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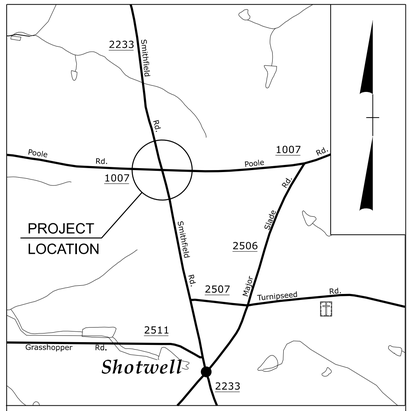
09/08/99

TIP PROJECT: HL-0031

CONTRACT: DE00400

See Sheet 1A For Index of Sheets



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

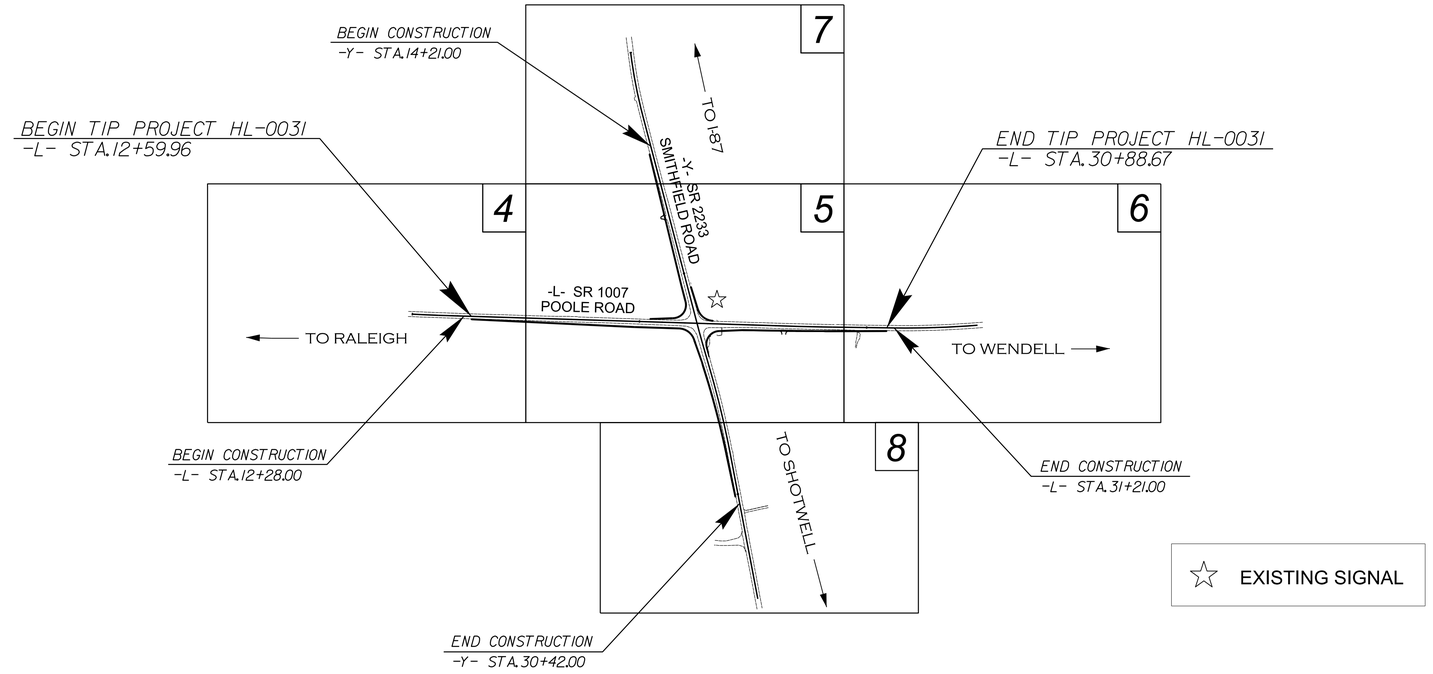
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HL-0031	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
48996.1.1	N/A	PE
49616.2.1	1007043	R/W
49616.2.2	1007043	UTIL
49616.3.1	1007043	CONST

LOCATION: *CONSTRUCT LEFT TURN LANES AT SR 1007 (POOLE ROAD) AND SR 2233 (SMITHFIELD ROAD) INTERSECTION*

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

NAD 83/2011



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

SR 1007
ADT 2019 = 4,700
V = 60 MPH

SR 2233
ADT 2019 = 14,500
V = 50 MPH

FUNC CLASS = MINOR ARTERIAL (SR 1007)

SUB-REGIONAL TIER

PROJECT LENGTH

TOTAL LENGTH TIP PROJECT HL-0031 = 0.346 MILES

NCDOT CONTACT: JOHN BRAXTON - DIVISION 5 PROJECT MANAGER

Prepared in the Office of:

SUMMIT
DESIGN AND ENGINEERING SERVICES
FIRM NO. P-0339
320 Executive Ct.
Hillsborough, NC 27278-8551
Voice: (919) 732-3883
Fax: (919) 732-6776
www.summitde.com

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 15, 2022

LETTING DATE: FEBRUARY 12, 2025

BRANDON JOHNSON, PE
PROJECT ENGINEER

SPENCER MERRITT, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
1/9/2025
NORTH CAROLINA PROFESSIONAL SEAL 053755 ENGINEER PATRICK M. HARTNETT
DocuSigned by: Patrick Hartnett
P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER
1/9/2025
NORTH CAROLINA PROFESSIONAL SEAL 053483 ENGINEER SPENCER W. MERRITT
Signed by:
P.E.
SIGNATURE:

DIVISION OF HIGHWAYS · DIVISION FIVE · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · DIVISION DESIGN UNIT

Docusign Envelope ID: 20B4759D-6684-4298-8A6E-5B129C0CA31D

5/26/20

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
3B-1	ROADWAY AND DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
3P-1	PARCEL INDEX SHEET
4 THRU 10	PLAN AND PROFILE SHEET
RW-01 THRU RW-08	SURVEY CONTROL, EXIST. CENTERLINES, RIGHT OF WAY, EASEMENT AND PROPERTY TIES
TMP-1 THRU TMP- 4E	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP- 6	PAVEMENT MARKING PLANS
EC-1 THRU EC- 13	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-6	SIGNING PLANS
SIG-1 THRU SIG- 3.2	SIGNAL PLANS
SCP-1 THRU SCP-5	SIGNAL COMMUNICATIONS PLANS
UO-1 THRU UO-6	UTILITIES BY OTHERS PLANS
X-0	CROSS-SECTION INDEX
X-0A	CROSS-SECTION SUMMARY
X-1 THRU X- 21	CROSS-SECTIONS

EFF. 01-16-2024
REV.

2024 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Contracts Standards and Development Unit - N. C. Department of Transportation - Raleigh, N. C., Dated January 16, 2024 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO. TITLE
DIVISION 2 - EARTHWORK
200.03 Method of Clearing - Method III
225.02 Guide for Grading Subgrade - Secondary and Local
225.04 Method of Obtaining Superelevation - Two Lane Pavement
225.06 Method of Grading Sight Distance at Intersections
DIVISION 3 - PIPE CULVERTS
300.01 Method of Pipe Installation
310.10 Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS
560.01 Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS
654.01 Pavement Repairs
DIVISION 8 - INCIDENTALS
806.01 Concrete Right-of-Way Marker
806.02 Granite Right-of-Way Marker
876.02 Guide for Rip Rap at Pipe Outlets

GENERAL NOTES: 2024 SPECIFICATIONS
EFFECTIVE: 01-16-2024
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3 FOOT RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY, AT&T,

SPECTRUM, AND DOMINION

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

HL-0031
1A

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

ROADWAY DESIGN ENGINEER
10/4/2024

Signed by:
53AE60F8E5C84DF...

PLANS PREPARED BY:
SUMMIT
DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
320 Executive Court
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

9/10/2021

HL-0031
1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

**S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (EIP)
- Computed Property Corner
- Existing Concrete Monument (ECM)
- Parcel/Sequence Number
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary
- Proposed Wetland Boundary
- Existing Endangered Animal Boundary
- Existing Endangered Plant Boundary
- Existing Historic Property Boundary
- Known Contamination Area: Soil
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign
- Well
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream
- Buffer Zone 1
- Buffer Zone 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch
- False Sump

- Standard Gauge
- RR Signal Milepost
- Switch
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Secondary Horiz and Vert Control Point
- Vertical Benchmark
- Existing Right of Way Monument
- Proposed Right of Way Monument (Rebar and Cap)
- Proposed Right of Way Monument (Concrete)
- Existing Permanent Easement Monument
- Proposed Permanent Easement Monument (Rebar and Cap)
- Existing C/A Monument
- Proposed C/A Monument (Rebar and Cap)
- Proposed C/A Monument (Concrete)
- Existing Right of Way Line
- Proposed Right of Way Line
- Existing Control of Access Line
- Proposed Control of Access Line
- Proposed ROW and CA Line
- Existing Easement Line
- Proposed Temporary Construction Easement
- Proposed Temporary Drainage Easement
- Proposed Permanent Drainage Easement
- Proposed Permanent Drainage/Utility Easement
- Proposed Permanent Utility Easement
- Proposed Temporary Utility Easement
- Proposed Aerial Utility Easement

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut
- Proposed Slope Stakes Fill
- Proposed Curb Ramp
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert
- Bridge Wing Wall, Head Wall and End Wall

MINOR:

- Head and End Wall
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB
- Paved Ditch Gutter
- Storm Sewer Manhole
- Storm Sewer

UTILITIES:

** SUE – Subsurface Utility Engineering*
LOS – Level of Service – A,B,C or D (Accuracy)

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H–Frame Pole
- U/G Power Line Test Hole (SUE – LOS A)*
- U/G Power Line (SUE – LOS B)*
- U/G Power Line (SUE – LOS C)*
- U/G Power Line (SUE – LOS D)*

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole
- Telephone Pedestal
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole
- U/G Telephone Test Hole (SUE – LOS A)*
- U/G Telephone Cable (SUE – LOS B)*
- U/G Telephone Cable (SUE – LOS C)*
- U/G Telephone Cable (SUE – LOS D)*
- U/G Telephone Conduit (SUE – LOS B)*
- U/G Telephone Conduit (SUE – LOS C)*
- U/G Telephone Conduit (SUE – LOS D)*
- U/G Fiber Optics Cable (SUE – LOS B)*
- U/G Fiber Optics Cable (SUE – LOS C)*
- U/G Fiber Optics Cable (SUE – LOS D)*

- Water Manhole
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line Test Hole (SUE – LOS A)*
- U/G Water Line (SUE – LOS B)*
- U/G Water Line (SUE – LOS C)*
- U/G Water Line (SUE – LOS D)*
- Above Ground Water Line

TV:

- TV Pedestal
- TV Tower
- U/G TV Cable Hand Hole
- U/G TV Test Hole (SUE – LOS A)*
- U/G TV Cable (SUE – LOS B)*
- U/G TV Cable (SUE – LOS C)*
- U/G TV Cable (SUE – LOS D)*
- U/G Fiber Optic Cable (SUE – LOS B)*
- U/G Fiber Optic Cable (SUE – LOS C)*
- U/G Fiber Optic Cable (SUE – LOS D)*

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line Test Hole (SUE – LOS A)*
- U/G Gas Line (SUE – LOS B)*
- U/G Gas Line (SUE – LOS C)*
- U/G Gas Line (SUE – LOS D)*
- Above Ground Gas Line

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line
- Above Ground Sanitary Sewer
- SS Force Main Line Test Hole (SUE – LOS A)*
- SS Force Main Line (SUE – LOS B)*
- SS Force Main Line (SUE – LOS C)*
- SS Force Main Line (SUE – LOS D)*

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box
- Utility Unknown U/G Line (SUE – LOS B)*
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc.
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

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5/26/20

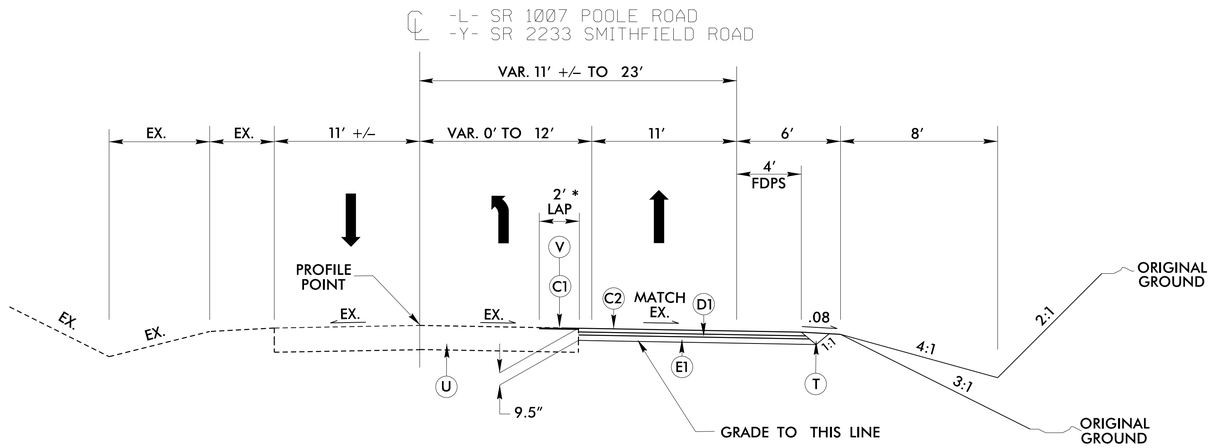
PAVEMENT SCHEDULE

FINAL PAVEMENT DESIGN

C1	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
D1	PROP. APPROX. 2.5″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING, 1.5″ DEPTH

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS NOTED OTHERWISE.

10/30/2023

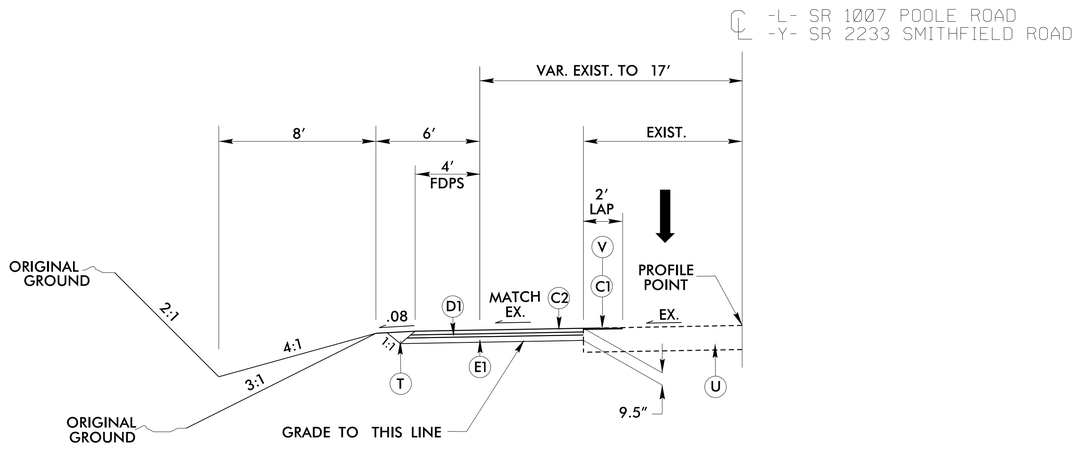


TYPICAL SECTION NO. 1

* MILL AND FILL 2′ LAP JOINT – MEASURED FROM EXISTING EOP

USE TYPICAL SECTION NO. 1

FROM –L– STA. 12+59.96 TO –L– STA. 30+88.67
FROM –Y– STA. 14+53.18 TO –Y– STA. 30+10.46



PARTIAL TYPICAL SECTION NO. 1A

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1

USE PARTIAL TYPICAL SECTION NO. 1A

FROM –L– STA. 20+44.28 LT. TO –L– STA. 21+44.28 LT.
FROM –Y– STA. 20+64.22 LT. TO –Y– STA. 21+64.22 LT.

HL-0031
2A-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

ROADWAY DESIGN ENGINEER
10/30/2023
NORTH CAROLINA PROFESSIONAL SEAL 053483 ENGINEER SPENCER W. MERRITT
DocuSigned by:
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT DESIGN ENGINEER
10/30/2023
NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M. CHAVEZ
Docusigned by:
7CD1E54398E040A...
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
320 Executive Court
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

5/26/20

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE	DRAINAGE PIPE THICKNESS OR GAUGE	C.S. PIPE (UNLESS NOTED OTHRWISE) SIZE	C.S. PIPE THICKNESS OR GAUGE	CLASS III R.C. PIPE (UNLESS OTHERWISE NOTED) SIZE	CLASS IV R.C. PIPE (UNLESS OTHERWISE NOTED) SIZE	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') LIN. *FT. PER EACH (0' THRU 5.0')	LIN. *FT. 5.0' THRU 10.0' A	LIN. *FT. 10.0' AND ABOVE B	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME & GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	FLOWABLE FILL C.Y.	PIPE REMOVAL LIN.FT.	REMARKS
Y 17+72.00	CL	0502			287.0	284.8							64																						
L 21+96.00	CL	0501			299.1	297.1							108																						
L 27+91.00	CL	0503			293.5	293.2							60																						
Y 16+27.00	RT	0504											52																						
Y 17+27.00	RT	0505										24																							
L 26+24.00	RT	0506										24																							
Y 16+67.00	RT																																29		
L 22+18.00	CL																																186		
PROJECT TOTALS												48	232																				215		

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I. (N.S.)	GRATED DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

SUMMARY OF EARTHWORK

IN CUBIC YARDS

STATION	STATION	UNCL. EXCAV.	ROCK EXCAVATION	EMBANK. +20%	BORROW	WASTE
L 12+28.00	L 31+21.00	2,417		514		1,903
Y 14+21.00	Y 20+18.23	803		2,750	1,948	
Y 24+36.36	Y 30+42.00	3,980		5,675	1,695	
L 23+90.00	L 24+25.00		75			75
TOTALS:		7,199	75	8,939	3,643	1,978
LOSS DUE TO CLEARING AND GRUBBING						
WASTE IN LIEU OF BORROW					- 1,903	
PROJECT TOTALS:		7,199	75	8,939	1,740	75
EST. 5% TO REPACE TOP SOIL ON BORROW PIT					87	
GRAND TOTAL		7,199	75	8,939	1,827	75
SAY:		7,200			1,830	

EST. UNDERCUT EXCAVATION = 50 CY (CONTENGENCY PER GEOTECH RECOMMENDATIONS)
EST. SELECT GRANULAR MATERIAL = 50 CY (CONTENGENCY PER GEOTECH RECOMMENDATIONS)
EST. CONTAMINATED SOIL EXCAVATION = 50 TONS(CONTENGENCY PER GEOENVIRONMENTAL UNIT)

Approximate quantities only. Unclassified excavation, borrow excavation, fine grading and clearing and grubbing will be paid for at the contract lump some price for grading.

Earthwork quantities are calculated by the Roadway Designer. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

SUMMARY OF MILLING (1.5"")

IN CUBIC YARDS

STATION	STATION	LOCATION	SQ-FT
-L- 12+59.95	-L- 22+34.68	RT	1,952.82
-L- 22+86.23	-L- 30+88.56	RT	1,613.83
-L- 20+44.37	-L- 22+17.65	LT	354.94
-L- 12+69.60	-L- 23+69.60	LT	111.84
-Y1- 14+53.18	-Y1- 21+19.63	RT	1,493.67
-Y1- 20+64.22	-Y1- 22+12.30	RT	1,539.63
-Y1- 14+53.18	-Y1- 21+19.63	LT	297.02
-Y1- 22+62.65	-Y1- 23+84.17	LT	223.96
		TOTAL	7,587.71
		SY	843.07
		SAY	850.00

HL-0031
3B-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

PLANS PREPARED BY:
SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
320 Executive Court
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

COMPUTED BY: Neil Roberson DATE: 1/9/2025
CHECKED BY: Jinyoung Park DATE: 1/9/2025

(2-3-23)

PROJECT NO.	SHEET NO.
HL-0031 (48996.1.1)	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Subgrade Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU (1)		100	200	300		
			TOTAL CY/TONS/SY:		100	200**	300**	0	0

*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)
*AST = Aggregate Stabilization
**Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Subgrade Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

PROJ. REFERENCE NO.	SHEET NO.
HL-0031	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

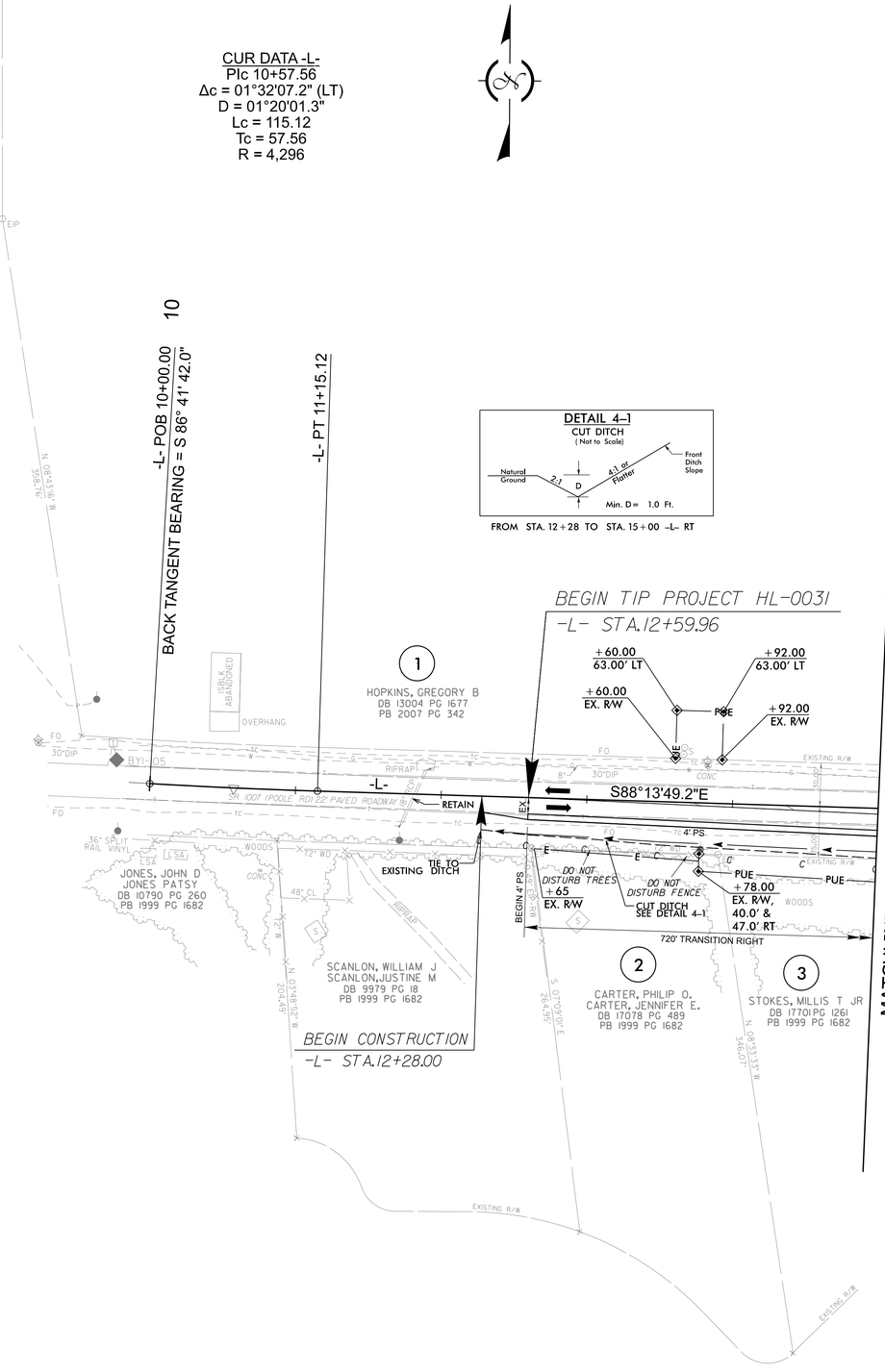
PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4, 5	GREGORY B. HOPKINS
2	4	PHILIP O. CARTER & JENNIFER E. CARTER
3	4, 5	MILLIS T. STOKES, JR.
4	5	JEREMIAH J. EARLEY & LAUREN M. EARLEY
5	5, 8	MAJED FAUD EL SHAIKH & ISSA FAUD SHAIKH
6	5, 7	POOLE ROAD HOLDINGS, LLC
7	5, 6, 7	GBK I, LLC
8	5	CLARENCE M. KIRK, JR.
9	5	CLARENCE M. KIRK, JR. & PHILIP G. KIRK
10	5	BETTY W. EDWARDS & BILLIE W. JOHNSON
11	5	DOUGLAS LYNN JOHNSON
12	5, 6	KIDD FARMS, LLC
14	8	DARYL R. LILES & DEREK W. LILES
15	8	BRANTON T. GRIMES & AMY J. GRIMES

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

DocuSign Envelope ID: A165E7D3-B91E-4537-AF67-B1682EE2F5A5

5/26/20

CUR DATA -L-
PIc 10+57.56
Δc = 01°32'07.2" (LT)
D = 01°20'01.3"
Lc = 115.12
Tc = 57.56
R = 4,296



DETAIL 4-1
CUT DITCH
(Not to Scale)

FROM STA. 12+28 TO STA. 15+00 -L- RT

FOR -L- PROFILE, SEE SHEET 9

HL-0031
004

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

ROADWAY DESIGN ENGINEER
10/30/2023
NORTH CAROLINA PROFESSIONAL SEAL 053483 ENGINEER SPENCER W. MERRITT
DocuSigned by:
SIGNATURE

HYDRAULICS ENGINEER
10/30/2023
NORTH CAROLINA PROFESSIONAL SEAL 053755 ENGINEER PATRICK M. HARTNETT
DocuSigned by:
SIGNATURE

PLANS PREPARED BY:
SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
320 Executive Court
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

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Docusign Envelope ID: 35740881-4BC4-4959-8CA1-D86E4C435615

5/26/20

MATCHLINE -L- STA. 15+00.00 SEE SHEET 4

MATCHLINE -Y- STA. 17+00.00 SEE SHEET 7

MATCHLINE -L- STA. 29+00.00 SEE SHEET 6

MATCHLINE -Y- STA. 26+00.00 SEE SHEET 8

FOR –L– PROFILE, SEE SHEET 9

CUR DATA -L-
PIc 27+50.30
Δc = 00°59'28.3" (LT)
D = 00°30'00.2"
Lc = 198.22
Tc = 99.11
R = 11,458
SE = EXIST.

-L- PC 26+51.19

-L- PT 28+49.41

BEARING AHEAD = S89°13'17.5"E

-L- POT 22+53.52 =
-Y- POT 22+26.74

-Y- PC 22+64.24

-Y- PT 23+09.15

-Y- PC 24+55.34

S14°39'40.8"E

S16°00'40.2"E

S88°13'49.2"E

BM #3
ELEVATION=297.06'
BY/STATION 12+44.00
14' LEFT
BENCHTIE IN 18" CEDAR

N 02°00'05" W
684.87'

S 05°56'16" E
233.07'

S 46°41'23" E
204.35'

S 11°27'26" W
66.46'

S 85°34'39" E
245.75'

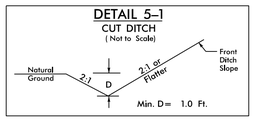
S 88°31'41" E
210.18'

S 88°31'41" E
210.00'

S 01°28'19" W
210.0'

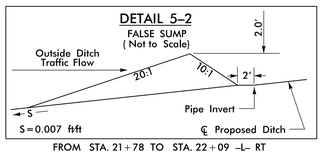
N 01°28'19" E
211.8'

DETAIL 5–1
CUT DITCH
(Not to Scale)



FROM	STA. 15+00	TO	STA. 22+09	–L– RT
FROM	STA. 23+15	TO	STA. 29+00	–L– RT
FROM	STA. 20+44	TO	STA. 21+83	–L– LT
FROM	STA. 22+86	TO	STA. 23+24	–L– LT
FROM	STA. 17+00	TO	STA. 21+57	–Y– RT
FROM	STA. 22+63	TO	STA. 26+00	–Y– RT
FROM	STA. 20+64	TO	STA. 22+03	–Y– LT
FROM	STA. 23+02	TO	STA. 23+84	–Y– LT

DETAIL 5–2
FALSE SUMP
(Not to Scale)



FROM STA. 21+78 TO STA. 22+09 –L– RT

CUR DATA -Y-
PIc 22+86.70
Δc = 01°20'50.3" (LT)
D = 02°59'59.9"
Lc = 44.91
Tc = 22.46
R = 1,909.88

CUR DATA -Y-
PIc 26+36.01
Δc = 05°15'16.3" (RT)
D = 01°27'18.5"
Lc = 361.10
Tc = 180.68
R = 3,937.45

1 HOPKINS, GREGORY B
DB 13004 PG 1677
PB 2007 PG 342

3 STOKES, MILLIS T JR
DB 17701 PG 1261
PB 1999 PG 1682

4 EARLEY, JEREMIAH J
EARLEY, LAUREN M
DB 16229 PG 575
PB 1999 PG 1682

5 ELSHAIKH, MAJED FUAD
SHAIKH, ISSA FAUD
DB 15929 PG 208
PBI998 PG328

6 POOLE ROAD HOLDINGS LLC
DB 16455 PG 2272
PBI996 PGII69

7 GBK I LLC
DB 17785 PG 2238

8 KIRK, CLARENCE M JR
KIRK, PHILIP G
DB 17233 PG 2128

9 KIRK, CLARENCE M JR
KIRK, PHILIP G
DB 17233 PG 2124

10 EDWARDS, BETTY W
JOHNSON, BILLIE W

11 JOHNSON, DOUGLAS LYNN
DB 11531 PG 2598

12 KIDD FARMS, LLC
DB 16520 PG 1378

16 GREENE, SAMUEL L
GREEN, IANTHA
DB 5083 PG 820
PB 1970 PG 207

HL-0031
005

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

ROADWAY DESIGN ENGINEER
1/9/2025
NORTH CAROLINA PROFESSIONAL SEAL 053483 ENGINEER SPENCER W. MERRITT
Signed by:
DocuSigned by:

HYDRAULICS ENGINEER
1/9/2025
NORTH CAROLINA PROFESSIONAL SEAL 053755 ENGINEER PATRICK M. HARTNETT
Signed by:
DocuSigned by:

PLANS PREPARED BY:
SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
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5/26/20

CUR DATA -L-
PIc 33+06.84
Δc = 05°15'09.2" (LT)
D = 01°26'51.3"
Lc = 362.85
Tc = 181.55
R = 3,958

30

-L- PC 31+25.29

-L- POE 34+88.14

MATCHLINE -L- STA. 29+00.00 SEE SHEET 5

7
GBK I LLC
DB 17785 PG 2238

WILLIAMS, KEVIN DAVID
WILLIAMS, DEBBIE ANNETTE
DB 16897 PG 2234

ETCHELLS, JAMES L
ETCHELLS, JUNE S
DB 2098 PG 261

BM #4

GUY

S 11°22'27" E
810.59'

N 00°36'49" W
300.14'

2.99' RW-EIP

1.71' EIP-RW

WOODS

EIP

EIP EXISTING R/W

INNERDUCT

BYT-108 30" DIP

30" DIP

TV FO

-L-

S89°13'17.5"E

POOLE RD (SR 1007) 23' PAVEMENT

8"

EX.

4" PS

+62.26
EX. R/W
& 35' RT

CUT DITCH
SEE DETAIL 6-1

END 4" PS

720' TRANSITION RIGHT

+50
EX. R/W,
35' &
50' RT

TIE TO
EXISTING DITCH

END CONSTRUCTION
-L- STA. 31+21.00

END TIP PROJECT HL-0031
-L- STA. 30+88.67

R/W

DECK

STAIRS

ISFD

72" WD

JAMES L CRESIMORE & ASSOC LP
DB 12057 PG 2363
PB 2006 PG 1228

KIDD FARMS, LLC
DB 16520 PG 1378

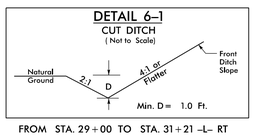
KIDD FARMS, LLC
DB 16520 PG 1378

12

N 01°28'19" E
274.55'

S 89°15'30" E
80.27'

DETAIL 6-1
CUT DITCH
(Not to Scale)



FROM STA. 29+00 TO STA. 31+21 -L- RT

FOR –L– PROFILE, SEE SHEET 9

HL-0031
006

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

ROADWAY DESIGN ENGINEER
10/30/2023

NORTH CAROLINA PROFESSIONAL SEAL 053483 ENGINEER SPENCER W. MERRITT

DocuSigned by:
Spencer W. Merritt
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER
10/30/2023

NORTH CAROLINA PROFESSIONAL SEAL 053755 ENGINEER PATRICK M. HARTNETT

DocuSigned by:
Patrick Hartnett
DEEF5CC8258A4D...
HYDRAULICS ENGINEER

PLANS PREPARED BY:

SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
320 Executive Court
Hillsborough, NC 27278
(919) 732-3883
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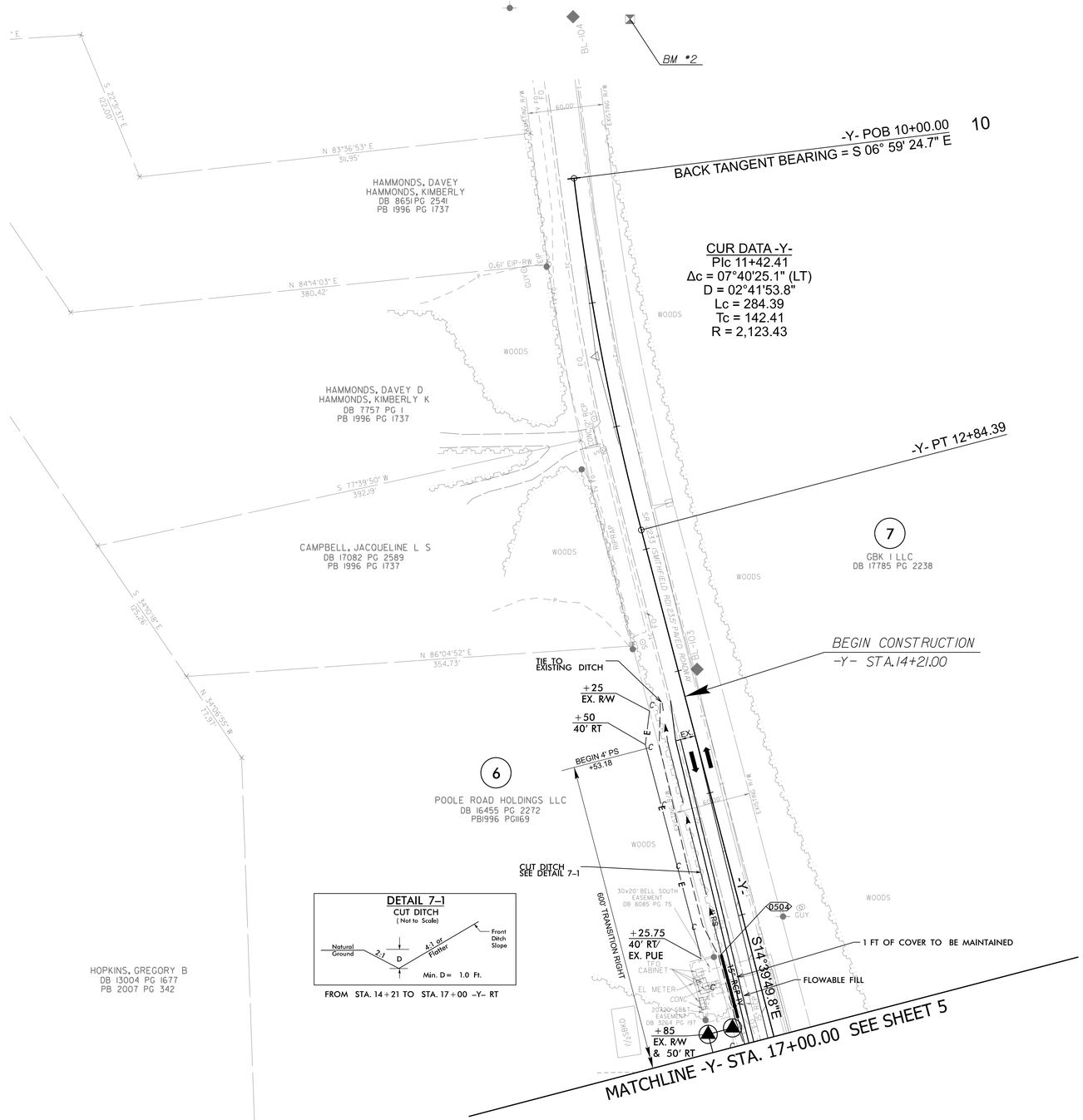
5/26/20



FOR –Y– PROFILE, SEE SHEET 10

HL-0031
007

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

ROADWAY DESIGN ENGINEER
10/30/2023

DocuSigned by:
Spencer W. Merritt
5DAE8DF8C0F84A0...

HYDRAULICS ENGINEER
10/30/2023

DocuSigned by:
Patrick Hartnett
3FCF75CC8258460...

PLANS PREPARED BY:

SUMMIT
DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
320 Executive Court
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

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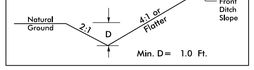
5/26/20

MATCHLINE -Y- STA. 26+00.00 SEE SHEET 5

DETAIL 8–1
CUT DITCH
(Not to Scale)



FROM STA. 26+00 TO STA. 30+42 –Y– RT

5
ELSHAIKH, MAJED FUAD
SHAIKH, ISSA FAUD
DB 15929 PG 208
PBI998 PG328

14
LILES, DARYL R
LILES, DEREK W
DB 10559 PG 2511
PB 1999 PG 1682

15
GRIMES, BRANTON T
GRIMES, AMY J
DB 9939 PG 1412
PB 1999 PG 1682

DAVIS, REGINALD K JR
DAVIS, PATRICIA L
DB 14625 PG 1906
PB 1999 PG 1682

GREENE, SAMUEL L
GREEN, IANTHA
DB 5083 PG 820
PB 1970 PG 207

WATSON, WILLIAM P
WATSON, EDNA E
DB 1952 PG 675
PB 1970 PG 207

MCCULLOUGH, ANNIE R
DB 1952 PG 673
PB 1970 PG 207

JONES, ROMUEL HEIRS
PB 1970 PG 207

CORONILLA, ALBA L
DB 15591PG 73
PB 1999 PG 1682

GOOD HOPE MISSIONARY
BAPTIST CHURCH
DB 16147 PG 601
PB 1977 PG 894

+35
50' &
55' RT
BM #1

600' TRANSITION RIGHT

+20
EX. R/W,
40' &
50' RT

CUT DITCH
SEE DETAIL 8–1

+20
40' RT

+10.46
END 4' PS

+20
EX. R/W
& 40' RT
TIE TO
EXISTING DITCH

-Y- PT 28+16.44

END CONSTRUCTION
-Y- STA. 30+42.00

-Y- POE 34+68.91

S 10°45'23.9"E -Y-

S 88°31'41" E
210.00'

N 0°43'06" E
63.42'

N 0°43'06" E
131.33'

N 0°43'06" E
100.01'

N 0°43'06" E
46.42'

N 88°32'53" W
210.18'

N 0°43'06" E
170.03'

N 0°43'06" E
417.42'

N 88°29'07" W
197.35'

N 0°43'06" E
382.30'

N 0°43'06" E
419.87'

N 79°07'35" E
455.53'

N 79°07'14" E
433.83'

N 79°03'06" E
387.07'

S 79°03'06" W
361.30'

S 5°05'43" W
350.04'

N 6°49'24" E
217.61'

N 78°28'49" E
260.15'

N 3°28'56" E
294.13'

N 84°30'48" W

CUR DATA -Y-
PIc 26+36.01
Δc = 05°15'16.3" (RT)
D = 01°27'18.5"
Lc = 361.10
Tc = 180.68
R = 3,937.45

FOR –Y– PROFILE, SEE SHEET 10

HL-0031
008

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

ROADWAY DESIGN ENGINEER
10/30/2021
NORTH CAROLINA PROFESSIONAL SEAL 053483 ENGINEER SPENCER W. MERRITT
DocuSigned by:
Spencer W. Merritt
SIGNATURE

HYDRAULICS ENGINEER
10/30/2021
NORTH CAROLINA PROFESSIONAL SEAL 053755 ENGINEER PATRICK M. HARTNETT
DocuSigned by:
Patrick Hartnett
SIGNATURE

PLANS PREPARED BY:
SUMMIT
DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
320 Executive Court
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

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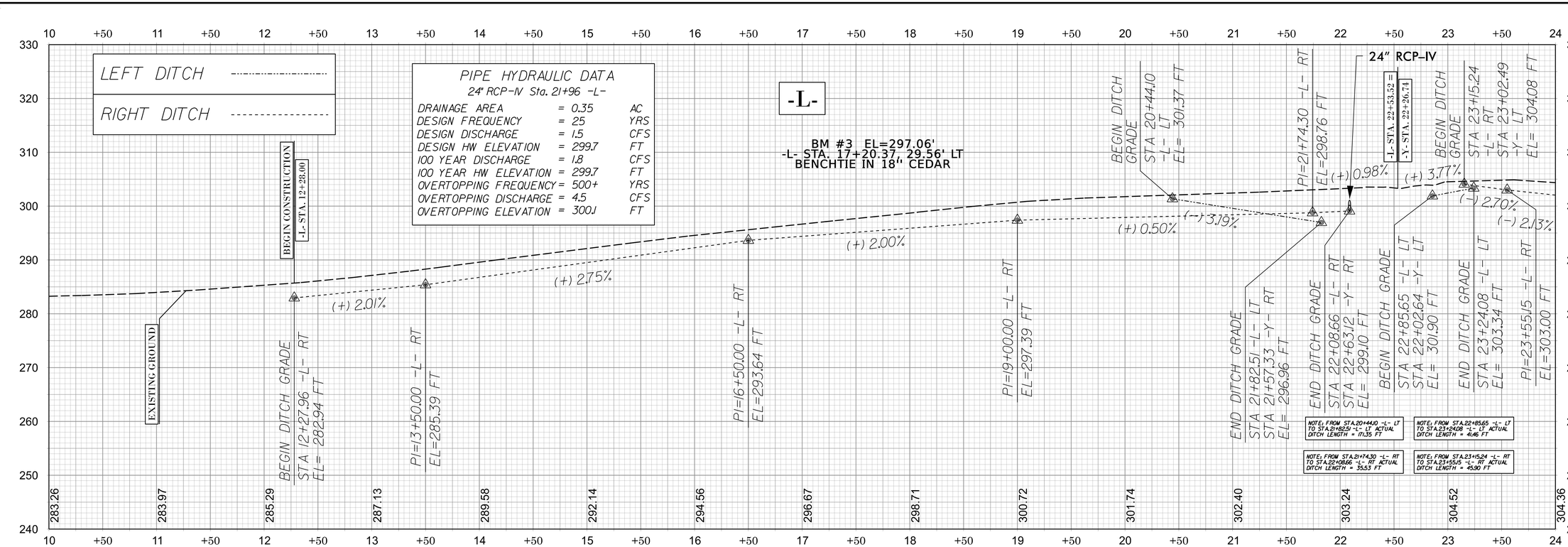
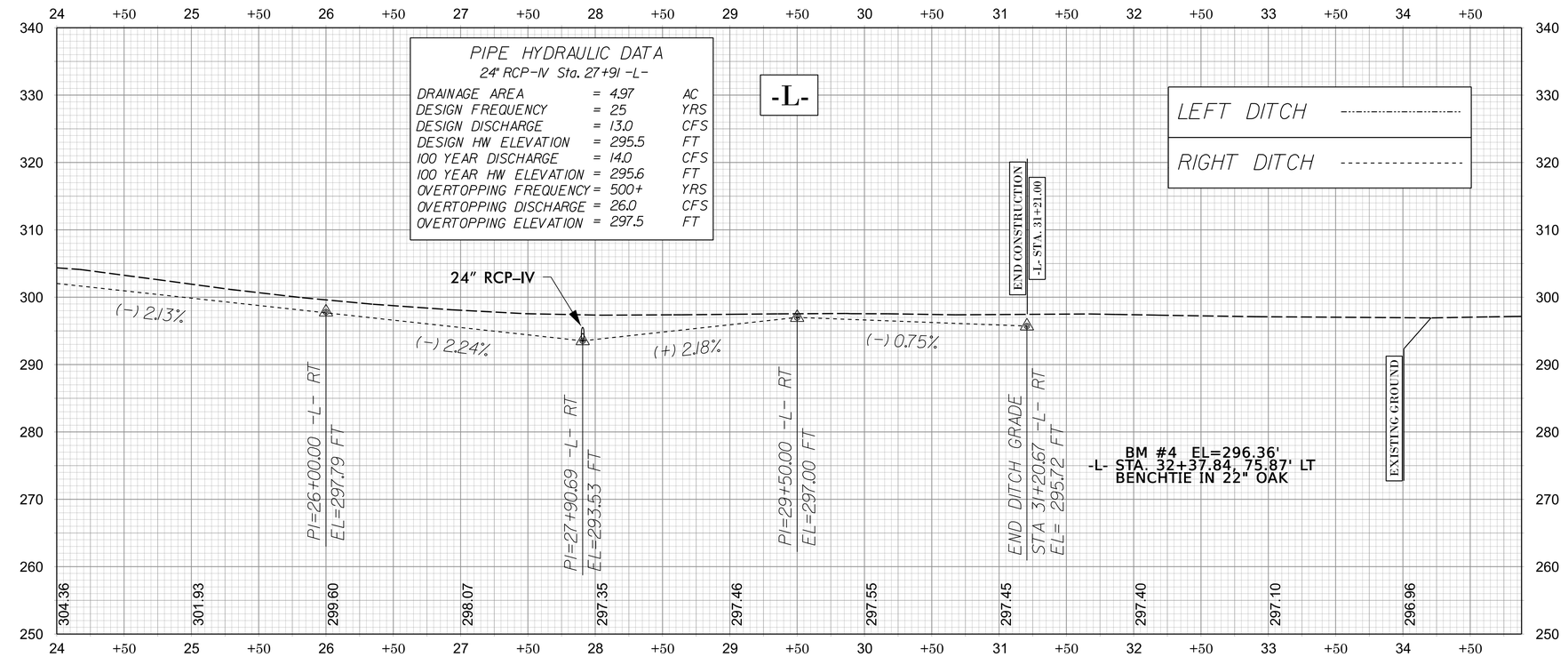
5/26/20



FOR –L– PLAN, SEE SHEETS 4 & 5

FOR –L– PLAN, SEE SHEETS 5 & 6



HL-0031

009

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

ROADWAY DESIGN ENGINEER
10/30/2020

DocuSigned by:
Spencer W. Merritt
3DAE8DF8A0F84E4...

HYDRAULICS ENGINEER
10/30/2020

DocuSigned by:
Patrick Hartnett
DF0F5CC8283B4E0...

PLANS PREPARED BY:

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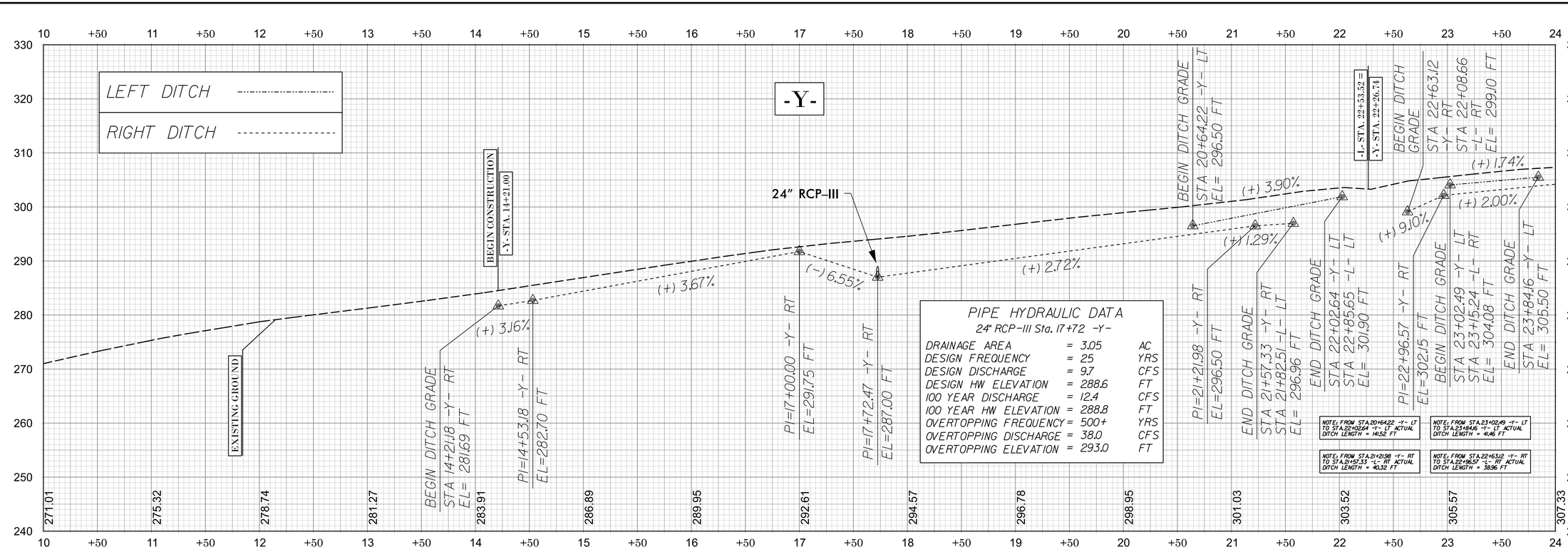
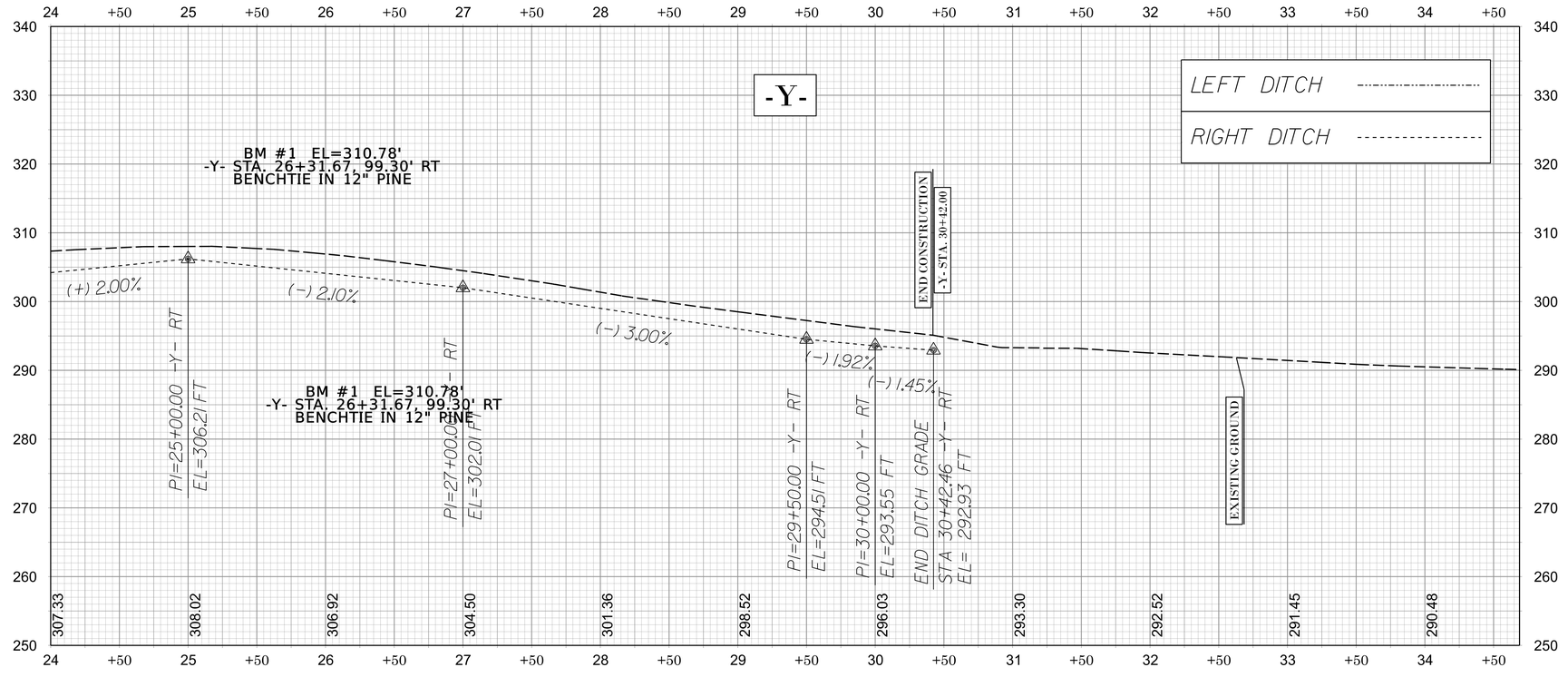
5/26/20



FOR –L– PLAN, SEE SHEETS 7 & 5

FOR –L– PLAN, SEE SHEETS 5 & 8



HL-0031
010

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

ROADWAY DESIGN ENGINEER
10/30/2023
NORTH CAROLINA PROFESSIONAL SEAL 053483 ENGINEER SPENCER W. MERRITT
DocuSigned by:
10AE0F0FB0C8488...

HYDRAULICS ENGINEER
10/30/2023
NORTH CAROLINA PROFESSIONAL SEAL 053755 ENGINEER PATRICK M. HARTNETT
DocuSigned by:
10AE0F0FB0C8488...

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09/08/99

TIP PROJECT: HL-0031

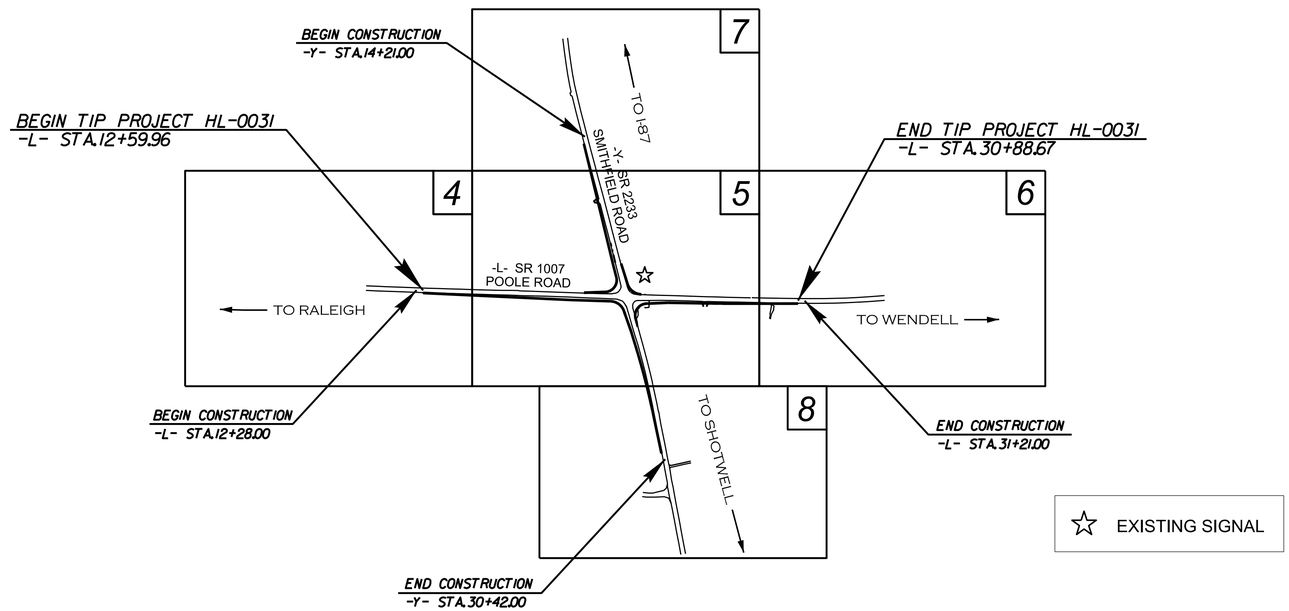
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HL-0031	RW01	7

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

WAKE COUNTY

NAD 83/2011



GRAPHIC SCALE

50 25 0 50 100

PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
NCGS FOR MONUMENT SM5705AJ-2
WITH NAD 83 (NA2011) STATE PLANE GRID COORDINATES OF
NORTHING: 726393.413(ft) EASTING: 2164302.071(ft)
ELEVATION: 292.7(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.99990079055
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
SM5705AJ-2 TO -Y- STATION 10+00 IS
N 14°08'23" W 2094.27(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared In the Office of:

McKIM & CREED

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:	LETTING DATE:
1/28/22	10/26/22

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-5060 LAND SURVEYOR RICHARD A. MITCHELL

DocuSigned by: Richard Mitchell 546176005B4E49F...

6/10/2022

SIGNATURE: Date:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

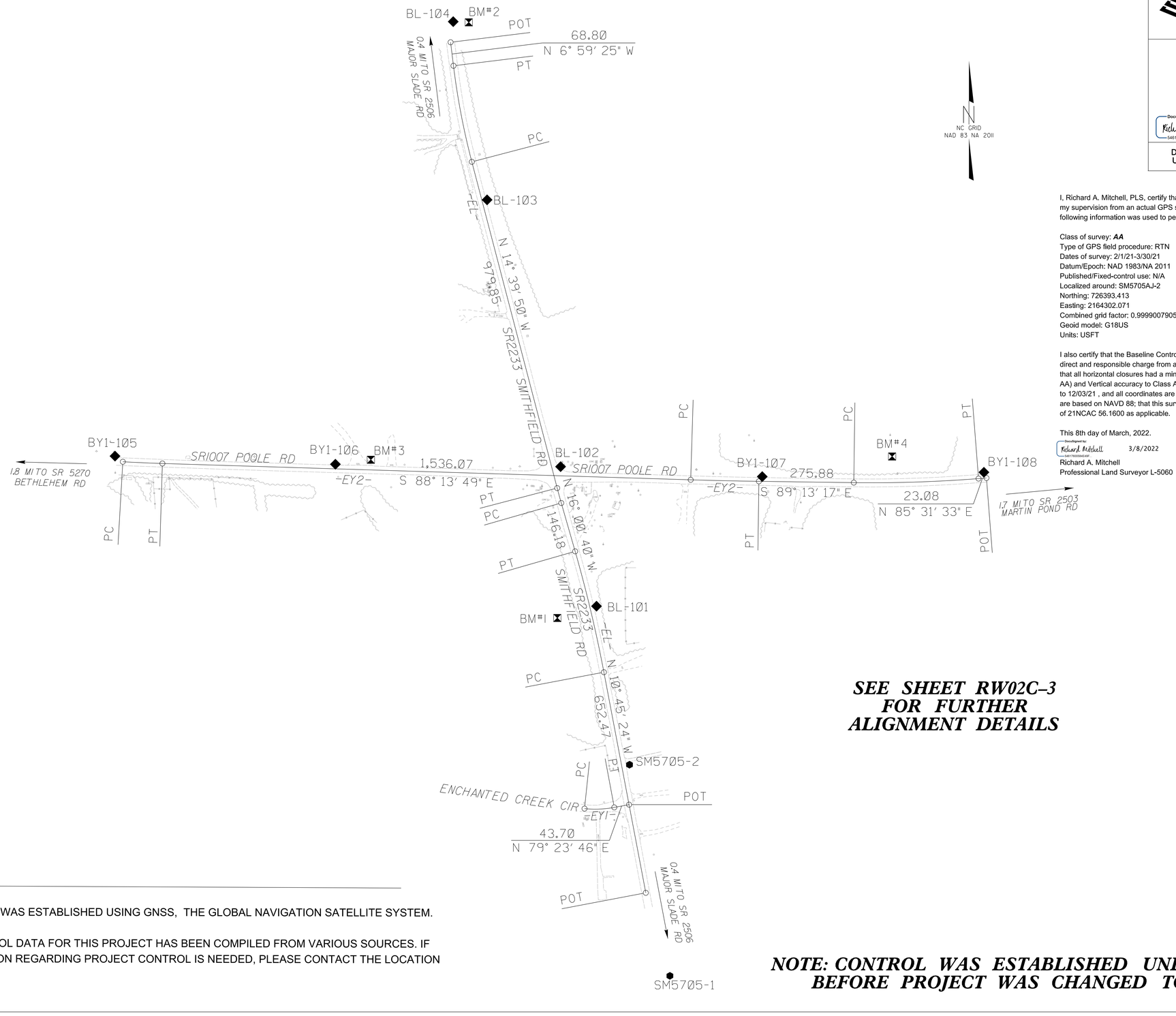
$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$

DocuSign Envelope ID: EE3FBD17-9242-4AE9-A8A0-C87B5236B944

6/2/99

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



NC GRID
NAD 83 NA 2011

PROJECT REFERENCE NO.	SHEET NO.
HL-0031	RW02C-1

Location and Surveys

McKIM & CREED

NORTH CAROLINA PROFESSIONAL SEAL L-5060 LAND SURVEYOR RICHARD A. MITCHELL

DocuSigned by: Richard Mitchell 54617600584E49F...
3/8/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, Richard A. Mitchell, PLS, certify that the Project Control was performed under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: ***AA***
Type of GPS field procedure: RTN
Dates of survey: 2/1/21-3/30/21
Datum/Epoch: NAD 1983/NA 2011
Published/Fixed-control use: N/A
Localized around: SM5705AJ-2
Northing: 726393.413
Easting: 2164302.071
Combined grid factor: 0.99990079055
Geoid model: G18US
Units: USFT

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from 11/15/21 to 12/03/21 , and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 8th day of March, 2022.

DocuSigned by: Richard Mitchell 54617600584E49F... 3/8/2022

Richard A. Mitchell
Professional Land Surveyor L-5060

SEE SHEET RW02C-3 FOR FURTHER ALIGNMENT DETAILS

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

NOTE: CONTROL WAS ESTABLISHED UNDER SM5705AJ BEFORE PROJECT WAS CHANGED TO HL-0031

08-MAR-2022 09:26
I:\0048\0035\Geomatics\00-Drawings\Working\sm5705aj_ls_rw02c-1.dgn
SVincent AT MC06833

DocuSign Envelope ID: 4C062C2A-F9E6-457D-8523-414C49C1A16D

6/2/99

REVISIONS

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
HL-0031	RW02C-2

Location and Surveys

McKIM&CREED

NORTH CAROLINA PROFESSIONAL SEAL L-5060 LAND SURVEYOR RICHARD A. MITCHELL

DocuSigned by: Richard Mitchell 5461760058A E49F... 3/8/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BL

POINT	DESC.	NORTH	EAST	ELEVATION
SM57051	SM5705AJ-1	725779.8980	2164419.4300	287.88
SM57052	SM5705AJ-2	726393.4130	2164302.0710	292.70
BL101	BL-101	726853.9350	2164206.1010	306.30
BL102	BL-102	727259.3860	2164101.6950	303.13
BL103	BL-103	728034.5970	2163888.0860	282.99
BL104	BL-104	728552.4180	2163789.6640	264.03

BY1

POINT	DESC.	NORTH	EAST	ELEVATION
BY1105	BY1-105	727290.0290	2162806.7520	282.58
BY1106	BY1-106	727266.3910	2163447.2390	294.67
ABL102	BL-102	727259.3860	2164101.6950	303.13
BY1107	BY1-107	727230.4500	2164687.7960	296.74
BY1108	BY1-108	727242.9760	2165332.0030	294.22

****
BM1 ELEVATION = 310.78
N 726820 E 2164092
BENCHTIE 12" PINE
****

****
BM2 ELEVATION = 270.48
N 728550 E 2163835
BENCHTIE 15" PINE
****

****
BM3 ELEVATION = 297.06
N 727279 E 2163550
BENCHTIE 18" CEDAR
****

****
BM4 ELEVATION = 296.36
N 727289 E 2165065
BENCHTIE 22" OAK
****

I, Richard A. Mitchell, PLS, certify that the Project Control was performed under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: ***AA***
Type of GPS field procedure: RTN
Dates of survey: 2/1/21-3/30/21
Datum/Epoch: NAD 1983/NA 2011
Published/Fixed-control use: N/A
Localized around: SM5705AJ-2
Northing: 726393.413
Easting: 2164302.071
Combined grid factor: 0.99990079055
Geoid model: G18US
Units: USFT

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from 11/15/21 to 12/03/21 , and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 8th day of March, 2022.

DocuSigned by: Richard Mitchell 5461760058A E49F... 3/8/2022

Richard A. Mitchell
Professional Land Surveyor L-5060

NOTE: CONTROL WAS ESTABLISHED UNDER SM5705AJ BEFORE PROJECT WAS CHANGED TO HL-0031

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

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6/2/99

REVISIONS

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	726021.176	2164349.423							
LINE			N 10°45'23.9" W	652.47					
PC	726662.184	2164227.647							
CURVE			N 13°23'02.0" W	360.97	05°15'16.3"(LT)	01°27'18.5"	361.10	180.68	3937.45
PT	727013.352	2164144.091							
LINE			N 16°00'40.2" W	146.18					
PC	727153.865	2164103.770							
CURVE			N 15°20'15.0" W	44.91	01°20'50.3"(RT)	02°59'59.9"	44.91	22.46	1909.88
PT	727197.175	2164091.891							
LINE			N 14°39'49.8" W	979.85					
PC	728145.111	2163843.845							
CURVE			N 10°49'37.3" W	284.18	07°40'25.1"(RT)	02°41'53.8"	284.39	142.41	2123.43
PT	728424.231	2163790.463							
LINE			N 06°59'24.7" W	68.80					
POT	728492.521	2163782.090							

EY1

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	726265.851	2164171.309							
CURVE			N 87°41'27.3" E	86.56	16°35'22.4"(LT)	19°05'54.9"	86.86	43.74	300.00
PT	726269.339	2164257.799							
LINE			N 79°23'46.1" E	43.70					
POT	726277.380	2164300.750							

EY2

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	727273.705	2162829.535							
CURVE			S 87°27'45.6" E	115.11	01°32'07.2"(LT)	01°20'01.3"	115.12	57.56	4296.00
PT	727268.609	2162944.536							
LINE			S 88°13'49.2" E	1536.07					
PC	727221.172	2164479.875							
CURVE			S 88°43'33.3" E	198.22	00°59'28.3"(LT)	00°30'00.2"	198.22	99.11	11458.00
PT	727216.765	2164678.043							
LINE			S 89°13'17.5" E	275.88					
PC	727213.017	2164953.901							
CURVE			N 88°09'07.9" E	362.72	05°15'09.2"(LT)	01°26'51.3"	362.85	181.55	3958.00
PT	727224.712	2165316.432							
LINE			N 85°31'33.4" E	23.08					
POT	727226.513	2165339.445							

NOTE: CONTROL WAS ESTABLISHED UNDER SM5705AJ BEFORE PROJECT WAS CHANGED TO HL-0031

PROJECT REFERENCE NO.	SHEET NO.
HL-0031	RW02C-3

Location and Surveys

McKIM&CREED

NORTH CAROLINA PROFESSIONAL SEAL L-5060 LAND SURVEYOR RICHARD A. MITCHELL

DocuSigned by: Richard Mitchell 54617600584E49F...

3/8/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, Richard A. Mitchell, PLS, certify that the Project Control was performed under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: ***AA***
Type of GPS field procedure: RTN
Dates of survey: 2/1/21-3/30/21
Datum/Epoch: NAD 1983/NA 2011
Published/Fixed-control use: N/A
Localized around: SM5705AJ-2
Northing: 726393.413
Easting: 2164302.071
Combined grid factor: 0.99990079055
Geoid model: G18US
Units: USFT

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from 11/15/21 to 12/03/21 , and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 8th day of March, 2022.

DocuSigned by: Richard Mitchell 3/8/2022

Richard A. Mitchell
Professional Land Surveyor L-5060

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

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SVincent AT MC06833

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6/2/9

REVISIONS

PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
HL-0031	RW03D-1

Location and Surveys

McKIM&CREED

NORTH CAROLINA PROFESSIONAL SEAL L-5060 LAND SURVEYOR RICHARD A MITCHELL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, Richard A. Mitchell, certify that the data compiled came from available surveys/mapping performed by others and provided to me by NCDOT and do not certify to the accuracy or quality of the individual data sources.

This 13th day of June, 2022.

DocuSigned by:
Richard Mitchell
546176005844E49F...
6/13/2022

Richard A. Mitchell
Professional Land Surveyor L-5060

L

TYPE	STATION	NORTH	EAST
PC	10+00.00	727273.705	2162829.535
PT	11+15.12	727268.609	2162944.536
PC	26+51.19	727221.172	2164479.875
PC	31+25.29	727213.017	2164953.901

Y

TYPE	STATION	NORTH	EAST
PC	10+00.00	728424.231	2163790.463
PT	12+84.39	728145.111	2163843.845
PC	22+64.24	727197.175	2164091.891
PT	23+09.15	727153.865	2164103.770
PC	24+55.34	727013.352	2164144.091
PT	28+16.44	726662.184	2164227.647

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

$$$$$$$$SYSTIME$$$$$$
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$$$$$$USERNAME$$$$

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6/2/9

REVISIONS

$$$$$$$$USERNAME$$$$ $$$$$$$$SYSTIME$$$$$ $$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$

RIGHT OF WAY CONTROL SHEET

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	15+60.00	35.00	727219.8868	2163388.1250
L	15+60.00	50.00	727204.8940	2163387.6620
L	21+70.00	50.00	727186.0561	2163997.3710
L	23+60.00	55.00	727175.1910	2164187.1260
L	24+60.00	50.00	727177.1004	2164287.2330
L	26+51.19	50.00	727171.1961	2164478.3310
L	28+49.41	50.00	727166.7695	2164677.3640
L	29+50.00	50.00	727165.4028	2164777.9460
L	29+50.00	30.00	727185.4010	2164778.2170
L	23+25.00	-30.00	727261.2313	2164154.7680
L	20+85.00	-30.00	727268.6429	2163914.8820
L	21+40.00	-50.00	727286.9349	2163970.4740

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y	23+10.00	50.00	727139.2607	2164055.9430
Y	24+55.34	50.00	726999.5610	2164096.0310
Y	27+20.00	50.00	726746.1636	2164159.6120
Y	27+20.00	35.00	726749.3232	2164174.2750
Y	23+45.00	-30.00	727127.6843	2164142.4940
Y	21+50.00	-30.00	727315.2918	2164091.9940
Y	21+20.00	50.00	727324.0628	2164007.0050
Y	16+85.00	30.00	727749.9568	2163916.2350
Y	16+85.00	50.00	727744.8939	2163896.8860

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	13+60.00	-30.00	727291.0322	2163190.2280
L	13+60.00	-63.00	727324.0165	2163191.2470
L	13+92.00	-63.00	727323.0282	2163223.2320
L	13+92.00	-30.00	727290.0440	2163222.2130
L	13+78.00	35.00	727225.5073	2163206.2120
L	13+78.00	47.00	727213.5130	2163205.8420
L	17+59.00	58.00	727190.7523	2163586.3200
L	17+55.00	68.00	727180.8806	2163582.0130
L	17+75.00	75.00	727173.2663	2163601.7880
L	17+82.00	60.00	727188.0430	2163609.2470
L	19+73.00	65.00	727177.1470	2163800.0020
L	19+73.00	81.00	727161.1546	2163799.5080
L	20+05.00	50.00	727160.1664	2163831.4930
L	20+05.00	81.00	727191.1516	2163832.4500
L	20+65.00	-30.00	727269.2605	2163894.8920
L	21+35.00	-77.00	727314.0764	2163966.3100
L	21+30.00	-93.00	727330.2232	2163961.8060
L	21+51.00	-100.00	727336.5713	2163983.0120
L	21+56.00	-85.00	727321.4241	2163987.5470
L	24+27.29	-104.059	727332.0966	2164259.2910
L	27+75.00	-30.00	727248.0114	2164604.2470
L	27+75.00	-40.00	727258.0094	2164604.4480
L	28+05.00	-40.00	727257.4482	2164634.3380
L	28+05.00	-30.00	727247.4498	2164634.1630

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y	21+39.80	-48.20	727329.7632	2164107.0160
Y	23+33.98	-48.50	727143.3773	2164157.2370
Y	25+10.00	-48.50	726973.4363	2164205.6030
Y	25+10.00	-30.00	726968.5809	2164187.7520
Y	17+55.00	-30.00	727697.4257	2163992.0010
Y	17+55.00	-50.00	727702.4887	2164011.3490
Y	17+85.00	-50.00	727673.4659	2164018.9440
Y	17+85.00	30.00	727668.4029	2163999.5950

PROJECT REFERENCE NO.	SHEET NO.
HL-0031	RW03E-1

Location and Surveys

McKIM&CREED

NORTH CAROLINA PROFESSIONAL SEAL L-5060 LAND SURVEYOR RICHARD A MITCHELL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, Richard A. Mitchell, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from 5/3/2022 to 5/9/2022, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 13th day of June, 2022.

DocuSigned by:
Richard Mitchell 6/13/2022
546176005B4E49F...

Richard A. Mitchell
Professional Land Surveyor L-5060

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

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6/2/9

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
HL-0031	RW04

Location and Surveys

McKIM&CREED

NORTH CAROLINA PROFESSIONAL SEAL L-5060 LAND SURVEYOR RICHARD A MITCHELL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, Richard A. Mitchell, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from 5/03/2022 to 5/09/2022, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 10th day of June, 2022.

