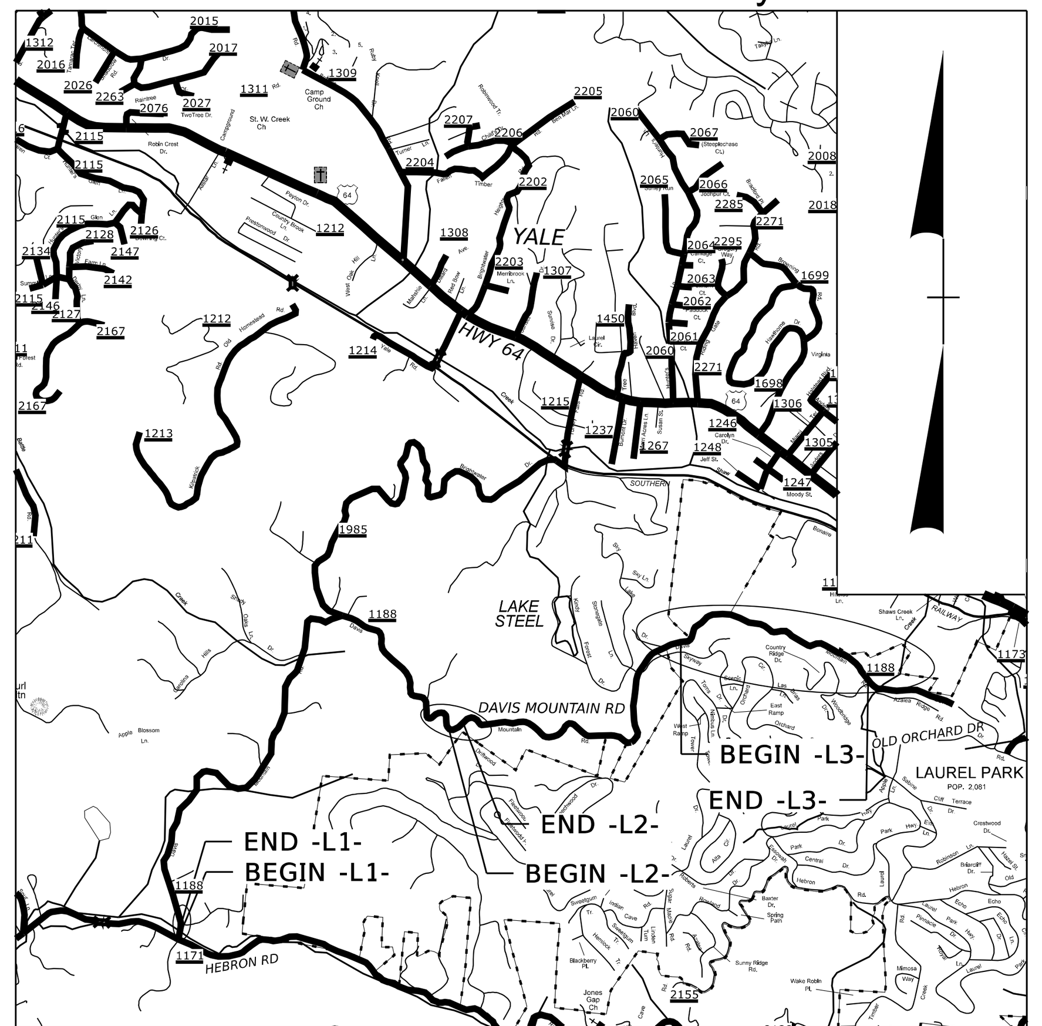
01/16/24

WBS PROJECT: DF18314.2045155 W03294

CONTRACT: C205180

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



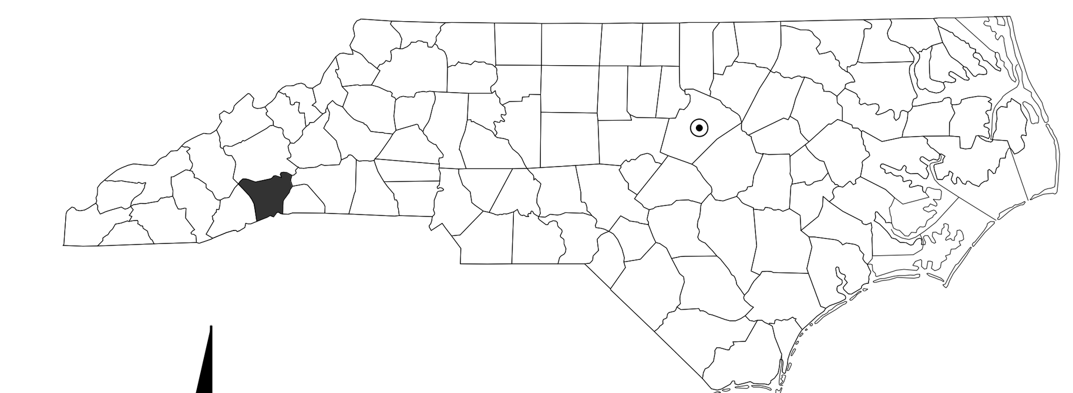
VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HENDERSON COUNTY

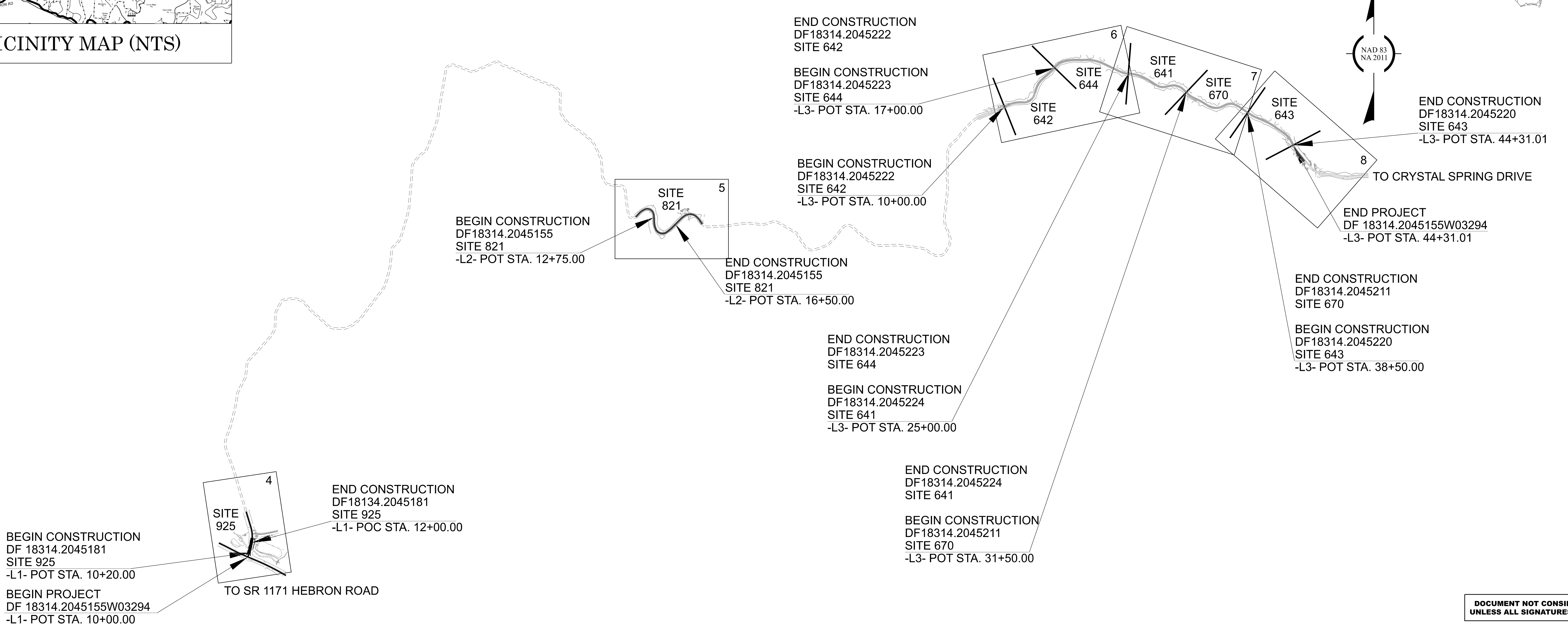
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18314.2045155 W03294	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
DF18314.2045155		SITE 821
DF18314.2045181		SITE 925
DF18314.2045222		SITE 642
DF18314.2045223		SITE 644
DF18314.2045224		SITE 641
DF18314.2045211		SITE 670
DF18314.2045220		SITE 643



LOCATION: *SR 1188 (DAVIS MOUNTAIN RD) FROM SR 1171 (HEBRON RD) TO 3.3 MILES NORTH OF SR-1171 (HEBRON RD)*

TYPE OF WORK: *GRADING, PAVING, DRAINAGE, CULVERT, AND RETAINING WALLS*



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GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2025 = 200
ADT 2045 = 200
V = 40 MPH (-L1- & -L3-)
30 MPH (-L2-)

FUNC CLASS = LOCAL SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY SITE 925 = 0.034 MILES
LENGTH ROADWAY SITE 821 = 0.071 MILES
LENGTH ROADWAY SITE 642 = 0.133 MILES
LENGTH ROADWAY SITE 644 = 0.152 MILES
LENGTH ROADWAY SITE 641 = 0.123 MILES
LENGTH ROADWAY SITE 670 = 0.133 MILES
LENGTH ROADWAY SITE 643 = 0.110 MILES

LENGTH STRUCTURES ALL SITES = 0.000 MILES

TOTAL LENGTH OF PROJECT = 0.756

Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27609
License No: C-3097

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
12/10/2025

LETTING DATE:
4/21/2026

CHARLES YOUNG, PE, PMP
PROJECT ENGINEER

ALEX FITZPATRICK, EI
PROJECT DESIGN ENGINEER

LONNIE WATKINS, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

Signed by:
SIGNATURE: P.E.
NORTH CAROLINA PROFESSIONAL SEAL 048313 ENGINEER COLE M. BENJAMIN
2/11/2026

ROADWAY DESIGN ENGINEER

Signed by:
SIGNATURE: P.E.
NORTH CAROLINA PROFESSIONAL SEAL 046062 ENGINEER CHARLES J. YOUNG
2/11/2026

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

$$$-USER NAME-$$$ - $$$-DATE-$$$

11/15/23

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DFI8314.2045I55W03294

RDY | 1A

Johnson, Mirmiran, & Thompson Inc.
2550 West Tyvola Road, Suite 120
Charlotte, NC, 28217
License No: C-3097

INDEX OF SHEETS

GENERAL NOTES

2024 SPECIFICATIONS
EFFECTIVE: 01-16-2024
REVISED:

GRADE LINE:
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 II.

SUPERELEVATION:

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

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

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 THE CITY OF HENDERSONVILLE, DUKE ENERGY, AT&T, AND ENBRIDGE.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS AND BY CONTRACT IN ACCORDANCE WITH DESIGNATED SYMBOLS.

STANDARD DRAWINGS

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
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
	DIVISION 3 - PIPE CULVERTS
300.01	Method of Pipe Installation (Use Details in Lieu of Standards for Sheets 1 and 2 of 2)
	DIVISION 5 - SUBGRADE, BASES AND SHOULDERS
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
	DIVISION 8 - INCIDENTALS
815.02	Subsurface Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" Thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
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
840.66	Drainage Structure Steps
840.72	Pipe Collar
846.02	Drop Inlet Installation in Expressway Gutter
848.02	Driveway Turnout - Radius Type
862.01	Guardrail Placement (Use Details in Lieu of Standards for Sheets 4, 6, 11, 12 and 14)
862.02	Guardrail Installation (Use Detail in Lieu of Standards for Sheet 5 of 9)
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

05/29/25

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

DFI8314.2045155WD3294	
RDY	1B

Note: Not to Scale

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

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

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

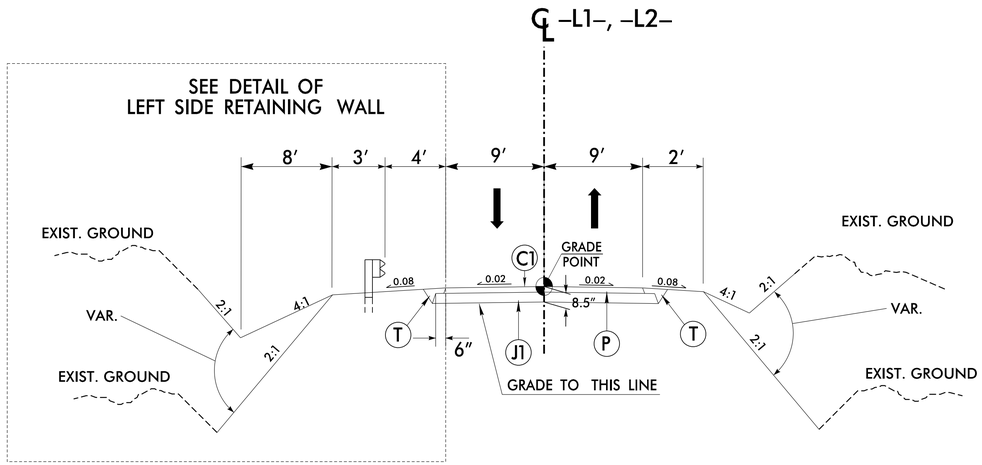
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box
- Utility Unknown U/G Line (SUE - LOS B)*
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc.
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- Abandoned According to Utility Records
-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

11/14/23

FINAL PAVEMENT SCHEDULE

C1	PROPOSED APPROX. 2.5″ ASPHALT CONCRETE SURFACE COURS, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROPOSED APPROX. 3″ ASPHALT CONCRETE SURFACE COURS, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
D1	PROPOSED APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
J1	PROP 6″ AGGREGATE BASE COURSE
P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YARD
T	EARTH MATERIAL
R1	CONCRETE EXPRESSWAY GUTTER

