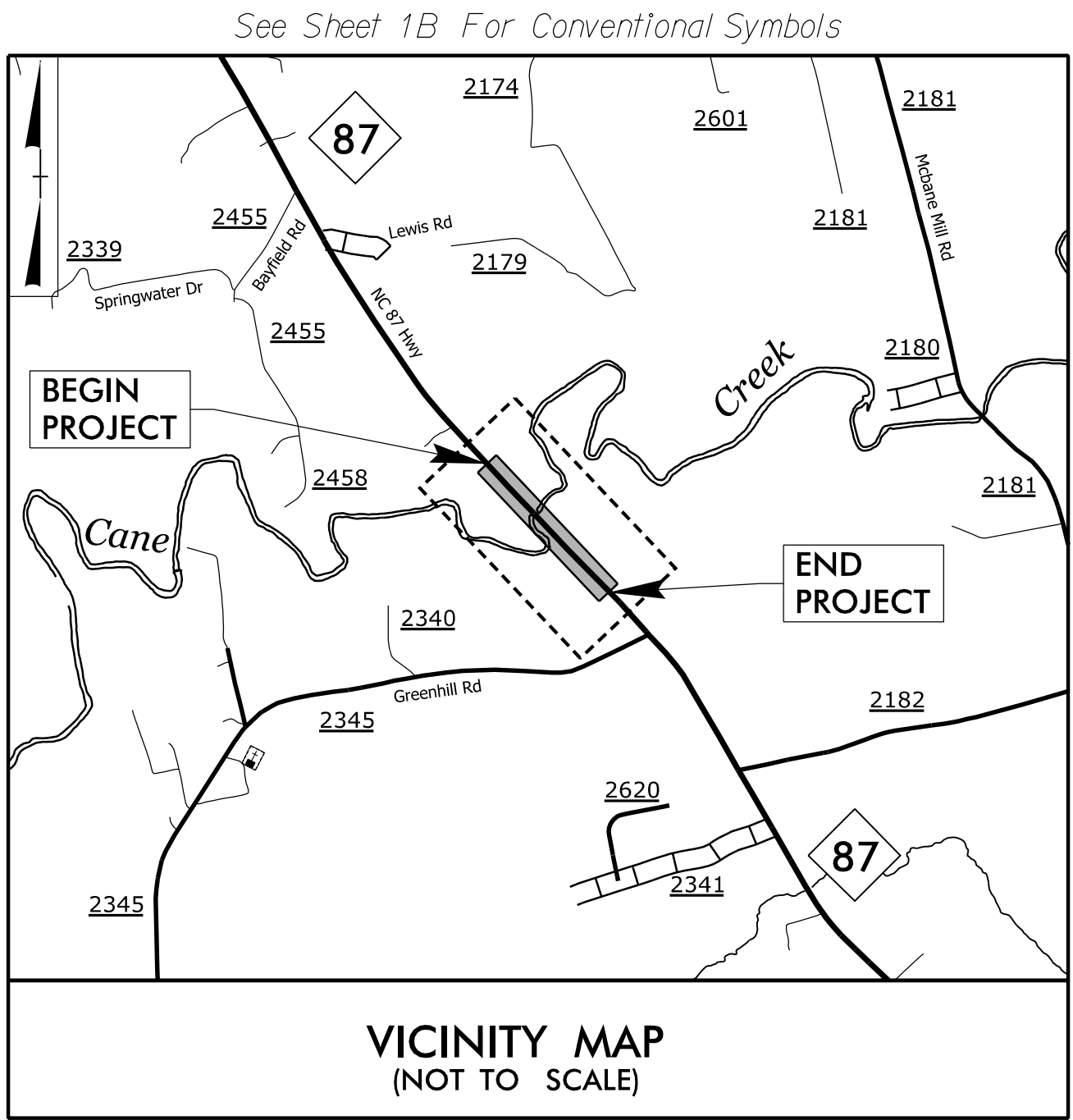


09.08/2019

TIP PROJECT: BR-0060

CONTRACT: C204936



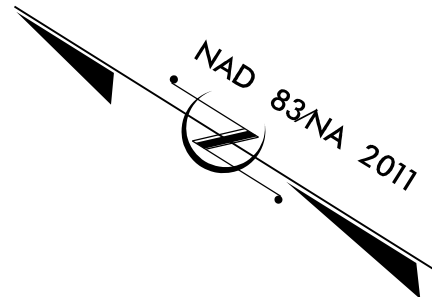
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ALAMANCE COUNTY

