09/08/09

TIP PROJECT: HL–0008I

CONTRACT: C205038

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

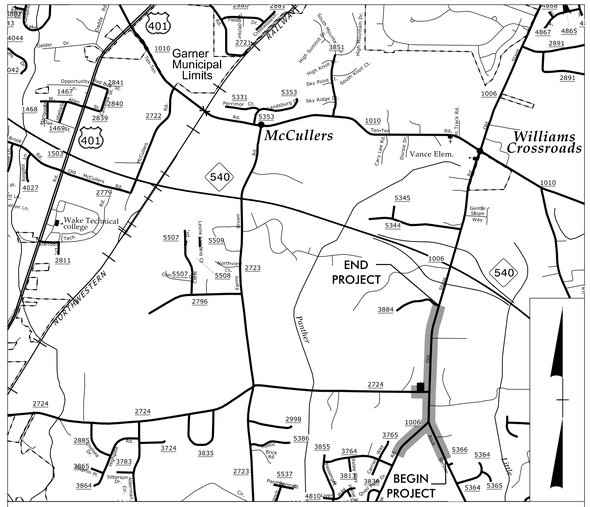
WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HL–0008I	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49367.1.9	NA	PE
49367.2.10	NA	ROW
49367.2.27	NA	UTILITIES
49367.3.9	NA	CONSTRUCTION

LOCATION: WIDENING SR 1006 (OLD STAGE ROAD) FROM SR 2736 (ROCK SERVICE STATION ROAD) TO SR 3884 (ROLLING MEADOWS DRIVE)

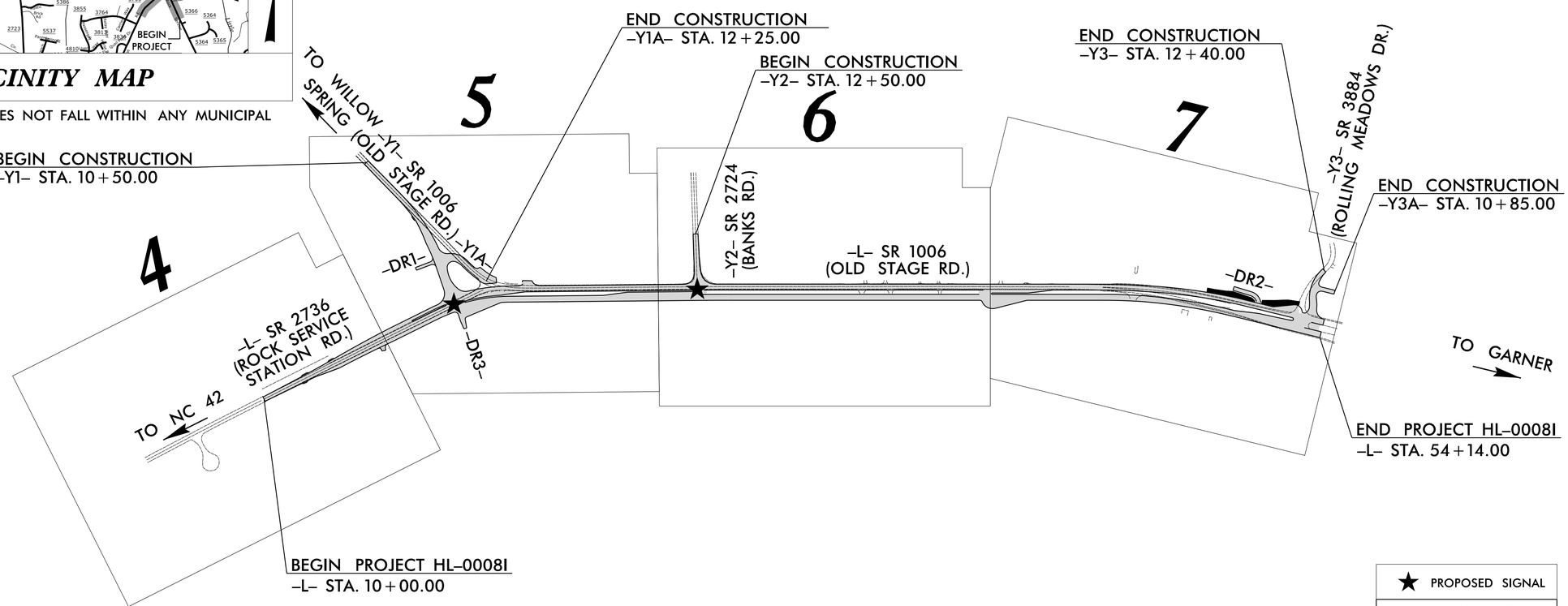
TYPE OF WORK: GRADING, DRAINAGE, PAVING & SIGNALS



VICINITY MAP

NOTE: THIS PROJECT DOES NOT FALL WITHIN ANY MUNICIPAL BOUNDARIES.

NAD 83/2011



★ PROPOSED SIGNAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2025 = 16,830
ADT 2045 = 26,400
V = 50 MPH
FUNC MINOR
CLASS = ARTERIAL

REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT HL–0008I = 0.836 MILES

TOTAL LENGTH TIP PROJECT HL–0008I = 0.836 MILES

NCDOT CONTACT: ANDREW MUSSELMAN, PE
PROJECT MANAGER, DIVISION 5

Prepared In the Office of:
SUMMIT DESIGN AND ENGINEERING SERVICES FIRM NO. C-5176
320 Executive Ct.
Hillsborough, NC 27278-8551
Voice: (919) 732-3883
Fax: (919) 732-6776
www.summitde.net

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: NOVEMBER 22, 2023

LETTING DATE: DECEMBER 16, 2025

BRANDON W. JOHNSON, PE
PROJECT ENGINEER

FAITH E. JAHNKE, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

9/25/2025

NORTH CAROLINA PROFESSIONAL SEAL 053755 ENGINEER PATRICK M. HARTNETT

DocuSigned by: Patrick Hartnett

P.E.

SIGNATURE:

ROADWAY DESIGN ENGINEER

9/25/2025

NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE

DocuSigned by: Faith Jahnke

P.E.

SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

25-SEP-2025 10:48
HL-0008I_Rdy_tsh.dgn
faith.jahnke

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
HL-00081	1A

ROADWAY DESIGN ENGINEER
9/8/2025

NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JOHNKE

DocuSigned by: Faith E. Johnke

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

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

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

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.

STREET TURNOUT:

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY, SEGRA,

VERIZON, CATV-SPECTRUM, CARDINAL PIPELINE and AT&T.

RIGHT-OF-WAY MARKERS:

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

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
275.01	Rock Plating
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation (Use Details in Lieu of Standards for Sheets 1 and 2 of 2)
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
806.03	Concrete Contol of Access Marker
815.02	Subsurface Drain
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
848.02	Driveway Turnout - Radius Type
848.04	Street Turnout
852.01	Concrete Islands
852.04	Method for Placement of Drop Inlets in Grassed Median - Using 1'-6" Curb and Gutter
852.06	Method for Placement of Drop Inlets in Concrete Islands
862.01	Guardrail Placement (Use Details in Lieu of Standards for Sheets 4, 6, 12, and 14 of 15)
876.01	Rip Rap in Channels and Ditches
876.04	Drainage Ditches with Class 'B' Rip Rap

9/10/2021

PROJECT REFERENCE NO.	SHEET NO.
HL-00081	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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 — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- 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)* — W
- U/G Water Line (SUE – LOS C)* — W
- U/G Water Line (SUE – LOS D)* — W
- 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.

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
HL-00081	2A-1

ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
9/8/2025	9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE	NORTH CAROLINA PROFESSIONAL SEAL 044590 ENGINEER ANDREW D. WARGO
DocuSigned by: Faith Jahnke BD02B5BCBE7C4A6...	DocuSigned by: Andrew D. Wargo 2D2C69BDCBCA49E...

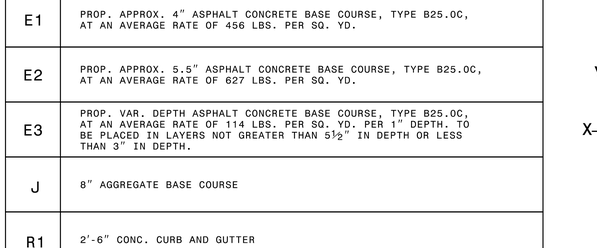
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE Nos C-5176
320 Executive Ct.
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

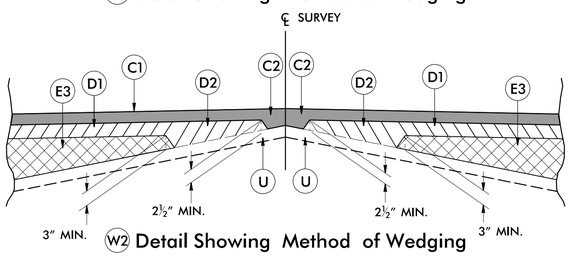
PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

C1	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½″ IN DEPTH.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT GREATER THAN 4″ OR LESS THAN 2½″ IN DEPTH.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. APPROX. 5.5″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT GREATER THAN 5½″ IN DEPTH OR LESS THAN 3″ IN DEPTH.
J	8″ AGGREGATE BASE COURSE
R1	2′-6″ CONC. CURB AND GUTTER
R2	1′-6″ CONC. CURB AND GUTTER
R3	5″ MONOLITHIC CONCRETE ISLAND (KEYED-IN)
R4	6″ CONCRETE DRIVEWAY.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	INCIDENTAL MILLING OF BITUMINOUS PAVEMENT (VARIABLE DEPTH 0″-3″)
V2	MILLING OF BITUMINOUS PAVEMENT (VARIABLE DEPTH 0″-3″)
W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL ON THIS SHEET)
W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL ON THIS SHEET)

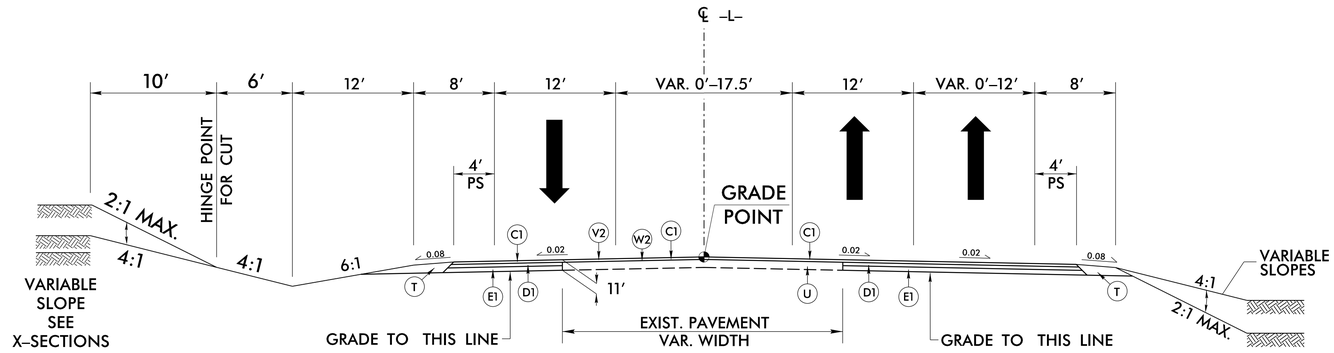
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



W1 Detail Showing Method of Wedging



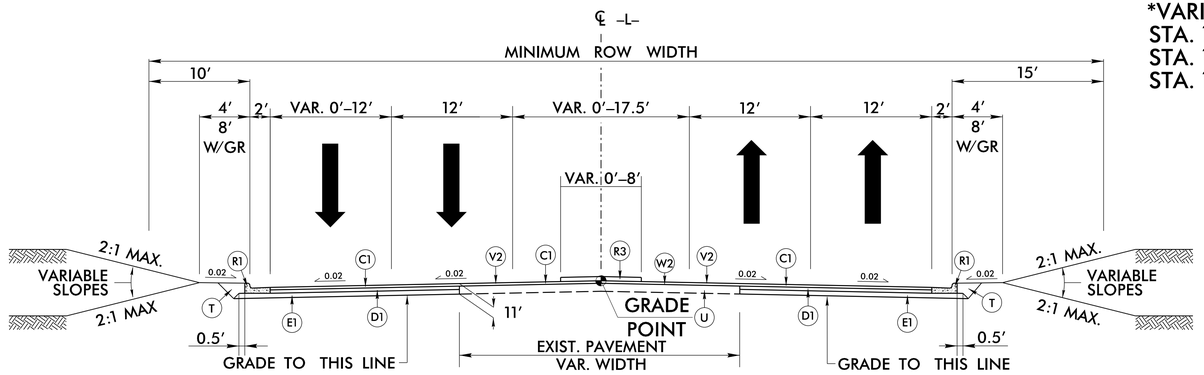
W2 Detail Showing Method of Wedging



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
–L– STA. 10+00.00 TO STA. 15+80.00

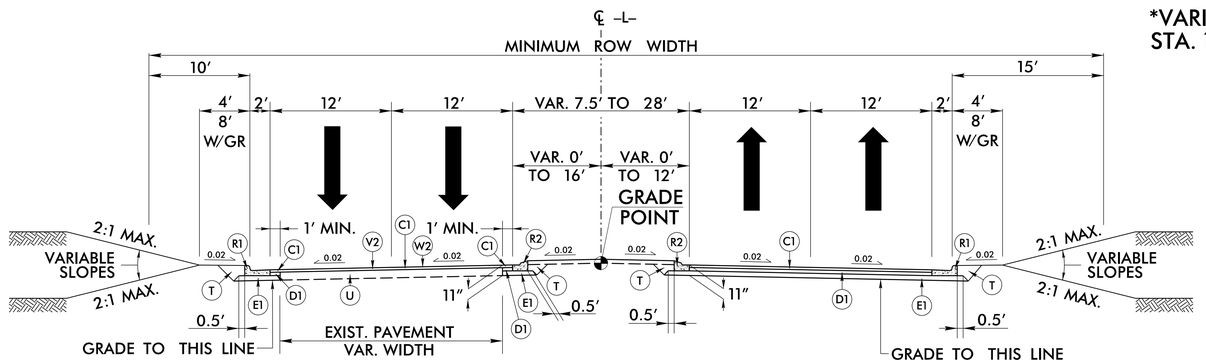
*VARIABLE MILLING REQUIRED AT:
STA. 10+75.00 TO STA. 10+80.00
STA. 12+65.00 TO STA. 13+80.00
STA. 15+60.00 TO STA. 15+80.00
(SEE CROSS SECTIONS)



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
–L– STA. 15+80.00 TO STA. 20+76.32

*VARIABLE MILLING REQUIRED AT:
STA. 15+80.00 TO STA 17+90.00
(SEE CROSS SECTIONS)



TYPICAL SECTION NO. 3

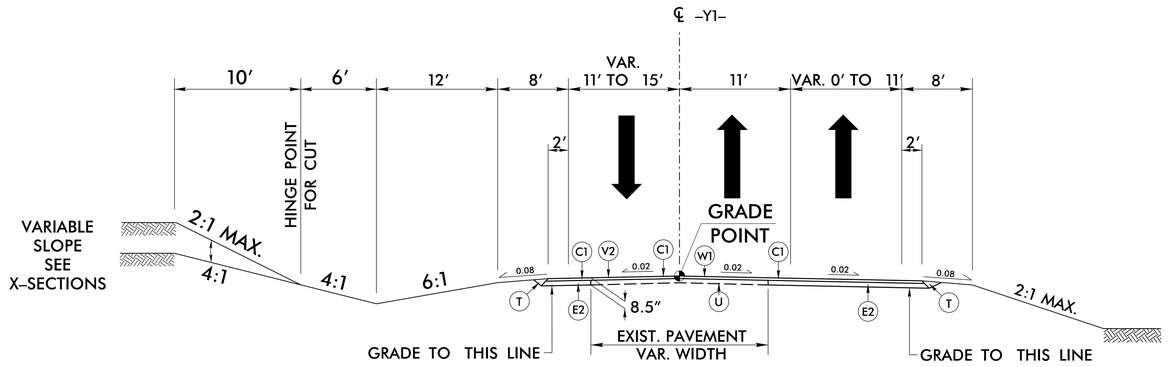
USE TYPICAL SECTION NO. 3
–L– STA. 20+76.32 TO STA. 54+14.00

*VARIABLE MILLING REQUIRED AT:
STA. 31+90.00 TO STA 32+90.00
STA. 52+70.00 TO STA 53+39.00
(SEE CROSS SECTIONS)

08-SEP-2025 08:55
HL-00081_Pvmt_Sht-Jan
ZDavis/DOT

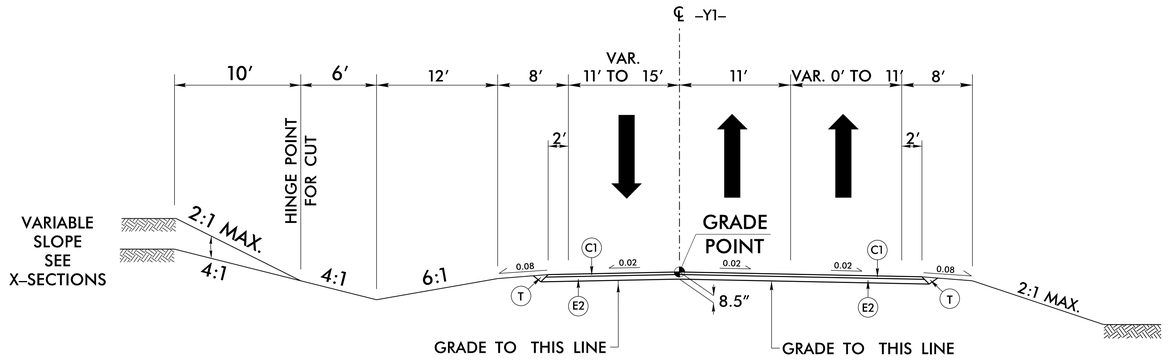
6/2/99

PAVEMENT SCHEDULE	
C1	3″ S9.5B
C2	VAR. S9.5B
D1	4″ I19.0C
D2	VAR. I19.0C
E1	4″ B25.0C
E2	5.5″ B25.0C
E3	VAR. B25.0C
J	8″ ABC
R1	2′-6″ C&G
R2	1′-6″ C&G
R3	MONO. ISLAND
R4	6″ CONC DRWY
T	EARTH MAT.
U	EX. PAVEMENT
V1	INC. MILLING
V2	VAR. MILLING
W1	WEDGING (2)
W2	WEDGING (3)