DocuSigned by:
Richard Mitchell 6/10/2022
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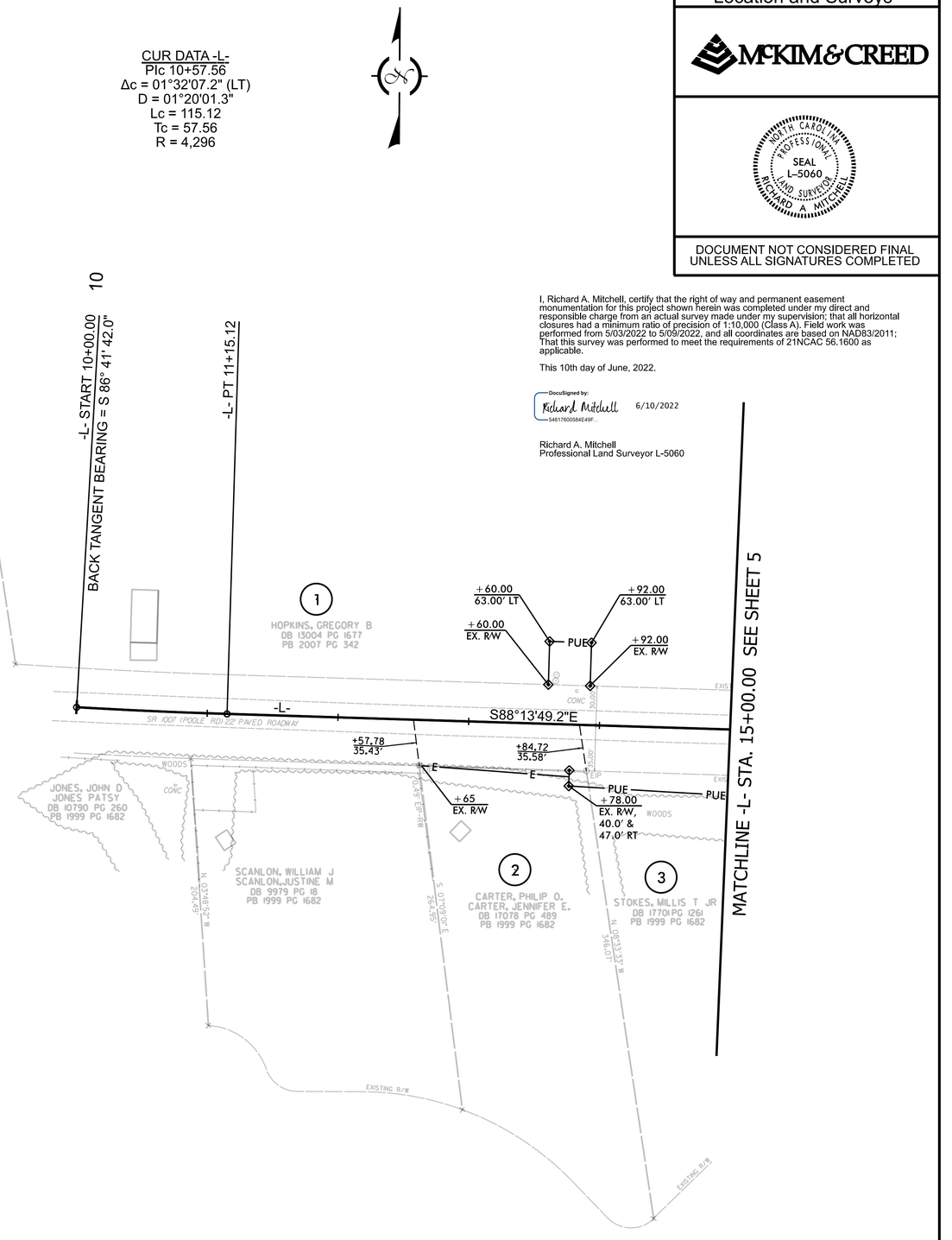
Richard A. Mitchell
Professional Land Surveyor L-5060



NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

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PROJECT REFERENCE NO.	SHEET NO.
HL-0031	RW05

Location and Surveys

McKIM&CREED

NORTH CAROLINA PROFESSIONAL SEAL L-5060 LAND SURVEYOR RICHARD A MITCHELL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I , Richard A. Mitchell , certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from 5/3/2022 to 5/9/2022, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 13th day of March, 2023.

DocuSigned by: Richard Mitchell 3/13/2023
5481760005B4E49F...

Professional Land Surveyor L-5060

REVISIONS

6/2/99

MATCHLINE -Y- STA. 17+00.00 SEE SHEET 7

MATCHLINE -L- STA. 15+00.00 SEE SHEET 4

MATCHLINE -L- STA. 29+00.00 SEE SHEET 6

MATCHLINE -Y- STA. 26+00.00 SEE SHEET 8

20

N 02°00'51" W 684.87'

-L- S88°13'49.2"E

-Y- S14°39'49.8"E

S16°00'40.2"E

-Y- PC 22+64.24

-Y- PT 23+09.15

-Y- PC 24+55.34

-L- PC 26+51.19

-L- PT 28+49.41

BEARING AHEAD = S89°11'17.5"E

EXISTING R/W

EOT (VAR PAVED SHOULDER)

SR 1007 (POOLE RD)(VAR PAVED ROADWAY)

PROP MON

PAVEMENT

CONC

WOODS

PDE

PUE

E

R/W

EIP

+55 EX. R/W & 50' LT

+85 EX. R/W & 50' LT

+60 EX. R/W & 40' LT

+50 EX. R/W

PR. R/W 40' LT

+25 EX. R/W

+20.00 –Y– 50.00' RT

+51.00 –L– 100.00' LT

+56.00 –L– 85.00' LT

+30.00 –L– 93.00' LT

+35.00 –L– 77.00' LT

+85 30' LT

+40 50' LT

+20 50' RT

+65.00 –L– EX. R/W

+70 50' RT

+83.00 –L– 59.75' RT

+73.00 65.00' RT

+73.00 81.00' RT

+05.00 50.00' RT, 60.00'RT, & 81.00' RT

PR. R/W 55' RT

+10 50' RT

+55.34 50' RT

+00 55' RT

+60 EX. R/W & 50' RT

+59.00 58.00' RT

+55.00 68.00' RT

+75.00 75.00' RT

+82.00 60.00' RT

+22.73 30.07'

+05.89 35.00'

+51.47 35.29'

0.54' RW-EIP

S 03°31'12" W 84.10'

S 05°53'51" E 233.91'

S 16°46'23" E 204.36'

S 85°34'39" E 245.75'

S 11°27'28" W 66.46'

+74.26 31.45'

+63.09 30.00'

+72.67 30.00'

+82.68 30.00'

+48.90 31.45'

0.98 RW-EIP

S 88°33'29" E 29.87'

S 01°37'31" W 210.08'

+70.00 –L– 60' RT

+60 50' RT

+00 50' RT

+20 60' RT

+60 55' RT

+62.00 –Y– 48.50' LT

+70.00 –L– 115' RT

+34.00 –Y– 48.50' LT

+45 EX. R/W

+80.18 31.38'

0.45' RW-EIP

S 88°31'41" E 102.87'

S 88°31'41" E 210.18'

+10.00 –Y– 48.50' LT

+75 EX. R/W & 40' LT

+05 EX. R/W & 40' LT

+51.19 50' RT

+49.41 50' RT

S 01°28'19" W 210.08'

N 01°28'19" E 210.08'

30.00' R/W

EXISTING 35.00' R/W

1 HOPKINS, GREGORY B
DB 13004 PG 1677
PB 2007 PG 342

2 STOKES, MILLIS T JR
DB 11770 PG 1561
PB 1999 PG 1682

3

4 EARLEY, JEREMIAH J
EARLEY, LAUREN M
DB 16229 PG 575
PB 1999 PG 1682

5 ELSHAIKH, MAJED FUAD
SHAIKH, ISSA FAUD
DB 15929 PG 208
PB1998 PG328

6 POOLE ROAD HOLDINGS LLC
DB 16455 PG 2272
PB1996 PG1169

7 GBK I LLC
DB 17785 PG 2238

8 EDWARDS, BETTY W
JOHNSON, BILLIE W

9 KIRK, CLARENCE M JR
KIRK, PHILIP G
DB 17233 PG 2124

10

11 JOHNSON, DOUGLAS LYNN
DB 11531 PG 2598

12 KIDD FARMS, LLC
DB 16520 PG 1578

16 GREENE, SAMUEL L
GREEN, IANTHA
DB 5083 PG 820
PB 1970 PG 207

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

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MBTaylor

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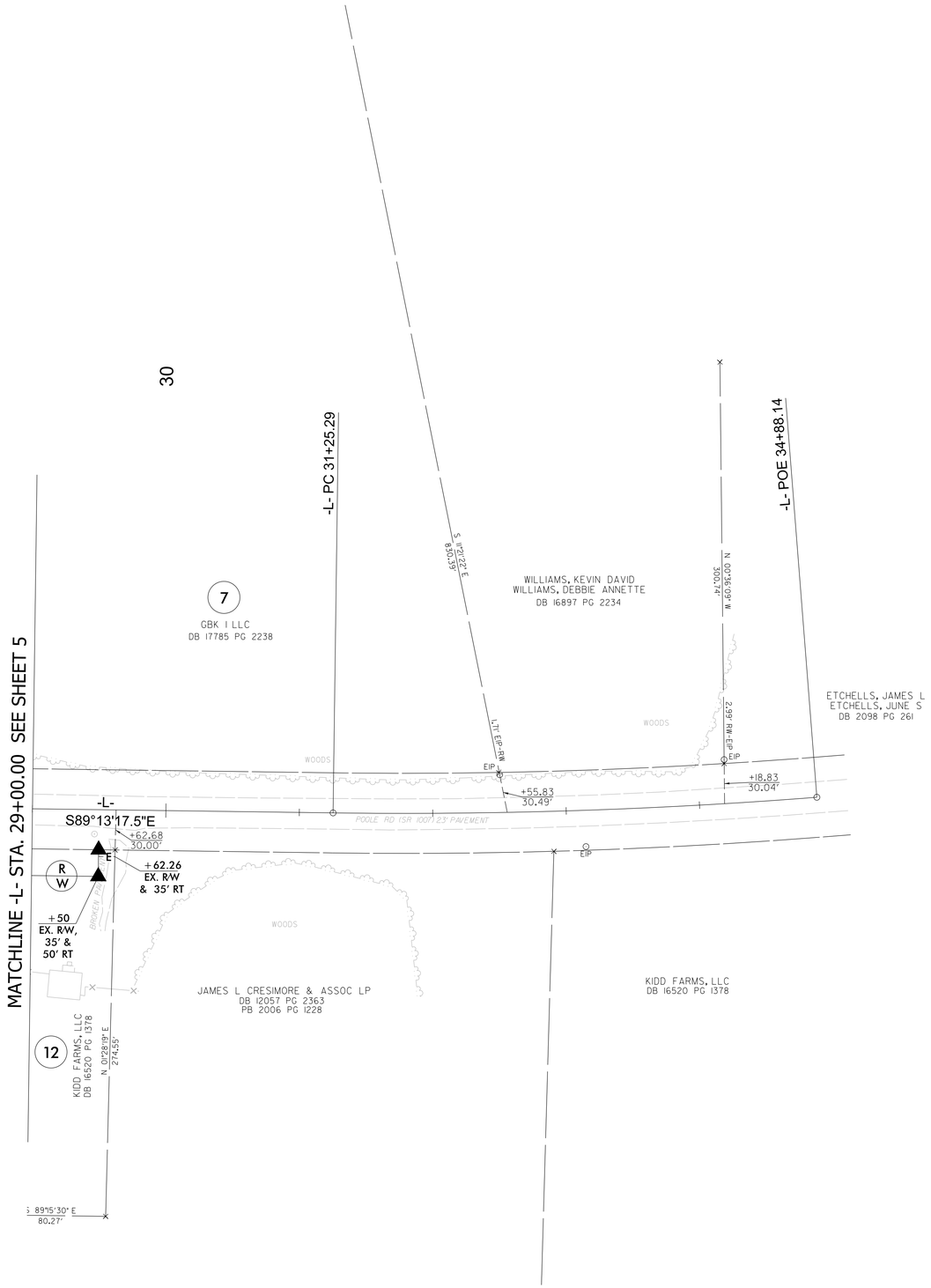
6/2/99

REVISIONS



PROJECT REFERENCE NO.	SHEET NO.
HE-0031	RW06

Location and Surveys

McKIM & CREED

NORTH CAROLINA PROFESSIONAL SEAL L-5060 LAND SURVEYOR RICHARD A MITCHELL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I , Richard A. Mitchell , certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from 5/3/2022 to 5/9/2022, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 13th day of March, 2023.

DocuSigned by:
Richard Mitchell 3/13/2023
54617600584E49F...

Professional Land Surveyor L-5060

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

13 MAR 2023 11:41
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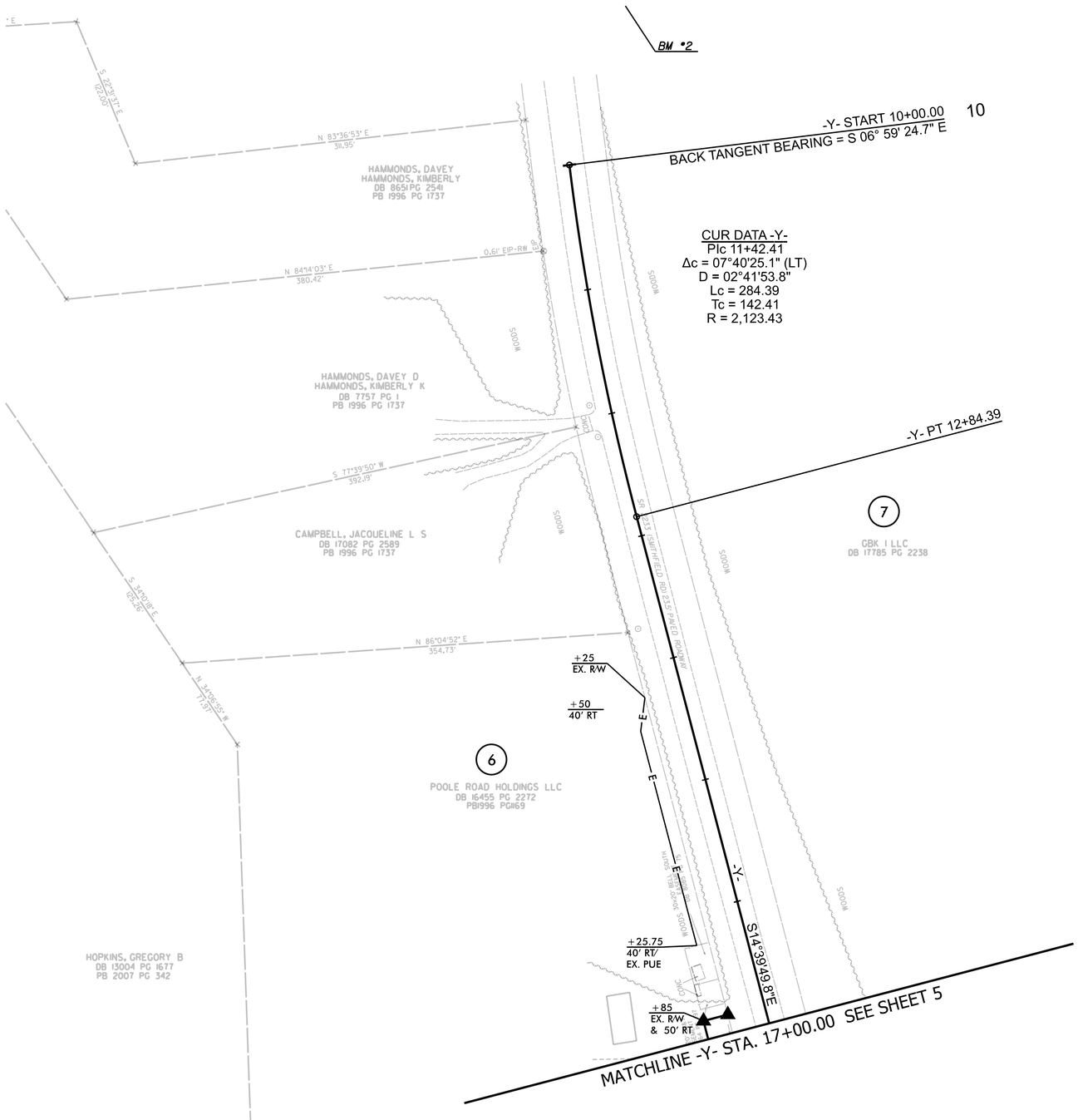
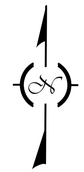
6/2/99

REVISIONS





PROJECT REFERENCE NO.	SHEET NO.
HL-0031	RW07

Location and Surveys

McKIM&CREED

NORTH CAROLINA PROFESSIONAL SEAL L-5060 LAND SURVEYOR RICHARD A MITCHELL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, Richard A. Mitchell, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from 5/03/2022 to 5/09/2022, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 10th day of June, 2022.

DocuSigned by:
Richard Mitchell
5461760005B4E49F...
6/10/2022

Richard A. Mitchell
Professional Land Surveyor L-5060

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

$$$$$$SYSTIME$$$$$$
$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
$$$$$$USERNAME$$$$

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PROJECT REFERENCE NO.	SHEET NO.
HL-0031	RW08

Location and Surveys

McKIM&CREED

SEAL L-5060 NORTH CAROLINA PROFESSIONAL LAND SURVEYOR RICHARD A. MITCHELL

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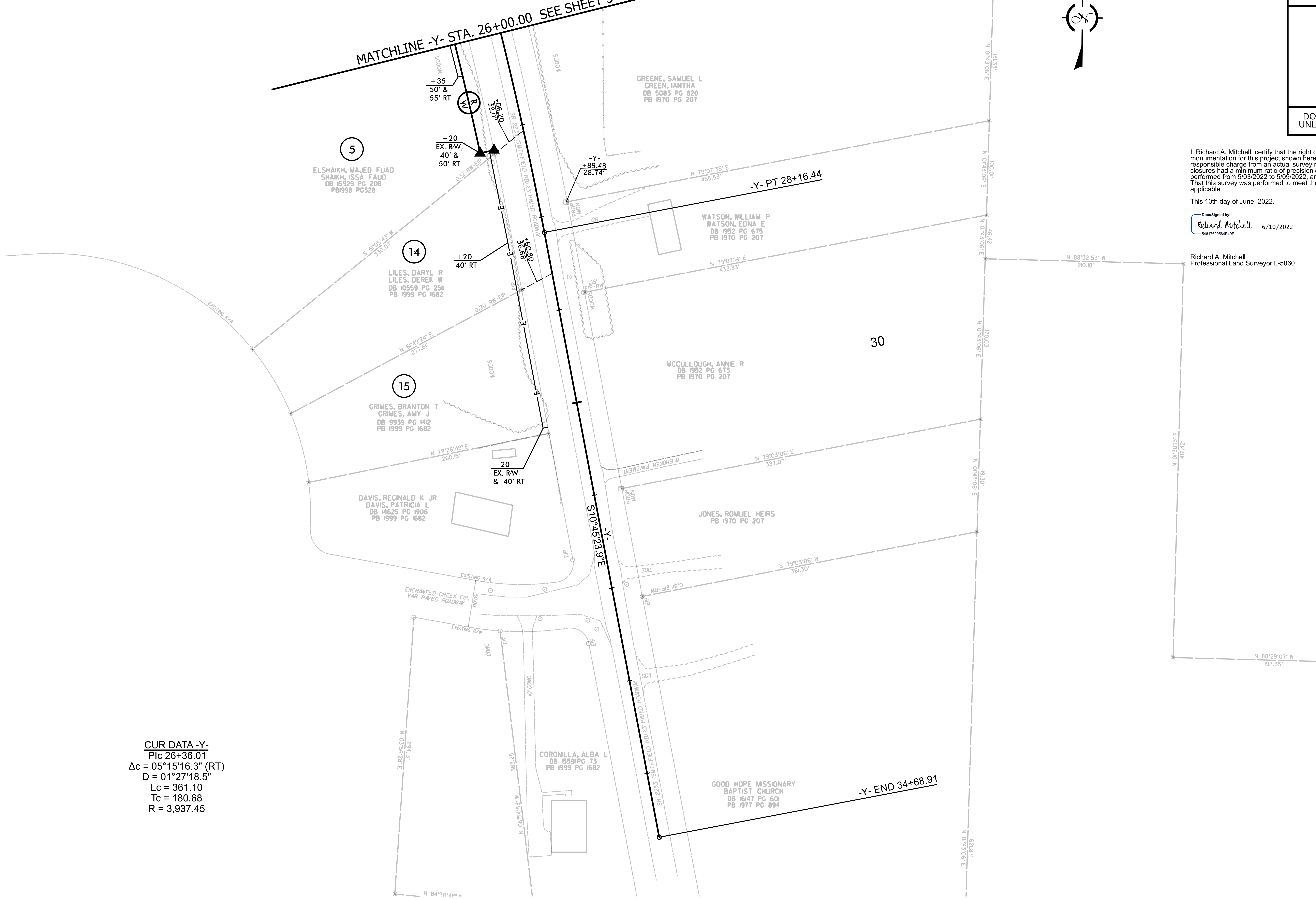

CUR DATA -Y-
PIc 26+36.01
Δc = 05°15'16.3" (RT)
D = 01°27'18.5"
Lc = 361.10
Tc = 180.68
R = 3,937.45

I, Richard A. Mitchell, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from 5/03/2022 to 5/09/2022, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 10th day of June, 2022.

DocuSigned by: Richard Mitchell 6/10/2022
54617600584E49F...

Richard A. Mitchell
Professional Land Surveyor L-5060

REVISIONS

6/2/99

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$DGN$$$$
$$$$$USERNAME$$$$

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09/08/99

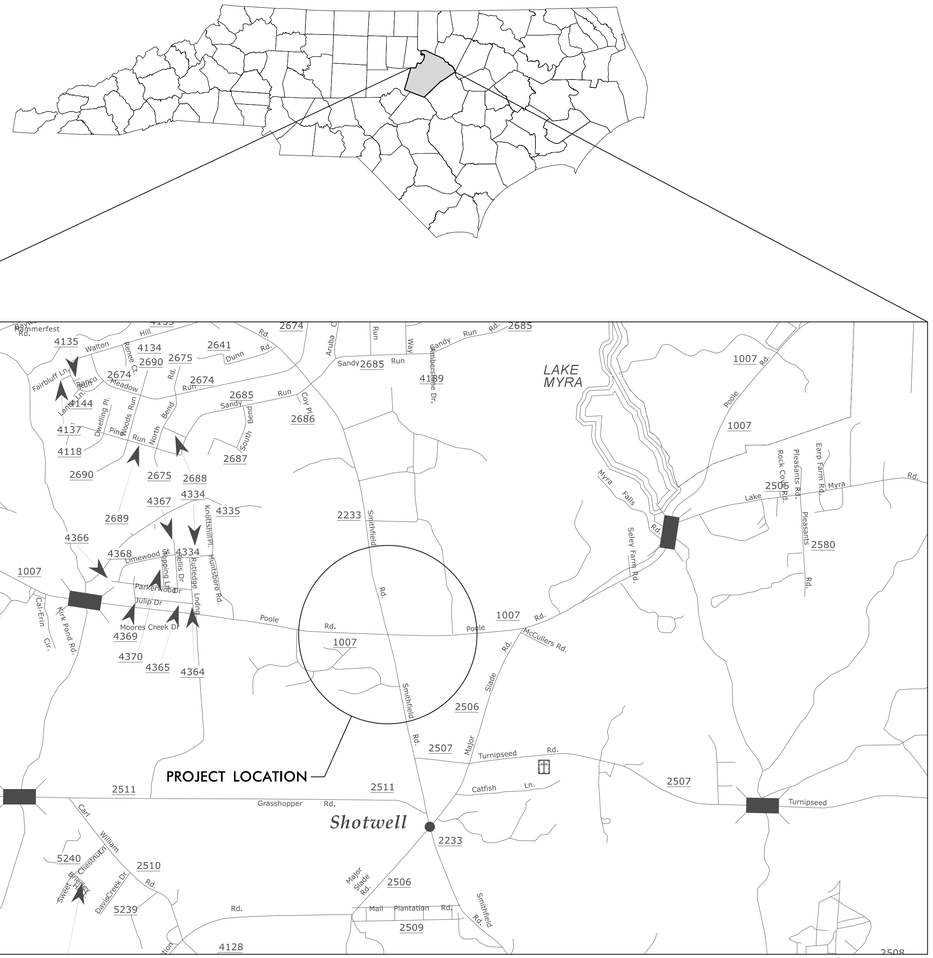
PROJECT: HL-0031

CONTRACT: DE00381

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

WAKE COUNTY



INDEX OF SHEETS

SHEET NO.	TITLE
TMP - 1	TITLE SHEET, VICINITY MAP, INDEX OF SHEETS
TMP - 1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND, AND TEMPORARY PAVEMENT MARKING SCHEDULE
TMP-1B	TRANSPORTATION OPERATIONS PLAN (MANAGEMENT STRATIGIES AND GENERAL NOTES)
TMP-2	TEMPORARY DETOUR DETAIL SHEET
TMP-3	TEMPORARY TRAFFIC CONTROL PHASING
TMP-4A THRU 4E	TEMPORARY TRAFFIC CONTROL DETAILS

WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

PLANS PREPARED BY:

SPENCER MERRITT, PE
PROJECT ENGINEER

JOSHUA JERNIGAN, EI
PROJECT DESIGNER

NCDOT CONTACTS:

JOHN BRAXTON
DIV. 5 PROJECT MANAGER

MARK CRAIG, PE
DIVISION CONSTRUCTION ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

PREPARED IN THE OFFICE OF:

SUMMIT
DESIGN AND ENGINEERING SERVICES
FIRM NO. P-0339

320 Executive Ct.
Hillsborough, NC 27278-8551
Voice: (919) 732-3883
Fax: (919) 732-6776
www.summitde.com

APPROVED: DocuSigned by: 53AE60F8E5C84DF...

DATE: 7/2/2024

NORTH CAROLINA PROFESSIONAL SEAL 053483 ENGINEER SPENCER W. MERRITT

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5/26/20

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.06	WARNING SIGNS FOR BLASTING ZONES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW BOARDS
1130.01	DRUM
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1160.01	TEMPORARY CRASH CUSHION
1165.01	WORK VEHICLE LIGHTING SYSTEMS AND TMA DELINEATION
1170.01	POSITIVE PROTECTION
1180.01	SKINNY-DRUM
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1205.03	PAVEMENT MARKINGS - EXITS AND ENTRANCE RAMPS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.06	PAVEMENT MARKINGS - LANE DROPS
1205.07	PAVEMENT MARKINGS - PEDESTRIAN CROSSWALKS
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.10	PAVEMENT MARKINGS - SCHOOL AREAS
1205.11	PAVEMENT MARKINGS - RAILROAD CROSSINGS
1205.12	PAVEMENT MARKINGS - BRIDGES
1205.13	PAVEMENT MARKINGS - LANE REDUCTIONS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION
1264.01	OBJECT MARKERS - TYPES
1264.02	OBJECT MARKERS - INSTALLATION

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.

- WORK AREA
- REMOVAL
- USER DEFINED (IF NEEDED)
- USER DEFINED (IF NEEDED)

SIGNALS

EXISTING PROPOSED TEMP TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM SKINNY DRUM TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW BOARD
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED ATTENUATOR (TMA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

PAVEMENT MARKING SYMBOLS

TEMPORARY PAVEMENT MARKING

SYMBOL	DESCRIPTION
PAINT (4")	
P1	WHITE EDGE LINE
P2	WHITE LANE LINE
P4	3 FT.-9FT./SP WHITE MINISKIP
P13	YELLOW DOUBLE CENTER
PAINT (12")	
P52	YELLOW DIAGONAL
PAINT	
T70	LEFT TURN ARROW
T72	STRAIGHT ARROW

HL-0031

TMP-1A

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

SEAL
10/30/2023

DocuSigned by:

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PLANS PREPARED BY:

SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
320 Executive Court
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

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5/26/20

MANAGEMENT STRATIGIES/GENERAL NOTES

THE FOLLOWING LISTED WORK ZONE STRATEGIES ARE RECOMMENDED FOR INCLUSION WITHIN THIS TRANSPORTATION MANAGEMENT PLAN (TMP).

RECOMMENDED STRATEGIES:

TRAFFIC MANAGEMENT STRATEGIES:
- LANE SHIFTS OR CLOSURES
- SHOULDER CLOSURES
- FLAGGING SERVICES
- WORK HOUR RESTRICTIONS FOR PEAK TRAVEL
- OFF–SITE DETOURS /USE OF ALTERNATIVE ROUTES

WORK ZONE SAFETY & MOBILITY STRATEGIES:
- TEMPORARY TRAFFIC SIGNALS

CORRIDOR /NETWORK MANAGEMENT STRATEGIES:
- STREET /INTERSECTION IMPROVEMENTS

TRAFFIC /INCIDENT MANAGEMENT & SPEED ENFORCEMENT STRATEGIES:
- LOCAL DETOUR ROUTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

TIME RESTRICTIONS

A) DO NOT CLOSE OR NARROW TRAVEL LANES AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
ALL ROADS	MONDAY THROUGH FRIDAY FROM 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM

B) DO NOT CLOSE OR NARROW TRAVEL LANES DURING HOLIDAYS AND SPECIAL EVENTS AS FOLLOWS:

ROAD NAME	HOLIDAY
ALL ROADS	1. FOR ANY UNEXPECTED OCCURRENCE THAT CREATES UNUSUALLY HIGH TRAFFIC VOLUMES, AS DIRECTED BY THE ENGINEER.
	2. FOR NEW YEAR'S, BETWEEN THE HOURS OF 7:00 A.M. DECEMBER 31st TO 6:00 P.M. JANUARY 2ND. IF NEW YEAR'S DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY THEN UNTIL 6:00 P.M. THE FOLLOWING TUESDAY.
	3. FOR EASTER, BETWEEN THE HOURS OF 7:00 A.M. THURSDAY AND 6:00 P.M. MONDAY.
	4. FOR MEMORIAL DAY, BETWEEN THE HOURS OF 7:00 A.M. FRIDAY TO 6:00 P.M. TUESDAY.
	5. FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 7:00 A.M. THE DAY BEFORE INDEPENDENCE DAY AND 6:00 P.M. THE DAY AFTER INDEPENDENCE DAY. IF INDEPENDENCE DAY IS ON A FRIDAY, SATURDAY, SUNDAY OR MONDAY THEN BETWEEN THE HOURS OF 7:00 A.M. THE THURSDAY BEFORE INDEPENDENCE DAY AND 6:00 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.
	6. FOR LABOR DAY, BETWEEN THE HOURS OF 7:00 A.M. FRIDAY AND 6:00 P.M. TUESDAY.
	7. FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 7:00 A.M. TUESDAY TO 6:00 P.M. MONDAY.
	8. FOR CHRISTMAS, BETWEEN THE HOURS OF 7:00 A.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 6:00 P.M. THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.

C) DO NOT CLOSE ROADS AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
ALL ROADS	MONDAY THROUGH SUNDAY FROM 6:00 AM TO 8:00 PM

LANE AND SHOULDER CLOSURE REQUIREMENTS

D) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

E) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

F) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

G) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

H) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

I) DO NOT INSTALL MORE THAN ONE LANE CLOSURE IN ANY ONE DIRECTION ON ALL ROADS..

PAVEMENT EDGE DROP OFF REQUIREMENTS

J) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP–OFF AS FOLLOWS:

BACKFILL DROP–OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

BACKFILL DROP–OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

K) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8–11) 350 FT IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

L) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

M) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

N) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

O) INSTALL BLACK ON ORANGE ''DIP'' SIGNS (W8–2) AND/OR "BUMP" SIGNS (W8–1) IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES

P) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON–CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

Q) PLACE ADDITIONAL SETS OF THREE CHANNELIZING DEVICES DRUMS PERPENDICULAR TO THE EDGE OF TRAVELWAY ON 500 FT CENTERS WHEN UNOPENED LANES ARE CLOSED TO TRAFFIC.

PAVEMENT MARKINGS AND MARKERS

R) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
ALL ROADS	PAINT	NONE

S) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.

T) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

U) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

MISCELLANEOUS

V) LAW ENFORCEMENT MAY BE USED TO MAINTAIN TRAFFIC THROUGH THE WORK AREA AND/OR INTERSECTIONS AS DIRECTED BY THE ENGINEER.

W) IN THE EVENT A TIE–IN CANNOT BE MADE IN ONE DAY'S TIME, BRING THE TIE–IN AREA TO AN APPROPRIATE ROADWAY ELEVATION AS DETERMINED BY THE ENGINEER. PLACE BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8–7) AND BLACK ON ORANGE ''PAVEMENT ENDS'' SIGNS (W8–3) 350 FT AND 700 FT RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS.

HL-0031
TMP-1B

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

SEAL
10/30/2023

DocuSigned by:
Spencer W. Merritt

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PLANS PREPARED BY:

SUMMIT
DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
320 Executive Court
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

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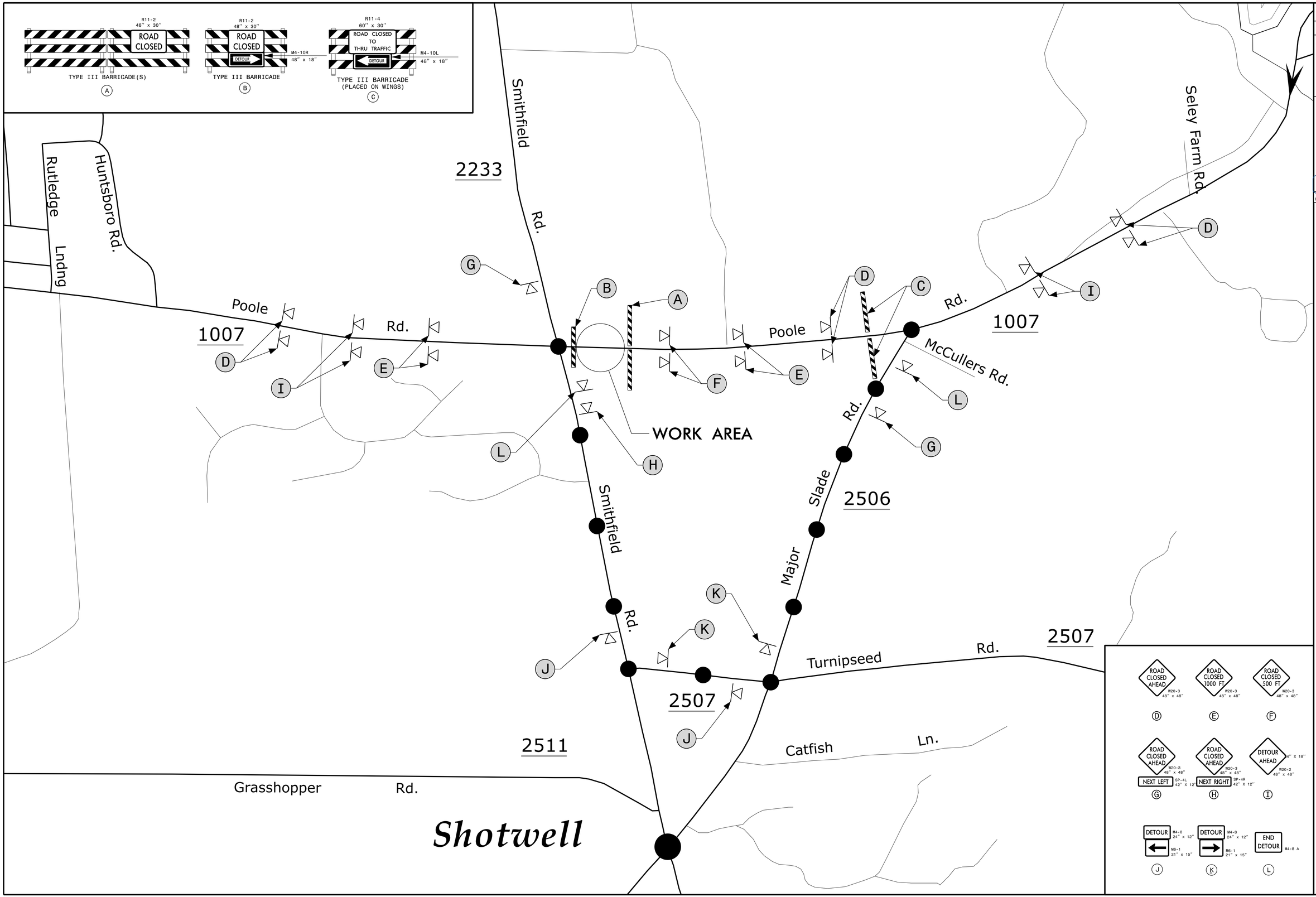

TEMPORARY DETOUR DETAIL

HL-0031

TMP-2

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

SEAL
10/30/2023
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 053483 SPENCER W. MORRIS

DocuSigned by:
Spencer W. Morris
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PLANS PREPARED BY:

SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
320 Executive Court
Hillsborough, NC 27278
(919) 732-3883
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5/26/20

PHASING

NOTES:

COMPLETE ANY WIDENING IN SUCH A MANNER THAT NO PONDING OF WATER WILL OCCUR WITHIN THE TRAVEL LANE.

WHEN USING LANE CLOSURES, RETURN TRAFFIC TO EXISTING AND/OR TEMPORARY TRAFFIC PATTERN UPON COMPLETING CONSTRUCTION ACTIVITIES UNLESS OTHERWISE NOTED IN THE PHASING.

WHEN INSTALLING TEMPORARY AND FINAL SIGNALS, USE LANE CLOSURES (RSD 1101.02, SHEET 1) AND LAW ENFORCEMENT.

INSTALL PROPOSED DRAINAGE IN SECTIONS USING TEMPORARY LANE CLOSURES AND FLAGGING OPERATIONS SHOWN IN RSD 1101.02 (SHEET 1) UNLESS OTHERWISE SPECIFIED IN PHASING.

STEP 1:

USE ROADWAY STANDARD DRAWING 1101.01 (SHEET 3) AND ERECT WORK ZONE ADVANCE WARNING SIGNS ON –L– (SR 1007) AND –Y– (SR 2233).

STEP 2:

USING RSD 1101.02 (SHEET 1) AND LAW ENFORCEMENT, INSTALL AND ACTIVATE TEMPORARY SIGNAL. COVER EXISTING SIGNAL HEADS AND REMOVE THE EXISTING TRAFFIC SIGNAL. INSTALL ROAD CLOSURE AND DETOUR SIGNING SHOWN ON TMP–2 FOR THE REMOVAL OF THE EXISTING UNDER GROUND STORAGE TANKS AT –L– STA. 23+30+/– RT AND COVER SIGNS UNTIL READY FOR USE.

WORK IN A CONTINUOUS MANNER TO COMPLETE STEP 3 FROM 8:00 PM TO 6:00 AM. SEE INTERMEDIATE CONTRACT TIME AND LIQUIDATED DAMAGES.

STEP 3: (TMP–4B)

UNCOVER –L– CLOSURE AND DETOUR SIGNING, CHANGE SIGNAL PATTERN TO FLASHING RED IN ALL DIRECTIONS, CLOSE –L– AND DETOUR TRAFFIC ALONG ROUTE SHOWN ON TMP–2. REMOVE EXISTING UNDERGROUND STORAGE TANKS AT –L– STA. 23+30+/– RT. THEN, CONVERT SIGNAL BACK TO THE TEMPORARY PATTERN, OPEN –L– TO TRAFFIC AND REMOVE ROAD CLOSURE AND OFFSITE DETOUR SIGNING.

STEP 4: (TMP–4A THRU TMP–4E)

USING TEMPORARY LANE CLOSURES AND FLAGGING OPERATIONS SHOWN IN RSD 1101.02 (SHEET 1), COMPLETE NECESSARY GRADING UP TO EXISTING ELEVATION, AND INSTALL PROPOSED DRAINAGE FROM:

–L– RT STA. 12+28+/– TO –Y– RT STA. 30+10+/–
–Y– LT STA. 28+84+/– TO –L– RT STA. 30+89+/–
–Y– RT STA. 14+53+/– TO –L– LT STA. 20+44+/–
–Y– LT STA. 20+64+/– TO –L– LT STA. 23+24+/–

STEP 5: (TMP–4A THRU TMP–4E)

USING TEMPORARY LANE CLOSURES AND FLAGGING OPERATIONS SHOWN IN RSD 1101.02 (SHEET 1), COMPLETE PROPOSED PAVEMENT WIDENING UP TO AND INCLUDING THE FINAL LAYER OF SURFACE COURSE FROM:

–L– RT STA. 12+28+/– TO –Y– RT STA. 30+10+/–
–Y– LT STA. 28+84+/– TO –L– RT STA. 30+89+/–
–Y– RT STA. 14+53+/– TO –L– LT STA. 20+44+/–
–Y– LT STA. 20+64+/– TO –L– LT STA. 23+24+/–

STEP 6:

USING RSD 1101.02 (SHEET 1) AND LAW ENFORCEMENT, INSTALL AND ACTIVATE FINAL SIGNALS. USING TEMPORARY LANE CLOSURES AND FLAGGING OPERATIONS REMOVE CONFLICTING EXISTING PAVEMENT MARKINGS, PLACE TEMPORARY PAINT PAVEMENT MARKINGS, AND SHIFT TRAFFIC INTO THE PROPOSED FINAL PATTERN.

STEP 7:

AFTER PAVEMENT CURE TIME HAS ELAPSED, USE TEMPORARY LANE CLOSURES AND FLAGGING OPERATIONS SHOWN IN RSD 1101.02 (SHEET 1), PLACE FINAL PAVEMENT MARKINGS SHOWN ON THE PAVEMENT MARKING PLANS.

HL-0031
TMP-3

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

SEAL
10/30/2023

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Spencer W. Merritt
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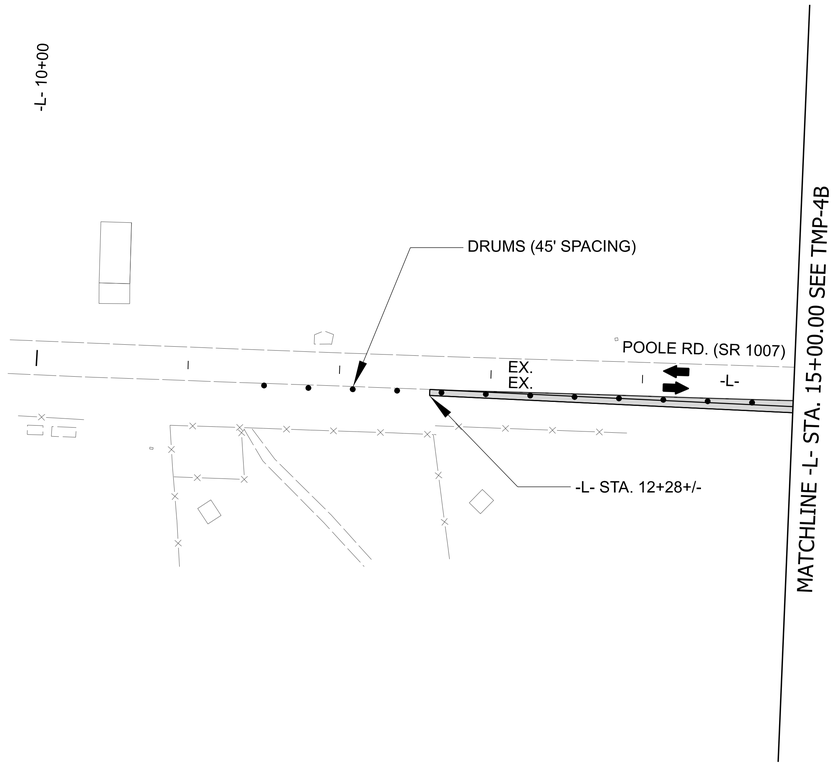
5/26/20

NAD
83/2001

SEE PAVEMENT MARKING PLANS FOR FINAL PAVEMENT MARKINGS NOT OTHERWISE SHOWN.



HL-0031
TMP-4A

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

SEAL
10/30/2023

NORTH CAROLINA PROFESSIONAL SEAL 053483 ENGINEER SPENCER W. MERRITT

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Spencer W. Merritt
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PLANS PREPARED BY:
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NC FIRM LICENSE No: P-0339
320 Executive Court
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

TEMPORARY TRAFFIC CONTROL PHASE I & II DETAILS

DocuSign Envelope ID: A165E7D3-B91E-4537-AF67-B1682EE2F5A5

5/26/20

MATCHLINE -Y- STA. 17+00.00 SEE TMP-4D

-Y-

GATE

GR

24" RCP-IV

EX.
EX.

SMITHFIELD RD. (SR 2233)

DRUMS (45' SPACING)

-Y- 20+00

-Y- STA. 20+64+/-

-L- 20+00

-L- 25+00

DRUMS (10' SPACING)

TEMPORARY TRAFFIC SIGNAL

DRUMS (10' SPACING)

-L- STA. 20+44+/-

-L- STA. 23+24+/-

MATCHLINE -L- STA. 15+00.00 SEE TMP-4A

POOLE RD. (SR 1007)

-L-

EX.
EX.

SOIL

SOIL

24" RCP-IV

DRUMS (45' SPACING)

DRUMS (10' SPACING)

POOLE RD.
(SR 1007)

EX.
EX.

-L-

24" RCP-IV

15"
SOIL

DRUMS (45' SPACING)

DRUMS (10' SPACING)

GR

-Y- STA. 23+84+/-

-Y- 25+00

DRUM (45' SPACING)

DRUMS (45' SPACING)

SMITHFIELD RD.
(SR 2233)

EX.
EX.

-Y-

MATCHLINE -Y- STA. 26+00.00 SEE TMP-4E

MATCHLINE -L- STA. 29+00.00 SEE TMP-4C

NAD
83/2001

SEE PAVEMENT MARKING PLANS FOR FINAL PAVEMENT MARKINGS NOT OTHERWISE SHOWN.

TEMPORARY TRAFFIC CONTROL PHASE I & II DETAILS

HL-0031

TMP-4B

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

SEAL
10/30/2023

NORTH CAROLINA
PROFESSIONAL
SEAL
053483
ENGINEER
SPENCER W. MERRITT

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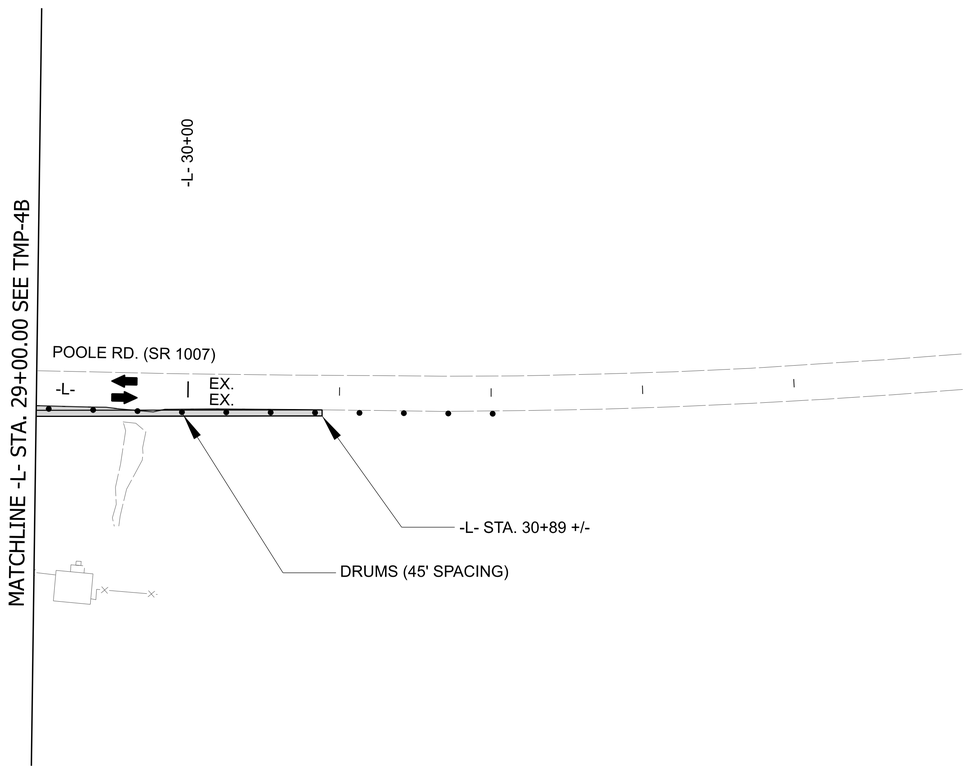

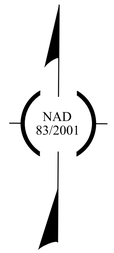

HL-0031

TMP-4C

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

SEAL
10/30/2023

NORTH CAROLINA PROFESSIONAL SEAL 053483 ENGINEER SPENCER W. MERRITT

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TEMPORARY TRAFFIC CONTROL PHASE I & II DETAILS

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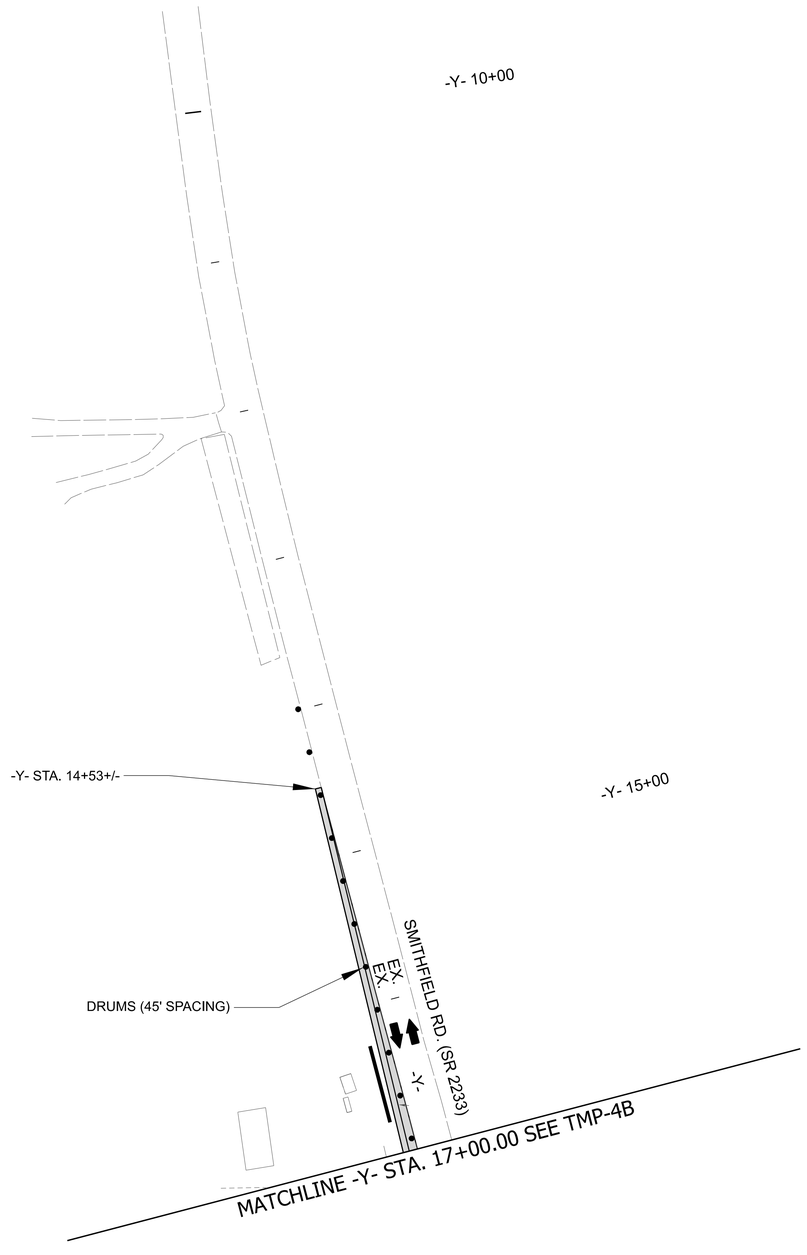

HL-0031

TMP-4D

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

SEAL
10/30/2023

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 053483 SPENCER W. MERRITT

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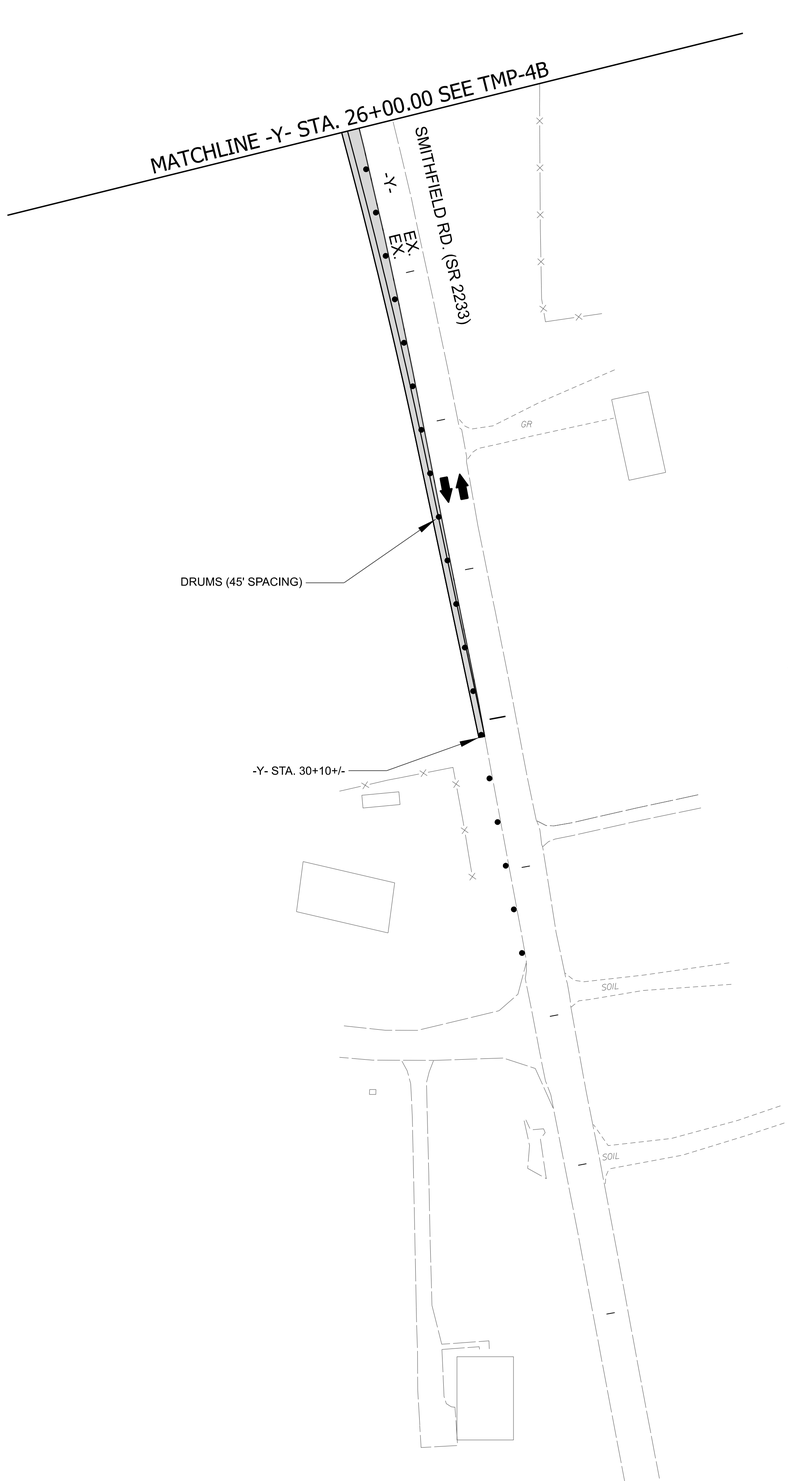

NAD
83/2001

SEE PAVEMENT MARKING PLANS FOR FINAL PAVEMENT MARKINGS NOT OTHERWISE SHOWN.

HL-0031

TMP-4E

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

SEAL
10/30/2023

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TEMPORARY TRAFFIC CONTROL PHASE I & II DETAILS

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09/08/99

PROJECT: HL-0031

CONTRACT: DE00381

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

LOCATION: *CONSTRUCT LEFT TURN LANES AT SR 1007 (POOLE ROAD) AND SR 2223 (SMITHFIELD ROAD) INTERSECTION*

TIP NO.	SHEET NO.
HL–0031	PMP–1

APPROVED: DocuSigned by: 53AE60F8ESCB4DF...

DATE: 4/23/2024

SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 053483 ENGINEER SPENCER W. MERRITT

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ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS

PROJECT HL-0031 PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION	
THERMO (4")		
T1	WHITE EDGE LINE	3,690 LF (90 MILS)
T2	WHITE LANE LINE	380 LF (90 MILS)
T4	3 FT. - 9FT./SP WHITE MINISKIP	120 LF (90 MILS)
T13	YELLOW DOUBLE CENTER	11,465 LF (90 MILS)
THERMO (12")		
T52	YELLOW DIAGONAL	345 LF (90 MILS)
THERMO (24")		
T61	WHITE STOPBAR	115 LF (90 MILS)
THERMO		
T70	LEFT TURN ARROW	5 EA (90 MILS)
T72	STRAIGHT ARROW	5 EA (90 MILS)

GENERAL NOTES

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
SR 2233	THERMOPLASTIC	NONE
SR 1007	THERMOPLASTIC	NONE

B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

D) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

E) UNLESS OTHERWISE SPECIFIED, HEATED IN-PLACE THERMOPLASTIC MAY BE USED IN LIEU OF EXTRUDED THERMOPLASTIC FOR STOP BARS, CHARACTERS AND DIAGONALS. IF HEATED IN-PLACE IS USED, IT SHALL BE PAID FOR USING THE EXTRUDED THERMOPLASTIC PAY ITEM.

Prepared in the Office of:

SUMMIT DESIGN AND ENGINEERING SERVICES FIRM NO. P-0339

320 Executive Ct.
Hillsborough, NC 27278-8551
Voice: (919) 732-3883
Fax: (919) 732-6776
www.summitde.net

SPENCER MERRITT, PE — *PROJECT ENGINEER*

JOSHUA JERNIGAN, EI — *PROJECT DESIGNER*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

INDEX

PMP-1	PAVEMENT MARKING PLAN TITLE, SCHEDULE, AND QUANTITIES
PMP-2	PAVEMENT MARKING DETAIL SHEET
PMP-3	PAVEMENT MARKING DETAIL SHEET
PMP-4	PAVEMENT MARKING DETAIL SHEET
PMP-5	PAVEMENT MARKING DETAIL SHEET
PMP-6	PAVEMENT MARKING DETAIL SHEET

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5/26/20

NAD
83/2011

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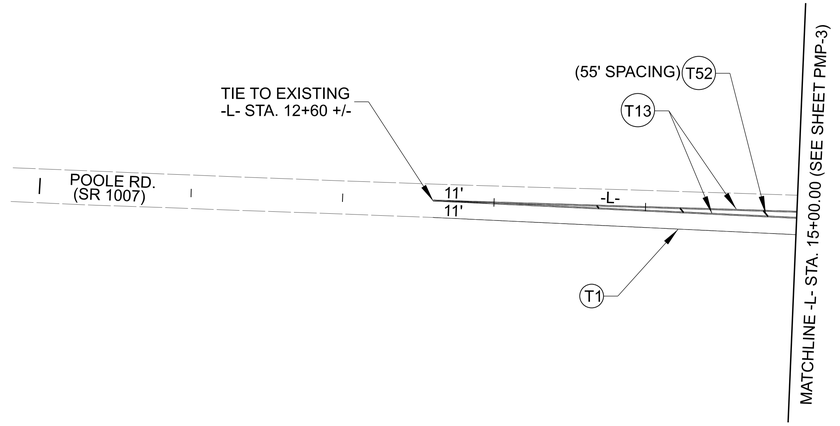
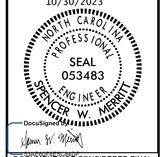


HL-0031

PMP-2

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

SEAL
10/30/2023



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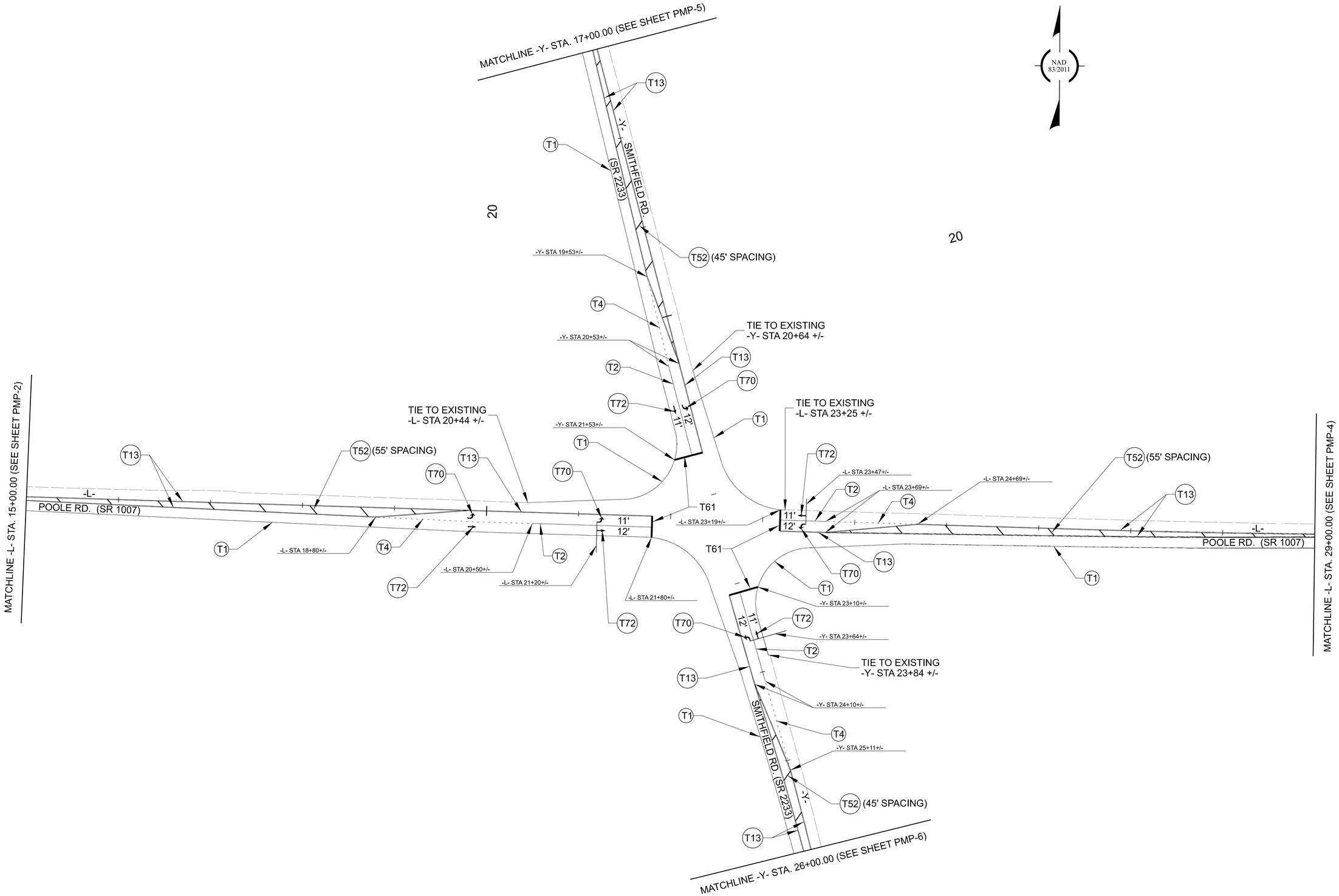

HL-0031

PMP-3

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

SEAL
11/13/2023

NORTH CAROLINA PROFESSIONAL SEAL 053483 ENGINEER SPENCER W. MERRITT

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5/26/20

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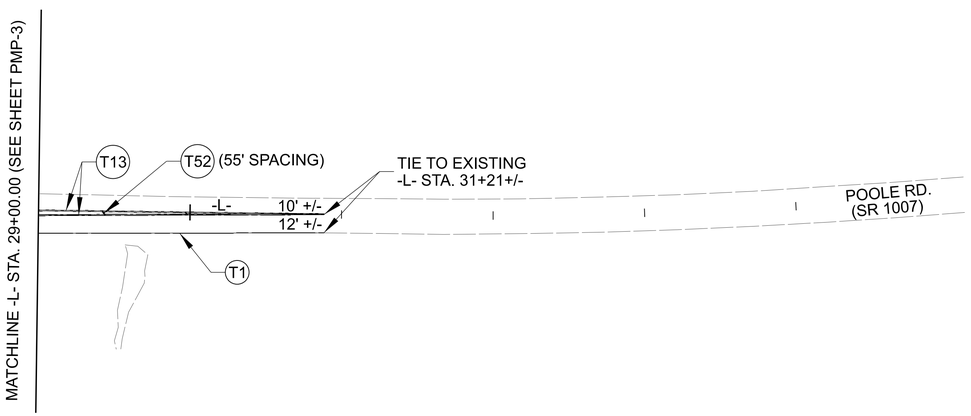

NAD
83/2011

HL-0031

PMP-4

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

SEAL
10/30/2023

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Spencer W. Merritt
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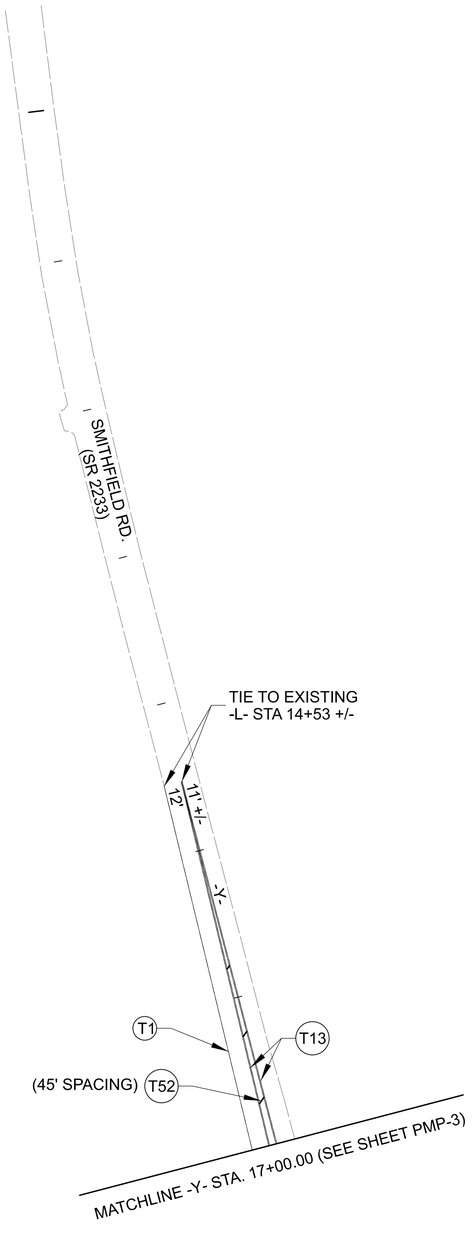

HL-0031

PMP-5

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

SEAL
10/30/2023

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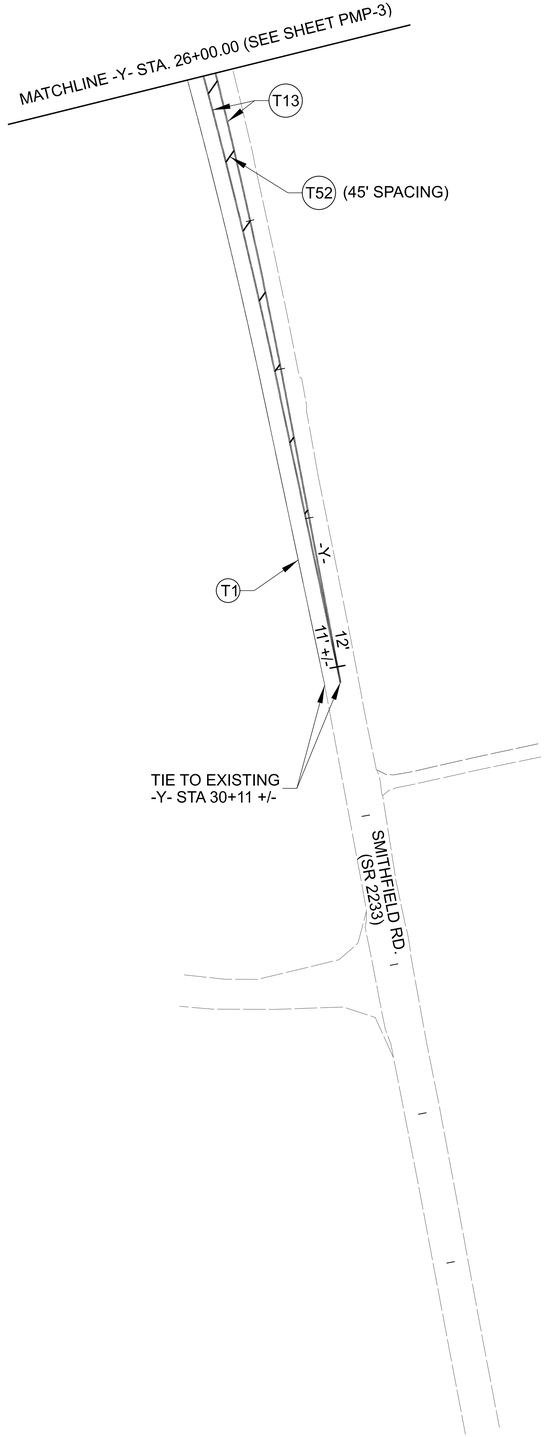
5/26/20



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HL-0031
PMP-6

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

SEAL
10/30/2023
NORTH CAROLINA PROFESSIONAL SEAL 053483 ENGINEER SPENCER W. MERRITT
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Hillsborough, NC 27278
(919) 732-3883
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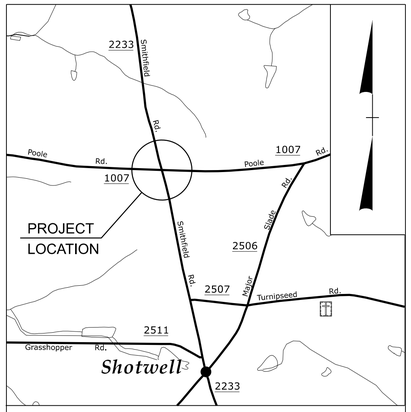
TIP PROJECT: HL-0031

CONTRACT: DE00381

See Sheet 1A For Index of Sheets



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

WAKE COUNTY

LOCATION: SMITHFIELD RD (SR2233) & POOLE RD (1007)
TYPE OF WORK: GRADING, PAVING, DRAINAGE, SIGNAL

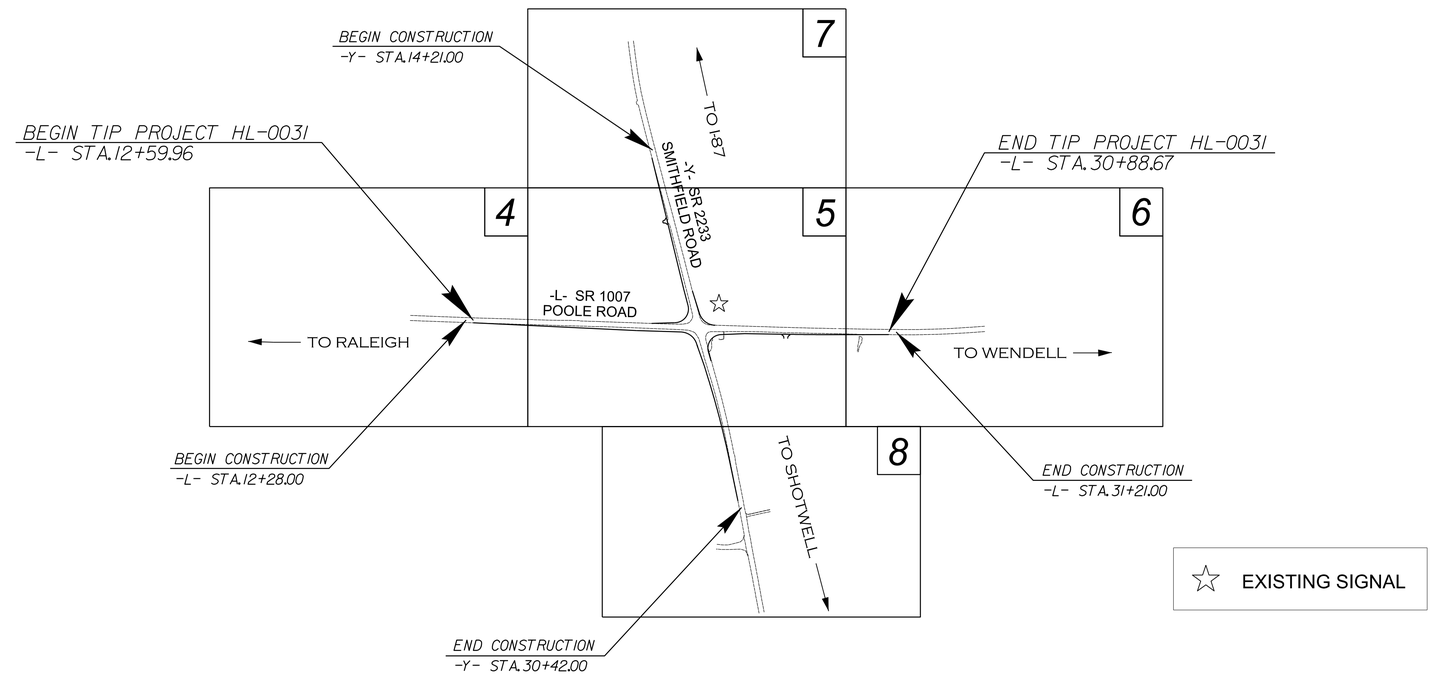
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HL-0031	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
48996.1.1	N/A	PE
49616.2.1	1007043	R/W
49616.2.2	1007043	UTL
49616.3.1	1007043	CONST

NAD 83/2011

THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.