NOTE: All Slopes Are 1:1 Unless Otherwise Noted

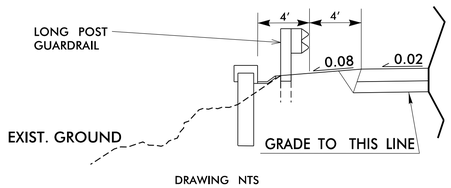


TYPICAL SECTION NO. 1

–L1– STA. 10+20.00 TO STA. 12+00.00

–L2– STA. 12+75.00 TO STA. 16+50.00

DETAIL OF LEFT SIDE RETAINING WALL

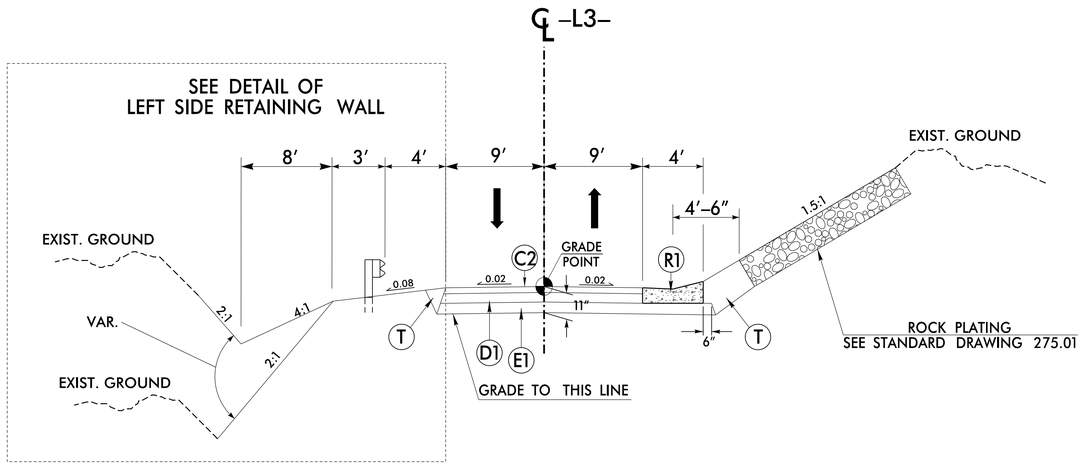


DRAWING NTS

–L2– STA. 12+92.90 TO STA. 15+72.45

–L3– STA. 10+62.00 TO STA. 43+24.00

USE CLEAR SPAN GUARDRAIL STANDARD 862.01 SHEET 10 WHEN BOXES ARE IN THE RETAINING WALL DITCH



TYPICAL SECTION NO. 2

–L3– STA. 10+00.00 TO STA. 44+31.01

DFI8314.2045155W03294

RDY	2A-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
HENDERSON COUNTY

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046062 CHARLES J. YOUNG

2/11/2026

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 52CR2872 MICHAEL J. WANKO

2/11/2026

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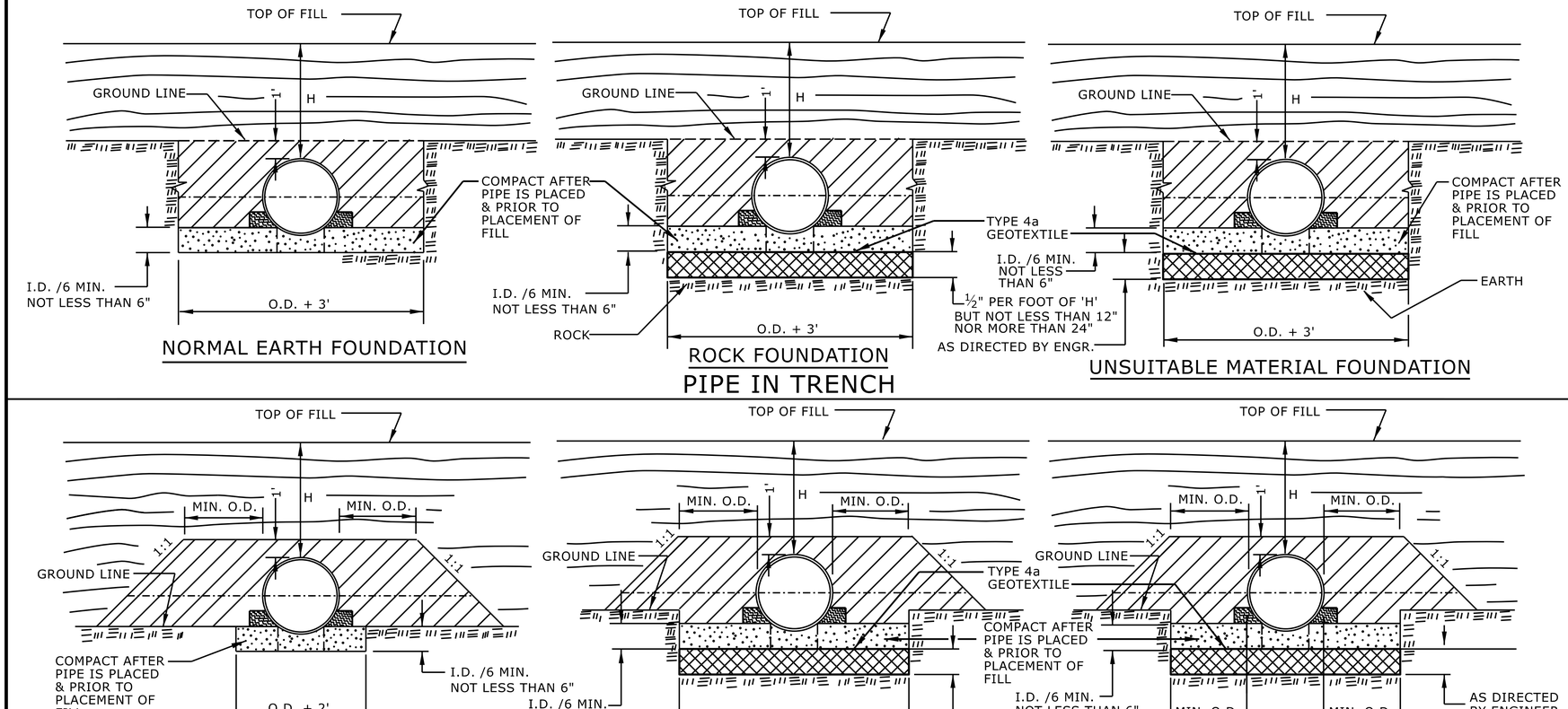
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27609
License No: C-3097

PROJECT REFERENCE NO.	SHEET NO.
DF18314.2045155W03294	2C-1



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

2/11/2026

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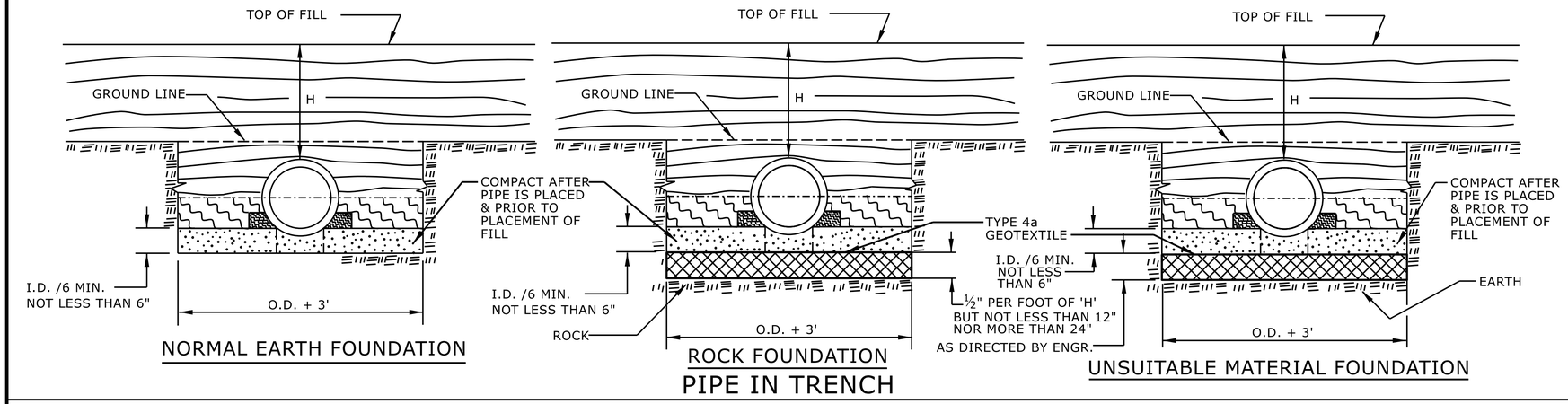
CONTRACTS STANDARDS
AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

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

PROJECT REFERENCE NO.	SHEET NO.
DF18314.2045155W03294	2C-2



GENERAL NOTES:

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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

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 053144 NICOLE M. HACKLER
2/11/2026

SHEET 2 OF 2

300.01

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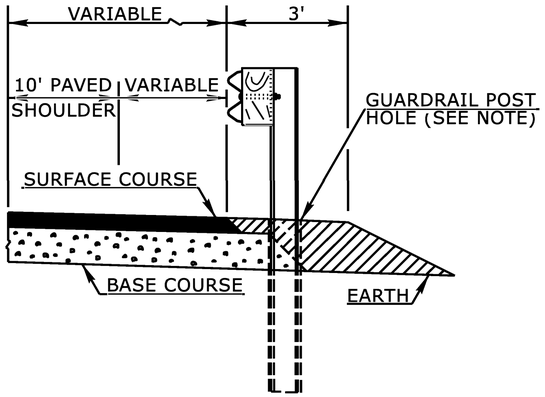
CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

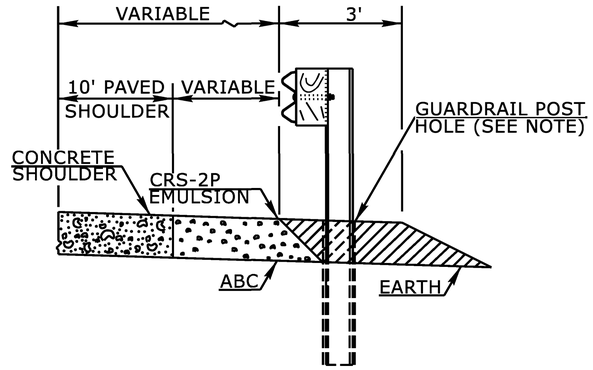
SEE TITLE BLOCK

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

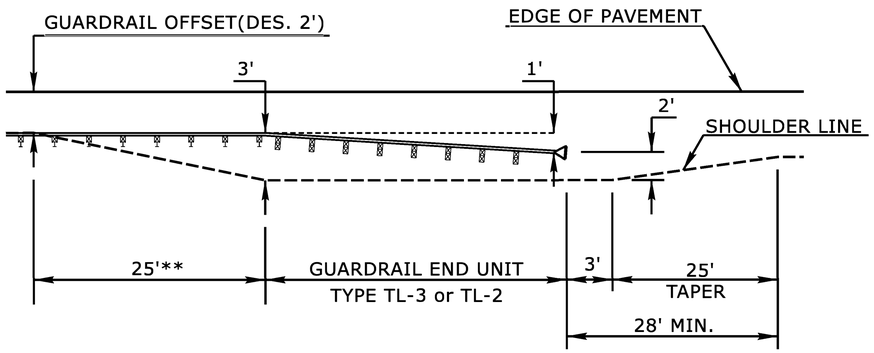
PROJECT REFERENCE NO.	SHEET NO.
DF18314.2045155W03294	2C-3



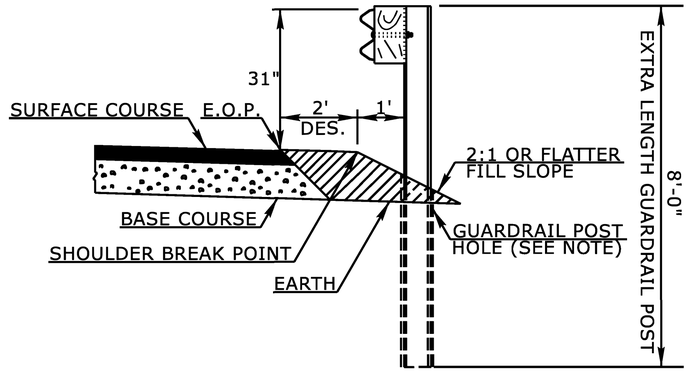
FLEXIBLE PAVED SHOULDER



CONCRETE PAVED SHOULDER



8' GUARDRAIL POST ON 2:1 SLOPE-END UNIT TRANSITION*
PLAN VIEW



8' GUARDRAIL POST ON 2:1 SLOPE*

* THE 8' GUARDRAIL POST ON 2:1 SLOPE DETAIL IS INTENDED FOR USE ONLY IN SEVERELY CONSTRAINED AREAS WITH A POSTED SPEED ≤ 60 MPH. GUARDRAIL END UNITS MAY NOT BE PLACED ON THE 2:1 SLOPE AND MUST TRANSITION TO THE SHOULDER.
** 8' GUARDRAIL POST SHOULD BE USED IN THIS RANGE

NOTE:
WHEN WOODEN GUARDRAIL POSTS ARE USED, DRILL HOLES THROUGH EARTH MATERIAL AND BASE COURSE.THE POST MAY THEN BE DRIVEN TO THE PROPER DEPTH. DRILL THE HOLE OF SUFFICIENT SIZE TO ACCOMMODATE THE PARTICULAR POST BEING USED. BACKFILL AND TAMP HOLES USING THE EXCAVATED MATERIAL.

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 11OF 15
862D01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033444 NICOLE M HACKLER
2/11/2026

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

SEE TITLE BLOCK

ORIGINAL BY: L.SMITH DATE: 10-14-2025
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

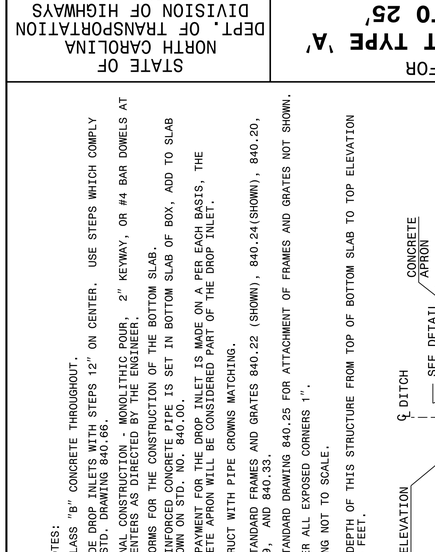
PROJECT REFERENCE NO.	SHEET NO.
DF18314.2045155W03294	2C-4

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

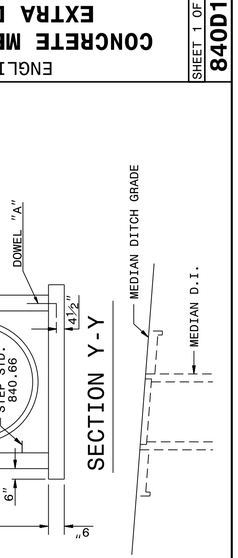
ENGLISH DETAIL DRAWING FOR
CONCRETE MEDIAN DROP INLET TYPE 'A'
EXTRA DEPTH OVER 12′ TO 25′
12″ THRU 72″ PIPE

SHEET 1 OF 2 **840D17**

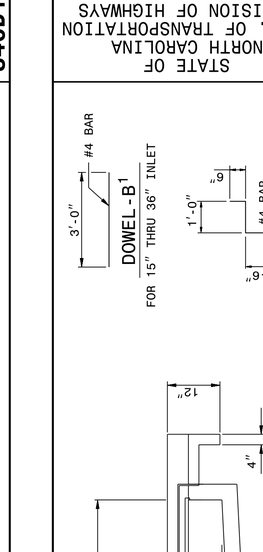
GENERAL NOTES:
USE CLASS "B" CONCRETE THROUGHOUT.
PROVIDE DROP INLETS WITH STEPS 12″ ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.
OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2″ KEYWAY, OR #4 BAR DOWELS AT 12″ CENTERS AS DIRECTED BY THE ENGINEER.
USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.
WHEN PAYMENT FOR THE DROP INLET IS MADE ON A PER EACH BASIS, THE CONCRETE APRON WILL BE CONSIDERED PART OF THE DROP INLET.
CONSTRUCT WITH PIPE CROWNS MATCHING.
USE STANDARD FRAMES AND GRATES 840.22 (SHOWN), 840.24(SHOWN), 840.20, 840.29, AND 840.33.
SEE STANDARD DRAWING 840.25 FOR ATTACHMENT OF FRAMES AND GRATES NOT SHOWN.
CHAMFER ALL EXPOSED CORNERS 1″.
DRAWING NOT TO SCALE.
MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEVATION IS 25 FEET.