LOCATION: BRIDGE 000014 ON NC 87 OVER CANE CREEK

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0060	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
67060.1.1	N/A	PE	
67060.2.1	N/A	ROW/UTIL	
67060.3.1	N/A	CONST	



BEGIN STATE TIP PROJECT BR-0060
-L- STA 12+16.55

TO LEWIS RD

BEGIN CONSTRUCTION
-L- STA 11+45.84

BEGIN BRIDGE
-L- STA 20+04.83

END BRIDGE
-L- STA 22+33.17

4

5

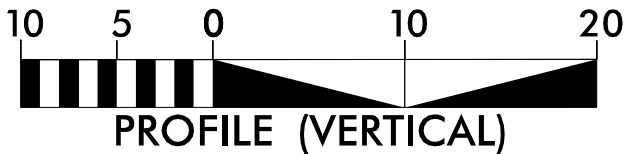
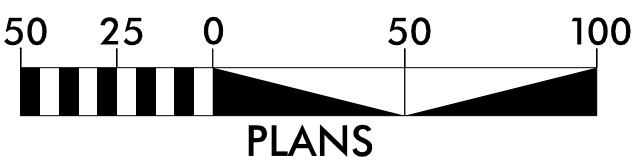
END CONSTRUCTION
-L- STA 35+16.10

TO GREENHILL RD

END STATE TIP PROJECT BR-0060
-L- STA 34+64.00

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



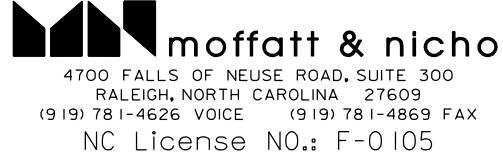
DESIGN DATA

ADT 2026 = 3,000
ADT 2046 = 3,300
K = 10 %
D = 60 %
T = 7 % *
V = 60 MPH
* TTST = 3% DUAL 4%
FUNC CLASS =
MINOR ARTERIAL-
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR-0060 = 0.383
LENGTH STRUCTURE TIP PROJECT BR-0060 = 0.043
TOTAL LENGTH TIP PROJECT BR-0060 = 0.426

Prepared for NCDOT In the Office of:



2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 27, 2023

LETTING DATE:
February 17, 2026

TRENT HUFFMAN, P.E.
PROJECT ENGINEER

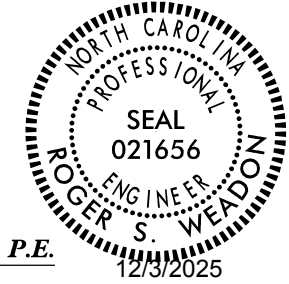
GRAY MODLIN, P.E.
PROJECT DESIGN ENGINEER

DAVID STUTTS, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER



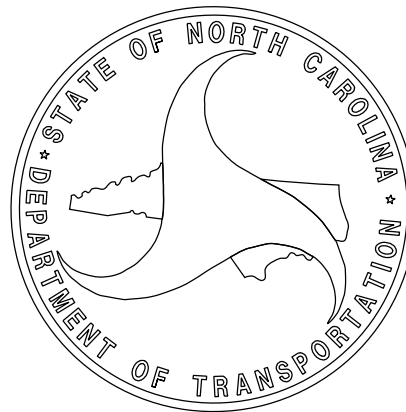
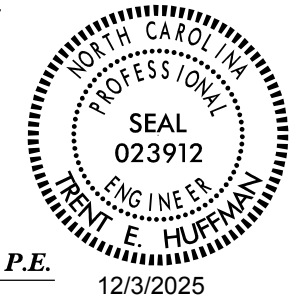
DocuSigned by:
Roger Weaden
10/9/2025
SIGNATURE:



ROADWAY DESIGN
ENGINEER



DocuSigned by:
Trent E. Huffman
12/3/2025
SIGNATURE:



8/17/99

PROJECT REFERENCE NO.
BR-0060

SHEET NO.
1A

ROADWAY DESIGN ENGINEER



12/3/2025

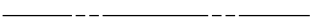
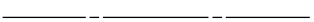
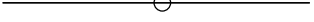
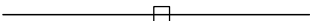
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

	INDEX OF SHEETS	2024 ROADWAY ENGLISH STANDARD DRAWINGS	EFF. 01-16-2024 REV.	GENERAL NOTES:	2024 SPECIFICATIONS EFFECTIVE: 01-16-2024 REVISED:
SHEET NUMBER	SHEET	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:		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.
1	TITLE SHEET			CLEARING:	CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD 11.
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS	STD.NO. TITLE		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.
1B	CONVENTIONAL SYMBOLS	DIVISION 2 - EARTHWORK		SHOULDER CONSTRUCTION:	ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01
2A-1 THRU 2A-2	PAVEMENT SCHEDULE AND TYPICAL SECTIONS	200.02 Method of Clearing - Method 11		SIDE ROADS:	THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.
2B-1 THRU 2B-2	ROADWAY DETAILS	225.02 Guide for Grading Subgrade - Secondary and Local		SUBSURFACE DRAINS:	SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.
2C-1 THRU 2C-5	SPECIAL DETAILS	225.04 Method of Obtaining Superelevation - Two Lane Pavement		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.
3B-1	ROADWAY SUMMARIES	DIVISION 3 - PIPE CULVERTS		TEMPORARY SHORING:	SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".
3D-1	DRAINAGE SUMMARIES	300.01 Method of Pipe Installation (Use Details in Lieu of Standards for Sheets 1 and 2 of 2)		END BENTS:	THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.
3G-1	GEOTECHNICAL SUMMARIES	310.10 Driveway Pipe Construction		UTILITIES:	UTILITY OWNERS ON THIS PROJECT ARE AT&T
3P-1	PARCEL INDEX SHEET	DIVISION 4 - MAJOR STRUCTURES			DUKE ENERGY
4 THRU 7	PLAN AND PROFILE SHEET	423.01 Bridge Approach Fills - Type 1 Approach Fill for Bridge Abutment			ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.
RW01 THRU RW05	SURVEY CONTRADL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENT AND PROPERTY TIES	DIVISION 5 - SUBGRADE, BASES AND SHOULDERS		RIGHT-OF-WAY MARKERS:	ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.
TMP-1 THRU TMP-13	TRAFFIC MANAGEMENT PLANS	560.01 Method of Shoulder Construction - High Side of Superelevated Curve - Method 1			
PMP-1 THRU PMP-4	PAVEMENT MARKING PLANS	DIVISION 6 - ASPHALT BASES AND PAVEMENTS			
EC-1 THRU EC-9	EROSION CONTROL PLANS	654.01 Pavement Repairs			
RF-1	REFORESTATION PLANS	DIVISION 8 - INCIDENTALS			
SIGN-1 THRU SIGN-4	SIGNING PLANS	815.02 Subsurface Drain			
U0-1 THRU U0-5	UTILITIES BY OTHERS PLANS	840.00 Concrete Base Pad for Drainage Structures			
X-1A	CROSS-SECTION SUMMARY SHEET	840.04 Concrete Open Throat Catch Basin - 12" thru 48" Pipe			
X-1 THRU X-23	CROSS-SECTIONS	840.05 Brick Open Throat Catch Basin - 12" thru 48" Pipe			
S-1 THRU S-37	STRUCTURE PLANS	840.17 Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe			
		840.18 Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe			
		840.20 Frames and Wide Slot Flat Grates			
		840.22 Frames and Wide Slot Sag Grates			
		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			
		840.35 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			
		840.71 Concrete and Brick Pipe Plug			
		846.01 Concrete Curb, Gutter and Curb & Gutter			
		846.04 Drop Inlet Installation in Shoulder Berm Gutter			
		862.01 Guardrail Placement (Use Details in Lieu of Standards for Sheets 4, 6, 12, and 14 of 15)			
		862.02 Guardrail Installation			
		862.03 Structure Anchor Units (Use Detail in Lieu of Standard for Sheet 8 of 9)			
		862.04 Anchoring End of Guardrail - for B-77 and B-83 Anchor Units			
		876.02 Guide for Rip Rap at Pipe Outlets			
		876.04 Drainage Ditches with Class 'B' Rip Rap			