GRAPHIC SCALE

50 25 0 50 100

PLANS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE APPLICABLE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2019 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF WATER RESOURCES.

SUMMIT
DESIGN AND ENGINEERING SERVICES
FIRM NO. P-0339

Prepared in the Office of:
320 Executive Ct.
Hillsborough, NC 27278-8551
Voice: (919)732-3883
Fax: (919)732-6776
www.summitde.com

Designed by:

Patrick Hartnett, PE 4124
NAME LEVEL III CERTIFICATION NO.

Roadway Standard Drawings

The "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2024 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

PROJECT REFERENCE NO.	SHEET NO.
HL-0031	EC-1A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

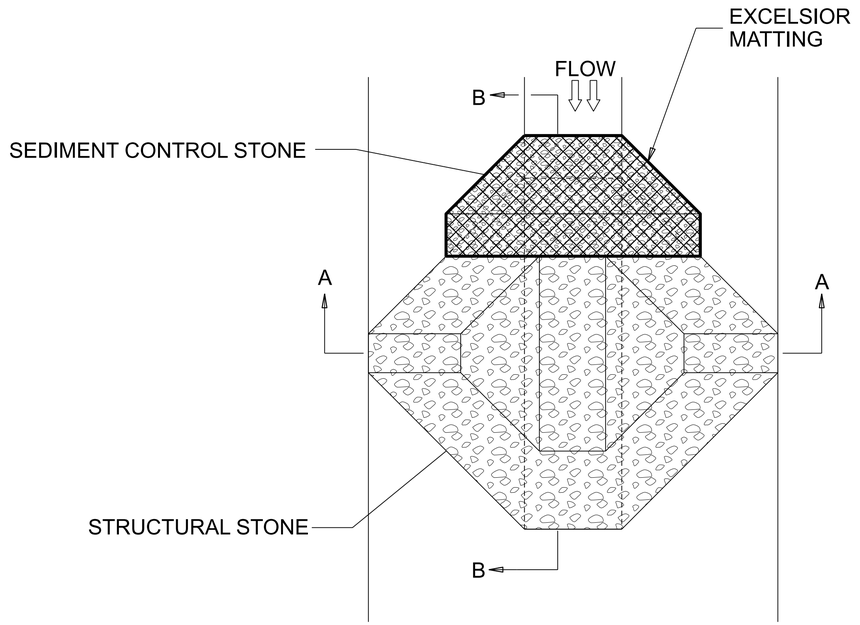
EROSION & SEDIMENT CONTROL LEGEND

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1630.03	Temporary Silt Ditch	TSD
1630.04	Stilling Basin	
1630.05	Temporary Diversion	TD
1630.06	Special Stilling Basin	
1630.07	Skimmer Basin	
1630.08	Tiered Skimmer Basin	
1630.09	Earthen Dam with Skimmer	
	Infiltration Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C

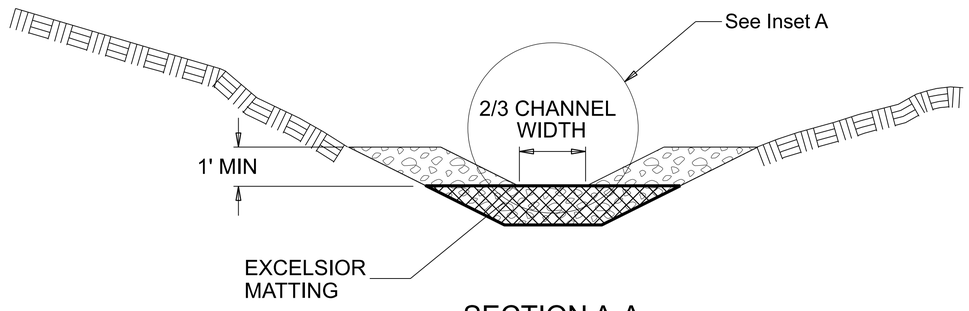
Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet Sediment Trap Type A	A
1635.02	Rock Pipe Inlet Sediment Trap Type B	B
1636.01	Excelsior Wattle Check	
1636.01	Excelsior Wattle Check with Flocculant	
1636.01	Coir Fiber Wattle Check	
1636.01	Coir Fiber Wattle Check with Flocculant	
1636.02	Silt Fence Excelsior Wattle Break	EW
	Silt Fence Coir Fiber Wattle Break	CFW
1636.03	Excelsior Wattle Barrier	—EW—EW—EW—
1636.03	Coir Fiber Wattle Barrier	—CFW—CFW—CFW—

PROJECT REFERENCE NO.	SHEET NO.
HL-0031	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)



PLAN



SECTION A-A

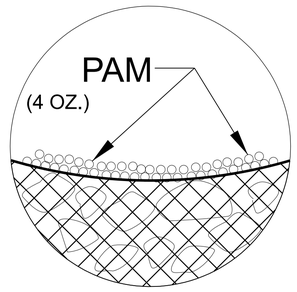
NOTES:

INSTALL TEMPORARY ROCK SILT CHECK TYPE A IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1633.01.

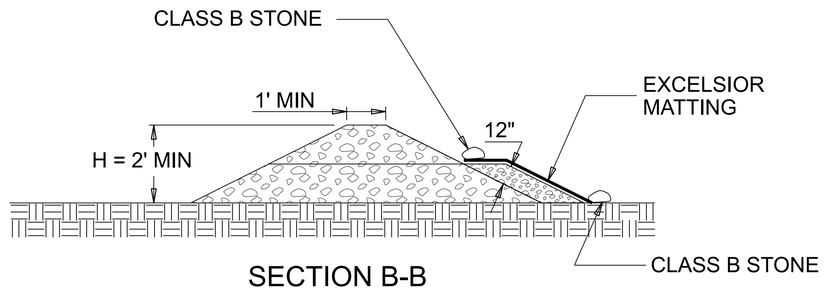
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION B-B

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
HL-0031	EC-3

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

5/26/20

NC GRID
NAD 83 NA 2011

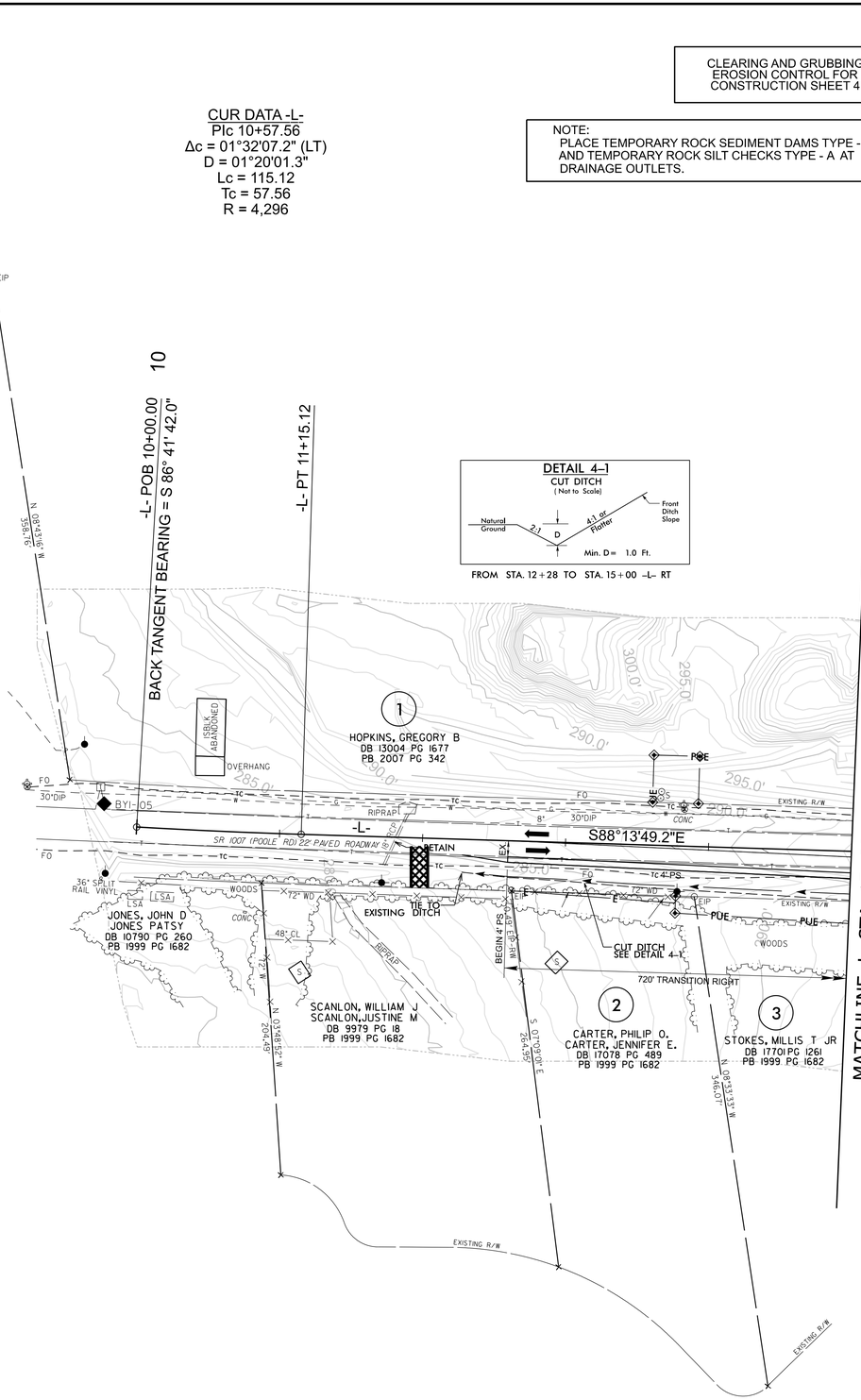
CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT
DRAINAGE OUTLETS.

CUR DATA -L-
PIc 10+57.56
Δc = 01°32'07.2" (LT)
D = 01°20'01.3"
Lc = 115.12
Tc = 57.56
R = 4,296

DETAIL 4-1
CUT DITCH
(Not to Scale)

FROM STA. 12+28 TO STA. 15+00 -L- RT



HL-0031
EC | 004

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PLANS PREPARED BY:

SUMMIT
DESIGN AND ENGINEERING SERV
NC FIRM LICENSE No: P-0339
320 Executive Court
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

5/26/20

MATCHLINE -Y- STA. 17+00.00 SEE SHEET EC 007

MATCHLINE -L- STA. 15+00.00 SEE SHEET EC 004

MATCHLINE -L- STA. 29+00.00 SEE SHEET EC 006

MATCHLINE -Y- STA. 26+00.00 SEE SHEET EC 008

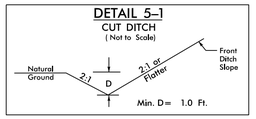
CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 5

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B AND TEMPORARY ROCK SILT CHECKS TYPE - A AT DRAINAGE OUTLETS.

CUR DATA -L-
PIc 27+50.30
Δc = 00°59'28.3" (LT)
D = 00°30'00.2"
Lc = 198.22
Tc = 99.11
R = 11,458
SE = EXIST.

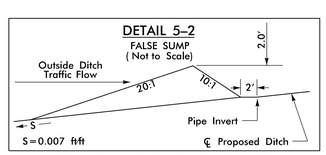
NC GRID
NAD 83 NA 2011

DETAIL 5–1
CUT DITCH
(Not to Scale)



FROM	STA. 15+00	TO	STA. 22+09	–L– RT
FROM	STA. 23+15	TO	STA. 29+00	–L– RT
FROM	STA. 20+44	TO	STA. 21+83	–L– LT
FROM	STA. 22+86	TO	STA. 23+24	–L– LT
FROM	STA. 17+00	TO	STA. 21+57	–Y– RT
FROM	STA. 22+63	TO	STA. 26+00	–Y– RT
FROM	STA. 20+64	TO	STA. 22+03	–Y– LT
FROM	STA. 23+02	TO	STA. 23+84	–Y– LT

DETAIL 5–2
FALSE SUMP
(Not to Scale)



FROM STA. 21+78 TO STA. 22+09 –L– RT

CUR DATA -Y-
PIc 22+86.70
Δc = 01°20'50.3" (LT)
D = 02°59'59.9"
Lc = 44.91
Tc = 22.46
R = 1,909.88

CUR DATA -Y-
PIc 26+36.01
Δc = 05°15'16.3" (RT)
D = 01°27'18.5"
Lc = 361.10
Tc = 180.68
R = 3,937.45

1 HOPKINS, GREGORY B
DB 13004 PG 1677
PB 2007 PG 342

3 STOKES, MILLIS T JR
DB 17701 PG 1261
PB 1999 PG 1682

4 EARLEY, JEREMIAH J
EARLEY, LAUREN M
DB 16229 PG 575
PB 1999 PG 1682

5 ELSHAIKH, MAJED FUAD
SHAIKH, ISSA FAUD
DB 15929 PG 208
PBI998 PG328

6 POOLE ROAD HOLDINGS LLC
DB 16455 PG 2272
PBI996 PGII69

7 GBK I LLC
DB 17785 PG 2238

8 KIRK, CLARENCE M JR
KIRK, PHILIP G
DB 17233 PG 2128

9 KIRK, CLARENCE M JR
KIRK, PHILIP G
DB 17233 PG 2124

10 EDWARDS, BETTY W
JOHNSON, BILLIE W

11 JOHNSON, DOUGLAS LYNN
DB 11531 PG 2598

12 KIDD FARMS, LLC
DB 16520 PG 1378

16 GREENE, SAMUEL L
GREEN, IANTHA
DB 5083 PG 820
PB 1970 PG 207

BM#3
ELEVATION=297.06'
BY STATION 12+44.00
14 LEFT
BENCHTIE IN 18" CEDAR

N 02°00'05" W
664.87'

-L- PC 26+51.19

-L- PT 28+49.41
BEARING AHEAD = S89°13'17.5"E

-L- POT 22+53.52 =
-Y- POT 22+26.74

-Y- PC 22+64.24

-Y- PT 23+09.15

-Y- PC 24+55.34

-L- S88°13'49.2"E

-Y- S16°39'49.8"E

S 85°34'39" E
245.75'

S 46°41'23" E
209.36'

S 11°27'25" W
66.46'

S 05°56'16" E
233.97'

S 88°53'29" E
289.87'

S 88°31'41" E
102.87'

S 88°31'41" E
210.18'

S 88°31'41" E
210.00'

S 01°28'19" W
210.01'

N 01°28'19" E
210.08'

S 01°37'31" W
210.08'

HL-0031
EC | 005

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PLANS PREPARED BY:
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320 Executive Court
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

5/26/20

CUR DATA -L-
PIc 33+06.84
Δc = 05°15'09.2" (LT)
D = 01°26'51.3"
Lc = 362.85
Tc = 181.55
R = 3,958

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 6

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT
DRAINAGE OUTLETS.

NC GRID
NAD 83 NA 2011

30

-L- PC 31+25.29

-L- POE 34+88.14

MATCHLINE -L- STA. 29+00.00 SEE SHEET EC 005

7

GBK I LLC
DB 17785 PG 2238

WILLIAMS, KEVIN DAVID
WILLIAMS, DEBBIE ANNETTE
DB 16897 PG 2234

S 11°22'27" E
850.39'

N 00°36'09" W
300.14'

BM#4
ELEVATION=296.36'
BY STATION 27+61.00
51' LEFT
BENCHTIE IN 22" OAK

GUY

L 17' EIP R/W

2.69' R/W EIP

ETCHELLS, JAMES L
ETCHELLS, JUNE S
DB 2098 PG 261

290.0'

295.0'

WOODS

DUCT

EIP EXISTING R/W

INNERDUCT

30" DIP

TV FO

-L-

S89°13'17.5"E

8"

FO

PS

TC

EX.

RD (SR 1007) 23' PAVEMENT

BY I-108 30" DIP

18" DIP

EXISTING R/W

R/W

+62.26
EX. R/W
& 35' RT

CUT DITCH
SEE DETAIL 6-1

TIE TO
EXISTING DITCH

END 4" PS

720' TRANSITION RIGHT

+50
EX. R/W
35' &
50' RT

APPROX. EDGE OF WOODS

DECK

STAIRS

ISFD

72" WD

JAMES L CRESIMORE & ASSOC LP
DB 12057 PG 2363
PB 2006 PG 1228

KIDD FARMS, LLC
DB 16520 PG 1378

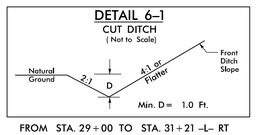
12

KIDD FARMS, LLC
DB 16520 PG 1378

N 01°28'19" E
274.55'

S 89°15'30" E
80.27'

DETAIL 6-1
CUT DITCH
(Not to Scale)



FROM STA. 29+00 TO STA. 31+21 -L- RT

HL-0031
EC | 006

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PLANS PREPARED BY:

SUMMIT
DESIGN AND ENGINEERING SERV
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(919) 732-3883
(919) 732-6676 (FAX)

5/26/20

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 7

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT
DRAINAGE OUTLETS.

NC GRID
NAD 83 NA 2011

BM#2
ELEVATION=270.48'
BL STATION 33+35.00
44 RIGHT
BENCHTIE IN 15" PINE

-Y- POB 10+00.00
BACK TANGENT BEARING = S 06° 59' 24.7" E

10

CUR DATA -Y-
PIc 11+42.41
Δc = 07°40'25.1" (LT)
D = 02°41'53.8"
Lc = 284.39
Tc = 142.41
R = 2,123.43

-Y- PT 12+84.39

S 24°39'37" E
122.00'

N 83°36'53" E
311.95'

N 84°14'03" E
380.42'

S 77°39'50" W
392.19'

S 34°20'18" E
125.26'

N 86°04'52" E
354.73'

N 34°06'55" W
77.37'

HAMMONDS, DAVEY
HAMMONDS, KIMBERLY
DB 8651 PG 2541
PB 1996 PG 1737

HAMMONDS, DAVEY D
HAMMONDS, KIMBERLY K
DB 7757 PG 1
PB 1996 PG 1737

CAMPBELL, JACQUELINE L S
DB 17082 PG 2589
PB 1996 PG 1737

HOPKINS, GREGORY B
DB 13004 PG 1677
PB 2007 PG 342

7
GBK 1 LLC
DB 17785 PG 2238

6
POOLE ROAD HOLDINGS LLC
DB 16455 PG 2272
PB1996 PG1169

0.61' EIP-RW

WOODS

275.0'
280.0'
285.0'
290.0'

W/R EXIST

SR 2435 (SMITHFIELD ROAD) PAVED ROADWAY

BL-103

TIE TO
EXISTING DITCH

BEGIN 4' PS
+53.18

CUT DITCH
SEE DETAIL 7-1

30x20' BELL SOUTH
EASEMENT
DB 8085 PG 75

600' TRANSITION RIGHT

TEL CABINET

EL METER
CONC

20x20 SBAT
EASEMENT
DB 3264 PG 197

0504
GUY

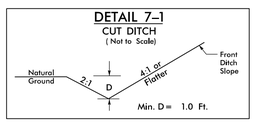
1 FT OF COVER TO BE MAINTAINED

FLOWABLE FILL

S 14°39'40.8" E

MATCHLINE -Y- STA. 17+00.00 SEE SHEET EC 005

DETAIL 7-1
CUT DITCH
(Not to Scale)



FROM STA. 14+21 TO STA. 17+00 -Y- RT

HL-0031
EC | 007

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PLANS PREPARED BY:

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(919) 732-3883
(919) 732-6676 (FAX)

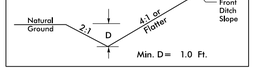
5/26/20

MATCHLINE -Y- STA. 26+00.00 SEE SHEET EC 005

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 8

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT
DRAINAGE OUTLETS.

DETAIL 8-1
CUT DITCH
(Not to Scale)



FROM STA. 26+00 TO STA. 30+42 -Y- RT

BM#1
ELEVATION=310.78'
BL STATION 15+85.00
118 LEFT
BENCHTIE IN 12" PINE

600' TRANSITION RIGHT

5
ELSHAIKH, MAJED FUAD
SHAIKH, ISSA FAUD
DB 15929 PG 208
PB1998 PG328

14
LILES, DARYL R
LILES, DERECK W
DB 10559 PG 2511
PB 1999 PG 1682

15
GRIMES, BRANTON T
GRIMES, AMY J
DB 9939 PG 1412
PB 1999 PG 1682

GREENE, SAMUEL L
GREEN, IANTHA
DB 5083 PG 820
PB 1970 PG 207

WATSON, WILLIAM P
WATSON, EDNA E
DB 1952 PG 675
PB 1970 PG 207

MCCULLOUGH, ANNIE R
DB 1952 PG 673
PB 1970 PG 207

DAVIS, REGINALD K JR
DAVIS, PATRICIA L
DB 14625 PG 1906
PB 1999 PG 1682

JONES, ROMUEL HEIRS
PB 1970 PG 207

CORONILLA, ALBA L
DB 15591PG 73
PB 1999 PG 1682

GOOD HOPE MISSIONARY
BAPTIST CHURCH
DB 16147 PG 601
PB 1977 PG 894

-Y- PT 28+16.44

-Y- POE 34+68.91

S 10°45'23.9"E -Y-

CUT DITCH
SEE DETAIL 8-1

ENCHANTED CREEK CIR.
VAR PAVED ROADWAY

SMITHFIELD RD 23' PAVED ROADWAY

8' BROKEN PAVEMENT

EXISTING R/W

NO UTILITY RECORD
INFORMATION
AS OF 03/08/21

WOODS

2SFD

1½SFD

S 88°31'41" E
210.00'

N 0°43'06" E
63.42'

N 0°43'06" E
131.33'

N 0°43'06" E
100.01'

N 0°43'06" E
46.42'

N 88°32'53" W
210.18'

N 0°43'06" E
170.03'

N 0°30'03" E
417.42'

N 88°29'07" W
197.35'

N 0°43'06" E
119.30'

N 0°43'06" E
418.26'

N 79°07'35" E
455.53'

N 79°07'14" E
433.83'

N 79°03'06" E
387.07'

S 79°03'06" W
361.30'

S 5°05'43" W
350.04'

N 61°49'24" E
217.61'

N 78°28'49" E
260.15'

N 84°30'48" W

N 6°56'28" E
294.13'

N 13°45'40" W
382.35'

CUR DATA -Y-
PIc 26+36.01
Δc = 05°15'16.3" (RT)
D = 01°27'18.5"
Lc = 361.10
Tc = 180.68
R = 3,937.45

NC GRID
NAD 83 NA 2011

30

HL-0031
EC | 008

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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5/26/20

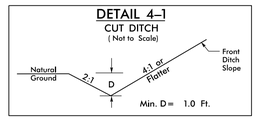
NC GRID
NAD 83 NA 2011

CUR DATA -L-
PIc 10+57.56
Δc = 01°32'07.2" (LT)
D = 01°20'01.3"
Lc = 115.12
Tc = 57.56
R = 4,296

-L- POB 10+00.00
BACK TANGENT BEARING = S 86° 41' 42.0" W

-L- PT 11+15.12

DETAIL 4-1
CUT DITCH
(Not to Scale)



FROM STA. 12+28 TO STA. 15+00 -L- RT

EIP
N 08°43'16" W
358.16'

1
HOPKINS, GREGORY B
DB 13004 PG 1677
PB 2007 PG 342

SR K ABANDONED
OVERHANG

FO
30"DIP
BYI-05
TC
RIPRAP
-L-
SR 1007 (POOLE RD) 22' PAVED ROADWAY
RETAIN
EX.
S88°13'49.2"E
8"
30"DIP
FO
TC
PUE
CONC
EXISTING R/W
TC 4 PS
72" WD
EIP
PUE
PUE
CUT DITCH
SEE DETAIL 4-1
WOODS
720' TRANSITION RIGHT
BEGIN 4' PS
W/F 45°
36" SPLIT RAIL VINYL
LSA
WOODS
CONC
72" WD
48" CL
TIE TO EXISTING DITCH
BUFFALO
W 2"

JONES, JOHN D
JONES PATSY
DB 10790 PG 260
PB 1999 PG 1682

SCANLON, WILLIAM J
SCANLON, JUSTINE M
DB 9979 PG 18
PB 1999 PG 1682

N 03°48'52" W
204.49'

2
CARTER, PHILIP O.
CARTER, JENNIFER E.
DB 17078 PG 489
PB 1999 PG 1682

S 01°09'01" E
261.55'

3
STOKES, MILLIS T JR
DB 17701 PG 1261
PB 1999 PG 1682

N 08°43'35" W
346.01'

EXISTING R/W

MATCHLINE -L- STA. 15+00.00 SEE SHEET EC 010

HL-0031
EC | 009

NORTH CAROLINA
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PLANS PREPARED BY:

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5/26/20

MATCHLINE -Y- STA. 17+00.00 SEE SHEET EC 012

MATCHLINE -L- STA. 15+00.00 SEE SHEET EC 009

MATCHLINE -L- STA. 29+00.00 SEE SHEET EC 011

MATCHLINE -Y- STA. 26+00.00 SEE SHEET EC 013

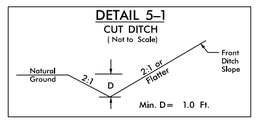
CUR DATA -L-
PIc 27+50.30
Δc = 00°59'28.3" (LT)
D = 00°30'00.2"
Lc = 198.22
Tc = 99.11
R = 11,458
SE = EXIST.

NC GRID
NAD 83 NA 2011

N 02°00'05" W
664.87'

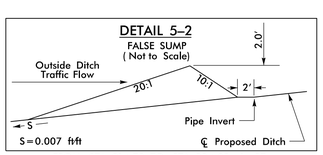
BM#3
ELEVATION=297.06'
BY1STATION 12+44.00
14 LEFT
BENCHTIE IN 18" CEDAR

DETAIL 5–1
CUT DITCH
(Not to Scale)



FROM STA. 15+00 TO STA. 22+09 –L– RT
FROM STA. 23+15 TO STA. 29+00 –L– RT
FROM STA. 20+44 TO STA. 21+83 –L– LT
FROM STA. 22+86 TO STA. 23+24 –L– LT
FROM STA. 17+00 TO STA. 21+57 –Y– RT
FROM STA. 22+63 TO STA. 26+00 –Y– RT
FROM STA. 20+64 TO STA. 22+03 –Y– LT
FROM STA. 23+02 TO STA. 23+84 –Y– LT

DETAIL 5–2
FALSE SUMP
(Not to Scale)



FROM STA. 21+78 TO STA. 22+09 –L– RT

1 HOPKINS, GREGORY B
DB 13004 PG 1677
PB 2007 PG 342

3 STOKES, MILLIS T JR
DB 17701 PG 1261
PB 1999 PG 1682

4 EARLEY, JEREMIAH J
EARLEY, LAUREN M
DB 16229 PG 575
PB 1999 PG 1682

5 ELSHAIKH, MAJED FUAD
SHAIKH, ISSA FAUD
DB 15929 PG 208
PBI998 PG328

6 POOLE ROAD HOLDINGS LLC
DB 16455 PG 2272
PBI996 PGII69

7 GBK I LLC
DB 17785 PG 2238

8 KIRK, CLARENCE M JR
KIRK, PHILIP G
DB 17233 PG 2128

9 KIRK, CLARENCE M JR
KIRK, PHILIP G
DB 17233 PG 2124

10 EDWARDS, BETTY W
JOHNSON, BILLIE W

11 JOHNSON, DOUGLAS LYNN
DB 11531 PG 2598

12 KIDD FARMS, LLC
DB 16520 PG 1378

16 GREENE, SAMUEL L
GREEN, IANTHA
DB 5083 PG 820
PB 1970 PG 207

CUR DATA -Y-
PIc 22+86.70
Δc = 01°20'50.3" (LT)
D = 02°59'59.9"
Lc = 44.91
Tc = 22.46
R = 1,909.88

CUR DATA -Y-
PIc 26+36.01
Δc = 05°15'16.3" (RT)
D = 01°27'18.5"
Lc = 361.10
Tc = 180.68
R = 3,937.45

-L- PC 26+51.19

-L- PT 28+49.41
BEARING AHEAD = S89°13'17.5"E

-L- POT 22+53.52 =
-Y- POT 22+26.74

-Y- PC 22+64.24

-Y- PT 23+09.15

-Y- PC 24+55.34

S 14°39'48.8"E

S 16°00'40.2"E

S 88°13'49.2"E

S 88°13'29" E
789.87'

S 88°31'41" E
210.18'

S 88°31'41" E
210.00'

S 01°28'19" W
210.01'

N 01°28'19" E
210.18'

S 05°36'19" E
233.97'

S 46°41'23" E
204.36'

S 11°27'26" W
66.46'

S 85°34'39" E
245.75'

102.87'

HL-0031
EC | 010

NORTH CAROLINA
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5/26/20

CUR DATA -L-
PIc 33+06.84
Δc = 05°15'09.2" (LT)
D = 01°26'51.3"
Lc = 362.85
Tc = 181.55
R = 3,958

NC GRID
NAD 83 NA 2011

30

-L- PC 31+25.29

-L- POE 34+88.14

MATCHLINE -L- STA. 29+00.00 SEE SHEET EC 010

7
GBK I LLC
DB 17785 PG 2238

WILLIAMS, KEVIN DAVID
WILLIAMS, DEBBIE ANNETTE
DB 16897 PG 2234

S 11°22'27" E
85.05'

N 00°36'09" W
300.14'

BM#4
ELEVATION=296.36'
BY STATION 27+61.00
51' LEFT
BENCHTIE IN 22" OAK

GUY

ETCHELLS, JAMES L
ETCHELLS, JUNE S
DB 2098 PG 261

DUCT

WOODS

LITTLE RIVER

2.69' RW

EIP

EIP EXISTING R/W

INNERDUCT

FO

BY1-108 30"DIP

30"DIP

TV FO

INNERDUCT -L-

S89°13'17.5"E

8"

EX.

RD (SR 1007) 23' PAVEMENT

8"

FO

PS

TC

EIP

EXISTING R/W

TIE TO
EXISTING DITCH

R/W

+62.26
EX. R/W
& 35' RT

CUT DITCH
SEE DETAIL 6-1

END 4" PS

720' TRANSITION RIGHT

+50
EX. R/W,
35' &
50' RT

RIPRAP EROSION CONTROL MAT

DECK

STAIRS

ISFD

72" WD

WOODS

JAMES L CRESIMORE & ASSOC LP
DB 12057 PG 2363
PB 2006 PG 1228

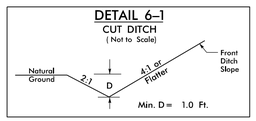
KIDD FARMS, LLC
DB 16520 PG 1378

12
KIDD FARMS, LLC
DB 16520 PG 1378

N 01°28'19" E
274.55'

S 89°15'30" E
80.27'

DETAIL 6-1
CUT DITCH
(Not to Scale)



FROM STA. 29+00 TO STA. 31+21 -L- RT

HL-0031
EC | 011

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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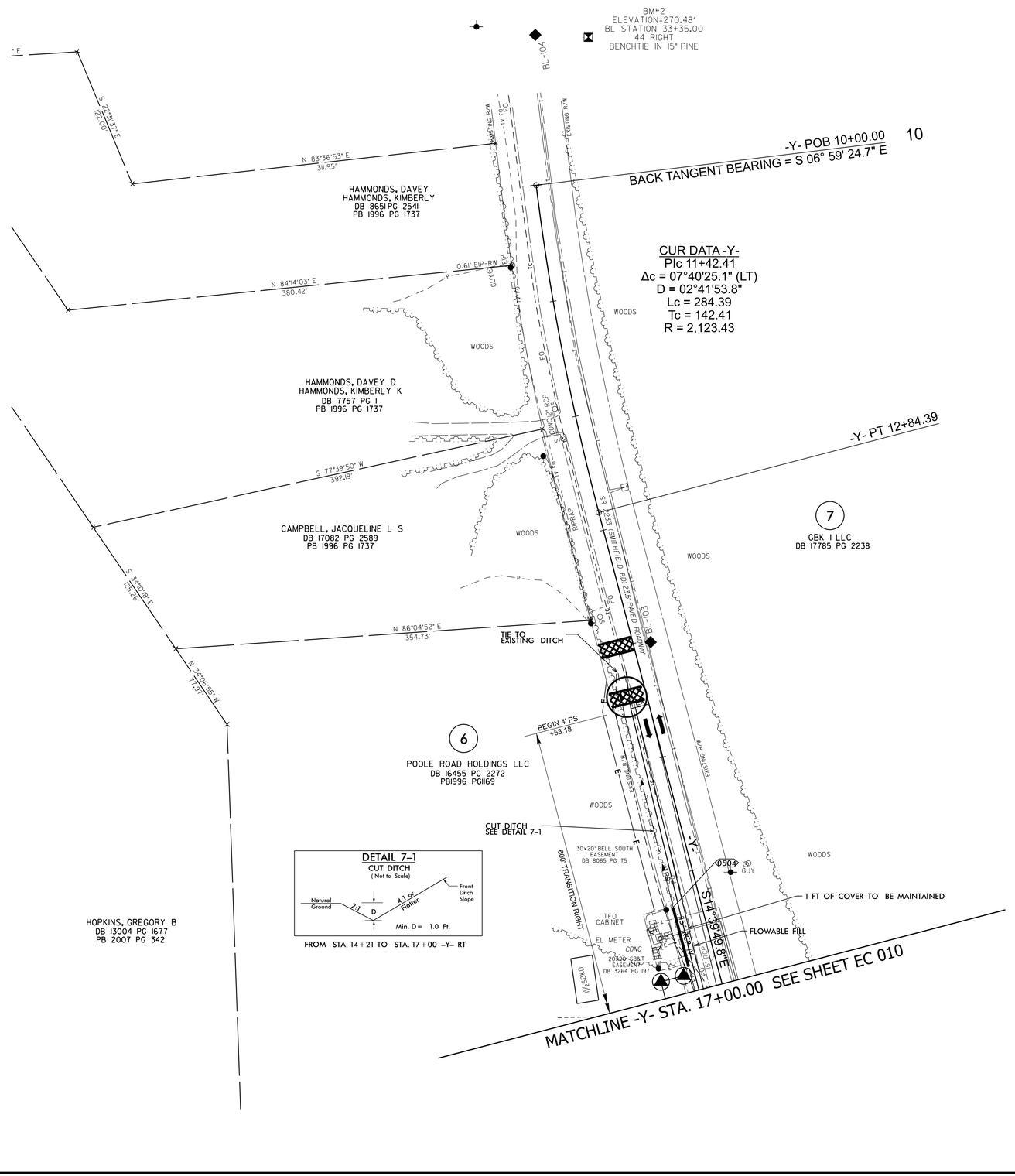
5/26/20



HL-0031

EC | 012

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5/26/20

MATCHLINE -Y- STA. 26+00.00 SEE SHEET EC 010

BM#1
ELEVATION=310.78'
BL STATION 15+85.00
118 LEFT
BENCHTIE IN 12" PINE

600' TRANSITION RIGHT

WOODS

GREENE, SAMUEL L
GREEN, IANTHA
DB 5083 PG 820
PB 1970 PG 207

5

ELSHAIKH, MAJED FUAD
SHAIKH, ISSA FAUD
DB 15929 PG 208
PB1998 PG328

DETAIL 8-1
CUT DITCH
(Not to Scale)

Natural Ground | 2:1 | D | 4:1 or Flatter | Front Ditch Slope

Min. D= 1.0 Ft.

FROM STA. 26+00 TO STA. 30+42 -Y- RT

CUT DITCH
SEE DETAIL 8-1

WATSON, WILLIAM P
WATSON, EDNA E
DB 1952 PG 675
PB 1970 PG 207

ISBKD

-Y- PT 28+16.44

14

LILES, DARYL R
LILES, DEREK W
DB 10559 PG 2511
PB 1999 PG 1682

EXISTING R/W

WOODS

30

MCCULLOUGH, ANNIE R
DB 1952 PG 673
PB 1970 PG 207

15

GRIMES, BRANTON T
GRIMES, AMY J
DB 9939 PG 1412
PB 1999 PG 1682

END 4" PS +10.46

DAVIS, REGINALD K JR
DAVIS, PATRICIA L
DB 14625 PG 1906
PB 1999 PG 1682

1½SFD

TIE TO EXISTING DITCH

8' BROKEN PAVEMENT

JONES, ROMUEL HEIRS
PB 1970 PG 207

ENCHANTED CREEK CIR.
VAR PAVED ROADWAY

NO UTILITY RECORD INFORMATION AS OF 03/08/21

CORONILLA, ALBA L
DB 15591PG 73
PB 1999 PG 1682

2SFD

GOOD HOPE MISSIONARY BAPTIST CHURCH
DB 16147 PG 601
PB 1977 PG 894

-Y- POE 34+68.91

S 10°45'23.9"E -Y-

S 88°31'41" E 210.00'

N 0°43'06" E 69.42'

N 0°43'06" E 131.33'

N 0°43'06" E 100.01'

N 0°43'06" E 46.42'

N 88°32'53" W 210.18'

N 0°43'06" E 170.03'

N 0°43'06" E 417.42'

N 88°29'07" W 197.35'

N 0°43'06" E 119.30'

N 0°43'06" E 439.29'

N 79°07'35" E 455.53'

N 79°07'14" E 433.83'

N 79°03'06" E 387.07'

S 79°03'06" W 361.30'

S 5°05'43" W 350.04'

N 61°49'24" E 217.61'

N 78°28'49" E 260.15'

N 84°30'48" W 294.13'

N 06°45'43" W 383.25'

S 82°23'3 (SMITHFIELD RD) 23' PAVED ROADWAY

NC GRID
NAD 83 NA 2011

CUR DATA -Y-
PIc 26+36.01
Δc = 05°15'16.3" (RT)
D = 01°27'18.5"
Lc = 361.10
Tc = 180.68
R = 3,937.45

HL-0031
EC | 013

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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09/08/99

PROJECT: HL-0031

CONTRACT: DE00381

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SIGNING PLAN
WAKE COUNTY

LOCATION: CONSTRUCT LEFT TURN LANES AT SR 1007 (POOLE ROAD) AND SR 2223 (SMITHFIELD ROAD) INTERSECTION

TIP NO.	SHEET NO.
HL-0031	SIGN-1

APPROVED: Signed by: Spencer W. Merritt 53AE60F8E5C84DF...

DATE: 8/13/2024

SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 053483 ENGINEER SPENCER W. MERRITT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GENERAL NOTES

SIGNS FURNISHED BY CONTRACTOR.

WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'D' AND 'E' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER.

WHEN EXISTING SIGNS ARE REMOVED AND INSTALLED ON NEW SUPPORTS, THE RE-ERECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL.

WHEN EXISTING SIGNS ARE REMOVED AND NEW SIGNS ARE INSTALLED ON EXISTING SUPPORTS, THE RE-ERECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL.

ANY SIGNS THAT ARE DAMAGED DURING CONSTRUCTION SHOULD BE REPLACED IN KIND.

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
901.70	SIGN STRINGERS AND SUPPORT SPACING
903.10	GROUND MOUNTED SIGN SUPPORTS
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POST

SUMMARY OF QUANTITIES

ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4025000000-E	901	Contractor Furnished, Type E Sign	52.5	SF
4072000000-E	903	Supports, 3-LB Steel U-Channel	105	LF
4102000000-N	904	Sign Erection, Type E	9	EA
4116100000-N	904	Sign Erection, Relocate Type D (Ground Mounted)	10	EA
4155000000-N	907	Disposal of Sign System, U-Channel	6	EA
4238000000-N	907	Disposal of Sign D, E or F	3	EA

PROJECT NOTES

1) SIGN ERECTION, TYPE E
2) SIGN ERECTION, RELOCATE TYPE D (GROUND MOUNTED)
3) DISPOSAL OF SIGN E
4) DISPOSAL OF SIGN SYSTEM, U-CHANNEL

Prepared In the Office of:

SUMMIT DESIGN AND ENGINEERING SERVICES FIRM NO. P-0339

320 Executive Ct.
Hillsborough, NC 27278-8551
Voice: (919) 732-3883
Fax: (919) 732-6776
www.summitde.com

SPENCER MERRITT, PE — PROJECT ENGINEER

JOSHUA JERNIGAN, EI — PROJECT DESIGNER

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

INDEX

SHEET NO.	DESCRIPTION
SIGN-1	GENERAL NOTES, PROJECT NOTES, PROJECT QUANTITIES, SHEET INDEX
SIGN-1A	E SHEET
SIGN-2 TO SIGN-6	SIGNING DETAIL SHEETS

Docusign Envelope ID: 567CD9BC-02C8-436A-869F-8EFD5A4227D8

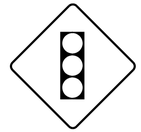
401 QUANTITY REQ'D 1

R2-1(D)
24" X 30"
ONE "U" POST PER SIGN

402 QUANTITY REQ'D 2

R2-1(E)
24" X 30"
ONE "U" POST PER SIGN

403 QUANTITY REQ'D 3



W3-3
30" X 30"
ONE "U" POST PER SIGN

404 QUANTITY REQ'D 3

W11-5
30" X 30"
ONE "U" POST PER SIGN

TIP NO.	SHEET NO.
HL-0031	SIGN-1A

APPROVED: Signed by: Spencer W. Merritt 53AE60F8E5C84DF...

DATE: 8/13/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 053483 ENGINEER SPENCER W. MERRITT

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NC FIRM LICENSE No: P-0339
320 Executive Ct.
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

TYPE "E" SIGNS

13-AUG-2024 09:04
Spencer.Merritt

DocuSign Envelope ID: A165E7D3-B91E-4537-AF67-B1682EE2F5A5

5/26/20

NAD
83/2011

10

BEGIN SIGNING TIP PROJECT HL-0031
-L- STA.12+60+/-

POOLE RD
(SR 1007)

-L-

MATCHLINE -L- STA. 15+00.00 SEE SIGN-3

HL-0031

SIGN-2

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

SEAL
10/30/2023

NORTH CAROLINA PROFESSIONAL SEAL 053483 ENGINEER SPENCER W. MERRITT

DocuSigned by:
Spencer W. Merritt

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Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

EXISTING AND PROPOSED SIGNS

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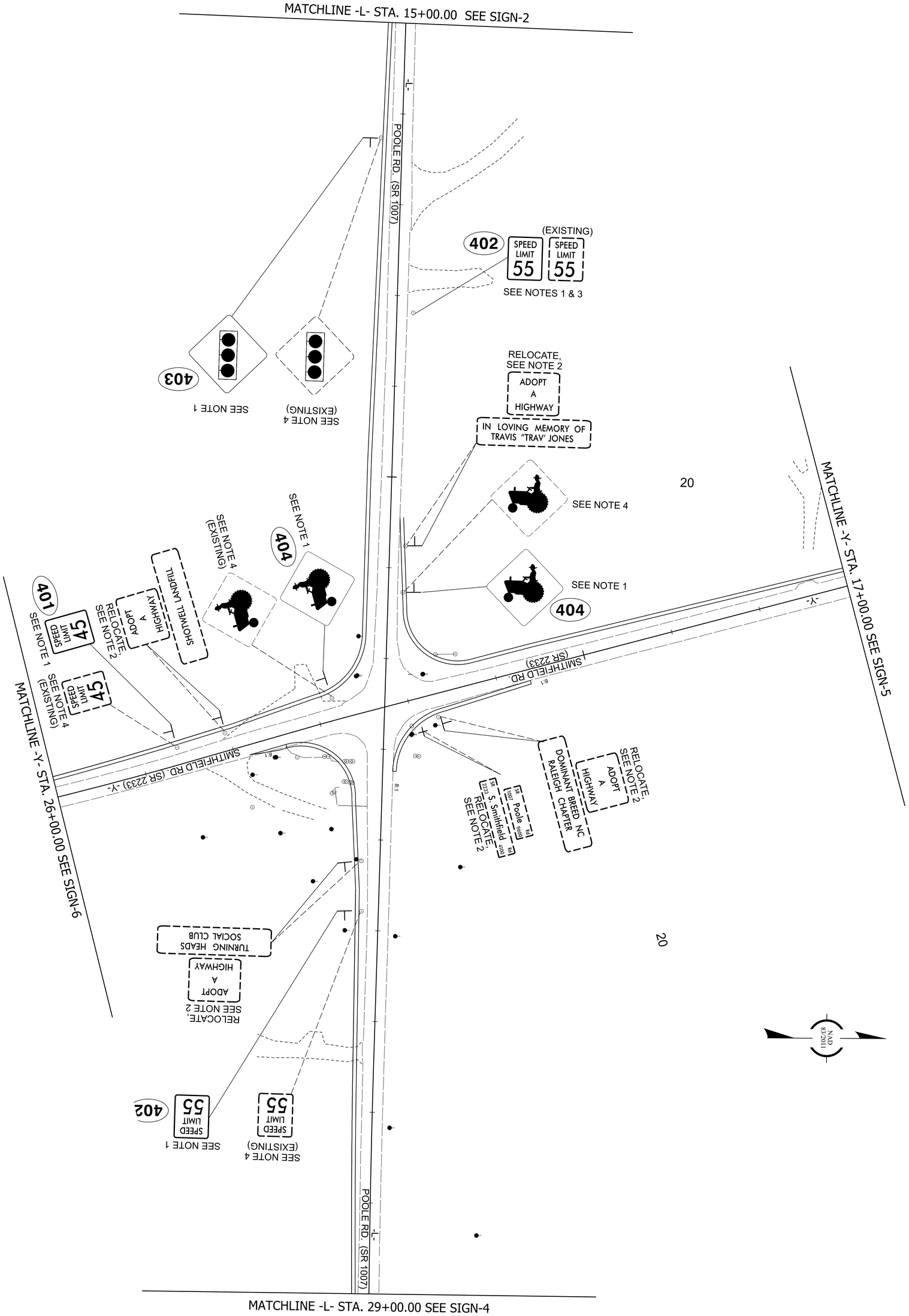

EXISTING AND PROPOSED SIGNS

PLANS PREPARED BY:
SUMMIT
NC FIRM LICENSE No: P-0339
1805 Bridgen Parkway, Suite 201
Hillsborough, NC 27278
(919) 732-3883
(919) 732-4676 (FAX)

10/25/2013

PROFESSIONAL ENGINEER
SEAL
053483
NORTH CAROLINA
JONATHAN W. LINEBERGER

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

HL-0031
SIGN-3

DocuSign Envelope ID: A165E7D3-B91E-4537-AF67-B1682EE2F5A5

5/26/20

30

MATCHLINE -L- STA. 29+00.00 SEE SIGN-3

-L-

POOLE RD. (SR 1007)

SEE NOTE 1

404

SEE NOTE 4 (EXISTING)

END SIGNING TIP PROJECT HL-0031
-L- STA.30+89+/-

NAD 83/2011

HL-0031

SIGN-4

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

SEAL
10/30/2023

NORTH CAROLINA PROFESSIONAL SEAL 053483 ENGINEER SPENCER W. MERRITT

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Spencer W. Merritt

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(919) 732-6676 (FAX)

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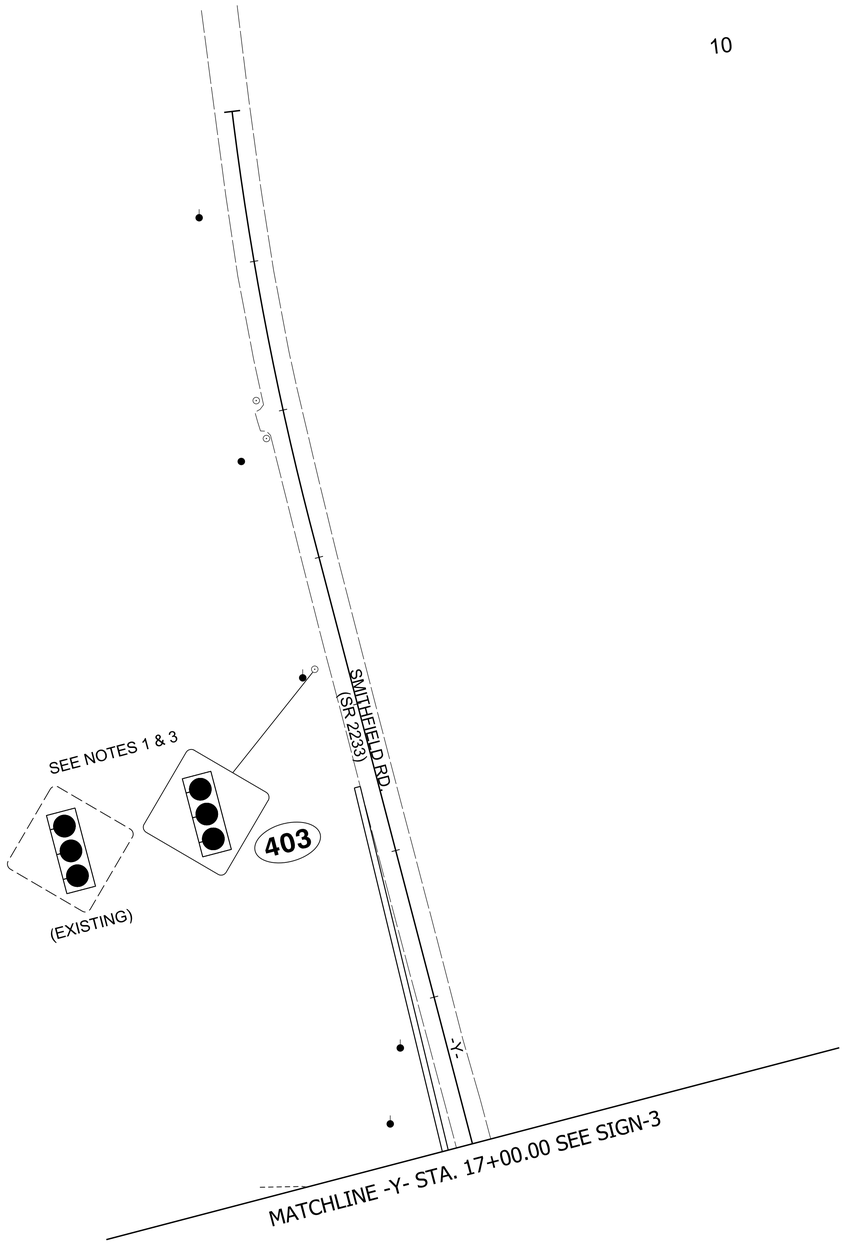

HL-0031

SIGN-5

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

SEAL
10/30/2023
NORTH CAROLINA PROFESSIONAL SEAL 053483 ENGINEER SPENCER W. MERRITT
DocuSigned by:
Spencer W. Merritt

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NC FIRM LICENSE No: P-0339
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Hillsborough, NC 27278
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(919) 732-6676 (FAX)

EXISTING AND PROPOSED SIGNS

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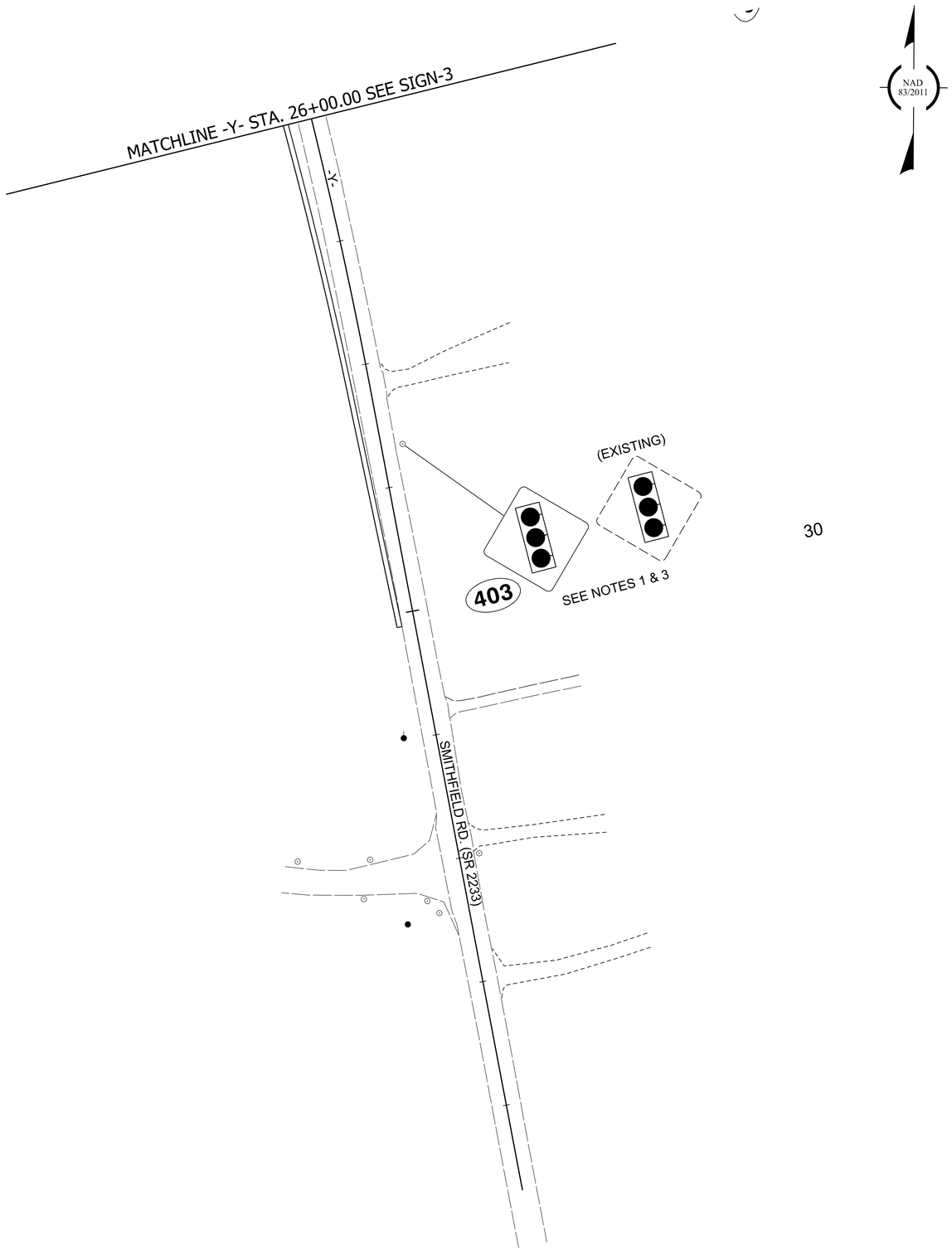
5/26/20



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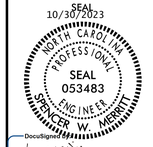
HL-0031

SIGN-6

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

SEAL
10/30/2023



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Spencer W. Merritt

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EXISTING AND PROPOSED SIGNS

Project No.	Sheet No.
HL–0031	Sig. 1.0

Project: HL–0031

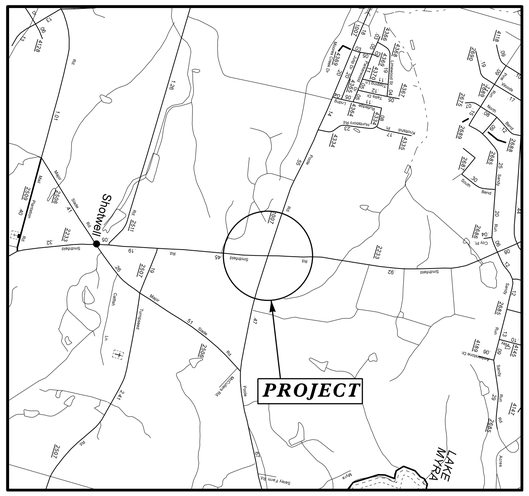
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

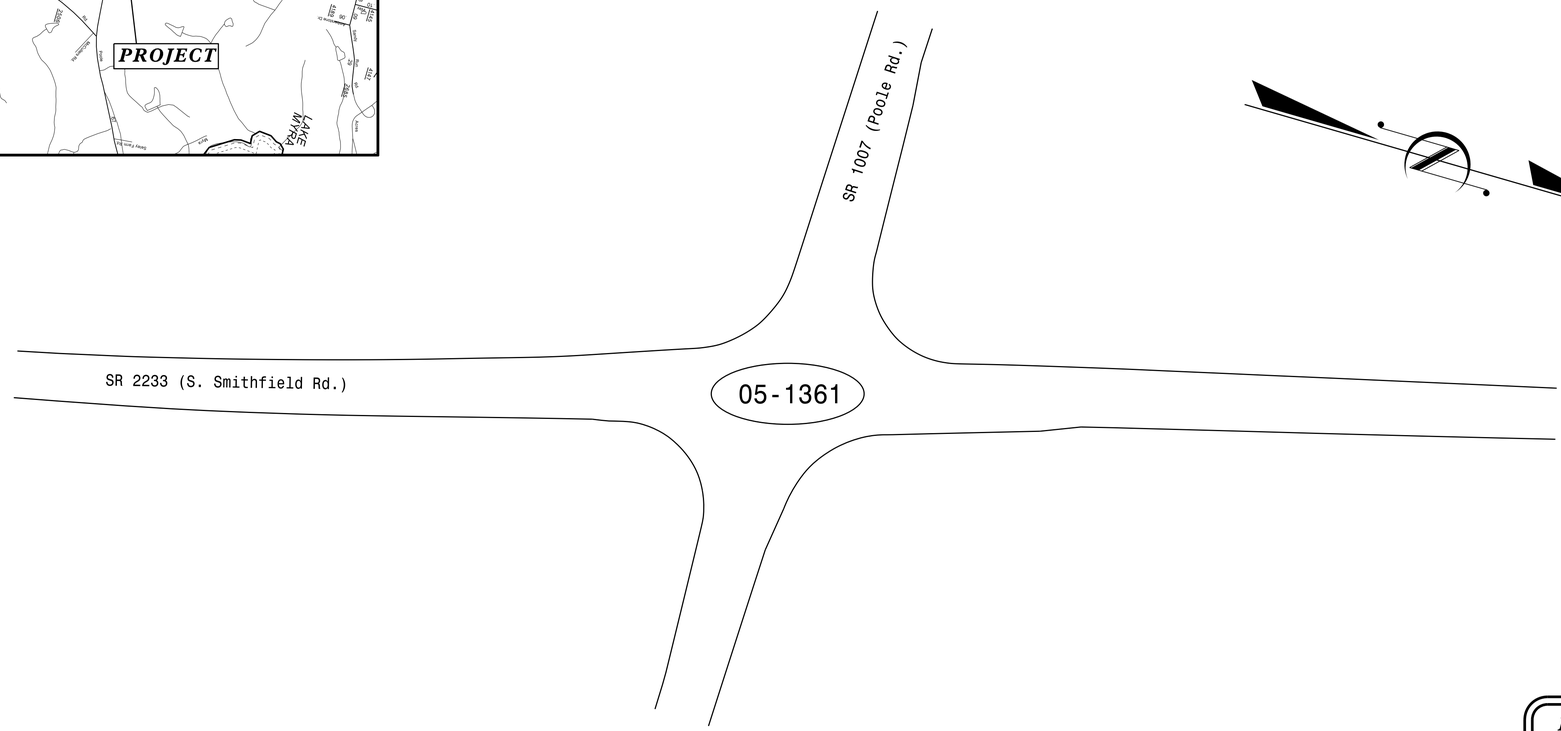
WAKE COUNTY

LOCATION: SR 2233 (SOUTH SMITHFIELD ROAD) AT SR 1007 (POOLE ROAD)

TYPE OF WORK: TRAFFIC SIGNALS

Vicinity





Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.

Index of Plans

Sheet #	Reference #	Location/Description
Sig. 1.0	--------	Title Sheet
Sig. 1.1	--------	Standard Plate Sheets
Sig 2.0–3.1	05–1361	SR 2233 (South Smithfield Road) at SR 1007 (Poole Road)

TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS

Contacts:

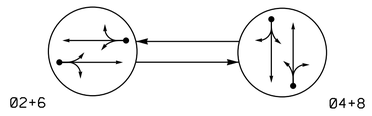
Robert J. Ziemba, PE – Central Region Signals Engineer
Ryan W. Hough, PE – Signal Equipment Design Engineer

Prepared In the Office of:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY & SAFETY DIVISION
TSMO UNIT
750 N. Greenfield Parkway, Garner, NC 27529

08-FEB-2023 05:19
C:\Users\jaziegler\Signals\Signal Design Section\Central Region\Div 5\05-1361\HL-0031_sig_tsh_20230208.dgn

PROJECT REFERENCE NO.	SHEET NO.
HL-0031	Sig 2.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

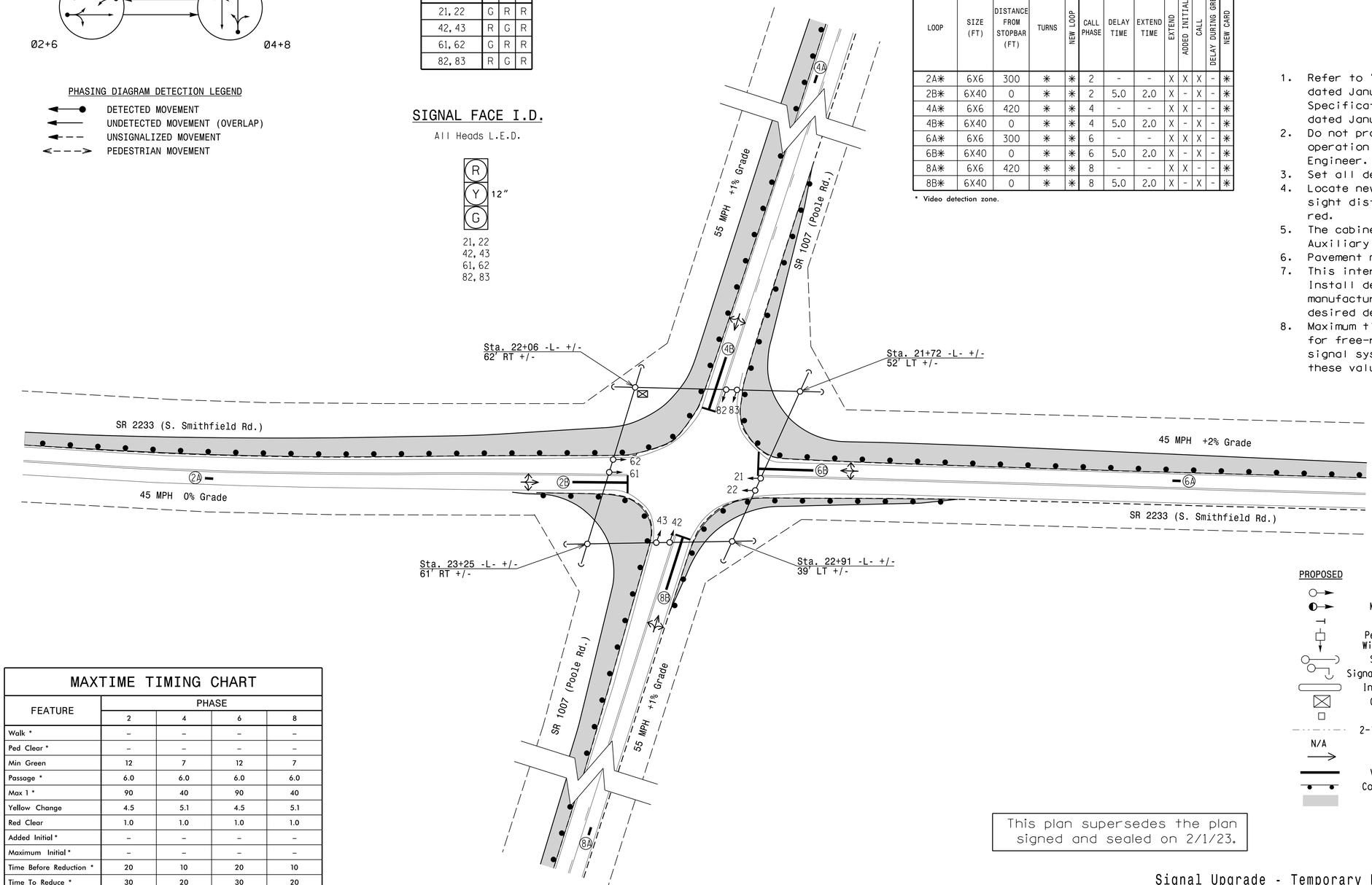
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE 02+6	PHASE 04+8	FLASH
21, 22	G	R	R
42, 43	R	G	R
61, 62	G	R	R
82, 83	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

21, 22
42, 43
61, 62
82, 83



MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A*	6X6	300	*	*	2	-	-	X	X	X	-	*
2B*	6X40	0	*	*	2	5.0	2.0	X	-	X	-	*
4A*	6X6	420	*	*	4	-	-	X	X	-	-	*
4B*	6X40	0	*	*	4	5.0	2.0	X	-	X	-	*
6A*	6X6	300	*	*	6	-	-	X	X	X	-	*
6B*	6X40	0	*	*	6	5.0	2.0	X	-	X	-	*
8A*	6X6	420	*	*	8	-	-	X	X	-	-	*
8B*	6X40	0	*	*	8	5.0	2.0	X	-	X	-	*

* Video detection zone.

2 Phase
Fully Actuated
(Knightdale Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. The cabinet should be designed to include an Auxiliary Output file for future use.
6. Pavement markings are existing.
7. This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Video Detection Area	
	Construction Zone Drums	
	Construction Zone	

MAXTIME TIMING CHART				
FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Walk *	–	–	–	–
Ped Clear *	–	–	–	–
Min Green	12	7	12	7
Passage *	6.0	6.0	6.0	6.0
Max 1 *	90	40	90	40
Yellow Change	4.5	5.1	4.5	5.1
Red Clear	1.0	1.0	1.0	1.0
Added Initial *	–	–	–	–
Maximum Initial *	–	–	–	–
Time Before Reduction *	20	10	20	10
Time To Reduce *	30	20	30	20
Minimum Gap	3.0	3.4	3.0	3.4
Advance Walk	–	–	–	–
Non Lock Detector	–	X	–	X
Vehicle Recall	MIN RECALL	–	MIN RECALL	–
Dual Entry	–	X	–	X

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

This plan supersedes the plan signed and sealed on 2/1/23.

Signal Upgrade - Temporary Design

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Prepared In the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 2233 (S. Smithfield Road) at SR 1007 (Poole Road)

Division 5 Wake County Knightdale

PLAN DATE: June 2024 REVIEWED BY:
PREPARED BY: J.A. Lohr REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026486 ROBERT J. ZIEMBA

DocuSigned by: Robert J. Ziemba 06/19/2024
DATE
1B0B4B6B274A494...

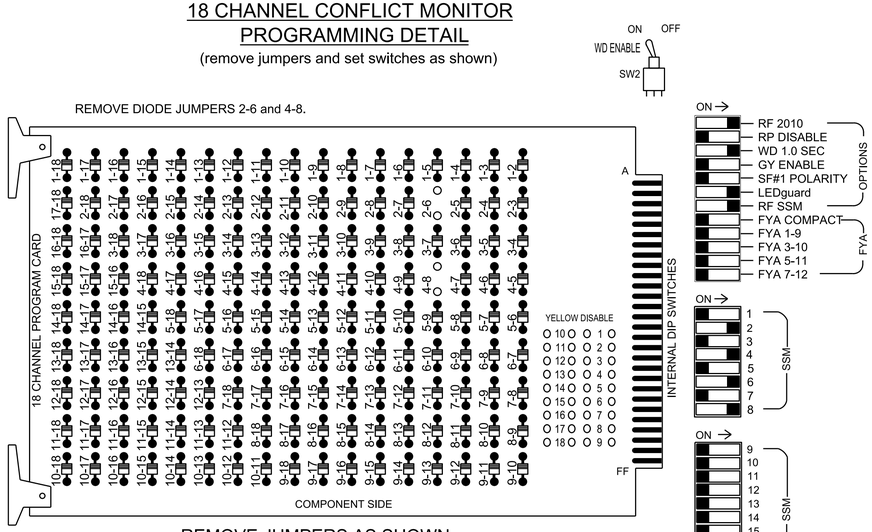
SIG. INVENTORY NO. 05-1361T

19-JUN-2024 14:50
w:\projects\roadway\Groups-TECC#1TS&SUs#ITS Signals#Signal Design Section#Central Region#Div 5#HL-0031 Poole @ Smithfield#05136lT_sig_dsn_20240617.dgn

PROJECT REFERENCE NO.	SHEET NO.
HL-0031	Sig. 2.1

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



■ = DENOTES POSITION OF SWITCH

REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that the Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	1O	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program phases 4 and 8 for Dual Entry.
3. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
4. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....18 With Aux. Output File
Load Switches Used.....S2, S5, S8, S11
Phases Used.....2, 4, 6, 8
Overlap "1".....NOT USED
Overlap "2".....NOT USED
Overlap "3".....NOT USED
Overlpa "4".....NOT USED

VIDEO DETECTION NOTE

Install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	42,43	NU	NU	61,62	NU	NU	82,83	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
FLASHING YELLOW ARROW																		
GREEN ARROW																		
✋																		
🚶																		

NU = Not Used

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channels Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 05-1361
DESIGNED: June 2024
SEALED: 6/19/2024
REVISED: N/A

This Plan Supersedes Electrical Detail Sealed on 2/2/2023

Electrical Detail - Temporary Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

SR 2233 (S. Smithfield Road)
at
SR 1007 (Poole Road)

Division 5 | Wake County | Knightdale

PLAN DATE: June 2024 | REVIEWED BY:
PREPARED BY: Zarrar Zafar | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ITS & Signals Management Section
750 N. Greenfield Pkwy, Garner, NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031001 ENGINEER D. TODD JOYCE

DocuSigned by: D. Todd Joyce A90CADFD8D824410 — 06/20/2024 DATE

SIG. INVENTORY NO. 05-1361T

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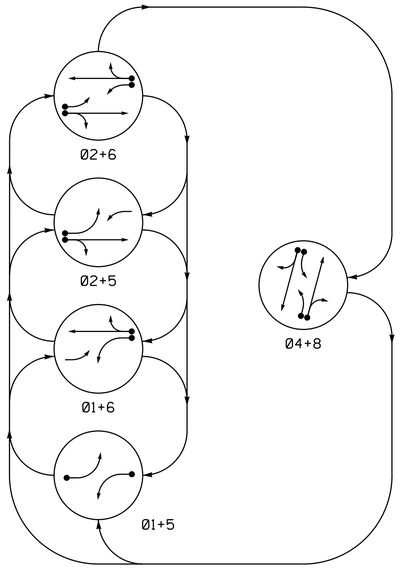
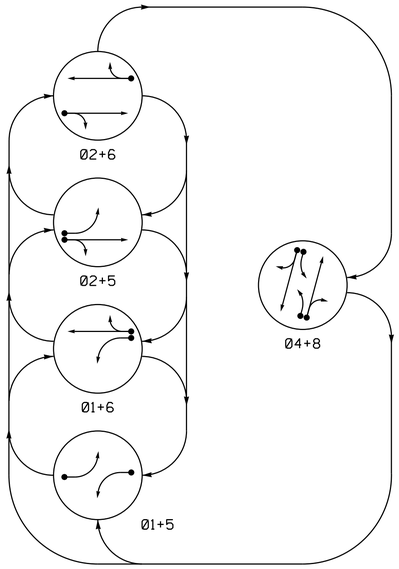
zzafar

PROJECT REFERENCE NO.	SHEET NO.
HL-0031	Sig 3.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
1A	6X40	0	2-4-2	X	1	15.0*	-	X	-	X	-	X
					6#	3.0	-	X	-	X	X	X
2A	6X6	300	6	X	2	-	-	X	X	X	-	X
4A	6X6	420	6	X	4	-	-	X	-	-	-	X
4B	6X40	0	2-4-2	X	4	3.0	-	X	-	X	-	X
4C	6X40	0	2-4-2	X	4	5.0	2.0	X	-	X	X	X
5A	6X40	0	2-4-2	X	5	15.0*	-	X	-	X	-	X
					2#	3.0	-	X	-	X	X	X
6A	6X6	300	6	X	6	-	-	X	X	X	-	X
8A	6X6	420	6	X	8	-	-	X	-	-	-	X
8B	6X40	0	2-4-2	X	8	3.0	-	X	-	X	-	X
8C	6X40	0	2-4-2	X	8	5.0	2.0	X	-	X	X	X

* Reduce Delay to 3.0 sec. During Alternate Phasing Operation.
\# Disable Phase Call For Loop(s) During Alternate Phasing Operation.