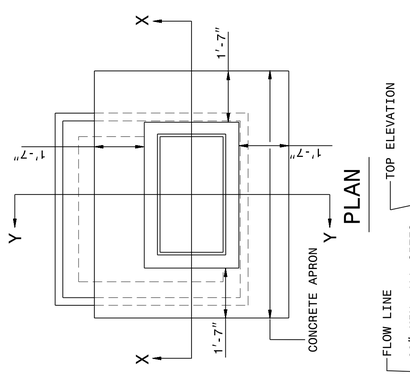
DETAIL
(APRON SUPPORT NOTCH)



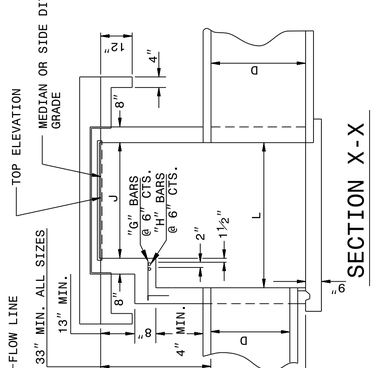
SECTION Y-Y



DOWEL-A



PLAN



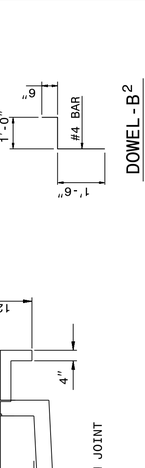
SECTION X-X

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

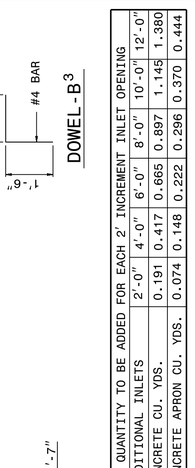
ENGLISH DETAIL DRAWING FOR
CONCRETE MEDIAN DROP INLET TYPE 'A'
EXTRA DEPTH OVER 12′ TO 25′
12″ THRU 72″ PIPE

SHEET 2 OF 2 **840D17**

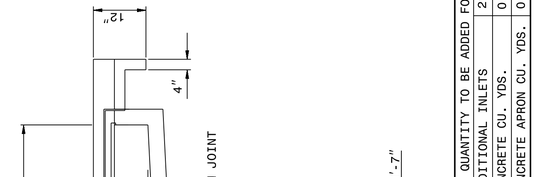
DOWEL-B¹
FOR 15″ THRU 36″ INLET



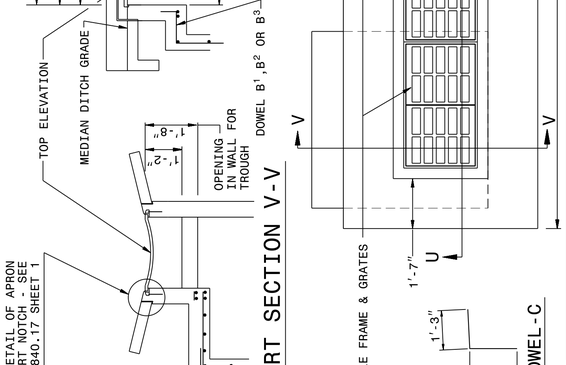
DOWEL-B²
FOR 42″ INLET



DOWEL-B³



PART SECTION U-U



PART SECTION V-V

DOWEL-C

QUANTITY TO BE ADDED FOR EACH 2′ INCREMENT INLET OPENING

	2′-0″	4′-0″	6′-0″	8′-0″	10′-0″	12′-0″
ADDITIONAL INLETS						
CONCRETE CU. YDS.	0.191	0.417	0.665	0.897	1.145	1.380
CONCRETE APRON CU. YDS.	0.074	0.148	0.222	0.296	0.370	0.444

MIN. DIMENSIONS AND QUANTITIES FOR CONCRETE GRATED DROP INLET(BASED ON MIN. HEIGHT, H)

DIMENSIONS OF BOX AND PIPE						REINFORCING STEEL - NO. 4 BARS								CU YDS CONC. IN BOX			DEDUCTIONS FOR ONE PIPE	
PIPE	SPAN	WIDTH	SPAN	WIDTH	HEIGHT	BARS E		BARS F		BARS G		BARS H		TOTAL	BOTTOM SLAB	H TOTAL	H PER FT HT	APRON	TOTAL LBS.	
	J	K	L	M	H	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH							
D																				
12″	3′-8″	2′-0″	3′-8″	2′-0″	3′-9″	—	—	—	—	—	—	—	—		0.362	0.926	0.247	0.395	1.683	0.024
15″	3′-8″	2′-0″	3′-8″	2′-0″	4′-0″	—	—	—	—	—	—	—	—		0.362	0.988	0.247	0.395	1.745	0.036
18″						—	—	—	—	—	—	—	—		0.362	1.050	0.247		1.807	0.049
24″				2′-10″	4′-9″	8	1′-5″	6	4′-9″	—	—	—	—	27	0.444	1.362	0.278		2.201	0.059	0.085
30″			3′-8″	3′-5″	5′-3″	8	2′-0″	7	4′-9″	—	—	—	—	33	0.502	1.644	0.288		2.541	0.092	0.127
36″			4′-0″	4′-0″	5′-9″	8	2′-5″	8	4′-11″	4	0′-9″	2	4′-11″	47	0.560	1.931	0.321		2.920	0.132	0.178
42″			4′-10″	4′-10″	6′-3″	10	3′-1″	9	5′-7″	3	1′-5″	3	5′-7″	67	0.704	2.500	0.370		3.677	0.180	0.243
48″			5′-4″	5′-4″	6′-9″	11	3′-7″	10	6′-1″	4	1′-11″	4	6′-1″	87	0.823	3.013	0.407		4.315	0.235	0.317
54″			6′-0″	6′-0″	7′-3″	12	4′-1″	11	6′-7″		2′-5″	5	6′-7″	107	0.951	3.589	0.444		5.072	0.297	0.401
60″			6′-6″	6′-6″	7′-9″	13	4′-9″	12	7′-3″		3′-1″	6	7′-3″	135	1.311	4.539	0.494		6.170	0.367	0.495
66″			7′-2″	7′-2″	8′-3″	14	5′-4″	14	7′-10″		3′-7″	7	7′-10″	168	1.136	5.061	0.537		6.901	0.444	0.599
72″	3′-8″	2′-0″	7′-8″	7′-8″	8′-9″	15	5′-11″	15	8′-5″	4	4′-3″	8	8′-5″	199	1.500	5.860	0.580	0.395	7.868	0.528	0.713

3/20/2026

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CONTRACT STANDARDS AND DEVELOPMENT UNIT
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ORIGINAL BY: 2002 STD.840.17 DATE:
MODIFIED BY: K.A. KEMPF DATE: 07-06-09
CHECKED BY: DATE:
FILE SPEC.: /stand/840d17 Extra Depth 2GI.dgn

01-MAR-2018 07:39
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RDY | 3B-1

Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27609
License No: C-3097

SITE 925 SUMMARY OF EARTHWORK
IN CUBIC YARDS

SELECT GRANULAR MATERIAL = 400 CY
GEOTEXTILE FOR SOIL STABILIZATION = 400 SY

SITE NUMBER	LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
925	–L1– STA. 10+20 TO –L1– STA. 12+00	185		291	106	
	PROJECT SUBTOTAL	185		291	106	
	ADDITIONAL UNDERCUT		400			400
	LOSS DUE TO CLEARING & GRUBBING	–50			50	
	PROJECT TOTAL	135	400	291	156	400
	EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				8	
	GRAND TOTAL	135	400	291	164	400
	SAY	135	400		165	

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

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

LINE	LOCATION	ASPHALT REMOVAL	ASPHALT BREAK-UP	CONCRETE REMOVAL	CONCRETE REMOVAL
–L1–	STA. 10+20.00 TO STA. 10+75.00	125.62			
–L1–	STA. 11+00.95 TO STA. 12+00.00	196.45			
	GRAND TOTAL	322.07			
	SAY	323			

"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 SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			REMOVE EXISTING GUARDRAIL	SINGLE FACED CONCRETE BARRIER RAIL	25' CLEAR SPAN (STD. 862.01)	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL-3	GREU TL-2	TYPE-III	CAT-1	B-77				PERMITTED NO.	PERMITTED G	PERMITTED NG				
–L1–	10+36.33	11+51.49	LT	102.28'			11+51.49	10+36.33	4	7	25	25	0.50	0.50		2												
–L1–	10+36.33	11+50.66	RT	102.75'			10+36.33	11+50.66	4	7	25	25	0.50	0.50		2												
			SUBTOTAL	205.03'																								2	
			LESS DEDUCTIONS FOR ANCHORS																										
			GREU-TL 2 4 @ 25'	100.0'																									
			25' CLEAR SPAN	100.0'																									
			PROJECT TOTALS:	5.03'												4													
			SAY	12.50'																									
			ADDITIONAL GUARDRAIL POSTS=5 EA.																										

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Raleigh, NC, 27609
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SITE 821 SUMMARY OF EARTHWORK
IN CUBIC YARDS

SELECT GRANULAR MATERIAL = 400 CY
GEOTEXTILE FOR SOIL STABILIZATION = 400 SY

SITE NUMBER	LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
821	–L2– STA. 12+75 TO –L2– STA. 16+50	608		179		429
821	–L2– STA. 13+25 TO –L2– STA. 15+25 (WALL)		1,400	1,610	1,610	1,400
	PROJECT SUBTOTAL	608	1,400	1,789	1,610	1,829
	LOSS DUE TO CLEARING & GRUBBING	–50			50	
	ADDITIONAL UNDERCUT		400			400
	WASTE IN LIEU OF BORROW				–429	–429
	PROJECT TOTAL	558	1,800	1,789	1,231	1,800
	EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				62	
	GRAND TOTAL	558	1,800	1,789	1,293	1,800
	SAY	560			1,300	

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS					
LINE	LOCATION	ASPHALT REMOVAL	ASPHALT BREAK–UP	CONCRETE REMOVAL	CONCRETE REMOVAL
–L2–	STA. 12+75.00 TO STA. 16+50.00	744.86			
	GRAND TOTAL	744.86			
	SAY	745			

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

"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 SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			REMOVE EXISTING GUARDRAIL	SINGLE FACED CONCRETE BARRIER RAIL	25' CLEAR SPAN (STD. 862.01)	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL–3	GREU TL–2	TYPE–III	CAT–1	B–77				NO.	PERMITTED G	PERMITTED NG				
–L2–	12+65.71	16+51.49	LT	355.48'			16+51.49	12+65.71	4	7	25	25	0.50	0.50		2											1	BOX 502
			SUBTOTAL	355.48'																								
			LESS DEDUCTIONS FOR ANCHORS																									
			GREU–TL 2 2 @ 25'	50.0'																								
			25' CLEAR SPAN	50.0''																								
			PROJECT TOTALS:	255.48'												2											1	
			SAY	262.50'																								
			EXTRA LENGTH GUARDRAIL POST 8' STEEL = 42 EA.																									

DFI8314.2045155W03294
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SITE 642 SUMMARY OF EARTHWORK
IN CUBIC YARDS

SELECT GRANULAR MATERIAL = 400 CY
GEOTEXTILE FOR SOIL STABILIZATION = 400 SY

SITE NUMBER	LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
642	–L3– STA. 10+00 TO –L3– STA. 17+00	3,211		340		2,871
	PROJECT SUBTOTAL	3,211		340		2,871
	LOSS DUE TO CLEARING AND GRUBBING	–50				–50
	ADDITIONAL UNDERCUT		400			400
	APPLY ROCK SWELL AND EARTH SHRINKAGE FACTORS TO PERMANENTLY WASTED HARD ROCK					62
	PROJECT TOTAL	3,161	400	340		3,283
	GRAND TOTAL	3,161	400	340		3,283
	SAY	3,165	400			

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

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

LINE	LOCATION	ASPHALT REMOVAL	ASPHALT BREAK-UP	CONCRETE REMOVAL	CONCRETE REMOVAL
–L3–	STA. 10+00.00 TO STA. 17+00.00	1,330.79			
	GRAND TOTAL	1,330.79			
	SAY	1,331			

"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 SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			REMOVE EXISTING GUARDRAIL	SINGLE FACED CONCRETE BARRIER RAIL	25' CLEAR SPAN (STD. 862.01)	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL-3	GREU TL-2	TYPE-III	CAT-1	B-77				NO.	PERMITTED G	PERMITTED NG				
–L3–	10+60.50	17+00.00	LT	510.79'	122.04'			10+60.50	4	7		25		0.50		1											6	BOX 604,608,612,615,618,620
			SUBTOTAL	510.79'	122.04'																						6	
			LESS DEDUCTIONS FOR ANCHORS																									
			GREU-TL 2 1 @ 25'	25.0'																								
			25' CLEAR SPAN	300.00'																								
			PROJECT TOTALS:	185.79'	122.04'											1												
			SAY	187.50'	125.00'																							
			EXTRA LENGTH GUARDRAIL POST 8' STEEL = 50 EA.																									

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RDY | 3B-4

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SITE 644 SUMMARY OF EARTHWORK
IN CUBIC YARDS

SELECT GRANULAR MATERIAL = 400 CY
GEOTEXTILE FOR SOIL STABILIZATION = 400 SY

SITE NUMBER	LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
644	–L3– STA. 17+00 TO –L3– STA. 25+00	571		1,536	965	
	PROJECT SUBTOTAL	571		1,536	965	
	LOSS DUE TO CLEARING AND GRUBBING	–50			50	
	ADDITIONAL UNDERCUT		400			400
	PROJECT TOTAL	521	400	1,536	1,015	400
	EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				51	
	GRAND TOTAL	521	400	1,536	1,066	400
	SAY	525	400		1,070	

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

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS					
LINE	LOCATION	ASPHALT REMOVAL	ASPHALT BREAK-UP	CONCRETE REMOVAL	CONCRETE REMOVAL
–L3–	STA. 17+00.00 TO STA. 25+00.00	1,096.63			
	GRAND TOTAL	1,096.63			
	SAY	1,097			

"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 SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			REMOVE EXISTING GUARDRAIL	SINGLE FACED CONCRETE BARRIER RAIL	25' CLEAR SPAN (STD. 862.01)	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL-3	GREU TL-2	TYPE-III	CAT-1	B-77				NO.	PERMITTED G	PERMITTED NG				
–L3–	17+00.00	25+00.00	LT	811.87'			44+36.48	10+60.50	4	7																		4	BOX 625,632,701,703
			SUBTOTAL	811.87'																								4	
			LESS DEDUCTIONS FOR ANCHORS																										
			25' CLEAR SPAN	200.00'																									
			PROJECT TOTALS:	611.87'																									
			SAY	612.50'																									
			EXTRA LENGTH GUARDRAIL POST 8' STEEL = 98 EA.																										

DFI8314.2045155W03294
RDY | 3B-5

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Raleigh, NC, 27609
License No: C-3097

SITE 641 SUMMARY OF EARTHWORK
IN CUBIC YARDS

SELECT GRANULAR MATERIAL = 400 CY
GEOTEXTILE FOR SOIL STABILIZATION = 400 SY

SITE NUMBER	LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
641	–L3– STA. 25+00 TO –L3– STA. 31+50	382		836	454	
	PROJECT SUBTOTAL	382		836	454	
	LOSS DUE TO CLEARING & GRUBBING	–50			50	
	ADDITIONAL UNDERCUT		400			400
	PROJECT TOTAL	332	400	836	504	400
	EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				25	
	GRAND TOTAL	332	400	836	529	400
	SAY	335	400		530	

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

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

LINE	LOCATION	ASPHALT REMOVAL	ASPHALT BREAK-UP	CONCRETE REMOVAL	CONCRETE REMOVAL
–L3–	STA. 25+00.00 TO STA. 31+50.00	997.93			
	GRAND TOTAL	997.93			
	SAY	998			

"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 SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			REMOVE EXISTING GUARDRAIL	SINGLE FACED CONCRETE BARRIER RAIL	25' CLEAR SPAN (STD. 862.01)	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL-3	GREU TL-2	TYPE-III	CAT-1	B-77				NO.	PERMITTED G	PERMITTED NG				
–L3–	25+00.00	31+50.00	LT	573.91'	84.75'		44+36.48	10+60.50	4	7																		4	BOX 708,714,711,717
			SUBTOTAL	573.91'	84.75'																							4	
			LESS DEDUCTIONS FOR ANCHORS																										
			25' CLEAR SPAN	200.00'																									
			PROJECT TOTALS:	373.91'	84.75'																								
			SAY	375.00'	87.50'																								
			EXTRA LENGTH GUARDRAIL POST 8' STEEL = 74 EA.																										

DFI8314.2045155W03294
RDY | 3B-6

Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27609
License No: C-3097

SITE 670 SUMMARY OF EARTHWORK
IN CUBIC YARDS

SELECT GRANULAR MATERIAL = 400 CY
GEOTEXTILE FOR SOIL STABILIZATION = 400 SY

SITE NUMBER	LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
670	–L3– STA. 31+50 TO –L3– STA. 38+50	271		1,236	965	
PROJECT SUBTOTAL		271		1,236	965	
LOSS DUE TO CLEARING & GRUBBING		–50			50	
ADDITIONAL UNDERCUT			400			400
PROJECT TOTAL		221	400	1,236	1,015	400
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT					51	
GRAND TOTAL		221	400	1,236	1,066	400
SAY		225	400		1,070	

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

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS					
LINE	LOCATION	ASPHALT REMOVAL	ASPHALT BREAK-UP	CONCRETE REMOVAL	CONCRETE REMOVAL
–L3–	STA. 31+50.00 TO STA. 38+50.00	913.36			
GRAND TOTAL		913.36			
SAY		914			

"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 SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			REMOVE EXISTING GUARDRAIL	SINGLE FACED CONCRETE BARRIER RAIL	25' CLEAR SPAN (STD. 862.01)	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL-3	GREU TL-2	TYPE-III	CAT-1	B-77				PERMITTED NO.	PERMITTED G	PERMITTED NG				
–L3–	31+50.00	38+50.00	LT	453.20'	244.82'		44+36.48	10+60.50	4	7																	5	BOX 721,726,728,731,806
			SUBTOTAL	453.20'	244.82'																						5	
			LESS DEDUCTIONS FOR ANCHORS																									
			25' CLEAR SPAN	250.00'																								
			PROJECT TOTALS:	203.20'	244.82'																							
			SAY	212.50'	250.00'																							
			EXTRA LENGTH GUARDRAIL POST 8' STEEL = 74 EA.																									