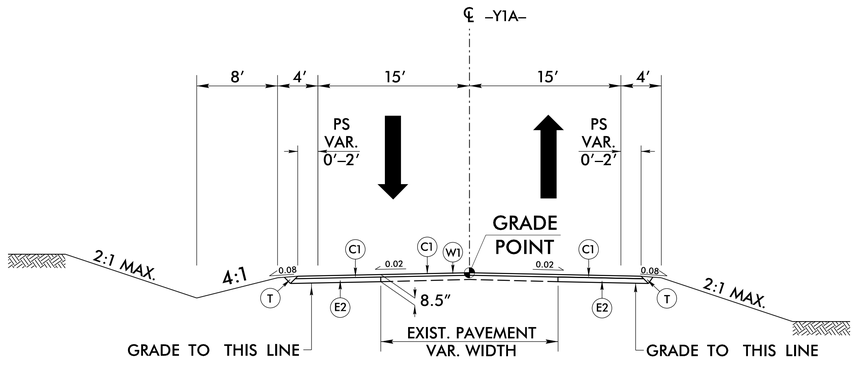
TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4
–Y1– STA. 10+50.00 TO STA. 14+11.00



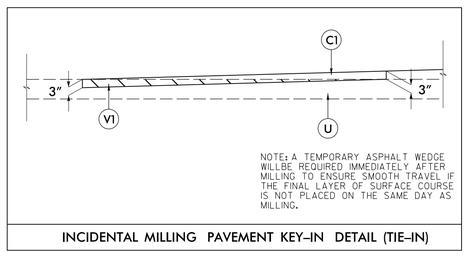
TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5
–Y1– STA. 14+11.00 TO STA. 17+04.48



TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6
–Y1A– STA. 10+11.00 TO 12+25.00



INCIDENTAL MILLING PAVEMENT KEY-IN DETAIL (TIE-IN)

–L– STA. 10+00.00 TO STA. 10+75.00
–L– STA. 53+39.00 TO STA. 54+14.00
–Y1– STA. 10+50.00 TO STA. 11+25.00
–Y1A– STA. 10+15.00 TO STA. 10+90.00
–Y2– STA. 12+50.00 TO STA. 13+25.00
–Y3– STA. 11+65.00 TO STA. 12+40.00

STATION RANGES ARE APPROXIMATE ONLY. GRADE MAY BE ADJUSTED BY ENGINEER TO ENSURE A PROPER TIE-IN.

PROJECT REFERENCE NO.	SHEET NO.
HL-00081	2A-2

ROADWAY DESIGN ENGINEER
9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE
DocuSigned by: Faith Jahnke
3DC0285BCE7C9466...

PAVEMENT DESIGN ENGINEER
9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 044590 ENGINEER ANDREW D. WARGO
DocuSigned by: Andrew D. Wargo
2CC0B6B0CBCA49E...

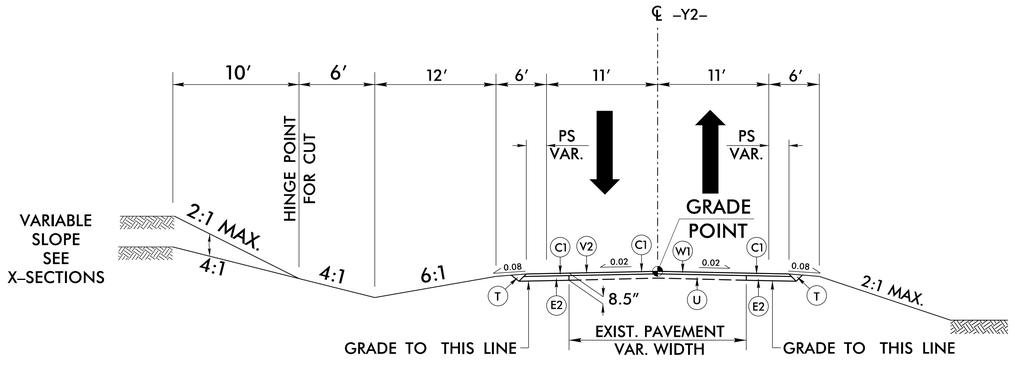
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE Nos C-5176
320 Executive Ct.
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

05-SEP-2025 08:47
H:\80081\03_Eng_Typ.dgn
jgaskamp

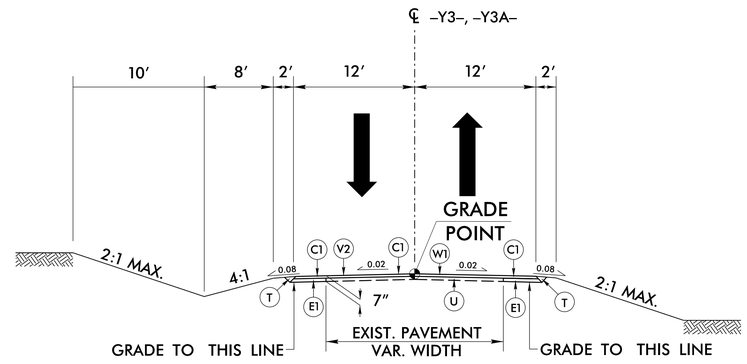
6/2/99

PAVEMENT SCHEDULE	
C1	3″ S9.5B
C2	VAR. S9.5B
D1	4″ I19.0C
D2	VAR. I19.0C
E1	4″ B25.0C
E2	5.5″ B25.0C
E3	VAR. B25.0C
J	8″ ABC
R1	2′-6″ C&G
R2	1′-6″ C&G
R3	MONO. ISLAND
R4	6″ CONC DRWY
T	EARTH MAT.
U	EX. PAVEMENT
V1	INC. MILLING
V2	VAR. MILLING
W1	WEDGING (2)
W2	WEDGING (3)



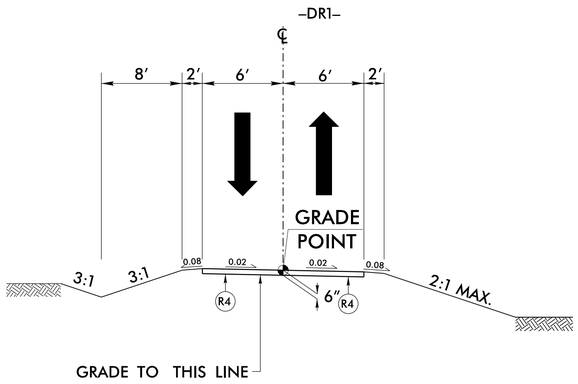
TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7
–Y2– STA. 12+50.00 TO STA. 14+54.98



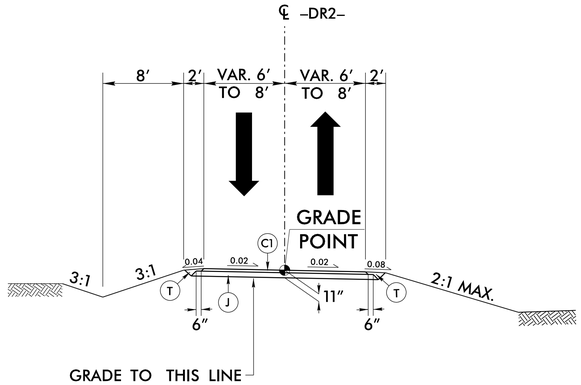
TYPICAL SECTION NO. 8

USE TYPICAL SECTION NO. 8
–Y3– STA. 10+40.00 TO STA. 12+40.00
–Y3A– STA. 10+12.00 TO STA. 10+85.00



TYPICAL SECTION NO. 9

USE TYPICAL SECTION NO. 9
–DR1– STA. 10+23.00 TO STA. 11+01.00



TYPICAL SECTION NO. 10

USE TYPICAL SECTION NO. 10
–DR2– STA. 10+41.45 TO STA. 11+69.45

PROJECT REFERENCE NO.	SHEET NO.
HL–00081	2A–3

ROADWAY DESIGN ENGINEER
9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE
DocuSigned by: Faith Jahnke

PAVEMENT DESIGN ENGINEER
9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 044590 ENGINEER ANDREW D. WARGO
DocuSigned by: Andrew D. Wargo

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of:
SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: C-5176
320 Executive Ct.
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

05-SEP-2025 08:47
H:\00081\05_Typ.typ.dgn
rgeraci

–L–/–Y1–/–Y1A– INTERSECTION DETAIL

PROJECT REFERENCE NO.	SHEET NO.
HL-00081	2B-1

ROADWAY DESIGN ENGINEER
9/8/2025

NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE

DocuSigned by: Faith E. Jahnke
8D02B3BCEFC3400...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of:
SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE Nos C-5176
320 Executive Ct.
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

20 10 0 20 40

NAD 83 NA 2011 NC GRID

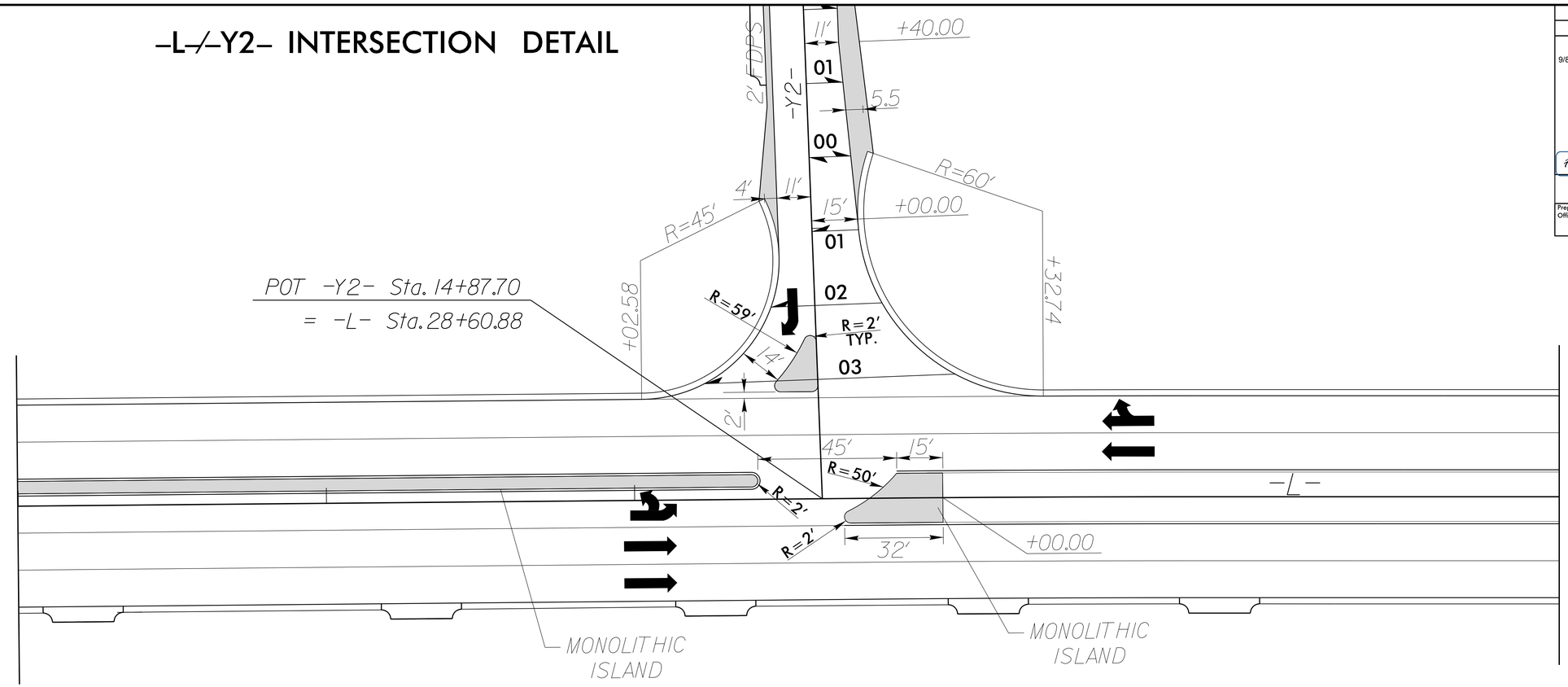
REVISIONS

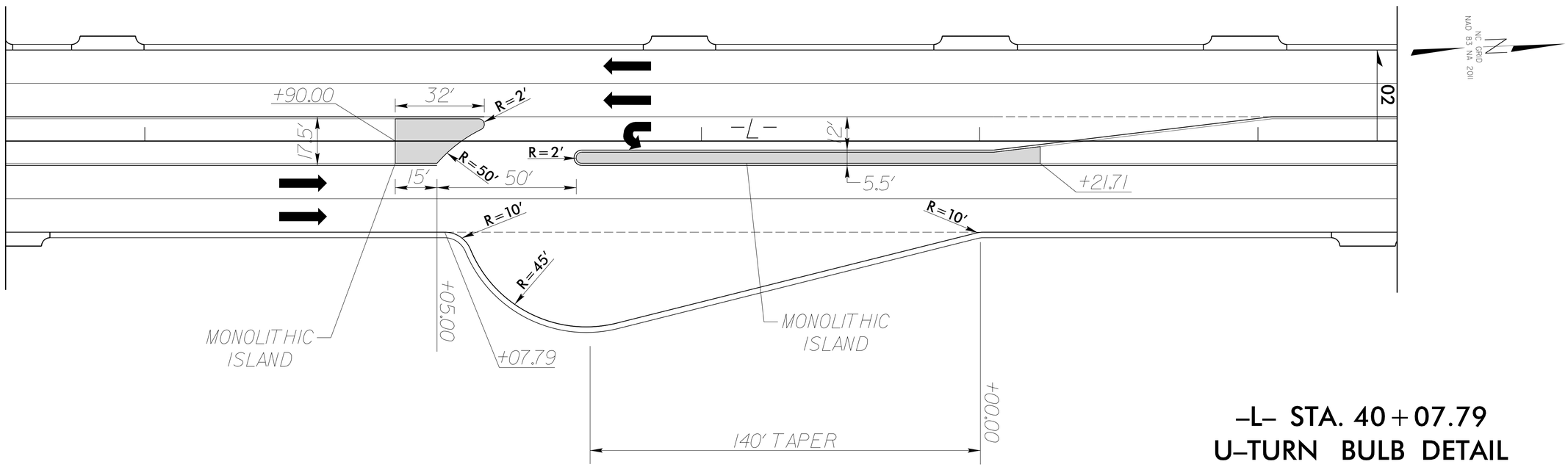
8/17/99

2' FDPS
2' FDPS
06
R=50'
+32.00
R=15'
05
R=40'
15'
02
–Y1A–
2'
+00.00
12'
01
8:1
15'
02
R=25'
+70.32
+38.63
–DRI–
04
2'
8:1
R=15'
01
R=15'
4'
R=120'
15'
15'
00
REMOVE EXISTING CURB AND PLACE PAVEMENT IN SHADED AREA
POT –Y1A– Sta. 10+00.00
03
01
02
+46.00
POT –Y1– Sta. 15+50.00
15'
POT –DRI– Sta. 11+25.00
OFFSET=10'
02
POT –Y1– Sta. 17+37.23
4'
11'
11'
R=50'
+33.79
R=42'
22'
15'
+49.15
POT –L– Sta. 18+66.47
02
R=35'
R=35'
01
R=50'
+90.00
02
04
03
02
+00.86
–Y1–
–L–
+76.32
+30.00
R=10'
R=2'
R=2'
02
R=15'
04
+10.00
+80.00
03
–DR3–
R=10'
MONOLITHIC ISLAND
+51.34
10'
10'
+99.33
–DR3– POT Sta. 10+00.00=
–L– POC Sta. 18+78.04
MONOLITHIC ISLAND
+77.18

07-AUG-2025 15:11
H:\2025\HL-00081\Design\SHEET_2B1.dgn
devonhoule

–L–/–Y2– INTERSECTION DETAIL





–L– STA. 40+07.79
U–TURN BULB DETAIL

PROJECT REFERENCE NO.	SHEET NO.
HL-00081	2B-2

ROADWAY DESIGN ENGINEER
9/8/2025

NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE

DocuSigned by: Faith E. Jahnke
8D02B3BCBFC3400...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE Nos C-5176
320 Executive Ct.
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

20 10 0 20 40

NC GRID NAD 83 NA 2011

REVISIONS

8/17/99

–L–/–Y3– INTERSECTION DETAIL

PROJECT REFERENCE NO.	SHEET NO.
HL-00081	2B-3

ROADWAY DESIGN ENGINEER
9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE
DocuSigned by: Faith E. Jahnke

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: C-5176
320 Executive Ct.
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

20 10 0 20 40

NC GRID NAD 83 NA 2011

REVISIONS 8/17/99

–Y3A– POT Sta. 10+00.00=
–Y3– POC Sta. 11+59.11

–DR2– POT Sta. 10+00.00
–L– POT Sta. 51+50.99

–Y3– POT Sta. 10+00.00=
–L– Sta. 53+59.39

07-AUG-2025 15:11
HL-00081_Rdy_DET_2B3.dgn
devonhulle

WATERLINE RELOCATION DETAIL
FOR PLAN, SEE SHEET 5

PROJECT REFERENCE NO.	SHEET NO.
HL-0008I	2B-4

Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: C-5176
320 Executive Ct.
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

20 10 0 20 40

NAD 83 NA 2011 NC GRID N

JAMES STEPHENSON
DB 4388 PG 545

JAMES STEP
WB 00-E PG
BM 1993 PG

SOUTHERN BELL TELEPHONE
DB 2909 PG 573

N 46°39'49" E 99.90'

167.47'
N 42°05'29" W

WATER LINE AND POWER BURIED IN SAME TRENCH

WOODS

POND

GAZEBO

S 87°14'46" E 176.58'