DEFAULT PHAISNG TABLE OF OPERATION

SIGNAL FACE	PHASE					
	01+05	01+06	02+05	02+06	04+08	FLASH
11	↚	↚	F/Y	F/Y	R̸	R̸
21, 22	R	R	G	G	R	R
41	R̸	R̸	R̸	R̸	F/Y	R̸
42, 43	R	R	R	R	G	R
51	↚	F/Y	↚	F/Y	R̸	R̸
61, 62	R	G	R	G	R	R
81	R̸	R̸	R̸	R̸	F/Y	R̸
82, 83	R	R	R	R	G	R

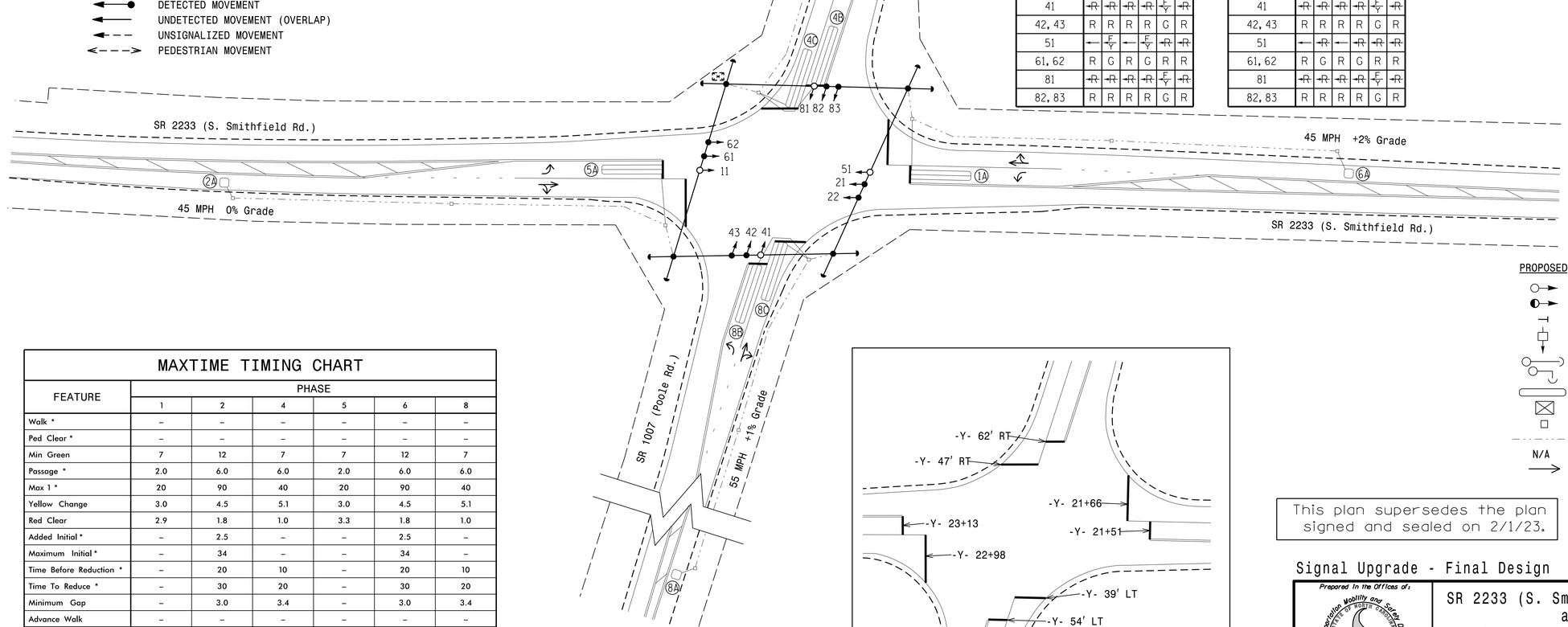
ALTERNATE PHAISNG TABLE OF OPERATION

SIGNAL FACE	PHASE					
	01+05	01+06	02+05	02+06	04+08	FLASH
11	↚	↚	R̸	R̸	R̸	R̸
21, 22	R	R	G	G	R	R
41	R̸	R̸	R̸	R̸	F/Y	R̸
42, 43	R	R	R	R	G	R
51	↚	R̸	↚	R̸	R̸	R̸
61, 62	R	G	R	G	R	R
81	R̸	R̸	R̸	R̸	F/Y	R̸
82, 83	R	R	R	R	G	R

5 Phase
Fully Actuated
(Knightdale Signal System)

NOTES

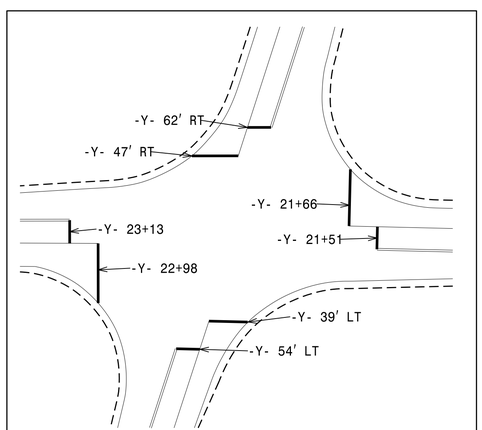
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Reposition all existing signal heads as shown.
5. Set all detector units to presence mode.
6. The Division Traffic Engineer will determine the hours of use for each phasing plan.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



MAXTIME TIMING CHART

FEATURE	PHASE					
	1	2	4	5	6	8
Walk *	–	–	–	–	–	–
Ped Clear *	–	–	–	–	–	–
Min Green	7	12	7	7	12	7
Passage *	2.0	6.0	6.0	2.0	6.0	6.0
Max 1 *	20	90	40	20	90	40
Yellow Change	3.0	4.5	5.1	3.0	4.5	5.1
Red Clear	2.9	1.8	1.0	3.3	1.8	1.0
Added Initial *	–	2.5	–	–	2.5	–
Maximum Initial *	–	34	–	–	34	–
Time Before Reduction *	–	20	10	–	20	10
Time To Reduce *	–	30	20	–	30	20
Minimum Gap	–	3.0	3.4	–	3.0	3.4
Advance Walk	–	–	–	–	–	–
Non Lock Detector	X	–	X	X	–	X
Vehicle Recall	–	MIN RECALL	–	–	MIN RECALL	–
Dual Entry	–	–	X	–	–	X

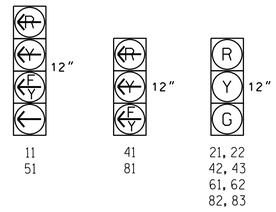
* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



PROPOSED STOP LINE LOCATIONS

SIGNAL FACE I.D.

All Heads L.E.D.



11
51

41
81

21, 22
42, 43
61, 62
82, 83

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▭↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⛶
□	Junction Box	■
·····	2-in Underground Conduit	·····
N/A	Right of Way	– – – –
→	Directional Arrow	→

This plan supersedes the plan signed and sealed on 2/1/23.

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 2233 (S. Smithfield Road)
at
SR 1007 (Poole Road)

Division 5 Wake County Knightdale

PLAN DATE: June 2024 REVIEWED BY:
PREPARED BY: J.A. Lohr REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
DocuSigned by: Robert J Ziemba 06/19/2024
DATE

SIG. INVENTORY NO. 05-1361

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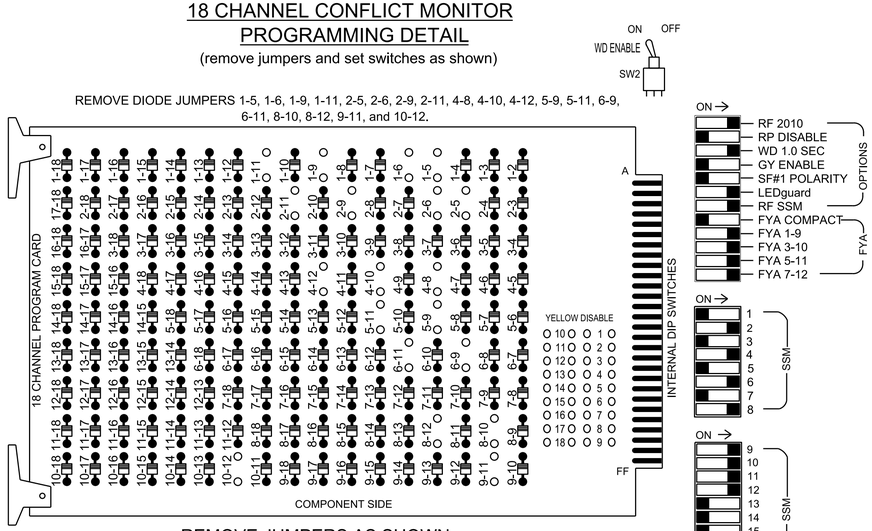
PROJECT REFERENCE NO.	SHEET NO.
HL-0031	Sig. 3.1

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



■ = DENOTES POSITION OF SWITCH

REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that the Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

INPUT FILE POSITION LAYOUT

(front view)

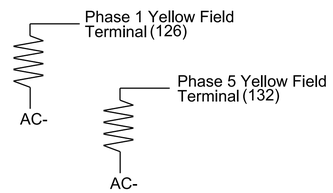
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø 1 1A	ø 2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø 4 4A	ø 4 4C	ø 4 4B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	NOT USED					NOT USED							ST DC ISOLATOR
FILE "J"	U	ø 5 5A	ø 6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø 8 8A	ø 8 8C	ø 8 8B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED					NOT USED							

EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)



ACCEPTABLE VALUES	
Value (ohms)	Wattage
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program phases 4 and 8 for Dual Entry.
3. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
4. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....18 With Aux. Output File
Load Switches Used.....S1, S2, S5, S7, S8, S11, AUX S1, AUX S2, AUX S4, AUX S5
Phases Used.....1, 2, 4, 5, 6, 8
Overlap "1".....*
Overlap "2".....*
Overlap "3".....*
Overlpa "4".....*

*See overlap programming detail on sheet 2

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters	
StartUp Clearance Hold	
6	

Unit Flash Parameters	
All Red Flash Exit Time	
6	

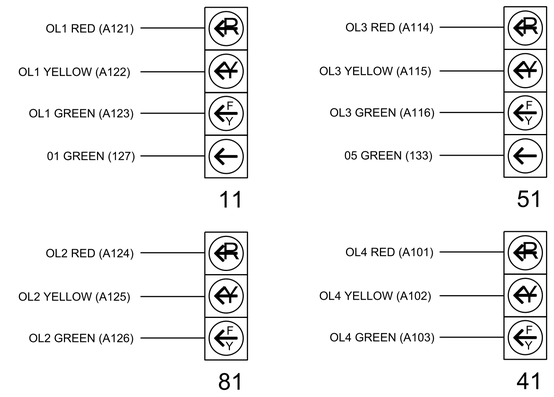
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11★	21,22	NU	NU	42,43	NU	51★	61,62	NU	NU	82,83	NU	11★	81★	NU	51★	41★	NU
RED		128			101			134			107							
YELLOW	*	129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114	A101	
YELLOW ARROW													A122	A125		A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW	127						133											
✋																		
🚶																		

NU = Not Used
* Denotes install load resistor. See load resistor installation detail this sheet.
★See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1 ★	1	15		X		X	
				-	29 ★	6	3		X		X	X
2A	TB2-5,6	I2U	39	1	2	2			X	X	X	
4A	TB4-9,10	I6U	41	3	8	4			X			
4B	TB4-11,12	I6L	45	7	9	4	3		X		X	
4C	TB6-1,2	I7U	65	31	10	4	5	2.0	X		X	X
5A	TB3-1,2	J1U	55	17	15 ★	5	15		X		X	
				-	31 ★	2	3		X		X	X
6A	TB3-5,6	J2U	40	2	16	6			X	X	X	
8A	TB5-9,10	J6U	42	4	22	8			X			
8B	TB5-11,12	J6L	46	8	23	8	3		X		X	
8C	TB7-1,2	J7U	66	32	24	8	5	2.0	X		X	X

★ For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 2.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

This Plan Supersedes Electrical Detail Sealed on 2/2/2023

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-1361
DESIGNED: June 2024
SEALED: 6/19/2024
REVISED: N/A

Electrical Detail - Final Design - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Traffic Signal & Signals Management Section
750 N. Greenfield Pkwy, Garner, NC 27529

SR 2233 (S. Smithfield Road)
at
SR 1007 (Poole Road)

Division 5 | Wake County | Knightdale

PLAN DATE:	June 2024	REVIEWED BY:	
PREPARED BY:	Zarrar Zafar	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031001 ENGINEER D. TODD JOYCE

DocuSigned by: D. Todd Joyce 06/20/2024
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SIG. INVENTORY NO. 05-1361

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zzafar

PROJECT REFERENCE NO.	SHEET NO.
HL-0031	Sig. 3.2

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	2	4	6	8
Modifier Phases	1		5	
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	-	4	-	8
Modifier Phases	1		5	
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

← NOTICE INCLUDED PHASE

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOPS 1A & 5A

Front Panel
Main Menu >Controller >Detector >Veh Det Plans

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

Plan 2

1A

Detector	Call Phase	Delay
1	1	3
29	0	-

5A

Detector	Call Phase	Delay
15	5	-
31	0	3

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2.
A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

PHASING	OVERLAP PLAN	VEH DET PLAN
ACTIVE PLAN REQUIRED TO RUN DEFAULT PHASING	1	1
ACTIVE PLAN REQUIRED TO RUN ALTERNATE PHASING	2	2

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAP PLAN 2: Modifies overlap included phases for heads 11 and 51 to run protected turns only.

VEH DET PLAN 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

* The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

This Plan Supersedes Electrical Detail Sealed on 2/2/2023

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 05-1361
DESIGNED: June 2024
SEALED: 6/19/2024
REVISED: N/A

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channels Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

Electrical Detail - Final Design - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering & Signals Management Section

750 N. Greenfield Pkwy, Garner, NC 27529

SR 2233 (S. Smithfield Road)
at
SR 1007 (Poole Road)

Division 5 | Wake County | Knightdale

PLAN DATE: June 2024 | REVIEWED BY:
PREPARED BY: Zarrar Zafar | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031001 ENGINEER D. TODD JOYCE

DocuSigned by: D. Todd Joyce 06/20/2024
DATE

SIG. INVENTORY NO. 05-1361

20-JUN-2024 14:14
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zzafar

PROJECT REFERENCE NO.	SHEET NO.
HL-0031	SCP-1

1. INSTALL COAX CABLE
2. INSTALL ETHERNET CABLE
3. EXISTING ETHERNET (OR COAX) CABLE
4. INSTALL SMFO CABLE
5. EXISTING SMFO CABLE
6. INSTALL FIBER OPTIC DROP CABLE
7. INSTALL TRACER WIRE
8. TRENCH
9. INSTALL PVC CONDUIT
10. INSTALL RIGID, GALVANIZED STEEL CONDUIT
11. INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD
12. INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL
13. INSTALL OUTER–DUCT POLYETHYLENE CONDUIT
14. INSTALL POLYETHYLENE CONDUIT
15. DIRECTIONAL DRILL CONDUIT
16. BORE AND JACK CONDUIT
17. INSTALL CABLE(S) IN EXISTING CONDUIT
18. INSTALL CABLE(S) IN NEW CONDUIT
19. INSTALL CABLE(S) IN EXISTING RISER
20. INSTALL CABLE(S) IN NEW RISER
21. INSTALL CABLE(S) IN EXISTING CONDUIT STUB–OUTS
22. INSTALL NEW CONDUIT INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB–OUTS WHEN AVAILABLE)
23. INSTALL NEW RISER INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB–OUTS WHEN AVAILABLE)
24. INSTALL NEW CONDUIT INTO EXISTING POLE MOUNTED CABINET
25. INSTALL NEW RISER INTO EXISTING POLE MOUNTED CABINET
26. INSTALL NEW ETHERNET EDGE SWITCH
27. INSTALL NEW FIBER OPTIC TRANSCEIVER
28. INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS AND FUSION SPLICE CABLE IN CABINET
29. INSTALL UNDERGROUND SPLICE ENCLOSURE
30. INSTALL AERIAL SPLICE ENCLOSURE
31. MODIFY EXISTING INTERCONNECT CENTER /SPLICE ENCLOSURE
32. INSTALL POLE MOUNTED SPLICE CABINET
33. INSTALL BASE MOUNTED SPLICE CABINET
34. INSTALL CABINET FOUNDATION
35. INSTALL CCTV CAMERA POLE MOUNTED CABINET
36. INSTALL CCTV CAMERA ASSEMBLY
37. INSTALL CCTV CAMERA WOOD POLE
38. INSTALL CCTV CAMERA METAL POLE AND FOUNDATION
39. INSTALL JUNCTION BOX
40A. INSTALL OVERSIZED JUNCTION BOX
40B. INSTALL SPECIAL OVERSIZED JUNCTION BOX (36" x 24" x 24")
41. REMOVE EXISTING JUNCTION BOX
42. INSTALL WOOD POLE
43. REMOVE EXISTING WOOD POLE
44. INSTALL AERIAL GUY ASSEMBLY
45. INSTALL STANDARD GUY ASSEMBLY
46. INSTALL SIDEWALK GUY ASSEMBLY
47. INSTALL MESSENGER CABLE
48A. REMOVE EXISTING COMMUNICATIONS AND MESSENGER CABLE
48B. REMOVE EXISTING COMMUNICATIONS CABLE
49. BACK PULL EXISTING COMMUNICATIONS CABLE
50. INSTALL CELL MODEM AND ANTENNA
51. INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
52A. INSTALL DELINEATOR MARKER
52B. INSTALL JUNCTION BOX MARKER
53A. STORE 20 FEET OF COMMUNICATIONS CABLE
53B. STORE 50 FEET OF EACH COMMUNICATIONS CABLE
54. LASH CABLE(S) TO EXISTING COMMUNICATIONS CABLE
55. LASH CABLE(S) TO EXISTING MESSENGER CABLE
56. LASH CABLE(S) TO NEW MESSENGER CABLE
57. MODIFY EXISTING ELECTRICAL SERVICE
58. INSTALL NEW ELECTRICAL SERVICE
59. INSTALL NEW EQUIPMENT CABINET DISCONNECT
60. BOND TRACER WIRE TO EQUIPMENT GROUND BUS
61. DO NOT BOND TRACER WIRE TO EQUIPMENT GROUND BUS
62. BOND RISER AND MESSENGER CABLE TO POLE GROUND
63. BOND RISER TO POLE GROUND
64. BOND MESSENGER CABLE TO POLE GROUND
65. INSTALL HEAT SHRINK TUBING RETROFIT KIT
66. INSTALL MOLDABLE DUCT SEAL
67. SLACK SPAN

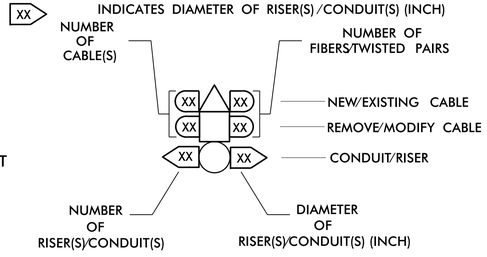
LEGEND

- FO — NEW FIBER OPTIC COMMUNICATIONS CABLE
- EXI — EXISTING COMMUNICATIONS CABLE
- REM — EXISTING COMMUNICATIONS CABLE TO BE REMOVED
- NEW AERIAL GUY ASSEMBLY
- NEW CONDUIT
- EXISTING CONDUIT
- DD — NEW DIRECTIONAL DRILLED CONDUIT

NEW		EXISTING
	OVERSIZED JUNCTION BOX	
	WOOD POLE	
S	AERIAL SPLICE ENCLOSURE	S
S	UNDERGROUND SPLICE ENCLOSURE	S
	METAL POLE	
	CCTV ASSEMBLY	
	STANDARD GUY ASSEMBLY	
	SIDEWALK GUY ASSEMBLY	
	CABLE STORAGE RACKS (SNOW SHOES)	
	SIGNAL/EQUIPMENT CABINET	
S	SPLICE CABINET	S
	FLAT PANEL ANTENNA (SINGLE)	
	YAGI ANTENNA (DOUBLE) FOR REPEATER OPERATION	
	YAGI ANTENNA (SINGLE)	
	OMNI ANTENNA	
SP	SIGNAL POLE	SP
XX–XXXX	SIGNAL INVENTORY NUMBER	XX–XXXX

CONSTRUCTION NOTE SYMBOLOGY KEY

- (XX) INDICATES NUMBER OF CABLES, LOOPS, ETC.
- (XX) INDICATES NUMBER OF FIBERS PER CABLE, TWISTED PAIRS PER CABLE, ETC.
- <XX> INDICATES NUMBER OF RISER(S)/CONDUIT(S)
- <XX> INDICATES DIAMETER OF RISER(S)/CONDUIT(S) (INCH)



ATTACHMENT POINT:

- XX"/SS / YYY — DISTANCE ABOVE (IN)/ATTACHMENT POINT REFERENCE POINT
- YYY / XX"/SS — REFERENCE POINT DISTANCE BELOW (IN)/ATTACHMENT POINT

"SS"	REFERENCE LOCATION
FS =	FRONT SIDE OF POLE
BS =	BACK SIDE OF POLE

Temp. Phase 1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Offices of:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION Transportation Mobility and Safety Division Traffic Engineering Branch

750 N. Greenfield Pkwy., Garner, NC 27529

CONSTRUCTION NOTES

Division 5 Wake County Knightdale

PLAN DATE: October 2024 REVIEWED BY: DocuSigned by: Greg Error

PREPARED BY: A. COOL INITIALS DATE

REVISIONS

SEAL NORTH CAROLINA PROFESSIONAL SEAL 046152 ENGINEER ALEX D. STEWART

Docusigned by: Alex D. Stewart 10/04/2024

SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
HL-0031	SCP-2

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION 5 TRAFFIC ENGINEER AT (919)220-4600 TO ARRANGE FOR THE DIVISION TO PROGRAM THE NEW FIELD ETHERNET SWITCHES WITH THE NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK AND VLAN ID INFORMATION. NOTIFY THE TRAFFIC ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.

2.A. BREAK EXISTING SPLICES ON ALL THREE EXISTING 24-FIBER CABLES AT THE EXISTING SPLICE ENCLOSURE. BACK PULL ONE (1) 24-FIBER CABLE TO POLE #82N71 TO THE WEST. REROUTE THIS CABLE BACK TO THE NEW SPLICE ENCLOSURE INSTALLED NEAR THE SIGNAL CABINET.

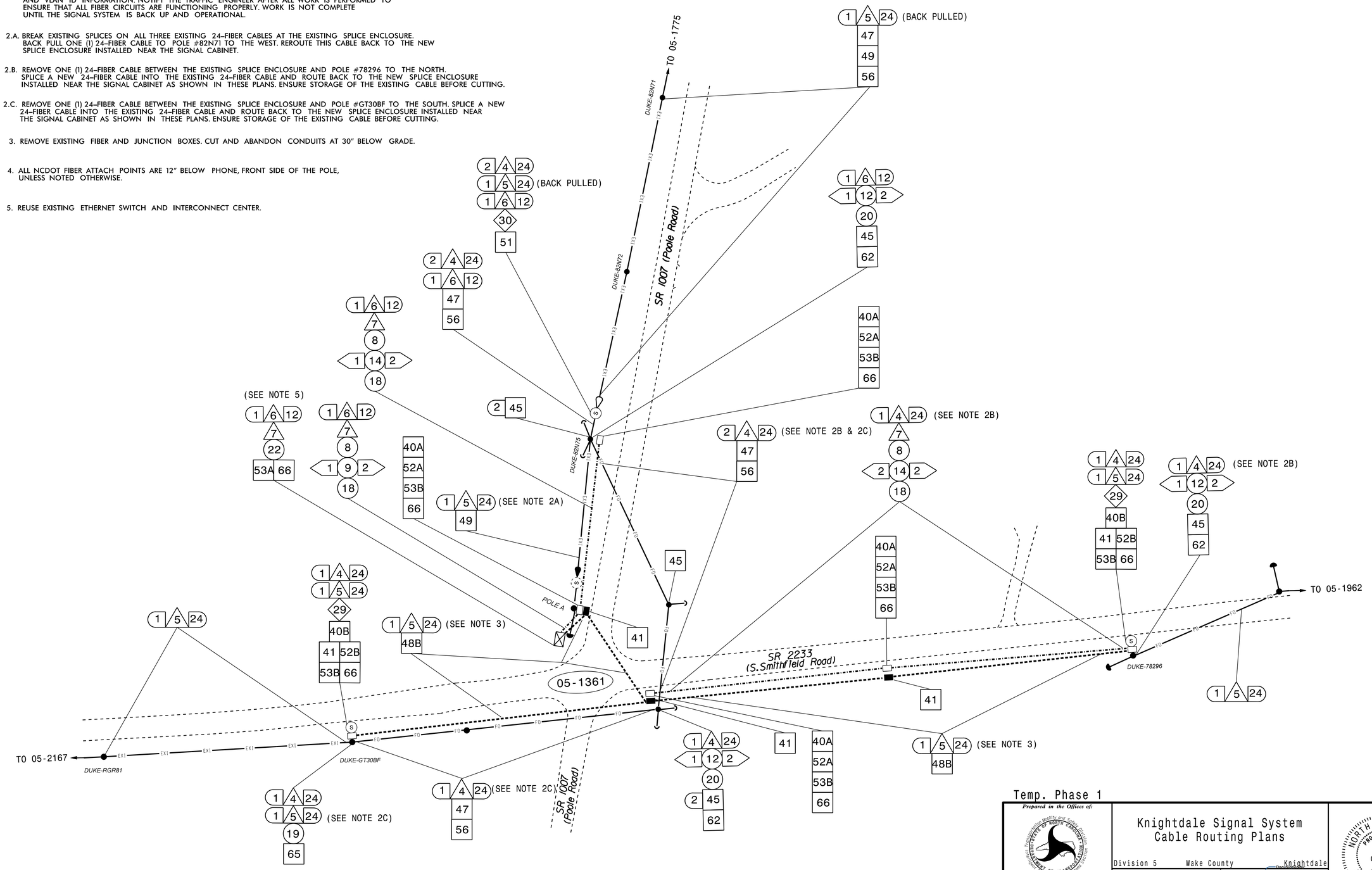
2.B. REMOVE ONE (1) 24-FIBER CABLE BETWEEN THE EXISTING SPLICE ENCLOSURE AND POLE #78296 TO THE NORTH. SPLICE A NEW 24-FIBER CABLE INTO THE EXISTING 24-FIBER CABLE AND ROUTE BACK TO THE NEW SPLICE ENCLOSURE INSTALLED NEAR THE SIGNAL CABINET AS SHOWN IN THESE PLANS. ENSURE STORAGE OF THE EXISTING CABLE BEFORE CUTTING.

2.C. REMOVE ONE (1) 24-FIBER CABLE BETWEEN THE EXISTING SPLICE ENCLOSURE AND POLE #GT30BF TO THE SOUTH. SPLICE A NEW 24-FIBER CABLE INTO THE EXISTING 24-FIBER CABLE AND ROUTE BACK TO THE NEW SPLICE ENCLOSURE INSTALLED NEAR THE SIGNAL CABINET AS SHOWN IN THESE PLANS. ENSURE STORAGE OF THE EXISTING CABLE BEFORE CUTTING.

3. REMOVE EXISTING FIBER AND JUNCTION BOXES. CUT AND ABANDON CONDUITS AT 30" BELOW GRADE.

4. ALL NCDOT FIBER ATTACH POINTS ARE 12" BELOW PHONE, FRONT SIDE OF THE POLE, UNLESS NOTED OTHERWISE.

5. REUSE EXISTING ETHERNET SWITCH AND INTERCONNECT CENTER.



Temp. Phase 1

Prepared in the Offices of:

750 N. Greenfield Pkwy., Garner, NC 27529

SCALE 0 NA

Knightdale Signal System Cable Routing Plans

Division 5 Wake County Knightdale

PLAN DATE:	October 2024	REVIEWED BY:	Greg Grin.
PREPARED BY:	A. COOL	REVIEWED BY:	09F8BBEF705A4FA...

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL 046152
ENGINEER
ALEX D. STEWART

DocuSigned by: Alex D. Stewart 10/04/2024
SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
HL-0031	SCP-3

U/G SPLICE ENCLOSURE SOUTH OF DROP AT SR 2233 (S. SMITHFIELD RD.) AND SR 1007 (POOLE RD.) SIG ID 05–1361

COLOR CODE TIA/EIA 598-C

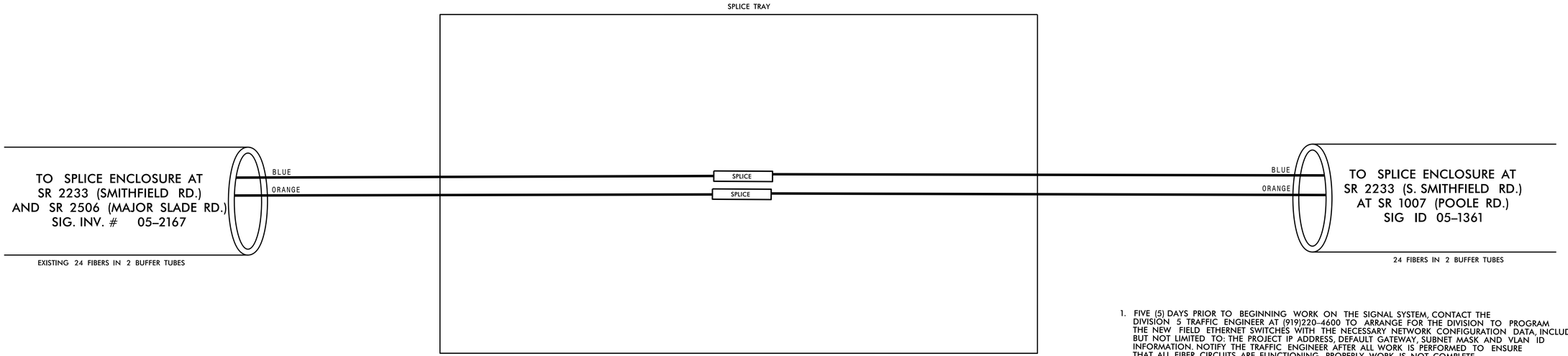
(1) BLUE	(7) RED
(2) ORANGE	(8) BLACK
(3) GREEN	(9) YELLOW
(4) BROWN	(10) VIOLET
(5) SLATE	(11) ROSE
(6) WHITE	(12) AQUA

LEGEND

X – FUSION SPLICE
C – CAP IN TRAY

EXPRESS	EXPRESS ENTIRE BUFFER TUBE
SPLICE	SPLICE ENTIRE BUFFER TUBE
EXISTING	MAINTAIN EXISTING SPLICE OR EXPRESSED BUFFER TUBE

NOTES:
1. UNUSED FIBERS LEFT COILED AND STORED IN SPLICE TRAY.
2. UNUSED BUFFER TUBES LEFT COILED AND STORED IN SPLICE TRAY.



1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION 5 TRAFFIC ENGINEER AT (919)220–4600 TO ARRANGE FOR THE DIVISION TO PROGRAM THE NEW FIELD ETHERNET SWITCHES WITH THE NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK AND VLAN ID INFORMATION. NOTIFY THE TRAFFIC ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL

2. CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE DETAILS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS-BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.

3. ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING \ ENSURING PROPER TERMINATIONS.

4. INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING: REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"

   1) SPLICE LOCATION
   2) DATE
   3) COMPANY NAME
   4) NAME OF INDIVIDUAL PERFORMING THE SPLICING

   PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1–4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

Temp. Phase 1

Prepared in the Offices of:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION – Transportation Mobility and Safety Division – Traffic Engineering Branch

750 N. Greenfield Pkwy., Garner, NC 27529

Knightdale Signal System
Splice Detail

Division 5 Wake County Knightdale

PLAN DATE: October 2024 REVIEWED BY: Greg Green
PREPARED BY: A. COOL REVIEWED BY: 99F88BEF705AAFA...

SCALE 0 NA

REVISIONS	INIT.	DATE

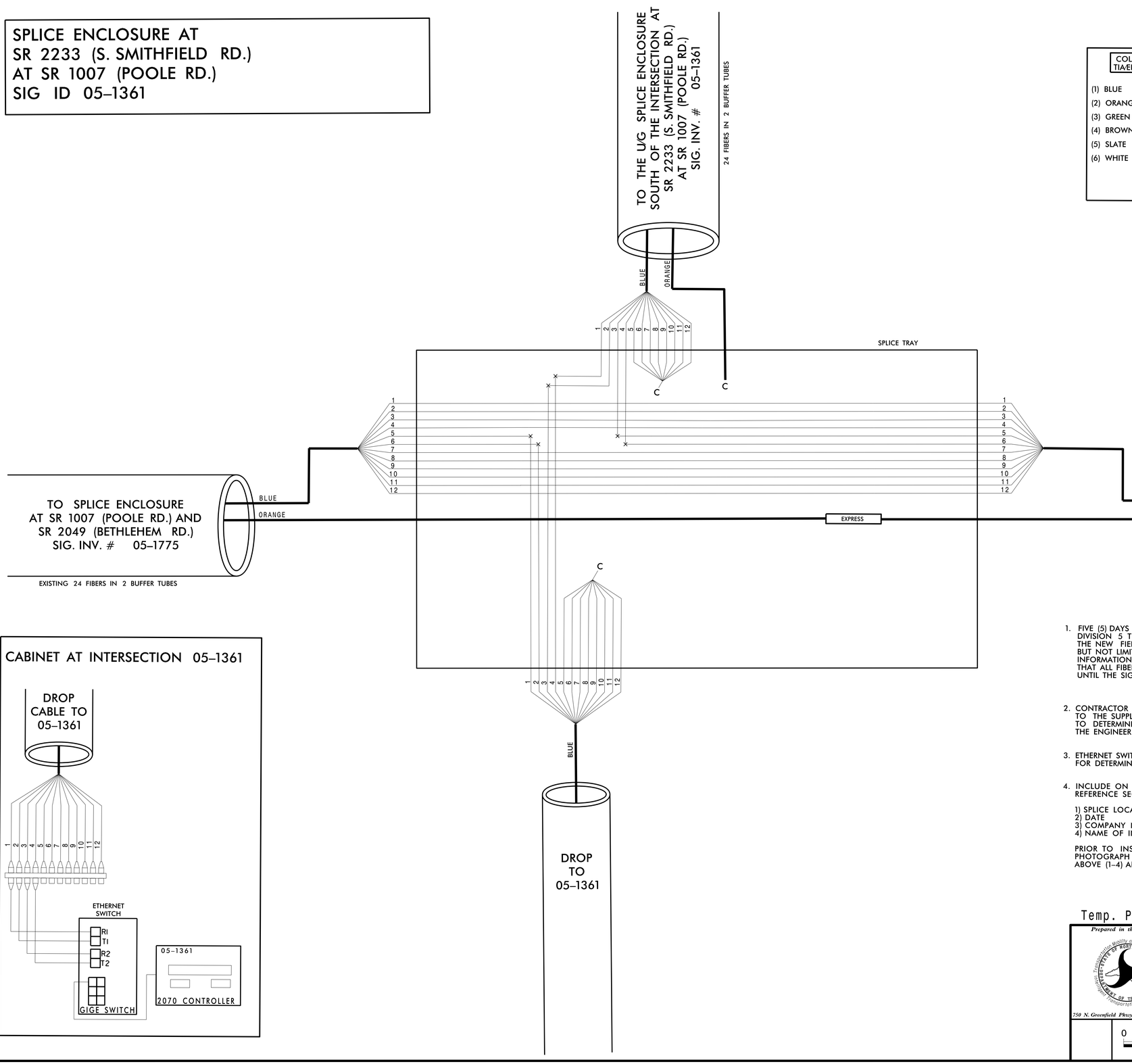
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 046152 ENGINEER ALEXI D. STEWART

Docusigned by: Alexi D. Stewart 10/04/2024
SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
HL-0031	SCP-4

SPLICE ENCLOSURE AT SR 2233 (S. SMITHFIELD RD.) AT SR 1007 (POOLE RD.) SIG ID 05–1361



TO SPLICE ENCLOSURE AT SR 1007 (POOLE RD.) AND SR 2049 (BETHLEHEM RD.) SIG. INV. # 05–1775

EXISTING 24 FIBERS IN 2 BUFFER TUBES

TO U/G SPLICE ENCLOSURE NORTH OF THE INTERSECTION AT SR 2233 (S. SMITHFIELD RD.) AND SR 1007 (POOLE RD.) SIG ID 05–1361

24 FIBERS IN 2 BUFFER TUBES

COLOR CODE TIA/EIA 598–C	
(1) BLUE	(7) RED
(2) ORANGE	(8) BLACK
(3) GREEN	(9) YELLOW
(4) BROWN	(10) VIOLET
(5) SLATE	(11) ROSE
(6) WHITE	(12) AQUA

LEGEND

X – FUSION SPLICE
C – CAP IN TRAY

EXPRESS	EXPRESS ENTIRE BUFFER TUBE
SPLICE	SPLICE ENTIRE BUFFER TUBE
EXISTING	MAINTAIN EXISTING SPLICE OR EXPRESSED BUFFER TUBE

NOTES:
1. UNUSED FIBERS LEFT COILED AND STORED IN SPLICE TRAY.
2. UNUSED BUFFER TUBES LEFT COILED AND STORED IN SPLICE TRAY.

CABINET AT INTERSECTION 05–1361

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION 5 TRAFFIC ENGINEER AT (919)220-4600 TO ARRANGE FOR THE DIVISION TO PROGRAM THE NEW FIELD ETHERNET SWITCHES WITH THE NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK AND VLAN ID INFORMATION. NOTIFY THE TRAFFIC ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL

2. CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE DETAILS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS–BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.

3. ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING \ ENSURING PROPER TERMINATIONS.

4. INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING: REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"

   1) SPLICE LOCATION
   2) DATE
   3) COMPANY NAME
   4) NAME OF INDIVIDUAL PERFORMING THE SPLICING

   PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1–4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

Temp. Phase 1

Prepared in the Offices of:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION Mobility and Safety Division Traffic Engineering Branch

750 N. Greenfield Pkwy., Garner, NC 27529

Knightdale Signal System Splice Detail

Division 5 Wake County Knightdale

PLAN DATE:	October 2024	REVIEWED BY:	Greg Green
PREPARED BY:	A. COOL	REVIEWED BY:	

Docusigned by: 99F8B8EF705A4F7A...

SCALE 0 NA

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 046152 ENGINEER ALEX D. STEWART

Docusigned by: Alex D. Stewart 10/04/2024
SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
HL-0031	SCP-5

U/G SPLICE ENCLOSURE
NORTH OF INTERSECTION
AT SR 2233 (S. SMITHFIELD RD.)
AND SR 1007 (POOLE RD.)
SIG ID 05–1361

COLOR CODE
TIA/EIA 598-C

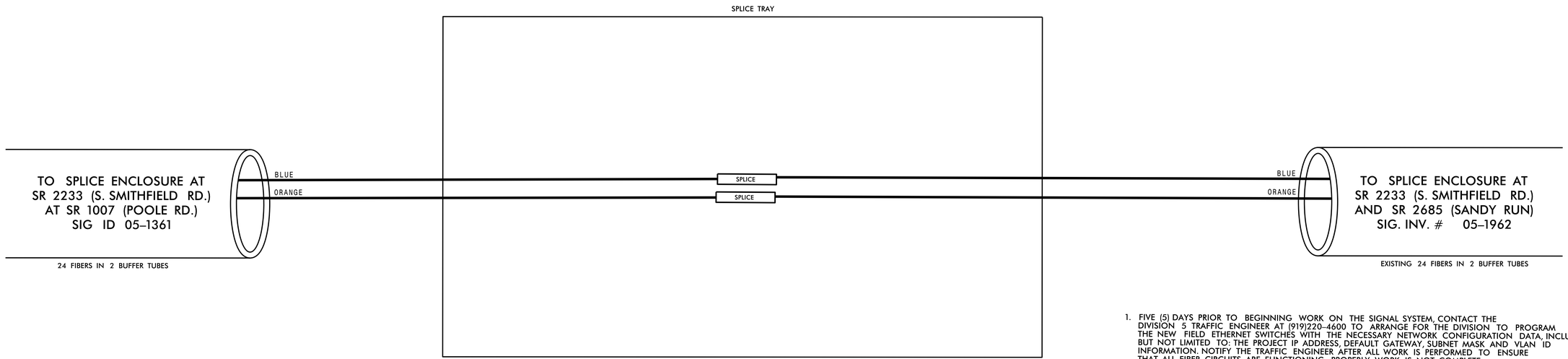
(1) BLUE	(7) RED
(2) ORANGE	(8) BLACK
(3) GREEN	(9) YELLOW
(4) BROWN	(10) VIOLET
(5) SLATE	(11) ROSE
(6) WHITE	(12) AQUA

LEGEND

X – FUSION SPLICE
C – CAP IN TRAY

EXPRESS — EXPRESS ENTIRE BUFFER TUBE
SPLICE — SPLICE ENTIRE BUFFER TUBE
EXISTING — MAINTAIN EXISTING SPLICE OR EXPRESSED BUFFER TUBE

NOTES:
1. UNUSED FIBERS LEFT COILED AND STORED IN SPLICE TRAY.
2. UNUSED BUFFER TUBES LEFT COILED AND STORED IN SPLICE TRAY.



1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION 5 TRAFFIC ENGINEER AT (919)220–4600 TO ARRANGE FOR THE DIVISION TO PROGRAM THE NEW FIELD ETHERNET SWITCHES WITH THE NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK AND VLAN ID INFORMATION. NOTIFY THE TRAFFIC ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL

2. CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE DETAILS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS-BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.

3. ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING \ ENSURING PROPER TERMINATIONS.

4. INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"

1) SPLICE LOCATION
2) DATE
3) COMPANY NAME
4) NAME OF INDIVIDUAL PERFORMING THE SPLICING

PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1–4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

Temp. Phase 1

Prepared in the Offices of:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION — Integrated Mobility and Technology Division — Traffic Engineering Branch — Traffic Signal Section

750 N. Greenfield Pkwy., Garner, NC 27529

Knightdale Signal System Splice Detail

Division 5 | Wake County | Knightdale

PLAN DATE: October 2024 | REVIEWED BY: Greg Green
PREPARED BY: A. COOL | REVIEWED BY: 99F8BBEF705A4FA...

SCALE: 0 — NA

REVISIONS	INIT.	DATE

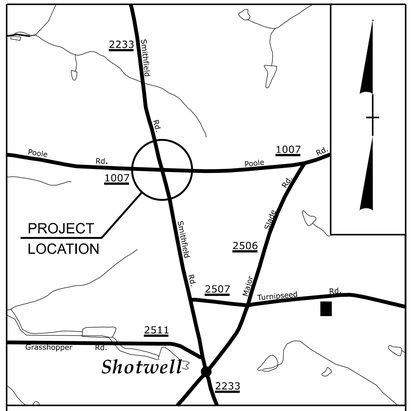
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 046152 ENGINEER ALEX D. STEWART

DocuSigned by: 10/04/2024
SIGNATURE DATE

CADD Filename:

TIP PROJECT: HL-0031

CONTRACT:



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
WAKE COUNTY

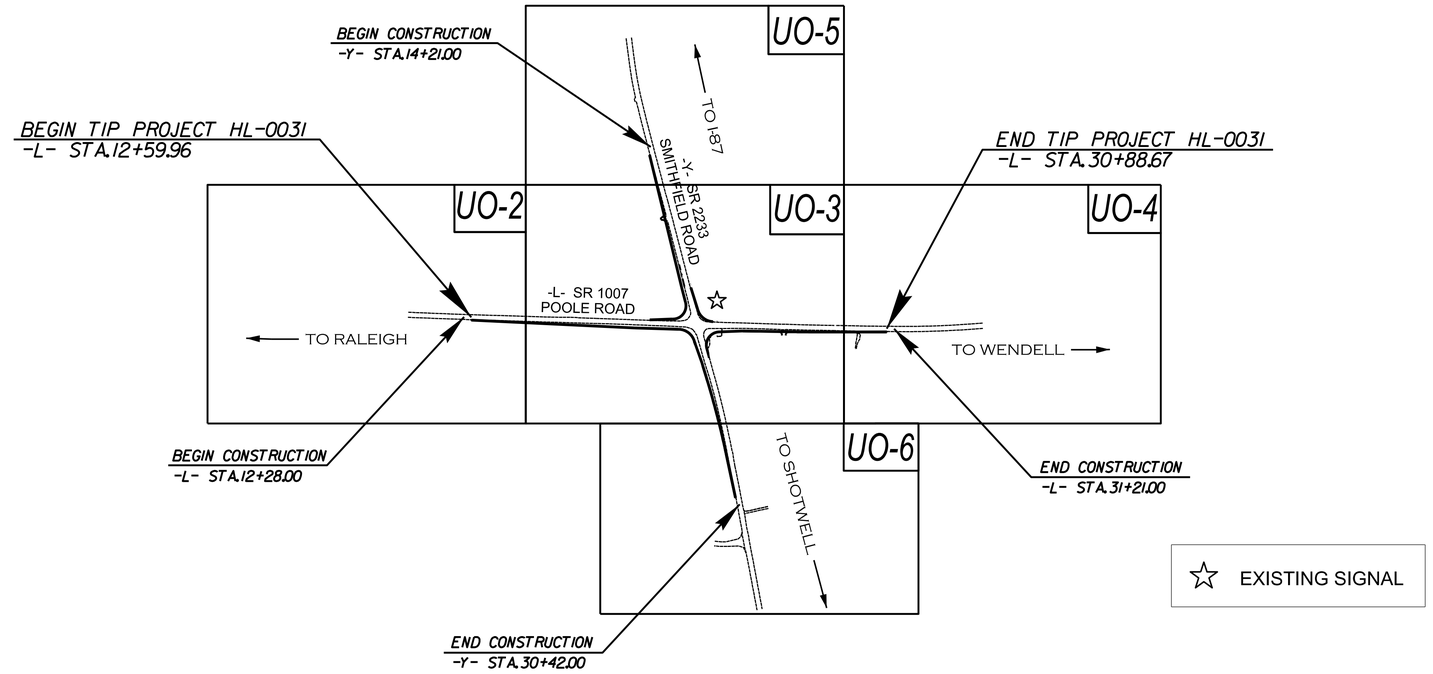
T.I.P. NO.	SHEET NO.
HL–0031	UO–1

NOTE:
ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS.
NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

NAD 83/2011

LOCATION: ***CONSTRUCT LEFT TURN LANES AT SR 1007 (POOLE RD) AND SR 2233 (SMITHFIELD ROAD) INTERSECTION***

TYPE OF WORK: ***DISTRIBUTION POWER, COMMUNICATIONS, CATV, GAS***



GRAPHIC SCALES

0
PLANS

0
PROFILE (HORIZONTAL)

0
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.:	*DESCRIPTION:*
UO–1	*TITLE SHEET*
UO–2 THRU UO–6	*UTILITY CONSTRUCTION SHEETS*

UTILITY OWNERS WITH CONFLICTS

(A) POWER – DUKE ENERGY
(B) COMMUNICATIONS – AT&T
(C) COMMUNICATIONS/CATV – SPECTRUM
(D) GAS – DOMINION

PREPARED IN THE OFFICE OF

TELICS
1598 WESTBROOK PLAZA DR.
SUITE 202
WINSTON–SALEM, NC 27103
(336) 705–8844

CORY WOOD — *UTILITY PROJECT MANAGER*
CORY WOOD — *PROJECT UTILITY COORDINATOR*

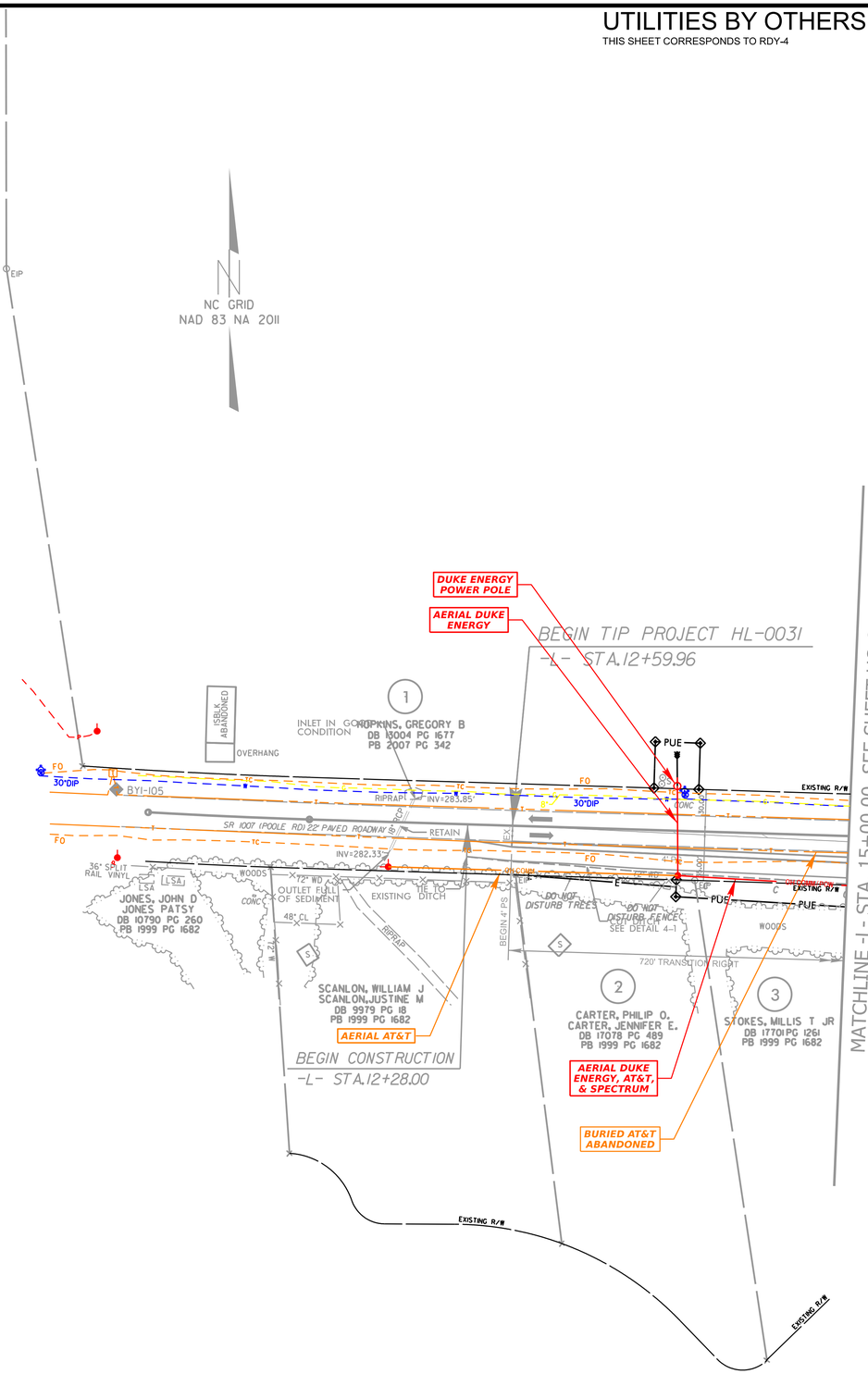
DIVISION OF HIGHWAYS
DIVISION 5
PROJECT DELIVERY UNIT
2612 DUKE STREET
DURHAM, NC 27704

BETH QUINN, PE — *TEAM LEAD*
JOHN BRAXTON — *DM STIP MANAGER*
DON PROPER — *DIV. 5 UTILITY ENGINEER*
JAMES SWINSON — *UTILITY ENGINEER*

09-29-21

UTILITIES BY OTHERS

THIS SHEET CORRESPONDS TO RDY-4



REVISIONS

HL-0031

UO-2

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

UTILITY DESIGN UNIT

UTILITY CONSTRUCTION PLANS ONLY

ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

DESIGNED BY: SPENCER MERRITT

DRAWN BY: CHRIS KENNEDY

CHECKED BY: CORY WOOD

APPROVED BY: JAMES SWINSON

REVISED: 6-26-2024

UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

09-29-21

UTILITIES BY OTHERS

THIS SHEET CORRESPONDS TO RDY-5

MATCHLINE -Y- STA. 17+00.00 SEE SHEET UO-5

MATCHLINE -L- STA. 15+00.00 SEE SHEET UO-2

MATCHLINE -L- STA. 29+00.00 SEE SHEET UO-4

MATCHLINE -Y- STA. 26+00.00 SEE SHEET UO-6

NC GRID
NAD 83 NA 2011

-L- POT 22+53.52 =
-Y- POT 22+26.74

BM #3
ELEVATION=297.06'
BY STATION 12+44.00
14' LEFT
BENCHTIE IN 18" CEDAR

DUKE ENERGY POLE REMOVED
AERIAL DUKE ENERGY
DUKE ENERGY JOINT USE POLE
AERIAL DUKE ENERGY, AT&T, & SPECTRUM
BURIED AT&T ABANDONED
BURIED NCDOT FIBER
BURIED SPECTRUM ABANDONED
SIGNAL POLE & GUYS
DOMINION GAS LOWERED
AERIAL AT&T
BURIED AT&T
DUKE ENERGY POWER POLE
SIGNAL POLE REMOVED
BURIED SPECTRUM

1 HOPKINS, GREGORY B
DB 13004 PG 1677
PB 2007 PG 342

3 STOKES, MILLIS T JR
DB 11701 PG 1261
PB 1999 PG 1682

4 EARLEY, JEREMIAH J
EARLEY, LAUREN M
DB 16229 PG 575
PB 1999 PG 1682

5 ELSHAIKH, MAJED FUAD
SHAIKH, ISSA FAUD
DB 15929 PG 208
PBI998 PG328

6 POOLE ROAD HOLDINGS LLC
DB 16455 PG 2272
PBI996 PGI69

7 GBK I LLC
DB 17785 PG 2238

9 KIRK, CLARENCE M JR
KIRK, PHILIP C
DB 17233 PG 2124

10 EDWARDS, BETTY W
JOHNSON, BILLIE W

11 JOHNSON, DOUGLAS LYNN
DB 11531 PG 2598

12 KIDD FARMS, LLC
DB 16520 PG 1378

16 GREENE, SAMUEL L
GREEN, IANTHA
DB 5083 PG 820
PB 1970 PG 207

HL-0031
UO-3

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

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REVISED: 6-26-2024

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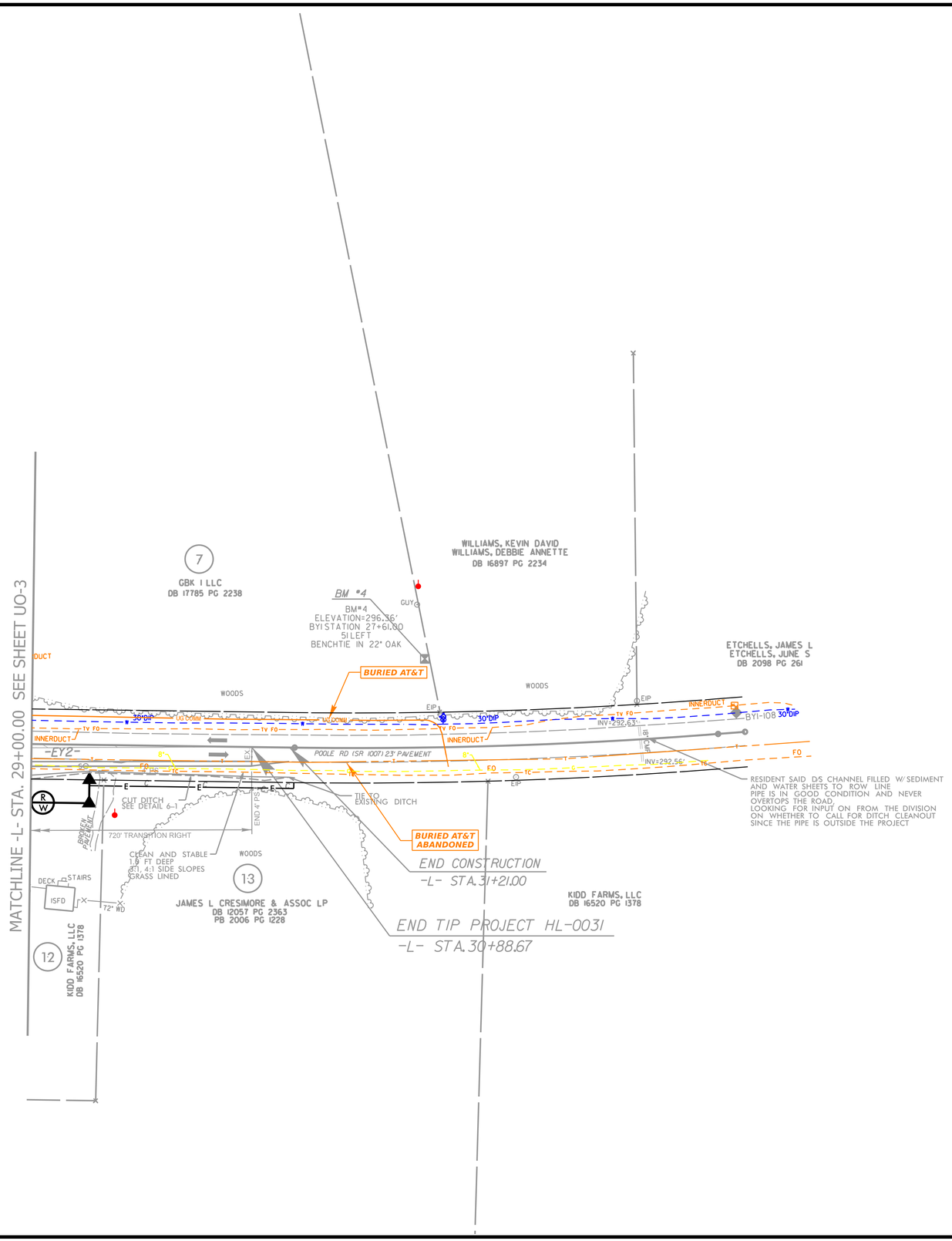
REVISIONS

09-29-21

UTILITIES BY OTHERS

THIS SHEET CORRESPONDS TO RDY-6



HL-0031

UO-4

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

UTILITY DESIGN UNIT

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CHECKED BY: CORY WOOD

APPROVED BY: JAMES SWINSON

REVISED: 6-26-2024

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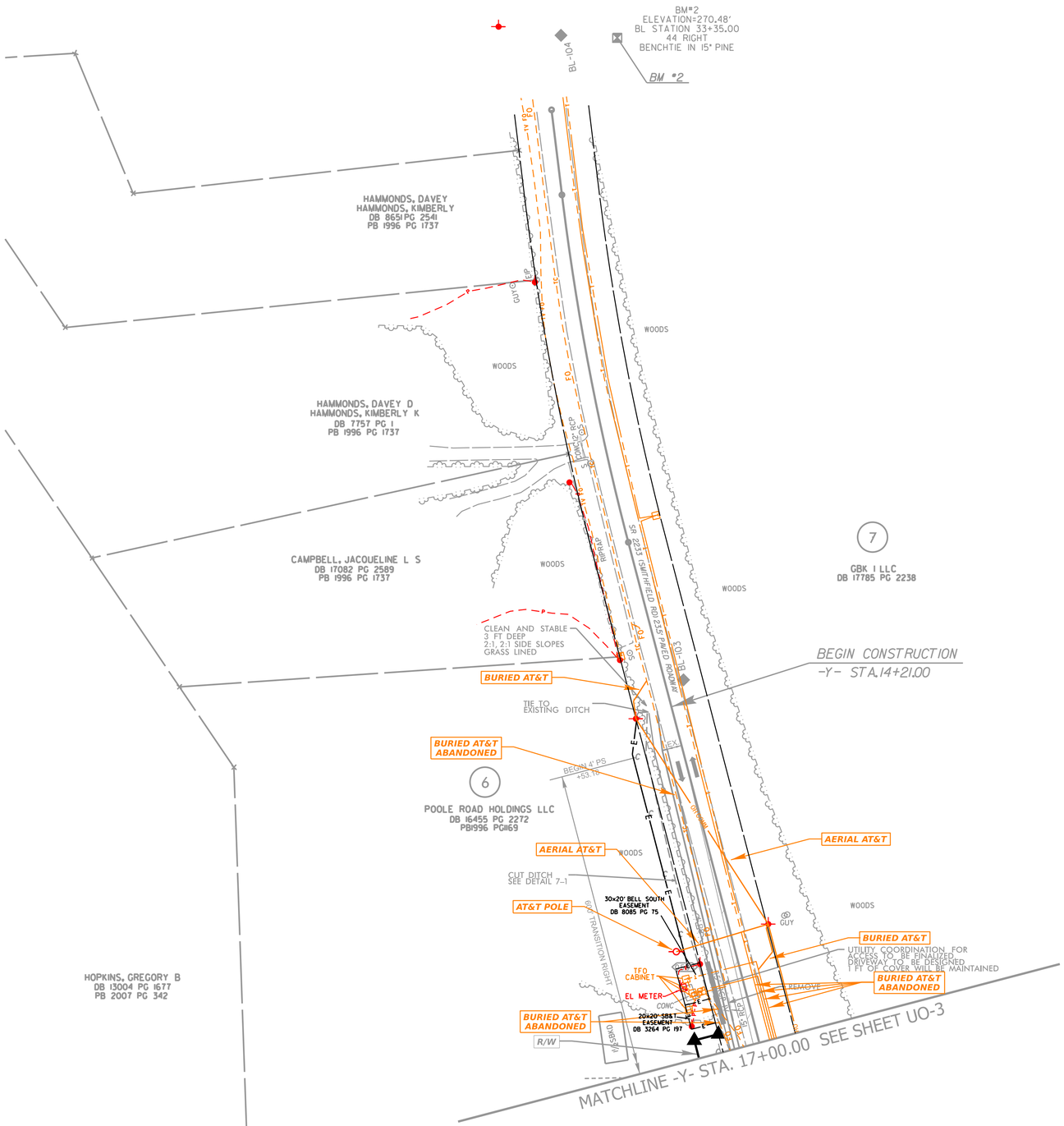
PHONE:(919)707-6690
FAX:(919)250-4151

REVISIONS

09-29-21

UTILITIES BY OTHERS

THIS SHEET CORRESPONDS TO RDY-7



NC GRID
NAD 83 NA 2011

HL-0031

UO-5

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

UTILITY DESIGN UNIT

UTILITY CONSTRUCTION
PLANS ONLY

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DRAWN BY: CHRIS KENNEDY

CHECKED BY: CORY WOOD

APPROVED BY: JAMES SWINSON

REVISED: 6-26-2024

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PHONE:(919)707-6690
FAX:(919)250-4151

REVISIONS

09-29-21

UTILITIES BY OTHERS

THIS SHEET CORRESPONDS TO RDY-8

MATCHLINE -Y- STA. 26+00.00 SEE SHEET UO-3

BM#1
ELEVATION=310.78'
BL STATION 15+85.00
118 LEFT
BENCHTIE IN 12" PINE

BM #1

600' TRANSITION RIGHT

WOODS

5

ELSHAIKH, MAJED FUAD
SHAIKH, ISSA FAUD
DB 15929 PG 208
PB1998 PG328

SIGNS OF RUTTING FROM ROADWAY TRAFFIC

CUT DITCH SEE DETAIL 8-1

14

LILES, DARYL R
LILES, DEREK W
DB 10559 PG 2511
PB 1999 PG 1682

EXISTING R/W

SR 2233 SMITHFIELD ROAD 23' PAVED ROADWAY

BL STA 26+00.00

GREENE, SAMUEL L
GREEN, IANTHA
DB 5083 PG 820
PB 1970 PG 207

36" WIRE

AERIAL AT&T

WOODS

PROP MON

GR

ISBKD

WATSON, WILLIAM P
WATSON, EDNA E
DB 1952 PG 675
PB 1970 PG 207

AERIAL AT&T

WOODS

BURIED AT&T ABANDONED

15

GRIMES, BRANTON T
GRIMES, AMY J
DB 9939 PG 1412
PB 1999 PG 1682

WOODS

END 4" PS +10.46

MCCULLOUGH, ANNIE R
DB 1952 PG 673
PB 1970 PG 207

BURIED AT&T

END CONSTRUCTION
-Y- STA. 30+42.00

8' BROKEN PAVEMENT

12" RCP

DAVIS, REGINALD K JR
DAVIS, PATRICIA L
DB 14625 PG 1906
PB 1999 PG 1682

TIE TO EXISTING DITCH

1½SFD

FINAL 400 FT OF DITCH IS CLEAN AND STABLE
1 FT DEEP
2:1, 3:1 SIDE SLOPES
GRASS LINED

JONES, ROMUEL HEIRS
PB 1970 PG 207

SNS705AJ 2

15" RCP

SOIL

EXISTING R/W

ENCHANTED CREEK CIR.
VAR PAVED ROADWAY

-EY1-

6"

NO UTILITY RECORD INFORMATION AS OF 03/08/21

CONC

10' CONC

15" CMP

18" RCP

RIPRAP

GUY

CORONILLA, ALBA L
DB 15591 PG 73
PB 1999 PG 1682

2SFD

GOOD HOPE MISSIONARY BAPTIST CHURCH
DB 16147 PG 601
PB 1977 PG 894

NC GRID
NAD 83 NA 2011

REVISIONS

HL-0031
UO-6

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

UTILITY DESIGN UNIT

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REVISED: 6-26-2024

UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
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5/26/20

HL-0031 INDEX OF CROSS-SECTIONS

LINE	PAGES
-L-	X-1 TO X-15
-Y-	X-16 TO X-21

PROJ. REFERENCE NO.	SHEET NO.
HL-0031	X-0A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

NOTE: EMBANKMENT COLUMN INCLUDES BACKFILL FOR UNDERCUT

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
12+36.00	2	1
12+50.00	2	1
13+00.00	6	7
13+50.00	7	10
14+00.00	8	15
14+50.00	12	13
15+00.00	17	13
15+50.00	23	11
16+00.00	26	12
16+50.00	26	13
17+00.00	43	6
17+50.00	77	4
18+00.00	97	2
18+50.00	118	7
19+00.00	112	7
19+50.00	100	9
20+00.00	90	11
20+50.00	80	11
21+00.00	80	11
21+50.00	113	17
22+00.00	153	94
22+50.00	161	62
23+00.00	197	1
23+50.00	220	0
24+00.00	112	0
24+50.00	112	0
25+00.00	80	1
25+50.00	40	4
26+00.00	30	1
26+50.00	32	0
27+00.00	28	2
27+50.00	37	8
28+00.00	46	15
28+50.00	32	11
29+00.00	14	9
29+50.00	9	4
30+00.00	13	0
30+50.00	6	6
31+00.00	6	11
31+21.00	6	1

Station Y1	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
16+50.00	26	13
17+00.00	43	6
17+50.00	77	4
18+00.00	97	2
18+50.00	118	7
19+00.00	112	7
19+50.00	100	9
20+00.00	90	11
20+50.00	80	11
21+00.00	80	11
21+50.00	113	17
21+50.00	113	17

Station Y1	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
23+50.00	220	0
24+00.00	173	0
24+50.00	960	0
25+00.00	240	1
25+50.00	335	0
26+00.00	321	0
26+50.00	164	3
27+00.00	57	15
27+50.00	19	14
28+00.00	18	16
28+50.00	22	8
29+00.00	19	14
29+50.00	19	26
30+00.00	23	28
30+50.00	10	13
31+00.00	6	11
31+21.00	6	1

Station Y1	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
12+36.00	2	1
12+50.00	2	1
13+00.00	6	7
13+50.00	7	10
14+00.00	8	15
14+50.00	12	13
15+00.00	17	13
15+50.00	23	11
16+00.00	26	12

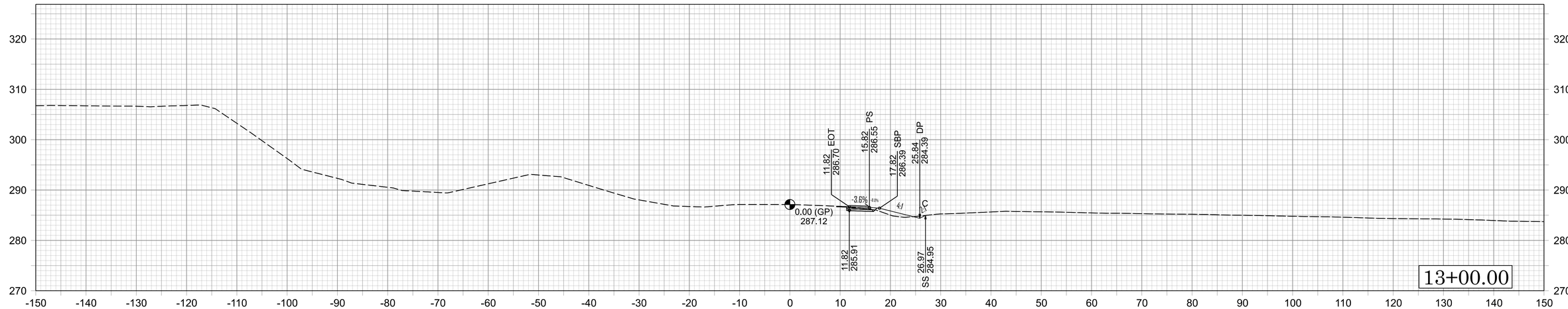
Earthwork quantites are calculated by the Rodayway Desgin Unit.
These earthwork qanatites are based in the part of the subsurface date provided by the Geotechnical Engineering unit.

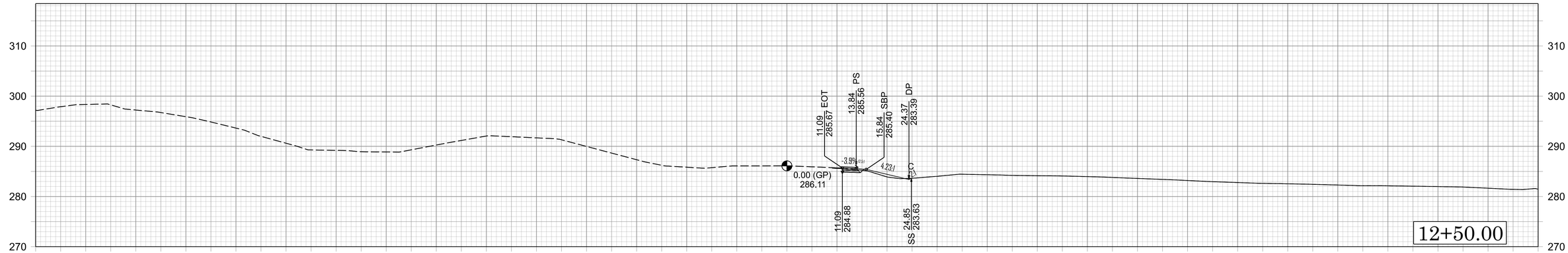
5/26/20

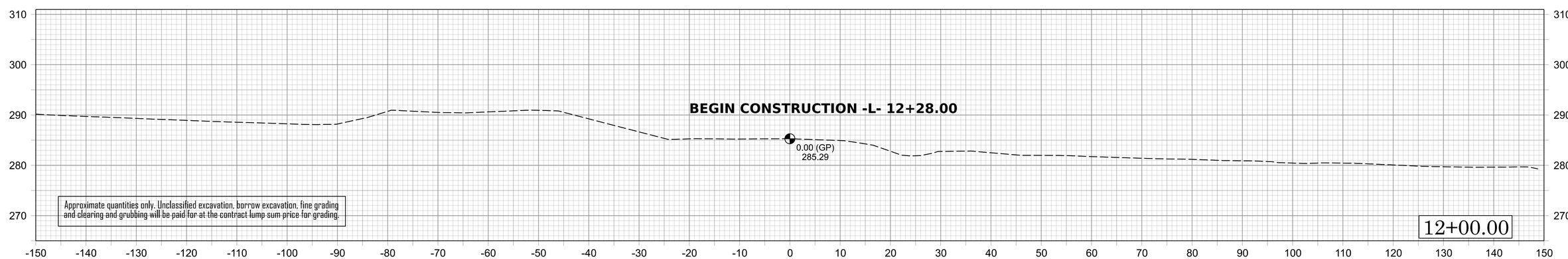
0 10 20

PLANS PREPARED BY: SUMMIT DESIGN AND ENGINEERING SERVICES

HL-0031
X-1-(L)







Approximate quantities only. Unclassified excavation, borrow excavation, fine grading and clearing and grubbing will be paid for at the contract lump sum price for grading.

