645	2,645.0	8.5	21	25	35	60		M		Brown, sandy SILT (A-4), with little rock fragments, micaceous, low plasticity	
2640	2,640.0	13.5	7	9	9	18		M		2,638.5	15.0

Boring Terminated at Elevation 2,638.5 ft in sandy SILT (RESIDUAL)

2-inches Topsoil

Other Samples:
BS-3 (0.0 - 10.0)

CONE PENETROMETER RESULTS

PROJECT NO.	B-5541
PROJECT NAME	2-Lane Extension of SR 1630
ROUTE	Replace Bridge No. 236 on I-40
COUNTY	Haywood

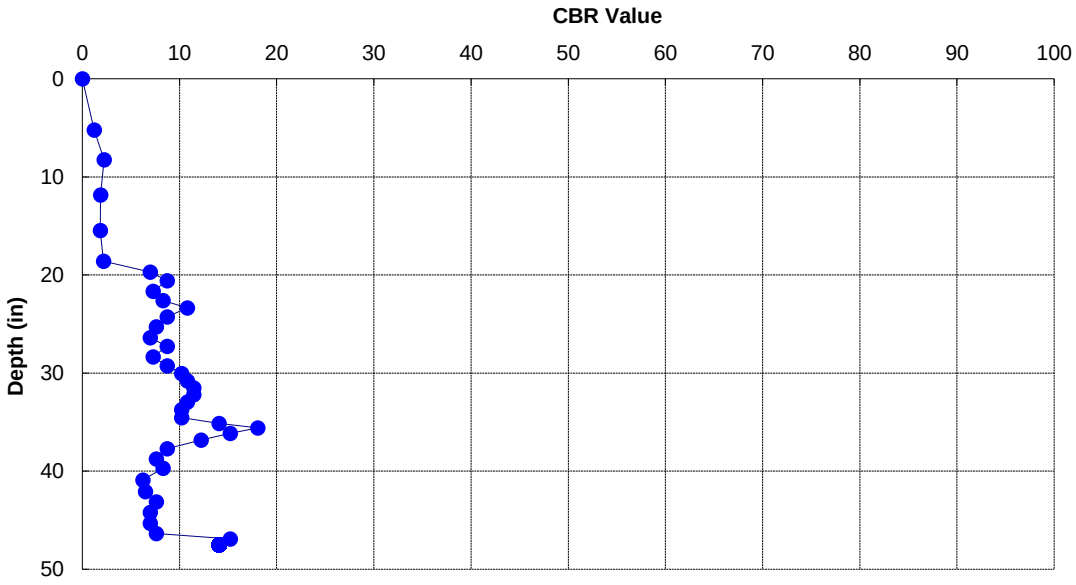
GEOLOGIST	Quinton Hill
GEOTECH(S)	C. Odom
	Z. Taylor
	N/A

L1700HA 1

Datum = Exstg Grd Lvl 3/14/24

Interval 0.0 to 18.6	
# of Values	6
Avg CBR	2.7
Wghtd Avg.	-
Max CBR	7.0
Min CBR	1.2

Interval 18.6 to 47.5	
# of Values	32
Avg CBR	9.8
Wghtd Avg.	-
Max CBR	18.1
Min CBR	6.2