ISBLK BUS

CANOPY OVER FUEL PUMPS

FUEL PORTS

CONC

BST

RIP RAP DITCH

EXISTING R/W

18" RCP–III
TIE TO EX. WATERLINE
–L– STA. 23+55.7±
97.0'± LT

TIE TO EX. WATERLINE
–L– STA. 23+35.9±
78.3'± LT

–L– STA. 23+52.8±
75.8'± LT

A

0520

2' MIN

TYPE D 2GI

15" HDPE

END UNK

18" RCP–IV

24" RCP–IV

0526

DI

288 FO

18" HDPE

0509 CB

15" RCP–IV

15" RCP–IV

0512 CB

18" RCP–IV

CB 0515

CB 0525

24" RCP–IV

SR 1006 OLD STAGE RD

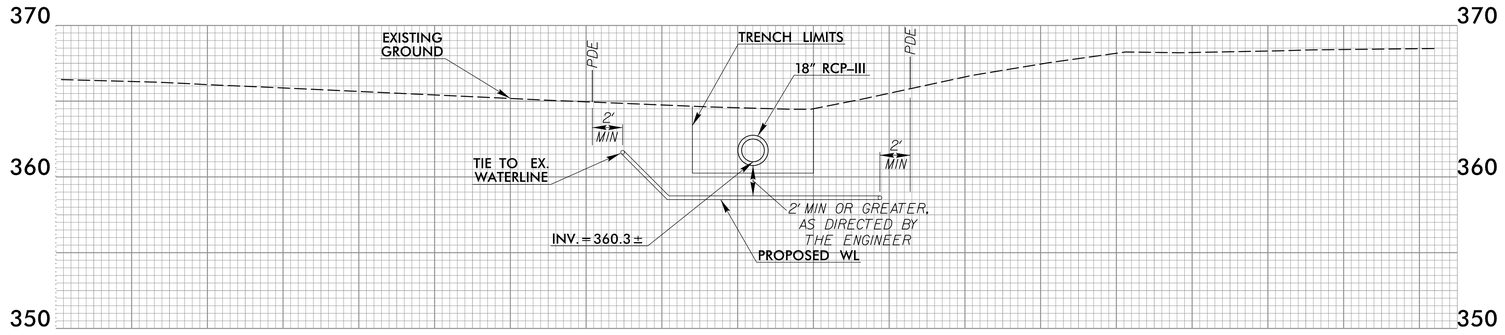
23' BST

0522
TB 2GI

N 1°39'54.6" E

18" RCP

18" HDPE

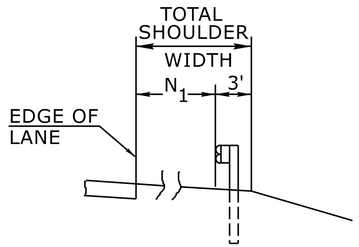


SECTION A–A

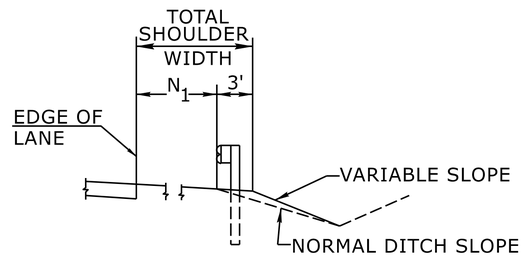
5 2.5 0 5 10

22-AUG-2025 16:37
HL-0008I_Sht_DET_284.dgn
faith.hinke

PROJECT REFERENCE NO.	SHEET NO.
HL-0008I	2C-1

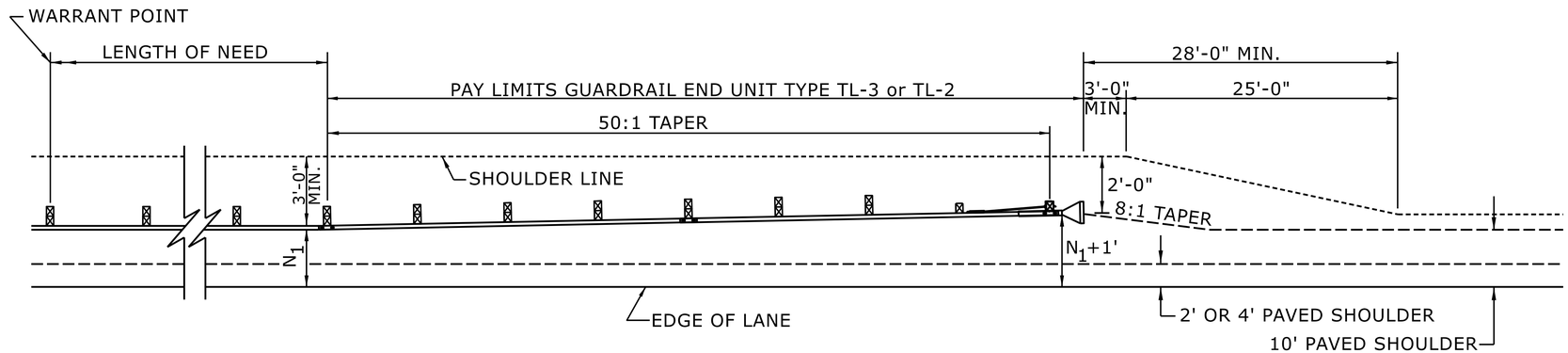


FILL SECTION



CUT SECTION

"N_1"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.



FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 6 OF 15

862D01

9/8/2025

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033144 NICOLE M. HACKLER

Signed by:
Nicole M Hackler
5884323D34164C5...

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

CONTRACTS STANDARDS
AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

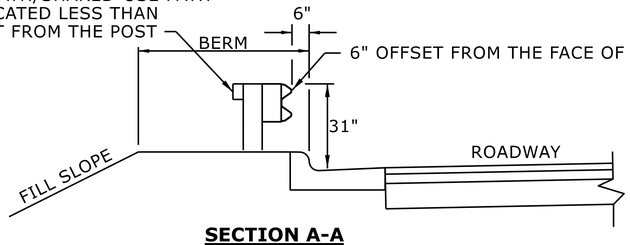
SEE TITLE BLOCK

ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

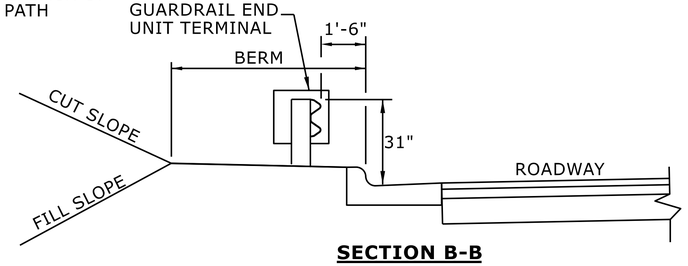
PROJECT REFERENCE NO.	SHEET NO.
HL-0008I	2C-2

PLACE APPROVED BICYCLE FRIENDLY RAILINGS, FENCE, OR RUB RAILS IF SIDEPATH/SHARED-USE PATH IS LOCATED LESS THAN 4 FEET FROM THE POST

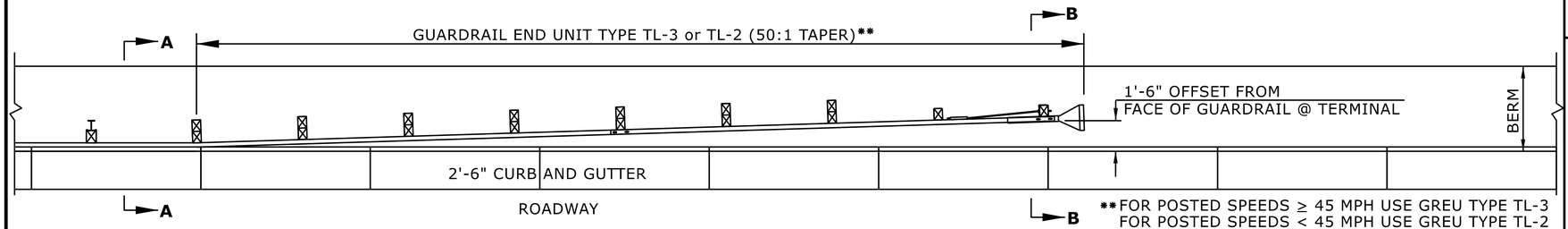
SEE THE ROADWAY DESIGN MANUAL (PART I CHAPTER 4 SECTION 4.14) FOR OFFSET DISTANCES FROM FACE OF GUARDRAIL AND BACK OF GUARDRAIL TO SIDEWALK OR SIDEPATH/SHARED-USE PATH



SECTION A-A



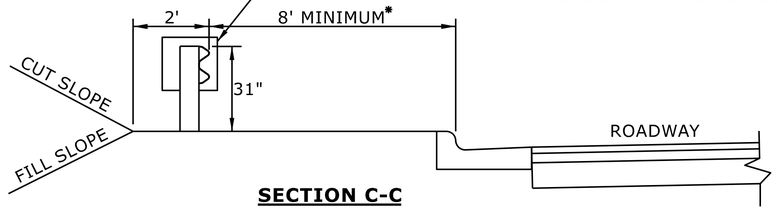
SECTION B-B



**FOR POSTED SPEEDS ≥ 45 MPH USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45 MPH USE GREU TYPE TL-2

BICYCLE FRIENDLY RAILINGS, FENCE OR RUB RAIL SHOULD NOT BE PLACED WITHIN THE LIMITS OF THE STRUCTURAL ANCHOR OR END UNITS

GUARDRAIL 6" FROM THE FACE OF CURB



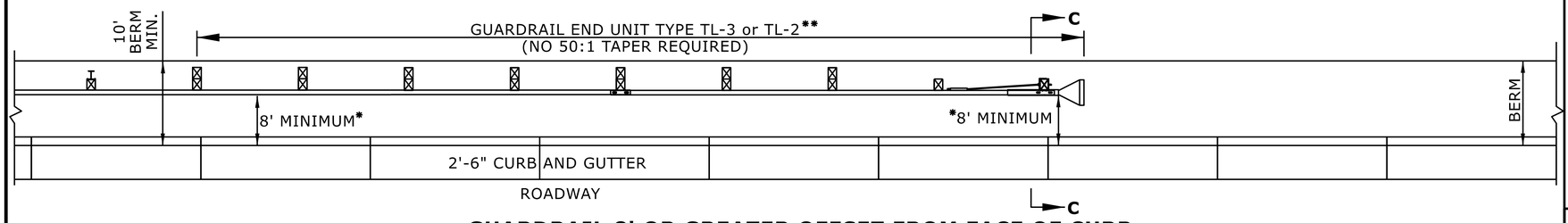
SECTION C-C

*FOR POSTED SPEED ≥ 40 MPH USE 13' MINIMUM OFFSET

SEE THE ROADWAY DESIGN MANUAL (PART I CHAPTER 4 SECTION 4.14) FOR OFFSET DISTANCES FROM FACE OF GUARDRAIL AND BACK OF GUARDRAIL TO SIDEWALK OR SIDEPATH/SHARED-USE PATH

**FOR POSTED SPEEDS ≥ 45 MPH USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45 MPH USE GREU TYPE TL-2

BICYCLE FRIENDLY RAILINGS, FENCE OR RUB RAIL SHOULD NOT BE PLACED WITHIN THE LIMITS OF THE STRUCTURAL ANCHOR OR END UNITS



GUARDRAIL 8' OR GREATER OFFSET FROM FACE OF CURB

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR

GUARDRAIL PLACEMENT

GUARDRAIL TREATMENT AT CURB AND GUTTER

SHEET 12 OF 15

862D01

9/8/2025

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033144 NICOLE M. HACKLER

Signed by:
Nicole M Hackler
588432303416405...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

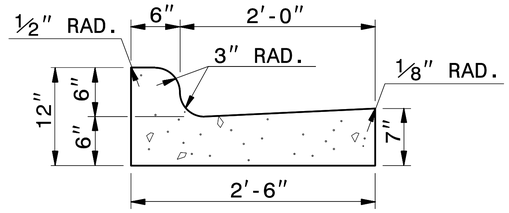
CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

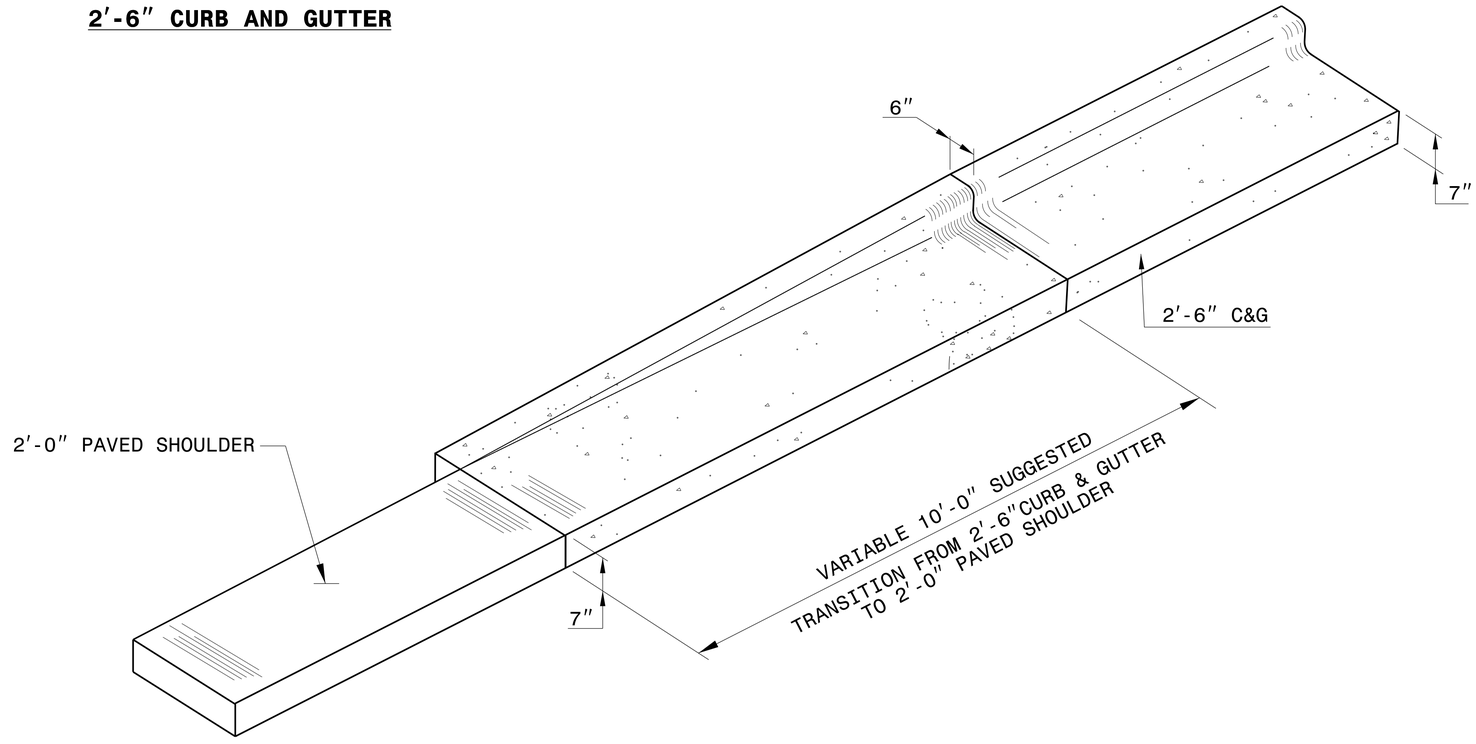
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
HL-0008I	2C-3



2'-6" CURB AND GUTTER

*NOTE: SEE STD. DWG. 846.01 FOR GENERAL NOTES



ISOMETRIC VIEW OF TRANSITION

9/8/2025

NORTH CAROLINA PROFESSIONAL SEAL 33144 ENGINEER LICENSE NOT TRANSFERABLE

Signed by:
Nicole M Hechler
5884323D34164C5...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

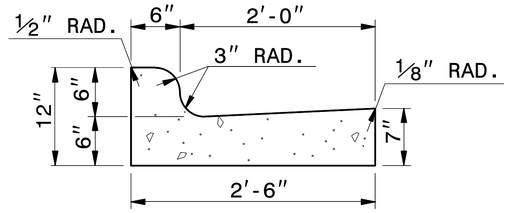
DETAIL OF 10' TRANSITION FROM 2'-6"CURB & GUTTER TO 2'-0" PAVED SHOULDER

ORIGINAL BY:_____ DATE:_____
MODIFIED BY: rnbritt DATE: 04-13-2016
CHECKED BY:_____ DATE:_____
FILE SPEC.: details/nbritt/english/misc/c&g transition sections.dgn

10-MAR-2020 14:30
S:\Contracts\Special Details\nbritt\english\misc\c&g transition sections.dgn
jhowerton
AT CSD-320965