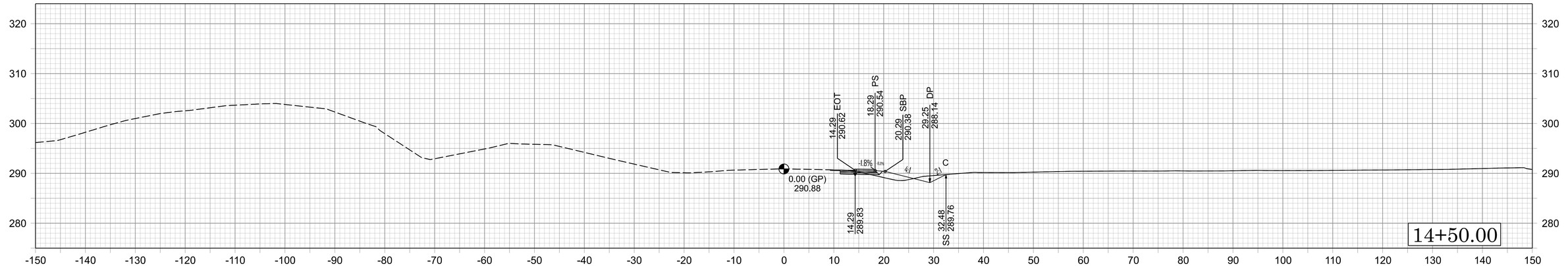
5/26/20

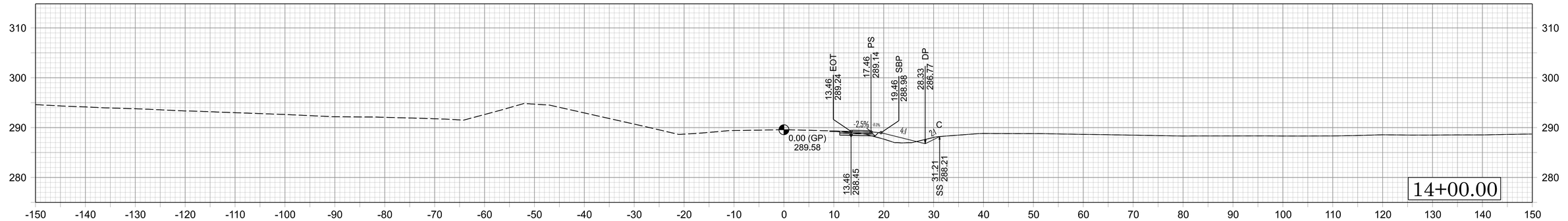
0 10 20

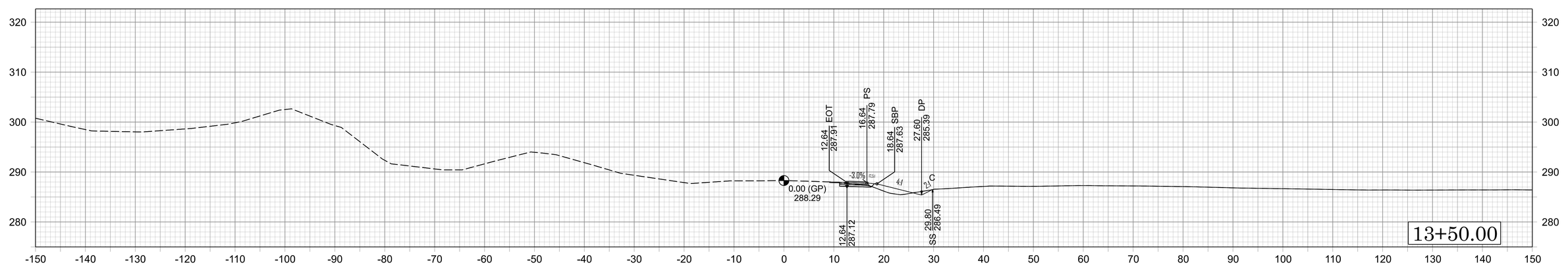
PLANS PREPARED BY: SUMMIT DESIGN AND ENGINEERING SERVICES

HL-0031

X-2 (L)





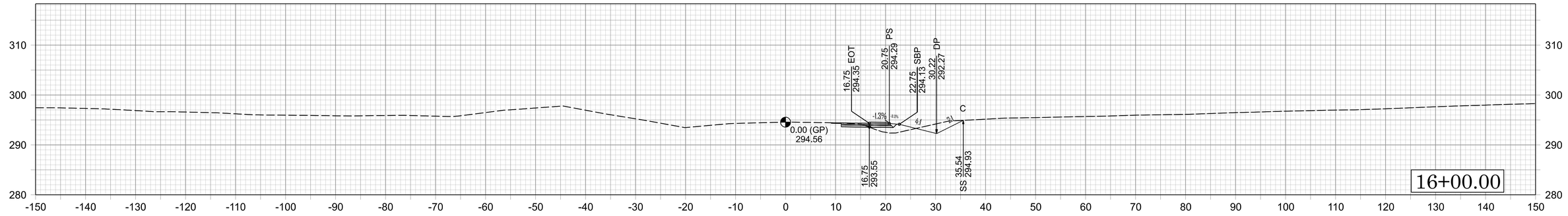


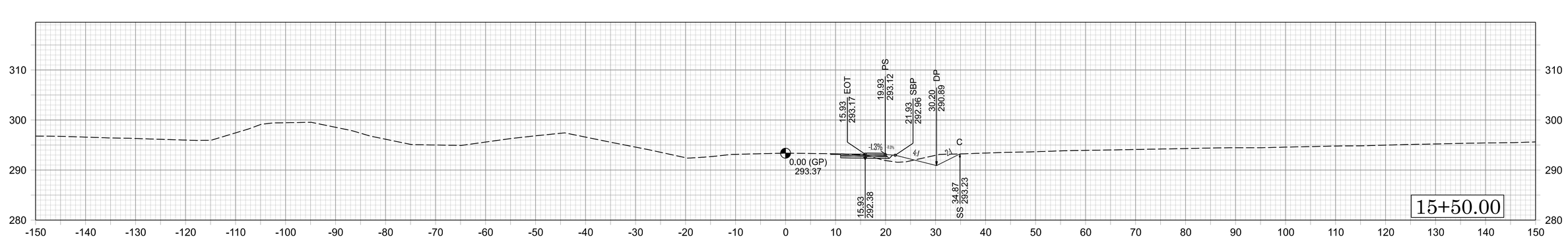
5/26/20

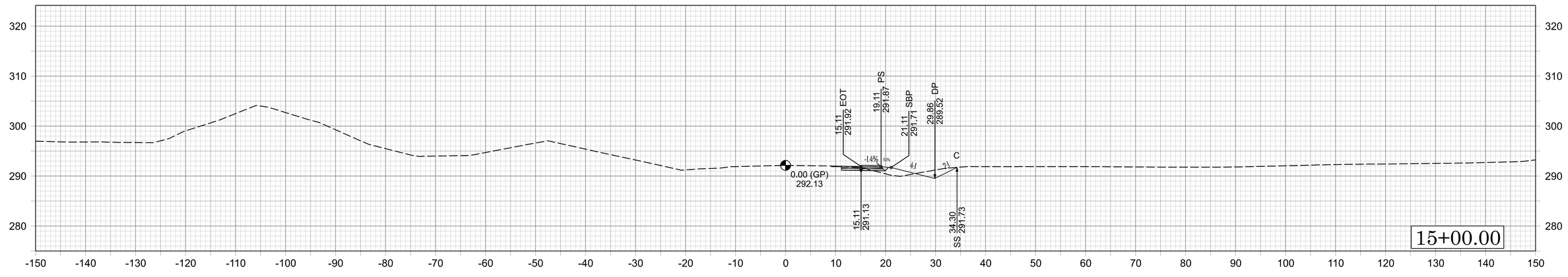
0 10 20

PLANS PREPARED BY: SUMMIT DESIGN AND ENGINEERING SERVICES

HL-0031
X-3 (L)





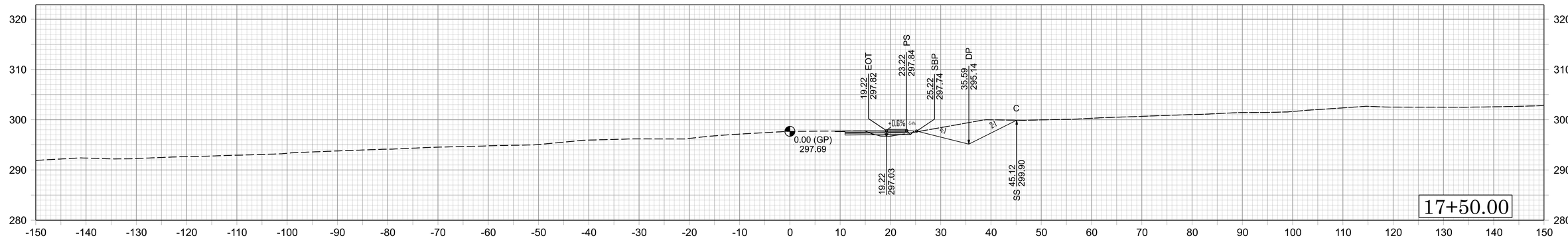


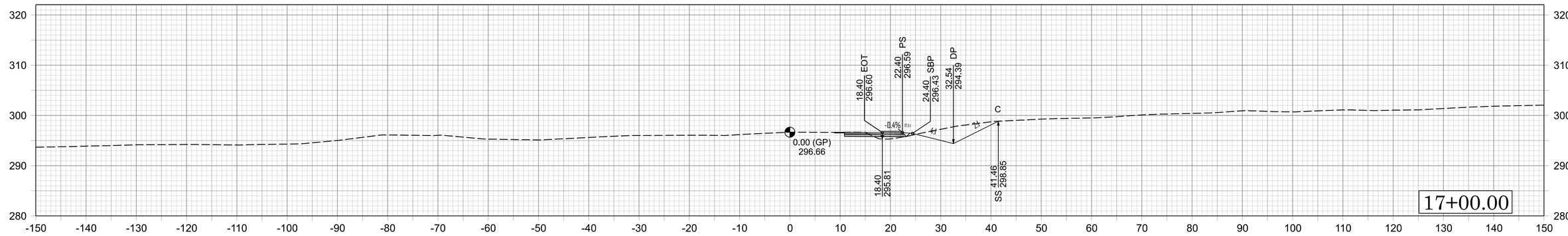
5/26/20

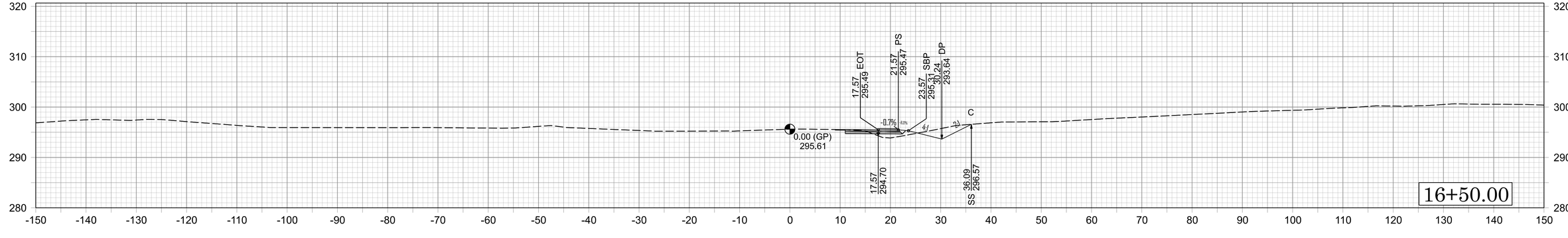
0 10 20

PLANS PREPARED BY: SUMMIT DESIGN AND ENGINEERING SERVICES

HL-0031
X-4 (L)





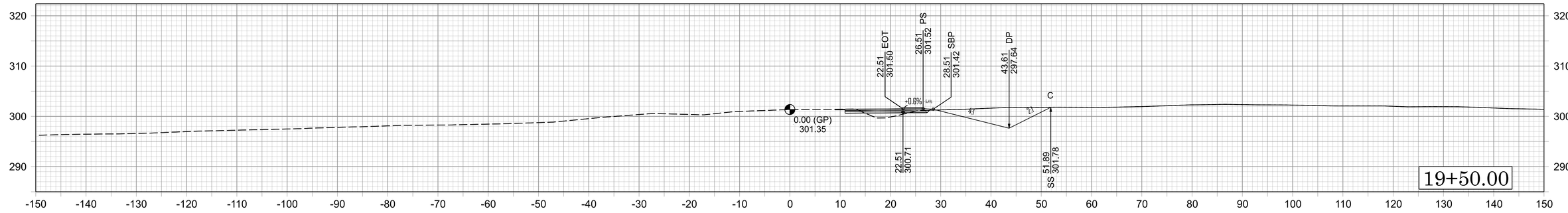


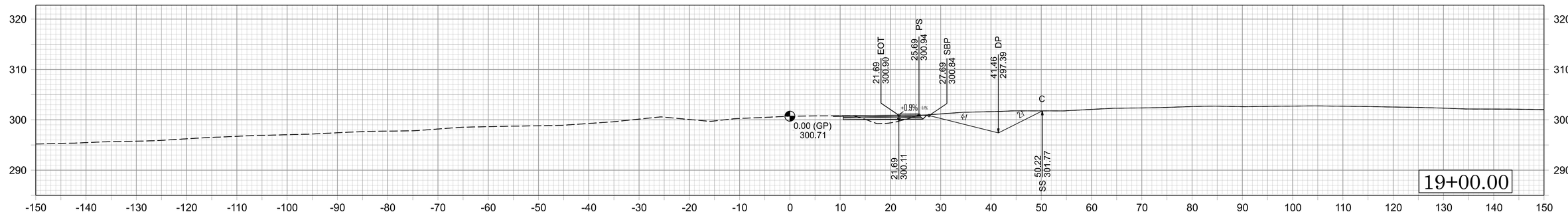
5/26/20

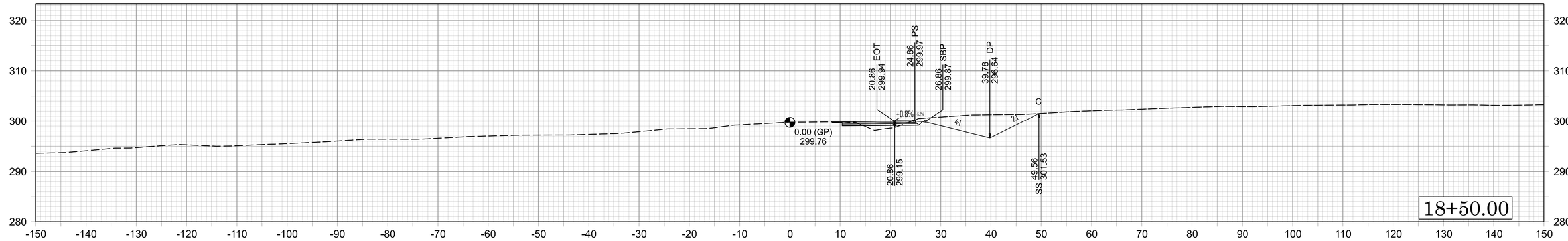
0 10 20

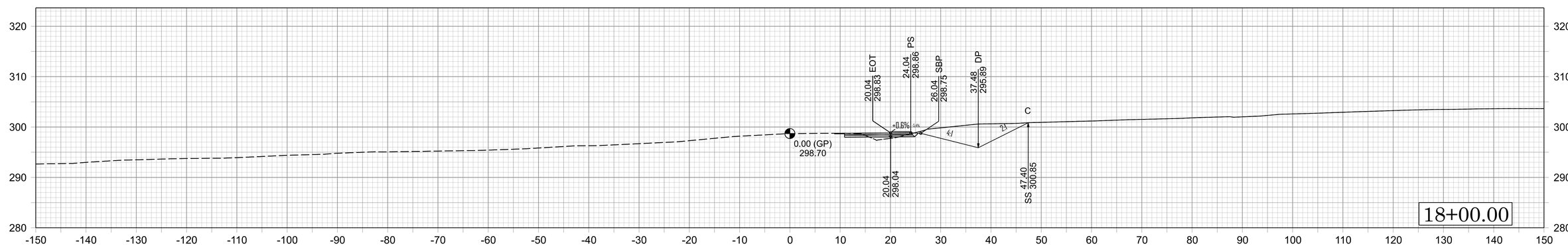
PLANS PREPARED BY: SUMMIT DESIGN AND ENGINEERING SERVICES

HL-0031
X-5 (L)







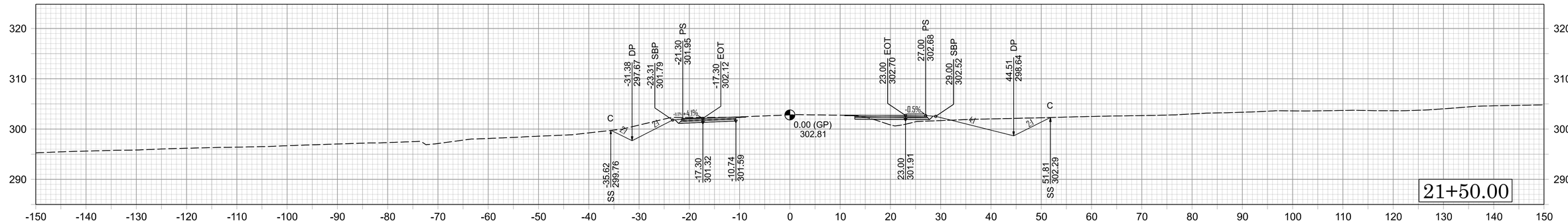


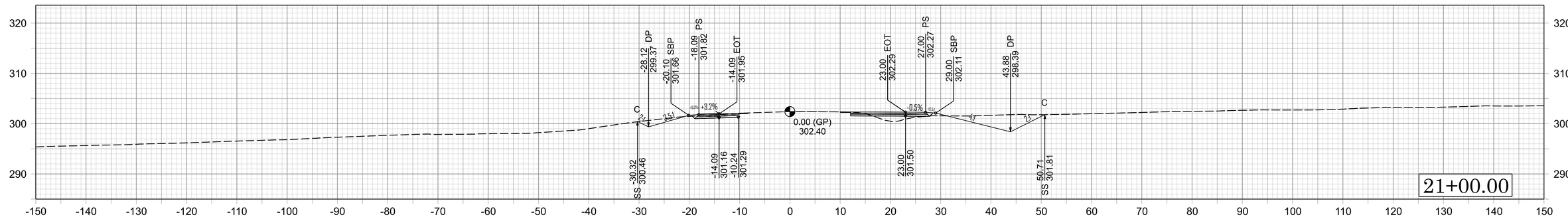
5/26/20

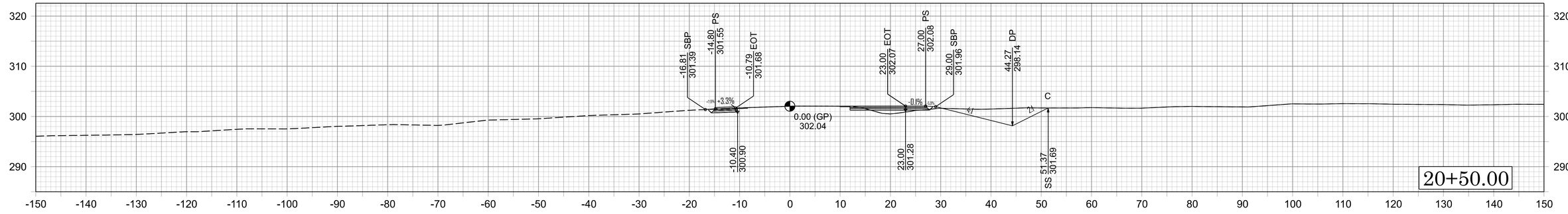
0 10 20

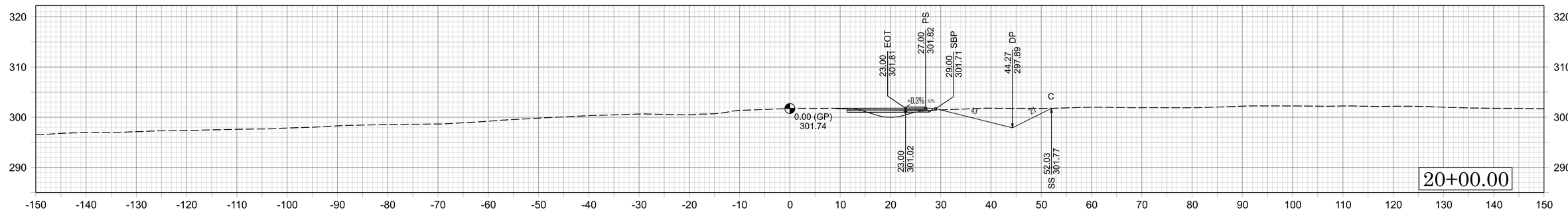
PLANS PREPARED BY: SUMMIT DESIGN AND ENGINEERING SERVICES

HL-0031
X-6 (L)





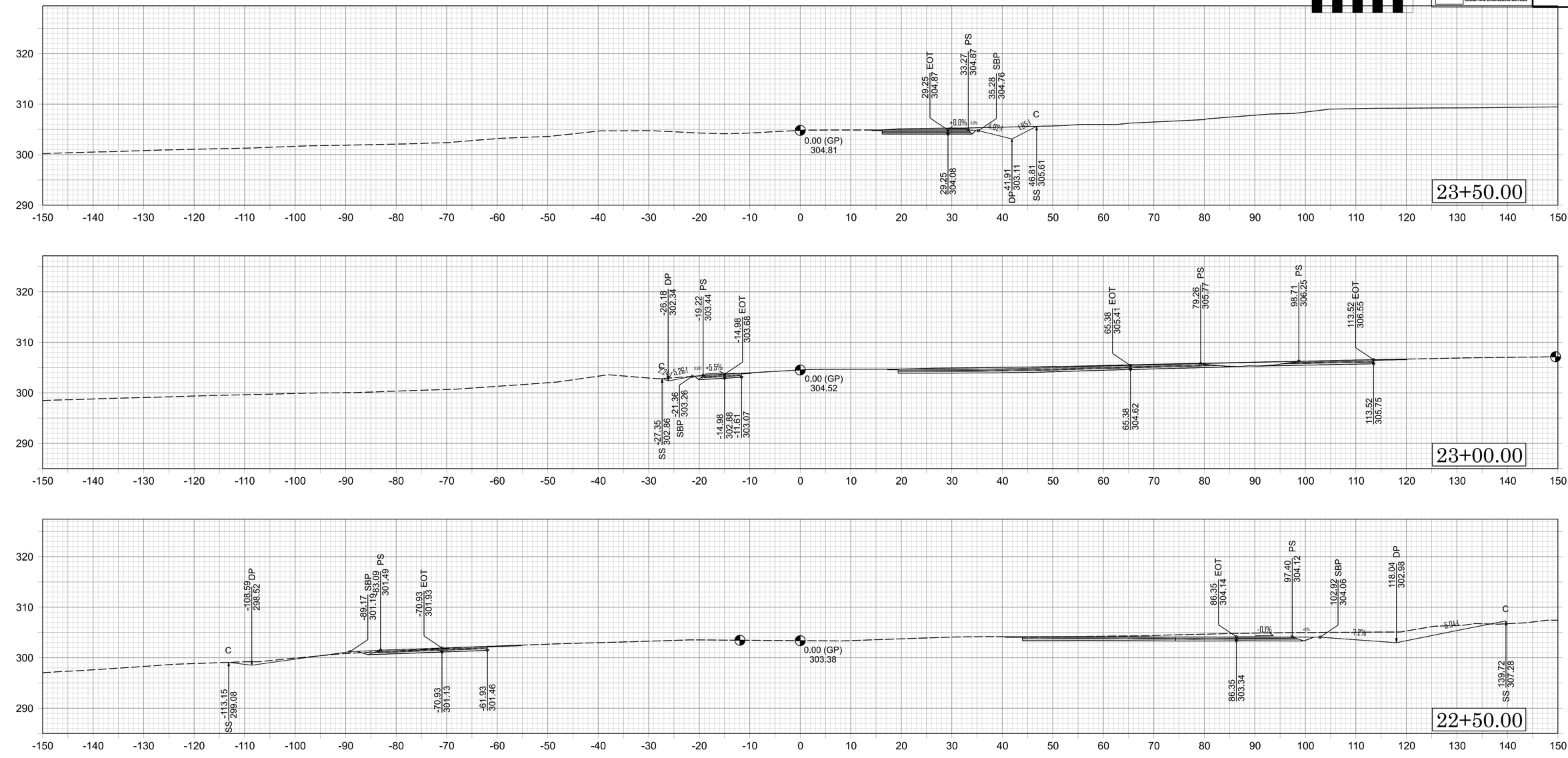




5/26/20

PLANS PREPARED BY: SUMMIT DESIGN AND ENGINEERING SERVICES

HL-0031
X-7 (L)

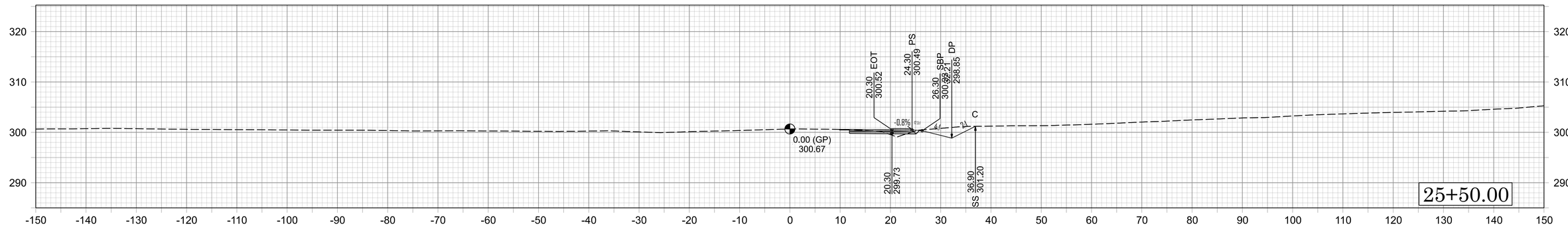


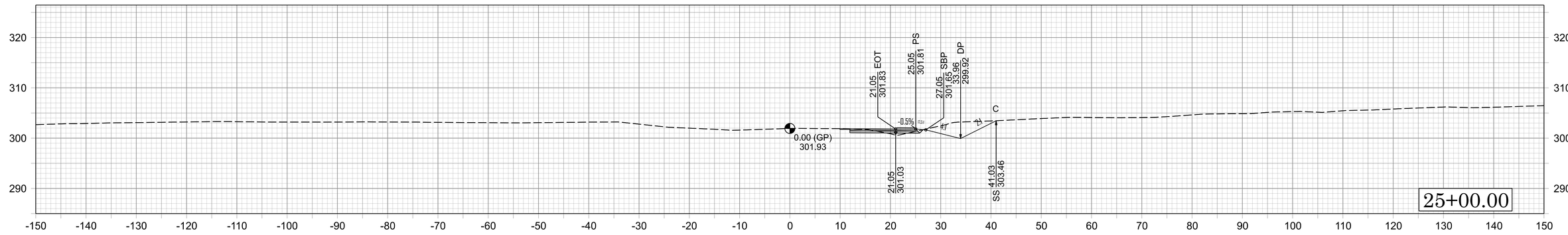
5/26/20

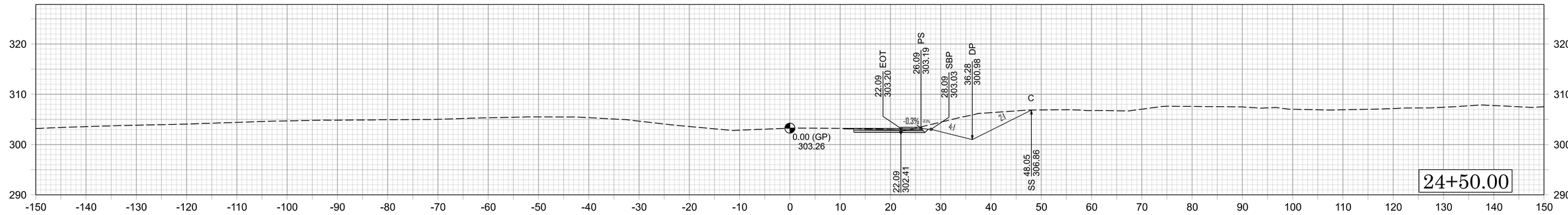
0 10 20

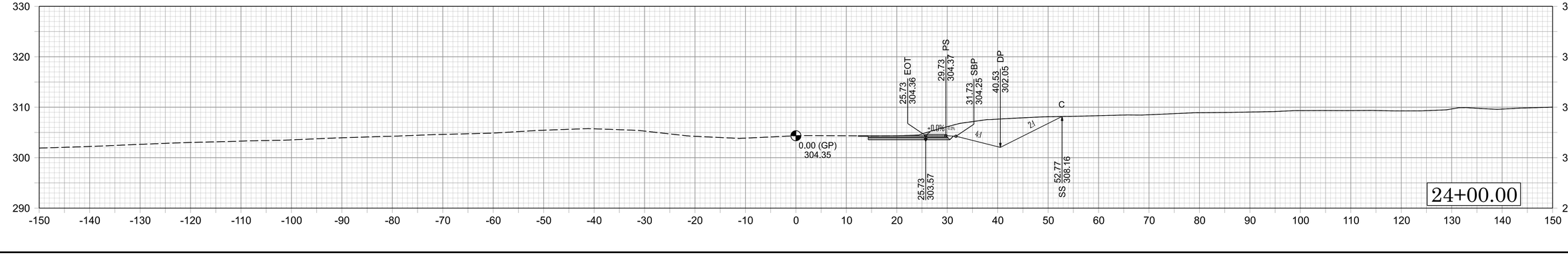
PLANS PREPARED BY: SUMMIT DESIGN AND ENGINEERING SERVICES

HL-0031
X-8 (L)









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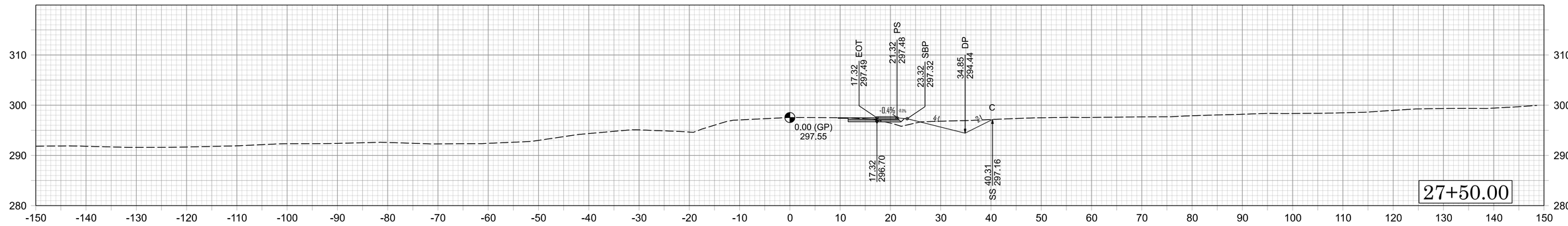
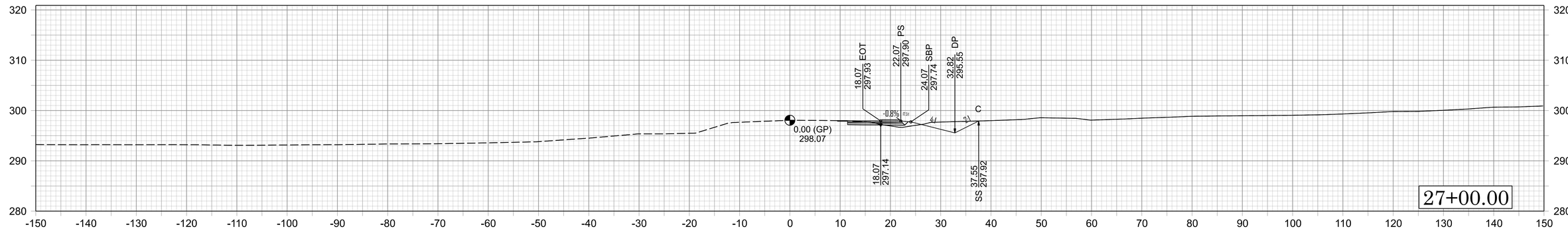
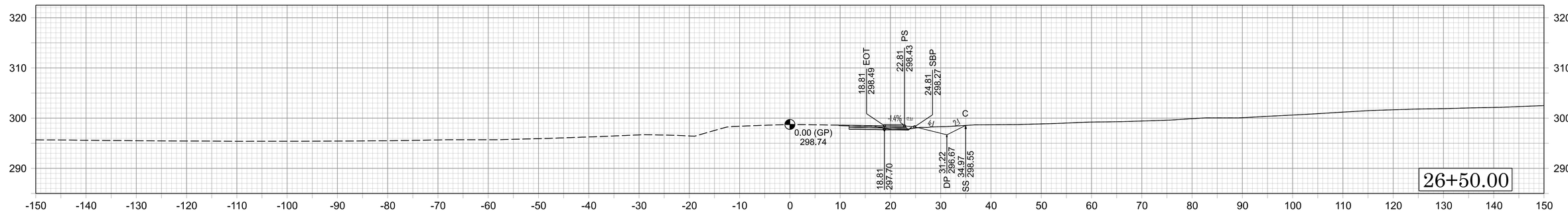
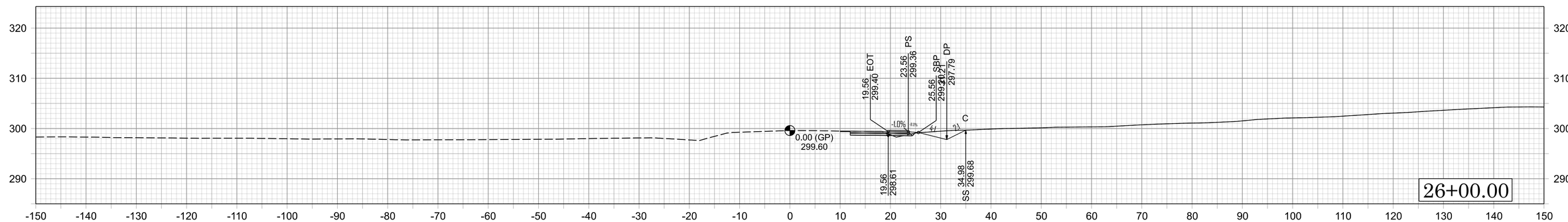
HL-0031
X-9 (L)









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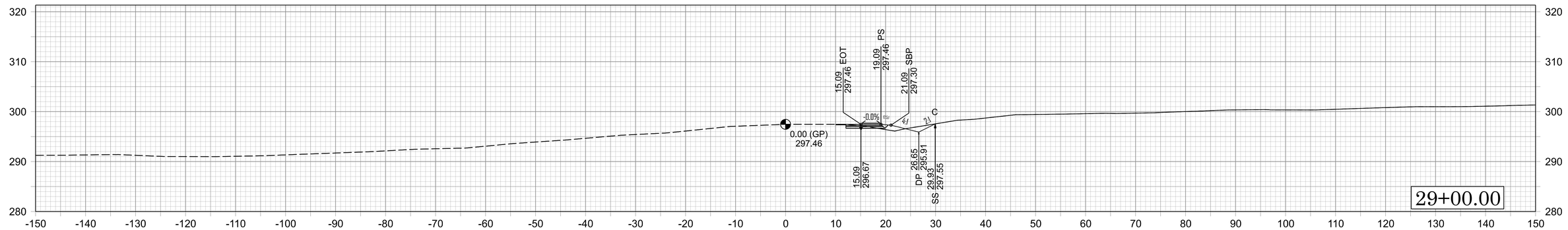

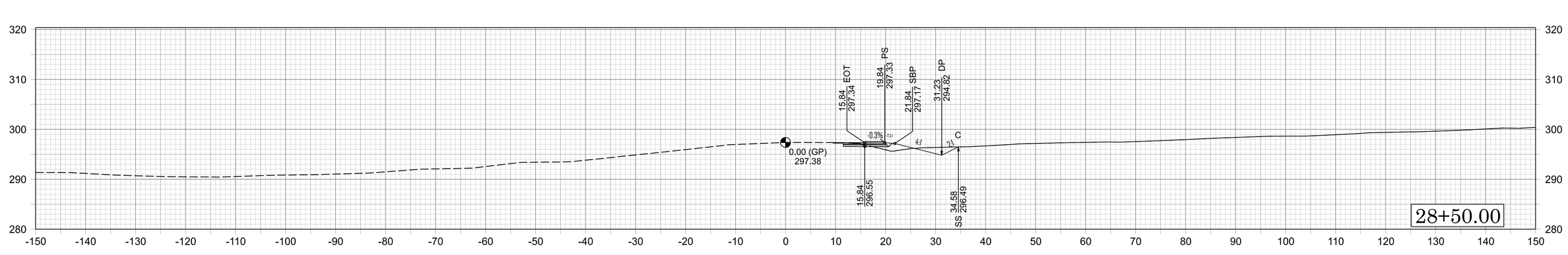

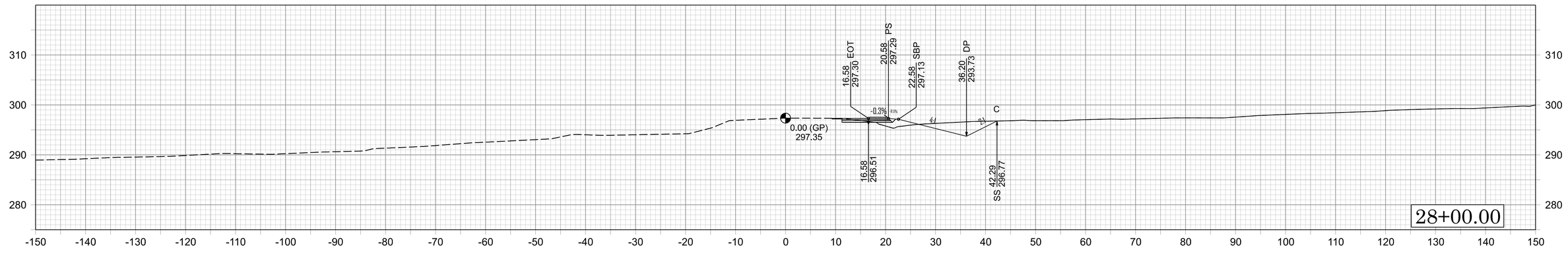

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HL-0031
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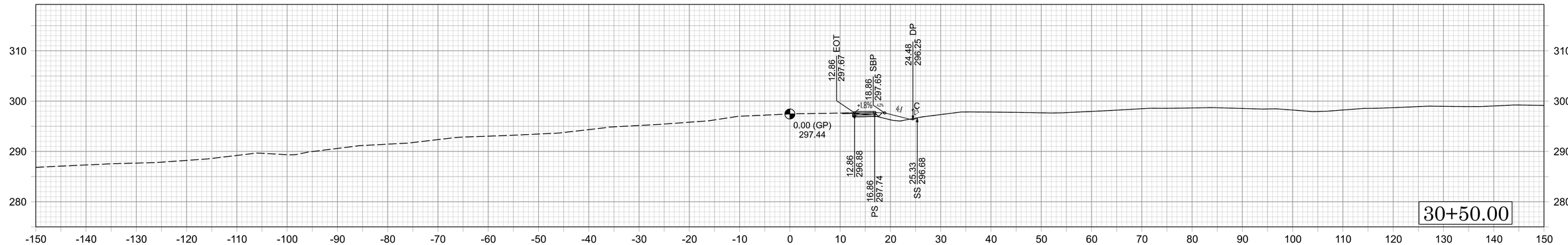

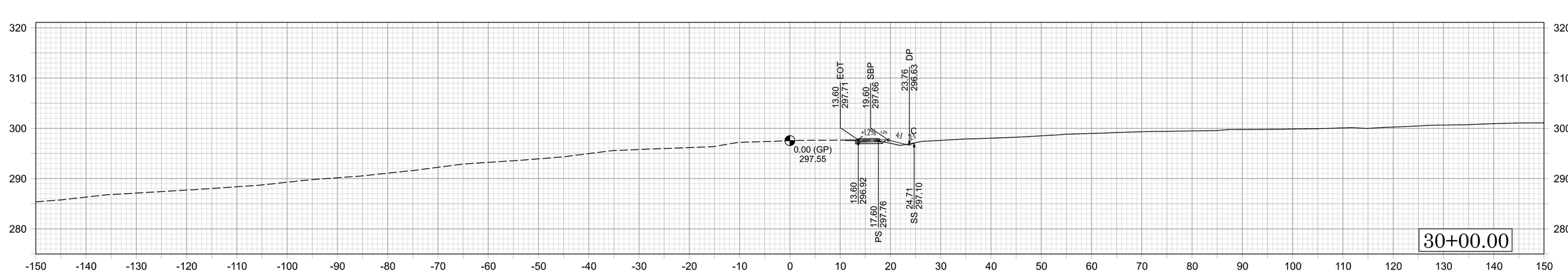

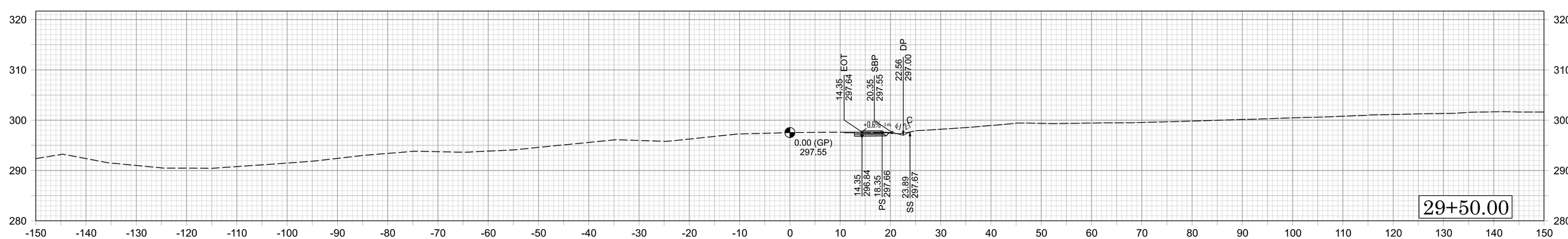

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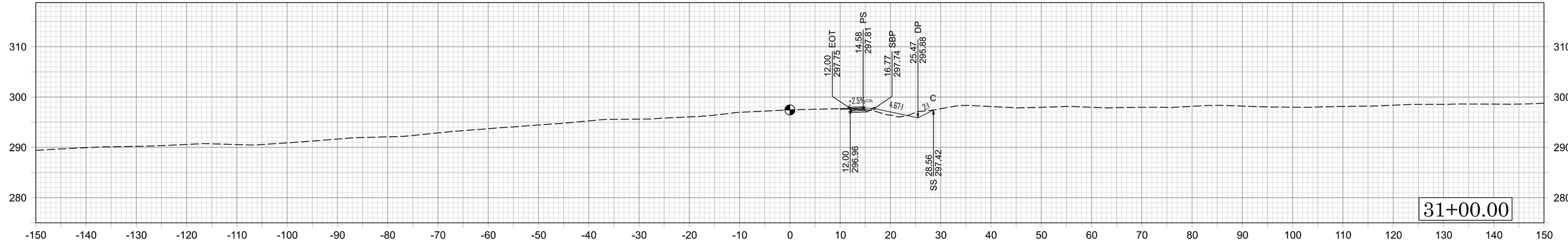
PLANS PREPARED BY:
SUMMIT
DESIGN AND ENGINEERING SERVICES

HL-0031
X-12 (L)



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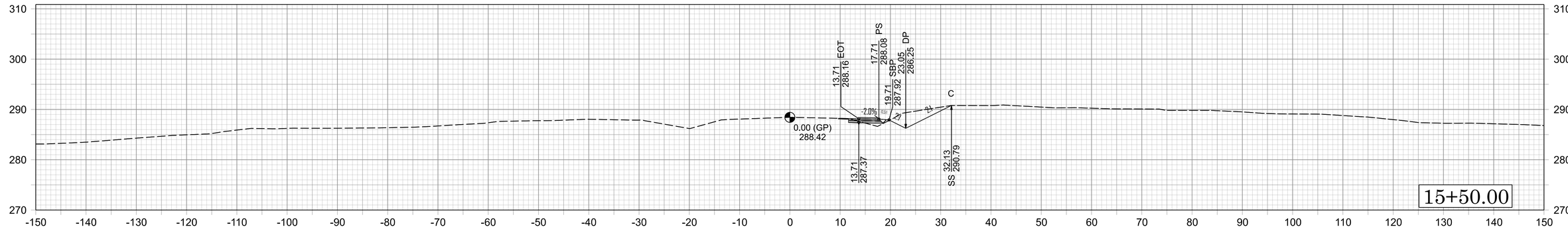
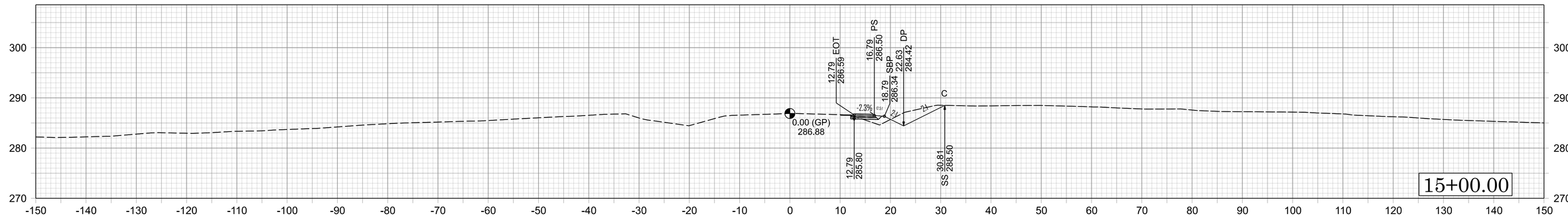
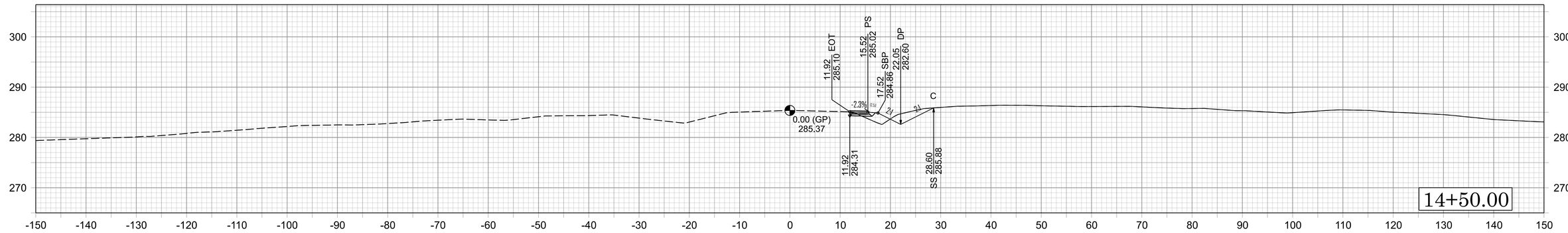
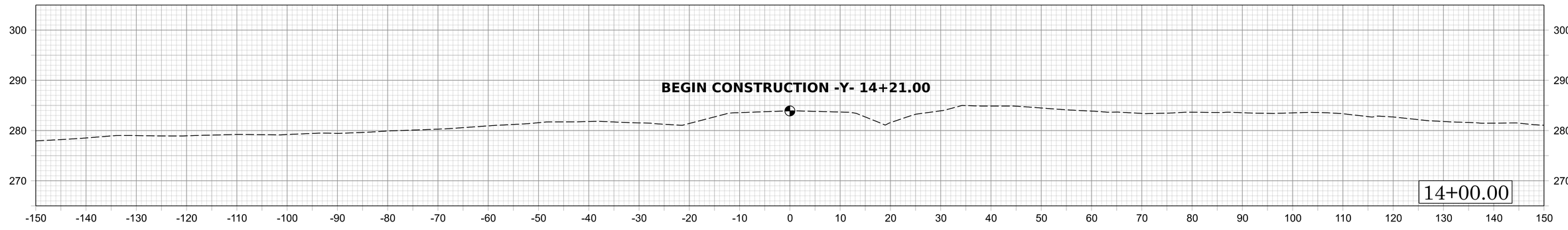
HL-0031
X-13 (Y)









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PLANS PREPARED BY: SUMMIT DESIGN AND ENGINEERING SERVICES

HL-0031
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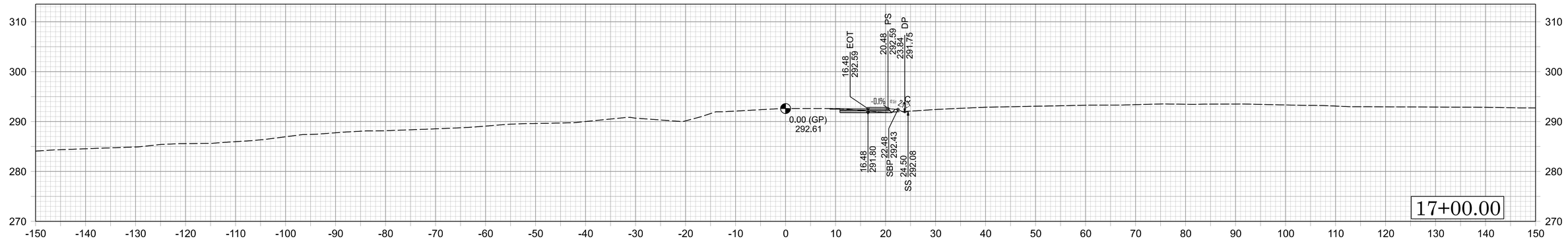

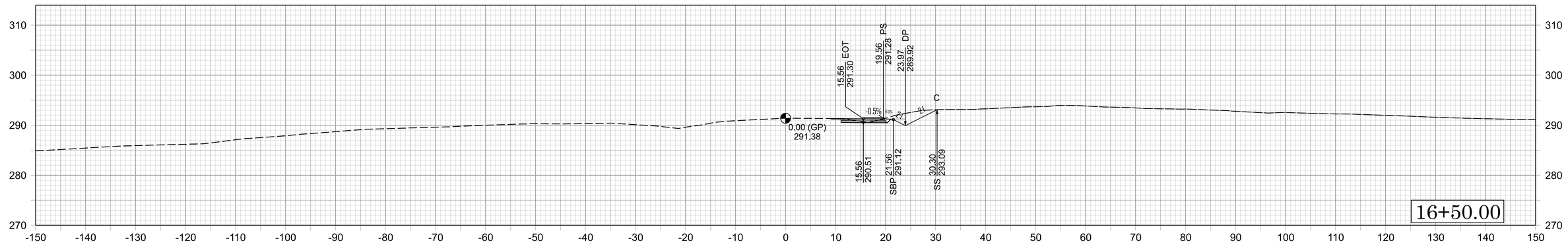

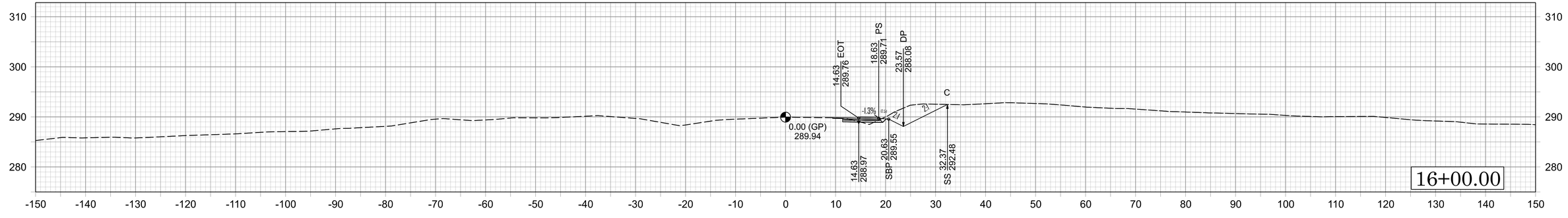

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HL-0031
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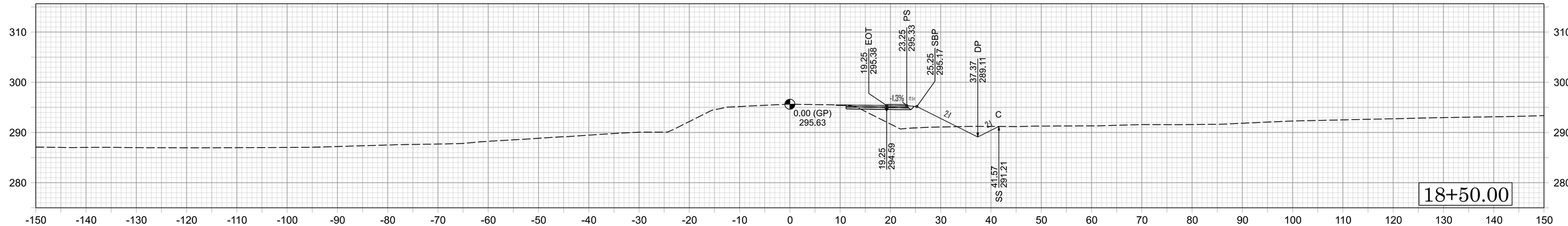

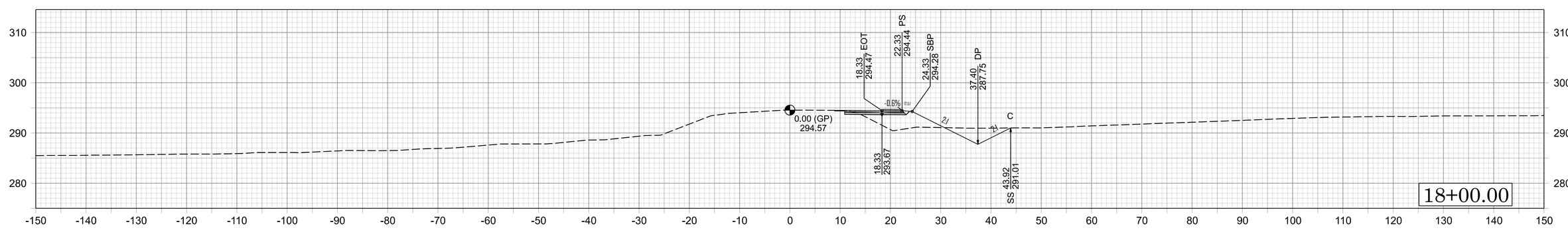

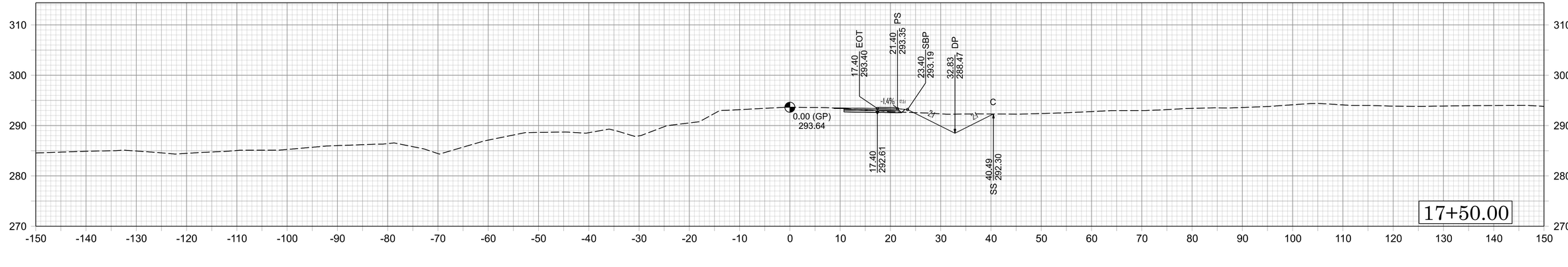

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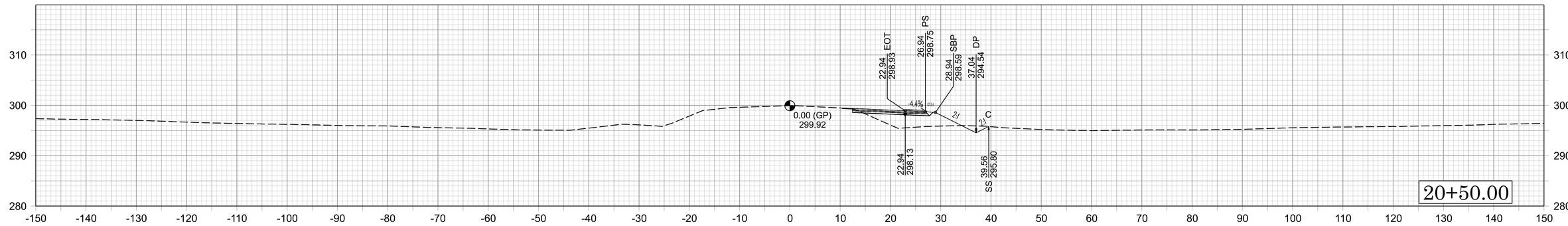
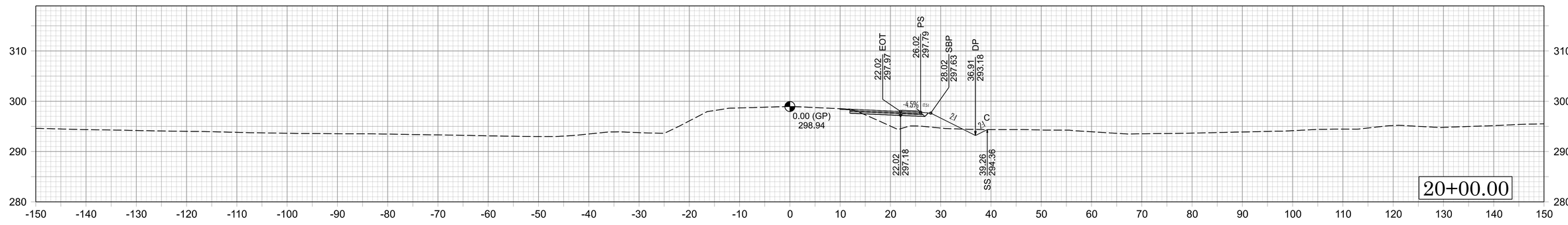
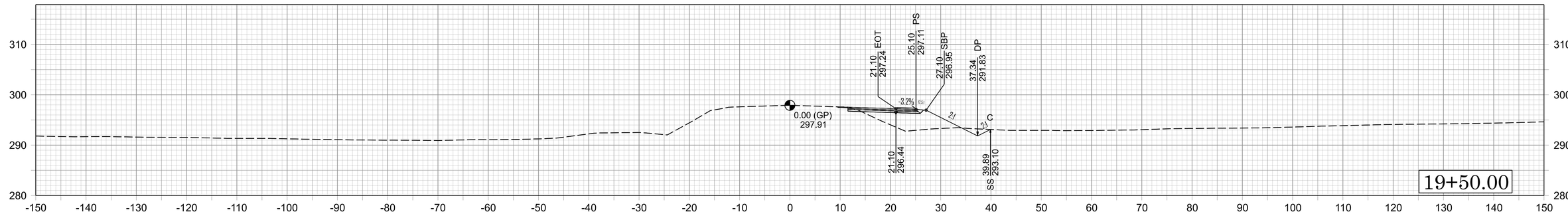
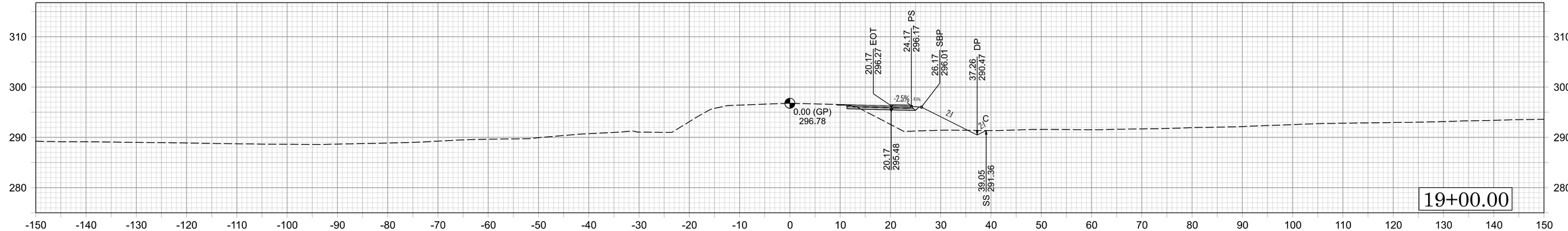
HL-0031
X-16 (Y)









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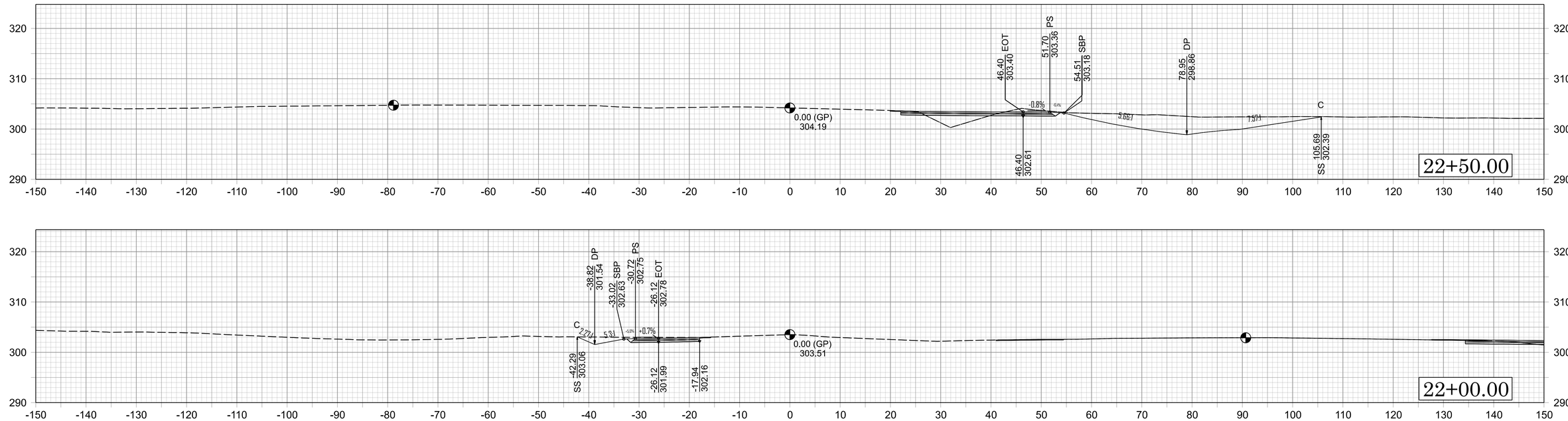

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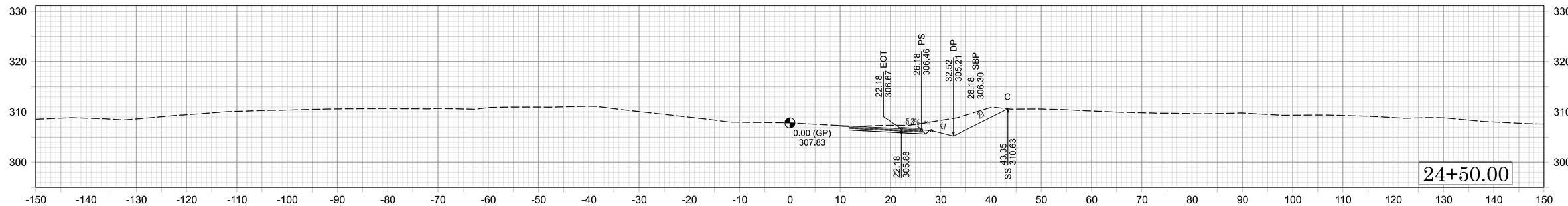

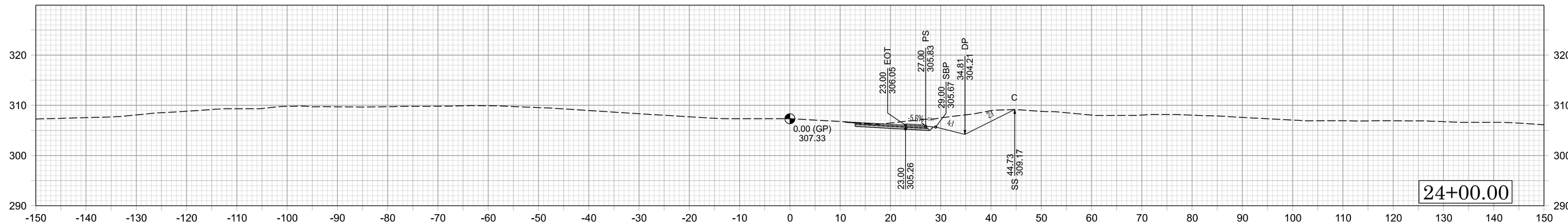

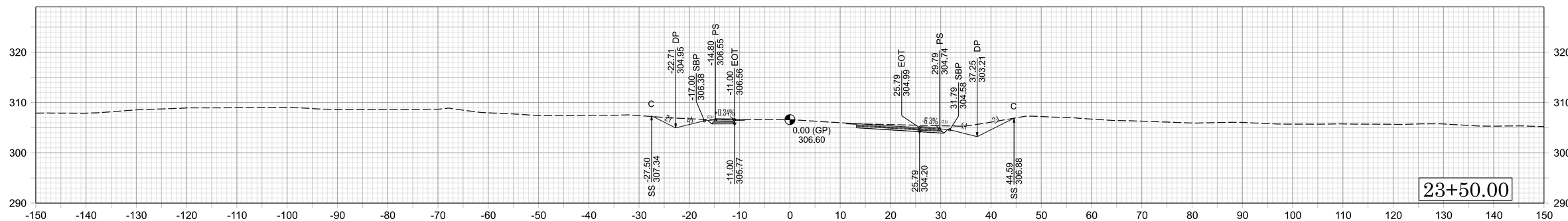

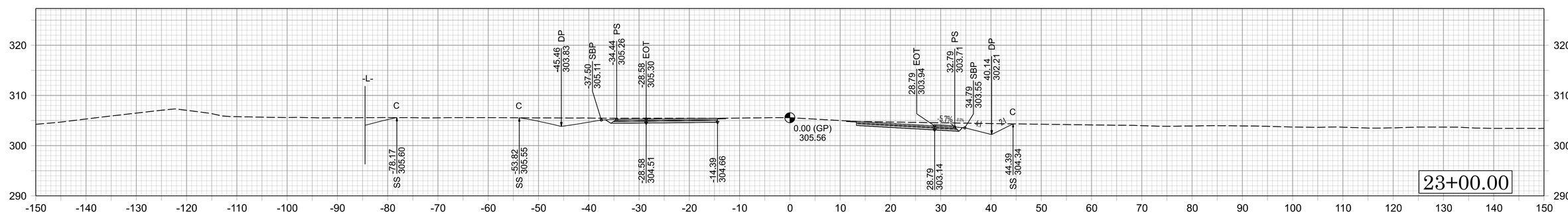

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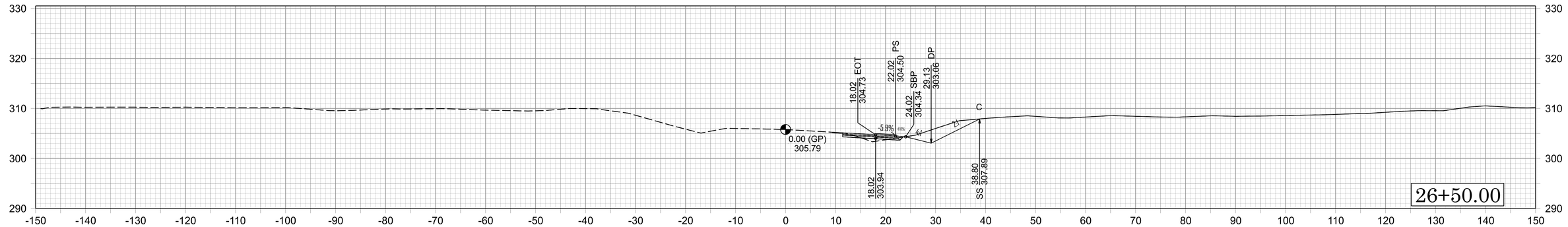
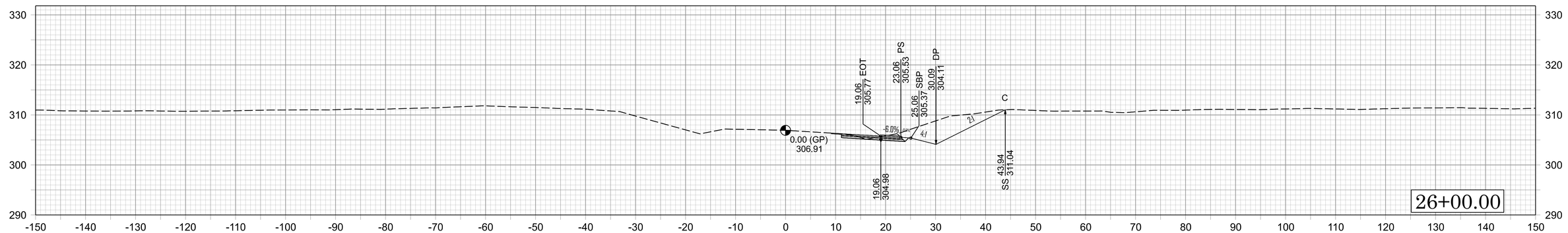
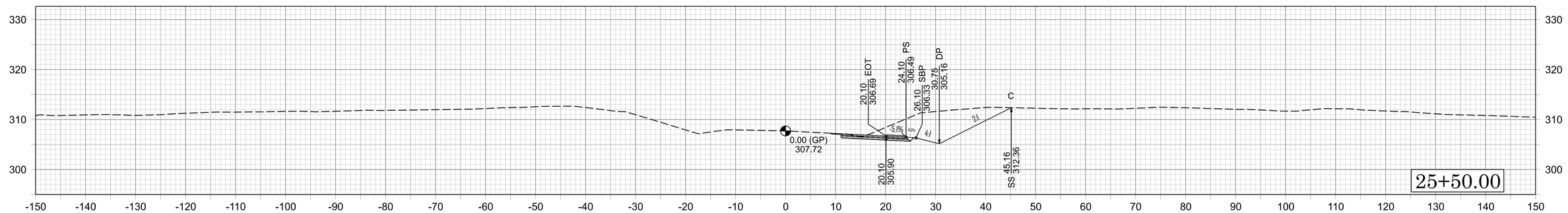
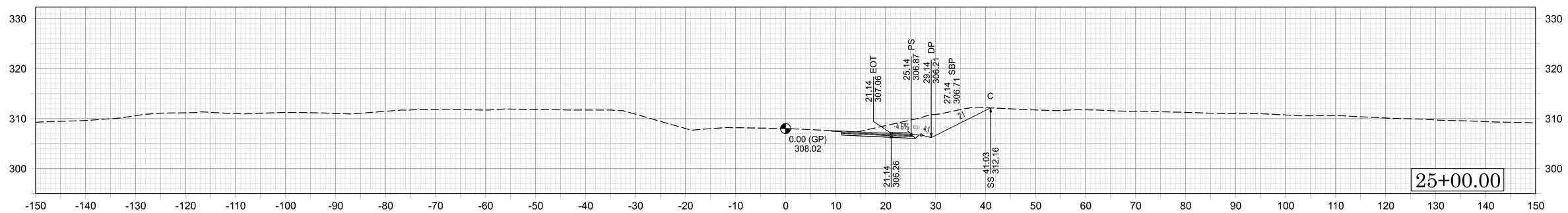
X-19 (Y)









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HL-0031
X-20 (Y)

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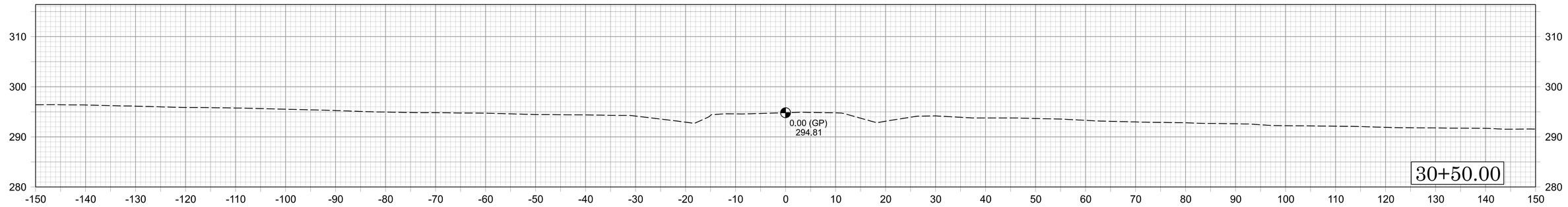
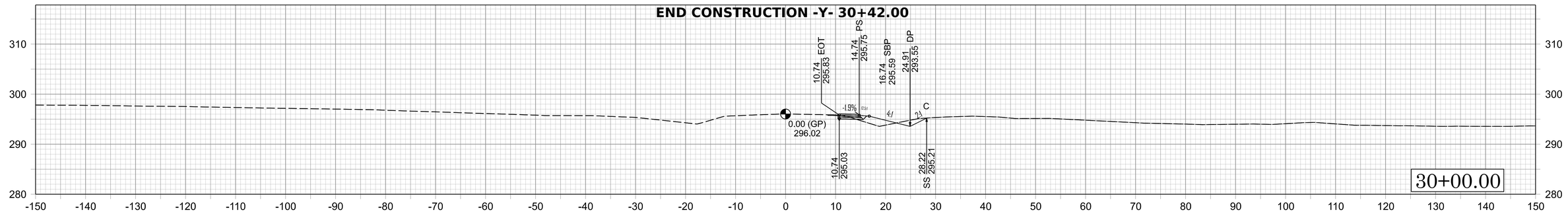
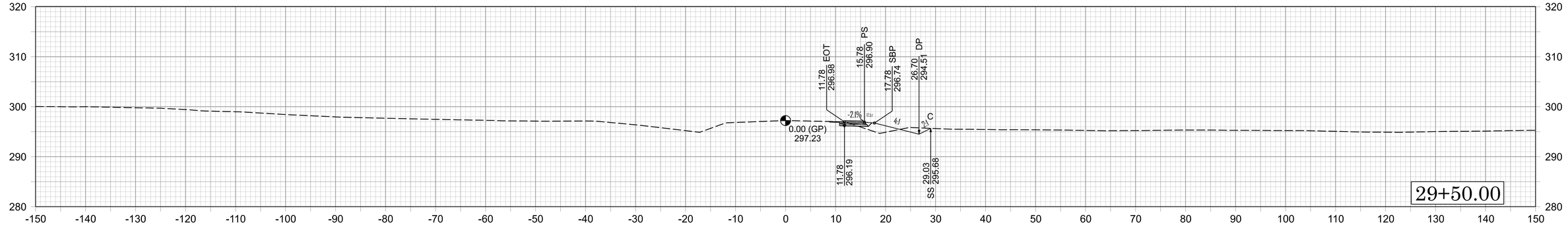
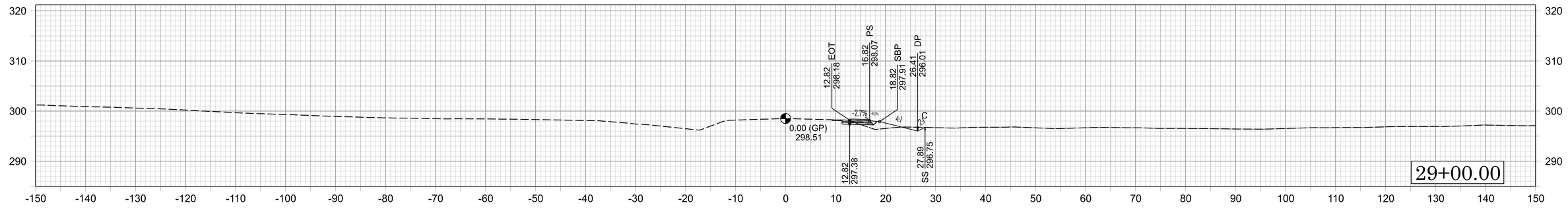
X-21(Y)









REFERENCE: HL-0031

PROJECT: 48996

SEE SHEET 3 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

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

ROADWAY SUBSURFACE INVESTIGATION

COUNTY WAKE

PROJECT DESCRIPTION CONSTRUCT LEFT TURN LANE AT SR 1007 (POOLE RD) AND SR 2233 (SMITHFIELD RD) INTERSECTION

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HL-0031	1	7

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF PREPARING THE SCOPE OF WORK TO BE INCLUDED IN THE REQUEST FOR PROPOSAL. 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.