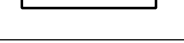
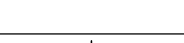
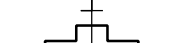
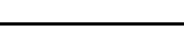
CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

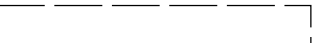
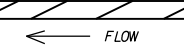
BOUNDARIES AND PROPERTY:

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

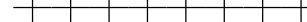
BUILDINGS AND OTHER CULTURE:

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

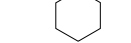
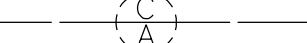
HYDROLOGY:

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

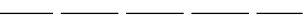
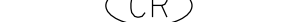
RAILROADS:

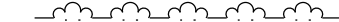
Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	
RR Dismantled	

RIGHT OF WAY & PROJECT CONTROL:

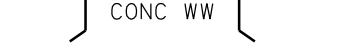
Primary Horiz Control Point	
Primary Horiz and Vert Control Point	
Secondary Horiz and Vert Control Point	
Vertical Benchmark	
Existing Right of Way Monument	
Proposed Right of Way Monument (Rebar and Cap)	
Proposed Right of Way Monument (Concrete)	
Existing Permanent Easement Monument	
Proposed Permanent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

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	
Existing Curb	
Proposed Slope Stakes Cut	
Proposed Slope Stakes Fill	
Proposed Curb Ramp	
Existing Metal Guardrail	
Proposed Guardrail	
Existing Cable Guiderail	
Proposed Cable Guiderail	
Equality Symbol	
Pavement Removal	
VEGETATION:	
Single Tree	
Single Shrub	
Hedge	

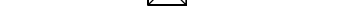
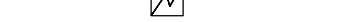
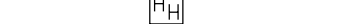
Woods Line	
Orchard	
Vineyard	

EXISTING STRUCTURES:

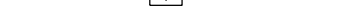
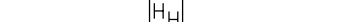
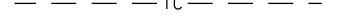
MAJOR:	
Bridge, Tunnel or Box Culvert	
Bridge Wing Wall, Head Wall and End Wall	
MINOR:	
Head and End Wall	
Pipe Culvert	
Footbridge	
Drainage Box: Catch Basin, DI or JB	
Paved Ditch Gutter	
Storm Sewer Manhole	
Storm Sewer	

UTILITIES:

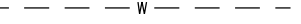
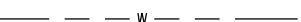
* SUE – Subsurface Utility Engineering
LOS – Level of Service – A,B,C or D (Accuracy)

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

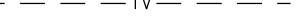
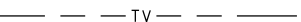
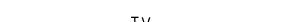
TELEPHONE:

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

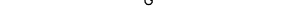
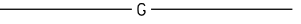
WATER:

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

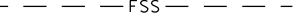
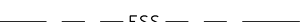
TV:

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

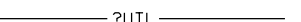
GAS:

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

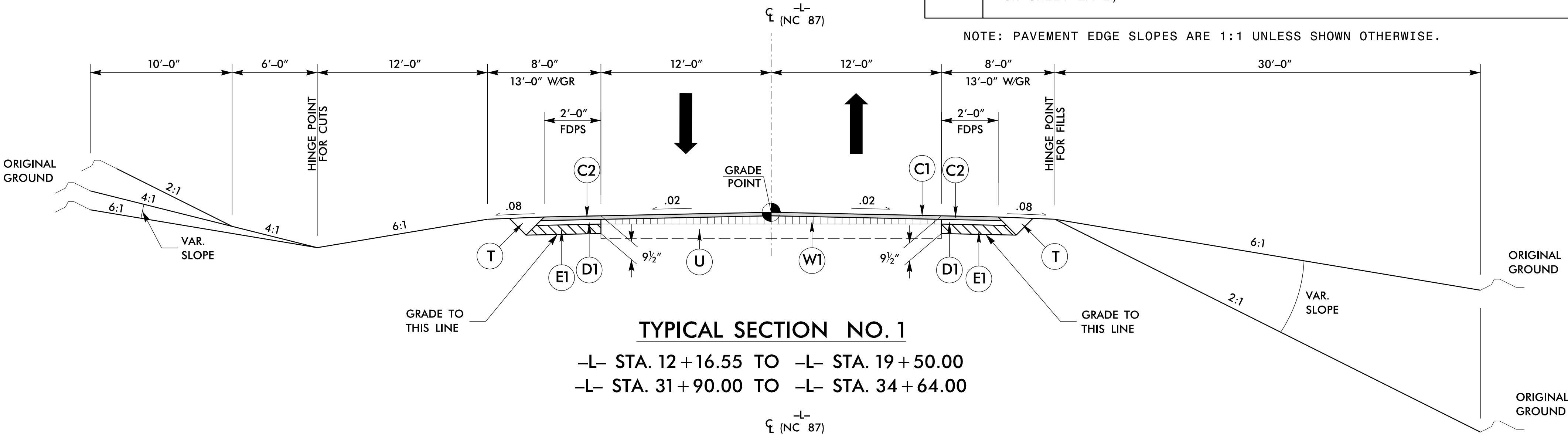
SANITARY SEWER:

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

MISCELLANEOUS:

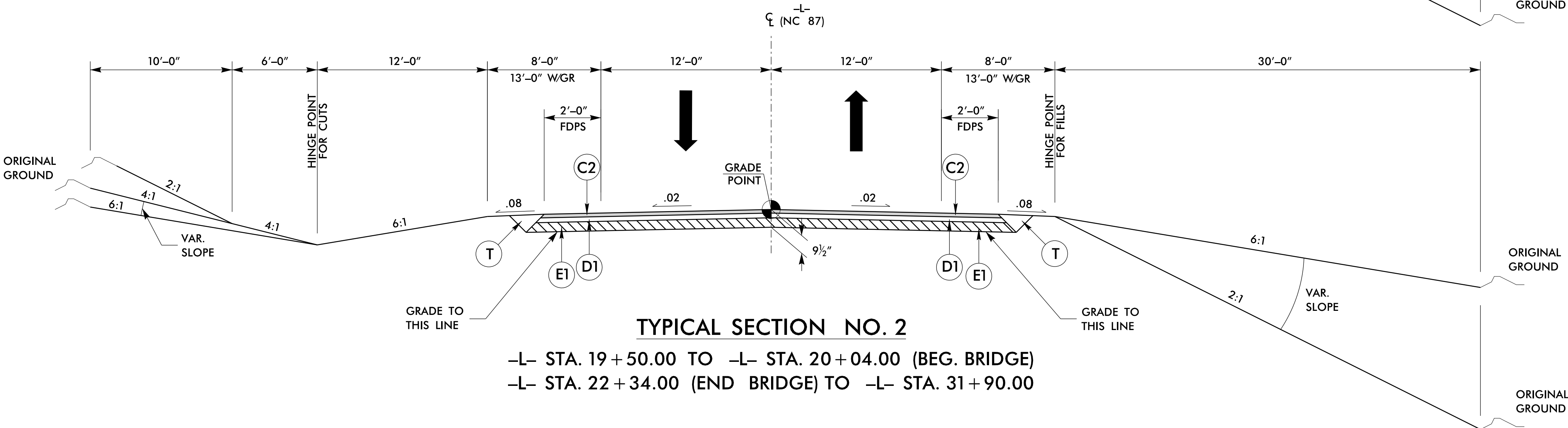
Utility Pole	
Utility Pole with Base	
Utility Located Object	
Utility Traffic Signal Box	
Utility Unknown U/G Line (SUE – LOS B)*	
U/G Tank; Water, Gas, Oil	
Underground Storage Tank, Approx. Loc.	
A/G Tank; Water, Gas, Oil	
Geoenvironmental Boring	
Abandoned According to Utility Records	
End of Information	

FINAL PAVEMENT SCHEDULE			
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168.0 LBS. PER SQ. YD.	J1	PROP. 8" AGGREGATE BASE COURSE.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168.0 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J2	PROP. 4" AGGREGATE BASE COURSE.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	P	PRIME COAT AT THE RATE OF 0.35 GAL. PER SQ. YD.
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	R1	SHOULDER BERM GUTTER
D2	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL
D3	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH	U	EXISTING PAVEMENT
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	V	INCIDENTAL MILLING
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL ON SHEET 2A-2)
		W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL ON SHEET 2A-2)