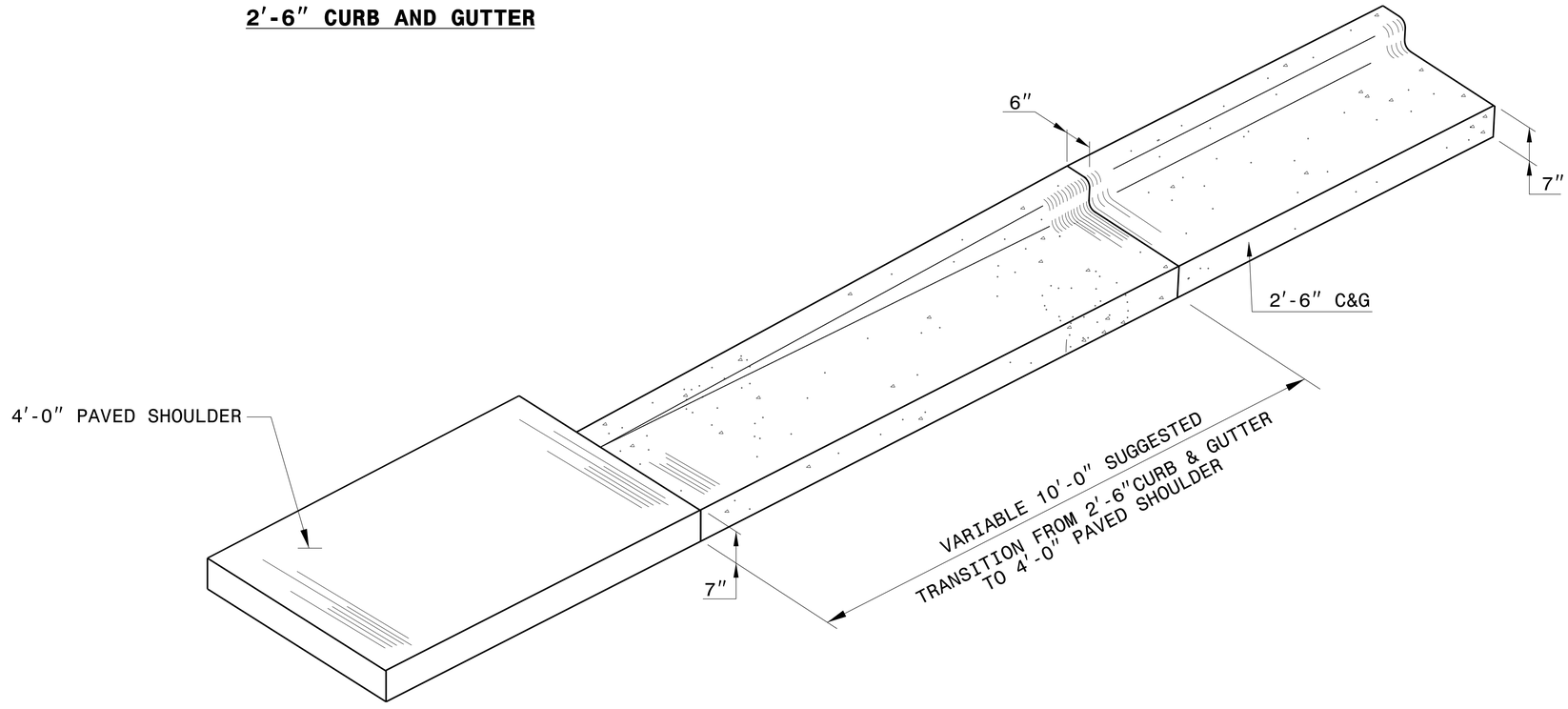
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
HL-0008I	2C-4



2'-6" CURB AND GUTTER

*NOTE: SEE STD. DWG. 846.01 FOR GENERAL NOTES



ISOMETRIC VIEW OF TRANSITION

9/8/2025

NORTH CAROLINA PROFESSIONAL SEAL 33144 ENGINEER NICOLE M HUCKLER

Signed by: Nicole M Huckler
5884323034164C5...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

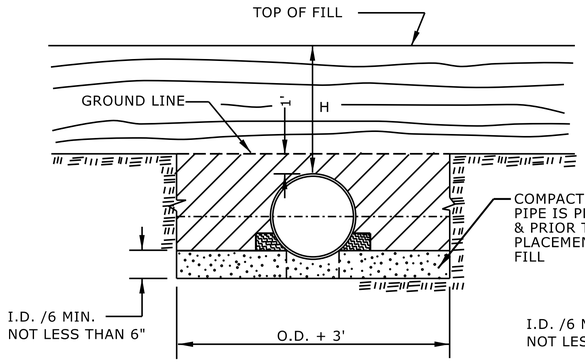
CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

DETAIL OF 10' TRANSITION FROM 2'-6"CURB & GUTTER TO 4'-0" PAVED SHOULDER

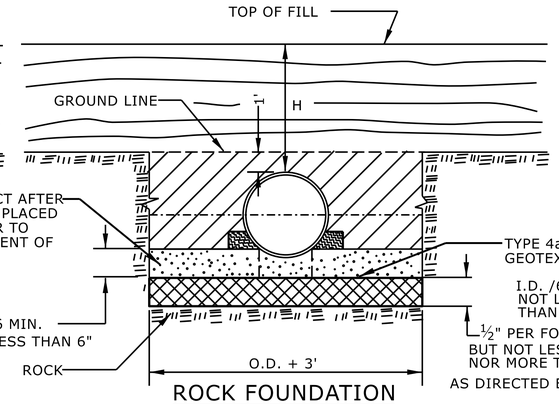
ORIGINAL BY:_____ DATE:_____
MODIFIED BY: rnbritt DATE: 04-13-2016
CHECKED BY:_____ DATE:_____
FILE SPEC.: details/nbritt/english/misc/c&g transition sections.dgn

10-MAR-2020 14:25
S:\Contracts\Special Details\nbritt\english\misc\c&g transition sections.dgn
jhowerton AT CSD-320965

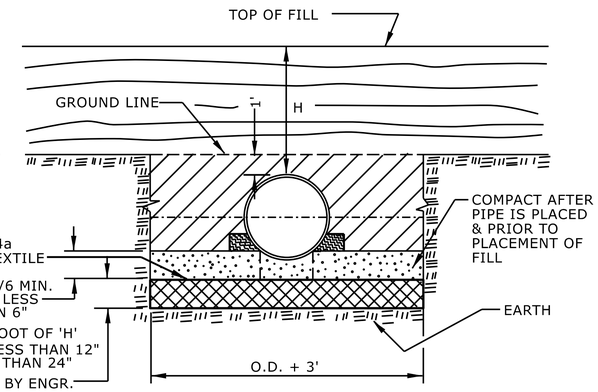
PROJECT REFERENCE NO.	SHEET NO.
HL-0008I	2C-5



NORMAL EARTH FOUNDATION

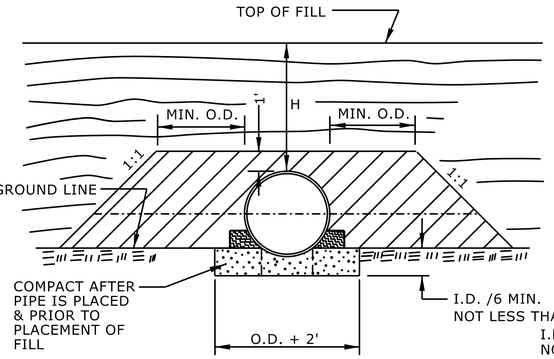


ROCK FOUNDATION

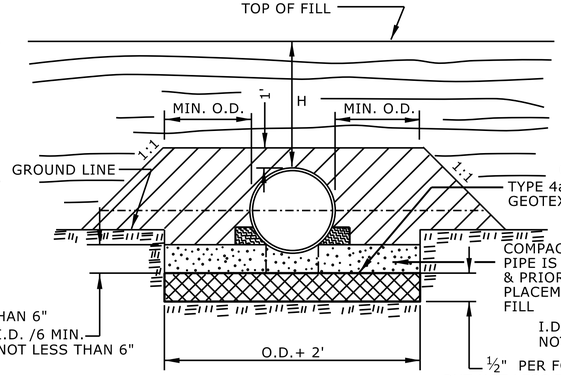


UNSUITABLE MATERIAL FOUNDATION

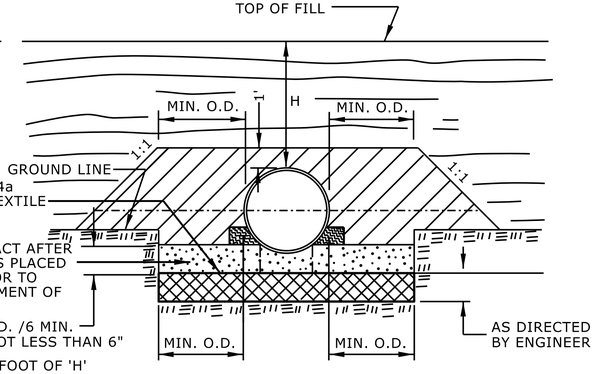
PIPE IN TRENCH



NORMAL EARTH FOUNDATION



ROCK FOUNDATION



UNSUITABLE MATERIAL FOUNDATION

PIPE ABOVE GROUND

GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

APPROVED SUITABLE LOCAL MATERIAL.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

REFER TO NCDOT PIPE MATERIAL SELECTION GUIDE AND STANDARD SPECIFICATIONS FOR ALLOWABLE PIPE FILL HEIGHTS AND PIPE SPECIFICATIONS.

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.

UNDISTURBED EARTH MATERIAL

SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH TYPE IV GEOTEXTILE AS DIRECTED BY THE ENGINEER.

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

SHEET 1 OF 2

300.01

9/8/2025

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER

Signed by: Nicole M Hackler
5884323D34164C5...

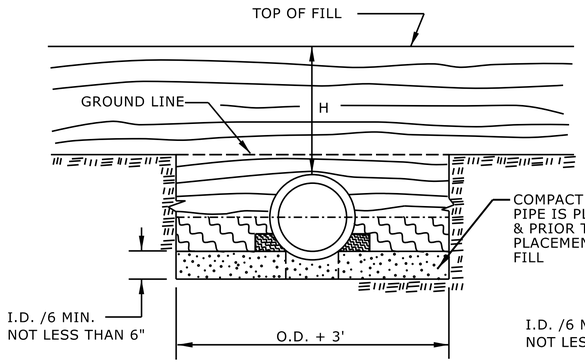
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

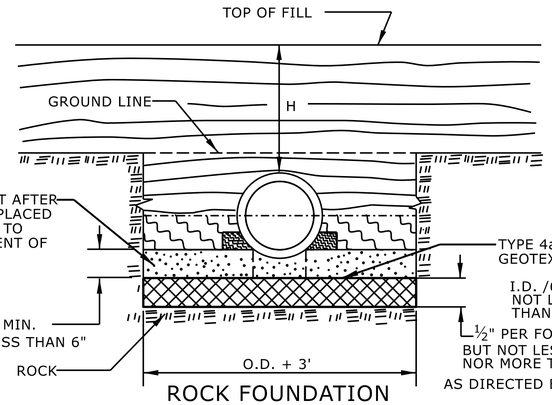
SEE TITLE BLOCK

ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

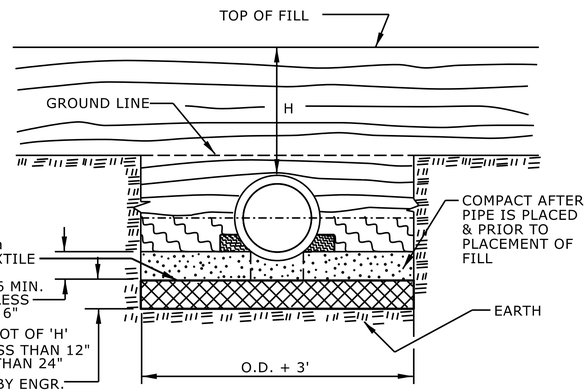
PROJECT REFERENCE NO.	SHEET NO.
HL-0008I	2C-6



NORMAL EARTH FOUNDATION

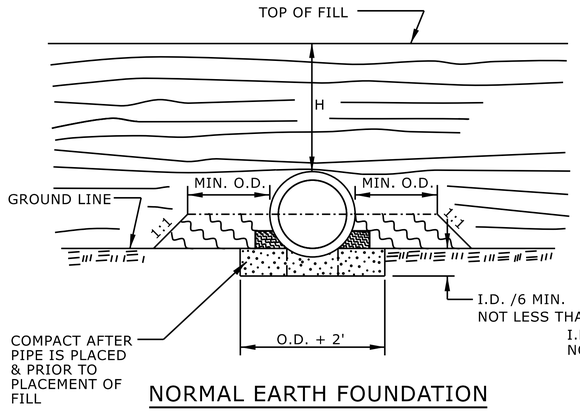


ROCK FOUNDATION

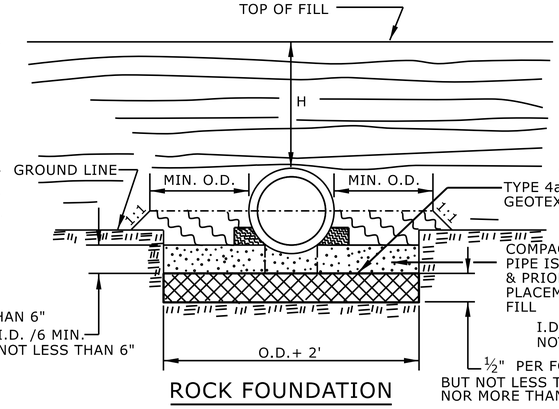


UNSUITABLE MATERIAL FOUNDATION

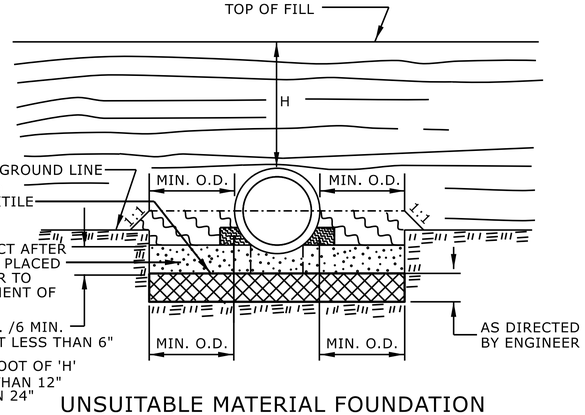
PIPE IN TRENCH



NORMAL EARTH FOUNDATION



ROCK FOUNDATION



UNSUITABLE MATERIAL FOUNDATION

PIPE ABOVE GROUND

GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

APPROVED SUITABLE LOCAL MATERIAL.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

REFER TO NCDOT PIPE MATERIAL SELECTION GUIDE AND STANDARD SPECIFICATIONS FOR ALLOWABLE PIPE FILL HEIGHTS AND PIPE SPECIFICATIONS.

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, BELOW SPRINGLINE.

UNDISTURBED EARTH MATERIAL

SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH TYPE IV GEOTEXTILE AS DIRECTED BY THE ENGINEER.

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

RIGID PIPE

SHEET 2 OF 2

300.01

9/8/2025

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER

Signed by: Nicole M Hackler
58843230341645...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

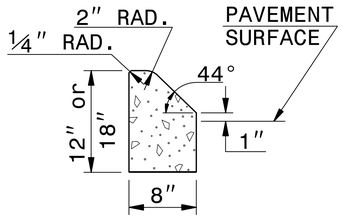
SEE TITLE BLOCK

ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

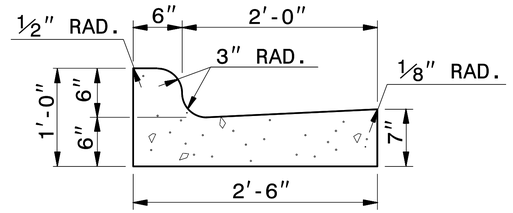
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
HL-0008I	2C-7

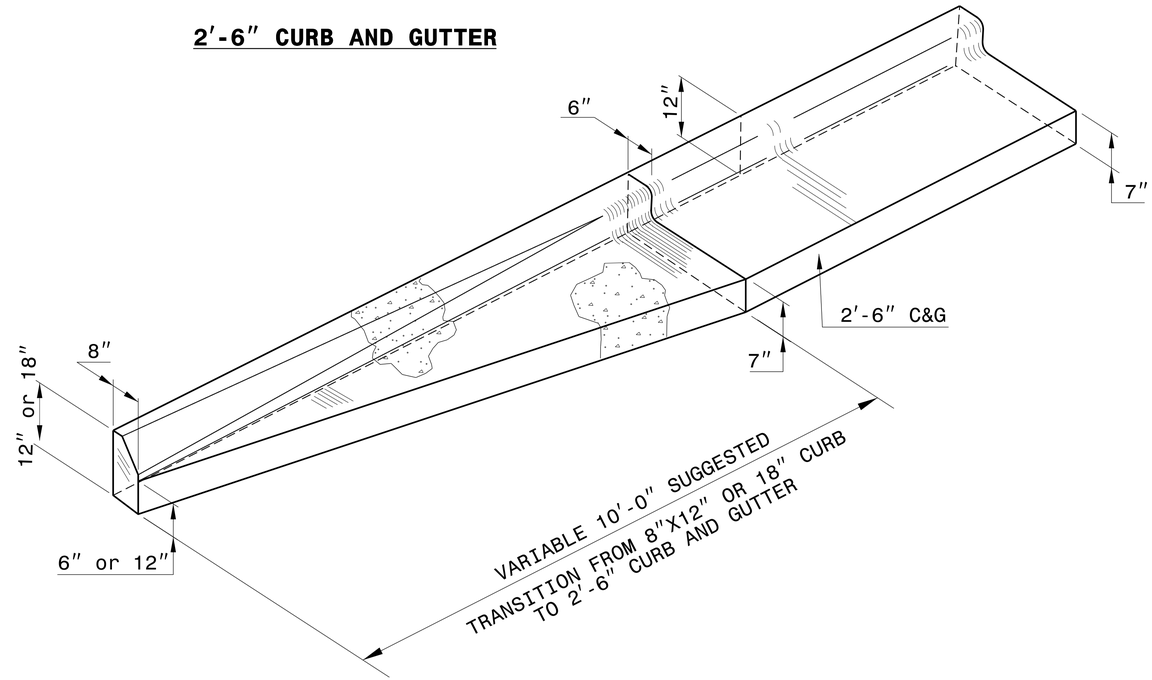
*NOTE: SEE STD. DWG. 846.01
FOR GENERAL NOTES



8" X 12" or 18" CONCRETE CURB



2'-6" CURB AND GUTTER



ISOMETRIC VIEW OF TRANSITION

9/8/2025

NORTH CAROLINA PROFESSIONAL SEAL 33144 ENGINEER NICOLE M HACKLER

Signed by:
Nicola M Hackler
588432303416 4C5...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