DFI8314.2045155W03294
RDY | 3B-7

Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27609
License No: C-3097

SITE 643 SUMMARY OF EARTHWORK
IN CUBIC YARDS

SELECT GRANULAR MATERIAL = 400 CY
GEOTEXTILE FOR SOIL STABILIZATION = 400 SY

SITE NUMBER	LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
643	–L3– STA. 38+50 TO –L3– STA. 44+30	1,302		1,113		189
PROJECT SUBTOTAL		1,302		1,113		189
LOSS DUE TO CLEARING & GRUBBING		–50				–50
ADDITIONAL UNDERCUT			400			400
PROJECT TOTAL		1,252	400	1,113		539
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT						
GRAND TOTAL		1,252	400	1,113		539
SAY		1,255	400			

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

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS					
LINE	LOCATION	ASPHALT REMOVAL	ASPHALT BREAK–UP	CONCRETE REMOVAL	CONCRETE REMOVAL
–L3–	STA. 38+50.00 TO STA. 44+31.01	963.07			
	GRAND TOTAL	963.07			
	SAY	964			

"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 SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			REMOVE EXISTING GUARDRAIL	SINGLE FACED CONCRETE BARRIER RAIL	25' CLEAR SPAN (STD. 862.01)	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL–3	GREU TL–2	TYPE–III	CAT–1	B–77				PERMITTED						
																							NO.	G	NG				
–L3–	38+50.00	44+36.48	LT	595.52'			44+36.48		4	7	25		0.50			1												3	BOX 807,808,812
			SUBTOTAL	595.52'																								3	
			LESS DEDUCTIONS FOR ANCHORS																										
			GREU–TL 2 1 @ 25'	25.0'																									
			25' CLEAR SPAN	150.00'																									
			PROJECT TOTALS:	420.52'												1													
			SAY	425.00'																									
			EXTRA LENGTH GUARDRAIL POST 8' STEEL = 68 EA.																										

COMPUTED BY:	MB	DATE:	12/16/2025	PROJECT NO.	SHEET NO.
CHECKED BY:	CB	DATE:	12/16/2025	DF18314.2045181	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 %	C. S. PIPE 12 .064	C. S. PIPE 15 .064	C. S. PIPE 18 .064	C. S. PIPE 24 .064	R. C. PIPE CLASS IV 12	R. C. PIPE CLASS IV 15	R. C. PIPE CLASS IV 18	R. C. PIPE CLASS IV 24	R. C. PIPE CLASS IV 30	R. C. PIPE CLASS IV 36	SEALED CROSS PIPE (SEALED XP) 12	SEALED CROSS PIPE (SEALED XP) 15	SEALED CROSS PIPE (SEALED XP) 18	SEALED CROSS PIPE (SEALED XP) 24	SEALED CROSS PIPE (SEALED XP) 30	SEALED CROSS PIPE (SEALED XP) 36	RESILIENT CONNECTORS	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.
SITE 925																														
L1 10+58	22 LT	0401	0402		2230.1	2230.1				4																				
SHEET TOTALS (48" or Less)										4																				
PROJECT TOTALS (48" or Less)										4																				

LINE & STATION	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	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	C.B. MIN DEPTH STD. (SPECIAL DETAIL)	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	G.D.I. (N.S. FLAT) FRAME W/ 3 GRATES STD. 840.29	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	STEEL GRATE AND FRAME (BICYCLE) STD. 840.39	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
SITE 925																																			
L1 10+58																																			
SHEET TOTALS (48" or Less)																																			
PROJECT TOTALS (48" or Less)																																			

LINE & STATION	CONVERT EXISTING J.B. TO C.B.	CONVERT EXISTING D.I. TO C.B.	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.	CONVERT EXISTING C.B. TO J.B. W/ MH	CONVERT EXISTING D.I. TO J.B. W/ MH	CONVERT EXISTING T.B. D.I. TO T.B. J.B.	CONVERT EXISTING J.B. TO 2G.I.	CONVERT EXISTING M.H. TO D.I.	CONVERT EXISTING OTCB TO 2G.I.		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
SITE 925																		
L1 10+58															0.4465			COLLAR AND EXTEND EXIST 18" CMP
SHEET TOTALS (48" or Less)															0.4465			
PROJECT TOTALS (48" or Less)															0.4465			

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: *MB* DATE: *02/10/2026*

CHECKED BY: *CB* DATE: *02/10/2026*

PROJECT NO.	SHEET NO.
DF18314.2045155	3D-2

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)

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**

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 %	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	SEALED CROSS PIPE (SEALED XP) 12	15	18	24	30	36	42	48	RESILIENT CONNECTORS	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	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	C.B. MIN DEPTH STD. (SPECIAL DETAIL)	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	G.D.I. (N.S. FLAT) FRAME W/ 3 GRATES STD. 840.29	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	STEEL GRATE AND FRAME (BICYCLE) STD. 840.39	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 J.B. TO C.B.	CONVERT EXISTING D.I. TO C.B.	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.	CONVERT EXISTING C.B. TO J.B. W/ MH	CONVERT EXISTING D.I. TO J.B. W/ MH	CONVERT EXISTING T.B. D.I. TO T.B. J.B.	CONVERT EXISTING J.B. TO 2G.I.	CONVERT EXISTING M.H. TO D.I.	CONVERT EXISTING OTCB TO 2G.I.		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
SITE 821																																																																																				
L2 14+67	25 RT	0501	0502		2728.0	2726.5				32																																																																									OEP
L2 14+70	12 LT	0502		2729.9																								1																1									1																														
		0502	0503		2725.6	2725.6												12																																																																SEALED XP
SHEET TOTALS (48" or Less)										32								12										1																1									1																														
PROJECT TOTALS (48" or Less)										32								12										1																1									1																														

COMPUTED BY:	MB	DATE:	02/10/2026	PROJECT NO.	SHEET NO.
CHECKED BY:	CB	DATE:	02/10/2026	DF18314.2045222	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 SIZE THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	R. C. PIPE CLASS IV								SEALED CROSS PIPE (SEALED XP)								RESILIENT CONNECTORS	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)		
			FROM	TO	FT.	FT.	FT.	%	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48		CY	CY	MASONRY CY	0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.
SITE 642																															
L3 10+80	11	RT	0601		2602.4																								1		
			0601	0602		2599.4	2599.1			54																					
L3 11+35	11	RT	0602		2602.1																								1		
			0602	0603		2599.1	2598.9			37																					
L3 11+72	11	RT	0603		2602.1																								1		
			0603	0604		2598.9	2598.1			27																					
L3 11+72	16	LT	0604		2601.5																								1		
			0604	0605		2598.1	2598.1											8							1						
L3 12+55	18	RT	0606		2601.7																					4.500					
			0606	0608		2598.0	2596.1															84			1						
L3 12+52	16	LT	0608		2600.8																								1	4.8	
			0608	0609		2591.0	2591.0																	4	1						
L3 13+59	16	LT	0612		2600.4																								1	0.4	
			0612	0613		2595.0	2595.0											8							1						
L3 14+50	11	RT	0614		2599.0																								1		
			0614	0615		2596.0	2595.4			28																					
L3 14+49	16	LT	0615		2599.0																								1		
			0615	0616		2595.3	2595.3											8							1						
L3 15+48	11	RT	0617		2593.6																								1		
			0617	0618		2590.4	2590.2			28																					
L3 15+48	16	LT	0618		2593.0																								1		
			0618	0623		2588.5	2588.5											8							1						
L3 16+55	16	LT	0620		2586.4																								1	0.5	
			0620	0621		2580.9	2580.9											4							1						
SHEET TOTALS (48" or Less)										174								36				84		4	7	4.500			11	5.6	
PROJECT TOTALS (48" or Less)										174								36				84		4	7	4.500			11	5.6	
																														TOTAL	5.6

LINE & STATION	FROM	TO	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	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	C.B. MIN DEPTH STD. (SPECIAL DETAIL)	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	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	STEEL GRATE AND FRAME (BICYCLE) STD. 840.39	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
SITE 642																																				
L3 10+80	0601																								1					1						
	0601	0602																																		
L3 11+35	0602																								1					1						
	0602	0603																																		
L3 11+72	0603																								1					1						
	0603	0604																																		
L3 11+72	0604													1									1													
	0604	0605																																		
L3 12+55	0606																																			
	0606	0608																																		
L3 12+52	0608												1									1	1													
	0608	0609																																		
L3 13+59	0612													1									1													
	0612	0613																																		
L3 14+50	0614																								1					1						
	0614	0615																																		
L3 14+49	0615													1									1													
	0615	0616																																		
L3 15+48	0617																								1					1						
	0617	0618																																		
L3 15+48	0618													1									1													
	0618	0623																																		
L3 16+55	0620													1									1													
	0620	0621																																		
SHEET TOTALS (48" or Less)													1	5								1	11					5								
PROJECT TOTALS (48" or Less)													1	5								1	11					5								

LINE & STATION	FROM	TO	CONVERT EXISTING J.B. TO C.B.	CONVERT EXISTING D.I. TO C.B.	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.	CONVERT EXISTING C.B. TO J.B. W/ MH	CONVERT EXISTING D.I. TO J.B. W/ MH	CONVERT EXISTING T.B. D.I. TO T.B. J.B.	CONVERT EXISTING J.B. TO 2G.I.	CONVERT EXISTING M.H. TO D.I.	CONVERT EXISTING OTCB TO 2G.I.		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
SITE 642																				
L3 10+80	0601																			
	0601	0602																		
L3 11+35	0602																			
	0602	0603																		
L3 11+72	0603																			
	0603	0604																		
L3 11+72	0604																			
	0604	0605																		SEALED XP
L3 12+55	0606																			HEADWALL - DUAL 36" RCP
	0606	0608																		(2) - 36" RCP; SEALED XP
L3 12+52	0608																			
	0608	0609																		SEALED XP
L3 13+59	0612																			
	0612	0613																		SEALED XP
L3 14+50	0614																			
	0614	0615																		
L3 14+49	0615																			
	0615	0616																		SEALED XP
L3 15+48	0617																			
	0617	0618																		
L3 15+48	0618																			
	0618	0623																		SEALED XP
L3 16+55	0620																			
	0620	0621																		SEALED XP
SHEET TOTALS (48" or Less)																				
PROJECT TOTALS (48" or Less)																				

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:	MB	DATE:	02/03/2026	PROJECT NO.	SHEET NO.
CHECKED BY:	CB	DATE:	02/03/2026	DF18314.2045223	3D-4

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)

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**

LINE & STATION SIZE THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER		TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	R. C. PIPE CLASS IV								SEALED CROSS PIPE (SEALED XP)								RESILIENT CONNECTORS
		FROM	TO					12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	
SITE 644																								
L3 19+07	11 RT	0619		2573.5																				
		0619	0622		2570.2	2569.8			49															
L3 19+57	11 RT	0622		2572.7																				
		0622	0624		2569.7	2569.0			23															
L3 19+80	11 RT	0624		2572.4																				
		0624	0625		2568.9	2568.7			28															
L3 19+80	16 LT	0625		2571.9																				
		0625	0626		2562.1	2562.1											8							1
L3 22+05	11 RT	0627		2565.8																				
		0627	0628		2562.3	2561.0				28														
L3 22+31	11 RT	0628		2564.6																				
		0628	0629		2560.9	2560.1				20														
L3 22+51	11 RT	0629		2563.6																				
		0629	0631		2559.6	2558.2				36														
L3 22+85	11 RT	0631		2562.2																				
		0631	0632		2558.1	2558.0				28														
L3 22+85	16 LT	0632		2561.6																				
		0632	0633		2553.6	2553.6												8						1
L3 24+40	16 LT	0701		2555.4																				
		0701	0702		2551.5	2551.5											8							1
L3 24+84	16 LT	0703		2553.2																				
		0703	0704		2545.1	2545.1											8							1
SHEET TOTALS (48" or Less)									100	112							24	8						4
PROJECT TOTALS (48" or Less)									100	112							24	8						4

LINE & STATION	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	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	C.B. MIN DEPTH STD. (SPECIAL DETAIL)	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	G.D.I. (N.S. FLAT) FRAME W/ 3 GRATES STD. 840.29
SITE 644																																
L3 19+07	0619					1																									1	
	0619	0622																														
L3 19+57	0622					1																									1	
	0622	0624																														
L3 19+80	0624					1																									1	
	0624	0625																														
L3 19+80	0625					1	4.8														1										1	
	0625	0626																														
L3 22+05	0627					1																									1	
	0627	0628																														
L3 22+31	0628					1																									1	
	0628	0629																														
L3 22+51	0629					1																									1	
	0629	0631																														
L3 22+85	0631					1																									1	
	0631	0632																														
L3 22+85	0632					1	3.0															1									1	
	0632	0633																														
L3 24+40	0701					1																1									1	
	0701	0702																														
L3 24+84	0703					1	3.1															1									1	
	0703	0704																														
SHEET TOTALS (48" or Less)						11	10.9														1	3									11	
PROJECT TOTALS (48" or Less)						11	10.9														1	3									11	
						TOTAL	10.9																									

LINE & STATION	FROM	TO	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	STEEL GRATE AND FRAME (BICYCLE) STD. 840.39	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 J.B. TO C.B.	CONVERT EXISTING D.I. TO C.B.	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.	CONVERT EXISTING C.B. TO J.B. W/ MH	CONVERT EXISTING D.I. TO J.B. W/ MH	CONVERT EXISTING T.B. D.I. TO T.B. J.B.	CONVERT EXISTING J.B. TO 2G.I.	CONVERT EXISTING M.H. TO D.I.	CONVERT EXISTING OTCB TO 2G.I.		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
SITE 644																															
L3 19+07	0619						1																								
	0619	0622																													
L3 19+57	0622						1																								
	0622	0624																													
L3 19+80	0624						1																								
	0624	0625																													
L3 19+80	0625																														21	REMOVE 21 LF OF EXIST. 18" CMP
	0625	0626																													SEALED XP
L3 22+05	0627						1																								
	0627	0628																													
L3 22+31	0628						1																								
	0628	0629																													
L3 22+51	0629						1																								
	0629	0631																													
L3 22+85	0631						1																								
	0631	0632																													
L3 22+85	0632																														
	0632	0633																													SEALED XP
L3 24+40	0701																														
	0701	0702																													SEALED XP
L3 24+84	0703																														
	0703	0704																													SEALED XP
SHEET TOTALS (48" or Less)							7																							21	
PROJECT TOTALS (48" or Less)							7																							21	

COMPUTED BY: MB DATE: 02/03/2026

CHECKED BY: CB DATE: 02/03/2026

PROJECT NO. DF18314.2045224

SHEET NO. 3D-5

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)

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**

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 %	R. C. PIPE CLASS IV 12	R. C. PIPE CLASS IV 15	R. C. PIPE CLASS IV 18	R. C. PIPE CLASS IV 24	R. C. PIPE CLASS IV 30	R. C. PIPE CLASS IV 36	R. C. PIPE CLASS IV 42	R. C. PIPE CLASS IV 48	SEALED CROSS PIPE (SEALED XP) 12	SEALED CROSS PIPE (SEALED XP) 15	SEALED CROSS PIPE (SEALED XP) 18	SEALED CROSS PIPE (SEALED XP) 24	SEALED CROSS PIPE (SEALED XP) 30	SEALED CROSS PIPE (SEALED XP) 36	SEALED CROSS PIPE (SEALED XP) 42	SEALED CROSS PIPE (SEALED XP) 48	RESILIENT CONNECTORS
SITE 641																								
L3 26+28	11 RT	0705		2544.0																				
		0705	0706		2540.8	2537.4			52															
L3 26+79	11 RT	0706		2540.6																				
		0706	0707		2537.3	2534.4			75															
L3 27+54	11 RT	0707		2537.4																				
		0707	0708		2534.3	2533.6			28															
L3 27+54	16 LT	0708		2536.9																				
		0708	0709		2531.1	2531.0										8								1
		0710	0714		2531.6	2531.1				40														
L3 29+28	16 LT	0711		2534.1																				
		0711	0734		2526.1	2526.1										8								1
L3 28+67	16 LT	0714		2534.2																				
		0714	0715		2525.0	2525.0											8							1
L3 30+97	11 RT	0736		2533.3																				
		0736	0716		2530.2	2529.9			41															
L3 31+38	11 RT	0716		2533.1																				
		0716	0717		2529.8	2529.5			28															
L3 31+38	16 LT	0717		2532.0																				
		0717	0718		2525.1	2525.1										8								1
SHEET TOTALS (48" or Less)									224	40						24	8							4
PROJECT TOTALS (48" or Less)									224	40						24	8							4