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

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

NOTES:
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

A. N. JONES

N. T. ROBERSON

D. G. PINTER

INVESTIGATED BY A. N. JONES

DRAWN BY J. L. LOVE

CHECKED BY N. T. ROBERSON

SUBMITTED BY N. T. ROBERSON

DATE MARCH 2022

NORTH CAROLINA LICENSED SEAL 2730 GEOLOGIST ALEXANDRIA NICOLE JONES

DocuSigned by:
Alexandria Nicole Jones 07/11/2022
3CF45D0C56424F1...
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
HL-0031	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
- [X] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

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.
- [ ] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

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

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

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:

BORING ELEVATIONS TAKEN FROM TIN FILE sm5705aj_ls_tin.tin dated 07/15/2021.

DATE: 8-15-14

5/26/20

HL-0031
3

NC GRID
NAD 83 NA 20II

BM#3
ELEVATION=297.06'
BY STATION 12+44.00
14 LEFT
BENCHTIE IN 18" CEDAR

BM#1
ELEVATION=310.78'
BL STATION 15+85.00
118 LEFT
BENCHTIE IN 12" PINE

-L- PC 26+51.19

-L- PT 28+49.41
BEARING AHEAD = S89°1317.5"E

S88°1349.2"E

S89°1311

-Y- PC 22+64.24

-Y- PT 23+09.15

-Y- PC 24+55.34

-Y- PT 28+16.44

20

20

30

WOODS

ISFD

EL METER

TFO CABINET

CONC

GUY

INNERDUCT

30"DIP

BY-101

INV=284.08

UNDERGROUND TANK

MON WELL

VENT

FILL

DECK

STAIRS

BROKEN PAVEMENT

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48996.1.1	**TIP** HL-0031	**COUNTY** WAKE	**GEOLOGIST** Jones, A. N.	
SITE DESCRIPTION CONSTRUCT LEFT TURN LANE AT SR 1007 (POOLE RD) AND SR 2233 (SMITHFIELD RD) INTERSECTION				**GROUND WTR (ft)**
BORING NO. L_2175	**STATION** 21+75	**OFFSET** 53 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 298.4 ft	**TOTAL DEPTH** 5.0 ft	**NORTHING** 727,289	**EASTING** 2,164,006	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** Automatic	
DRILLER Pinter, D. G.	**START DATE** 12/16/21	**COMP. DATE** 12/16/21	**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)
300										298.4 GROUND SURFACE	0.0
								M		**RESIDUAL** ORANGE AND TAN, VERY LOOSE TO LOOSE, CLAYEY SAND WITH TRACE MICA	
295										293.4	5.0
										Boring Terminated at Elevation 293.4 ft IN RESIDUAL (CLAYEY SAND)	

WBS 48996.1.1	**TIP** HL-0031	**COUNTY** WAKE	**GEOLOGIST** Jones, A. N.	
SITE DESCRIPTION CONSTRUCT LEFT TURN LANE AT SR 1007 (POOLE RD) AND SR 2233 (SMITHFIELD RD) INTERSECTION				**GROUND WTR (ft)**
BORING NO. L_2218	**STATION** 22+18	**OFFSET** 53 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 304.4 ft	**TOTAL DEPTH** 5.0 ft	**NORTHING** 727,182	**EASTING** 2,164,045	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** Automatic	
DRILLER Pinter, D. G.	**START DATE** 12/16/21	**COMP. DATE** 12/16/21	**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
305										304.4 GROUND SURFACE 0.0
								M		303.4 **RESIDUAL** BROWN, LOOSE, SILTY SAND 1.0
300								M		ORANGE AND TAN, LOOSE TO MEDIUM DENSE, CLAYEY SAND WITH TRACE MICA
										299.4 5.0
										Boring Terminated at Elevation 299.4 ft IN RESIDUAL (CLAYEY SAND)

NCDOT BORE DOUBLE HL-0031_GEO_RDWY_BH.GPJ NC_DOT.GDT 3/15/22

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48996.1.1	**TIP** HL-0031	**COUNTY** WAKE	**GEOLOGIST** Jones, A. N.	
SITE DESCRIPTION CONSTRUCT LEFT TURN LANE AT SR 1007 (POOLE RD) AND SR 2233 (SMITHFIELD RD) INTERSECTION				**GROUND WTR (ft)**
BORING NO. L_2283	**STATION** 22+83	**OFFSET** 44 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 302.7 ft	**TOTAL DEPTH** 5.0 ft	**NORTHING** 727,277	**EASTING** 2,164,113	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** Automatic	
DRILLER Pinter, D. G.	**START DATE** 12/16/21	**COMP. DATE** 12/16/21	**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)
305											
										302.7 GROUND SURFACE	0.0
								M		**RESIDUAL** ORANGE, TAN, AND BROWN, LOOSE TO MEDIUM DENSE, CLAYEY SAND WITH TRACE MICA AND GRAVEL	
300								M		298.2	4.5
										297.7 TAN-ORANGE, VERY LOOSE TO LOOSE, SILTY SAND WITH TRACE MICA AND GRAVEL	5.0
										Boring Terminated at Elevation 297.7 ft IN RESIDUAL (SILTY SAND)	

WBS 48996.1.1	**TIP** HL-0031	**COUNTY** WAKE	**GEOLOGIST** Jones, A. N.	
SITE DESCRIPTION CONSTRUCT LEFT TURN LANE AT SR 1007 (POOLE RD) AND SR 2233 (SMITHFIELD RD) INTERSECTION				**GROUND WTR (ft)**
BORING NO. L_2397	**STATION** 23+97	**OFFSET** 34 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 307.2 ft	**TOTAL DEPTH** 1.5 ft	**NORTHING** 727,195	**EASTING** 2,164,225	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** Automatic	
DRILLER Pinter, D. G.	**START DATE** 12/16/21	**COMP. DATE** 12/16/21	**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
310										
								M		307.2 GROUND SURFACE 0.0
										305.7 **RESIDUAL** TOPSOIL, BROWN, VERY LOOSE TO LOOSE, SILTY SAND WITH TRACE ROOT FRAGMENTS 1.5
										Boring Terminated BY AUGER REFUSAL at Elevation 305.7 ft ON RESIDUAL (SILTY SAND)

NCDOT BORE DOUBLE HL-0031_GEO_RDWY_BH.GPJ NC_DOT.GDT 3/15/22

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48996.1.1	**TIP** HL-0031	**COUNTY** WAKE	**GEOLOGIST** Jones, A. N.	
SITE DESCRIPTION CONSTRUCT LEFT TURN LANE AT SR 1007 (POOLE RD) AND SR 2233 (SMITHFIELD RD) INTERSECTION				**GROUND WTR (ft)**
BORING NO. L_2401	**STATION** 24+01	**OFFSET** 36 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 307.2 ft	**TOTAL DEPTH** 3.4 ft	**NORTHING** 727,193	**EASTING** 2,164,229	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE RFC0067 CME-550X 88% 10/22/2020		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Pinter, D. G.	**START DATE** 02/08/22	**COMP. DATE** 02/08/22	**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)
310											
	307.2	0.0	3	4	8	12		M		307.2 GROUND SURFACE	0.0
305								M		306.0 **ROADWAY EMBANKMENT** ORANGE-BROWN, SOFT, SANDY CLAY WITH TRACE SAND AND GRAVEL	1.2
	303.9	3.3	60/0.1			60/0.1				303.9	3.3
										303.8 **RESIDUAL** TAN, WHITE, AND GRAY, LOOSE, SILTY SAND WITH TRACE MICA	3.4
										CRYSTALLINE ROCK GRANITE	
										Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 303.8 ft IN CRYSTALLINE ROCK (GRANITE)	

WBS 48996.1.1	**TIP** HL-0031	**COUNTY** WAKE	**GEOLOGIST** Jones, A. N.	
SITE DESCRIPTION CONSTRUCT LEFT TURN LANE AT SR 1007 (POOLE RD) AND SR 2233 (SMITHFIELD RD) INTERSECTION				**GROUND WTR (ft)**
BORING NO. L_2443	**STATION** 24+43	**OFFSET** 40 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 306.5 ft	**TOTAL DEPTH** 5.0 ft	**NORTHING** 727,188	**EASTING** 2,164,271	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** Automatic	
DRILLER Pinter, D. G.	**START DATE** 12/16/21	**COMP. DATE** 12/16/21	**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
310										
										306.5 GROUND SURFACE 0.0
305								M		**RESIDUAL** ORANGE AND BROWN, LOOSE TO MEDIUM DENSE, CLAYEY SAND WITH TRACE MICA
										301.5 5.0
										Boring Terminated at Elevation 301.5 ft IN RESIDUAL (CLAYEY SAND)

NCDOT BORE DOUBLE HL-0031_GEO_RDWY_BH.GPJ NC_DOT.GDT 3/15/22

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48996.1.1	**TIP** HL-0031	**COUNTY** WAKE	**GEOLOGIST** Jones, A. N.	
SITE DESCRIPTION CONSTRUCT LEFT TURN LANE AT SR 1007 (POOLE RD) AND SR 2233 (SMITHFIELD RD) INTERSECTION				**GROUND WTR (ft)**
BORING NO. L_2448	**STATION** 24+48	**OFFSET** 31 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 304.9 ft	**TOTAL DEPTH** 9.4 ft	**NORTHING** 727,196	**EASTING** 2,164,276	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Automatic	
DRILLER Pinter, D. G.	**START DATE** 02/08/22	**COMP. DATE** 02/08/22	**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)
305										304.9 GROUND SURFACE	0.0
			2	3		5 10 18 25		M		**RESIDUAL** ORANGE AND BROWN, LOOSE TO DENSE, CLAYEY SAND WITH TRACE MICA	
300			5	5		24					
			8	10		31 39 39 36					
			10	15							
			11	13							
			15	16							
			17	22							
			26	13						295.9	9.0
			14	22		100/0.4				295.5 **WEATHERED ROCK** GRANITE	9.4
			100/0.4							Boring Terminated at Elevation 295.5 ft ON CRYSTALLINE ROCK (GRANITE)	

WBS 48996.1.1	**TIP** HL-0031	**COUNTY** WAKE	**GEOLOGIST** Jones, A. N.	
SITE DESCRIPTION CONSTRUCT LEFT TURN LANE AT SR 1007 (POOLE RD) AND SR 2233 (SMITHFIELD RD) INTERSECTION				**GROUND WTR (ft)**
BORING NO. L_2493	**STATION** 24+93	**OFFSET** 35 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 303.5 ft	**TOTAL DEPTH** 5.0 ft	**NORTHING** 727,191	**EASTING** 2,164,321	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** Automatic	
DRILLER Pinter, D. G.	**START DATE** 12/16/21	**COMP. DATE** 12/16/21	**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
305										
										303.5 GROUND SURFACE 0.0
300								M		**RESIDUAL** TAN AND ORANGE, LOOSE TO MEDIUM DENSE, CLAYEY SAND
										298.5 5.0
										Boring Terminated at Elevation 298.5 ft IN RESIDUAL (CLAYEY SAND)

NCDOT BORE DOUBLE HL-0031_GEO_RDWY_BH.GPJ NC_DOT.GDT 3/15/22

09/08/99

TIP PROJECT: HS-2005I

CONTRACT: DE00400

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

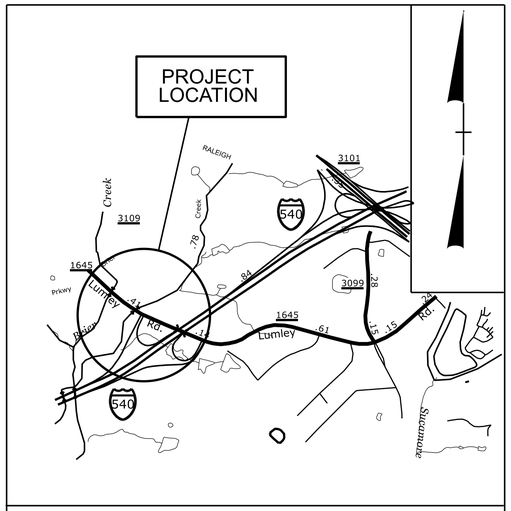
WAKE COUNTY

LOCATION: ADD LEFT TURN LANE TO OFF–RAMP OF I–540 WITH SR 1645 (LUMLEY ROAD).

TYPE OF WORK: GRADING, PAVING & SIGNAL

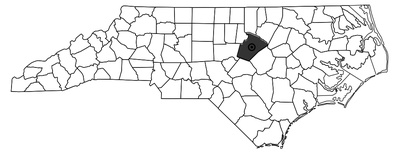
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS-2005I	1	

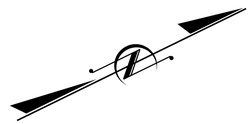
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49309.1.10	1645004	P E
49309.2.10	1645004	ROW
49309.3.10	1645004	CONST.

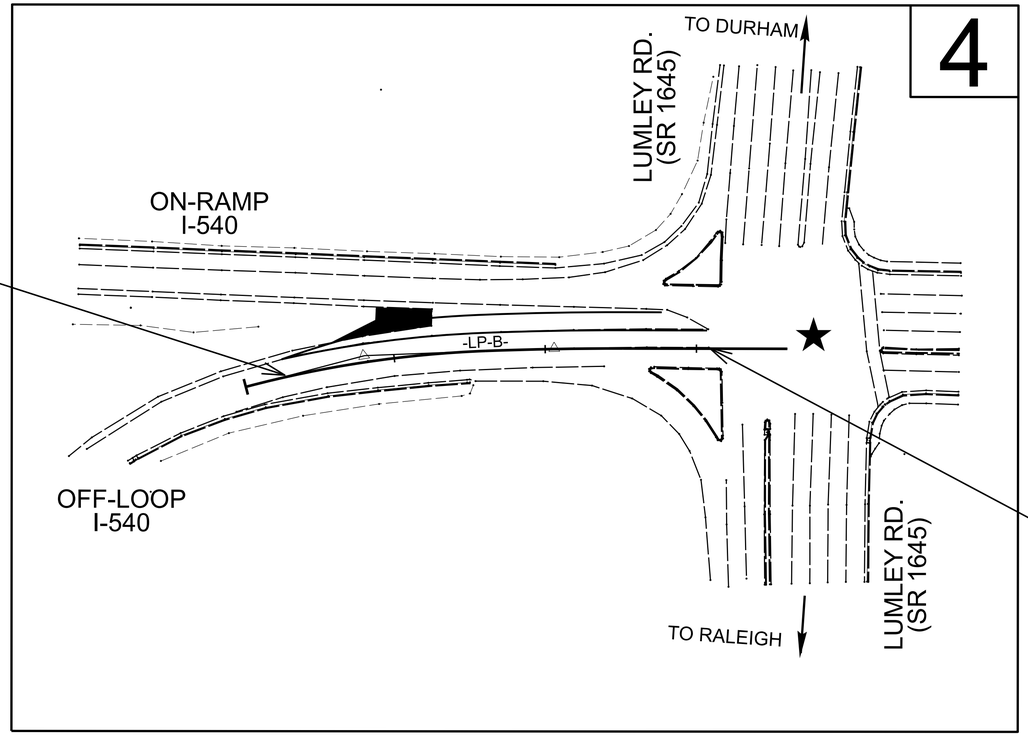


VICINITY MAP (NTS)

See Sheet 1-B for Conventional Symbols
See Sheet 1A For Index of Sheets







BEGIN TIP PROJECT HS-2005I
-LP-B- STA. 10+27.00
BEGIN CONSTRUCTION

END TIP PROJECT HS-2005I
-LP-B- POT STA.13+07.00
END CONSTRUCTION

★ MODIFIED SIGNAL

GRAPHIC SCALES

40 20 0 40 80
PLANS

20 10 0 20 40
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2023 = 2,400
ADT 2043 = 3,600
K = %
D = %
T = % *
V = MPH
* TTST = DUAL
FUNC CLASS =
INTERSTATE
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT HS-2005I = 0.053 MILES

TOTAL PROJECT HS-2005I = 0.053 MILES

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

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 27, 2023

LETTING DATE:
FEBRUARY 12, 2025

VICTOR M CHAVEZ, PE
PROJECT ENGINEER

BETH A QUINN, PE
TEAM LEADER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAL
DocuSigned by: 06F097D904114D5...
SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M CHAVEZ
DocuSigned by: Victor Chavez 7CD1F54298E940A...
12/05/2024
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
FIFTH DIVISION
BRANDON H. JONES, P. E.
DIVISION ENGINEER

DIVISION OF HIGHWAYS · DIVISION FIVE · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · DIVISION DESIGN UNIT

5/26/20

HS-20051
SHEET 1-A

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A–1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B–1	MONOLITHIC CONCRETE ISLAND DETAIL
3B–1	ROADWAY SUMMARY
4 THRU 5	PLAN AND PROFILE SHEET
RW02C–1	SURVEY CONTROL SHEET
TMP–1 THRU TMP–2	TRANSPORTATION MANAGEMENT PLANS
PMP–1 THRU PMP–2	PAVEMENT MARKING PLANS
EC–1 THRU EC–3	EROSION CONTROL PLANS
SIGN–1 THRU SIGN–3	SIGNING PLANS
SIG–1 THRU SIG–1.2	SIGNAL PLANS
X–1 THRU X–5	CROSS SECTIONS

EFF. 01–16–2024
REV.

2024 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch – N. C. Department of Transportation – Raleigh, N. C., Dated January, 2024 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 – EARTHWORK	
200.02	Method of Clearing – Method II
225.01	Guide for Grading Subgrade – Interstate and Freeway
225.04	Method of Obtaining Superelevation – Two Lane Pavement
DIVISION 6 – ASPHALT, BASES, AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 – INCIDENTALS	
852.01	Concrete Island

GENERAL NOTES: 2024 SPECIFICATIONS

EFFECTIVE: 01–16–2024
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT CONTROL POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. CONTROL LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE–IN.

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

RIGHT–OF–WAY MARKERS:

NONE.

UTILITIES:

NO UTILITY CONFLICTS ON THIS PROJECT.

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR CHAVEZ
Digitally signed by Victor Chavez
7CD1F54298E940A...
06/27/2024

5/26/20

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

HS-20051
SHEET | 001B

Note: Not to Scale

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (EIP) — EIP
- Computed Property Corner
- Existing Concrete Monument (ECM) — ECM
- Parcel / Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Secondary Horiz and Vert Control Point
- Vertical Benchmark
- Existing Right of Way Monument
- Proposed Right of Way Monument (Rebar and Cap)
- Proposed Right of Way Monument (Concrete)
- Existing Permanent Easement Monument
- Proposed Permanent Easement Monument (Rebar and Cap)
- Existing C/A Monument
- Proposed C/A Monument (Rebar and Cap)
- Proposed C/A Monument (Concrete)
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Existing Control of Access Line — CA
- Proposed Control of Access Line — CA
- Proposed ROW and CA Line — RW CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage/Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

** SUE - Subsurface Utility Engineering*
LOS - Level of Service - A,B,C or D (Accuracy)

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole — HH
- H-Frame Pole
- U/G Power Line Test Hole (SUE - LOS A)*
- U/G Power Line (SUE - LOS B)* — P
- U/G Power Line (SUE - LOS C)* — P
- U/G Power Line (SUE - LOS D)* — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- U/G Telephone Test Hole (SUE - LOS A)*
- U/G Telephone Cable (SUE - LOS B)* — T
- U/G Telephone Cable (SUE - LOS C)* — T
- U/G Telephone Cable (SUE - LOS D)* — T
- U/G Telephone Conduit (SUE - LOS B)* — TC
- U/G Telephone Conduit (SUE - LOS C)* — TC
- U/G Telephone Conduit (SUE - LOS D)* — TC
- U/G Fiber Optics Cable (SUE - LOS B)* — T FO
- U/G Fiber Optics Cable (SUE - LOS C)* — T FO
- U/G Fiber Optics Cable (SUE - LOS D)* — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line Test Hole (SUE - LOS A)*
- U/G Water Line (SUE - LOS B)*
- U/G Water Line (SUE - LOS C)*
- U/G Water Line (SUE - LOS D)*
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Test Hole (SUE - LOS A)*
- U/G TV Cable (SUE - LOS B)* — TV
- U/G TV Cable (SUE - LOS C)* — TV
- U/G TV Cable (SUE - LOS D)* — TV
- U/G Fiber Optic Cable (SUE - LOS B)* — TV FO
- U/G Fiber Optic Cable (SUE - LOS C)* — TV FO
- U/G Fiber Optic Cable (SUE - LOS D)* — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line Test Hole (SUE - LOS A)*
- U/G Gas Line (SUE - LOS B)* — G
- U/G Gas Line (SUE - LOS C)* — G
- U/G Gas Line (SUE - LOS D)* — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Force Main Line Test Hole (SUE - LOS A)*
- SS Force Main Line (SUE - LOS B)* — FSS
- SS Force Main Line (SUE - LOS C)* — FSS
- SS Force Main Line (SUE - LOS D)* — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line (SUE - LOS B)* — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

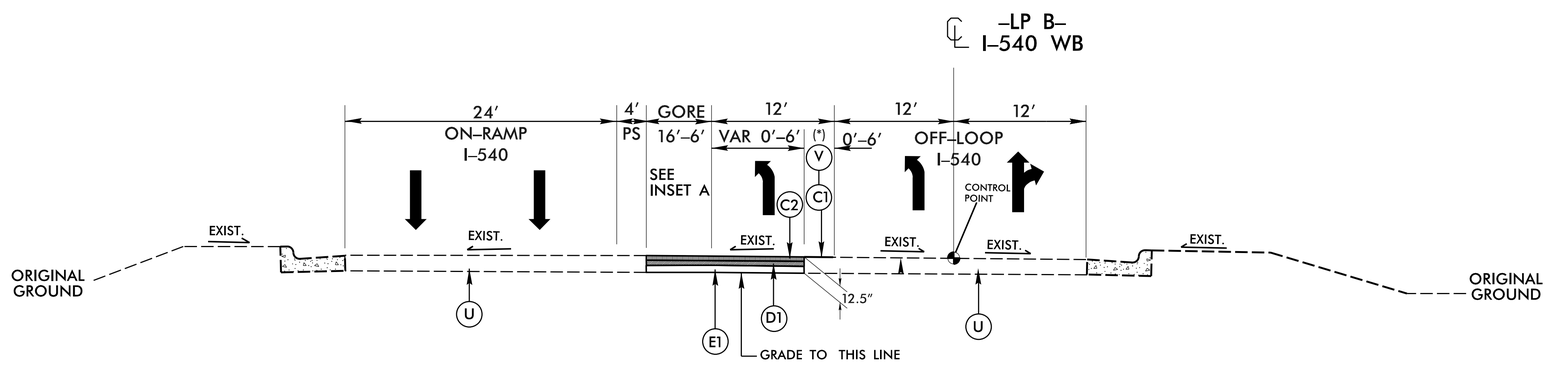
5/26/20

P A V E M E N T S C H E D U L E

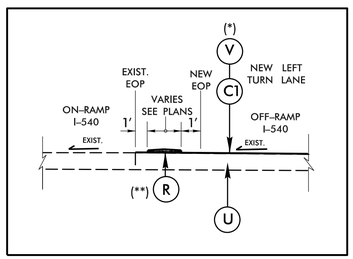
FINAL P A V E M E N T DESIGN

C1	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	R	5″ MONOLITHIC CONCRETE ISLAND (KEYED-IN)
C2	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	U	EXISTING PAVEMENT
D1	PROP. APPROX. 4″ ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	V	1.5″ MILLING
E1	PROP. APPROX. 5.5″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.		

NOTES:
1).PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



INSET A



(**) –LP B– STA. 11+27.00 TO STA. 12+77.00 +/– , LT
FOR 5″ MONOLITHIC CONCRETE ISLAND
(KEYED–IN) SEE SHEET 2B–1

TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

–LP B– STA. 10+27.00 TO STA. 11+27.00

(*) –LP B– STA. 10+27.00 TO STA. 13+07 – MILLING (NEW LEFT LANE)

GORE AREA –LP B– STA. 10+89.22 TO STA. 11+27 – SEE X–SECT.

REVISIONS

HS-20051
SHEET 2A-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

DIVISION OF HIGHWAYS - 5

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M CHAVEZ

5/27/2024

Victor Chavez

7CD1F54298E940A...

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M CHAVEZ

5/27/2024

Victor Chavez

7CD1F54298E940A...

5/26/20

06/27/2024

HS-20051

SHEET 2B-1

0' 5' 20'

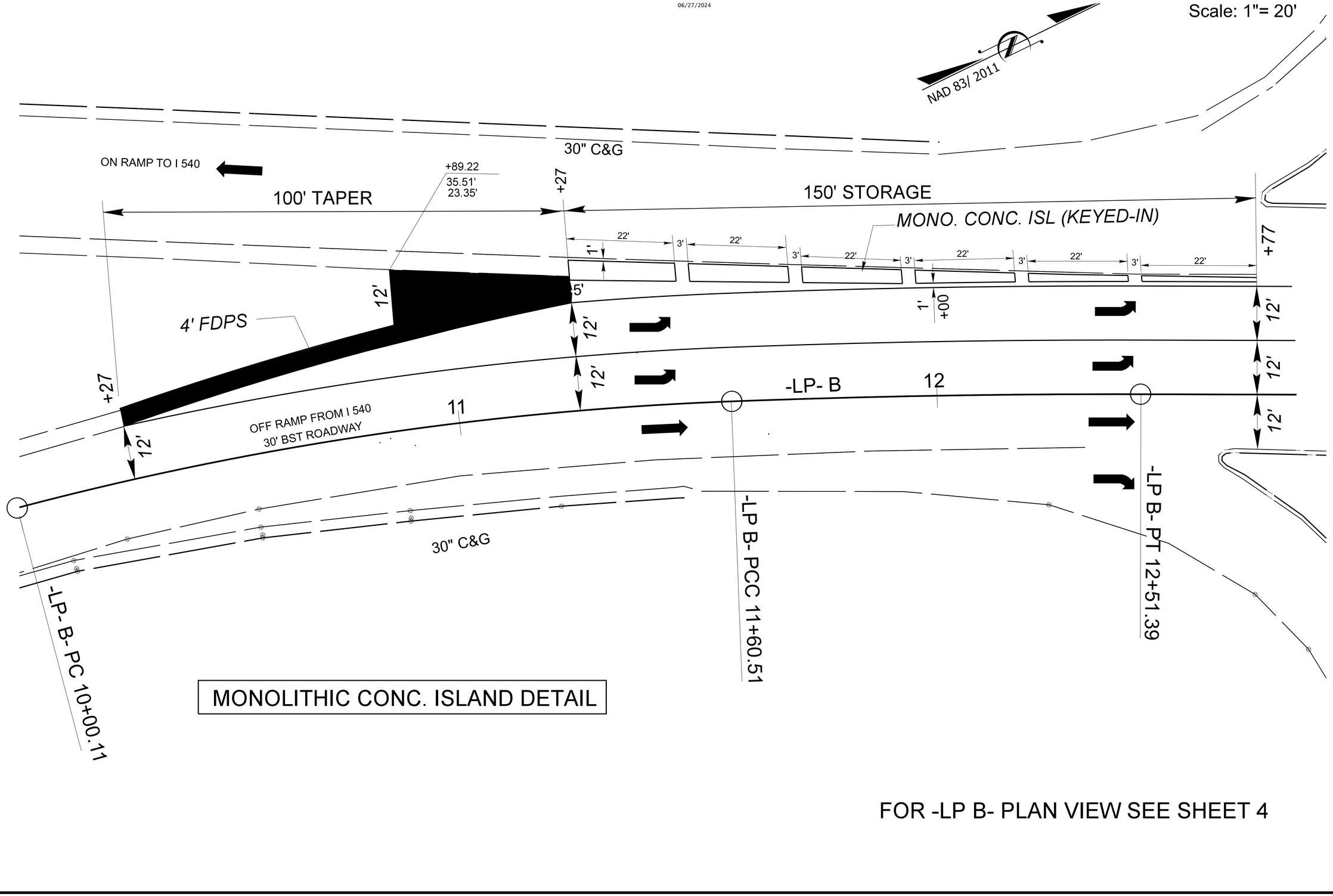
Scale: 1"= 20'

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M CHAVEZ

06/27/2024

DocuSigned by: Victor Chavez 7CD1F54298E940A...

NAD 83/ 2011



MONOLITHIC CONC. ISLAND DETAIL

FOR -LP B- PLAN VIEW SEE SHEET 4

5/26/20

HS-20051
SHEET 3B-1

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR A CHAVEZ
06/27/2022
Docusigned by:
Victor Chavez
7CD1F54298E940A...

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SUMMARY OF MILLING

IN SQUARE YARDS

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	PLAN. AREA SQ. FT.	WIDTH FT.	SQ. YDS.
–LB–	10+27.00 LT	–L– 13+07 LT	LT	2645	VARIES	295
			TOTAL:			295
			SAY:			325

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	EMBT+%	BORROW	WASTE
–L– 10+27.00 LT TO –L– 11+27.00 LT	30	0	40	30
				0
SUBTOTALS No. 1	30	0	40	30
SUBTOTALS No. 2	0	0	0	0
PROJECT SUBTOTALS	30	0	40	30
WASTE IN LIEU OF BORROW				
PROJECT TOTALS	30	0	40	30
REPLACE TOP SOIL BORROW PITS				
GRAND TOTALS	30		40	
SAY	40		50	

SHALLOW UNDERCUT: 10 CY
CLASS IV STABILIZATION: 5 TONS

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Shoulder Borrow, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

5/26/20

HS-2005I
SHEET 004
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M CHAVEZ
5/27/2020
Victor Chavez
7CD1F54298E940A...

DRAINAGE DESIGN ENGINEER

NAD 83/ 2001

WARD VENTURES, LLC
DB 8355 PG 1511
BM 1997 PG 674

EXISTING R/W

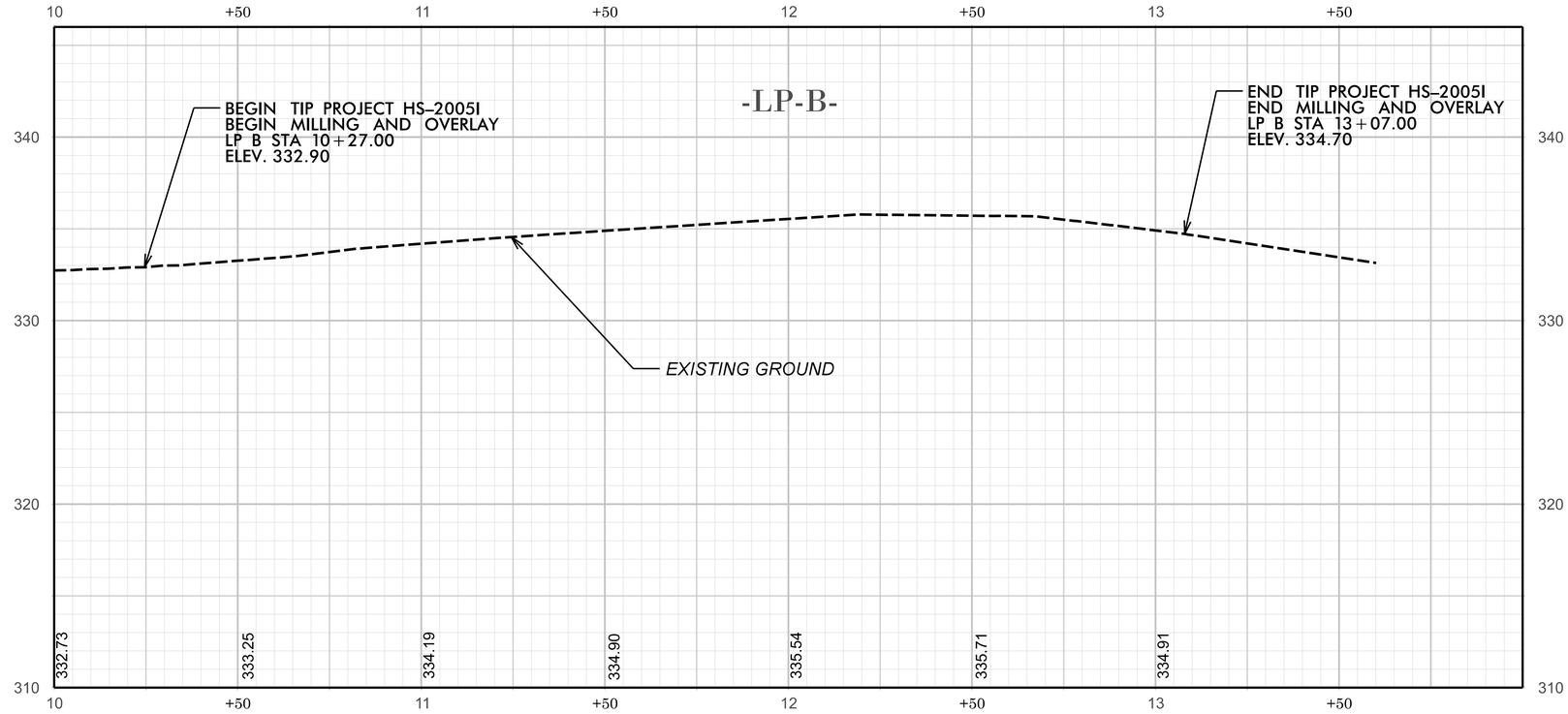
NCDOT

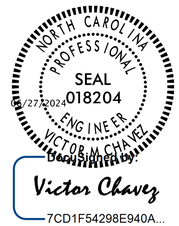
BEGIN TIP PROJECT HS-2005I
-LP-B- POC STA 10+27.00
BEGIN CONSTRUCTION

MTL
30" C&G
ON RAMP TO I 540
30' BST ROADWAY
100' TAPER
PAVED GORE AREA
30" C&G
150' STORAGE
MONO. CONC. ISL (keyed in)
4' FDPS
HS2005I2
OFF RAMP FROM I 540
30' BST ROADWAY
-LP-B-
-EL-
-EY1-
CONC
90' BST ROADWAY
CONCRETE ROAD
30" C&G
EXISTING R/W
WARD VENTURES, LLC
DB 8355 PG 1511
BM 2012 PG 134
AKG CORPORATE DRIVE
48' BST ROADWAY
CROSSWALK
CONC
24' BST ROADWAY
N25°47'14.0"E
-LP-B- POT 13+60.10
30" C&G
42" RCP
-LP-B- PC 10+00.11
-LP-B- PCC 11+60.51
-LP-B- PT 12+51.39
WOODS
CURDATA-LP-B-
PIc 10+80.63
Δc = 12°37'24.8" (RT)
D= 07°52'13.1"
Lc=160.40'
Tc=80.52'
R= 728'
e= Exist.
CURDATA-LP-B-
PIc 12+05.96
Δc = 02°19'35.7"(RT)
D= 02°33'36.5"
Lc=90.88'
Tc=45.45'
R=2,238'
e= Exist.
36' BST ROADWAY
62' BST ROADWAY
LUMLEY ROAD
30" C&G
15"RCP
18"RCP
END TIP PROJECT HS-2005I
-LP-B- POT STA 13+07.00
END CONSTRUCTION
WARD VENTURES, LLC
DB 8355 PG 1511
BM 2012 PG 134
EXISTING R/W
MODIFIED SIGNAL

FOR -LPB- PROFILE, SEE SHEET 5
FOR MONO. CONC. ISL. DETAIL, SEE SHEET 2B-1

5/26/20





FOR -LP-B- PLAN VIEW SEE SHEET 4

HS-2005I

SHEET 5

5/26/20

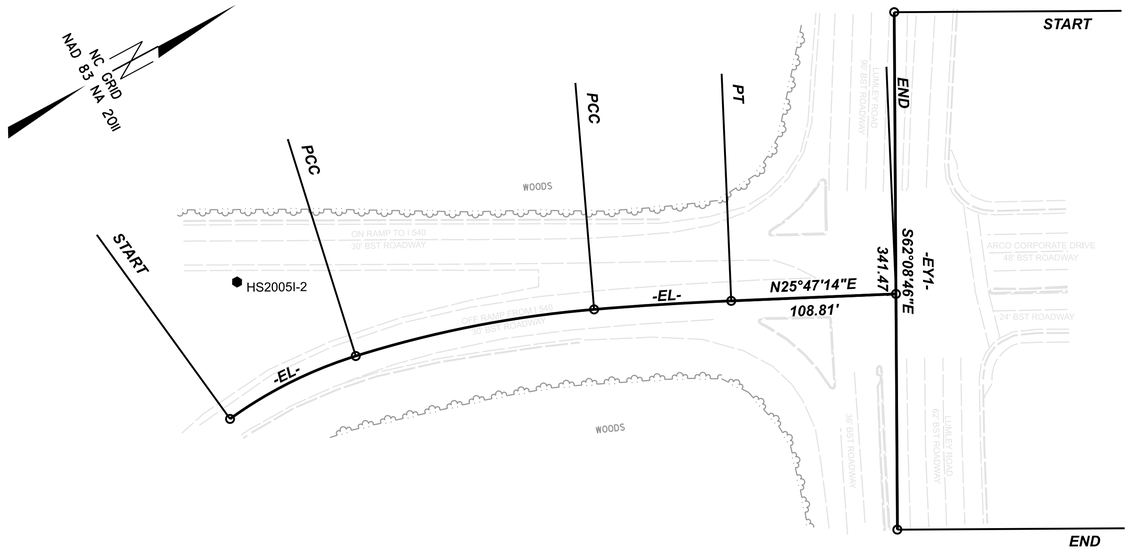
SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

EXISTING ALIGNMENT NAME:EL									
POINT	NORTHING	EASTING	BEARING	DIST	DELTA	D	L	T	R
PC	781983.9279	2062969.3505							
CURVE					18°36'26.762" Right	19°58'28.375"	93.156	46.992	286.844
PCC	782076.6381	2062971.9582							
CURVE					12°39'27.493" Right	07°52'52.285"	160.606	80.631	726.994
PCC	782229.7985	2063019.1951							
CURVE					02°19'35.712" Right	02°33'56.898"	90.677	45.345	2233.053
PT	782312.2236	2063056.9739							
LINE			N25°47'13.962"E	108.8079					
END	782410.1960	2063104.3086							

EXISTING ALIGNMENT NAME:EY1									
POINT	NORTHING	EASTING	BEARING	DIST	DELTA	D	L	T	R
START	782497.0276	2062939.9118							
LINE			S62°08'45.652"E	341.4673					
END	782337.4873	2063241.8170							

HS2005I-1



BASELINE CONTROL				
POINT	DESC	NORTH	EAST	ELEVATION
HS2005I-1	GPS-1	781315.1243	2062470.887	327.378
HS2005I-2	GPS-2	782030.7064	2062891.893	331.099

50 25 0 50 100
PLANS 1"=50'

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE PROPOSED ALIGNMENT CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

I, MICHAEL R. JACKSON, PLS, CERTIFY THAT THE PROJECT CONTROL WAS PERFORMED UNDER MY SUPERVISION FROM AN ACTUAL GPS SURVEY MADE UNDER MY SUPERVISION AND THE FOLLOWING INFORMATION WAS USED TO PERFORM THE SURVEY:

CLASS OF SURVEY: ***AA***
TYPE OF GPS FIELD PROCEDURE: RTN
DATES OF SURVEY: 03/21/2023
DATUM/EPOCH: NAD 83/NA 2011
PUBLISHED/FIXED-CONTROL USE: N/A
LOCALIZED AROUND: HS2005I-2
NORTHING: 782030.7064
EASTING: 2062891.8927
COMBINED GRID FACTOR: 0.999925373
GEOID MODEL: GEOID 18
UNITS: US SURVEY FEET

I ALSO CERTIFY THAT THE BASELINE CONTROL FOR THIS PROJECT WAS COMPLETED UNDER MY DIRECT AND RESPONSIBLE CHARGE FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; THAT ALL HORIZONTAL CLOSURES HAD A MINIMUM RATIO OF PRECISION OF 1:20,000 (CLASS AA) AND VERTICAL ACCURACY TO CLASS A. FIELD WORK WAS PERFORMED FROM 03/21/2023TO 03/27/2023 , AND ALL COORDINATES ARE BASED ON NAD 83/2011 AND ALL ELEVATIONS ARE BASED ON NAVD 88; THAT THIS SURVEY WAS PERFORMED TO MEET THE REQUIREMENTS OF 21NCAC 56.1600 AS APPLICABLE.

THIS 13TH DAY OF MAY, 2024.

DocuSigned by:
Michael Jackson
1AB7677107514G7...

PROFESSIONAL LAND SURVEYOR L-4363

HS-2005-I
R/W | 02C-I

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR
NORTH CAROLINA PROFESSIONAL SEAL L-4363 LAND SURVEYOR MICHAEL R. JACKSON

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

2018 STANDARD SPECIFICATIONS

TIP PROJECT: HS-2005-I
COUNTY: WAKE

PREPARED FOR

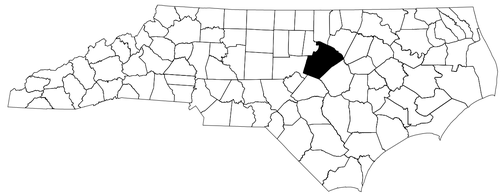
LOCATION AND SURVEYS UNIT

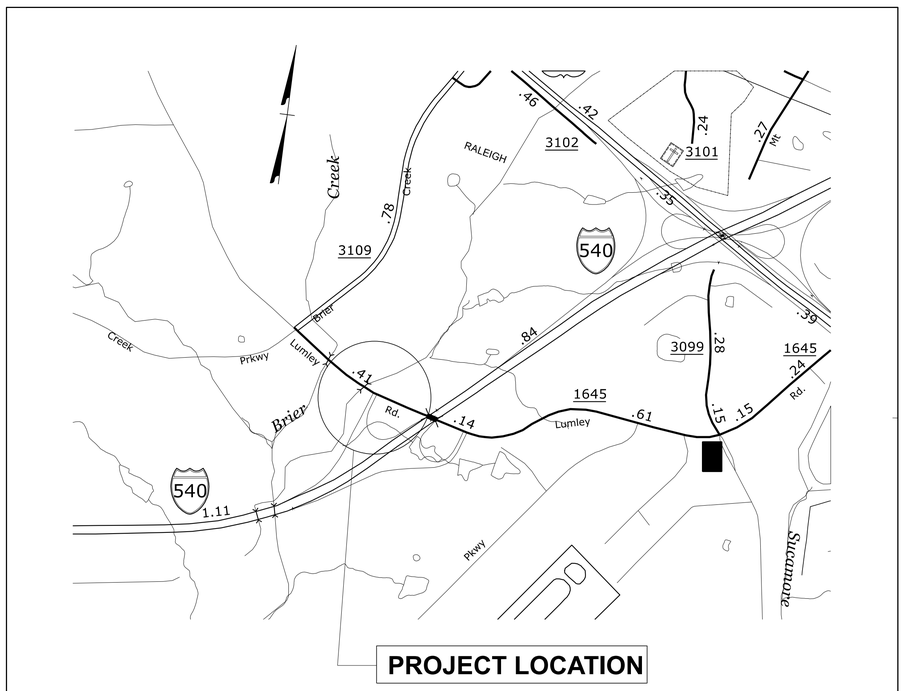
PREPARED BY
LOCATION & SURVEYS
DIVISION 5
3301 JONES SAUSAGE RD.
SUITE 100
GARNER, NC 27529

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

WAKE COUNTY





VICINITY MAP

WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

PLANS PREPARED BY:

VICTOR M CHAVEZ, PE

DIVISION FIVE DDC ENGINEER

NCDOT CONTACTS:

VICTOR M. CHAVEZ, PE
PROJECT ENGINEER

KYRILLOS HELMY, EI
PROJECT DESIGN ENGINEER

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, LEGEND AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND GENERAL NOTES
TMP-2	PHASING DETAIL

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- WORK AREA
- REMOVAL

SIGNALS

EXISTING · PROPOSED · TEMP TEMPORARY

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM · SKINNY DRUM · TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW BOARD
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED ATTENUATOR (TMA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

PAVEMENT MARKING SYMBOLS

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
FIFTH DIVISION
BRANDON H. JONES, P. E.
DIVISION ENGINEER

APPROVED: _____

DATE: 06/27/2024

DocuSigned by: Victor Chavez 70D1564298E940...

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 018204 VICTOR M CHAVEZ

SHEET NO.
TMP-1

HS-2005I

TIP PROJECT:

5/6/2024
S:\DDC\Dist\FUNDED TIP\HS-2005I\Roadway\Proj\ORD\HS2005I_TRAFFIC CONTROL.dgn
User:vmchavez1

PROJ. REFERENCE NO.	SHEET NO.
HS-2005I	TMP-1A

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW BOARD
1130.01	DRUMS
1135.01	CONES
1150.01	FLAGGERS
1180.01	SKINNY DRUMS

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

TIME RESTRICTIONS

A) DO NOT CLOSE OR NARROW TRAVEL LANES AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
OFF-RAMP I-540 WB	6:00 AM TO 9:00 AM AND 4:00PM TO 7:00PM (MON. - FRIDAY)

LANE AND SHOULDER CLOSURE REQUIREMENTS

B) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

C) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

E) PROVIDE TRAFFIC CONTROL FOR APPROPRIATE LANE CLOSURES FOR SURVEYING DONE BY THE DEPARTMENT.

GENERAL NOTES

PAVEMENT EDGE DROP OFF REQUIREMENTS

F) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

TRAFFIC PATTERN ALTERATIONS

G) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

H) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

I) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

J) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 50FT IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES

K) PLACE ADDITIONAL SETS OF THREE CHANNELIZING, DRUMS, PERPENDICULAR TO THE EDGE OF TRAVELWAY ON 50 FT CENTERS WHEN UNOPENED LANES ARE CLOSE TO TRAFFIC.

PAVEMENT MARKINGS AND MARKERS

L) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

M) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

MISCELLANEOUS

N) IN THE EVENT A TIE-IN CANNOT BE MADE IN ONE DAY'S TIME, BRING THE TIE-IN AREA TO AN APPROPRIATE ROADWAY ELEVATION AS DETERMINED BY THE ENGINEER.PLACE AND BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8-7) AND BLACK ON ORANGE "PAVEMENT ENDS" SIGNS (W8-3) 100FT AND 150FT RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS.

O) PLACE DRUMS TO DELINEATE EXISTING AND PROPOSED ISLANDS BEFORE INSTALLATION.

APPROVED: _____

DATE: 06/27/2024

SEAL
DocuSigned by:
Victor Chavez
7CD1F54298E940A...

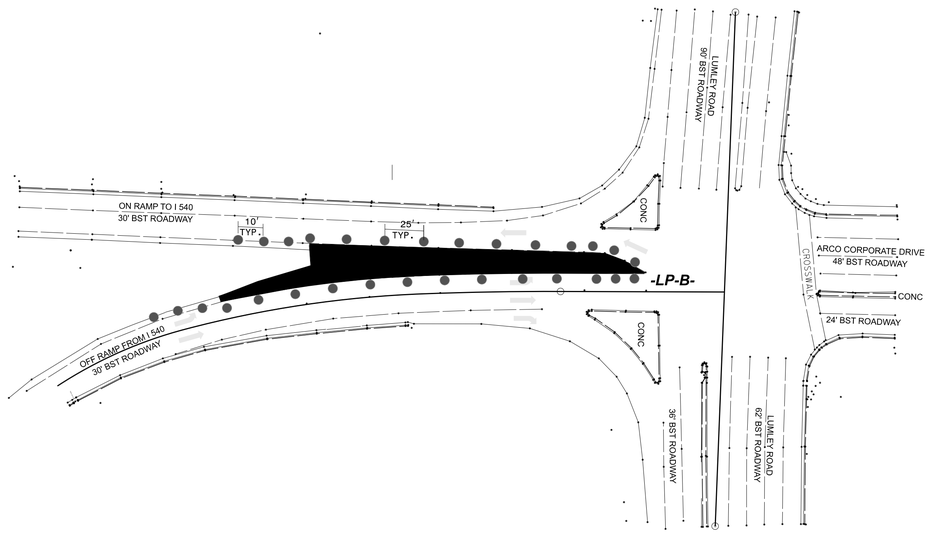
NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M CHAVEZ

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

TRANSPORTATION OPERATIONS PLAN

5/16/2024
S:\DDC\Dist\FUNDED TIP\HS-2005I\Roadway\Proj\ORD\HS2005I_TRAFFIC CONTROL.dgn
User:vmchavez1

PROJ. REFERENCE NO.	SHEET NO.
HS-2005I	TMP-2



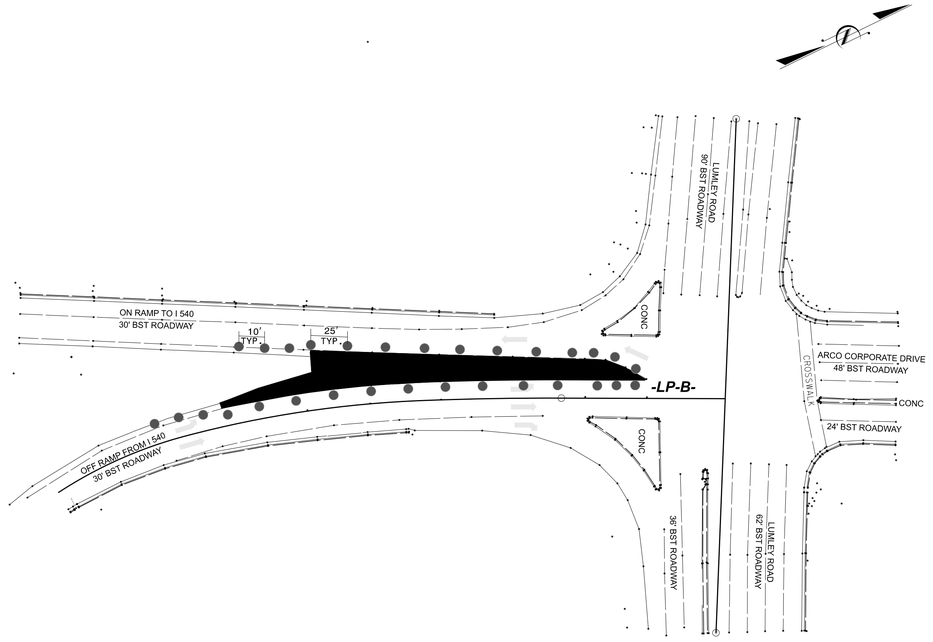
PHASE I:

STEP 1 - INSTALL ALL ADVANCE WORK ZONE MARKING SIGNS PER RSD 1101.01, ON OFF-RAMP I-540.

STEP 2 - USING RSD 1101.04 , SHEET 1 OF 2, CONSTRUCT WIDENING AND GORE AREA, MILLING, OF OFF-RAMP I-540 AT LUMLEY ROAD (SR 1645) FROM STA 10+27.00 TO STA 12+77.00 +/-, UP TO BUT NOT INCLUDING FINAL LAYER OF SURFACE COURSE, AWAY FROM TRAFFIC.

ALL STEPS ABOVE SHOULD BE COMPLETED BEFORE MOVING TO THE NEXT PHASE.

PROPOSED PAVEMENT



PHASE II:

STEP 3 - USING RSD 1101.04 , SHEET 1 OF 2, CONSTRUCT MONOLITHIC CONCRETE ISLAND OF OFF-RAMP I-540. FROM STA 10+27.00 TO STA 12+77 +/-, AWAY FROM TRAFFIC.

STEP 4 - USING RSD 1101.04 , SHEET 1 OF 2, AND RSD 1101.02, SHEET 7 OF 19, INSTALL SIGNAL LOOP

STEP 5 - USING RSD 1101.04 , SHEET 1 OF 2,AND RDS 1101.02, SHEET 7 OF 19, PLACE FINAL SURFACE COURSE LAYER ON OFF-RAMP I-540 FROM STA 10+27 TO STA 13+07.

STEP 6 - APPLY FINAL PAVEMENT MARKING.

STEP 7 - INSTALL MODIFIED SIGNAL AND SIGNS.

PROPOSED PAVEMENT

APPROVED: _____

DATE: 06/27/2024

SEAL
DocuSigned by:
Victor Chavez
7CD1F54298E940A...

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M CHAVEZ

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

PHASING DETAIL

6/27/2024
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User:rmorovez

PROJECT REFERENCE NO.	SHEET NO.
HS-2005I	PMP-1

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M CHAVEZ

08/26/2024

DocuSigned by:
Victor Chavez
7CD1F54298E940A...

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PAVEMENT MARKING PLAN

WAKE COUNTY

LOCATION: OFF-RAMP I-540 WB AT LUMLEY ROAD (SR 1645)

HS-2005I

TIP PROJECT:

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKINGS PLAN TITLE AND SCHEDULE SHEET
PMP-2	PAVEMENT MARKINGS DETAIL SHEET

GENERAL NOTES

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
I-540 WB LOOP RAMP	THERMOPLASTIC	NONE

B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.
D) UNLESS OTHERWISE SPECIFIED, HEATED-IN-PLACE THERMOPLASTIC MAY BE USED IN LIEU OF EXTRUDED THERMOPLASTIC FOR SYMBOLS.
E) REFER TO THE TRAFFIC SIGNAL DESIGN PLANS FOR STOP BAR LOCATION.

PAVEMENT MARKING SCHEDULE

SYMB	DESCRIPTION AND TYPE	PAY ITEM QUANTITY
T2	WHITE SOLID LANE LINE (4", 90 MILS)	300 LF
T4	3FT - 9FT/ SP. WHITE MINI SKIP (4", 90 MILS)	300 LF
T10	YELLOW EDGELINE (4", 90 MILS)	450 LF
T24	2FT - 6FT/ SP. WHITE MINI SKIP (6", 90 MILS)	275 LF
T61	WHITE STOP BAR (24", 90 MILS)	40 LF
T70	LEFT TURN ARROW (90 MILS)	4 EA
T71	RIGHT TURN ARROW (90 MILS)	1 EA
T72	STRAIGHT ARROW (90 MILS)	2 EA
T80	WRONG WAY ARROW (90 MILS)	1 EA
MF	SNOWPLOWALE PAVEMENT MARKERS. CRYSTAL/RED	14 EA

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.03	PAVEMENT MARKINGS - EXIT AND ENTRANCE RAMPS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES

PLANS PREPARED BY:

VICTOR M CHAVEZ, PE

DIVISION FIVE DDC ENGINEER

NCDOT CONTACTS:

VICTOR M CHAVEZ, PE
PROJECT ENGINEER

KYRILLOS HELMY, EI
PROJECT DESIGN ENGINEER

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION DESIGN UNIT

$$$$$$$$SYSTIME$$$$$$
$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

5/26/20

HS-20051
SHEET | PM-2

NORTH CAROLINA PROFESSIONAL ENGINEER VICTOR M CHAVEZ SEAL 018204
5/28/2024

DocuSigned by:
Victor Chavez
7CD1F54298E940A...

MAINTAIN EXIST. SYMBOL.

MONO. CONC. ISL

LUMLEY ROAD
90' BST ROADWAY

30" C&G

CONC

REMOVE EXIST. MARKING

ON RAMP TO I 540

T10

T70

T61

T 24

ARCO CORPORATE DRIVE

CROSSWALK

1' 1' 1' 1'

12' 5' 12' 12' 12' 12' 12'

+00 +27 +85 +07

11 12 13

-LP-B-

-LP-B-

OFF RAMP FROM I 540

T10 T80 MF T 4 T72 T70 T 2 T 4 T72 T71 T61 T 24

CONC

CONC

36' BST ROADWAY

LUMLEY ROAD
62' BST ROADWAY

BEGIN CONSTRUCTION
BEGIN TIP PROJECT HS-2005I
-LP-B- POC STA 10+27.00

END CONSTRUCTION
END TIP PROJECT HS-2005I
-LP-B- POT STA 13+07.00

★ MODIFIED SIGNAL

12/6/2023

CONTRACT: **TIP PROJECT: HS-2005I**

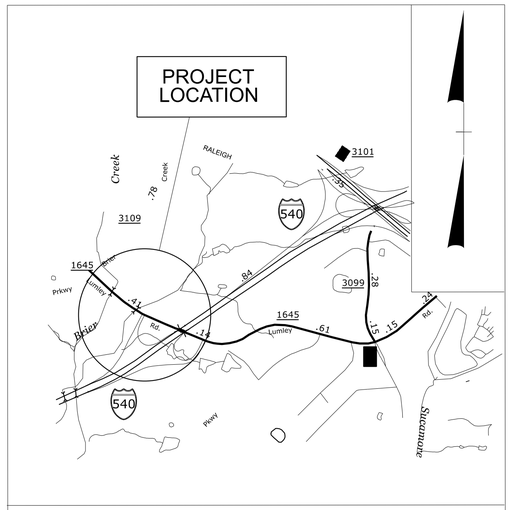
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

PLAN FOR PROPOSED
EROSION CONTROL

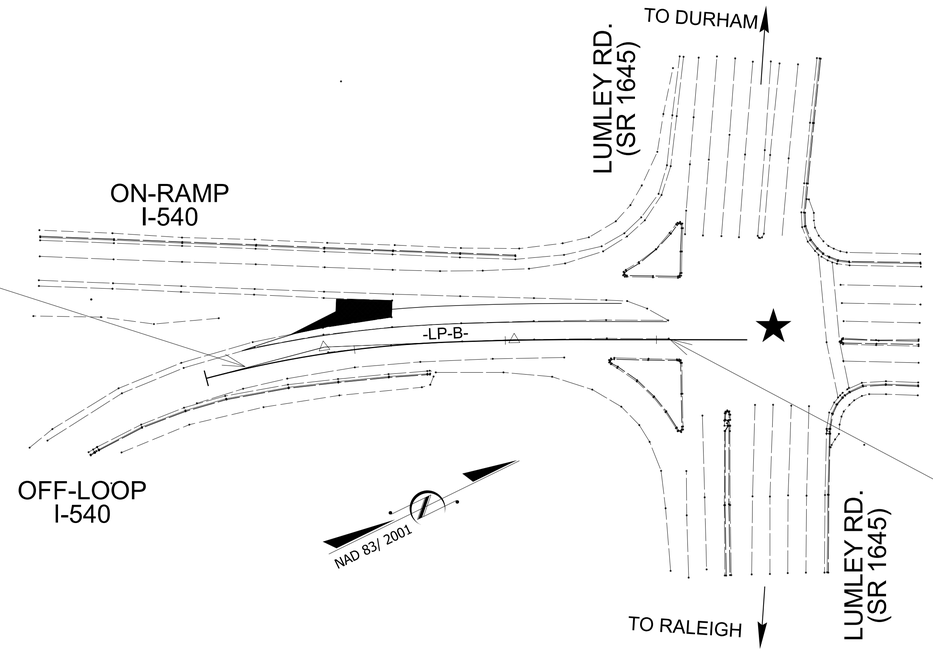
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS-2005I	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49309.1.10	1645004	P E
49309.2.10	1645004	ROW
49309.3.10	1645004	CONST.



VICINITY MAP (NTS)

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1630.03	Tree Protection Fence	
1630.05	Temporary Diversion	TD
1630.06	Special Stilling Basin	
1632.03	Rock Inlet Sediment Trap Type C	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
1636.03	Wattle Barrier	
	Wattle with Polyacrylamide (PAM)	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	



BEGIN TIP PROJECT HS-2005I
-LP-B- STA. 10+27.00
BEGIN CONSTRUCTION

END TIP PROJECT HS-2005I
-LP-B- POT STA.13+07.00
END CONSTRUCTION

★ MODIFIED SIGNAL

THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LOCATION: ADD LEFT TURN LANE TO OFF–RAMP OF I–540 WITH LUMLEY ROAD (SR 1645).

TYPE OF WORK: GRADING, PAVING & SIGNAL

NOTE:

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

GRAPHIC SCALES

40 20 0 40 80
PLANS

20 10 0 20 40
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2023 = 2,400
ADT 2043 = 3,600
K = %
D = %
T = % *
V = MPH
* TTST = DUAL
FUNC CLASS =
INTERSTATE
REGIONAL TIER

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG–010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2019 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

Prepared in the Office of:

DIVISION DESIGN & CONSTRUCTION
815 Stadium Drive
Durham, NC 27704

2024 STANDARD SPECIFICATIONS

Designed by:

David Davis — *NAME*
3553 — *LEVEL III CERTIFICATION NO.*

Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"– Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated January 2024 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.02	Silt Basin Type B	1634.02	Temporary Rock Sediment Dam Type B
1630.03	Temporary Silt Ditch	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.04	Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.05	Temporary Diversion	1640.01	Coir Fiber Baffle
1630.06	Special Stilling Basin	1645.01	Temporary Stream Crossing
1631.01	Matting Installation		

PROJECT REFERENCE NO.	SHEET NO.
HS-20051	EC-2
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

12/6/23

HS-2005I
SHEET EC3

Place wattle barrier
behind proposed widening

WARD VENTURES, LLC
DB 8355 PG 1511
BM 1997 PG 674

WARD VENTURES, LLC
DB 8355 PG 1511
BM 2012 PG 134

3

MODIFIED SIGNAL

-LP-B- POT 13+60.10

END TIP PROJECT HS-2005I
-LP-B- POT STA 13+07.00
END CONSTRUCTION

WARD VENTURES, LLC
DB 8355 PG 1511
BM 2012 PG 134

BEGIN TIP PROJECT HS-2005I
-LP-B- POC STA 10+27.00
BEGIN CONSTRUCTION

FOR -LPB- PROFILE, SEE SHEET 5
FOR MONO. CONC. ISL. DETAIL, SEE SHEET 2B-1

-LP-B- PC 10+00.00

-LP-B- PCC 11+60.51

-LP-B- PT 12+51.39

CURDATA-LP-B-
PIc 10+80.63
Δc = 12°37'24.8" (RT)
D= 07°52'13.1"
Lc=160.51'
Tc=80.52'
R= 728'
e= Exist.

CURDATA-LP-B-
PIc 12+05.96
Δc = 02°19'35.7"(RT)
D= 02°33'36.5"
Lc=90.88'
Tc=45.45'
R=2,238'
e= Exist.

-LP-B- N10°50'13.4"E
-LP-B- N23°27'38.2"E
-EL-
-LP-B- N25°47'14.0"E
-EY1-

ON RAMP TO I 540
30' BST ROADWAY

OFF RAMP FROM I 540
30' BST ROADWAY

100' TAPER

4' FDPS

30" C&G

150' STORAGE

PAVED GORE AREA

MONO. CONC. ISL. (keyed in)

HS2005I-2

LUMLEY ROAD
90' BST ROADWAY

LUMLEY ROAD
62' BST ROADWAY

36' BST ROADWAY

ARCO CORPORATE DRIVE
48' BST ROADWAY

24' BST ROADWAY

CROSSWALK

CONC

MTL

15"RCP

12" RCP

SODOM

09/08/99

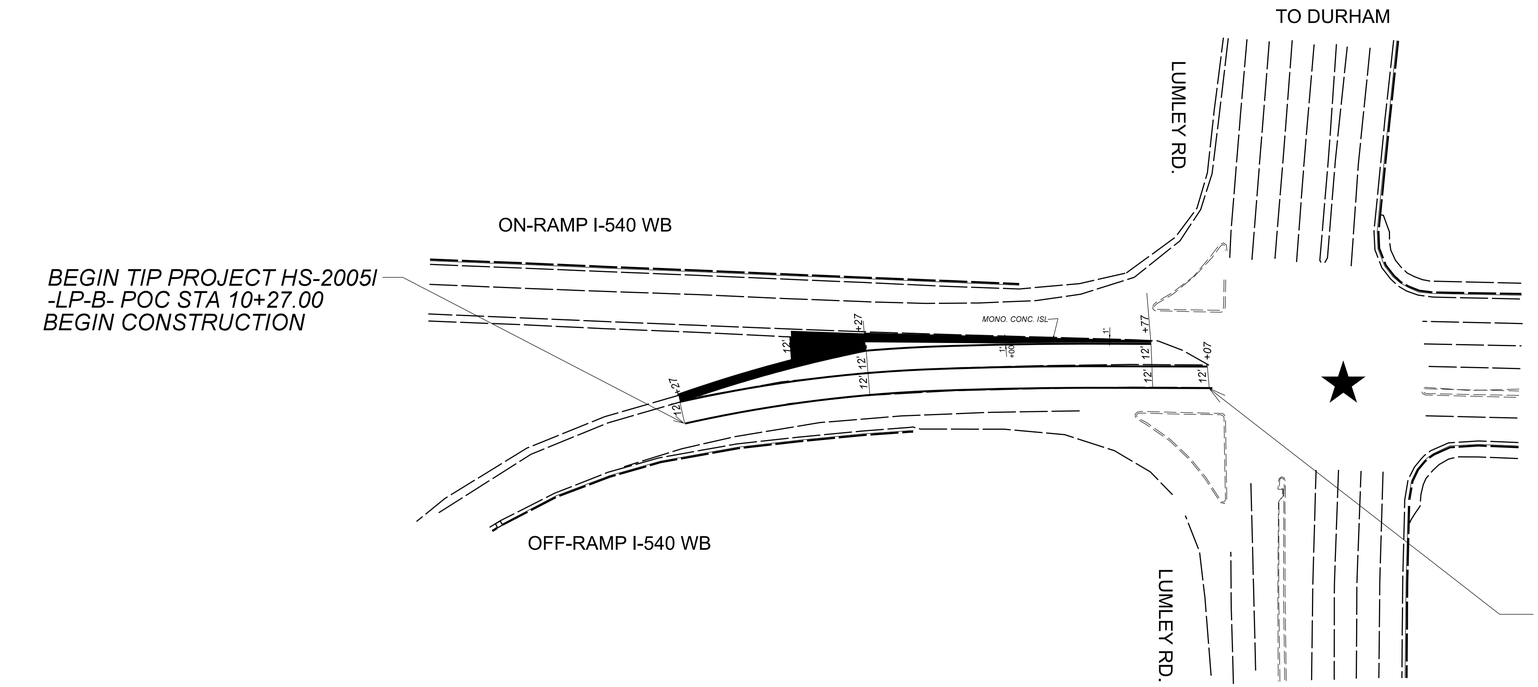
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.
N.C.	HS–2005I	SIGN–1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SIGNING PLANS

WAKE COUNTY

LOCATION: OFF–RAMP OF I–540 WB AT LUMLEY ROAD (SR 1645)



★ MODIFIED SIGNAL

TIP PROJECT: HS–2005I

CONTRACT: DE00400

$$$$SYSTIME$$$$
$$$$USERNAME$$$$ $$$$DGN$$$$

INDEX OF SHEETS

SHEET NO.	*DESCRIPTION*
1	*TITLE SHEET*
2	*TYPE E SIGN DESIGNS*
3	*SIGN ROADWAY SHEET*

Prepared In the Office of:
DIVISION DESIGN & CONSTRUCTION
815 Stadium Dr., Durham NC, 27704

2024 STANDARD SPECIFICATIONS

VICTOR M. CHAVEZ, PE
PROJECT ENGINEER

KYRILLOS HELMY, EI
PROJECT DESIGN ENGINEER

DIVISION FIVE DESIGN & CONSTRUCTION ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M CHAVEZ
12/19/2024

DocuSigned by:
Victor Chavez
7CD1F54298E940A...
SIGNATURE: *P.E.*

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
FIFTH DIVISION
B. H. JONES, P.E.
DIVISION ENGINEER

DIVISION OF HIGHWAYS · DIVISION FIVE · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · DIVISION DESIGN UNIT

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
HS-2005I	SIGN-2

DIVISION FIVE DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M CHAVEZ

05/27/2024

DocuSigned by:
Victor Chavez
7CD1F54298E940A...
SIGNATURE:

P.E.

TYPE "E" SIGNS

401 QTY REQUIRED : 2

R5-1

1 - 30" X 30"

ONE "U" CHANNEL POST PER SIGN

402 QTY REQUIRED :1

R4-7

1 - 24" X 30"

ONE "U" CHANNEL POST PER SIGN

5/20/2024
S:\DOC\Dist1\FUNDED TIP\HS-2005I\Roadway\Proj\DRD\HS2005I_SIGNING.dgn
User:mgchavez1

TYPE "E" SIGNS

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
HS-2005I	SIGN-3

DIVISION FIVE DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M. CHAVEZ

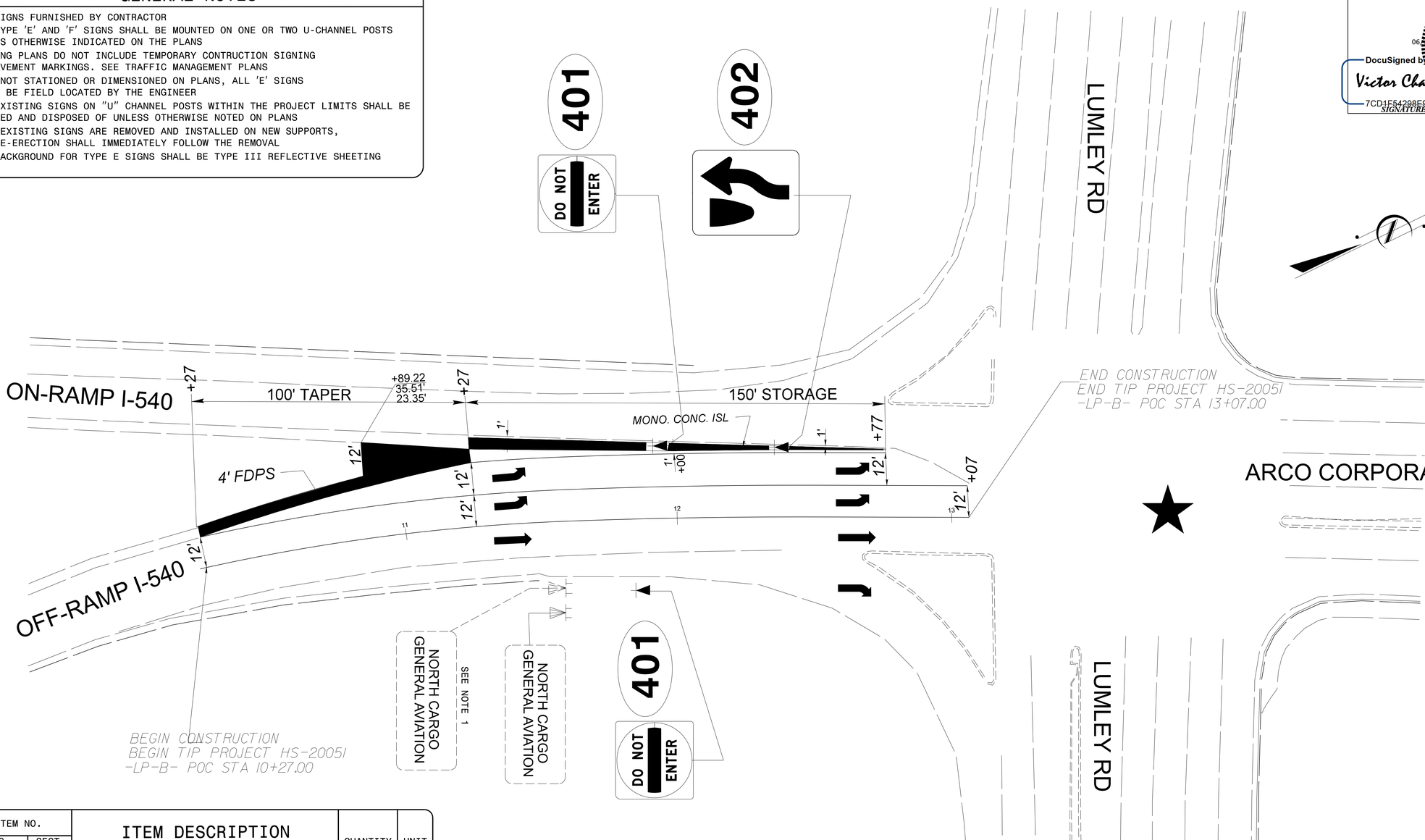
06/27/2024

DocuSigned by: Victor Chavez 7CD1F54298E940A...

SIGNATURE: P.E.