DETAIL OF 8"x 12"or 18" CURB TO 2'-6" CURB & GUTTER TRANSITION SECTION

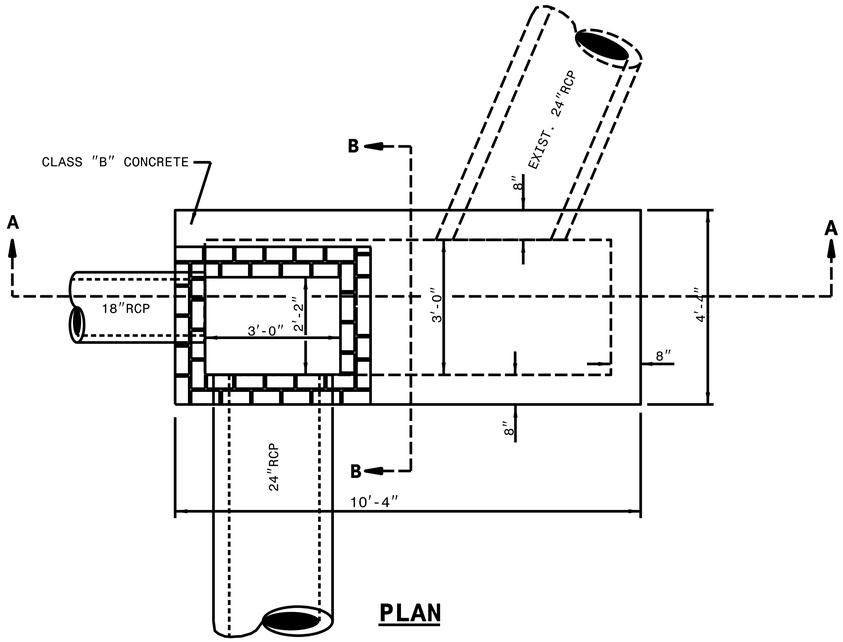
ORIGINAL BY: _____ DATE: _____
MODIFIED BY: K. KEMPF DATE: 4-05-18
CHECKED BY: _____ DATE: _____
FILE SPEC.: details/ericward/usr/details/stand/cgtransit.dgn

13-MAR-2019 09:50
$:\Contracts\Special Details\ericward\usr\details\stand\c&g transition sections.dgn
jhowerton
AT CSD-292595

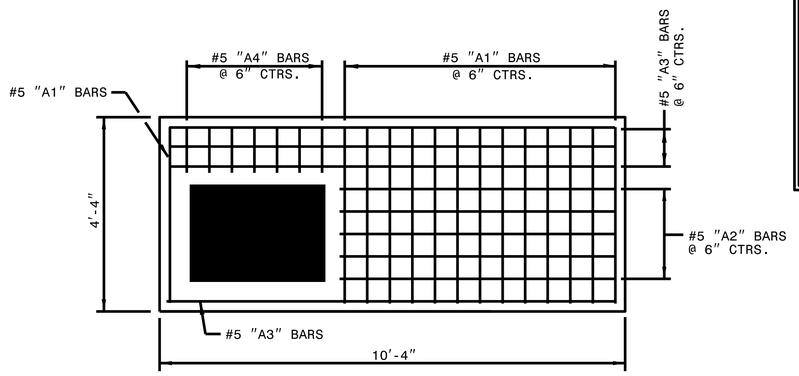
5/14/99

Structure 0515

PROJECT REFERENCE NO.	SHEET NO.
HL-0008I	2D-1



PLAN



PLAN OF TOP SLAB

GENERAL NOTES:

DRAINAGE STRUCTURE SHALL MEET REQUIREMENTS OF SECTION 840 OF THE STANDARD SPECIFICATIONS.

ALL EXPOSED CONCRETE CORNERS TO BE CHAMFERED 1"

CLASS "B" CONCRETE TO BE USED THROUGHOUT

IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE SLAB AS SHOWN ON STANDARD 840.00

STEPS, 12" ON CENTERS SHALL BE PROVIDED IN ACCORDANCE WITH STD. 840.66.

CONSTRUCT STRUCTURE BY FORMING.

REINFORCING STEEL CAN BE RELOCATED TO POSITION GRATE AND FRAME AS DIRECTED BY THE ENGINEER.

BILL OF MATERIALS

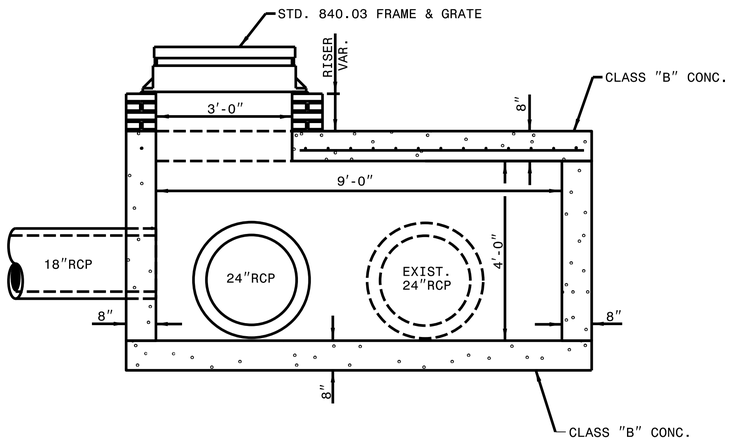
REINFORCING STEEL

CODE	BAR #	LENGTH	LBS/FT.	QTY.	LBS. ST.
A1	5	4'-0"	1.043	14	58.4
A2	5	6'-4"	1.043	5	33.0
A3	5	10'-0"	1.043	4	41.7
A4	5	1'-2"	1.043	7	8.5
			TOTAL		141.6

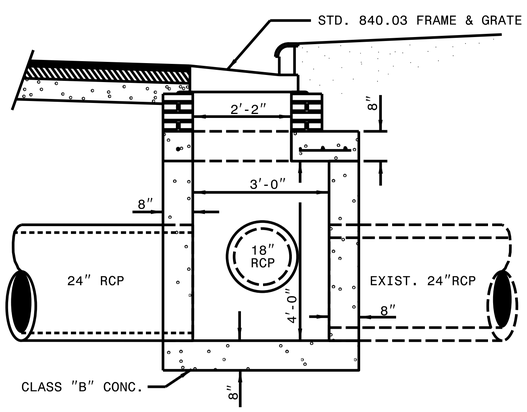
CONCRETE QUANTITIES

CLASS "B" CONCRETE = 5.03 CU. YDS.

NO DEDUCTIONS HAVE BEEN MADE FOR PIPE OPENINGS



ELEVATION A-A



ELEVATION B-B

DocuSigned by: Patrick Hartnett 9/8/2025

NORTH CAROLINA PROFESSIONAL SEAL 053755 ENGINEER PATRICK M. HARTNETT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

DETAIL OF SPECIAL CATCH BASIN

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: pmhartnett DATE: 10-31-23
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

14-MAR-2025 13:57
HL-0008I_HYD-psh_2D-1.dgn
.zoe.zwack

6/21/00

COMPUTED BY: DJH DATE: 9/27/2023
CHECKED BY: FEJ DATE: 9/27/2023

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
HL-00081	3B-1

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	GREU TL-2	GREU TL-3	M-350	XIII	CAT-1	VI MOD	BIC	AT-1	EA	G	NG				
-L-	15+50.00	18+31.25	RT	281.25'					2'	6'	50'		1'				1			1									
-L-	48+33.34	51+20.84	LT	293.75'				48+75.00	2'	6'	50'		1'				1			1									
-L-	51+54.75	52+80.78	LT	93.75'	41.00'		52+38.50		2'	6'	25'		0.5'			1				1									
			SUBTOTAL:	668.75'	41.00'																								
			(-) LESS ANCHOR DEDUCTIONS																										
			(1) GREU TL-2 @ 25.0' EA.	25'																									
			(2) GREU TL-3 @ 50' EA.	100'																									
			(3) CAT-1 @ 6.25' EA.	18.75'																									
			PROJECT TOTALS:	525.00'	41.00'											1	2			3									
			5 ADDITIONAL GUARDRAIL POSTS																										

SUMMARY OF EARTHWORK
IN CUBIC YARDS

DRAINAGE DITCH EXCAVATION = 21.6 C.Y
ESTIMATED UNDERCUT EXCAVATION = 900 C.Y.
ESTIMATED SHALLOW UNDERCUT = 100 C.Y.

NOTE: APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE LUMP SUM PRICE FOR "GRADING".

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
LT -L- STA. 12+50.00 TO 18+50.00	848		49		799
RT -L- STA. 12+50.00 TO 53+00.00	2,561		5,370	2,809	
-Y1- STA. 11+00.00 TO 17+00.00	1,456		224		1,232
-DR1- STA. 10+25.00 TO 11+00.00	96				96
SUBTOTAL:	4,961		5,644	2,809	2,126
LT -L- STA. 19+50.00 TO 48+50.00	332		7,071	6,739	
-Y1A- STA. 10+50.00 TO 12+25.00	107		43		64
-Y2- STA. 13+00.00 TO 14+50.00	100		122	22	
-Y3- STA. 10+50.00 TO 12+00.00	17		436	419	
-Y3A- STA. 13+00.00 TO 14+50.00	100		151	51	
-DR2- STA. 10+25.00 TO 11+70.00					
SUBTOTAL:	656		7,824	7,232	64
MED -L- STA. 21+50.00 TO 53+00.00	276		4,057	3,781	
SUBTOTAL:	276		4,057	3,781	
SHEET TOTALS	5,893		17,525	13,822	2,190
LOSS DUE TO CLEARING AND GRUBBING	-50			50	
MATERIAL FOR SHOULDER CONSTRUCTION			1,104	1,104	
EARTH WASTE IN LIEU OF BORROW				-2,190	-2,190
PROJECT TOTALS	5,843		18,629	12,786	
5% TO REPLACE TOP SOIL				639	
GRAND TOTALS	5,843			13,425	
SAY	5,850			13,430	

ESTIMATED 1,100 CY OF UNCLASSIFIED EXCAVATION PER GEOTECH RECOMMENDATION ACCEPTABLE BUT NOT TO BE USED IN THE TOP 3 FT OF EMBANKMENT OR BACKFILL, -L- STA 25+75 TO 27+75.
SELECT GRANULAR MATERIAL (CONTINGENCY) = 800 CY (PER GEOTECH RECOMMENDATION - 6/19/24)

SUMMARY OF ASPHALT PAVEMENT REMOVAL

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
-L-	19+50	21+41	LT	469.48
-L-	22+01	24+30	LT	5.41
-L-	27+57	28+19	LT	2.51
-L-	45+52	46+86	LT	16.56
-L-	44+48	52+92	CL	1,622.57
-Y1-	12+78	15+62	LT	489.59
-Y2-	14+00	14+29	RT	3.30
-Y2-	14+10	14+55	LT	14.77
-Y3-	10+48	12+14	LT	306.50
			TOTAL:	2,930.70
			SAY:	2940

8"x18" CURB SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	LF
-L-	-Y1A- 12+10.00	21+49.15	LT	170
			TOTAL:	170
			SAY:	170

MILLING VARIABLE DEPTH

SURVEY LINE	STATION	STATION	SF/SY
-L-	10+75.00	10+80.00	111.67
-L-	12+65.00	13+80.00	2,522.80
-L-	15+60.00	17+90.00	5,335.14
-L-	31+90.00	32+90.00	2,302.80
-L-	52+70.00	53+39.00	5,455.04
		TOTAL(SF):	15,727.45
		TOTAL(SY):	1,747.49
		SAY(SY):	1,750

03-SEP-2025 09:13
H:\2020\HL-00081\Design\Roadway\Sheets\HL-00081_3B-1.dgn

CIVILLAP122021D

COMPUTED BY:	DJH	DATE:	08/05/2025
CHECKED BY:	PMH	DATE:	08/05/2025

PROJECT NO.	SHEET NO.
HL-0008I	3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

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

LINE & STATION SIZE THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE)									R. C. PIPE CLASS III									R. C. PIPE CLASS IV								
								12	15	18	24	30	36	42	48	54	12	15	18	24	30	36	42	48	54	12	15	18	24	30	36	42	48	54
L 14+98	48 RT	0402		368.6																														
		0402	0401		364.7	364.5																							36					
L 15+50	34 RT	0403		369.3																														
		0403	0402		365.0	364.7																							52					
L 15+89	35 RT	0501		369.0																														
		0501	0403		365.2	365.0																							40					
L 15+89	23 LT	0502		369.3																														
		0502	0501		365.5	365.2																							56					
L 15+89	35 LT	0503		372.1																														
		0503	0502		367.8	365.5																							16					
L 16+84	6 LT	0504		369.6																														
		0504	0505		366.6	365.8																						40							
L 16+84	35 RT	0505		369.0																														
		0505	0501		365.8	365.3																						92							
L 18+55	35 RT	0506		370.3																														
		0506	0505		366.7	365.8																						168							
L 18+99	69 RT	0507		370.0																														
		0507	0506		366.9	366.7																						52							
L 19+74	51 LT	0508		374.8																														
		0508	0509		372.5	369.7																						160							
L 21+26	35 LT	0509		373.6																														
		0509	0512		369.7	365.5																						216							
L 21+26	4 LT	0510		373.1																														
		0510	0509		369.9	369.7																						32							
L 23+00	35 RT	0511		368.9																														
		0511	0514		365.5	362.5																						96							
L 23+43	35 LT	0512		368.5																														
		0512	0520		361.5	360.4																							28						
L 23+96	56 RT	0513		367.5																														
		0513	0514		362.5	362.3																								24					
L 23+96	35 RT	0514		370.3																														
		0514	0515		362.3	361.3																								68					
L 23+96	35 LT	0515		368.3																														
L 25+60	35 RT	0517		370.0																														
		0517	0514		366.6	362.3																							164						
L 15+89	55 RT	0518		368.6																														
		0518	0501		366.6	365.8		20																										
L 19+12	5 RT	0519		372.1																														
		0519	0506		367.7	366.7																						60							
L 23+43	62 LT	0520		362.9																														
		0520	0521		360.4	359.3														152														
L 25+75	4 LT	0522		370.8																														
		0522	0517		367.8	366.6																						40							
L 25+11	35 LT	0525		369.1																														
		0525	0526		363.2	362.1	0.3																						12					
L 25+10	47 LT	0526		366.4																														
L 27+00	35 RT	0601		374.2																														
		0601	0517		370.9	366.6																							140						
L 28+00	35 LT	0602		377.8																														
		0602	0525		374.0	363.2																								288					
SHEET TOTALS								20											152								956	332	592					

LINE & STATION	OFFSET	FROM	TO	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05
L 14+98	48 RT	0402					1									
		0402	0401													
L 15+50	34 RT	0403					1			1		1				
		0403	0402													
L 15+89	35 RT	0501					1			1	1					
		0501	0403													
L 15+89	23 LT	0502					1			1	1					
		0502	0501													
L 15+89	35 LT	0503														
		0503	0502													
L 16+84	6 LT	0504					1								1	
		0504	0505													
L 16+84	35 RT	0505					1			1			1			
		0505	0501													
L 18+55	35 RT	0506					1			1			1			
		0506	0505													
L 18+99	69 RT	0507					1			1	1					
		0507	0506													
L 19+74	51 LT	0508					1									
		0508	0509													
L 21+26	35 LT	0509					1			1			1			
		0509	0512													
L 21+26	4 LT	0510					1								1	
		0510	0509													
L 23+00	35 RT	0511					1			1		1				
		0511	0514													
L 23+43	35 LT	0512					1	2.0		1			1			
		0512	0520													
L 23+96	56 RT	0513														
		0513	0514													
L 23+96	35 RT	0514					1	3.0		1	1					
		0514	0515													
L 23+96	35 LT	0515					1	4.7								
L 25+60	35 RT	0517					1			1			1			
		0517	0514													
L 15+89	55 RT	0518														
		0518	0501													
L 19+12	5 RT	0519					1								1	
		0519	0506													
L 23+43	62 LT	0520					1									
		0520	0521													
L 25+75	4 LT	0522					1								1	
		0522	0517													
L 25+11	35 LT	0525					1	1.0		1		1				
		0525	0526													
L 25+10	47 LT	0526					1									
L 27+00	35 RT	0601					1			1			1			
		0601	0517													
L 28+00	35 LT	0602					1			1		1				
		0602	0525													
SHEET TOTALS							23	10.7		14	4	4	6		4	

LINE & STATION	OFFSET	FROM	TO	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING C.B. TO D.I.	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO D.I.	ADJUST C.B.	ADJUST D.I.	SPECIAL DETAIL CATCH BASIN	MODIFIED CONC. FLUME	PREFORMED SCOUR HOLE (PER EACH)	ENERGY DISSIPATION BASIN	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
L 14+98	48 RT	0402				1	1																																					
		0402	0401																																									
L 15+50	34 RT	0403																																										
		0403	0402																																									
L 15+89	35 RT	0501																																										
		0501	0403																																									
L 15+89	23 LT	0502																																										
		0502	0501																																									
L 15+89	35 LT	0503																																										
		0503	0502																																									
L 16+84	6 LT	0504																1						1																				
		0504	0505																																									
L 16+84	35 RT	0505																																										
		0505	0501																																									
L 18+55	35 RT	0506																																										
		0506	0505																																									
L 18+99	69 RT	0507																																										
		0507	0506																																									
L 19+74	51 LT	0508				1	1																																					
		0508	0509																																									
L 21+26	35 LT	0509																																										
		0509	0512																																									
L 21+26	4 LT	0510																1						1																				
		0510	0509																																									
L 23+00	35 RT	0511																																										
		0511	0514																																									
L 23+43	35 LT	0512																																										
		0512	0520																																									
L 23+96	56 RT	0513																																										
		0513	0514																																									
L 23+96	35 RT	0514																																										
		0514	0515																																									
L 23+96	35 LT	0515																																		1								See Sheet 2D-1
L 25+60	35 RT	0517																																										
		0517	0514																																									
L 15+89	55 RT	0518																																										
		0518	0501																																									
L 19+12	5 RT	0519																1						1																				
		0519	0506																																									
L 23+43	62 LT	0520								1						1																												
		0520	0521																																									
L 25+75	4 LT	0522																1						1																				
		0522	0517																																									
L 25+11	35 LT	0525																																										
		0525	0526																																									
L 25+10	47 LT	0526				1	1																																					
L 27+00	35 RT	0601																																										
		0601	0517																																									
L 28+00	35 LT	0602																																										
		0602	0525																																									
SHEET TOTALS						3	3			1						1		4						4												1								