TYPICAL SECTION NO. 1

-L- STA. 12+16.55 TO -L- STA. 19+50.00
-L- STA. 31+90.00 TO -L- STA. 34+64.00



TYPICAL SECTION NO. 2

-L- STA. 19+50.00 TO -L- STA. 20+04.00 (BEG. BRIDGE)
-L- STA. 22+34.00 (END BRIDGE) TO -L- STA. 31+90.00

PROJECT REFERENCE NO.
BR-0060

SHEET NO.
2A-1

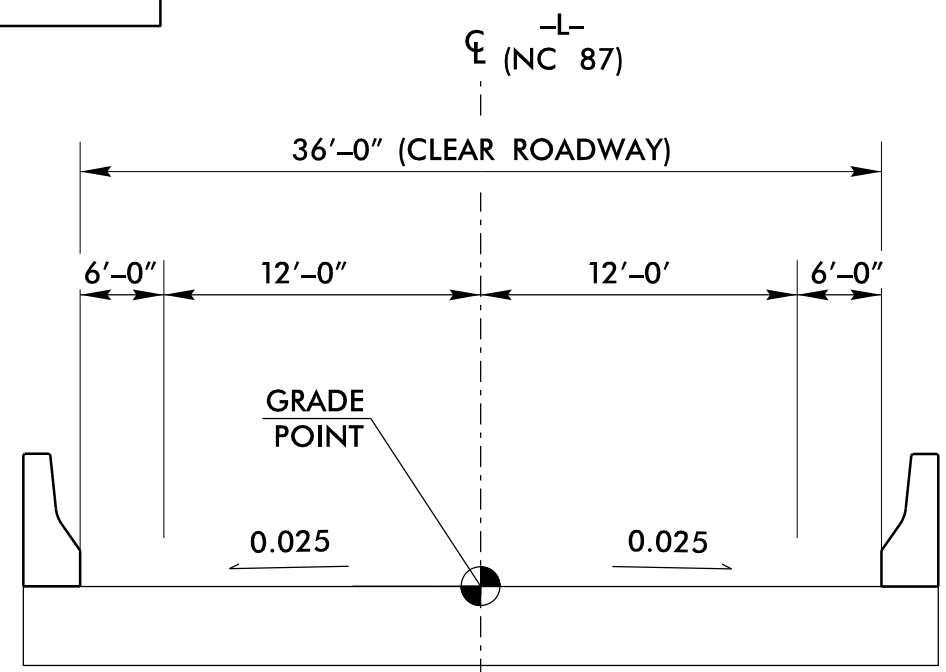
ROADWAY DESIGN
ENGINEER
NORTH CAROLINA
PROFESSIONAL
SEAL
023912
PLUMB
E. HUFFMAN
11/25/2025

PAVEMENT DESIGN
ENGINEER
NORTH CAROLINA
PROFESSIONAL
SEAL
027513
SHI ZHANG
11/25/2025

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

moffatt & nichol

4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4600 VOICE (919) 781-4609 FAX
NC LICENSE NO. F-0105