LINE & STATION	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	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	C.B. MIN DEPTH STD. (SPECIAL DETAIL)	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
SITE 641																							
L3 26+28	0705					1																	
	0705	0706																					
L3 26+79	0706					1																	
	0706	0707																					
L3 27+54	0707					1																	
	0707	0708																					
L3 27+54	0708					1	0.8															1	
	0708	0709																					
	0710	0714																					
L3 29+28	0711					1	3.0															1	
	0711	0734																					
L3 28+67	0714					1	4.2															1	
	0714	0715																					
L3 30+97	0736					1																	
	0736	0716																					
L3 31+38	0716					1																	
	0716	0717																					
L3 31+38	0717					1	1.9															1	
	0717	0718																					
SHEET TOTALS (48" or Less)						9	9.7															4	
PROJECT TOTALS (48" or Less)						9	9.7															4	

TOTAL 9.7

LINE & STATION	FROM	TO	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	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	STEEL GRATE AND FRAME (BICYCLE) STD. 840.39	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 J.B. TO C.B.	CONVERT EXISTING D.I. TO C.B.	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.	CONVERT EXISTING C.B. TO J.B. W/ MH	CONVERT EXISTING D.I. TO J.B. W/ MH	CONVERT EXISTING T.B. D.I. TO T.B. J.B.	CONVERT EXISTING J.B. TO 2G.I.	CONVERT EXISTING M.H. TO D.I.	CONVERT EXISTING OTCB TO 2G.I.		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
SITE 641																																							
L3 26+28	0705									1					1																								
	0705	0706																																					
L3 26+79	0706									1					1																								
	0706	0707																																					
L3 27+54	0707									1					1																								
	0707	0708																																					
L3 27+54	0708									1																													
	0708	0709																																					SEALED XP
	0710	0714																																					OEP
L3 29+28	0711									1																													
	0711	0734																																					SEALED XP
L3 28+67	0714									1																													
	0714	0715																																					SEALED XP
L3 30+97	0736									1					1																								
	0736	0716																																					
L3 31+38	0716									1					1																								
	0716	0717																																					
L3 31+38	0717									1																													
	0717	0718																																					SEALED XP
SHEET TOTALS (48" or Less)										9					5																								
PROJECT TOTALS (48" or Less)										9					5																								

COMPUTED BY:	MB	DATE:	02/03/2026	PROJECT NO.	SHEET NO.
CHECKED BY:	CB	DATE:	02/03/2026	DF18314.2045211	3D-6

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)

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**

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 %	R. C. PIPE CLASS IV 12	R. C. PIPE CLASS IV 15	R. C. PIPE CLASS IV 18	R. C. PIPE CLASS IV 24	R. C. PIPE CLASS IV 30	R. C. PIPE CLASS IV 36	R. C. PIPE CLASS IV 42	R. C. PIPE CLASS IV 48	SEALED CROSS PIPE (SEALED XP) 12	SEALED CROSS PIPE (SEALED XP) 15	SEALED CROSS PIPE (SEALED XP) 18	SEALED CROSS PIPE (SEALED XP) 24	SEALED CROSS PIPE (SEALED XP) 30	SEALED CROSS PIPE (SEALED XP) 36	SEALED CROSS PIPE (SEALED XP) 42	SEALED CROSS PIPE (SEALED XP) 48	RESILIENT CONNECTORS	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	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	C.B. MIN DEPTH STD. (SPECIAL DETAIL)	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	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	STEEL GRATE AND FRAME (BICYCLE) STD. 840.39	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 J.B. TO C.B.	CONVERT EXISTING D.I. TO C.B.	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.	CONVERT EXISTING C.B. TO J.B. W/ MH	CONVERT EXISTING D.I. TO J.B. W/ MH	CONVERT EXISTING T.B. D.I. TO T.B. J.B.	CONVERT EXISTING J.B. TO 2G.I.	CONVERT EXISTING M.H. TO D.I.	CONVERT EXISTING OTCB TO 2G.I.	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27 (SPECIAL DETAIL)	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
SITE 670																																																																																		
		0719	0721		2530.1	2527.1				40																																																																								OEP
L3 32+20	16 LT	0721		2530.0																								1	5.0	1.9														1									1																														
		0721	0722		2518.1	2518.1												8						1																																																										SEALED XP
L3 33+53	11 RT	0723		2528.1																								1																									1					1																									
		0723	0724		2525.5	2525.3			44																																																																											
		0725	0726		2522.3	2522.0				36																																																																								OEP
L3 34+10	16 LT	0726		2525.2																								1	4.7															1									1																														
		0726	0727		2515.5	2515.5												8						1																																																										SEALED XP
L3 35+13	16 LT	0728		2520.5																								1	3.3														1									1	1																														
		0728	0730		2512.2	2512.2											8							1																																																									SEALED XP
L3 35+80	16 LT	0731		2518.3																								1	5.0	8.3																							1																								1				40	SPECIAL DESIGN (EXTRA DEPTH) SEE 2C-5; REMOVE 40 LF OF EXIST. 18" CMP
		0731	0732		2500.0	2500.0											8							1																																																									SEALED XP
L3 37+85	11 RT	0733		2516.0																								1																									1					1																									
		0733	0801		2512.9	2512.8			23																																																																										
L3 38+07	11 RT	0801		2516.0																								1																									1					1																									
		0801	0805		2512.7	2512.5			35																																																																									
L3 38+42	11 RT	0805		2515.8																								1																									1					1																									
		0805	0806		2512.4	2512.2			28																																																																									
L3 38+43	16 LT	0806		2515.0																								1	5.0	1.0														1									1																														
		0806	0803		2504.0	2504.0											8							1																																																									SEALED XP
SHEET TOTALS (48" or Less)									130	76							24	16						5				9	23.0	11.2													1	3								1	9					4																				1				40	
PROJECT TOTALS (48" or Less)									130	76							24	16						5				9	23.0	11.2													1	3								1	9					4																				1				40	
																													TOTAL	37.56																																																						

Docusign Envelope ID: E8FB9089-1599-4565-A561-754C77D38618

COMPUTED BY:	MB	DATE:	02/03/2026	PROJECT NO.	SHEET NO.
CHECKED BY:	CB	DATE:	02/03/2026	DF18314.2045220	3D-7

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		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	R. C. PIPE CLASS IV								SEALED CROSS PIPE (SEALED XP)								RESILIENT CONNECTORS	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02
SIZE								12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48						A	B	
THICKNESS OR GAUGE		FROM	TO	FT.	FT.	FT.	%																		CY	CY	MASONRY CY	0' THRU 5' EACH	5' THRU 10' LIN. FT.	10' AND ABOVE LIN. FT.	
SITE 643																															
L3 39+27	16 LT	0807		2513.4																								1	1.0		
		0807	0815		2507.4	2507.4											8							1							
L3 39+69	16 LT	0808		2512.4																								1	3.4		
		0808	0809		2504.0	2504.0											8							1							
L3 41+69	11 RT	0810		2506.7																								1			
		0810	0811		2503.4	2501.0			152																						
L3 43+20	11 RT	0811		2504.0																								1			
		0811	0812		2500.9	2500.4			28																						
L3 43+20	16 LT	0812		2503.9																								1			
		0812	0813		2500.3	2500.3											8							1							
SHEET TOTALS (48" or Less)									180								24							3				5	4.4		
PROJECT TOTALS (48" or Less)									180								24							3				5	4.4		
																													TOTAL	4.4	

LINE & STATION	FROM	TO	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE				CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	C.B. MIN DEPTH STD. (SPECIAL DETAIL)	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	G.D.I. (N.S. FLAT) FRAME W/ 3 GRATES STD. 840.29
			E	F	G		D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																	
SITE 643																									
L3 39+27	0807														1									1	
	0807	0815																							
L3 39+69	0808														1									1	
	0808	0809																							
L3 41+69	0810																							1	
	0810	0811																							
L3 43+20	0811																							1	
	0811	0812																							
L3 43+20	0812														1									1	
	0812	0813																							
SHEET TOTALS (48" or Less)															3									5	
PROJECT TOTALS (48" or Less)															3									5	

LINE & STATION	FROM	TO	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	STEEL GRATE AND FRAME (BICYCLE) STD. 840.39	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 J.B. TO C.B.	CONVERT EXISTING D.I. TO C.B.	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.	CONVERT EXISTING C.B. TO J.B. W/ MH	CONVERT EXISTING D.I. TO J.B. W/ MH	CONVERT EXISTING T.B. D.I. TO T.B. J.B.	CONVERT EXISTING J.B. TO 2G.I.	CONVERT EXISTING M.H. TO D.I.	CONVERT EXISTING OTCB TO 2G.I.		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
SITE 643																															
L3 39+27	0807																														
	0807	0815																													SEALED XP
L3 39+69	0808																														
	0808	0809																													SEALED XP
L3 41+69	0810						1																							25	REMOVE 25 LF OF EXIST. 18" CMP
	0810	0811																													
L3 43+20	0811						1																								
	0811	0812																													
L3 43+20	0812																														
	0812	0813																													SEALED XP
SHEET TOTALS (48" or Less)							2																							25	
PROJECT TOTALS (48" or Less)							2																							25	

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: K. de Montbrun DATE: 07/23/25
CHECKED BY: M. Walko DATE: 07/31/25

(9-17-24)

PROJECT NO.	SHEET NO.
DF18314.2045181	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	200
				TOTAL LF:	200

*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			ASU1	12	100	200	300		
			TOTAL CY/TONS/SY:		100	200**	300**	0	0

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

COMPUTED BY: K. de Montbrun DATE: 07/23/25
CHECKED BY: M. Walko DATE: 07/31/25

(9-17-24)

PROJECT NO.	SHEET NO.
DF18314.2045155	3G-2

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	200
				TOTAL LF:	200

*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			ASU1	12	100	200	300		
			TOTAL CY/TONS/SY:		100	200**	300**	0	0

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

COMPUTED BY: K. de Montbrun DATE: 07/23/25
CHECKED BY: M. Walko DATE: 07/31/25

(9-17-24)

PROJECT NO.	SHEET NO.
DF18314.2045222	3G-3

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	200
				TOTAL LF:	200

*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			ASU1	12	100	200	300		
			TOTAL CY/TONS/SY:		100	200**	300**	0	0

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

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
-L3-	1.5:1	10+00	1.5:1	17+00	RT	4		2250
							TOTAL SY:	2250

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

COMPUTED BY: K. de Montbrun DATE: 07/23/25
CHECKED BY: M. Walko DATE: 07/31/25

(9-17-24)

PROJECT NO.	SHEET NO.
DF18314.2045223	3G-4

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	200
				TOTAL LF:	200

*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			ASU1	12	100	200	300		
			TOTAL CY/TONS/SY:		100	200**	300**	0	0

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

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
-L3-	1.5:1	17+00	1.5:1	25+00	RT	4		2175
							TOTAL SY:	2175

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

COMPUTED BY: K. de Montbrun DATE: 07/23/25
CHECKED BY: M. Walko DATE: 07/31/25

(9-17-24)

PROJECT NO.	SHEET NO.
DF18314.2045224	3G-5

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	200
				TOTAL LF:	200

*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			ASU1	12	100	200	300		
			TOTAL CY/TONS/SY:		100	200**	300**	0	0

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

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
-L3-	1.5:1	25+00	1.5:1	31+50	RT	4		2150
							TOTAL SY:	2150

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

COMPUTED BY: K. de Montbrun DATE: 07/23/25
CHECKED BY: M. Walko DATE: 07/31/25

(9-17-24)

PROJECT NO.	SHEET NO.
DF18314.2045211	3G-6

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	200
				TOTAL LF:	200

*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			ASU1	12	100	200	300		
			TOTAL CY/TONS/SY:		100	200**	300**	0	0

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

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
-L3-	1.5:1	31+50	1.5:1	38+50	RT	4		1675
							TOTAL SY:	1675

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

COMPUTED BY: K. de Montbrun DATE: 07/23/25
CHECKED BY: M. Walko DATE: 07/31/25

(9-17-24)

PROJECT NO.	SHEET NO.
DF18314.2045220	3G-7

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	200
				TOTAL LF:	200

*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			ASU1	12	100	200	300		
			TOTAL CY/TONS/SY:		100	200**	300**	0	0

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

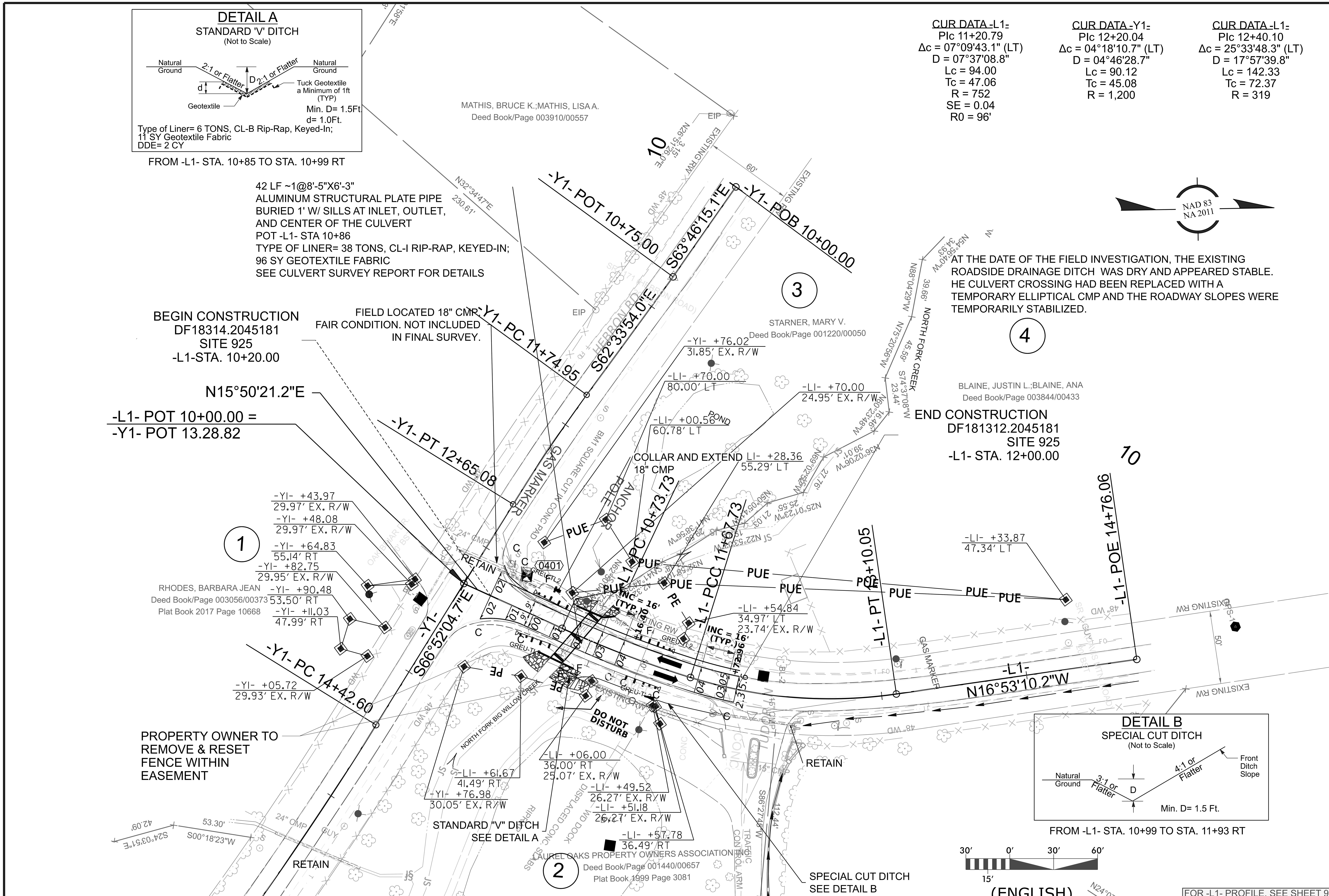
SUMMARY OF ROCK PLATING

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
-L3-	1.5:1	38+50	1.5:1	43+00	RT	4		1350
							TOTAL SY:	1350

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

SITE NO.	PARCEL NO.	PROPERTY OWNERS NAMES
925	1	BARBARA JEAN RHODES
925	2	LAUREL OAKES PROPERTY OWNERS ASSOCIATION, INC.
925	3	MARY V. STARNER
925	4	JUSTIN L. BLAINE AND ANA BLAINE
821	5	TONY QUEBBEMANN AND JULIE QUEBBEMANN
642	6	TODD WILLIAMS AND JENNIFER WILLIAMS
642	7	WXZ SG ACQUISITION LLC AN OHIO LL COMPANY
641	8	AARON THOMAS LODGE AND MICHELLE LODGE
641	9	JAMES C. JARRELL AND DEBORAH M. MACK
641	10	RYAN CHILDS AND DAVID LAWRENCE
643	11	SIXTH AVENUE PSYCHIATRIC REHABILITATION PARTNERS, INC.