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

CIVILLAP122021D

COMPUTED BY:	DJH	DATE:	08/05/2025
CHECKED BY:	PMH	DATE:	08/05/2025

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
HL-0008I	3D-2

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

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

LINE & STATION	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	R. C. PIPE CLASS IV 15	R. C. PIPE CLASS IV 18	R. C. PIPE CLASS IV 24	R. C. PIPE CLASS IV 30	QUANTITIES FOR DRAINAGE STRUCTURES 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	GRATE TYPE E	F	G	REMARKS
Y2 13+95	15	RT	0603		379.7								1			1	1			
			0603	0602		376.7	374.5		72											
Y2 13+95	17	LT	0604		379.9								1			1	1			
			0604	0603		376.9	376.7		32											
L 29+34	35	LT	0605		381.8								1	0.3		1		1		
			0605	0602		376.5	374.0				132									
L 29+34	62	LT	0606		381.9															
			0606	0605		377.9	376.5				28									
L 29+65	35	RT	0607		382.5								1			1			1	
			0607	0601		379.5	371.2		264											
L 32+15	35	LT	0608		384.3								1			1		1		
			0608	0605		381.0	376.5		280											
L 32+15	35	RT	0609		384.3								1			1			1	
			0609	0607		381.0	379.5		248											
L 33+60	35	LT	0610		384.7								1			1		1		
			0610	0614		381.7	378.9		140											
L 33+60	35	RT	0611		384.7								1			1			1	
			0611	0613		381.7	379.8		140											
L 35+00	35	RT	0613		385.2								1	1.6		1			1	
			0613	0612		378.6	378.0	0.4				20								
L 35+00	35	LT	0614		385.2								1	1.2		1		1		
			0614	0613		378.9	378.6					68								
L 36+00	35	RT	0615		385.5								1			1			1	
			0615	0613		382.0	379.6			100										
L 36+45	35	LT	0616		385.6								1	0.9		1		1		
			0616	0614		379.7	378.9					144								
L 36+58	50	LT	0617		383.0															
			0617	0616		379.8	379.7					20								
L 37+15	35	RT	0618		385.8								1			1			1	
			0618	0615		382.6	382.0			116										
L 37+80	35	LT	0619		386.2								1			1		1		
			0619	0616		383.2	380.9		136											
L 37+90	35	RT	0620		386.3								1			1		1		
			0620	0618		383.3	382.8		76											
L 40+06	35	RT	0621		389.6								1			1			1	
			0621	0620		385.9	383.3		216											
L 40+30	35	LT	0622		389.9								1			1		1		
			0622	0619		386.9	383.2		248											
Y2 12+47	22	RT	0624		380.0															
			0624	0603		378.0	376.7		148											
L 40+29	58	RT	0625		389.5								1			1	1			
			0625	0621		386.2	385.9		32											
L 40+63	69	RT	0701		389.6								1			1			1	
			0701	0625		386.5	386.2		32											
L 42+30	35	LT	0702		393.2								1			1		1		
			0702	0622		390.2	386.9		200											
L 42+03	35	RT	0703		392.8								1			1		1		
			0703	0701		389.8	386.5		144											
L 44+92	35	LT	0704		398.3								1			1		1		
			0704	0702		394.8	390.2		260											
							SHEET TOTALS		2668	216	160	252	22	4.0		22	3	11	8	

Other columns printed on the sheet. They have no entries:

SIZE / THICKNESS OR GAUGE	Drainage Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE) 12, 15, 18, 24, 30, 36, 42, 48, 54	R. C. PIPE CLASS III 12, 15, 18, 24, 30, 36, 42, 48, 54	R. C. PIPE CLASS IV 12, 36, 42, 48, 54	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	FRAME, GRATES, AND HOOD STD. 840.03	CONCRETE TRANSITIONAL SECTION: D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING C.B. TO D.I.	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO D.I.	ADJUST C.B.	ADJUST D.I.	SPECIAL DETAIL CATCH BASIN	MODIFIED CONC. FLUME	PREFORMED SCOUR HOLE (PER EACH)	ENERGY DISSIPATION BASIN	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.

NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

CIVILLAP122021D

COMPUTED BY:	DJH	DATE:	08/05/2025
CHECKED BY:	PMH	DATE:	08/05/2025

PROJECT NO.	SHEET NO.
HL-0008I	3D-3

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

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

| LINE & STATION | OFFSET | | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Drainage Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE) SIZE 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | R. C. PIPE CLASS III SIZE 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | R. C. PIPE CLASS IV SIZE 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY | REINFORCED ENDWALLS CY | DRAINAGE STRUCTURE MASONRY CY | QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) 0' THRU 5' EACH | A 5' THRU 10' LIN. FT. | B 10' AND ABOVE LIN. FT. | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E | F | G | CONCRETE TRANSITIONAL SECTION D.I. STD. 852.06 OR STD. 852.04 | C.B. STD. 852.05 | OPEN THROAT C.B. STD. 840.04 OR STD. 840.05 | CONCRETE BRIDGE APPROACH D.I. STD. 840.13 | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATES STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24 | G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24 | G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29 | G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29 | DRIVEWAY D.I. STD. 840.30 | FRAME W/ GRATE FOR DRIVEWAY STD. 840.30 | J.B. STD. 840.31 OR STD. 840.32 | ANGLED VANE GRATES AND FRAMES STD. 840.33 | T.B.J.B. STD. 840.34 | T.B.D.I. STD. 840.35 | T.B.D.I. FOR STEEL GRATES STD. 840.36 | STEEL FRAME WITH TWO GRATES STD. 840.37 | TEMP STEEL PLATE COVER MASONRY DRAINAGE | M.H. STD. 840.51, STD. 840.52, OR STD. 840.53 | M.H. FRAME AND COVER STD. 840.54 | CONVERT EXISTING C.B. TO J.B. | CONVERT EXISTING C.B. TO D.I. | CONVERT EXISTING D.I. TO J.B. | CONVERT EXISTING J.B. TO D.I. | ADJUST C.B. | ADJUST D.I. | SPECIAL DETAIL CATCH BASIN | MODIFIED CONC. FLUME | PREFORMED SCOUR HOLE (PER EACH) | ENERGY DISSIPATION BASIN | FLOWABLE FILL CY | CONCRETE COLLARS CL. "B" STD. 840.72 CY | CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---|---

CIVILLAP122021D

COMPUTED BY:	DJH	DATE:	08/05/2025
CHECKED BY:	PMH	DATE:	08/05/2025

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
HL-0008I	3D-4

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

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

Line & Station / Size / Thickness or Gauge	Offset		Structure Number From	To	Top Elevation (FT.)	Invert Elevation (FT.)	Invert Elevation (FT.)	Minimum Required Slope (%)	Drainage Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE) 12	15	18	24	30	36	42	48	54	R. C. Pipe Class III 12	15	18	24	30	36	42	48	54	R. C. Pipe Class IV 12	15	18	24	30	36	42	48	54	Pipe Removal (LIN. FT.)	Remarks
L 36+51	16	LT	0000																																	53	
L 36+24	41	LT	0000																																	40	
L 36+44	4	LT	0000																																	28	
L 37+64	38	LT	0000																																	19	
L 38+07	6	LT	0000																																	24	
L 38+40	38	LT	0000																																	19	
L 38+47	6	LT	0000																																	32	
L 38+86	38	LT	0000																																	20	
L 40+93	38	LT	0000																																	19	
L 42+00	39	LT	0000																																	26	
L 42+90	39	LT	0000																																	34	
L 49+60	44	LT	0000																																	20	
L 52+68	2	RT	0000																																	119	
L 52+77	101	LT	0000																																	84	
Y3A 10+20	1	LT	0000																																	50	
Y2 13+29	22	RT	0000																																	161	
Y2 14+27	33	RT	0000																																	40	
L 11+96	23	LT	0404							28																											
L 13+17	27	LT	0405							40																											
L 13+49	26	RT	0528							28																											
L 21+89	57	RT	0529							24																											
L 22+22	60	RT	0530							24																											
L 24+83	66	RT	0531							24																											
L 34+67	52	LT	0626							20																											
L 35+41	56	LT	0627							24																											
L 35+26	73	RT	0628							32																											
L 36+24	62	LT	0629							16																											
L 36+44	65	RT	0630							24																											
L 37+63	63	LT	0631							16																											
L 38+10	59	RT	0632							20																											
L 38+42	66	LT	0634							12																											
L 38+86	63	LT	0635							12																											
L 40+92	53	LT	0721							24																											
L 41+97	52	LT	0722							20																											
L 42+96	54	LT	0723							24																											
L 49+61	61	RT	0724							16																											
Y3A 10+50	1	RT	0725																												52								
			0515	0512		362.0	361.0																						52								
																																					Overflow pipe

Column	SHEET TOTALS	PROJECT TOTALS
Drainage Pipe 12		20
Drainage Pipe 15	428	428
Drainage Pipe 18		
Drainage Pipe 24		
Drainage Pipe 30		
Drainage Pipe 36		
Drainage Pipe 42		
Drainage Pipe 48		
Drainage Pipe 54		
R. C. Pipe Class III 12		
R. C. Pipe Class III 15		712
R. C. Pipe Class III 18		456
R. C. Pipe Class III 24		132
R. C. Pipe Class III 30		
R. C. Pipe Class III 36		
R. C. Pipe Class III 42		
R. C. Pipe Class III 48		
R. C. Pipe Class III 54		
R. C. Pipe Class IV 12		
R. C. Pipe Class IV 15		3912
R. C. Pipe Class IV 18	104	652
R. C. Pipe Class IV 24		752
R. C. Pipe Class IV 30		252
R. C. Pipe Class IV 36		
R. C. Pipe Class IV 42		
R. C. Pipe Class IV 48		
R. C. Pipe Class IV 54		
Endwalls Std. 838.01 or Std. 838.11 (unless noted otherwise) (CY)		
Reinforced Endwalls (CY)		
Drainage Structure Masonry (CY)		
Quantities for Drainage Structures (Note: Total Lin. Ft. for pay quantity shall be A + (1.3 X B)) — 0' thru 5' (EACH)		60
A: 5' thru 10' (LIN. FT.) / B: 10' and above (LIN. FT.)		30.7
C.B. Std. 840.01 or Std. 840.02		45
Frame, Grates, and Hood Std. 840.03 — Grate Type E		9
Frame, Grates, and Hood Std. 840.03 — Grate Type F		18
Frame, Grates, and Hood Std. 840.03 — Grate Type G		18
Frame, Grates, and Hood Std. 840.03 — (unlabelled column)		
Concrete Transitional Section — D.I. Std. 852.04 or Std. 852.06		9
Concrete Transitional Section — C.B. Std. 852.05		
Open Throat C.B. Std. 840.04 or Std. 840.05		
Concrete Bridge Approach D.I. Std. 840.13		
D.I. Std. 840.14 or Std. 840.15		3
D.I. Frame and Grates Std. 840.16		3
G.D.I. Type "A" Std. 840.17 or Std. 840.26		
G.D.I. Type "B" Std. 840.18 or Std. 840.27		
G.D.I. Type "D" Std. 840.19 or Std. 840.28		1
G.D.I. (W.S. Flat) Frame with Grate Std. 840.20		
G.D.I. (W.S. Flat) Frame w/ 2 Grates Std. 840.20		
G.D.I. (W.S. Sag) Frame w/ Grate Std. 840.22		
G.D.I. (W.S. Sag) Frame w/ 2 Grates Std. 840.22		
G.D.I. (N.S. Sag) Frame w/ Grate Std. 840.24		
G.D.I. (N.S. Sag) Frame w/ 2 Grates Std. 840.24		1
G.D.I. (N.S. Flat) Frame w/ Grate Std. 840.29		
G.D.I. (N.S. Flat) Frame w/ 2 Grates Std. 840.29		9
Driveway D.I. Std. 840.30		
Frame w/ Grate for Driveway Std. 840.30		
J.B. Std. 840.31 or Std. 840.32		1
Angled Vane Grates and Frames Std. 840.33		
T.B.J.B. Std. 840.34		
T.B.D.I. Std. 840.35		9
T.B.D.I. for Steel Grates Std. 840.36		
Steel Frame with Two Grates Std. 840.37		
Temp Steel Plate Cover Masonry Drainage		
M.H. Std. 840.51, Std. 840.52, or Std. 840.53		
M.H. Frame and Cover Std. 840.54		1
Convert Existing C.B. to J.B.		
Convert Existing C.B. to D.I.		
Convert Existing D.I. to J.B.		
Convert Existing J.B. to D.I.		
Adjust C.B.		
Adjust D.I.		
Special Detail Catch Basin		1
Modified Conc. Flume		
Preformed Scour Hole (per each)		
Energy Dissipation Basin		
Flowable Fill (CY)		
Concrete Collars Cl. "B" Std. 840.72 (CY)		
Concrete and Brick Pipe Plug Std. 840.71 (CY)		
Pipe Removal (LIN. FT.)	788	1890

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

COMPUTED BY: HDP DATE: 7/9/2024
CHECKED BY: MBL DATE: 7/9/2024

(2-3-23)

PROJECT NO.	SHEET NO.
HL-0008I	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	300
				TOTAL LF:	300

*UD = Underdrain
*BD = Blind Drain
*SD = Subsurface Drain

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					100	200	300		200
				TOTAL CY/TONS/SY:	100	200**	300**	0	200

*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.

SUMMARY OF ROCK PLATING

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
-L-	1.5:1	49+25	1.5:1	53+00	LT	1		700
							TOTAL SY:	700

*Use Class 1, 2 or B riprap if riprap class is not shown for rock plating location.

PROJ. REFERENCE NO.	SHEET NO.
HL-0008I	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4	MICHAEL BALL
2	4,5	CATHERINE RACKLEY
3	5	WILLIAM & CATHERINE RACKLEY
4	4,5	ANNETTE ATKINSON
5	5	TIMOTHY & ROBERT BRYAN
6	5	SOUTHERN BELL TELEPHONE
7	5	JAMES STEPHENSON
8	5,6	JAMES STEPHENSON
9	6	DURWOOD BALL
10	6	DURWOOD BALL
11	6	PEGGY ARNOLD
12	6	PEGGY ARNOLD
13	6	MARR LIMITED PARTNERSHIP OF NC
14	6	JAMES GODWIN
15	6,7	JAMES & PHYLLIS GODWIN
16	7	JAMES GODWIN
17	7	JAMES GODWIN
18	7	JUDSON WALTON JR.
19	7	JOHN & AMY BYNUM
20	7	KATHRYN FAIRWEATHER, ET ALS
21	4	DAVID BALL
22	4,5	MARION WEST, SR. & MARY WEST
23	5	WONDER DAISY, LLC
24	5	50' JOINT DRIVEWAY & UTILITY EASEMENT
25	5	JOHNNY BYNUM JR. & AMY BYNUM
26	5	VERONICA NAVARRO
27	5	FORREST & MARSHA BALL
28	5,6	FORREST & MARSHA BALL
29	6	MARION WEST, JR. & DONNA WEST
30	6	MARY T BALL PROPERTIES LLC
31	6	MARY BALL
32	6	LEE & CAROLINE WILLIS
33	6	JAMES, JR. & DAVILENE KING
34	6,7	MARY T BALL PROPERTIES LLC
35	7	NCDOT
36	7	TRIANGLE BAPTIST CHURCH OF RALEIGH
37	7	MICHAEL FERRELL

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
HL-00081	4

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
9/8/2025	9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE	NORTH CAROLINA PROFESSIONAL SEAL 053755 ENGINEER PATRICK M. HARNETT
DocuSigned by: Faith E. Jahnke 8D02B3BCBE7C3400	DocuSigned by: Patrick Harnett BF6FF9B0B8B04BD

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

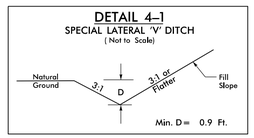
Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE Nos C-5176
320 Executive Ct.
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

-L-

PI Sta 12+46.24
△ = 2° 12' 19.7" (LT)
D = 1° 08' 45.3"
L = 192.46'
T = 96.24'
R = 5,000.00'
SE = RC
RO = SEE PLANS

PI Sta 14+49.03
△ = 2° 26' 31.1" (RT)
D = 1° 08' 45.3"
L = 213.10'
T = 106.57'
R = 5,000.00'
SE = RC
RO = 84'

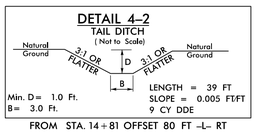
DETAIL 4-1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D= 0.9 Ft.