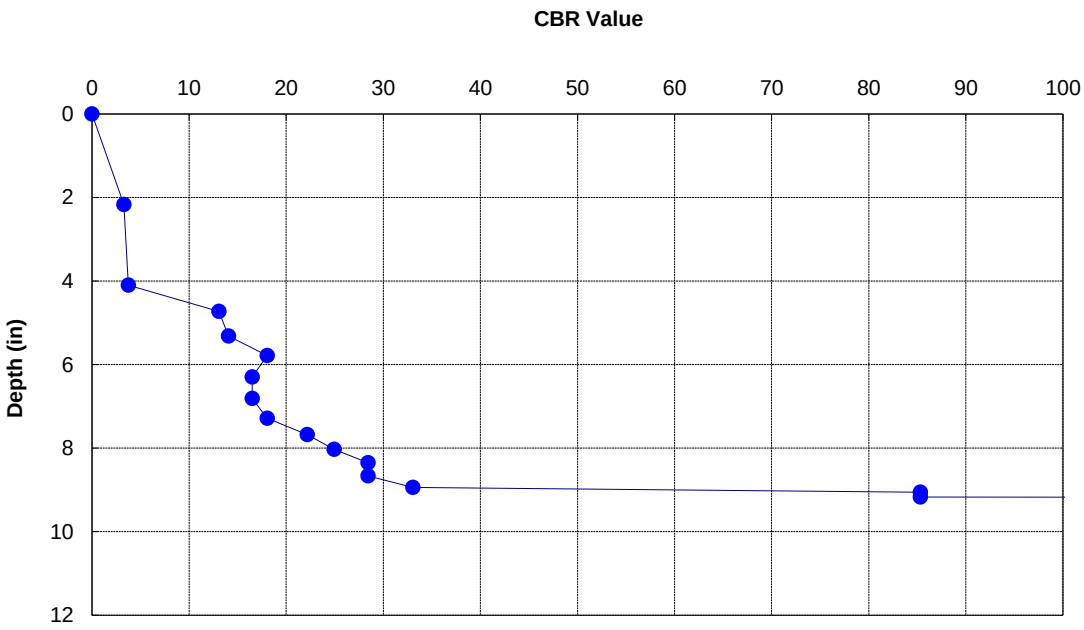


L3500HA-A 2

Datum = Exstg Grd Lvl 3/14/24

Interval 0.0 to 4.1	
# of Values	3
Avg CBR	6.7
Wghtd Avg.	-
Max CBR	13.1
Min CBR	3.3

Interval 4.1 to 9.6	
# of Values	23
Avg CBR	100+
Wghtd Avg.	-
Max CBR	100+
Min CBR	14.1



CONE PENETROMETER RESULTS

PROJECT NO.	B-5541
PROJECT NAME	2-Lane Extension of SR 1630
ROUTE	Replace Bridge No. 236 on I-40
COUNTY	Haywood

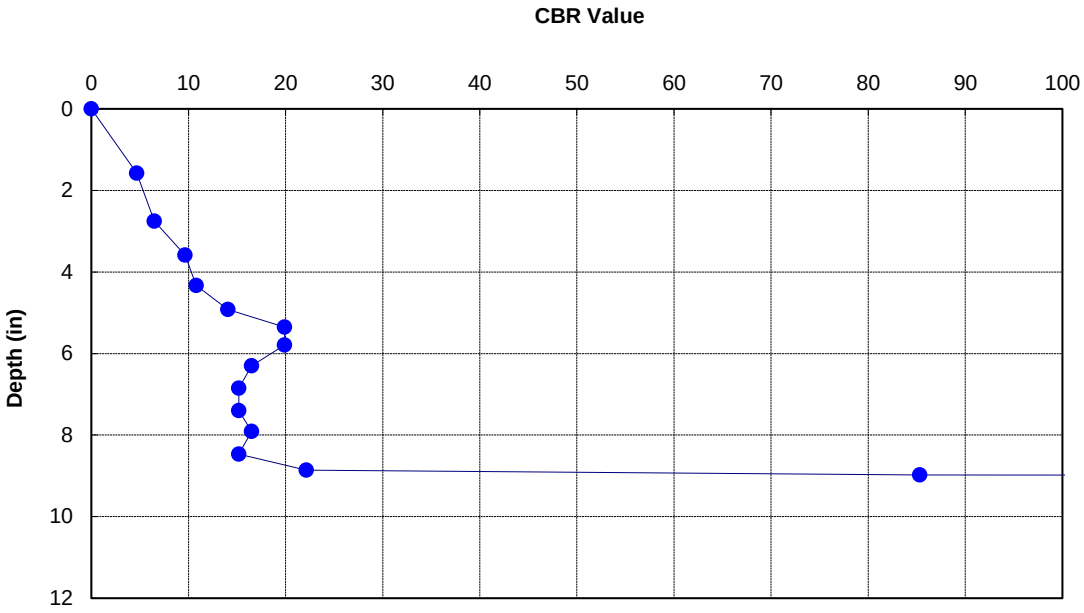
GEOLOGIST	Quinton Hill
GEOTECH(S)	C. Odom
	Z. Taylor
	N/A

L3500HA-B 3

Datum = Exstg Grd Lvl 3/14/24

Interval 0.0 to 4.9	
# of Values	5
Avg CBR	9.1
Wghtd Avg.	-
Max CBR	14.1
Min CBR	4.7