GENERAL NOTES

- ALL SIGNS FURNISHED BY CONTRACTOR
- ALL TYPE 'E' AND 'F' SIGNS SHALL BE MOUNTED ON ONE OR TWO U-CHANNEL POSTS UNLESS OTHERWISE INDICATED ON THE PLANS
- SIGNING PLANS DO NOT INCLUDE TEMPORARY CONTRUCTION SIGNING OR PAVEMENT MARKINGS. SEE TRAFFIC MANAGEMENT PLANS
- WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER
- ALL EXISTING SIGNS ON "U" CHANNEL POSTS WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS
- WHEN EXISTING SIGNS ARE REMOVED AND INSTALLED ON NEW SUPPORTS, THE RE-ERECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL
- THE BACKGROUND FOR TYPE E SIGNS SHALL BE TYPE III REFLECTIVE SHEETING



ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL.....	65	LF
4102000000	904	SIGN ERECTION, TYPE E.....	3	EA

PAY ITEM NOTES

1	DISPOSAL OF SUPPORT, U-CHANNEL

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.

904.10 ORIENTATION OF GROUND MOUNTED SIGNS
904.50 MOUNTING OF "D", "E", 'F" SIGNS ON "U" CHANNEL POSTS

★ MODIFIED SIGNAL

EXISTING and PROPOSED SIGNS
OFF–RAMP I–540 AT LUMLEY ROAD (SR 1645)

5/20/2024
S:\DOCD\Dist1\FUNDED TIP\HS-2005I\Roadway\Proj\ORD\HS2005I_SIGNING.dgn
User:vmchavez1

PROJECT REFERENCE NO.	SHEET NO.
HS-2005I	Sig. 1

PHASING DIAGRAM

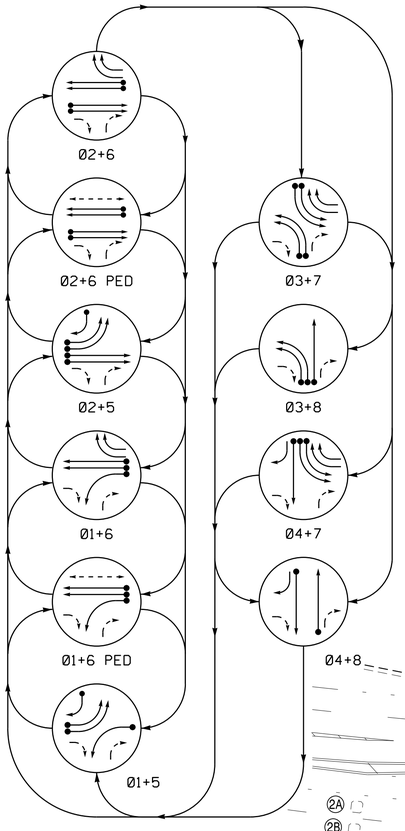


TABLE OF OPERATION

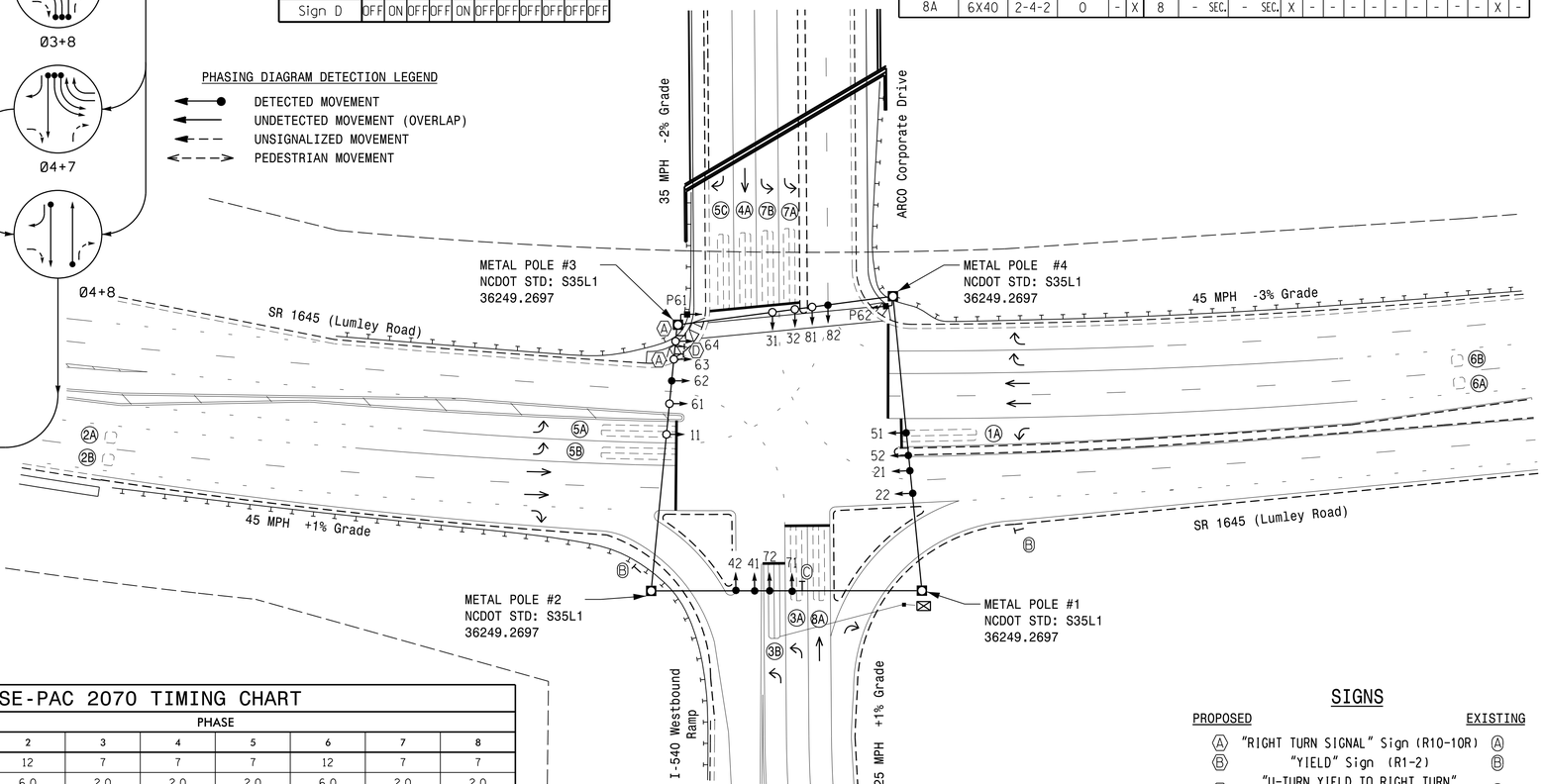
SIGNAL FACE	PHASE								
	01+5	01+6 PED	01+6	02+5	02+6 PED	02+6	03+7	04+8	FLASH
11	←	←	←	↱	↱	↱	↱	↱	↱
21, 22	R	R	R	G	G	G	R	R	R	Y
31, 32	↱	↱	↱	↱	↱	↱	←	↱	↱	↱
41	R	R	R	R	R	R	R	G	G	R
42	R/←	R	R	R/→	R	R	R	G	G	R
51, 52	←	↱	↱	←	↱	↱	↱	↱	↱	↱
61, 62	R	G	G	R	G	G	R	R	R	Y
63, 64	R	R	→	R	R	→	→	R	→	R	Y
71, 72	↱	↱	↱	↱	↱	↱	←	↱	←	↱	↱
81, 82	R	R	R	R	R	R	R	G	R	G	R
P61, P62	DW	W	DW	DW	W	DW	DW	DW	DW	DW	DRK
Sign D	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF

SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

INDUCTIVE LOOPS						DETECTOR PROGRAMMING																				
								TIMING		OPERATION MODE														STATUS	
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	ASSIGNED PHASE	DELAY	EXTEND (STRETCH)	0 VEHICLE	1 PEDESTRIAN	2 1 CALL	3 STOP A	4 STOP B	5 PROTPER LEFT	6 PROTPER THROUGH	7 AND		SWITCH	SYSTEM LOOPS	NEW	EXISTING
1A	6X40	2-4-2	0	-	X	1	- SEC.	- SEC.	X	-	-	-	-	-	-	-		-	-	X	-
2A	6X6	EXIST	300	-	X	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-		-	-	X	-
2B	6X6	EXIST	300	-	X	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-		-	-	X	-
3A	6X40	2-4-2	0	-	X	3	3 SEC.	- SEC.	X	-	-	-	-	-	-	-		-	-	X	-
3B	6X40	2-4-2	0	X	-	3	3 SEC.	- SEC.	X	-	-	-	-	-	-	-		-	-	X	-
4A	6X40	2-4-2	0	-	X	4	- SEC.	- SEC.	X	-	-	-	-	-	-	-		-	-	X	-
5A	6X40	2-4-2	0	-	X	5	3 SEC.	- SEC.	X	-	-	-	-	-	-	-		-	-	X	-
5B	6X40	2-4-2	0	-	X	5	- SEC.	- SEC.	X	-	-	-	-	-	-	-		-	-	X	-
5C	6X40	2-4-2	0	-	X	5	15 SEC.	- SEC.	X	-	-	-	-	-	-	-		-	-	X	-
6A	6X6	EXIST	300	-	X	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-		-	-	X	-
6B	6X6	EXIST	300	-	X	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-		-	-	X	-
7A	6X40	2-4-2	0	-	X	7	- SEC.	- SEC.	X	-	-	-	-	-	-	-		-	-	X	-
7B	6X40	2-4-2	0	-	X	7	- SEC.	- SEC.	X	-	-	-	-	-	-	-		-	-	X	-
8A	6X40	2-4-2	0	-	X	8	- SEC.	- SEC.	X	-	-	-	-	-	-	-		-	-	X	-

PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT



8 Phase Fully Actuated (Raleigh Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Reposition existing signal heads numbered 62 and 82.
6. Replace Existing Right Arrow "ONLY" (R3-5R) signs with "RIGHT TURN SIGNAL" (R10-10R) signs as shown.
7. Set all detector units to presence mode.
8. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
9. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
10. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
11. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
12. Illuminate Sign D at the beginning of the preceeding red clearance interval. This sign will remain illuminated until the end of the Flashing DON'T WALK display.
13. Pavement markings are existing unless otherwise shown.
14. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
15. Record existing Fiber Optic Splice Configuration before breaking existing splicing.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
N/A	Guardrail	
	Metal Strain Pole	

SIGNS

PROPOSED		EXISTING
Ⓐ	"RIGHT TURN SIGNAL" Sign (R10-10R)	Ⓐ
Ⓑ	"YIELD" Sign (R1-2)	Ⓑ
Ⓒ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓒ
Ⓓ	"NO TURN ON RED" L.E.D. Blankout Sign	Ⓓ

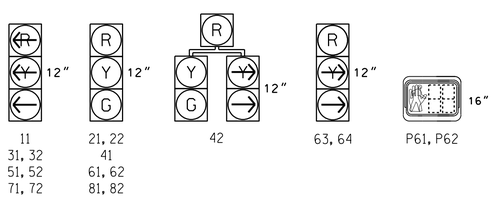
SE-PAC 2070 TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Passage Gap *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Maximum Green *	30	70	30	20	30	70	30	20
Yellow Change	3.0	4.4	3.0	4.0	3.0	4.8	3.0	3.1
Red Clear	3.1	1.3	3.1	2.2	3.4	1.4	3.3	3.0
Walk *	-	-	-	-	-	7	-	-
Pedestrian Clear	-	-	-	-	-	21	-	-
Added Initial *	-	1.5	-	-	-	1.5	-	-
Maximum Initial *	-	34	-	-	-	34	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	NON-LOCK	LOCK	NON-LOCK	NON-LOCK	NON-LOCK	LOCK	NON-LOCK	NON-LOCK
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

SIGNAL FACE I.D.

All Heads L.E.D.



11
31, 32
51, 52
71, 72

21, 22
41
61, 62
81, 82

42

63, 64

P61, P62

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 1645 (Lumley Road) at I-540 Westbound Ramp/ Arco Corporate Drive

Division 5 Wake County Raleigh

PLAN DATE: January 2024 REVIEWED BY:

PREPARED BY: J.A. Lohr REVIEWED BY:

SCALE 0 50 1"=50'

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA

DocuSigned by: Robert J Ziemba 01/29/2024
DATE

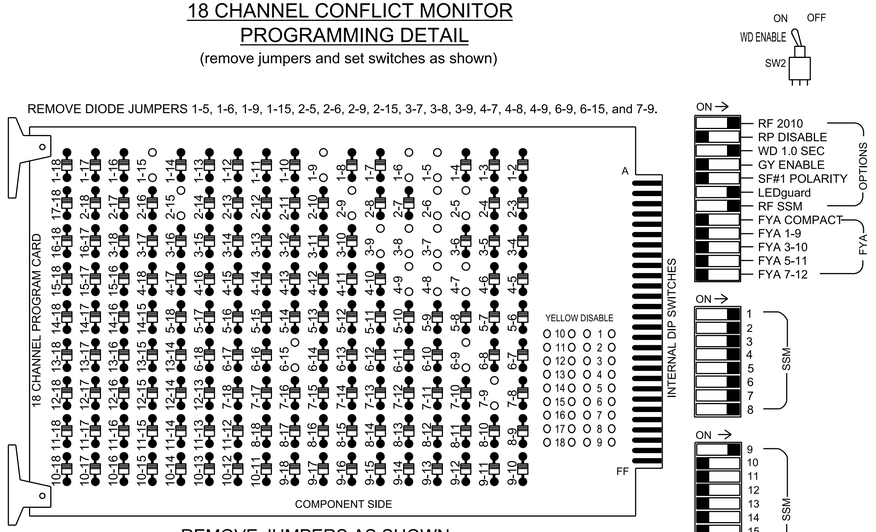
SIG. INVENTORY NO. 05-2334

31-JAN-2024 11:23
$USER$
z:\ems\HS Signals\Signal Design Section\Central Region\Div 5\HS-2334\05234_sig_dsn_20240129.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
HS-2005I	Sig. 1.1

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that the Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phases 2 and 6 Green/ Don't Walk.
3. Enable simultaneous gap-out feature for all phases.
4. Program phases 2 and 6 for volume density operation.
5. The cabinet and controller are part of the Raleigh City Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
CABINET.....332 w/ AUX
SOFTWARE.....SE-PAC ver. 5
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S9, S10,S11,AUX S1,AUX S3**
PHASES USED.....1,2,3,4,5,6,6 PED,7,8
OVERLAP "A".....*
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED
OVERLAP "E".....*

* See Sheet 2 for Overlap Programming Detail.
** Utilized for Blankout Sign only.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	OLE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	31,32	41,42	NU	42	51,52	61,62	P61, P62	71,72	81,82	NU	63,64	NU	BLANK OUT SIGN	NU	NU	NU
RED		128			101				134			107		A121		** A111			
YELLOW		129			102				135			108				*			
GREEN		130			103				136			109				*			
RED ARROW	125			116			131			122									
YELLOW ARROW	126			117			132	132		123			A122						
GREEN ARROW	127			118			133	133		124			A123						
✋									119										
🚶									121										

* Denotes install load resistor. See load resistor installation detail on Sheet 2.
** See Blankout sign wiring detail on Sheet 2.
NU = Not Used

Install a white flash program block for load switch AUX S3.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	Ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	Ø7 7A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	Ø2 2B				Ø5 5C	Ø7 7B						NOT USED	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø5 5A	Ø6 6A	SLOT EMPTY	SLOT EMPTY	Ø8 8A	Ø3 3A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø5 5B	Ø6 6B			NOT USED	Ø3 3B							

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
1A	TB2-1,2	I1U	56	1	1		
2A	TB2-5,6	I2U	39	3	2		
2B	TB2-7,8	I2L	43	4	2		
3A	TB7-1,2	J7U	66	33	3	3	
3B	TB7-3,4	J7L	79	34	3	3	
4A	TB4-9,10	I6U	41	11	4		
5A	TB3-5,6	J2U	40	21	5	3	
5B	TB3-7,8	J2L	44	22	5		
5C	TB4-11,12	I6L	45	12	5	15	
6A	TB3-9,10	J3U	64	23	6		
6B	TB3-11,12	J3L	77	24	6		
7A	TB6-1,2	I7U	65	13	7		
7B	TB6-3,4	I7L	78	14	7		
8A	TB5-9,10	J6U	42	31	8		
PED PUSH BUTTONS							
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED		

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

INIT & N.A. RESP PROGRAMMING DETAIL

1. From Main Menu select [3 - PHASE DATA]
2. From PHASE DATA Submenu select [4 - INIT & N.A RESP]

```
PHASE.....1...2...3...4...5...6...7...8
 INITIAL   1   6   1   1   1   6   1   1
 NA RESP   0   1   0   2   0   1   0   2

CODES.....0....1....2....3....4....5...6
 INITL  NONE INACT RED  YEL  GRN  DRK G/DW
 NA RSP NONE  NA1  NA2  1&2  ---  --- ---
                                      ***
```

INIT & N.A. RESP PROGRAMMING COMPLETE

CODE 6 (G/DW) ALLOWS PHASE TO START IN GREEN AND SKIP THE PED PHASE.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-2334
DESIGNED: January 2024
SEALED: 1/29/2024
REVISED:

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1645 (Lumley Road)
at
I-540 Westbound Ramp/
Arco Corporate Drive

Division 5 | Wake County | Raleigh

PLAN DATE: January 2024 | REVIEWED BY: D.T.J.
PREPARED BY: D.J. Craddock | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
North Carolina Department of Transportation Mobility and Safety Division Traffic Engineering Branch Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031001 ENGINEER D. TODD JOYCE

DocuSigned by: D. Todd Joyce 01/30/2024
SIGNATURE DATE

SIG. INVENTORY NO. 05-2334

30-JAN-2024 06:16
M:\Signals\Workgroups\Sig Mgmt\Projects From Signal Design\Active Projects\Craddock\2_Pending\HS05-2334_49309.1.1\HS2334_sm.ele.20240made.dgn
dicraddock1

PROJECT REFERENCE NO.	SHEET NO.
HS-2005I	Sig. 1.2

OVERLAP PROGRAMMING DETAIL

1. From Main Menu select [4 - UNIT DATA]

2. From UNIT DATA Submenu select [3 - OVERLAP DATA]

Use Up/Dn/Left/Right keys to position cursor on the desired Overlap. Use the NEXT key to select the overlap type. Press the ENT key and then program as per the Overlap screen(s) shown.

```
OVERLAP DATA

   A: STD   E: STD   I: ---   M: ---
   B: ---   F: ---   J: ---   N: ---
   C: ---   G: ---   K: ---   O: ---
   D: ---   H: ---   L: ---   P: ---

 PREV/NEXT TO CYCLE
```

↓

OVERLAP A

Use Up/Dn/Left/Right keys to position cursor on Overlap 'A', use the NEXT key to select 'STD', then press ENT

```
OVERLAP - A        12345678 90123456
          PARENTS: 00000110 00000000
     +GRN PHASES:  00000000 00000000
     -G/Y PHASES:  00000000 00000000
     -PED PHASES:  00000100 00000000
 TRAIL GREEN STANDARD:    0  YEL/10:  40
 TRAIL GREEN  PREEMPT:    0  RED/10:  20
```

↓ Press ESC

OVERLAP E

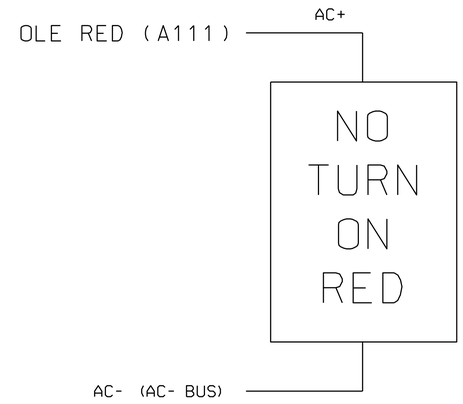
Use Up/Dn/Left/Right keys to position cursor on Overlap 'E', use the NEXT key to select 'STD', then press ENT

```
OVERLAP - E        12345678 90123456
          PARENTS: 11111111 00000000
     +GRN PHASES:  00000000 00000000
     -G/Y PHASES:  00000000 00000000
     -PED PHASES:  00000100 00000000
 TRAIL GREEN STANDARD:    0  YEL/10:  40
 TRAIL GREEN  PREEMPT:    0  RED/10:  20
```

END OVERLAP PROGRAMMING

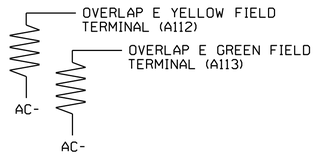
BLANKOUT SIGN WIRING DETAIL

(wire as shown)



LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



LOAD SWITCH MAPPING DETAIL

(program controller as shown below)

1. From Main Menu select [4 - UNIT DATA]

2. From UNIT DATA Submenu select [9 - OUTPUT MAPPING]

```
OUTPUT MAPPING                EDIT MODE: LDSW
                                E-TOGGLE MODE
LDSW .13.. .14.. .15.. .16.. .17.. .18..
RED  OLA   OLB   OLE R OLC   OLD   PD3
YEL   -     -    NONE   -     -     -
GRN   -     -    NONE   -     -     -
FIO   13    14    15    16    17    18
PREV/NEXT TO CYCLE      D-DISPLAY COMPAT
```

USE ENTER AND NEXT KEYS TO MAP 'LDSW 15 GRN', 'LDSW 15 YEL', AND 'LDSW 15 RED' AS 'OLE', 'NONE', AND 'NONE' RESPECTIVELY

LOAD SWITCH MAPPING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 05-2334
DESIGNED: January 2024
SEALED: 1/29/2024
REVISED:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1645 (Lumley Road)
at
I-540 Westbound Ramp/
Arco Corporate Drive

Division 5 | Wake County | Raleigh

PLAN DATE: January 2024 | REVIEWED BY: D.T.J.

PREPARED BY: D.J. Craddock | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:

NCDOT Transportation Mobility and Safety Division
Traffic Engineering Branch
Signals Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL 031001
ENGINEER
D. TODD JOYCE

DocuSigned by: D. Todd Joyce 01/30/2024
SIGNATURE DATE

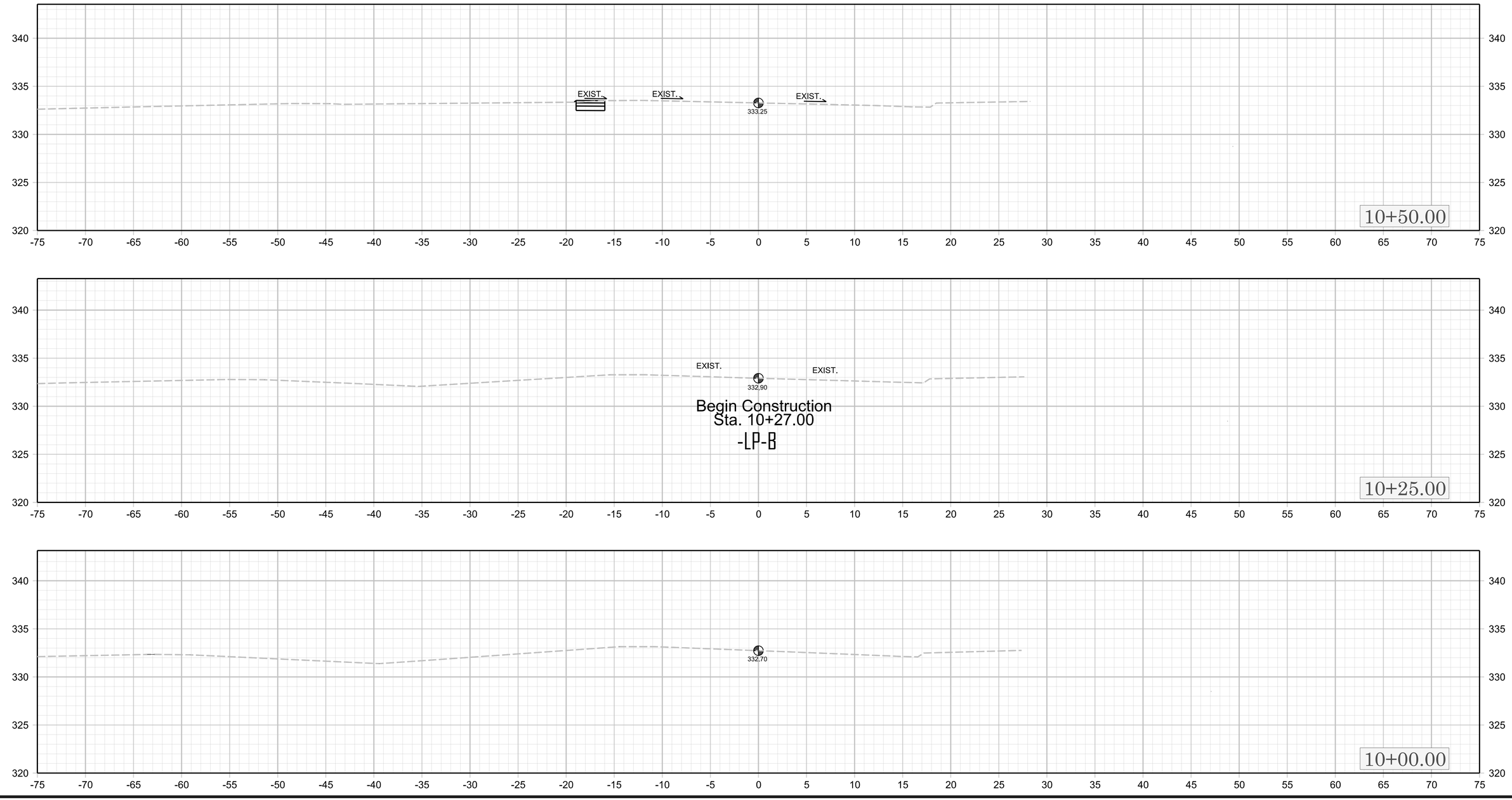
SIG. INVENTORY NO. 05-2334

30-JAN-2024 08:37
S:\ATS\Signals\Workgroups\Sig Mgmt\Projects From Signal Design\Active Projects\Craddock\2_Pending\05-2334_49309_1_10405334_smdet_20240mds.dgn
djcraddock1

5/26/20

0 5 10

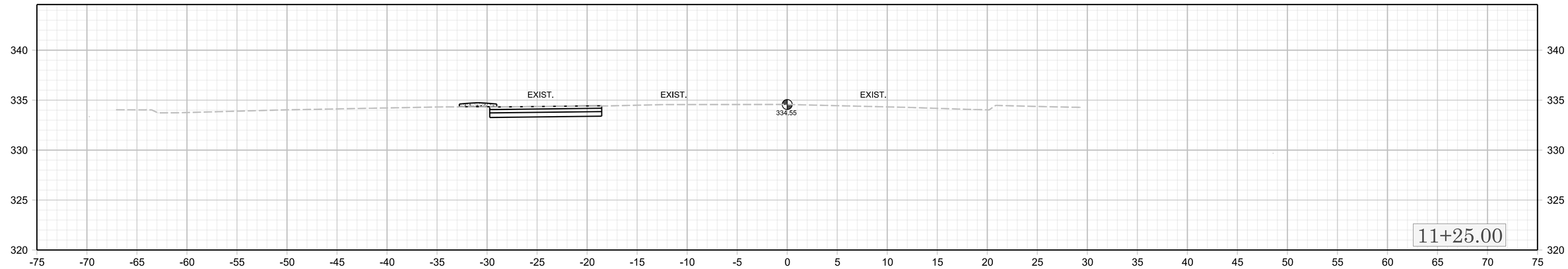
HS-20051
SHEET | X-1

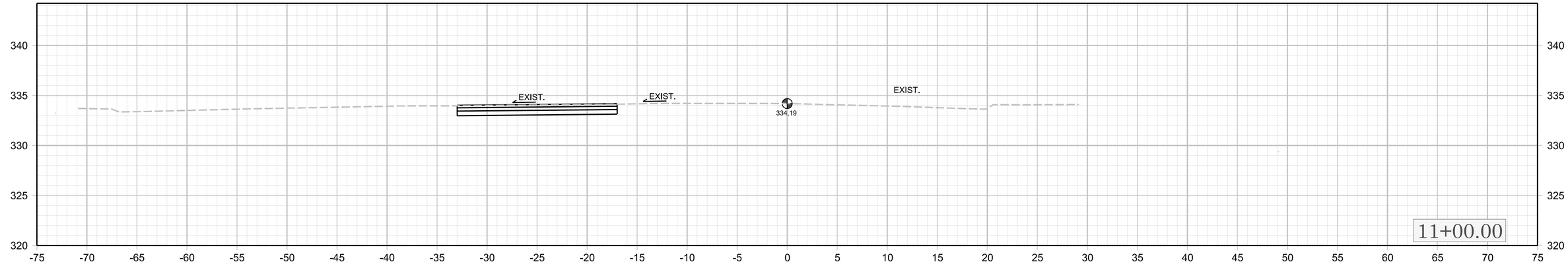


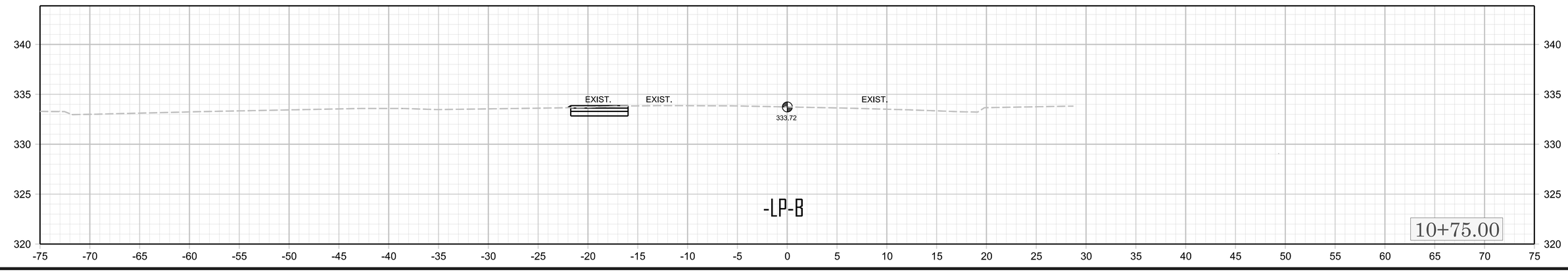
5/26/20

0 5 10

HS-20051
SHEET | X-2





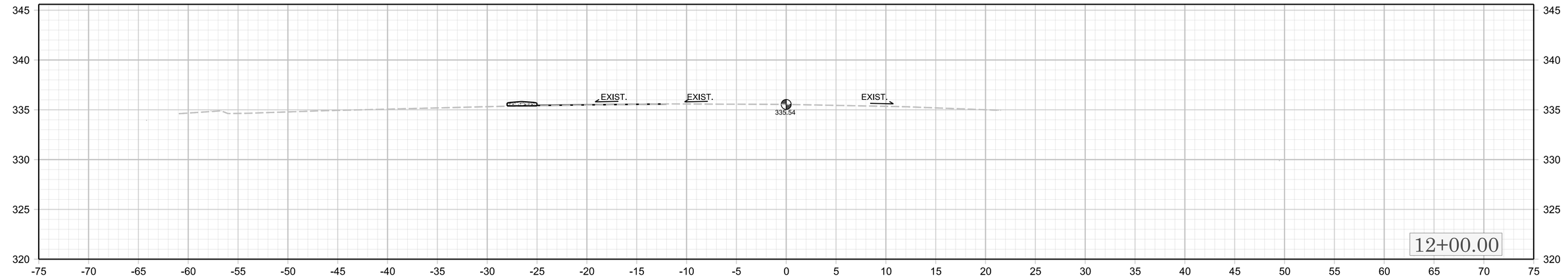


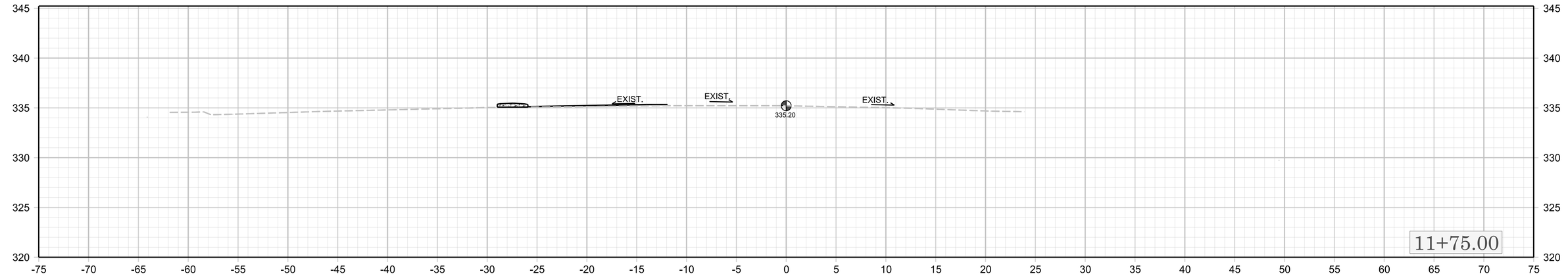
-LP-B

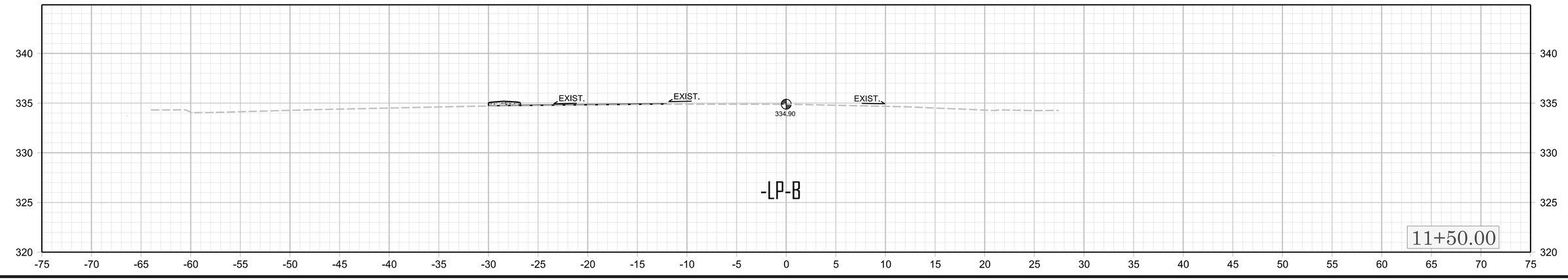
5/26/20

0 5 10

HS-20051
SHEET | X-3





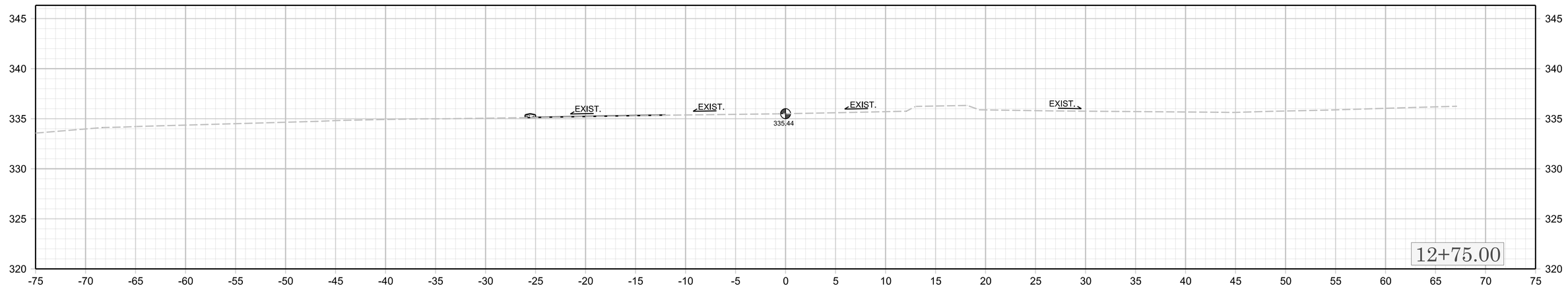


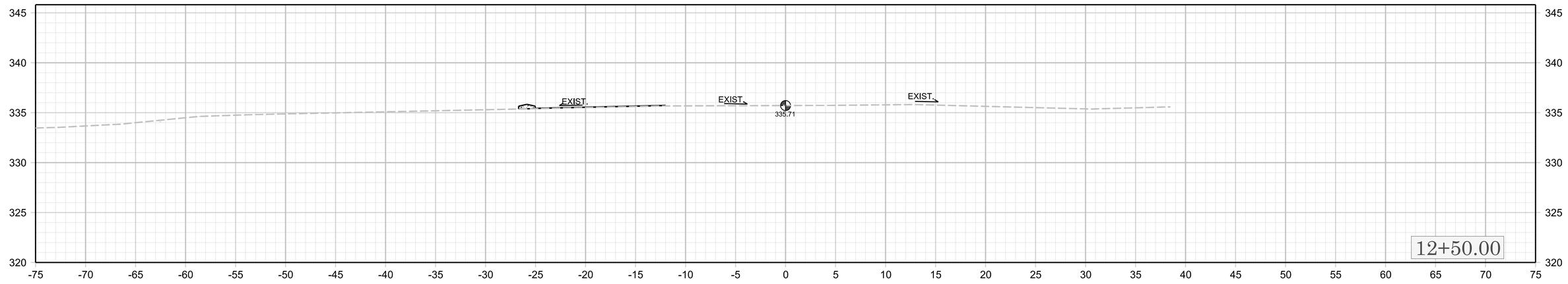
-LP-B

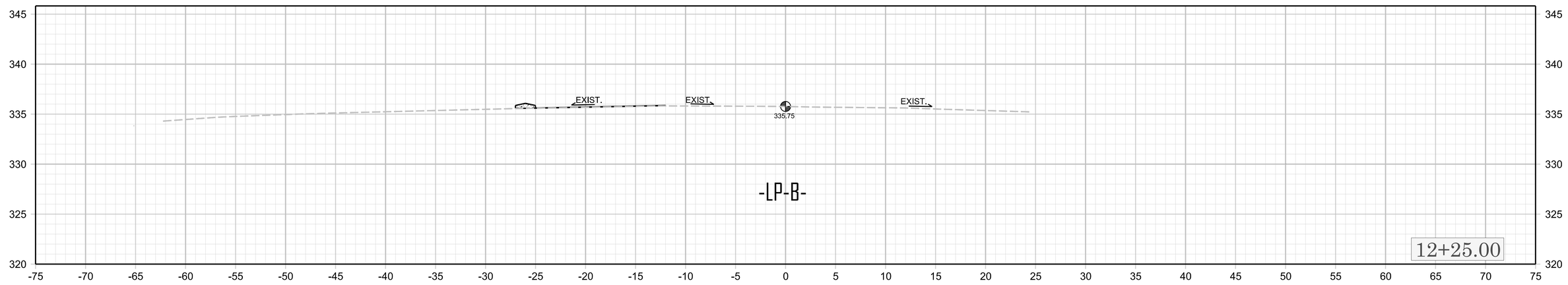
5/26/20

0 5 10

HS-20051
SHEET | X-4





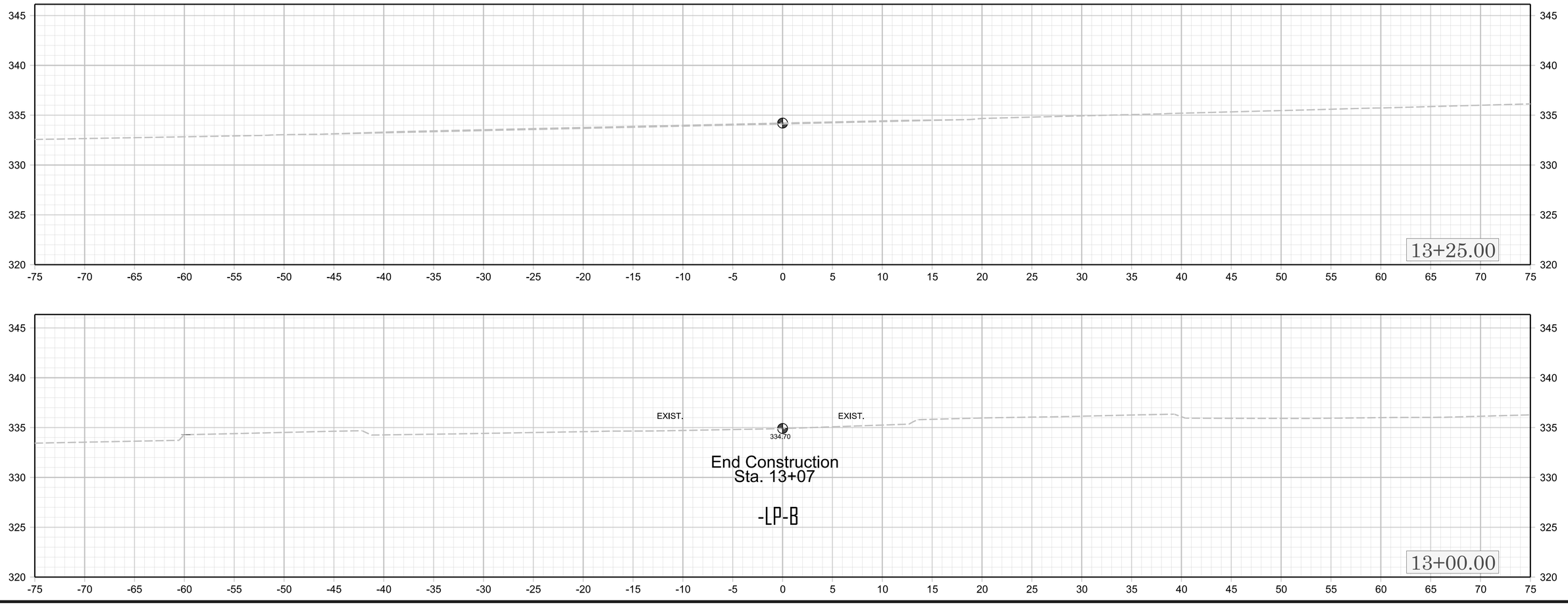


-LP-B-

5/26/20

0 5 10

HS-20051
SHEET | X-5



09/08/99

TIP PROJECT: HS-2005J

CONTRACT: DE00400

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

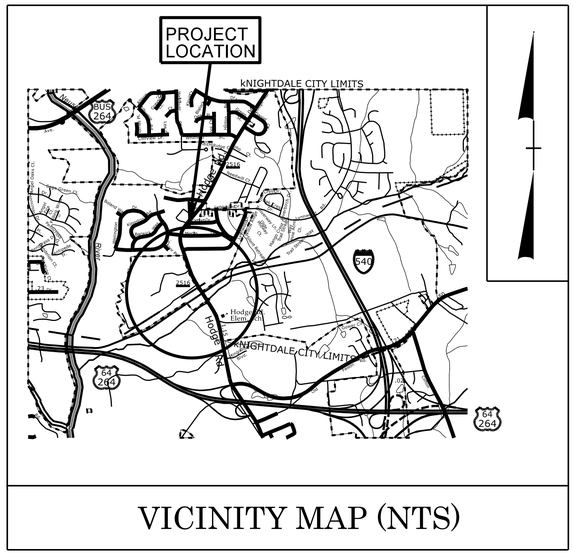
WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS-2005J	1	

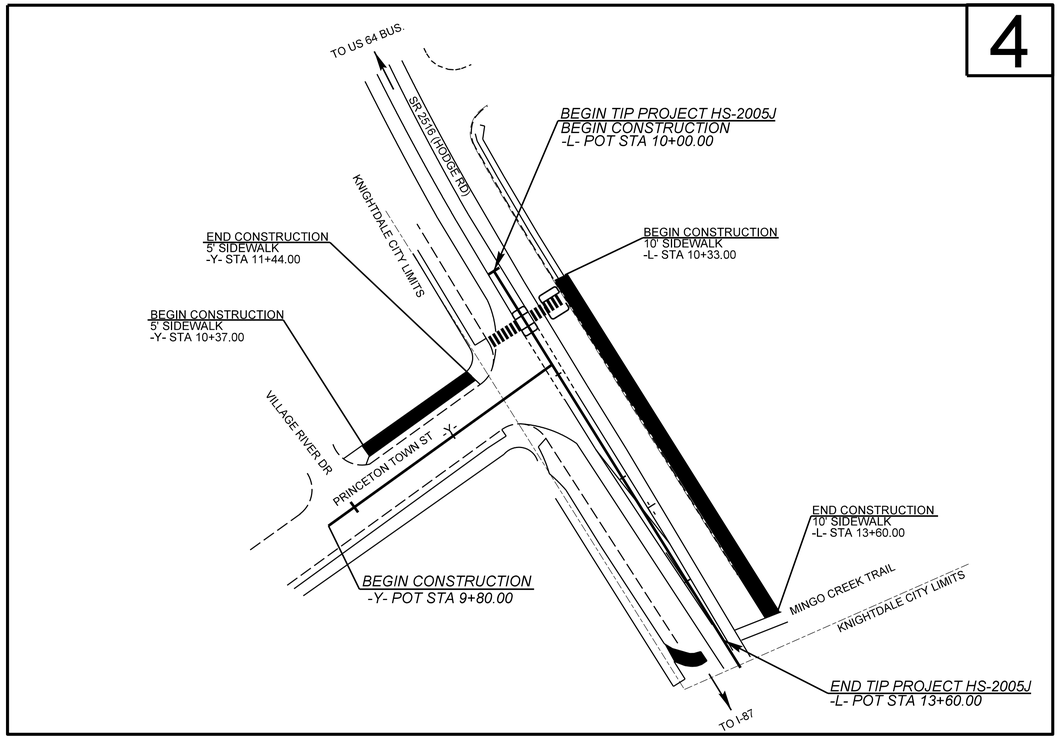
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49309.1.11	2516002	PE
49309.2.11	2516002	ROW
49309.3.11	2516002	CONST.

LOCATION: *SR 2516 (HODGE ROAD) AT THE MINGO CREEK TRAIL CROSSING*

TYPE OF WORK: *DRAINAGE, WIDENING EXISTING SIDEWALK, PAVEMENT MARKING AND SIGNING.*



VICINITY MAP (NTS)



NOTE:

THIS PROJECT IS WITHIN THE CITY BOUNDARIES OF CITY OF KNIGHTDALE.

See Sheet 1B For Conventional Symbols
See Sheet 1A For Index of Sheets

GRAPHIC SCALES

40 20 0 40 80
PLANS

20 10 0 20 40
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2024 = 10,613
ADT 2044 = 14860
K = %
D = %
T = % *
V = MPH
* TTST = DUAL
FUNC CLASS =
MAJOR COLLECTOR
TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT HS-2005J = 0.068 MILES

TOTAL PROJECT HS-2005J = 0.068 MILES

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

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MAY 5, 2024

LETTING DATE:
FEBRUARY 12, 2025

VICTOR M CHAVEZ PE
PROJECT ENGINEER/PROJECT DESIGN ENGINEER

BETH A QUINN, PE
TEAM LEAD

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W GALEN CAIL
DocuSigned by:
SIGNATURE:

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M CHAVEZ
DocuSigned by: Victor Chavez
12/09/2024
7CD1F54298E940A...
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
FIFTH DIVISION
BRANDON H. JONES, P. E.
DIVISION ENGINEER

DIVISION OF HIGHWAYS · DIVISION FIVE · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · DIVISION DESIGN UNIT

5/26/20

HS-2005J
SHEET 1-A

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A–1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B–1	MONOLITHIC CONCRETE ISLAND DETAIL
2C–1	RECTANGULAR RAPID FLASHING BEACON ASSEMBLY
4 THRU 5	PLAN AND PROFILE SHEET
SC–1C	SURVEY CONTROL SHEETS
TMP–1 THRU TMP–2	TRAFFIC MANAGEMENT PLANS
PMP–1 THRU PMP–2	PAVEMENT MARKING PLANS
EC–1 THRU EC–5	EROSION CONTROL PLANS
SIGN–1 THRU SIGN–3	SIGNING PLANS
X–1 THRU X–5	CROSS SECTIONS

EFF. 01–16–2024
REV.

GENERAL NOTES: 2024 SPECIFICATIONS

EFFECTIVE: 01–16–2024
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT CONTROL POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. CONTROL LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE–IN.

CLEARING:

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

CURB RAMPS:

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS.

UTILITIES:

NO UTILITY CONFLICTS ON THIS PROJECT.

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M. CHAVEZ

DocuSigned by: Victor Chavez 7CD1F5429B3940...
08/02/2024

2024 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch – N. C. Department of Transportation – Raleigh, N. C., Dated January 16, 2024 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 – EARTHWORK	
200.02	Method of Clearing – Method II
225.02	Guide for Grading Subgrade – Secondary and Local
DIVISION 6 – ASPHALT, BASES, AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 – INCIDENTALS	
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.06	Curb Ramps – Sheet 1 thru Sheet 13
852.01	Concrete Island
852.01	Concrete Island
DIVISION 17 – SIGNALS AND TRAFFIC MANAGEMENT SYSTEMS	
1705.04	Signal Heads
1743.02	Pedestals – Heavy Duty (Tipe III)

5/26/20

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

HS-2005J
SHEET 1-B

Note: Not to Scale

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (EIP)
- Computed Property Corner
- Existing Concrete Monument (ECM)
- Parcel / Sequence Number
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary
- Proposed Wetland Boundary
- Existing Endangered Animal Boundary
- Existing Endangered Plant Boundary
- Existing Historic Property Boundary
- Known Contamination Area: Soil
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign
- Well
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream
- Buffer Zone 1
- Buffer Zone 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch
- False Sump

RAILROADS:

- Standard Gauge
- RR Signal Milepost
- Switch
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Secondary Horiz and Vert Control Point
- Vertical Benchmark
- Existing Right of Way Monument
- Proposed Right of Way Monument (Rebar and Cap)
- Proposed Right of Way Monument (Concrete)
- Existing Permanent Easement Monument
- Proposed Permanent Easement Monument (Rebar and Cap)
- Existing C/A Monument
- Proposed C/A Monument (Rebar and Cap)
- Proposed C/A Monument (Concrete)
- Existing Right of Way Line
- Proposed Right of Way Line
- Existing Control of Access Line
- Proposed Control of Access Line
- Proposed ROW and CA Line
- Existing Easement Line
- Proposed Temporary Construction Easement
- Proposed Temporary Drainage Easement
- Proposed Permanent Drainage Easement
- Proposed Permanent Drainage/Utility Easement
- Proposed Permanent Utility Easement
- Proposed Temporary Utility Easement
- Proposed Aerial Utility Easement

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut
- Proposed Slope Stakes Fill
- Proposed Curb Ramp
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert
- Bridge Wing Wall, Head Wall and End Wall

MINOR:

- Head and End Wall
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB
- Paved Ditch Gutter
- Storm Sewer Manhole
- Storm Sewer

UTILITIES:

** SUE - Subsurface Utility Engineering*
LOS - Level of Service - A,B,C or D (Accuracy)

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line Test Hole (SUE - LOS A)*
- U/G Power Line (SUE - LOS B)*
- U/G Power Line (SUE - LOS C)*
- U/G Power Line (SUE - LOS D)*

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole
- Telephone Pedestal
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole
- U/G Telephone Test Hole (SUE - LOS A)*
- U/G Telephone Cable (SUE - LOS B)*
- U/G Telephone Cable (SUE - LOS C)*
- U/G Telephone Cable (SUE - LOS D)*
- U/G Telephone Conduit (SUE - LOS B)*
- U/G Telephone Conduit (SUE - LOS C)*
- U/G Telephone Conduit (SUE - LOS D)*
- U/G Fiber Optics Cable (SUE - LOS B)*
- U/G Fiber Optics Cable (SUE - LOS C)*
- U/G Fiber Optics Cable (SUE - LOS D)*

WATER:

- Water Manhole
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line Test Hole (SUE - LOS A)*
- U/G Water Line (SUE - LOS B)*
- U/G Water Line (SUE - LOS C)*
- U/G Water Line (SUE - LOS D)*
- Above Ground Water Line

TV:

- TV Pedestal
- TV Tower
- U/G TV Cable Hand Hole
- U/G TV Test Hole (SUE - LOS A)*
- U/G TV Cable (SUE - LOS B)*
- U/G TV Cable (SUE - LOS C)*
- U/G TV Cable (SUE - LOS D)*
- U/G Fiber Optic Cable (SUE - LOS B)*
- U/G Fiber Optic Cable (SUE - LOS C)*
- U/G Fiber Optic Cable (SUE - LOS D)*

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line Test Hole (SUE - LOS A)*
- U/G Gas Line (SUE - LOS B)*
- U/G Gas Line (SUE - LOS C)*
- U/G Gas Line (SUE - LOS D)*
- Above Ground Gas Line

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line
- Above Ground Sanitary Sewer
- SS Force Main Line Test Hole (SUE - LOS A)*
- SS Force Main Line (SUE - LOS B)*
- SS Force Main Line (SUE - LOS C)*
- SS Force Main Line (SUE - LOS D)*

MISCELLANEOUS:

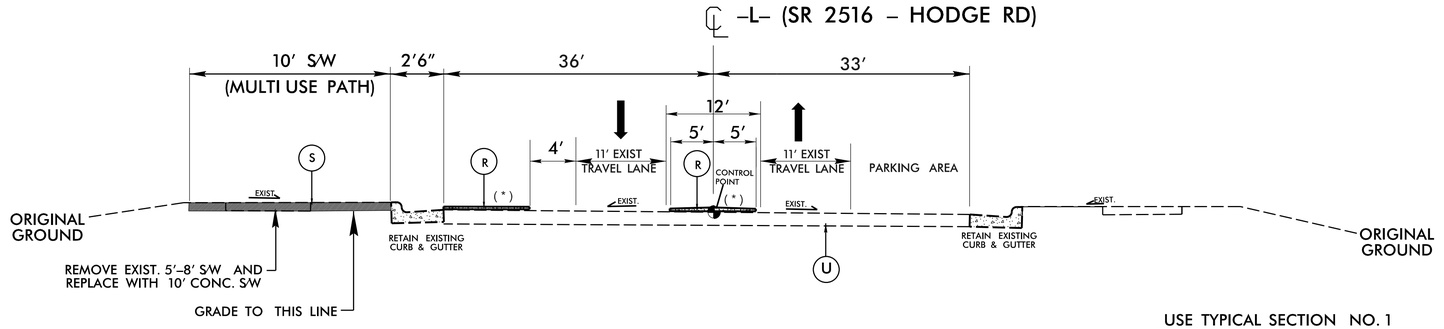
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box
- Utility Unknown U/G Line (SUE - LOS B)*
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc.
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

5/26/20

P A V E M E N T S C H E D U L E

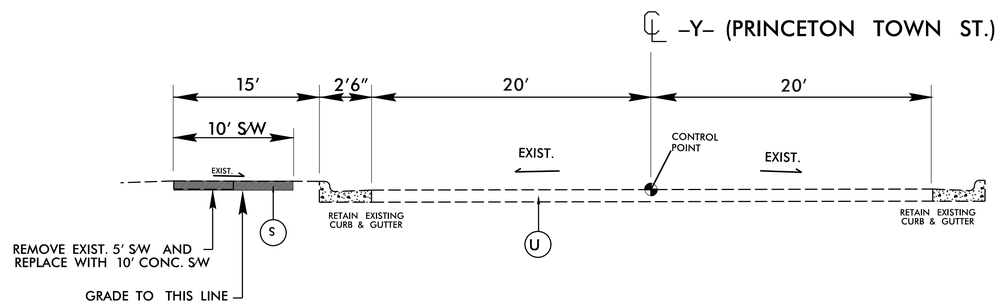
FINAL PAVEMENT DESIGN

S	4" CONCRETE SIDEWALK.	U	EXISTING PAVEMENT.
R	5 " MONOLITHIC CONCRETE ISLAND (SURFACE MOUNTED) LAYERS.		



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
–L– STA. 10+00.00 TO STA. 13+60.00
(*) ISLANDS LOCATION, FROM–L– STA. 10+46.00 TO STA. 10+56.00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
–Y– STA. 10+37.00 +/– TO STA. 11+44.00 +/–

REVISIONS

HS-2005J
SHEET 2A-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

DIVISION OF HIGHWAYS - 5

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M CHAVEZ

DocuSigned by: Victor Chavez 7CD1F54298E5...

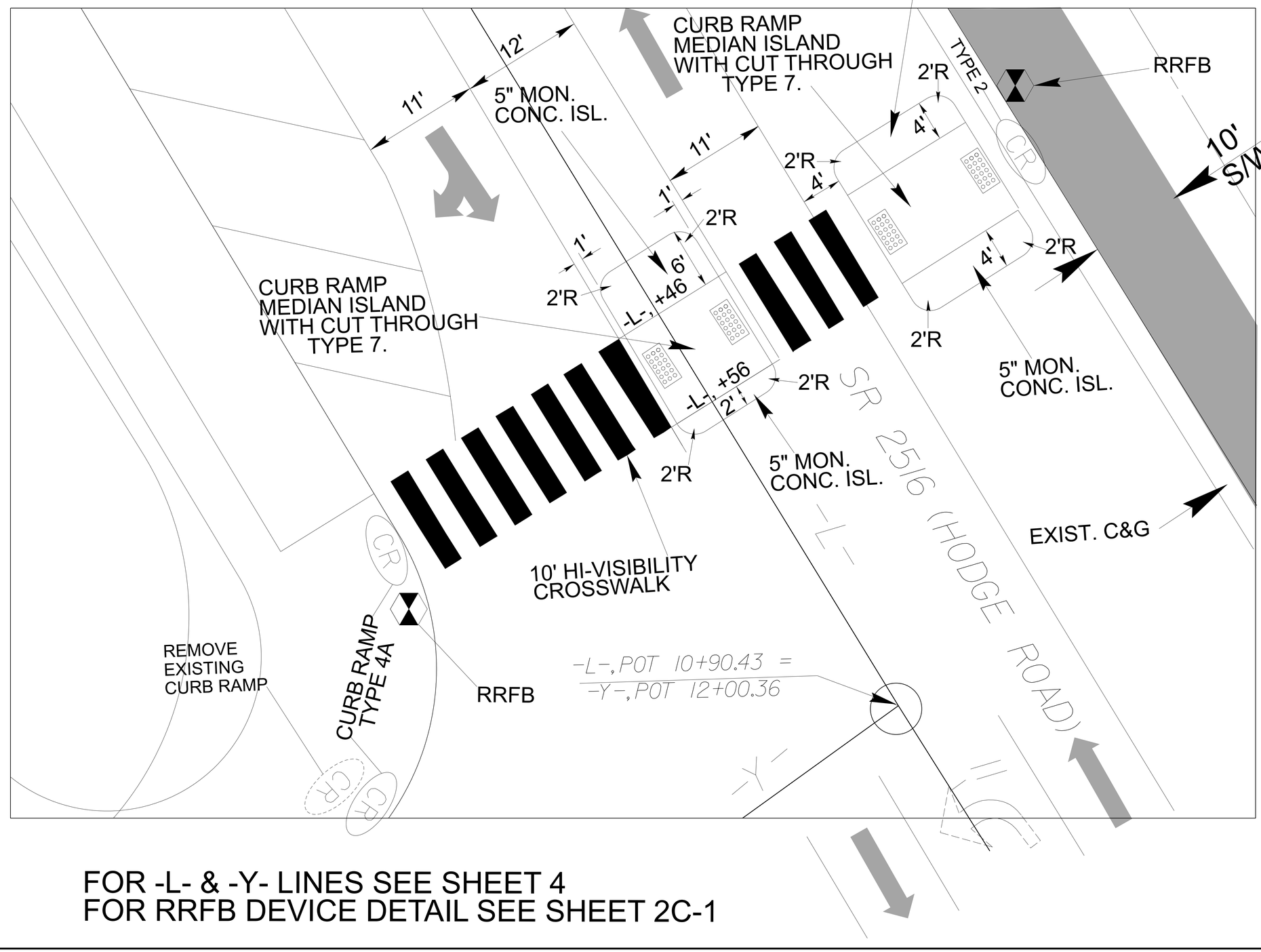
08/02/2024

HYDRAULICS ENGINEER

MONOLITHIC CONC. ISLAND DETAIL

0' 5' 20'

Scale: 1"= 20'



FOR -L- & -Y- LINES SEE SHEET 4
FOR RRFB DEVICE DETAIL SEE SHEET 2C-1

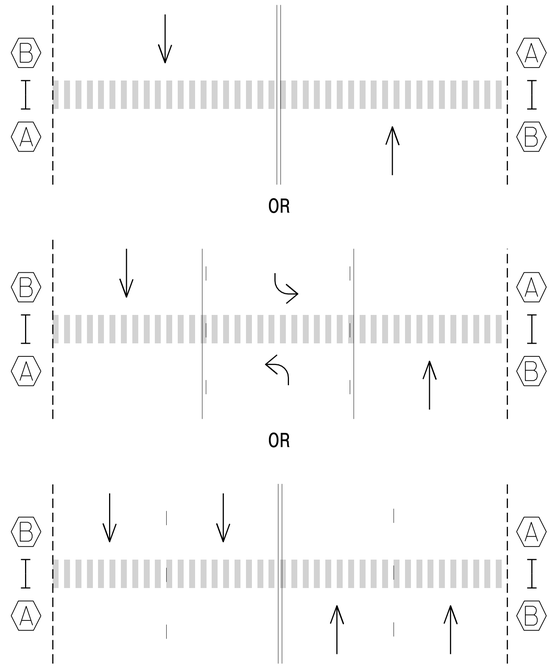
HS-2005J
SHEET 2B-1

NORTH CAROLINA PROFESSIONAL ENGINEER VICTOR M. CHAVEZ SEAL 018204
DocuSigned by: Victor Chavez 7CD1F54298E940A...

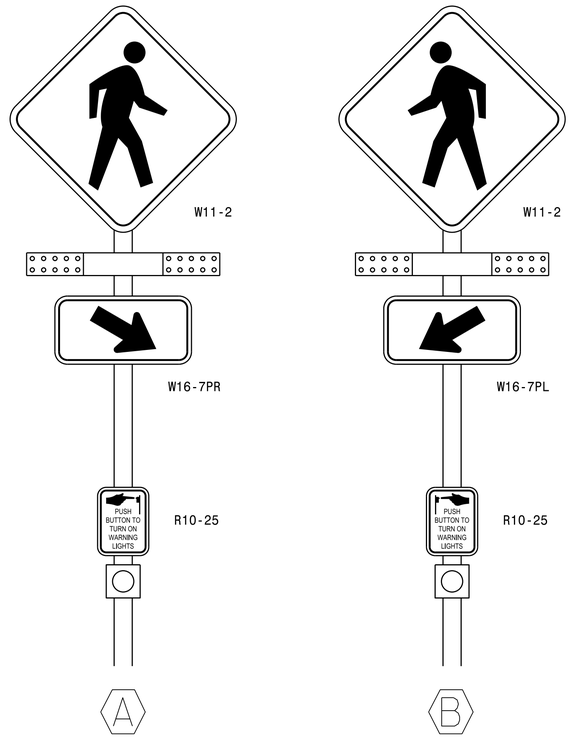
5/26/20

PROJECT REFERENCE NO.	SHEET NO.
HS-2005J	2C-1

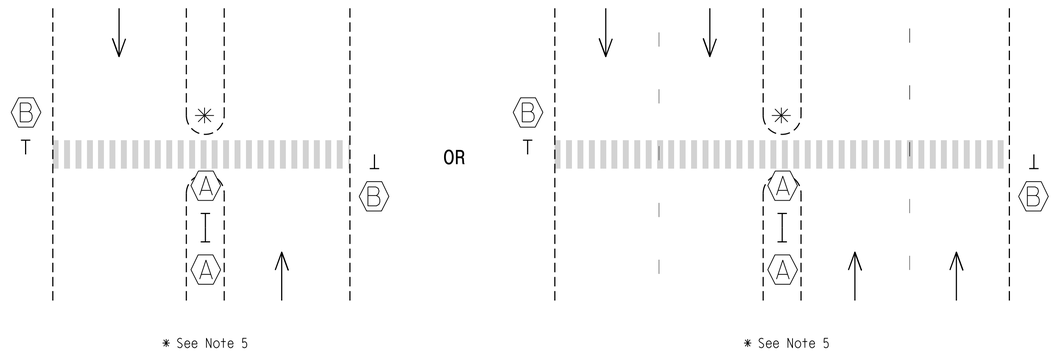
Two to Four Lanes, Undivided



RRFB Sign Detail



Two or Multi-Lanes, Divided



* See Note 5

* See Note 5

Notes

1. Design the RRFB in accordance with the 2023 MUTCD, 11th Edition, Chapter 4L: Rectangular Rapid-Flashing Beacons. The RRFB unit associated with a post-mounted sign and plaque should be located between the pedestrian crossing warning (W11-2) sign and the supplemental downward diagonal arrow plaque (W16-7p).
2. If needed, a supplemental RRFB with an "AHEAD" (W16-9P) or distance (W16-2P) plaque may be installed on the approach in advance of the crosswalk. The addtional RRFB shall be a supplemental to and not a replacement for the RRFB at the actual crosswalk.
3. When practical, the RRFB and mounting post on the right side of the road shall be mounted on the approach side of the crosswalk closest to approaching traffic.
4. When practical, the RRFB and mounting post on the left side of the road may be mounted on the back of the post for the opposing approach.
5. A RRFB on the left side of the roadway or in the median may be individually mounted on the approach side of the crosswalk closest to approaching traffic, or, when practical, may be mounted back to back on the same post and mounted on either side of the crosswalk in the median.
6. Locate push button sign (R10-25) and push button to face crosswalk, even if it is mounted on the back side of the sign.
7. All RRFB units associated with a given crosswalk (including those with an advance crossing sign) shall, when actuated, simultaneously commence operation of their rapid-flashing indications and shall cease operation simultaneously.
8. For quantitative purposes, a single sided, post mounted RRFB is one assembly unit. A double sided RRFB mounted on the same post is counted as two (2) assemblies.
9. For additional information, see Version 24 of the Transportation Systems Management and Operations (TSMO) Unit Project Special Provisions (PSP).

Timing of RRFBs

When actuated, the two yellow indications in each RRFB unit shall flash in a rapidly flashing sequence.

The RRFB shall flashing sequence shall provide enough time for pedestrians to cross from curb to curb. It is recommened to be a minimum of 7 seconds plus the crossing distance (D) divided by 3.5 feet/per sec., rounded up to the next whole second:

$$\text{Flash Time (sec.)} = 7 + D/3.5$$

Per Section 4L.03 of the 2023 MUTCD, RRFBs shall provide 75 flashing sequences per minute. During each 800 millisecond flashing sequence, the left and right RRFB indications shall operate using the following sequence:

- The RRFB indication on the left-hand side shall be illuminated for approximately 50 milliseconds. Both RRFB indications shall be dark for approximately 50 milliseconds.
- The RRFB indication on the right-hand side shall be illuminated for approximately 50 milliseconds. Both RRFB indications shall be dark for approximately 50 milliseconds.
- The RRFB indication on the left-hand side shall be illuminated for approximately 50 milliseconds. Both RRFB indications shall be dark for approximately 50 milliseconds.
- The RRFB indication on the right-hand side shall be illuminated for approximately 50 milliseconds. Both RRFB indications shall be dark for approximately 50 milliseconds.
- Both RRFB indications shall be illuminated for approximately 50 milliseconds. Both RRFB indications shall be dark for approximately 50 milliseconds.
- Both RRFB indications shall be illuminated for approximately 50 milliseconds. Both RRFB indications shall be dark for approximately 250 milliseconds.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Standard Drawing for Rectangular Rapid Flashing Beacon

Prepared in the Offices of:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •
TSMO Unit

750 N. Greenfield Parkway
Garner, NC 27529

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA

DocuSigned by: Robert J Ziemba
SIGNATURE

05/30/2024
DATE

30-MAY-2024 16:59
S:\Traffic\Signals\Signal Design Section\Central Region\Rob's Files\RRFB Stds\rrfb Updated 5-24.dgn
rziemba

5/26/20

HS-2005J
SHEET 4

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M. CHAVEZ
05/15/2024
DocuSigned by:
Victor Chavez
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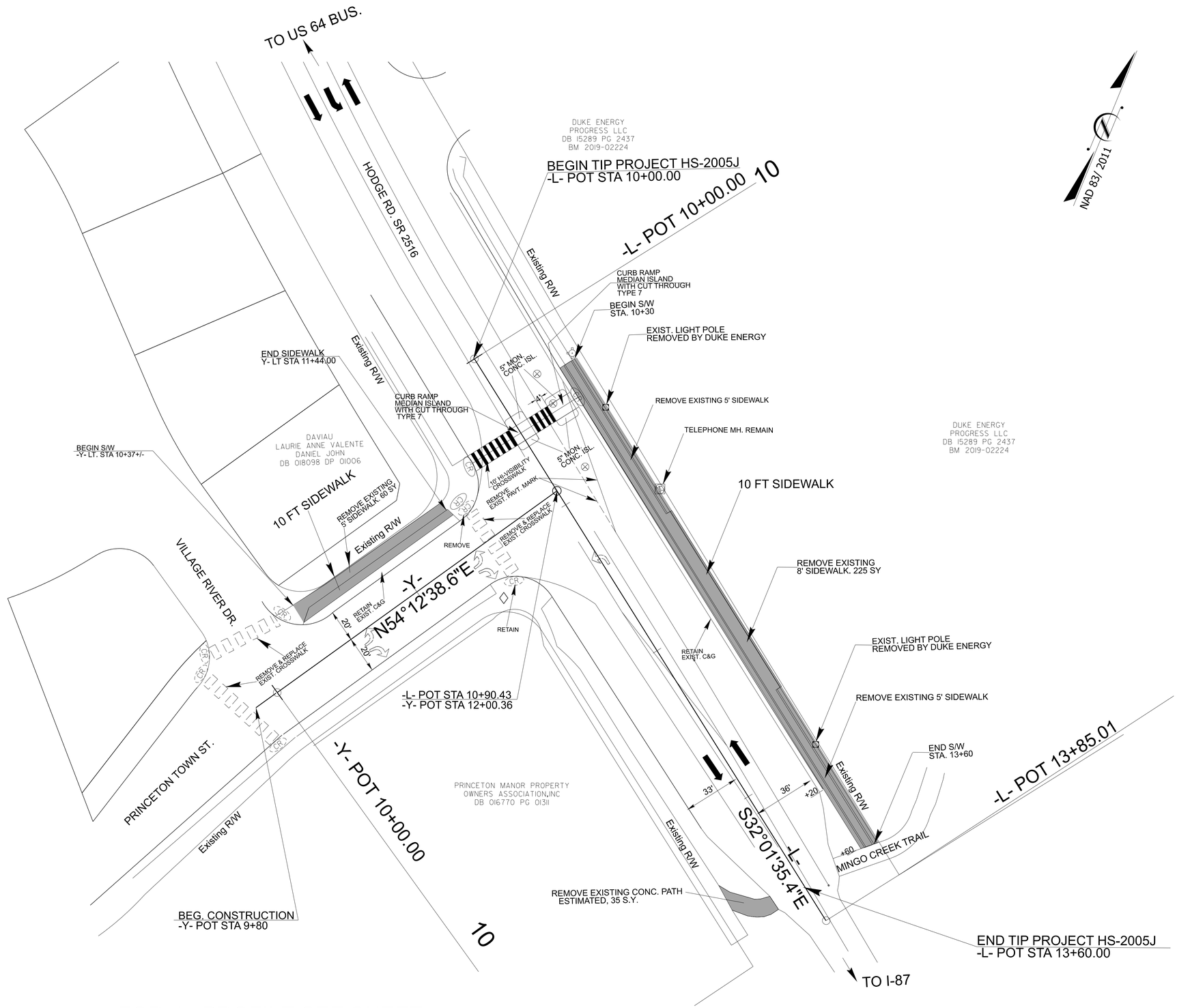
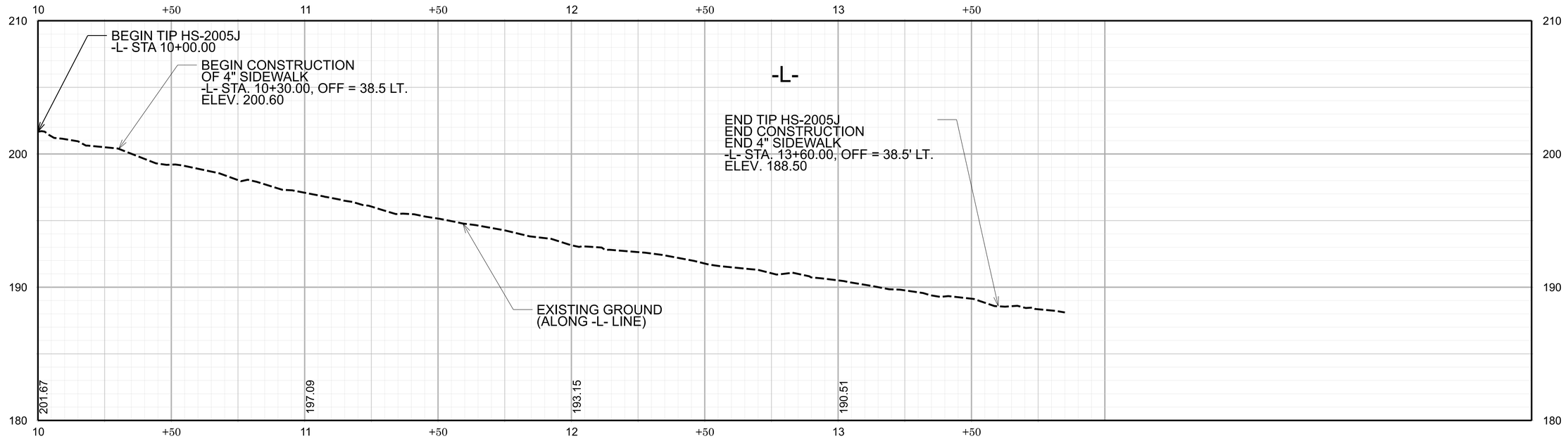
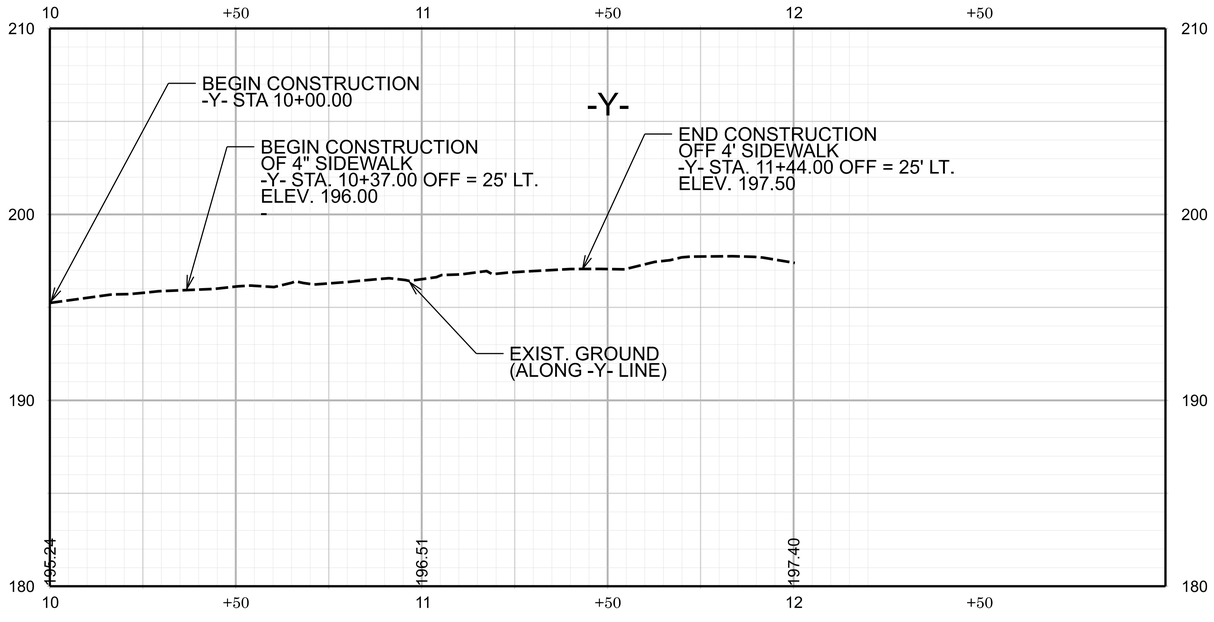


FOR -L- PROFILE SEE SHEET 5
FOR -Y- PROFILE SEE SHEET 5

FOR MONO. CONC. ISL. DETAIL SEE SHEET 2B-1
FOR CURB RAMP TYPE SEE SHEET 2B-1

5/26/20





NOTE:

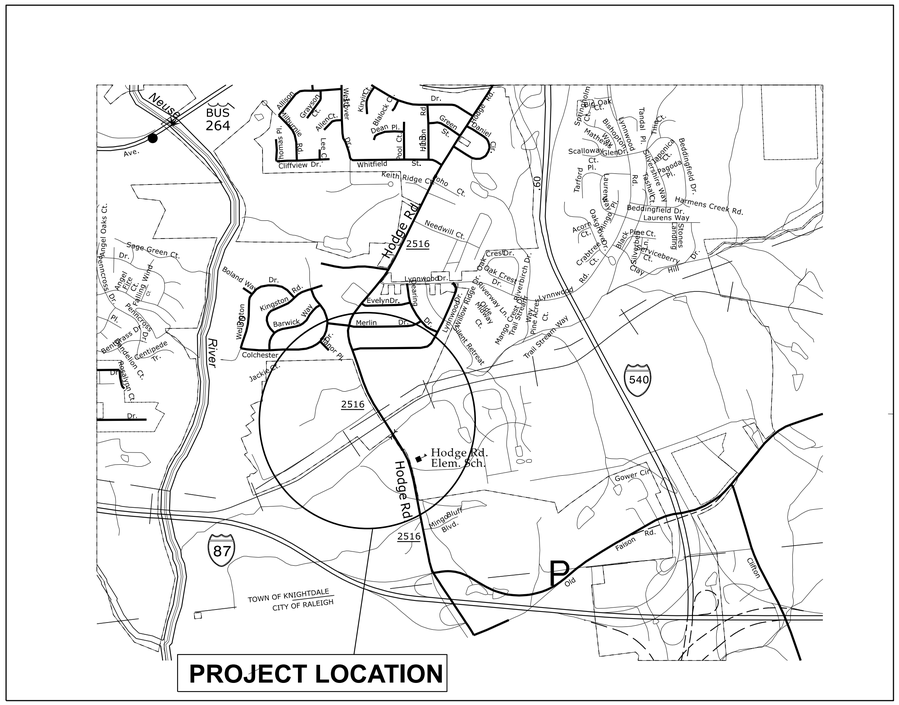
SIDEWALK GRADE TO FOLLOW EXISTING C&G ELEVATION

FOR -L- PLAN SEE SHEET 4
FOR -Y- PLAN SEE SHEET 4

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

WAKE COUNTY



VICINITY MAP

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, LEGEND AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND GENERAL NOTES
TMP-2	PHASING DETAIL

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- WORK AREA
- REMOVAL

SIGNALS

EXISTING · PROPOSED · TEMP TEMPORARY

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM · SKINNY DRUM · TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW BOARD
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED ATTENUATOR (TMA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

PAVEMENT MARKING SYMBOLS

SHEET NO.
TMP-1

HS-2005J

TIP PROJECT:

WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

PLANS PREPARED BY:

VICTOR M CHAVEZ, PE

DIVISION FIVE DDC ENGINEER

NCDOT CONTACTS:

VICTOR M. CHAVEZ, PE
PROJECT ENGINEER

PROJECT DESIGN ENGINEER

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

APPROVED:

DATE: 08/02/2024

DocuSigned by: Victor Chavez
7CD1F54298E9...