FROM STA. 10+50 TO STA. 15+50 -L- LT

DETAIL 4-2
TAIL DITCH
(Not to Scale)



Min. D= 1.0 Ft.
B= 3.0 Ft.
LENGTH = 39 FT
SLOPE = 0.005 FT/FT
9 CY DDE

FROM STA. 14+81 OFFSET 80 FT -L- RT

NAD 83/2011

PRC -L- Sta. 13+42.46

PC -L- Sta. 11+50.00

POT -L- Sta. 10+00.00

BEGIN PROJECT HL-00081
-L- Sta.10+00.00

MATCHLINE -L- STA.15+50.00
(SEE SHEET 5)

FOR -L- PROFILE, SEE SHEET 8

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
HL-00081	5

ROADWAY DESIGN ENGINEER
9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE
DocuSigned by: Faith E. Jahnke
8D02B3BCBE7C3400

HYDRAULICS ENGINEER
9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 053755 ENGINEER PATRICK M. HARTNETT
DocuSigned by: Patrick Hartnett
BF6FF9B0B8B340D

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of:
SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE Nos C-5176
320 Executive Ct.
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

NAD 83/2011

PC -Y1- Sta. 10+00.00
PT -Y1- Sta. 11+33.42
BEGIN CONSTRUCTION -Y1- Sta.10+50.00
PC -Y1- Sta. 12+36.80
PT -Y1- Sta. 15+73.97
BEGIN CONSTRUCTION -DRI- Sta.10+23.00
PT -DRI- Sta. 10+00.00
N 18° 27' 52.4" W AHD
END CONSTRUCTION -DR3- Sta.11+10.00
-DR3- POT Sta. 11+33.72
PT -L- Sta. 15+55.57
PC -L- Sta. 17+71.96
POT -Y1- Sta. 17+37.23
POT -L- Sta. 18+66.47
PT -L- Sta. 20+95.12
POT -Y1A- Sta. 10+00.00
POT -Y1- Sta. 15+50.00
POT -DRI- Sta. 11+25.00
N 18° 27' 52.4" W
PC -Y1A- Sta. 10+17.81
PRC -Y1A- Sta. 11+10.01
-DR3- POT Sta. 10+00.00= N 74° 09' 54.3" E (AH)
-L- POC Sta.18+78.04
PCC -Y1A- Sta. 12+12.79
PT -Y1A- Sta. 12+30.66
END RESURFACING -L- Sta.20+46.00
END CONSTRUCTION END GRADE -Y1A- Sta.12+25.00
N 6° 39' 54.6" E

CATHERINE RACKLEY
DB 13823 PG 303
BM 2018 PG 888

TIMOTHY & ROBERT BRYAN
DB 15205 PG 1102
BM 2002 PG 1878

ANNETTE ATKINSON
DB 17149 PG 2076
BM 2018 PG 888

SOUTHERN BELL TELEPHONE DB 2909 PG 573

JAMES STEPHENSON
DB 4388 PG 545

JAMES STEPHENSON
WB 00-E PG 275
BM 1993 PG 1100

VERONICA NAVARRO
DB 19147 PG 319

WILLIAM & CATHERINE RACKLEY
DB 2168 PG 157

WONDER DAISY, LLC
DB 19365 PG 821
BM 2020 PG 1481

JOHNNY BYNUM JR. & AMY BYNUM
DB 18449 PG 512
BM 2020 PG 1482

FORREST & MARSHA BALL
DB 7806 PG 504
BM 2016 PG 1645

MARION WEST, SR. & MARY WEST
DB 1590 PG 651

DETAIL 5-1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1 or Flatter, Fill Slope
Min. D= 0.6 Ft.
FROM STA. 10+50 TO STA. 13+50 -Y1- LT
FROM STA. 10+50 TO STA. 15+44 -Y1- RT

DETAIL 5-2
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1 or Flatter, Fill Slope
Min. D= 0.7 Ft.
FROM STA. 15+56 TO STA. 16+90 -Y1- RT

DETAIL 5-3
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1 or Flatter, Fill Slope
Min. D= 0.9 Ft.
FROM STA. 15+50 TO STA. 18+00 -L- LT

DETAIL 5-4
TOE PROTECTION
(Not to Scale)
2:1 or Flatter Fill Slope, d, 2:1 or Flatter, Tuck Geotextile a Minimum of 1ft (TYP), Geotextile
d= 1 Ft.
Type of Liner= 13 Tons Class B Rip-Rap 40 SY Geotextile
FROM STA. 23+41.82 TO STA. 23+91.81 -L- RT

-DRI-
PI Sta 10+65.04
Δ = 77° 48' 25.0" (LT)
D = 114° 35' 29.6"
L = 67.90'
T = 40.35'
R = 50.00'

PI Sta 11+37.19
Δ = 83° 27' 46.4" (RT)
D = 114° 35' 29.6"
L = 72.84'
T = 44.60'
R = 50.00'

-Y1-
PI Sta 10+66.71
Δ = 0° 08' 11.2" (LT)
D = 0° 06' 08.1"
L = 133.42'
T = 66.71'
R = 56,028.76'

PI Sta 14+08.21
Δ = 25° 25' 08.0" (RT)
D = 7° 32' 20.1"
L = 337.17'
T = 171.40'
R = 760.00'
SE = 06
RO = SEE PLANS
DS = 45 MPH

-Y1A-
PI Sta 10+69.79
Δ = 66° 01' 49.1" (RT)
D = 71° 37' 11.0"
L = 92.20'
T = 51.98'
R = 80.00'

PI Sta 11+61.54
Δ = 10° 17' 04.6" (LT)
D = 10° 00' 22.3"
L = 102.78'
T = 51.53'
R = 572.60'

PI Sta 12+21.73
Δ = 6° 06' 42.8" (LT)
D = 34° 12' 23.2"
L = 17.87'
T = 8.94'
R = 167.50'

SR 1006 (OLD STAGE RD)/-L- (ROCK SERVICE STATION RD) INTERSECTION
2025 ADT
2045 ADT
7470 / 12600 OLD STAGE RD -Y1-
320 / 400 -L- OLD STAGE RD
17160 / 28900
9380 / 15900
9700 / 16300 -L- ROCK SERVICE STATION RD.

★ PROPOSED SIGNAL
PAVEMENT REMOVAL

FOR -L- PROFILE, SEE SHEET 8
FOR -Y1- & -Y1A- PROFILE, SEE SHEET 10
FOR -DR1- & -DR3- PROFILE, SEE SHEET 11
FOR INTERSECTION DETAILS SEE SHEET 2B-1

MATCHLINE -L- STA. 15+50.00 (SEE SHEET 4)
MATCHLINE -L- STA. 27+00.00 (SEE SHEET 6)

03-SEP-2025 09:17
H:\projects\HL-00081\eng\psh_5.dgn

PROJECT REFERENCE NO.	SHEET NO.
HL-00081	6

ROADWAY DESIGN ENGINEER
9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE
DocuSigned by: Faith E. Jahnke
8D02B3BCBE7C3400

HYDRAULICS ENGINEER
9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 053755 ENGINEER PATRICK M. HARNETT
DocuSigned by: Patrick Harnett
BF6FF8B0B8B340D...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE Nos C-5176
320 Executive Ct.
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

REVISIONS

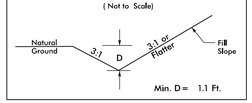
8/17/99

NAD 83/2011

POT -Y2- Sta. 10+00.00

10

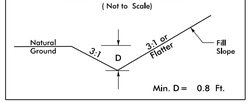
DETAIL 6-1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D = 1.1 Ft.

FROM STA. 12+50 TO STA. 14+31 -Y2- LT

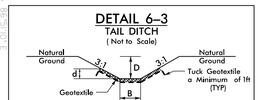
DETAIL 6-2
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D = 0.8 Ft.

FROM STA. 29+34 TO STA. 34+50 -L- LT

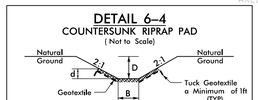
DETAIL 6-3
TAIL DITCH
(Not to Scale)



Min. D = 1.3 Ft.
d = 1.4 Ft.
B = 2.0 Ft.
Type of Liner = 12 TONS CL B Rip-Rap, Keyed-In 1 ft
LENGTH = 40 FT
SLOPE = 0.034 FT/FT
13 CY DDE

FROM STA. 34+91 OFFSET 72 FT -L- RT

DETAIL 6-4
COUNTERSUNK RIPRAP PAD
(Not to Scale)



Min. D = 2.0 Ft.
d = 2.0 Ft.
B = 2.0 Ft.
Type of Liner = 6 TONS CL B Rip-Rap, Keyed-In 1 ft
LENGTH = 10 FT

FROM STA. 36+66 OFFSET 58 FT -L- LT

BEGIN CONSTRUCTION -Y2- Sta.12+50.00

PC -L- Sta. 28+79.02

-Y2- N 89°59'02.3" E

-Y2- +50.00
35.00' LT
EX R/W

SPECIAL LATERAL V DITCH
SEE DETAIL 6-1

-Y2- +43.00
EX R/W

-Y2- +80.00
EX. R/W

END 2'6" C&G
-Y2- +90.55

-Y2- +06.00
EX. R/W

DO NOT DISTURB OAK TREES

-L- +08.00
EX. R/W

-L- +98.00
EX. R/W

REMOVE +74.00

75' TAPER TO EX.

125' TAPER TO EX.

END 2'6" C&G
-Y2- +76.42

-Y2- +81.50
65.00' LT
45.00' LT
PROP R/W

-Y2- +00.00
37.00' LT
86.00' LT

-L- +23.72

-Y2- +19.00
PROP R/W

428.98'

24" RCP-IV

-L- +55.00
EX. R/W

SPECIAL LATERAL V DITCH
SEE DETAIL 6-2

REMOVE
-L- +50.00
60.00' LT

-L- +68.52
60.00' LT
EX. R/W

-L- +68.00
EX. R/W

REMOVE

-L- +99.46
60.00' LT

-L- +99.00
EX. R/W

REMOVE

-L- +07.00
184.50' LT
174.00' LT

-L- +23.00
184.00' LT
163.00' LT

-L- +77.00
176.00' LT

-L- +07.00
164.00' LT

-L- +50.08
74.00' LT

-L- +48.72
69.98' LT

-L- +43.00
EX. R/W

-L- +68.00
127.00' LT

-L- +99.00
118.00' LT

-L- +83.54
74.35' LT

-L- +83.22
74.00' LT

-L- +78.05
59.00' LT

-L- +76.00
EX. R/W

-L- +47.00
71.00' LT
59.00' LT

-L- +55.00
98.00' LT
71.00' LT
EX R/W

-L- +86.00
98.00' LT
73.00' LT
EX R/W

-L- +12.00
58.00' LT

COUNTERSUNK RIPRAP PAD
SEE DETAIL 6-4
6 TONS CL B RIPRAP
12 SY GEOTEXTILE

-L- +30.00
75.00' RT
67.94' RT

-L- +95.00
68.34' RT
PROP. R/W

-L- +58.00
75.00' RT
68.11' RT

-L- +11.00
68.44' RT
PROP R/W

275' TURN LANE

-L- +80.99
50.00' RT

-L- +79.02
50.00' RT

DO NOT DISTURB WELL

RIPRAP LINED TAIL DITCH
SEE DETAIL 6-3
12 TONS CL B RIPRAP
25 SY GEOTEXTILE
13 CY OF EXCAVATION

-L- +61.00
97.00' RT
67.55' RT
PROP R/W

-L- +86.00
249.00' RT

-L- +50.00
85.00' RT
67.50' RT

-L- +12.00
67.50' RT

-L- +07.00
PROP R/W

-L- +04.08
67.50' RT

2 TONS CL B RIPRAP
7 SY GEOTEXTILE

-L- +01.17
85.00' RT

-L- +98.00
104.00' RT

-L- +15.00
237.00' RT

-L- +31.00
236.00' RT

-L- +32.00
256.50' RT

-L- +16.00
257.50' RT
246.00' RT

-L- +47.00
274.00' RT

-L- +78.00
268.00' RT

-L- +55.00
73.00' RT
67.47' RT

-L- +43.00
67.50' RT

-L- +43.96
73.00' RT

SEPTIC REPAIR FIELD

SEPTIC DRAIN FIELD

-L- +60.00
82.00' RT
67.00' RT

-L- +81.00
82.00' RT
67.00' RT

-L- +13.11
67.00' RT

BEGIN C/A
-L- +00.00
50.00' RT

-L- +27.00
85.00' RT

POT -Y2- Sta. 14+87.70
= -L- Sta.28+60.88

PT -L- Sta. 29+80.99

-L-
PI Sta 29+30.00
Δ = 0° 31' 52.1" (RT)
D = 0° 31' 15.1"
L = 101.97'
T = 50.99'
R = 11,000.00'
SE = NC
RO = N/A

SR 2724 (BANKS RD)/-L- (OLD STAGE RD) INTERSECTION

2025 ADT
2045 ADT

5540
9800

-Y2- BANKS RD

3950
6300

1590
3500

17160
28900

-L- OLD STAGE RD

-L- OLD STAGE RD

13900
27300

DALVIS CONERLY
DB 17816 PG 2410
BM 1993 PG 1100

8 JAMES STEPHENSON
WB 00-E PG 275
BM 1993 PG 1100

9 DURWOOD BALL
DB 13823 PG 321
BM 2002 PG 1877
BM 2013 PG 150
BM 2013 PG 499

10 DURWOOD BALL
DB 13823 PG 321
BM 2002 PG 1877
BM 2013 PG 150
BM 2013 PG 499

11 PEGGY ARNOLD
WB 10-E PG 3304
DB 2455 PG 248

12 PEGGY ARNOLD
WB 10-E PG 3304
DB 2665 PG 341

13 MARR LIMITED PARTNERSHIP OF NC
DB 13296 PG 2616

14 JAMES GODWIN
DB 6727 PG 807
BM 1982 PG 305

15 JAMES & PHYLLIS GODWIN
DB 8266 PG 592
BM 1982 PG 305

28 FORREST & MARSHA BALL
DB 7806 PG 504
BM 2016 PG 1645

29 MARION WEST, JR. & DONNA WEST
DB 5963 PG 805

30 MARY T BALL PROPERTIES LLC
DB 15114 PG 2782
TRACT EIGHT

31 MARY BALL
WB 08-E PG 500
BM 2009 PG 1005

32 LEE & CAROLINE WILLIS
DB 13707 PG 1112
BM 2009 PG 1005

33 JAMES, JR. & DAVILENE KING
DB 6202 PG 128

34 MARY T BALL PROPERTIES LLC
DB 15114 PG 2782
TRACT SIX

BM#2
N: 687,139
E: 2,097,890
-BL- STA. 23+79.00
O/S 197 RIGHT
ELEV.= 380.00'
BENCH TIE IN BASE
OF 8" MAPLE

MATCHLINE -L- STA. 27+00.00 (SEE SHEET 5)

MATCHLINE -L- STA. 40+50.00 (SEE SHEET 7)

★ PROPOSED SIGNAL

FOR -L- PROFILE, SEE SHEET 8 & 9
FOR -Y2- PROFILE, SEE SHEET 10
FOR INTERSECTION DETAILS SEE SHEET 2B-2

03-SEP-2025 09:18
H:\...\HL-00081\Roadway\psh_6.dgn
zgeiger

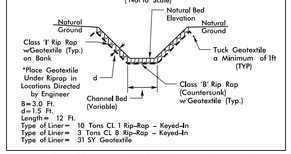
8/17/99

REVISIONS

-L-	-DR2-
PI Sta 47+88.68	PI Sta 10+71.08
△ = 13° 46' 40.1" (RT)	△ = 71° 42' 11.4" (LT)
D = 2° 29' 28.0"	D = 127° 19' 26.2"
L = 553.08'	L = 56.32'
T = 277.88'	T = 32.52'
R = 2,300.00'	R = 45.00'
SE = 03	
RO = 126'	

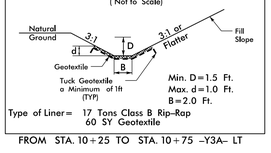
-Y3-		
PI Sta 10+77.50	PI Sta 11+74.38	PI Sta 13+10.38
△ = 20° 04' 19.6" (LT)	△ = 50° 35' 12.0" (RT)	△ = 63° 12' 10.0" (LT)
D = 38° 11' 49.9"	D = 38° 11' 49.9"	D = 61° 23' 53.1"
L = 52.55'	L = 132.44'	L = 102.94'
T = 26.55'	T = 70.88'	T = 57.41'
R = 150.00'	R = 150.00'	R = 93.32'
SE = 02	SE = 02	
RO = SEE PLANS	RO = 36'	

DETAIL 7-1
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



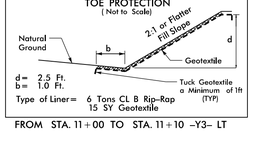
FROM STA. 52+68 TO STA. 52+75 -L- LT

DETAIL 7-2
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM STA. 10+25 TO STA. 10+75 -Y3A- LT

DETAIL 7-3
TOE PROTECTION
(Not to Scale)



FROM STA. 11+00 TO STA. 11+10 -Y3- LT

PROJECT REFERENCE NO.	SHEET NO.
HL-00081	7

ROADWAY DESIGN ENGINEER
9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JANNKE
Docusigned by: Faith E. Jannke
8D02B3BCBE7C3400

HYDRAULICS ENGINEER
9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 053755 ENGINEER PATRICK M. HARTSELL
Docusigned by: Patrick Hartsell
BF6FF9B0B8934B5...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of:
SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: C-5176
320 Executive Ct
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

NAD 83/2011

-Y3- PT Sta. 13+55.91
-Y3- PC Sta. 12+52.97
END CONSTRUCTION
-Y3- Sta.12+40.00
-Y3- PT Sta. 12+35.93
N 42° 59' 23.8" W (AH)
END CONSTRUCTION
-Y3A- Sta.10+85.00
-Y3A- POT Sta. 10+00.00=
-Y3- POC Sta.11+59.11
-Y3- PRC Sta. 11+03.50
-Y3- PC Sta. 10+50.95
-DR2- PC Sta. 10+38.56
N 89° 06' 07.5" W BK
-DR2- PT Sta. 10+94.88
END CONSTRUCTION
-DR2- Sta.11+69.45
-DR2- POT Sta. 11+71.37
S 19° 11' 41.2" W BK
PT -L- Sta. 50+63.88
PC -L- Sta. 45+10.80
-DR2- POT Sta. 10+00.00
-L- POT Sta. 51+50.99
END GRADE
-L- Sta.53+40.00
-Y3- POT Sta. 10+00.00=
N 73° 30' 16.2" W (AH)
-L- Sta.53+59.39
END PROJECT HL-00081
-L- Sta.54+14.00
POT -L- Sta. 54+66.32
-L- N 2° 11' 46.7" E
MATCHLINE -L- STA. 40+50.00 (SEE SHEET 6)
BM#3 N: 689,010 E: 2,097,519 -BL- STA 41+37.00 O/S 344' LEFT ELEV.= 372.96' BENCH TIE IN BASE OF 10" GUM
-L- N 15° 58' 26.8" E

15 JAMES & PHYLLIS GODWIN DB 8266 PG 592 BM 1982 PG 305
16 JAMES GODWIN DB 7825 PG 120 BM 1998 PG 1586
17 JAMES GODWIN DB 7825 PG 120 BM 1998 PG 1586
18 JUDSON WALTON JR. DB 17025 PG 1689
19 JOHN & AMY BYNUM DB 7227 PG 521 BM 1996 PG 1022 DB 18005 PG 1127
20 KATHRYN FAIRWEATHER, ET ALS DB 7874 PG 244 DB 18100 PG 158 BM 1991PG 244 DB 17914 PG 251MEMO
34 MARY T BALL PROPERTIES LLC DB 15114 PG 2782 TRACT SIX
35 NCDOT DB 19759 PG 718 BM 1974 PG 373
36 TRIANGLE BAPTIST CHURCH OF RALEIGH DB 7226 PG 464 BM 1996 PG 944 DB 17763 PG 2733
37 MICHAEL FERRELL DB 6195 PG 197 BM 1994 PG 309 DB 17764 PG 96
JOHN BUFFALOE, ET ALS DB 14980 PG 2471 BM 1974 PG 373 DB 17790 PG 178
ROLLING MEADOWS HOMEOWNERS ASSOCIATION DB 4577 PG 662 BM 1985 PG 1751
WORTH & WANDA GOODWIN DB 3883 PG 639 BM 1985 PG 1751 DB 17909 PG 2782 DB 17909 PG 2784
NCDOT DB 18507 PG 449
MARY T BALL PROPERTIES LLC DB 15114 PG 2782 DB 2502 PG 574 MB 1974 PG 373
AQUA NORTH CAROLINA, INC.