Interval 4.9 to 9.5	
# of Values	50
Avg CBR	100+
Wghtd Avg.	-
Max CBR	100+
Min CBR	15.2



REPLACE BRIDGE NO. 236 ON I-40 OVER SR 1513 IN HAYWOOD COUNTY

SOIL TEST RESULTS -L-

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-15	17+00	45' LT	1.5-2.5	A-7-5 (7)	43	13	17.2	29	24.4	29.5	99	87.9	59.7	21	-
S-16	17+00	45' LT	6.5-7.5	A-4 (0)	NP	NP	24.6	28.7	27.2	19.5	99.8	81.2	53.3	15	-
SS-57	19+00	75' RT	0.0-1.5	A-2-6 (0)	40	11	47.9	21.4	1.9	28.8	74.3	43.3	26.4	22	-
SS-65	21+00	100' RT	8.5-10.0	A-4 (0)	NP	NP	19.2	36.2	30.1	14.6	95.8	85.2	51.1	14	-
SS-68	21+00	100' RT	23.5-25.0	A-7-6 (10)	44	19	19.9	19.5	29.9	30.7	94.2	85	55.3	25	-
SS-74	23+00	95' RT	13.5-15.0	A-2-6 (0)	40	15	52.2	24.9	2.8	20.1	69.5	36.8	21	11	-
SS-76	23+00	95' RT	23.5-25.0	A-6 (2)	39	14	36.9	20.8	12	30.2	84.8	56.7	41.1	18	-
BS-2	25+00	80' RT	0.0-10.0	A-6 (5)	40	16	30.6	17.5	15.8	36.1	89.3	67.3	50.3	20	-
SS-54	25+00	80' RT	13.5-15.0	A-6 (5)	36	13	25.5	20.7	22	31.8	92.4	72.2	56.1	19	-
SS-47	27+00	70' RT	13.5-15.0	A-4 (0)	NP	NP	33	33	18.5	15.6	98.9	77.5	40	12	-
SS-167	28+50	11' RT	6.0-7.5	A-4 (0)	35	8	14.5	28.9	24.4	24.4	92.3	77.8	48.9	21	-
SS-170	28+50	11' RT	18.5-20.0	A-7-6 (11)	43	20	17.2	25.1	18.1	39.6	99.2	87.3	62.7	19	-
SS-34	28+50_R	95' RT	0.0-1.5	A-2-7 (0)	46	16	40.4	29.6	14.6	15.4	90.1	62.3	22	17	-
SS-40	28+50_R	95' RT	23.5-25.0	A-4 (0)	NP	NP	33.6	30.9	13.1	22.3	94.8	74.4	38.5	29	-
SS-84	30+50	105' LT	0.0-1.5	A-5 (4)	45	10	18.8	33.6	23.6	24.1	99.6	89.6	54.3	23	-
SS-85	30+50	105' LT	3.5-5.0	A-4 (2)	39	7	25.4	30.2	21.7	22.7	97.9	80.8	49.2	22	-
ST-1	30+50	105' LT	13.0-15.0	A-2-7 (1)	41	20	51.2	14.7	4.2	29.9	88.4	48.5	32.5	21	-
SS-89	30+50	105' LT	18.5-20.0	A-4 (2)	34	10	20.9	31.3	15.6	32.1	92.1	80.9	49.1	18	-
SS-97	30+50_R	107' RT	0.0-1.5	A-7-5 (8)	52	16	13.5	38.8	22.2	25.5	99.8	92.8	56.3	35	-
ST-2	30+50_R	107' RT	8.0-10.0	A-4 (0)	NP	NP	33.2	42	10.9	13.9	98.9	80.5	36.4	23	-
SS-101	30+50_R	107' RT	13.5-15.0	A-4 (0)	NP	NP	26.3	35.7	17.4	20.6	97.8	81.6	43.6	26	-
SS-190	30+75	14' LT	42.9-44.4	A-4 (0)	45	11	19.6	32	23.3	23.3	98.2	78.6	46.6	33	-
SS-191	30+75	14' LT	47.9-49.4	A-7-6 (9)	43	17	8.3	35.7	20.3	35.8	99.6	96.5	62.7	23	