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M CHAVEZ

SEAL

8/1/2024
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User:vmchavez1

PROJ. REFERENCE NO.	SHEET NO.
HS-2005J	TMP-1A

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 16, 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.04	TEMPORARY SHOULDER CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW BOARD
1130.01	DRUMS
1135.01	CONES
1150.01	FLAGGERS
1180.01	SKINNY DRUMS

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

TIME RESTRICTIONS

A) DO NOT CLOSE OR NARROW TRAVEL LANES AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
HODGE ROAD	6:00 AM TO 9:00 AM AND 4:00PM TO 7:00PM (MON. - FRIDAY)

LANE AND SHOULDER CLOSURE REQUIREMENTS

B) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

C) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

E) PROVIDE TRAFFIC CONTROL FOR APPROPRIATE LANE CLOSURES FOR SURVEYING DONE BY THE DEPARTMENT.

GENERAL NOTES

PAVEMENT EDGE DROP OFF REQUIREMENTS

F) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

TRAFFIC PATTERN ALTERATIONS

G) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

H) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

I) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

J) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 50FT IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES

K) PLACE ADDITIONAL SETS OF THREE CHANNELIZING, DRUMS,SKIM DRUMS PERPENDICULAR TO THE EDGE OF TRAVELWAY ON 50 FT CENTERS WHEN UNOPENED LANES ARE CLOSE TO TRAFFIC.

PAVEMENT MARKINGS AND MARKERS

L) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

M) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

MISCELLANEOUS

N) IN THE EVENT A TIE-IN CANNOT BE MADE IN ONE DAY'S TIME, BRING THE TIE-IN AREA TO AN APPROPRIATE ROADWAY ELEVATION AS DETERMINED BY THE ENGINEER.PLACE BLACK ON ORANGE "PAVEMENT ENDS" SIGNS (W8-3) 100FT AND 150FT RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS.

O) PLACE SKINNY DRUMS TO DELINEATE EXISTING AND PROPOSED ISLANDS BEFORE INSTALLATION.

APPROVED: _____

DATE: 08/05/2024

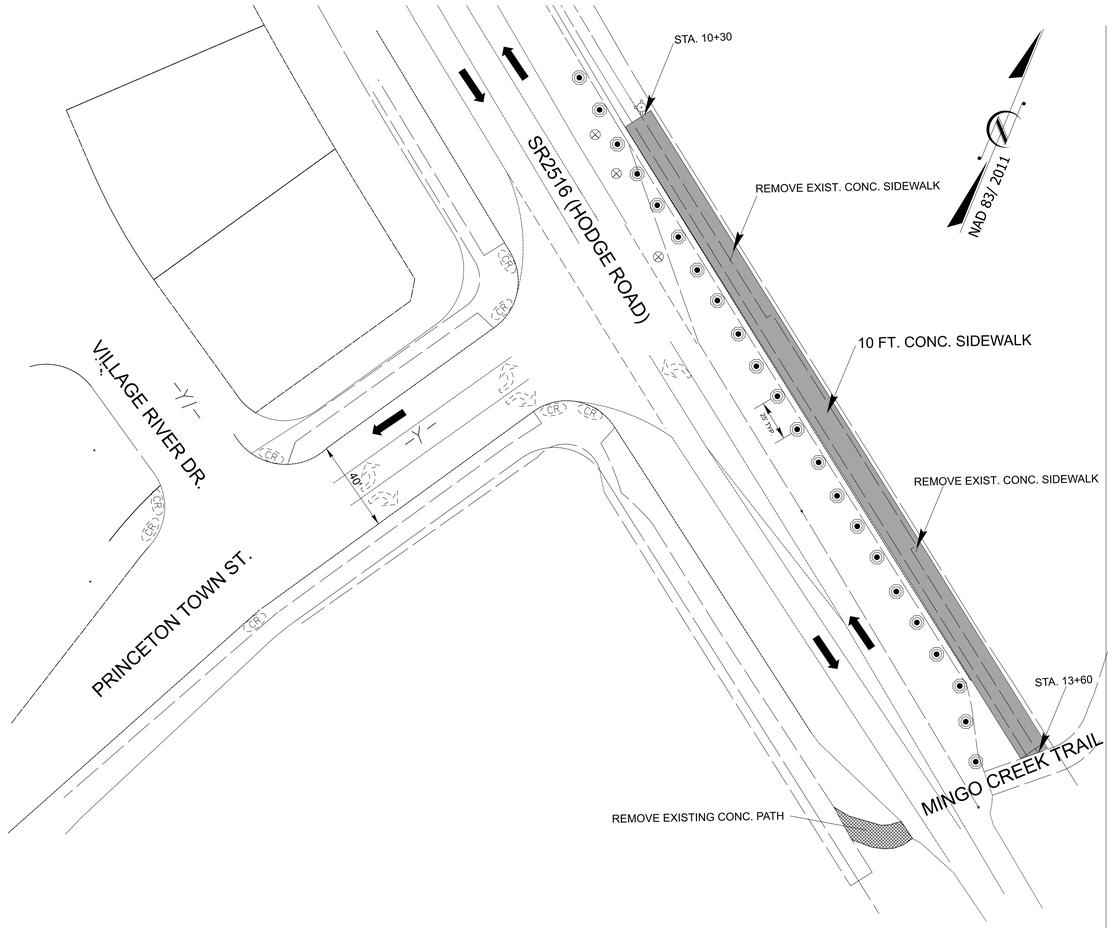
SEAL
DocuSigned by:
Victor Chavez
7CD1F54298E940A...

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M. CHAVEZ

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

TRANSPORTATION OPERATIONS PLAN

PROJ. REFERENCE NO.	SHEET NO.
HS-2005J	TMP-2



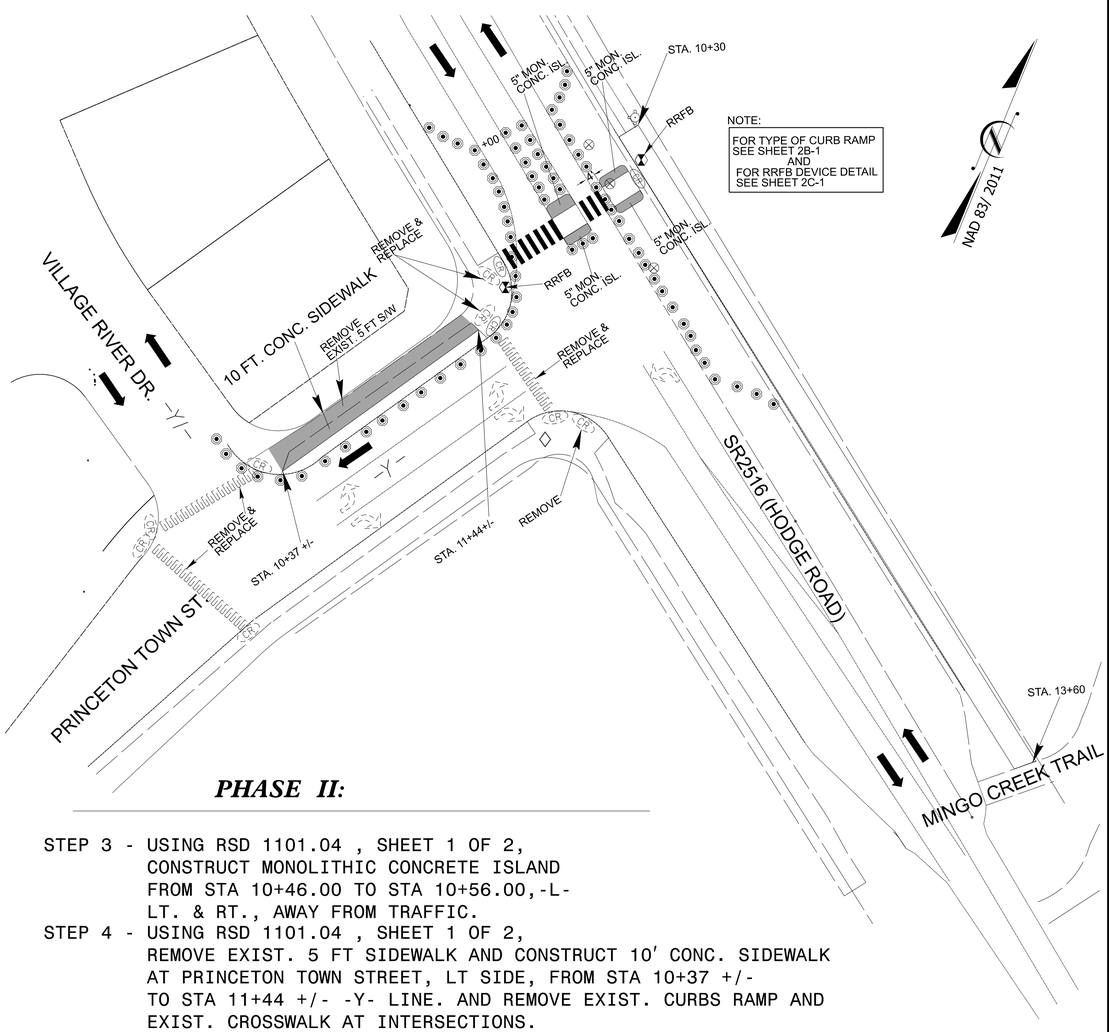
PHASE I:

STEP 1 - INSTALL ALL ADVANCE WORK ZONE MARKING SIGNS PER RSD 1101.01, ON HODGE ROAD.

STEP 2 - USING RSD 1101.04 , SHEET 1 OF 2, REMOVE EXISTING SIDEWALK AND CONSTRUCT 10′ CONC. SIDEWALK AT SR 2516 (HODGE ROAD), LEFT SIDE, FROM STA 10+30.00 TO STA 13+60.00 +/-,AND REMOVE EXISTING CONCRETE PATH, -L- STA 13+60, RT. SIDE.

ALL STEPS ABOVE SHOULD COMPLETED BEFORE MOVE NEXT PHASE.

PROPOSED SIDEWALK



PHASE II:

STEP 3 - USING RSD 1101.04 , SHEET 1 OF 2, CONSTRUCT MONOLITHIC CONCRETE ISLAND FROM STA 10+46.00 TO STA 10+56.00,-L- LT. & RT., AWAY FROM TRAFFIC.

STEP 4 - USING RSD 1101.04 , SHEET 1 OF 2, REMOVE EXIST. 5 FT SIDEWALK AND CONSTRUCT 10′ CONC. SIDEWALK AT PRINCETON TOWN STREET, LT SIDE, FROM STA 10+37 +/- TO STA 11+44 +/- -Y- LINE. AND REMOVE EXIST. CURBS RAMP AND EXIST. CROSSWALK AT INTERSECTIONS.

STEP 5 - INSTALL RRFB DEVICE AND SIGNS.

STEP 6 - APPLY FINAL PAVEMENT MARKING.

PROPOSED SIDEWALK AND CONCRETE ISLAND

APPROVED: _____

DATE: 08/02/2024

SEAL

DocuSigned by:
Victor Chavez
7CD1F54298E940A...

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M. CHAVEZ

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

PHASING DETAIL

PROJECT REFERENCE NO.	SHEET NO.
HS-2005J	PMP-1

08/13/2024

DocuSigned by:
Victor Chavez
7CD1F54298E940A...

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M CHAVEZ

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PAVEMENT MARKING PLAN

WAKE COUNTY

LOCATION: SR 2516 (HODGE ROAD) AT THE MINGO CREEK TRAIL CROSSING.

TIP PROJECT: HS-2005J

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKINGS PLAN TITLE AND SCHEDULE SHEET
PMP-2	PAVEMENT MARKINGS DETAIL SHEET

GENERAL NOTES

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON EXISTING FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
HODGE ROAD (SR 2516)	THERMOPLASTIC	NONE
PRINCETON TOWN ROAD	THERMOPLASTIC	NONE
VILLAGE RIVER DRIVE	THERMOPLASTIC	NONE

B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

D) UNLESS OTHERWISE SPECIFIED, HEATED-IN-PLACE THERMOPLASTIC MAY BE USED IN LIEU OF EXTRUDED THERMOPLASTIC FOR SYMBOLS.

PAVEMENT MARKING SCHEDULE

SYMB	DESCRIPTION AND TYPE	PAY ITEM QUANTITY
T1	WHITE EDGELINE (4", 90 MIL)	180 LF
T13	YELLOW DOUBLE CENTER (4",90MIL)	200 LF
T41	WHITE DIAGONAL (8", 90 MIL)	210 LF
T42	YELLOW DIAGONAL (8", 90 MIL)	60 LF
T62	WHITE CROSSWALK LINE (24", 90 MIL)	200 LF
T103	24" YIELD LINE TRIANGLE (90 MIL)	20 EA

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES

PLANS PREPARED BY:

VICTOR M CHAVEZ, PE

DIVISION FIVE DDC ENGINEER

NCDOT CONTACTS:

VICTOR M CHAVEZ,PE
PROJECT ENGINEER

PROJECT DESIGN ENGINEER

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · DIVISION DESIGN UNIT

8/13/2024
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User:vmchavez1

5/26/20

HS-2005J

SHEET PM-2

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M CHAVEZ

08/22/2024

DocuSigned by:
Victor Chavez
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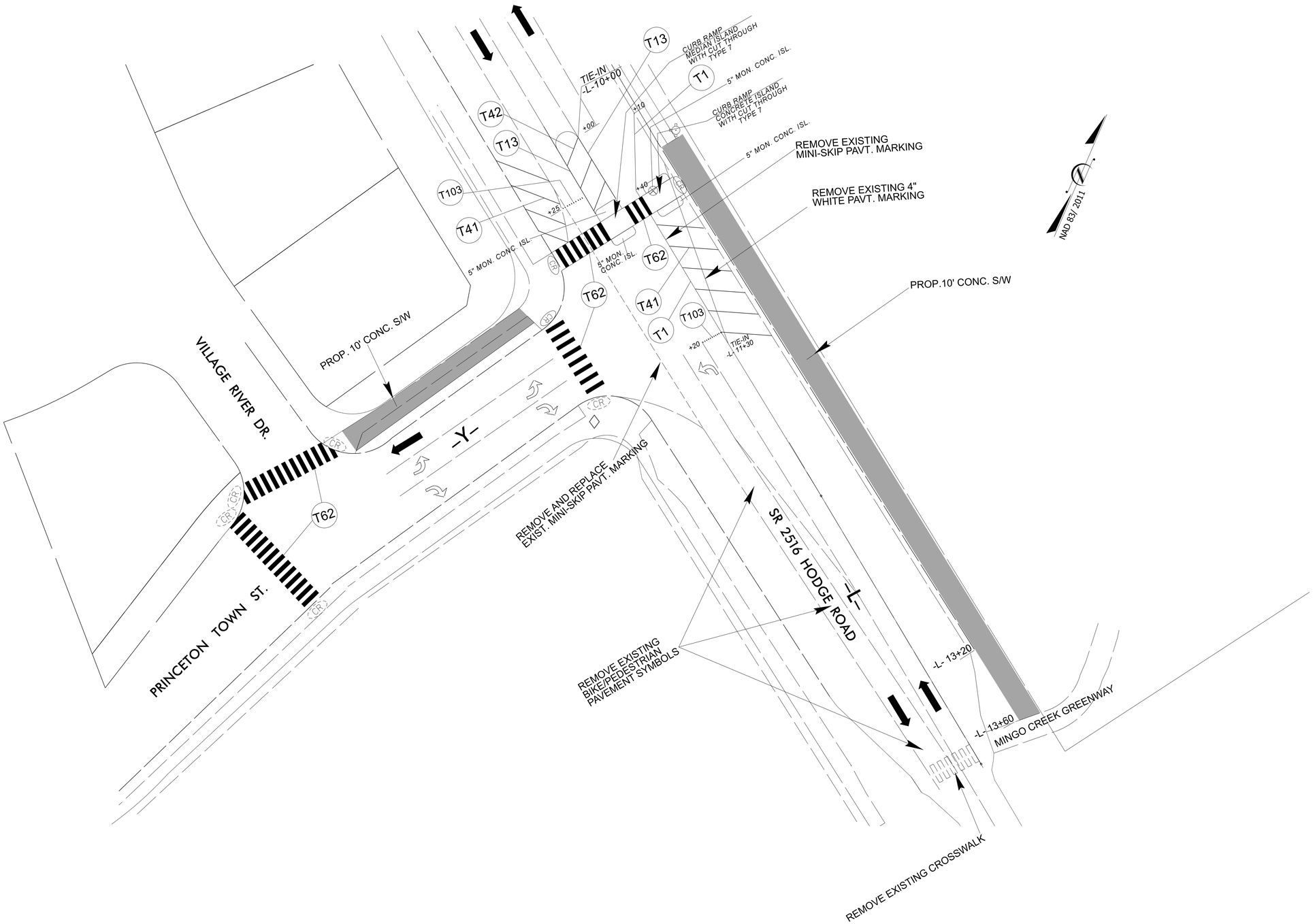


09/08/99

TIP PROJECT: HS-2005J

CONTRACT: ____________

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS-2005J	1	4

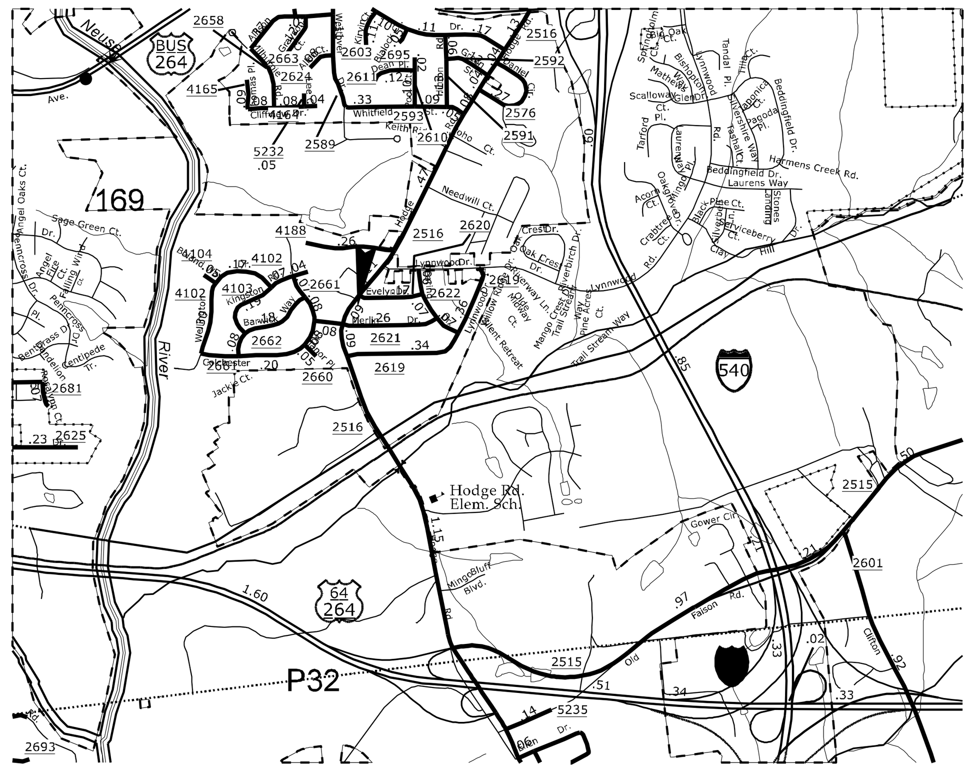
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49309.1.11	2516002	PE

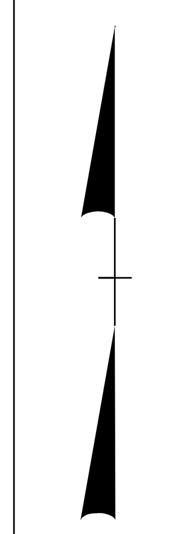
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED EROSION CONTROL

LOCATION: *SR 2516 (HODGE ROAD) AT THE MINGO CREEK TRAIL CROSSING*

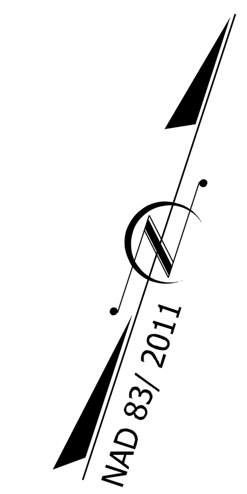
TYPE OF WORK: *DRAINAGE, WIDENING EXISTING SIDEWALK, PAVEMENT MARKING AND SIGNING.*

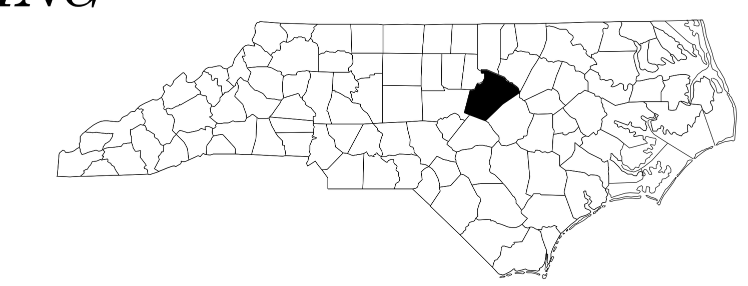


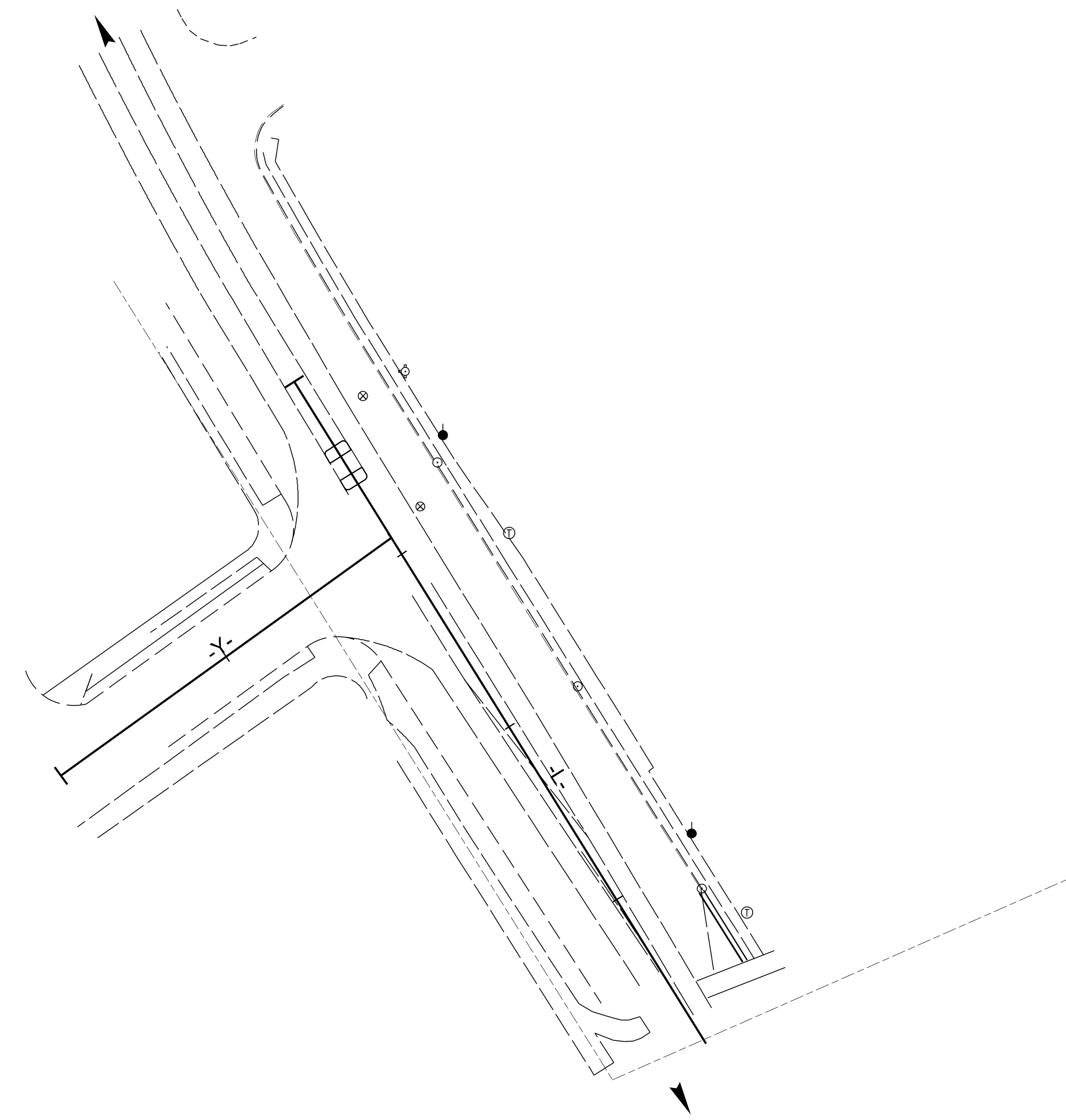


VICINITY MAP (NTS)

See Sheet 1A For Index of Sheets







GRAPHIC SCALES

40 20 0 40 80
PLANS

20 10 0 20 40
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2024 = 10,613
ADT 2044 = 14860
K = __ %
D = __ %
T = __ % *
V = __ MPH
* TTST =__ DUAL __
FUNC CLASS =
MAJOR COLLECTOR
__________ TIER

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG–010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2019 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

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

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: 11/08/23

LETTING DATE: 6/24/24

VICTOR M CHAVEZ PE
PROJECT ENGINEER

KYRILLOS HELMY, EI
PROJECT DESIGN ENGINEER

EC PLANS BY"

__________________ *P.E.*
SIGNATURE:

EROSION CONTROL DESIGN:

DAVID DAVIS
LEVEL III CERT. NUMBER : 3553

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

PROJECT REFERENCE NO.	SHEET NO.
HS-2005J	EC-3B
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

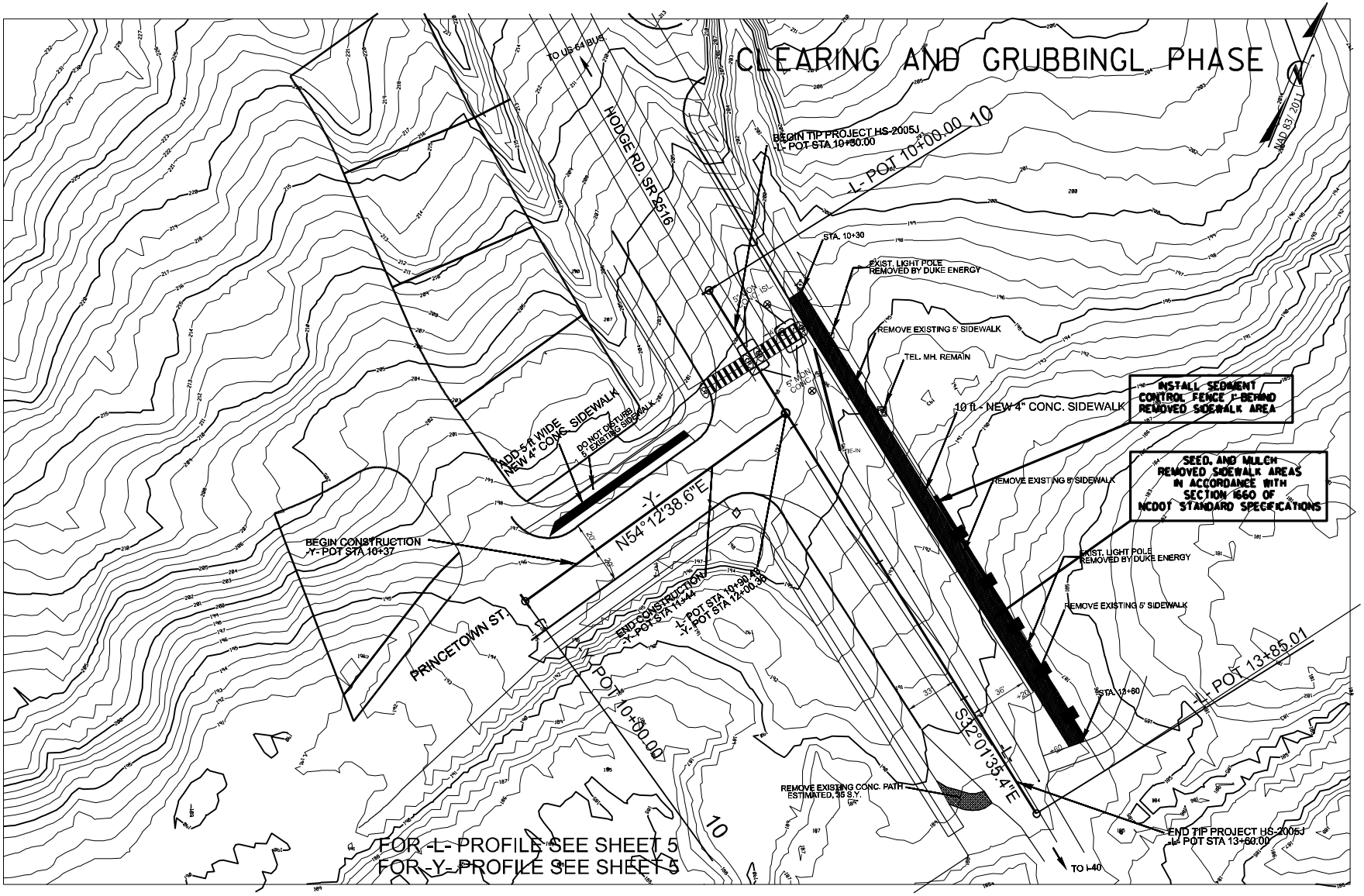
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

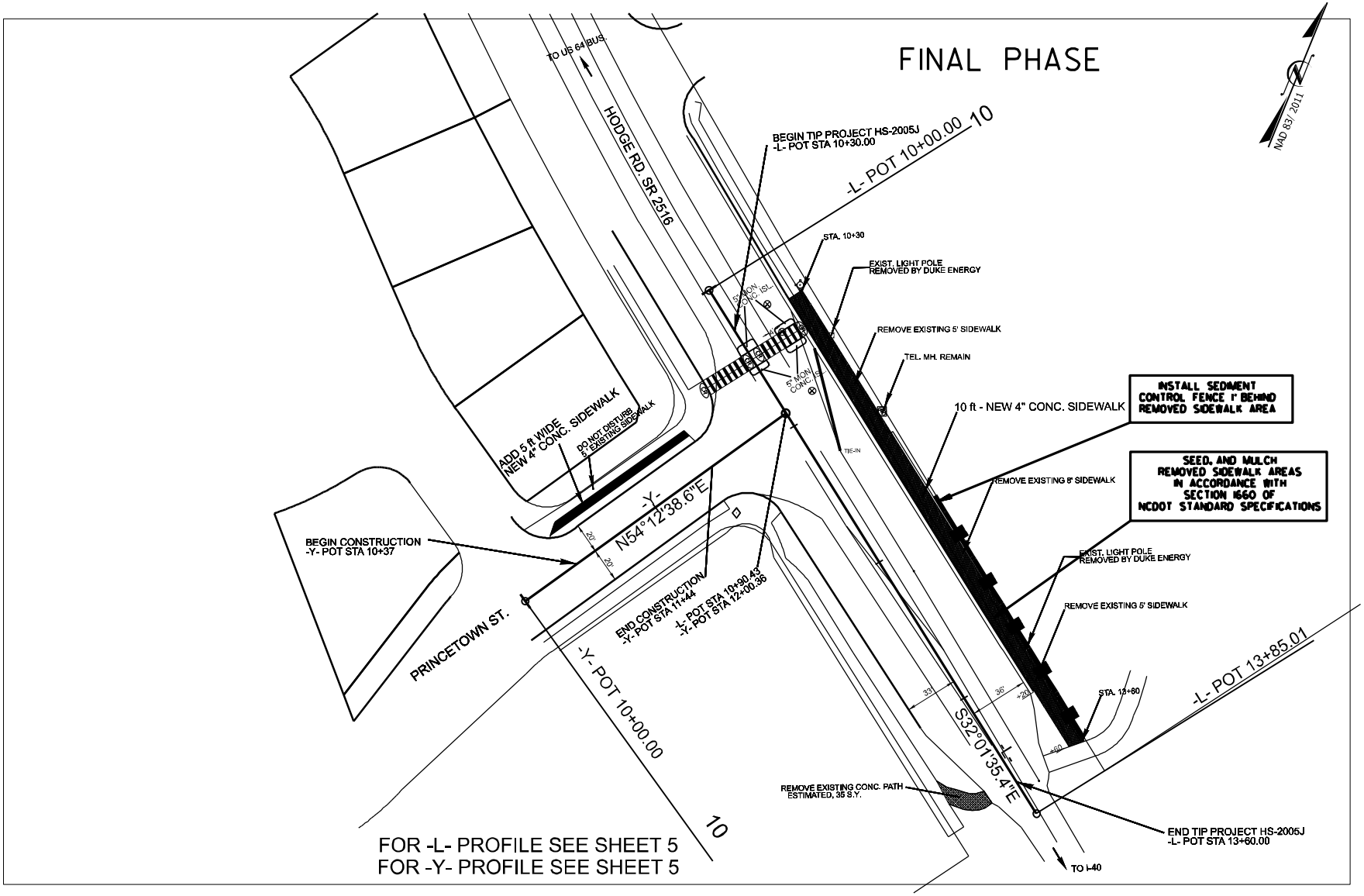
5/26/20

HS2005J
SHEET EC4



5/26/20

HS2005J
SHEET EC5



09/08/99

TIP PROJECT: HS–2005J

CONTRACT: DE00400

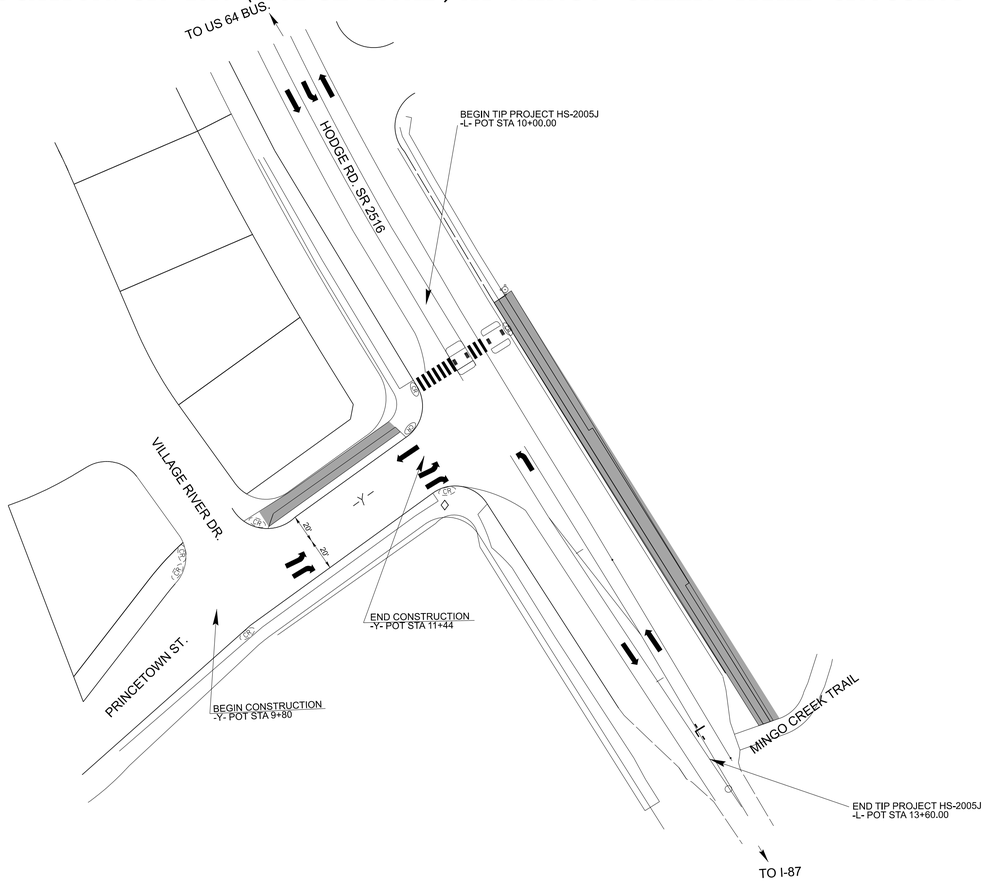
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.
N.C.	HS–2005J	SIGN–1

SIGNING PLANS

WAKE COUNTY

LOCATION: SR 2516 (HODGE ROAD) AT MINGO CREEK TRAIL CROSSING



INDEX OF SHEETS

SHEET NO.	*DESCRIPTION*
1	*TITLE SHEET*
2	*TYPE E SIGN DESIGNS*
3	*SIGN ROADWAY SHEET*

Prepared in the Office of:
DIVISION DESIGN & CONSTRUCTION
815 Stadium Dr., Durham NC, 27704

2024 STANDARD SPECIFICATIONS

VICTOR M CHAVEZ, PE
PROJECT ENGINEER

PROJECT DESIGN ENGINEER

DIVISION FIVE DESIGN & CONSTRUCTION ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M. CHAVEZ
12/9/2024
DocuSigned by: Victor Chavez
7CD1F54298E940A...
P.E.
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
FIFTH DIVISION
B.H. JONES, P.E.
DIVISION ENGINEER

DIVISION OF HIGHWAYS · DIVISION FIVE · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · DESIGN UNIT

12/9/2024
S:\DDC\Dist\FUNDED TIP\HS-2005J\Roadway\Proj\ORD\HS-2005J_sgn.dgn
User:vmchavez1

8/17/99

TYPE "E" SIGNS

PROJECT REFERENCE NO.	SHEET NO.
HS-2005J	SIGN-2

DIVISION FIVE DESIGN ENGINEER

08/13/2024

DocuSigned by:
Victor Chavez
7CD1F54298E940A...

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M CHAVEZ

P.E.

SIGNATURE:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

401 QTY REQUIRED :2

W13-1P
1 - 30" X 30"

ONE "U" CHANNEL POST PER SIGN

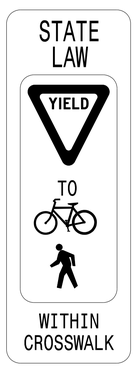
402 QTY REQUIRED :2

R1-5L
2 - 36" X 36"

402

ONE "U" CHANNEL POST PER SIGN

403 QTY REQUIRED :2



R1-6d
1 - 12" X 36"

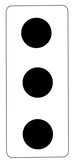
ONE "U" CHANNEL POST PER SIGN

404 QTY REQUIRED :1

SP-200
1 - 36" X 36"

ONE "U" CHANNEL POST PER SIGN

405 QTY REQUIRED :3



OM2-1V
1 - 6" X 12"

ONE "U" CHANNEL POST PER SIGN

406 QTY REQUIRED :1

W11-15
1 - 36" X 36"

W11-15P
1 - 24" X 30"

W16-2aP
1 - 24" X 12"

ONE "U" CHANNEL POST PER SIGN

407 QTY REQUIRED :2

D11-1
1 - 24" X 18"

M6-4P
1 - 21" X 15"

ONE "U" CHANNEL POST PER SIGN

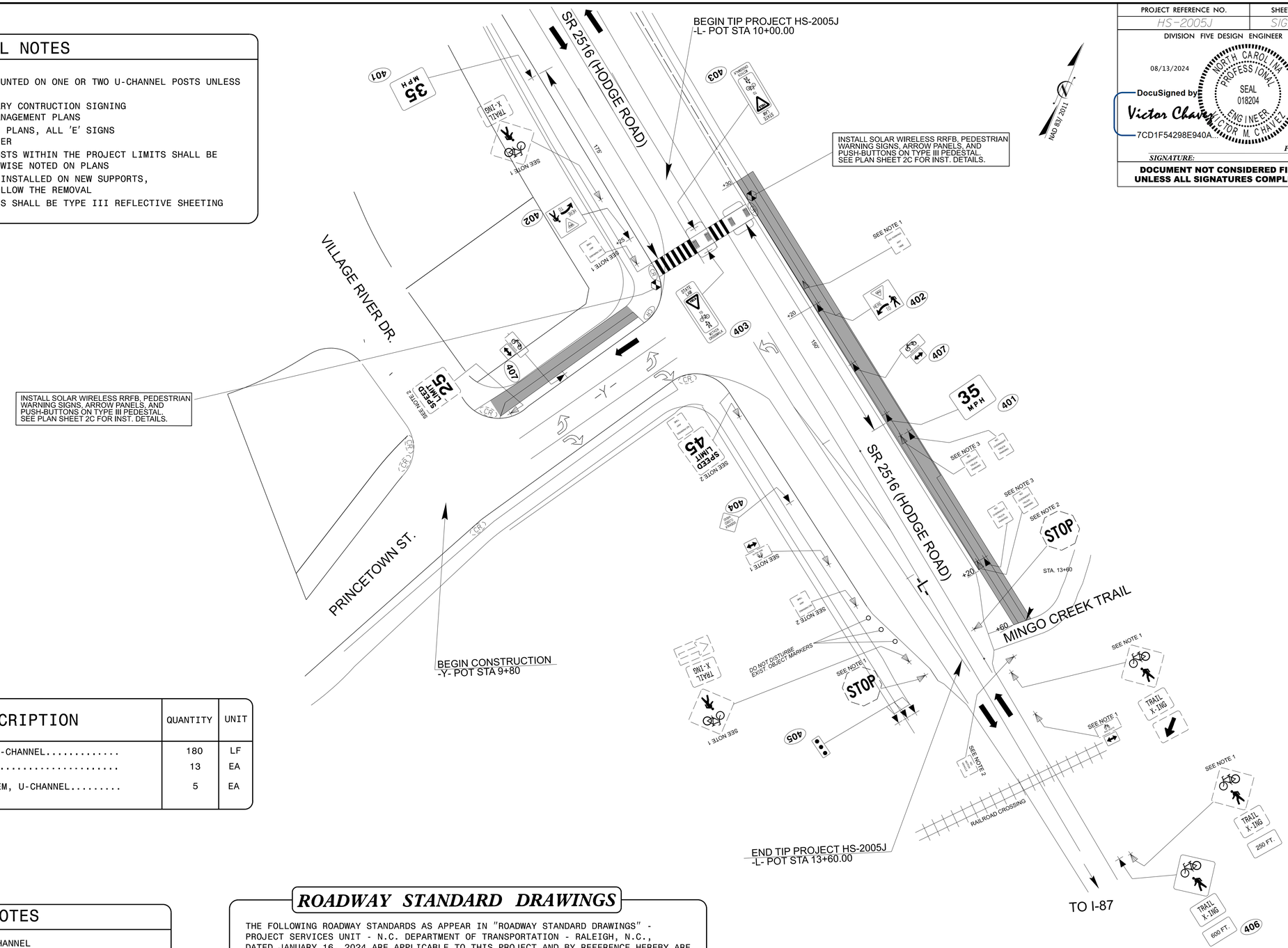
TYPE "E" SIGNS

8/13/2024
S:\DOT\Dist1\FUNDED TIP\HS-2005J\Roadway\Proj\ORD\HS-2005J_sgn.dgn
jsarvis

8/17/99

GENERAL NOTES

- ALL SIGNS FURNISHED BY CONTRACTOR
- ALL TYPE 'E' AND 'F' SIGNS SHALL BE MOUNTED ON ONE OR TWO U-CHANNEL POSTS UNLESS OTHERWISE INDICATED ON THE PLANS
- SIGNING PLANS DO NOT INCLUDE TEMPORARY CONTRUCTION SIGNING OR PAVEMENT MARKINGS. SEE TRAFFIC MANAGEMENT PLANS
- WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER
- ALL EXISTING SIGNS ON "U" CHANNEL POSTS WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS
- WHEN EXISTING SIGNS ARE REMOVED AND INSTALLED ON NEW SUPPORTS, THE RE-ERECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL
- THE BACKGROUND FOR TYPE E AND F SIGNS SHALL BE TYPE III REFLECTIVE SHEETING



ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL.....	180	LF
4102000000	904	SIGN ERECTION, TYPE E.....	13	EA
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL.....	5	EA

PAY ITEM NOTES

1	DISPOSAL OF SIGN SISTEM,U-CHANNEL
2	RETAIN SIGN
3	DISPOSAL OF SUPPORT

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 16, 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	
901.50	ARROWS AND SHIELDS
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF "D", "E", 'F" SIGNS ON "U" CHANNEL POSTS
1705.04	SIGNAL HEADS- PEDESTRIAN PUSHBUTTON PLACEMENT
1743.03	PEDESTALS - HEAVY DUTY (TYPE III)
1743.04	PEDESTALS - FOUNDATIONS

PROJECT REFERENCE NO.	SHEET NO.
HS-2005J	SIGN-3

DIVISION FIVE DESIGN ENGINEER

08/13/2024

DocuSigned by:
Victor Chavez
7CD1F54298E940A...

NORTH CAROLINA PROFESSIONAL SEAL 018204 ENGINEER VICTOR M. CHAVEZ

P.E.

SIGNATURE:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/ 2011

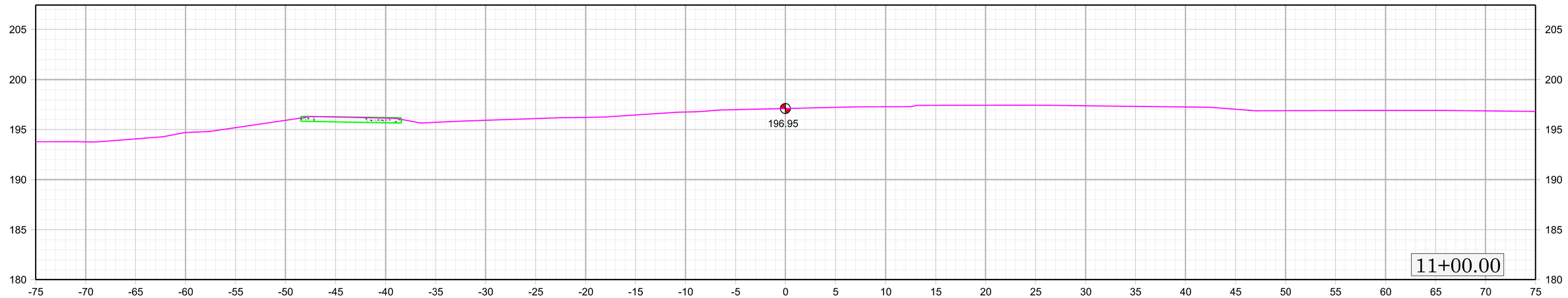
EXISTING and PROPOSED SIGNS SR 2516 (HODGE ROAD) AT MINGO CREEK TRAIL CROSSING

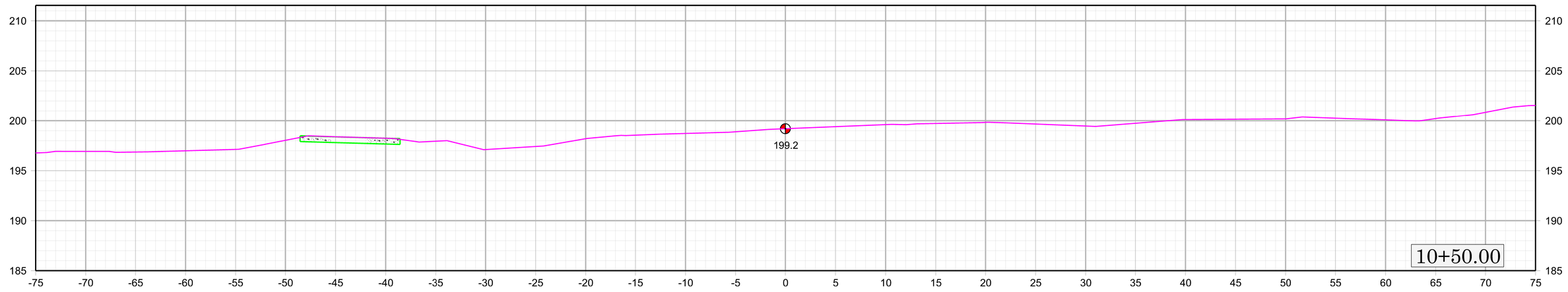
8/13/2024
8:10:05 AM
C:\Users\dlist\FUNDED TIP\HS-2005J\Roadway\Proj\ORD\HS-2005J_sgn.dgn
User:vmchavez1

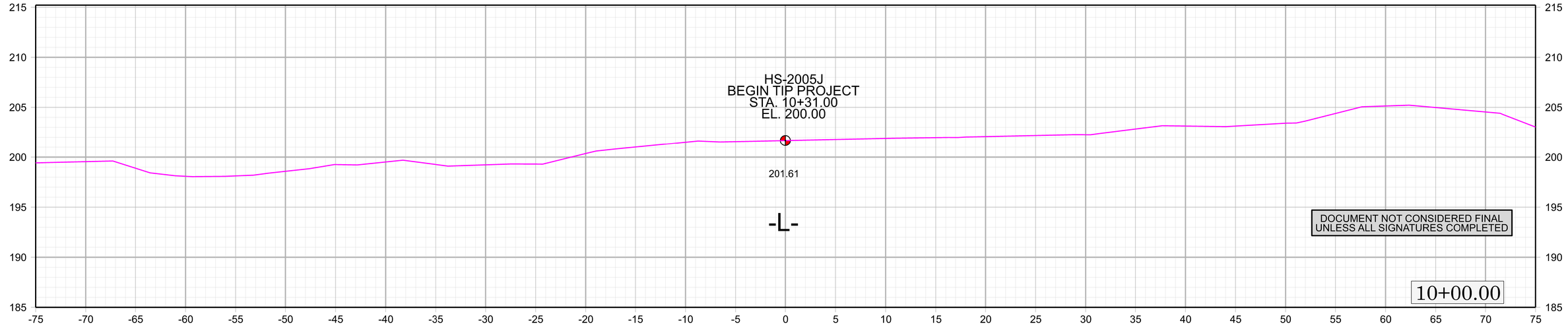
5/26/20

0 5 10

HS-2005J
SHEET 1 X-1







5/26/20

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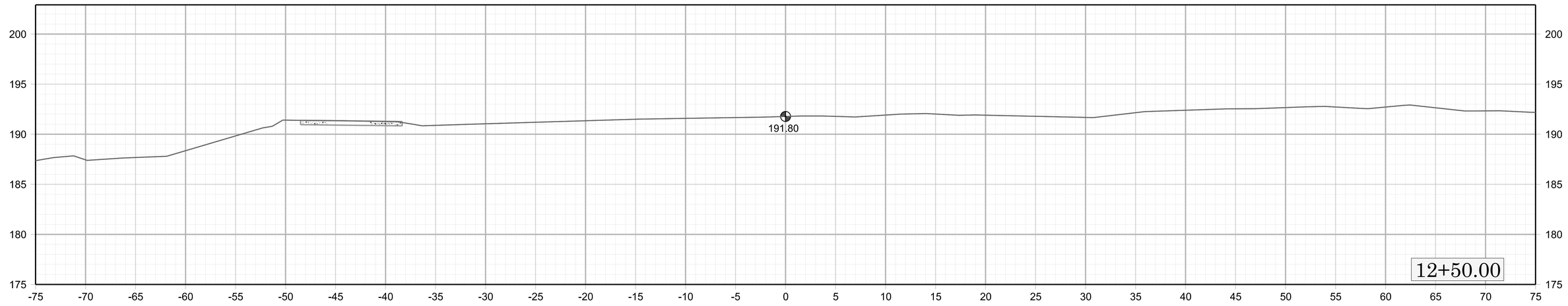
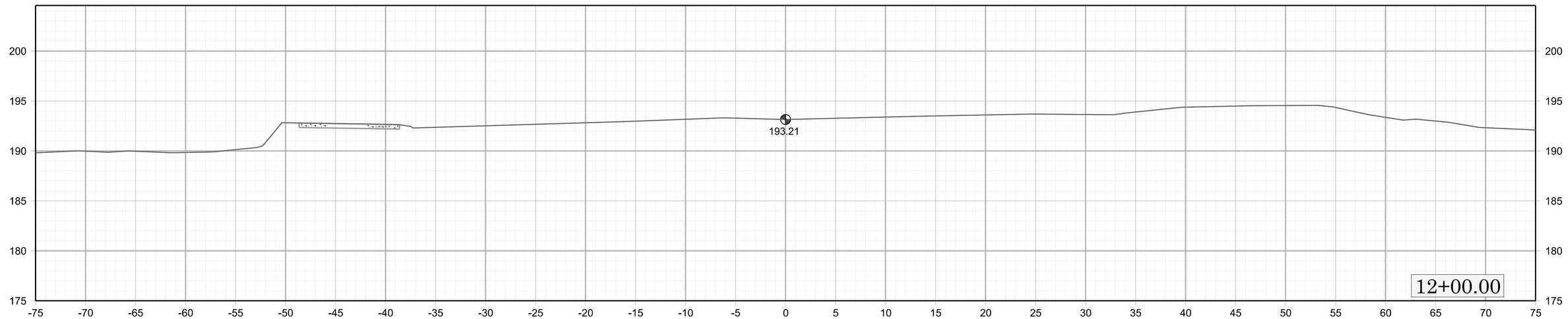
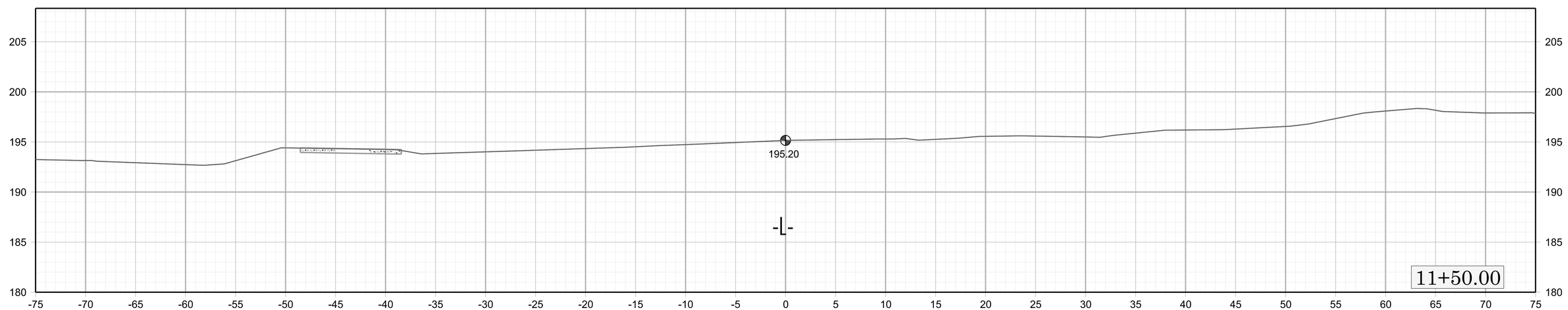
HS-2005J
SHEET X-2







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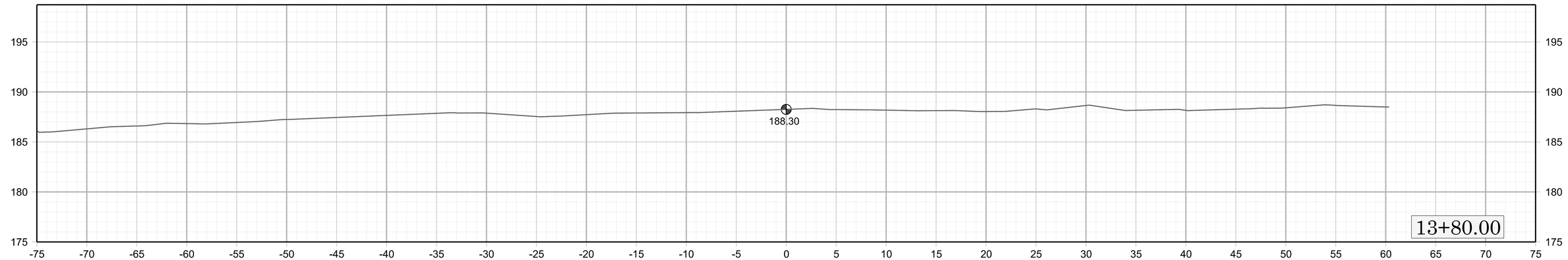
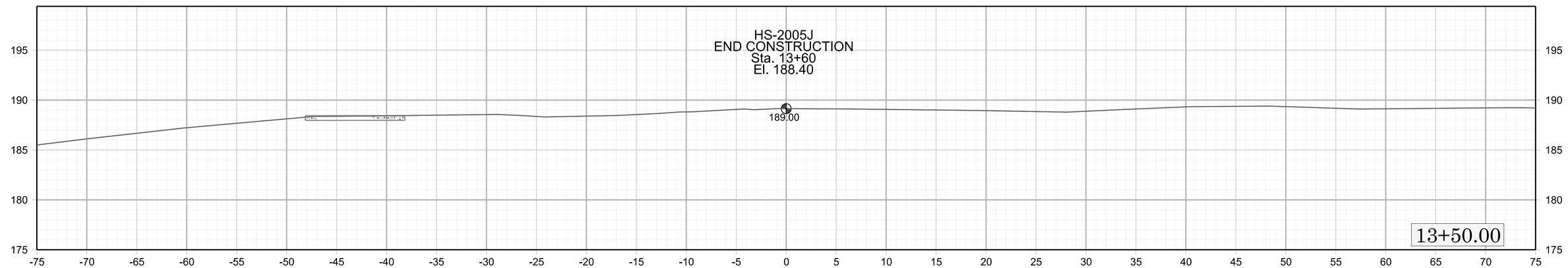
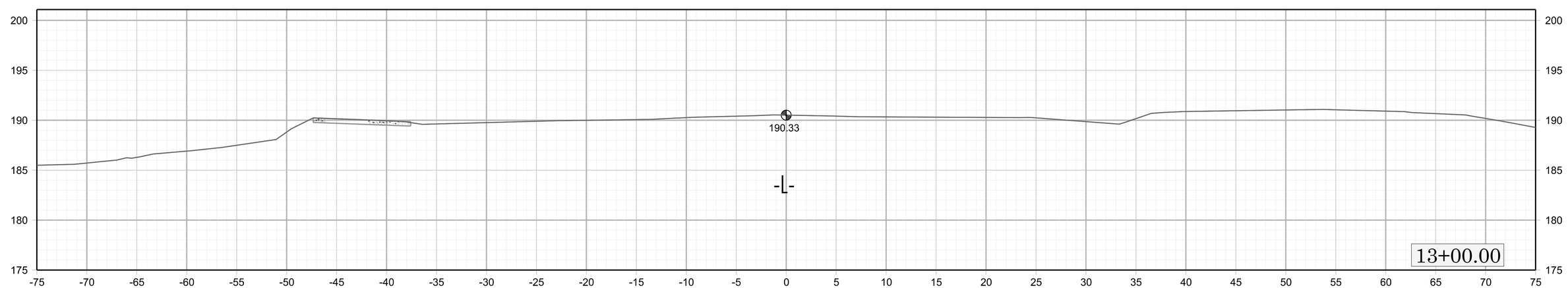
HS-2005J
SHEET | X-3







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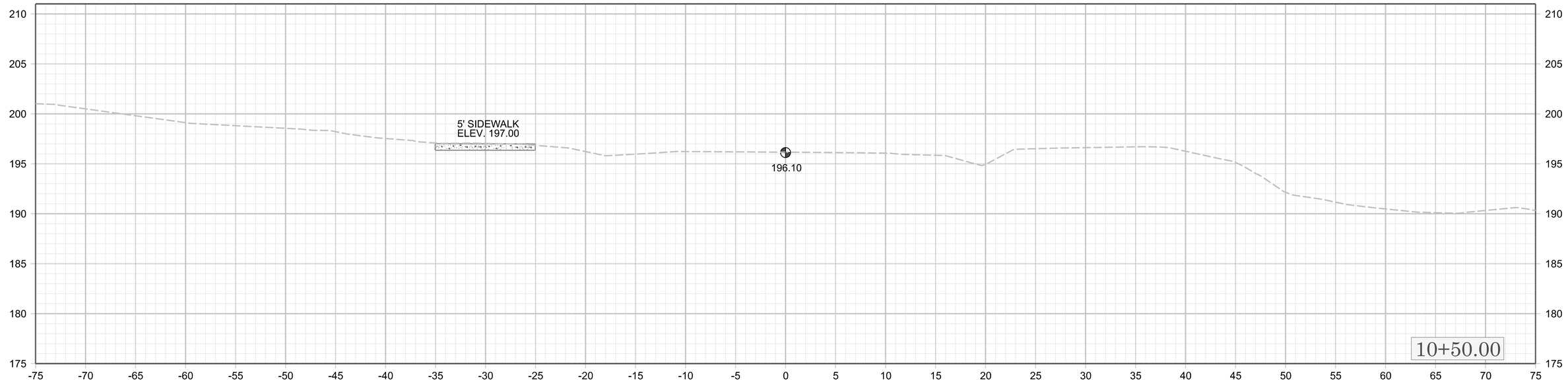
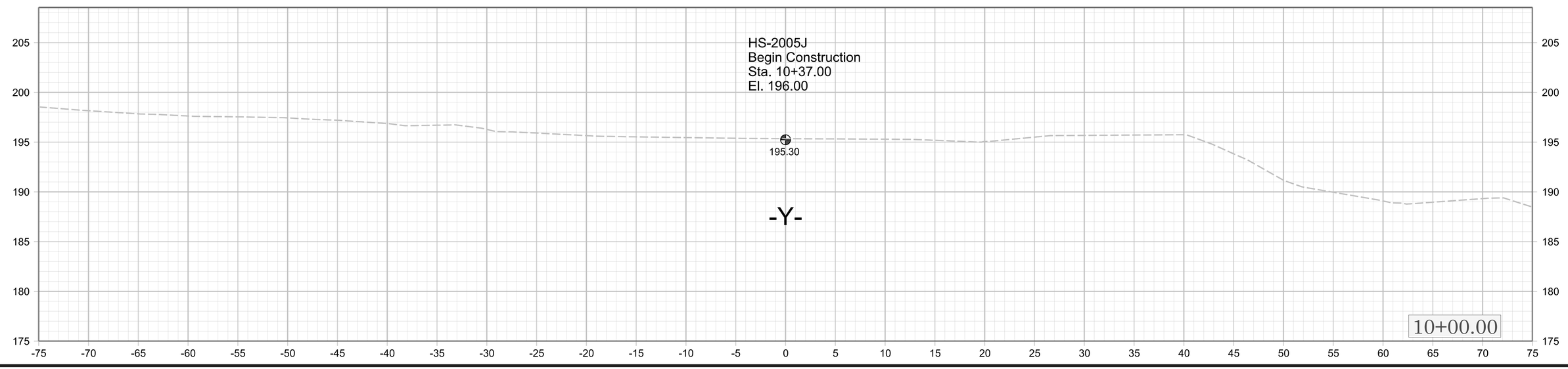
HS-2005J
SHEET X-4





5/26/20

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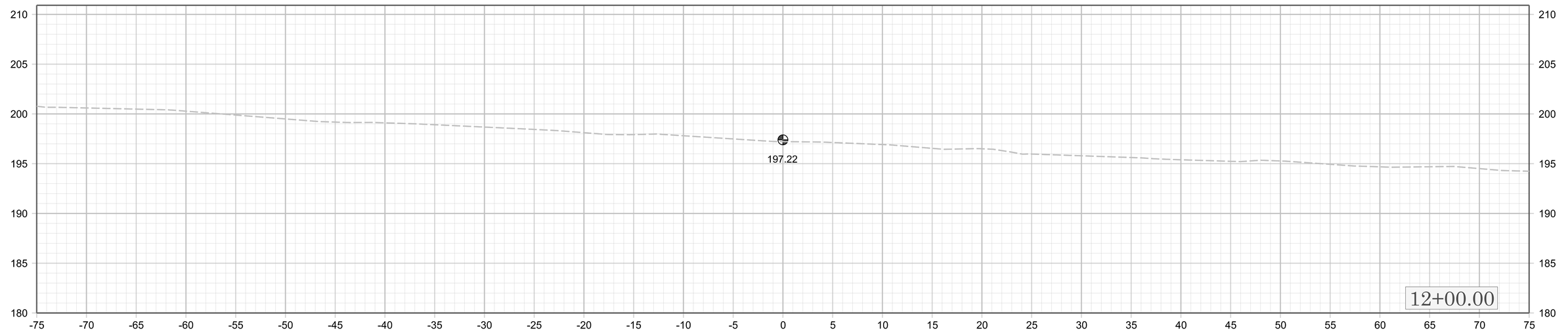
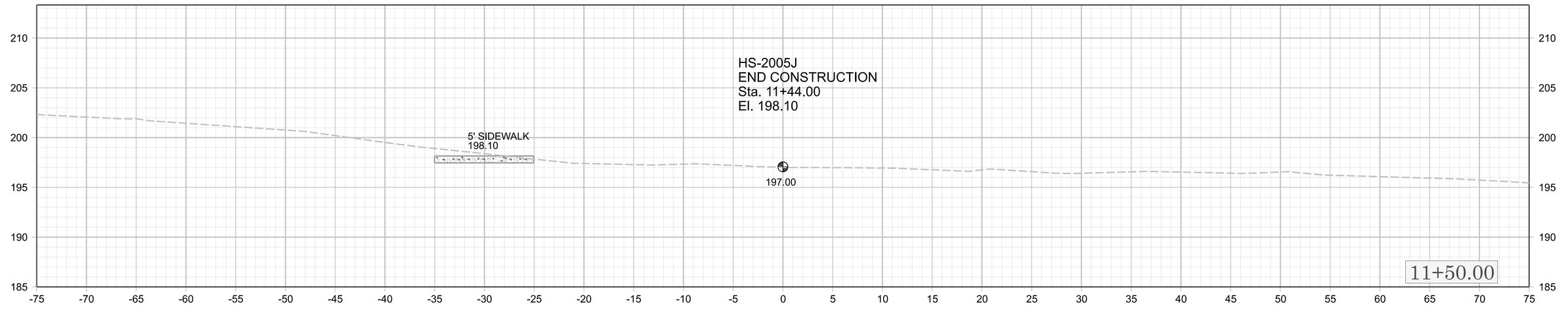
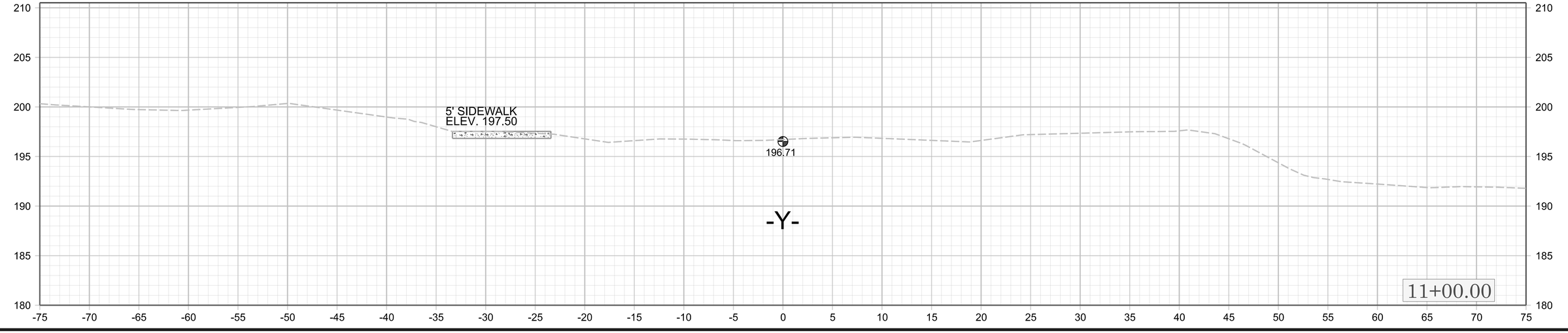
HS-2005J
SHEET | X-5







-Y-