PIPE OUTLET CHANNEL STABILIZATION, SEE DETAIL 7-1
TOE PROTECTION SEE DETAIL 7-3
SPECIAL LATERAL BASE DITCH SEE DETAIL 7-2
RETAIN
REMOVE EXISTING JB w/MH
TIE TO EX R-2828 BASE DITCHES
REMOVE 58 FT OF EXIST PIPE
RETAIN 232 FT OF EXIST PIPE
PROPOSED R-2828 EOP (BY OTHERS)
SEPTIC DRAIN FIELD
BEGIN ROCK PLATING -L- STA.49+25.00
END ROCK PLATING -L- STA.53+00.00
END C/A -L- +03.16 50.00' RT
TIE CURB & GUTTER TO EXISTING -L- +00.00
DO NOT DISTURB WELL
DO NOT DISTURB EXISTING SIGN.
150' TURN LANE
100' TAPER
190' TURN LANE
375' WIDENING LT/RT
SR 1006 OLD STAGE RD
CULTIVATED FIELD
PROPANE TANK
MTL CAN
ISFD
ISBK TRIANGLE BAPTIST CHURCH
SILT FENCE

PAVEMENT REMOVAL

FOR -L- PROFILE, SEE SHEET 9
FOR -DR2- PROFILE, SEE SHEET 11
FOR -Y3- PROFILE, SEE SHEET 10
FOR -Y3A- PROFILE, SEE SHEET 11

03-SEP-2025 09:18
HL-00081_Rdy_pln_7.dgn

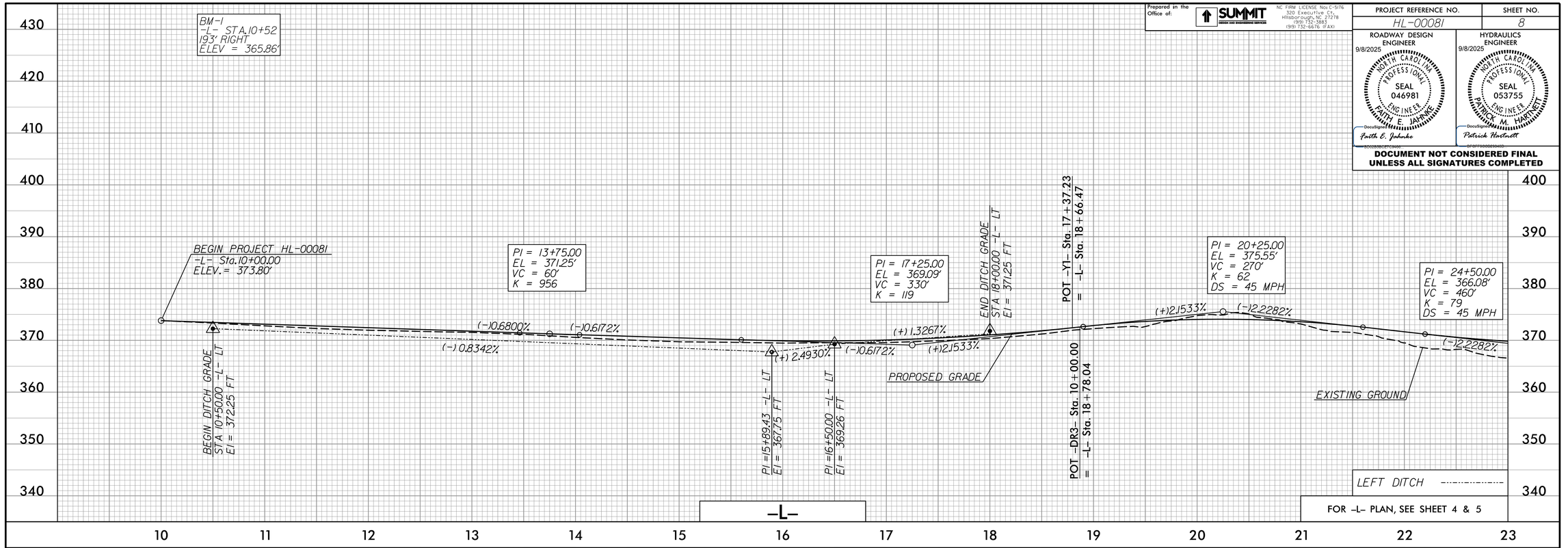
Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: C-5176
320 Executive Ct.
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

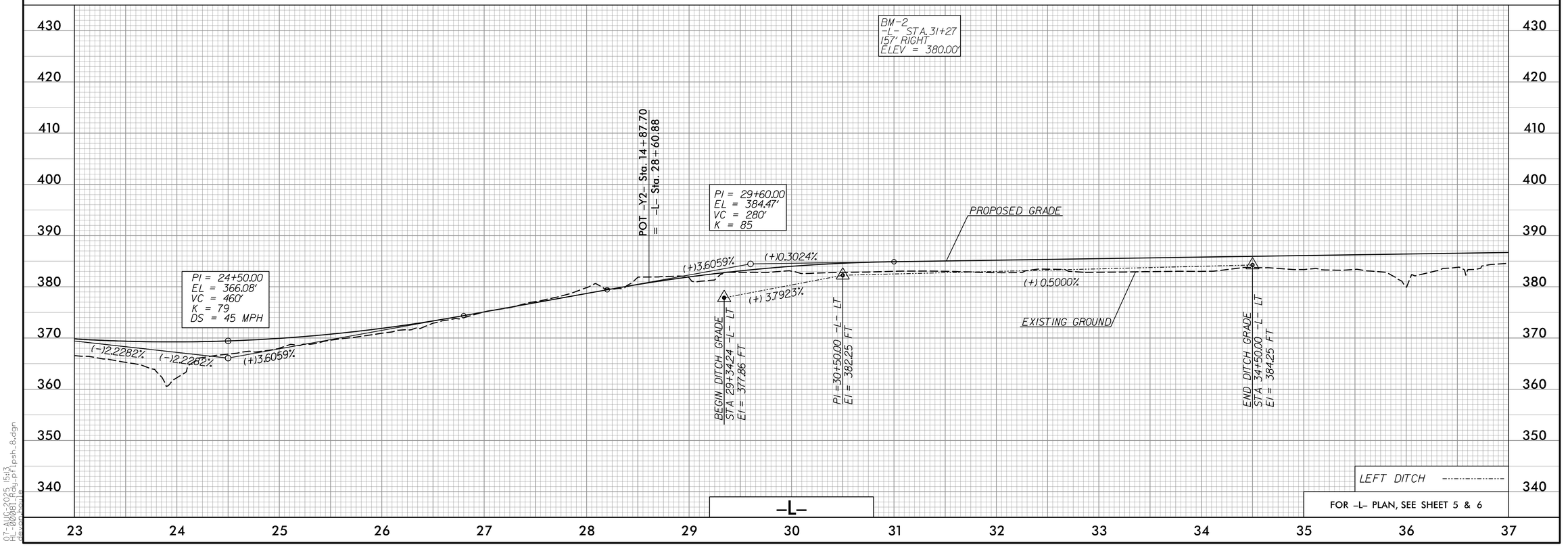
PROJECT REFERENCE NO.	SHEET NO.
HL-00081	8

ROADWAY DESIGN ENGINEER
9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE
DocuSigned by: Faith E. Jahnke
8D02B3BCBE7C3400...

HYDRAULICS ENGINEER
9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 053755 ENGINEER PATRICK M. HARNETT
DocuSigned by: Patrick Harnett
BF6FF9BBB89340D...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





Prepared in the Office of:
SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: C-5176
320 Executive Ct.
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

PROJECT REFERENCE NO.	SHEET NO.
HL-00081	9

ROADWAY DESIGN ENGINEER
9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE
DocuSigned by: Faith E. Jahnke
8D02B3BCEFC3466...

HYDRAULICS ENGINEER
9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 053755 ENGINEER PATRICK M. HARNETT
DocuSigned by: Patrick Harnett
8F6FF8B0B8194BD...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BM-3
-L- STA. 49+25
327' LEFT
ELEV. = 372.96'

PI = 37+90.00
EL = 386.98'
VC = 130'
K = 98

PI = 45+35.00
EL = 399.10'
VC = 300'
K = 155

PI = 51+10.00
EL = 397.33'
VC = 150'
K = 247

PROPOSED GRADE
EXISTING GROUND
(+)0.3024%
(+)1.6272%
(+)1.6272%
(-)0.3083%
(-)0.3083%

-L-

FOR -L- PLAN, SEE SHEET 6 & 7

PI = 51+10.00
EL = 397.33'
VC = 150'
K = 247

PI = 52+65.00
EL = 397.80'
VC = 150'
K = 250

END GRADE
-L- Sta. 53+40.00
ELEV. = 397.57'

END PROJECT HL-00081
END RESURFACING
-L- Sta. 54+14.00

(+)0.3000%
(-)0.3000%
(+)0.3000%
(-)0.3083%
EXISTING GROUND

POT -DR2- Sta. 10+00.00
= -L- Sta. 51+50.99

POT -Y3- Sta. 10+00.00
= -L- Sta. 53+59.39

-L-

FOR -L- PLAN, SEE SHEET 7

07-AUG-2025 15:13
H:\projects\HL-00081\design\plan_profile_sheets\HL-00081_pp_sh_9.dgn

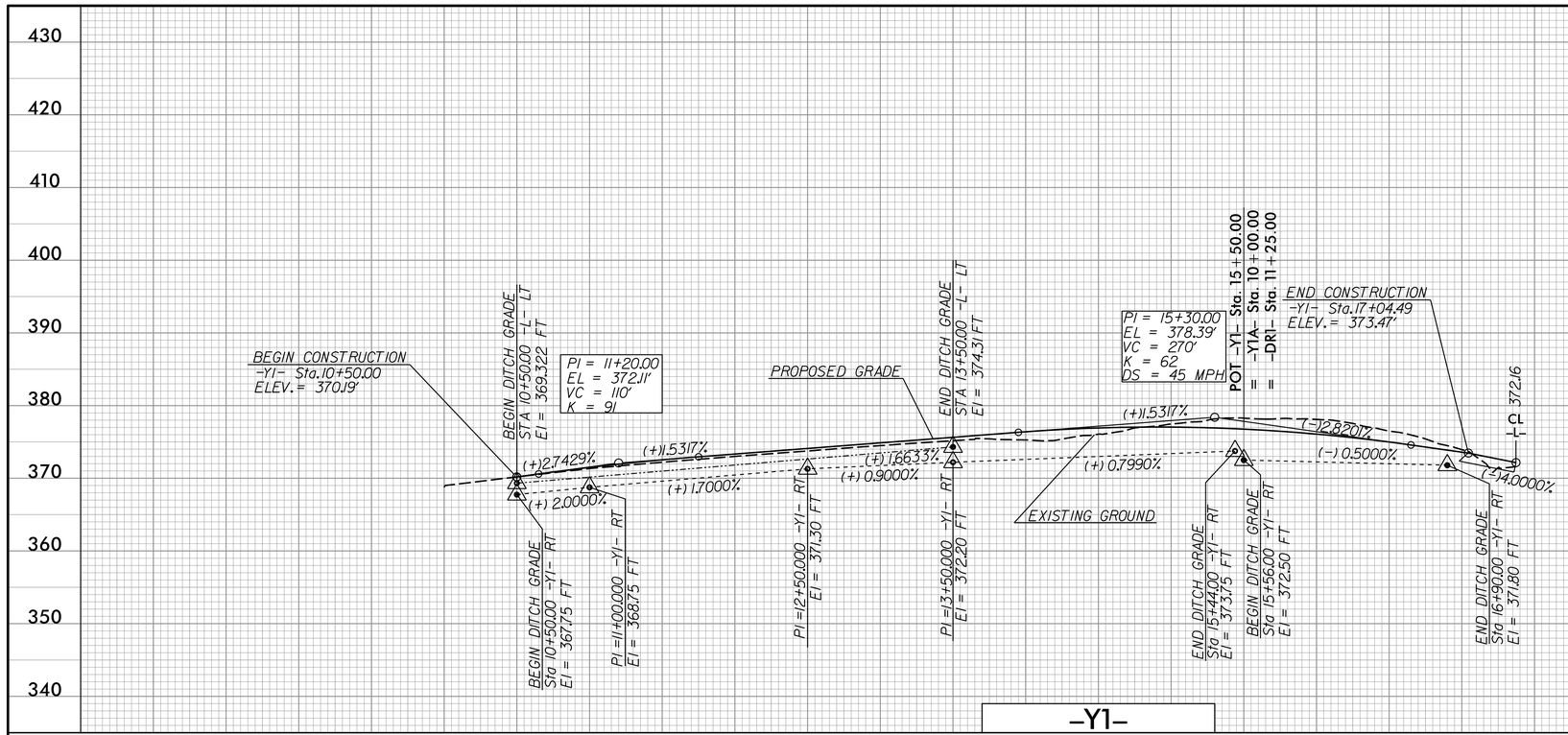
Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: C-5176
320 Executive Ct.
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

PROJECT REFERENCE NO.	SHEET NO.
HL-00081	10

ROADWAY DESIGN ENGINEER
9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE
DocuSigned by: Faith E. Jahnke
8D02B3BCBE7C3460...

HYDRAULICS ENGINEER
9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 053755 ENGINEER PATRICK M. HARNETT
DocuSigned by: Patrick Harnett
BF8FF8B0B89040D...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



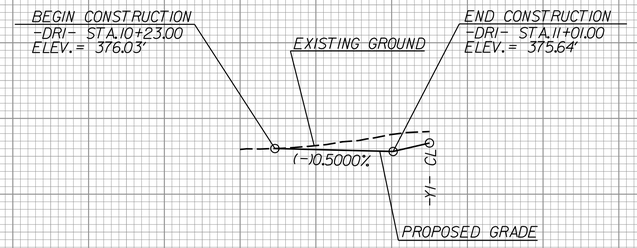
Prepared in the Office of:
SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: C-5176
320 Executive Ct.
Hillsborough, NC 27278
(919) 752-5883
(919) 732-6676 (FAX)

PROJECT REFERENCE NO.	SHEET NO.
HL-00081	11

ROADWAY DESIGN ENGINEER
9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE
DocuSigned by: Faith E. Jahnke
8D02B3BC8ETC3400

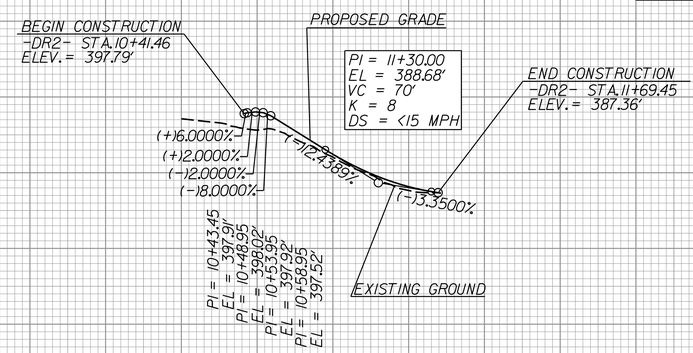
HYDRAULICS ENGINEER
9/8/2025
NORTH CAROLINA PROFESSIONAL SEAL 053755 ENGINEER PATRICK M. HARNETT
DocuSigned by: Patrick Harnett
BFBFF38BB89B4BD...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



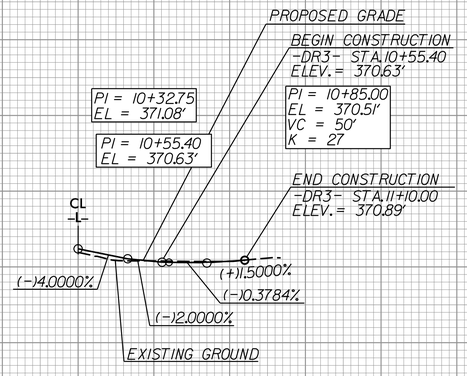
-DR1-

FOR -DR1- PLAN, SEE SHEET 5



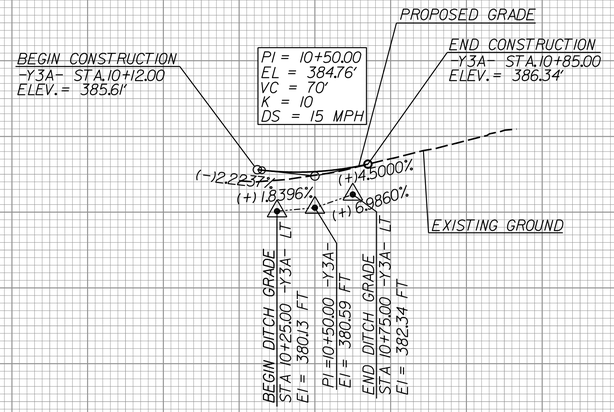
-DR2-

FOR -DR2- PLAN, SEE SHEET 7



-DR3-

FOR -DR3- PLAN, SEE SHEET 5



-Y3A-

FOR -Y3A- PLAN, SEE SHEET 7