ST-3	31+00_L	158' LT	8.6-10.6	A-2-4 (0)	NP	NP	44.4	39.4	5.9	10.4	85.4	57.5	19.1	21	-
SS-105	31+00_R	117' RT	0.0-1.5	A-7-5 (7)	46	15	18.6	26.6	23	31.8	95.2	83.4	58	27	-
SS-212	31+50	52' LT	3.5-5.0	A-4 (0)	NP	NP	17.6	34.9	21.3	26.3	96.9	87.1	53.4	23	-
SS-221	31+50	52' LT	47.5-49.0	A-4 (1)	34	8	28.9	29.8	15.2	26.1	92.3	71	43.5	22	-
SS-114	31+50_R	114' RT	6.0-7.5	A-2-4 (0)	NP	NP	36.3	32.9	8	22.8	89.6	64	33.4	49	-
SS-129	31+50_L	202' LT	3.5-5.0	A-2-4 (0)	NP	NP	34.2	38.2	13.3	14.4	96.5	79.7	31.6	20	-
SS-130	31+50_L	202' LT	6.0-7.5	A-4 (0)	NP	NP	23.9	27.8	20.3	28	94.1	77.6	50.2	46	-
SS-134	32+00_L	158' LT	3.5-5.0	A-2-6 (0)	40	12	34.5	33.3	1.5	30.6	90	66.7	34.2	21	-
SS-135	32+00_L	158' LT	6.0-7.5	A-2-4 (0)	NP	NP	37.9	35.1	16.4	10.7	98.1	76.1	31.8	23	-
SS-26	32+50_R	90' RT	0.0-1.5	A-4 (0)	NP	NP	35	27.8	9.2	28	93.1	71.2	39.1	21	-
SS-23	34+50	80' RT	13.5-15.0	A-4 (0)	NP	NP	23.6	30	32.6	13.8	97.4	85.9	44.3	12	-
BS-1	34+50	80' RT	0.0-10.0	A-7-5 (4)	52	15	30.4	27	18.3	24.3	96.2	75.7	46	19	-
SS-142	35+00	100' LT	3.5-5.0	A-2-7 (1)	49	19	37.5	26.8	5.3	30.4	84.9	61.5	33.6	20	-
SS-145	35+00	100' LT	13.5-15.0	A-4 (0)	NP	NP	37.9	28.7	24.2	9.2	92.8	67.4	37.1	12	-
SS-16	36+50	85' RT	8.5-10.0	A-4 (0)	NP	NP	19.8	39.3	26.8	14.1	99.5	88.2	48.3	23	-
SS-151	37+50	135' LT	6.0-7.5	A-4 (0)	NP	NP	19.7	35.4	31.2	13.7	98.5	88.5	50.5	12	-
SS-157	37+50	135' LT	33.5-35.0	A-2-4 (0)	NP	NP	40	39.5	5.6	14.9	96.6	77.4	26.4	14	-
SS-199	38+50	50' LT	3.9-5.4	A-7-5 (5)	41	11	16.4	34.5	24.4	24.8	99.7	89.2	57.3	20	-
SS-205	38+50	50' LT	33.8-35.3	A-4 (0)	NP	NP	24.4	29.8	30.6	15.1	98.7	81.7	51.9	24	-

REPLACE BRIDGE NO. 236 ON I-40 OVER SR 1513 IN HAYWOOD COUNTY

SOIL TEST RESULTS -Y1-

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-2	20+50	75' RT	3.5-5.0	A-1-b (0)	NP	NP	66	9.1	4.5	20.4	54.1	21.8	14.1	38	-
SS-3	20+50	75' RT	6.0-7.5	A-2-4 (0)	NP	NP	38.5	35.7	16.6	9.2	99	79.3	30.8	29	-
SS-4	20+50	75' RT	8.5-10.0	A-2-4 (0)	39	7	40.5	32.5	4	23	86.4	62.2	28.3	33	-
SS-79	26+00	15' LT	0.0-1.5	A-2-4 (0)	35	5	35.9	30.4	8.9	24.9	89.6	66.7	35.2	21	-
BS-3	26+00	15' LT	0.0-10.0	A-2-6 (0)	37	12	48.6	24	5	22.4	64.9	40.3	20.5	14	-