CUR DATA -L1-	CUR DATA -Y1-	CUR DATA -L1-
PIc 11+20.79	PIc 12+20.04	PIc 12+40.10
Δc = 07°09'43.1" (LT)	Δc = 04°18'10.7" (LT)	Δc = 25°33'48.3" (LT)
D = 07°37'08.8"	D = 04°46'28.7"	D = 17°57'39.8"
Lc = 94.00	Lc = 90.12	Lc = 142.33
Tc = 47.06	Tc = 45.08	Tc = 72.37
R = 752	R = 1,200	R = 319
SE = 0.04		
R0 = 96'		



DETAIL A
STANDARD 'V' DITCH
(Not to Scale)
Natural Ground
2:1 or Flatter
Tuck Geotextile a Minimum of 1ft (TYP)
Geotextile
Min. D= 1.5Ft.
d= 1.0Ft.
Type of Liner= 6 TONS, CL-B Rip-Rap, Keyed-In;
11 SY Geotextile Fabric
DDE= 2 CY
FROM -L1- STA. 10+85 TO STA. 10+99 RT
42 LF ~1@8'-5"X6'-3"
ALUMINUM STRUCTURAL PLATE PIPE
BURIED 1' W/ SILLS AT INLET, OUTLET,
AND CENTER OF THE CULVERT
POT -L1- STA 10+86
TYPE OF LINER= 38 TONS, CL-I RIP-RAP, KEYED-IN;
96 SY GEOTEXTILE FABRIC
SEE CULVERT SURVEY REPORT FOR DETAILS
MATHIS, BRUCE K.;MATHIS, LISA A.
Deed Book/Page 003910/00557
BEGIN CONSTRUCTION
DF18314.2045181
SITE 925
-L1-STA. 10+20.00
FIELD LOCATED 18" CMP
FAIR CONDITION. NOT INCLUDED
IN FINAL SURVEY.
N15°50'21.2"E
-L1- POT 10+00.00 =
-Y1- POT 13.28.82
-Y1- POT 10+75.00
-Y1- POB 10+00.00
S63°46'15.1"E
-Y1- PC 11+74.95
S62°33'54.0"E
-Y1- PT 12+65.08
-Y1- PC 14+42.60
S66°52'04.7"E
STARNER, MARY V.
Deed Book/Page 001220/00050
BLAINE, JUSTIN L.;BLAINE, ANA
Deed Book/Page 003844/00433
RHODES, BARBARA JEAN
Deed Book/Page 003056/00373
Plat Book 2017 Page 10668
LAUREL OAKS PROPERTY OWNERS ASSOCIATION INC.
Deed Book/Page 001440/00657
Plat Book 1999 Page 3081
AT THE DATE OF THE FIELD INVESTIGATION, THE EXISTING ROADSIDE DRAINAGE DITCH WAS DRY AND APPEARED STABLE. HE CULVERT CROSSING HAD BEEN REPLACED WITH A TEMPORARY ELLIPTICAL CMP AND THE ROADWAY SLOPES WERE TEMPORARILY STABILIZED.
END CONSTRUCTION
DF181312.2045181
SITE 925
-L1- STA. 12+00.00
COLLAR AND EXTEND
18" CMP
-L1- PC 10+73.73
-L1- PCC 11+67.73
-L1- PT 12+10.05
-L1- POE 14+76.06
-L1-
N16°53'10.2"W
PROPERTY OWNER TO
REMOVE & RESET
FENCE WITHIN
EASEMENT
STANDARD "V" DITCH
SEE DETAIL A
SPECIAL CUT DITCH
SEE DETAIL B
RETAIN
DO NOT DISTURB
PUE
PE
GAS MARKER
EXISTING RW
NORTH FORK CREEK
NORTH FORK BIG WILLOW CREEK
DETAIL B
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground
3:1 or Flatter
4:1 or Flatter
Front Ditch Slope
Min. D= 1.5 Ft.
FROM -L1- STA. 10+99 TO STA. 11+93 RT
NAD 83
NA 2011
(ENGLISH)

FOR -L1- PROFILE, SEE SHEET 9

DF18314.2045155W03294

RDY	4

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION HENDERSON COUNTY

ROADWAY DESIGN ENGINEER
SEAL 046062
CHARLES J. YOUNG
3/19/2026

HYDRAULICS ENGINEER
SEAL 048713
COLE M. BENJAMIN
3/19/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Raleigh, NC. 27609
License No: C-3097

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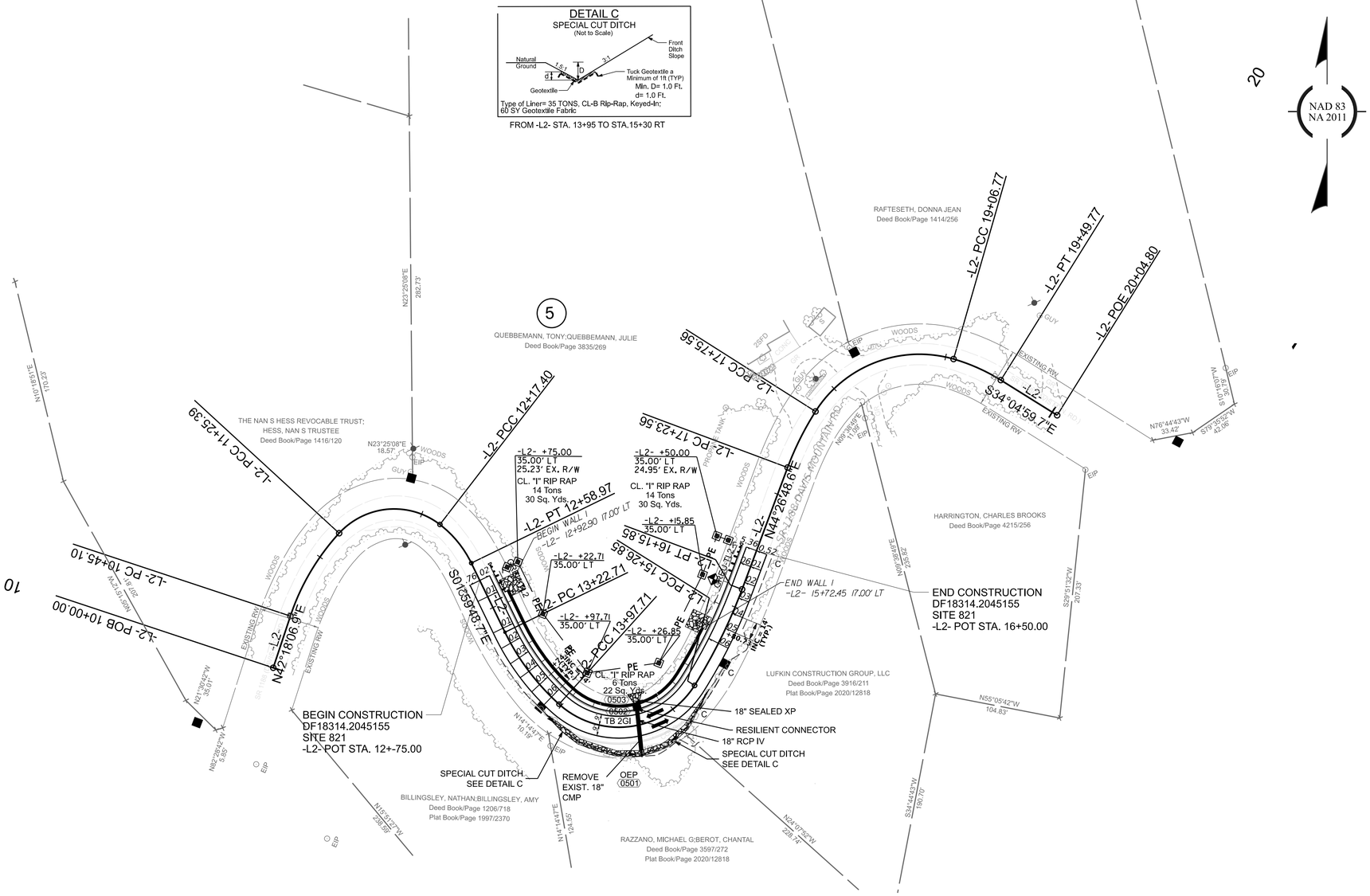

CUR DATA -L2-	CUR DATA -L2-	CUR DATA -L2-	CUR DATA -L2-	CUR DATA -L2-	CUR DATA -L2-	CUR DATA -L2-	CUR DATA -L2-	CUR DATA -L2-
PIc 10+85.85	PIc 11+82.23	PIc 12+38.56	PIc 13+60.67	PIc 14+85.88	PIc 15+71.50	PIc 17+49.66	PIc 18+52.01	PIc 19+28.41
Δc = 24°12'49.4" (RT)	Δc = 85°01'28.6" (RT)	Δc = 26°27'46.4" (RT)	Δc = 21°55'27.9" (LT)	Δc = 99°59'22.6" (LT)	Δc = 11°38'32.3" (LT)	Δc = 11°52'12.2" (RT)	Δc = 73°42'17.7" (RT)	Δc = 15°53'41.8" (RT)
D = 30°09'20.4"	D = 92°24'45.2"	D = 63°39'43.1"	D = 29°13'57.1"	D = 77°25'36.2"	D = 13°04'52.4"	D = 22°49'37.2"	D = 56°10'20.4"	D = 36°57'54.1"
Lc = 80.30	Lc = 92.01	Lc = 41.57	Lc = 75.00	Lc = 129.14	Lc = 89.00	Lc = 52.00	Lc = 131.21	Lc = 43.00
Tc = 40.76	Tc = 56.84	Tc = 21.16	Tc = 37.96	Tc = 88.17	Tc = 44.65	Tc = 26.09	Tc = 76.45	Tc = 21.64
R = 190	R = 62	R = 90	R = 196	R = 74	R = 438	R = 251	R = 102	R = 155
			SE = 0.06	SE = 0.06	SE = 0.06			
			RO = 96'	RO = 96'	RO = 96'			

FOR -L2- PROFILE, SEE SHEET 10
FOR -WALL1- PROFILE, SEE SHEET W-1

DF18314.2045155W03294

RDY	5

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HENDERSON COUNTY

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 046062 ENGINEER CHARLES J. YOUNG
2/11/2026

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 048313 ENGINEER COLE M. BENJAMIN
2/11/2026

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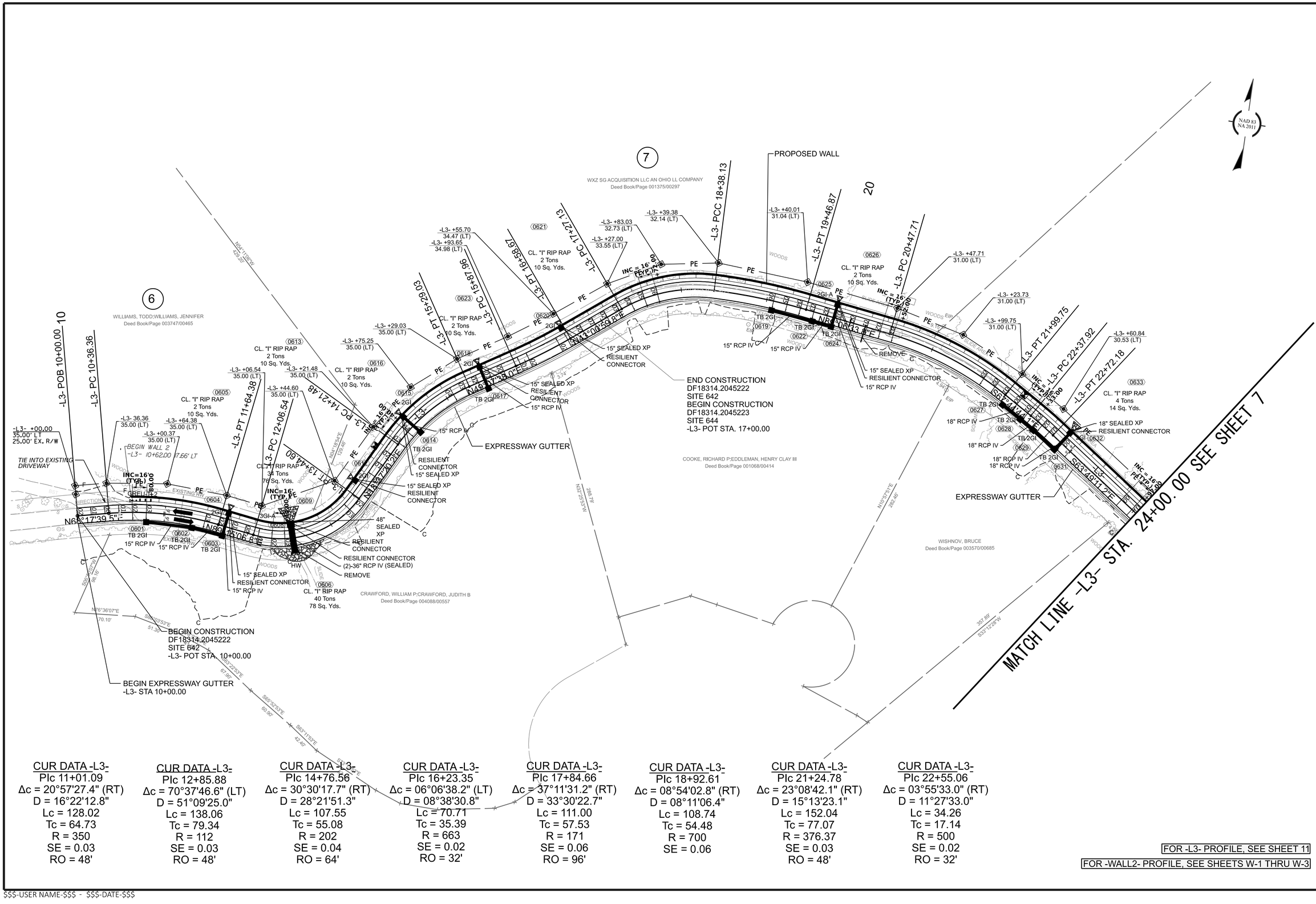

CUR DATA -L3-
PIc 11+01.09
Δc = 20°57'27.4" (RT)
D = 16°22'12.8"
Lc = 128.02
Tc = 64.73
R = 350
SE = 0.03
RO = 48'

CUR DATA -L3-
PIc 12+85.88
Δc = 70°37'46.6" (LT)
D = 51°09'25.0"
Lc = 138.06
Tc = 79.34
R = 112
SE = 0.03
RO = 48'

CUR DATA -L3-
PIc 14+76.56
Δc = 30°30'17.7" (RT)
D = 28°21'51.3"
Lc = 107.55
Tc = 55.08
R = 202
SE = 0.04
RO = 64'

CUR DATA -L3-
PIc 16+23.35
Δc = 06°06'38.2" (LT)
D = 08°38'30.8"
Lc = 70.71
Tc = 35.39
R = 663
SE = 0.02
RO = 32'

CUR DATA -L3-
PIc 17+84.66
Δc = 37°11'31.2" (RT)
D = 33°30'22.7"
Lc = 111.00
Tc = 57.53
R = 171
SE = 0.06
RO = 96'

CUR DATA -L3-
PIc 18+92.61
Δc = 08°54'02.8" (RT)
D = 08°11'06.4"
Lc = 108.74
Tc = 54.48
R = 700
SE = 0.06

CUR DATA -L3-
PIc 21+24.78
Δc = 23°08'42.1" (RT)
D = 15°13'23.1"
Lc = 152.04
Tc = 77.07
R = 376.37
SE = 0.03
RO = 48'

CUR DATA -L3-
PIc 22+55.06
Δc = 03°55'33.0" (RT)
D = 11°27'33.0"
Lc = 34.26
Tc = 17.14
R = 500
SE = 0.02
RO = 32'

FOR -L3- PROFILE, SEE SHEET 11
FOR -WALL2- PROFILE, SEE SHEETS W-1 THRU W-3

DF18314.2045155WO3294
RDY | 6

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HENDERSON COUNTY

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046062 CHARLES J. YOUNG
2/11/2026

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 048313 COLE M. BENJAMIN
2/11/2026

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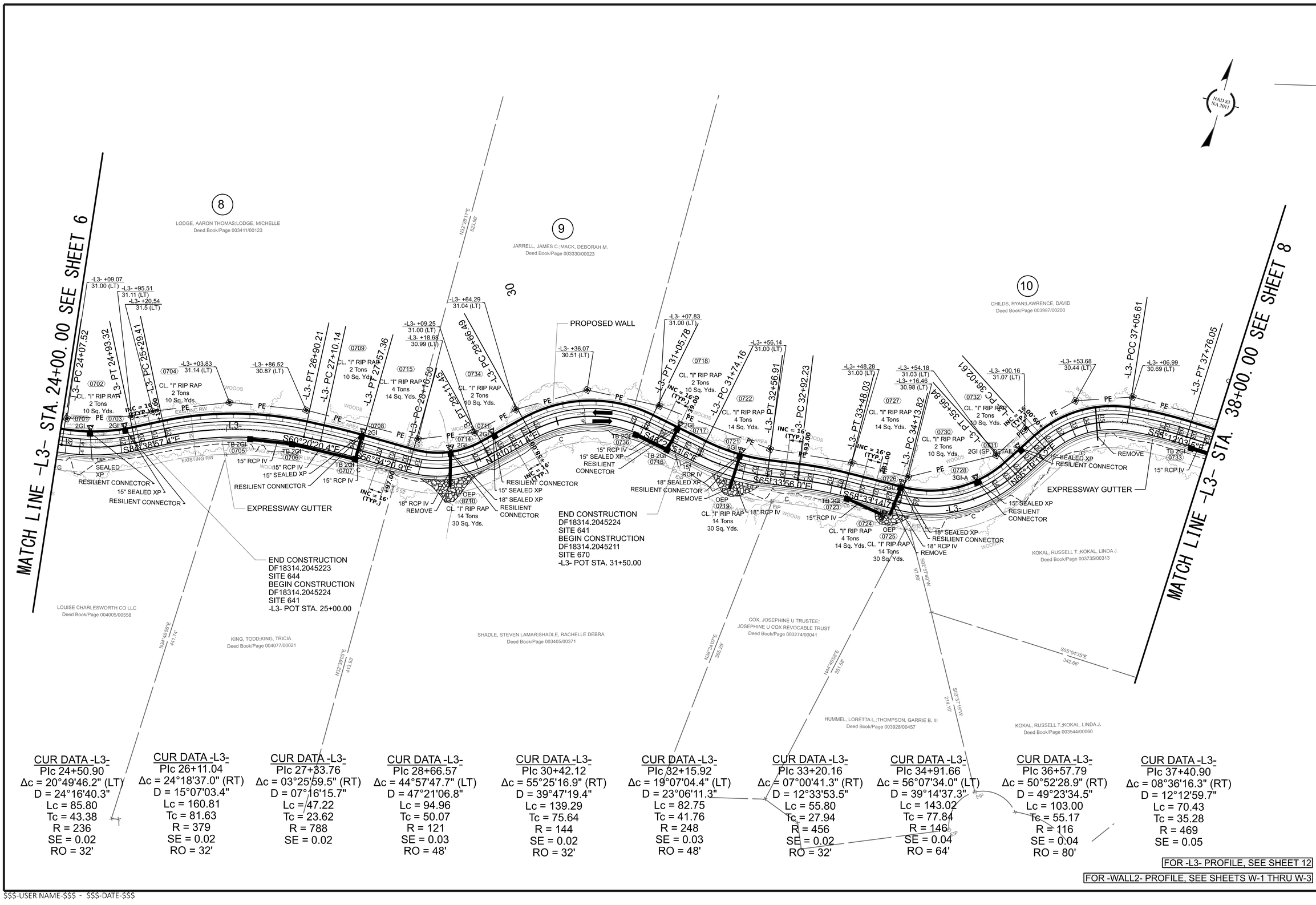

CUR DATA -L3-	CUR DATA -L3-	CUR DATA -L3-	CUR DATA -L3-	CUR DATA -L3-	CUR DATA -L3-	CUR DATA -L3-	CUR DATA -L3-	CUR DATA -L3-
PIc 24+50.90	PIc 26+11.04	PIc 27+33.76	PIc 28+66.57	PIc 30+42.12	PIc 32+15.92	PIc 33+20.16	PIc 34+91.66	PIc 36+57.79	PIc 37+40.90
Δc = 20°49'46.2" (LT)	Δc = 24°18'37.0" (RT)	Δc = 03°25'59.5" (RT)	Δc = 44°57'47.7" (LT)	Δc = 55°25'16.9" (RT)	Δc = 19°07'04.4" (LT)	Δc = 07°00'41.3" (RT)	Δc = 56°07'34.0" (LT)	Δc = 50°52'28.9" (RT)	Δc = 08°36'16.3" (RT)
D = 24°16'40.3"	D = 15°07'03.4"	D = 07°16'15.7"	D = 47°21'06.8"	D = 39°47'19.4"	D = 23°06'11.3"	D = 12°33'53.5"	D = 39°14'37.3"	D = 49°23'34.5"	D = 12°12'59.7"
Lc = 85.80	Lc = 160.81	Lc = 47.22	Lc = 94.96	Lc = 139.29	Lc = 82.75	Lc = 55.80	Lc = 143.02	Lc = 103.00	Lc = 70.43
Tc = 43.38	Tc = 81.63	Tc = 23.62	Tc = 50.07	Tc = 75.64	Tc = 41.76	Tc = 27.94	Tc = 77.84	Tc = 55.17	Tc = 35.28
R = 236	R = 379	R = 788	R = 121	R = 144	R = 248	R = 456	R = 146	R = 116	R = 469
SE = 0.02	SE = 0.02	SE = 0.02	SE = 0.03	SE = 0.02	SE = 0.03	SE = 0.02	SE = 0.04	SE = 0.04	SE = 0.05
RO = 32'	RO = 32'		RO = 48'	RO = 32'	RO = 48'	RO = 32'	RO = 64'	RO = 80'	

FOR -L3- PROFILE, SEE SHEET 12

FOR -WALL2- PROFILE, SEE SHEETS W-1 THRU W-3

DF18314.2045155WD3294

RDY | 7

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HENDERSON COUNTY

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046062 CHARLES J. YOUNG
2/11/2026

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 048313 COLE M. BENJAMIN
2/11/2026

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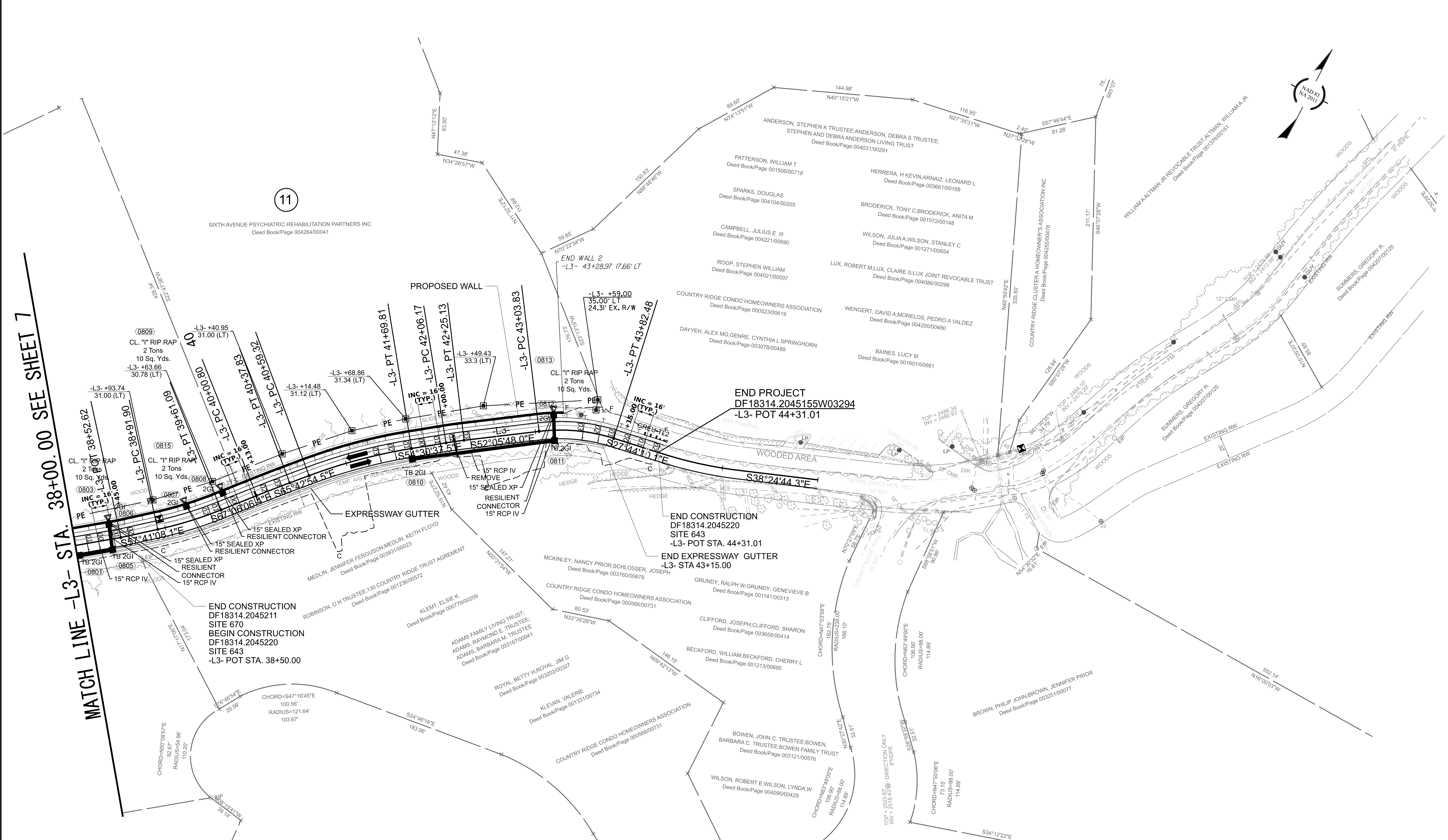

CUR DATA -L3-	CUR DATA -L3-	CUR DATA -L3-	CUR DATA -L3-	CUR DATA -L3-	CUR DATA -L3-
PIc 39+26.57	PIc 40+19.31	PIc 41+14.74	PIc 42+15.65	PIc 43+43.76	PIc 44+77.30
Δc = 09°24'58.3" (LT)	Δc = 01°23'11.9" (RT)	Δc = 11°12'16.9" (RT)	Δc = 02°24'49.5" (RT)	Δc = 24°21'38.0" (RT)	Δc = 10°40'34.2" (LT)
D = 13°36'34.0"	D = 03°44'41.4"	D = 10°08'27.0"	D = 12°43'56.6"	D = 30°58'14.5"	D = 13°15'46.5"
Lc = 69.19	Lc = 37.03	Lc = 110.49	Lc = 18.96	Lc = 78.66	Lc = 80.50
Tc = 34.67	Tc = 18.52	Tc = 55.42	Tc = 9.48	Tc = 39.93	Tc = 40.37
R = 421	R = 1,530	R = 565	R = 450	R = 185	R = 432
SE = 0.02	SE = 0.02	SE = 0.03	SE = 0.02	SE = 0.03	SE = 0.01
RO = 32'	RO = 48'		RO = 48'	RO = 96'	

FOR -L3- PROFILE, SEE SHEET 13
FOR -WALL2- PROFILE, SEE SHEETS W-1 THRU W-3

DF18314.2045155W03294

RDY | 8

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HENDERSON COUNTY

ROADWAY DESIGN ENGINEER
SEAL 046062
CHARLES J. YOUNG
2/11/2026

HYDRAULICS ENGINEER
SEAL 048313
COLE M. BENJAMIN
2/11/2026

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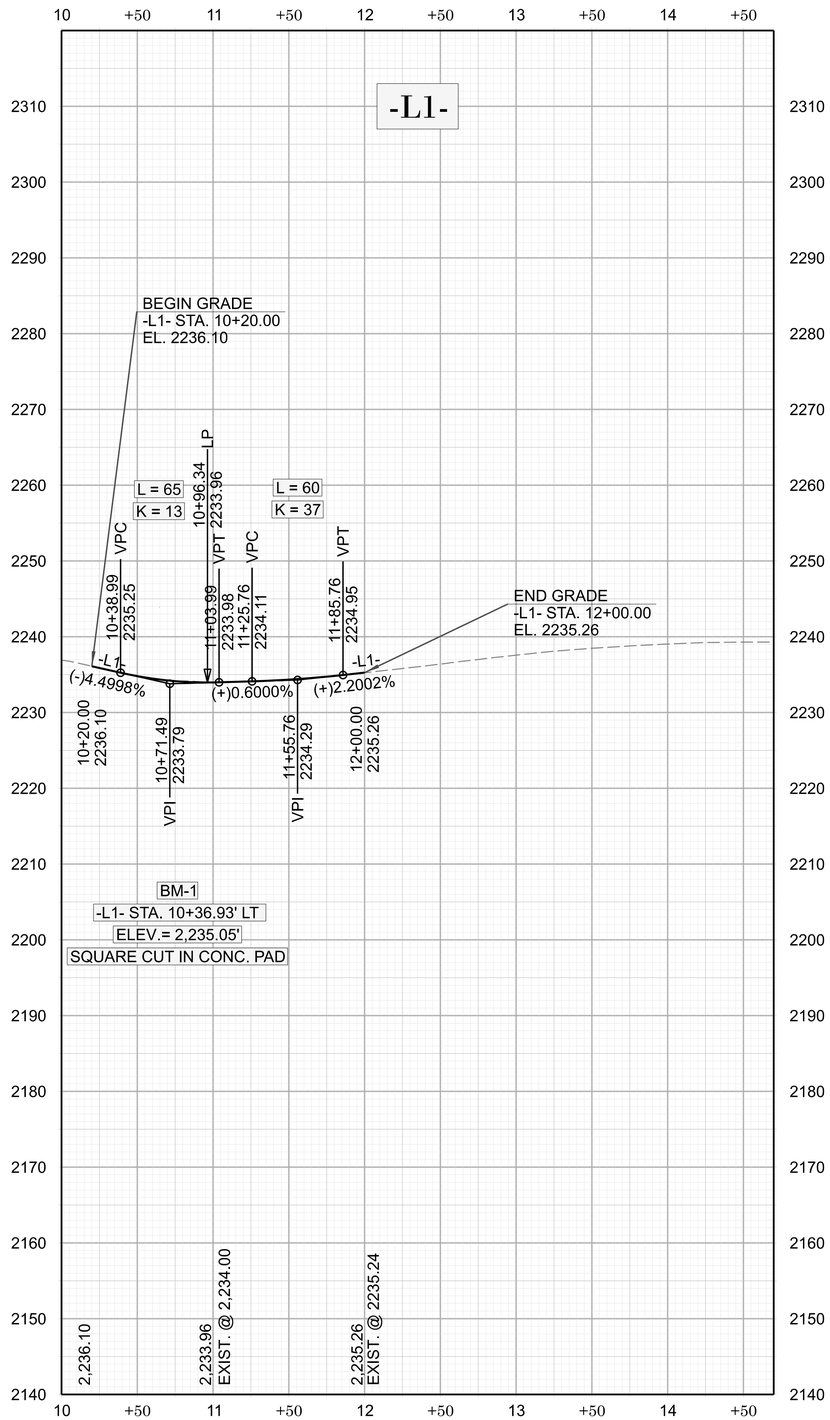
11/14/23



FOR -L1- PLAN, SEE SHEET 4

DFI8314.2045155W03294

RDY	9

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HENDERSON COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER

2/11/2026

HYDRAULICS ENGINEER

2/11/2026

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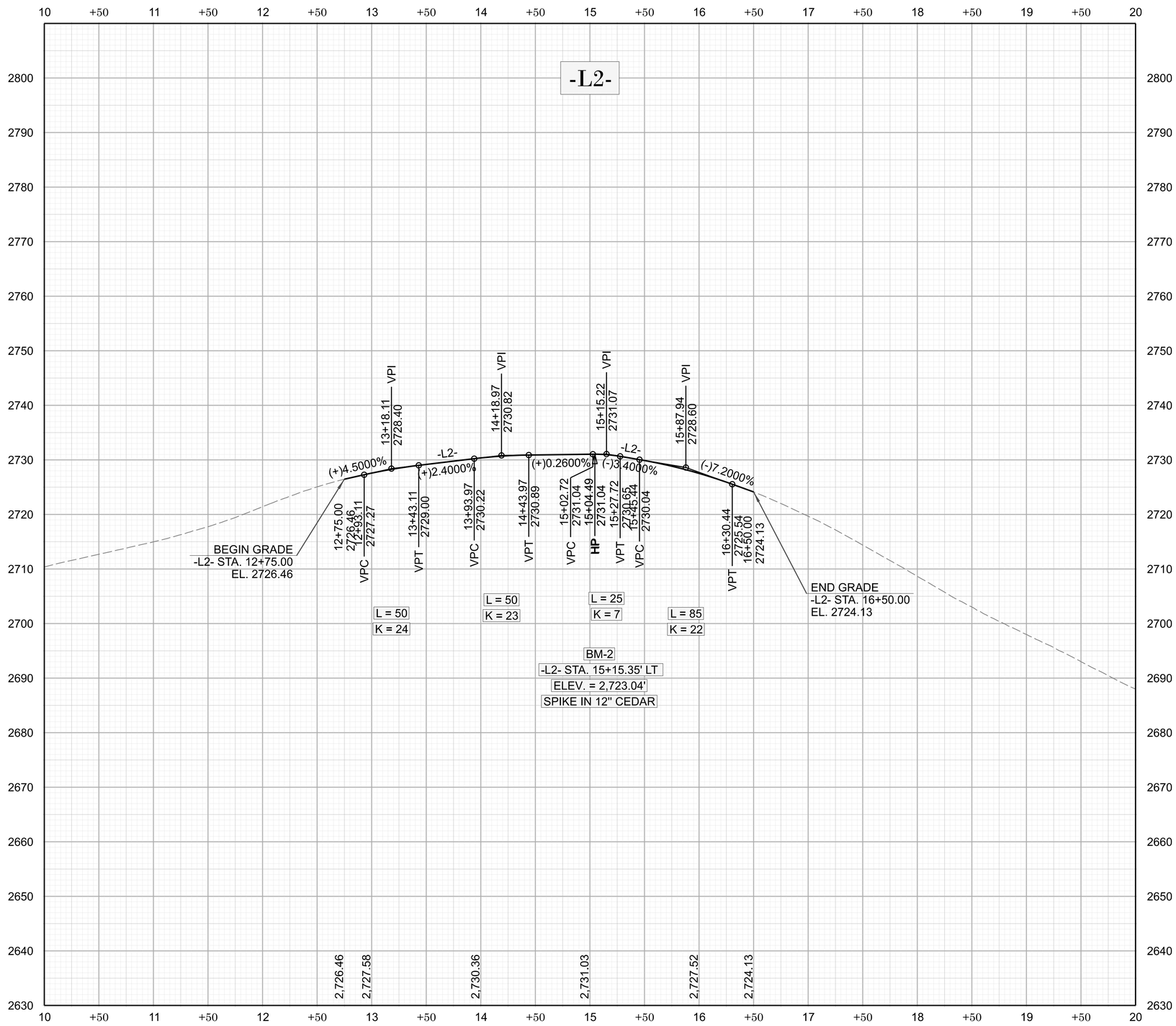


FOR -L2- PLAN, SEE SHEET 5

DFI8314.2045155W03294

RDY	10

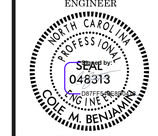
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HENDERSON COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER

2/11/2026

HYDRAULICS ENGINEER



2/11/2026

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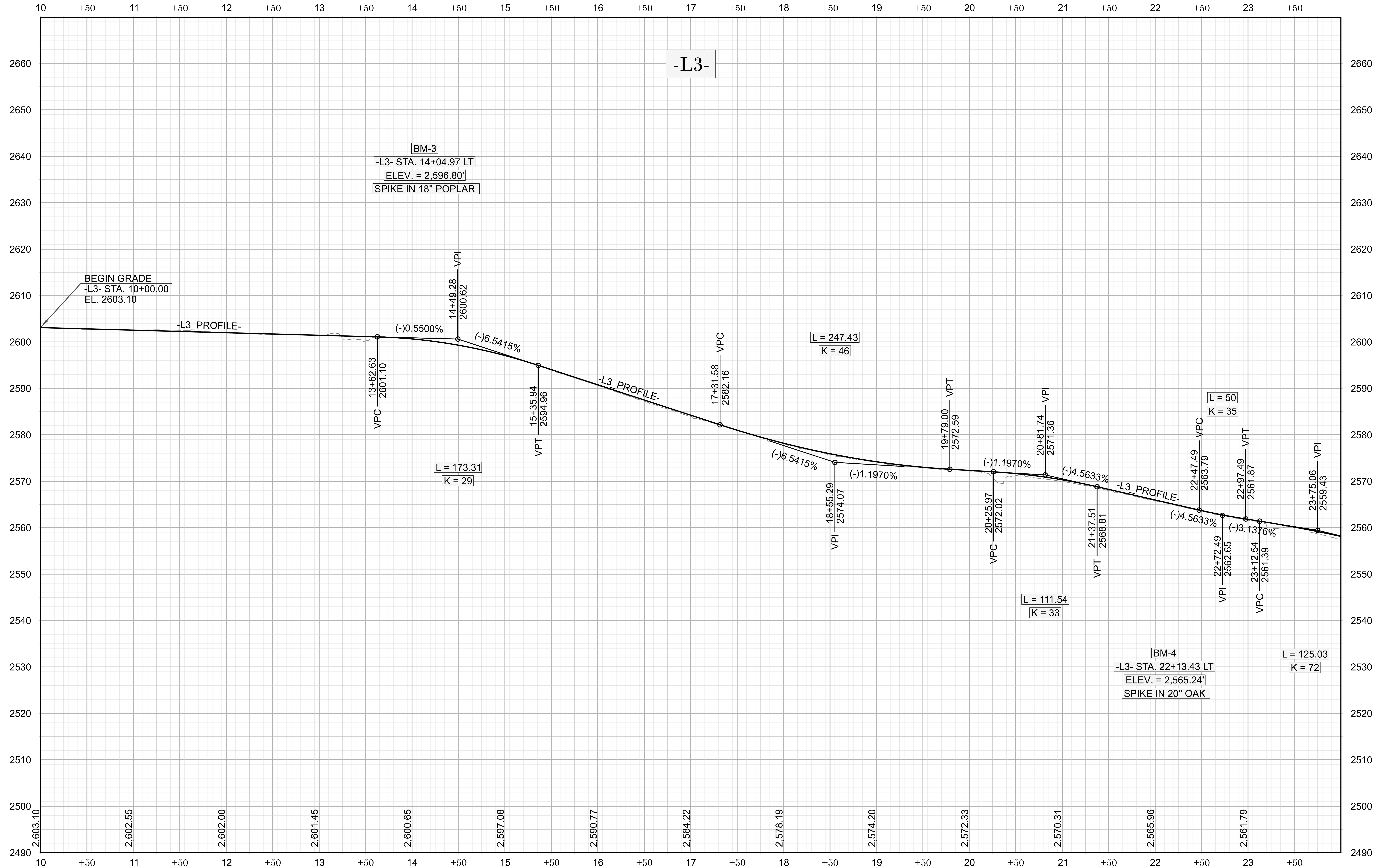
License No: C-3097

11/14/23



FOR -L3- PLAN, SEE SHEET 6

DF18314.2045155W03294

RDY	11

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HENDERSON COUNTY

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 046062 ENGINEER CHARLES J. YOUNG

2/11/2026

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 048313 ENGINEER COLE M. BENJAMIN

2/11/2026

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Johnson, Mirmiran, & Thompson Inc.
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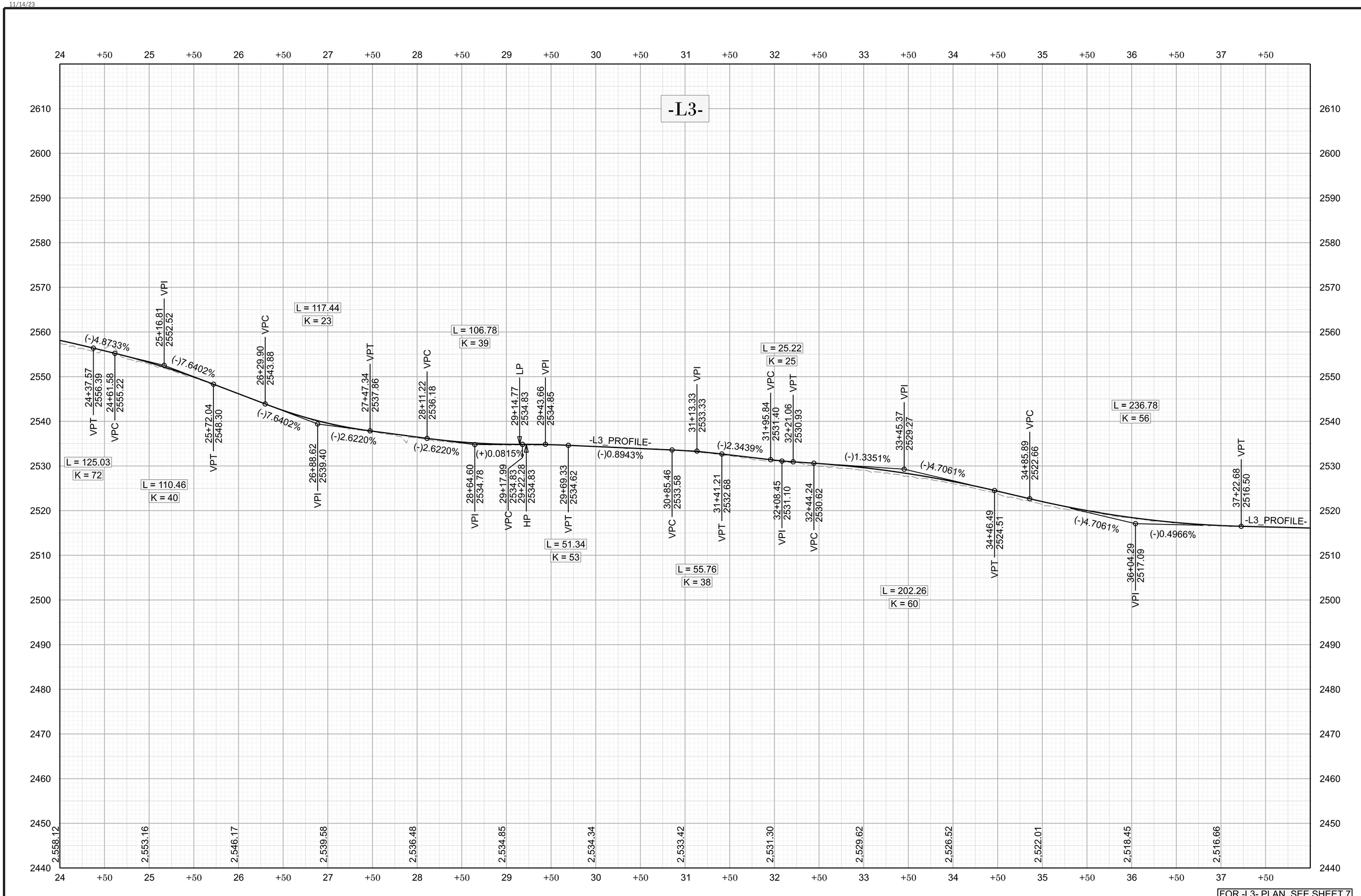
$$$-USER NAME-$$$ - $$$-DATE-$$$

11/14/23



FOR -L3- PLAN, SEE SHEET 7

DF18314.2045155W03294

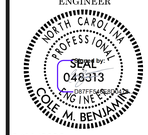
RDY	12

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HENDERSON COUNTY

ROADWAY DESIGN ENGINEER

2/11/2026

HYDRAULICS ENGINEER



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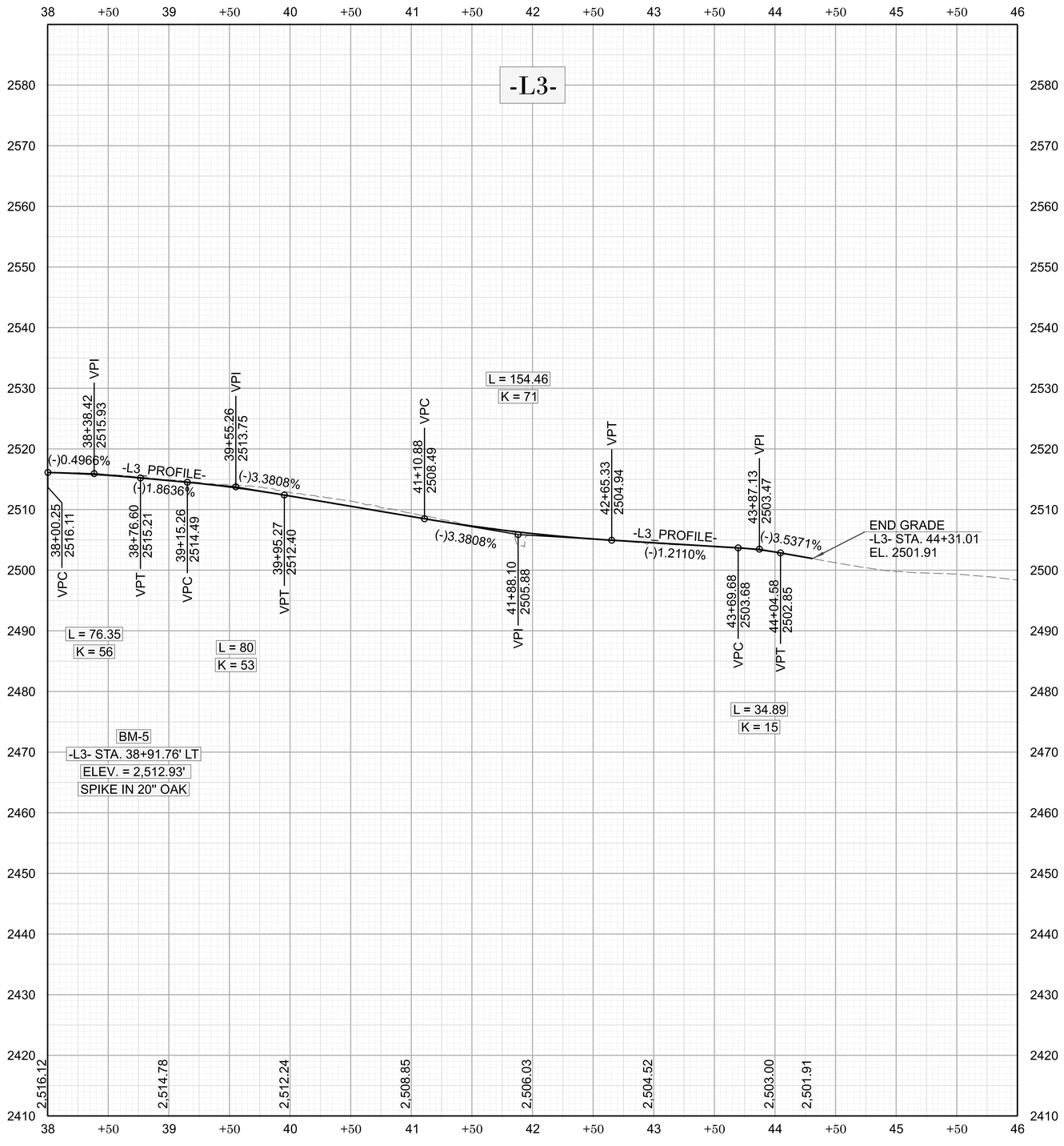
License No: C-3097

11/14/23



FOR -L3- PLAN, SEE SHEET 8

DFI8314.2045155W03294

RDY	13

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HENDERSON COUNTY

ROADWAY DESIGN ENGINEER

2/11/2026

HYDRAULICS ENGINEER

2/11/2026

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