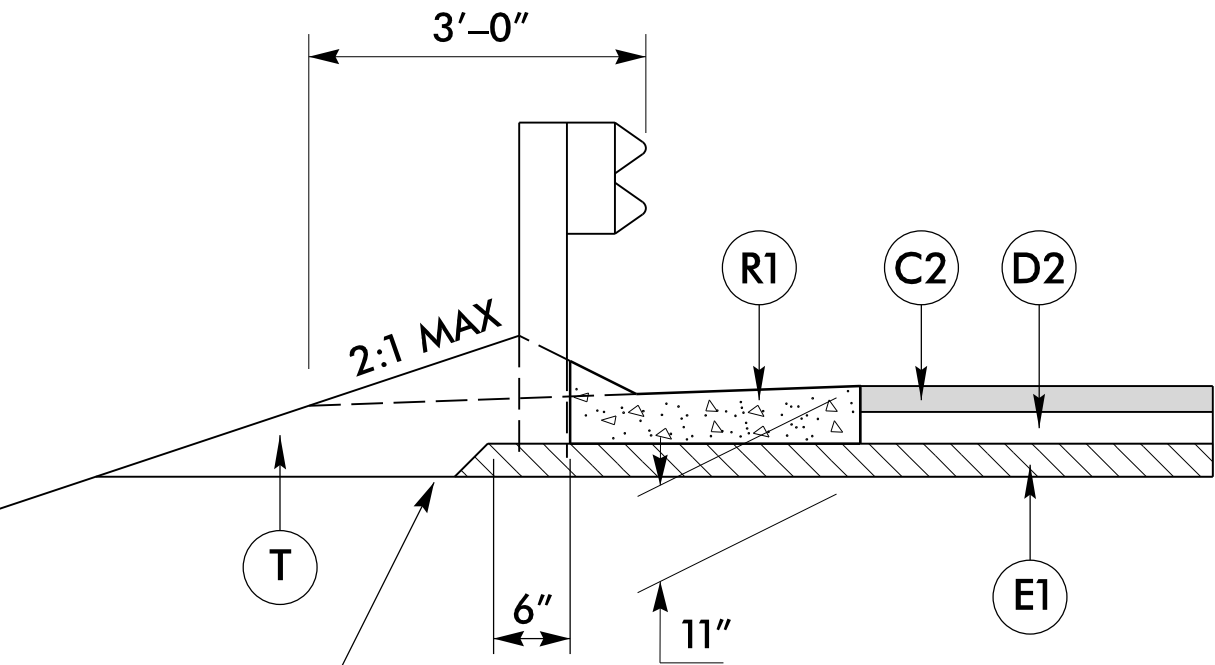


NOTE: 1. SEE STRUCTURE PLANS FOR BRIDGE DESIGN
2. NORMAL CROWN SLOPE SET AT 2.50% FOR HYDRAULIC SPREAD

BRIDGE TYPICAL

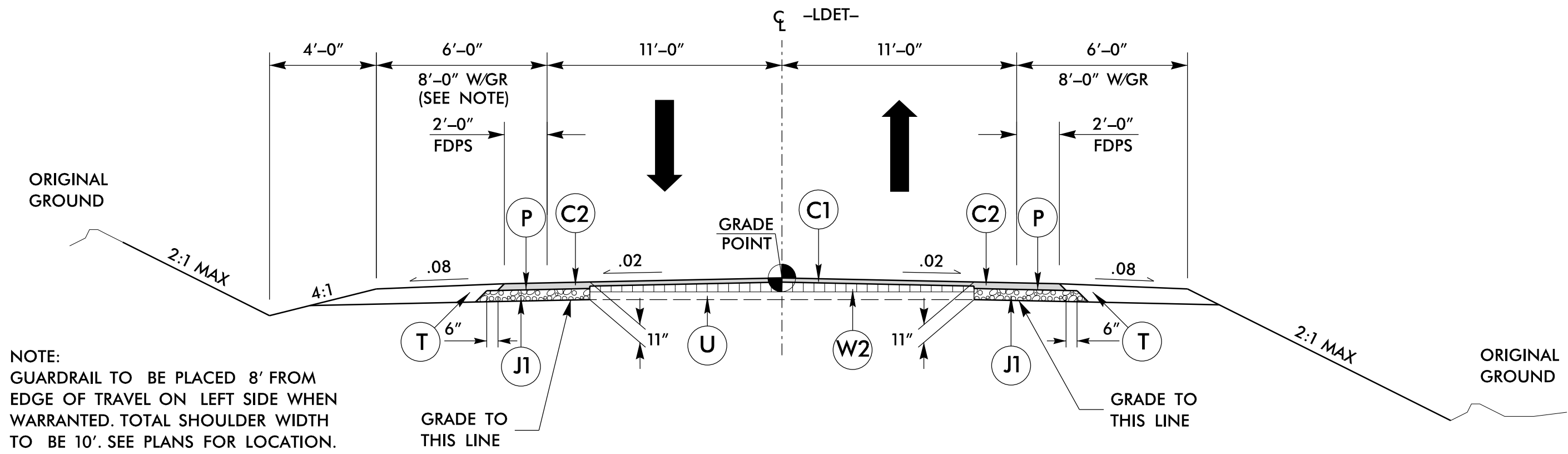
(-L-) NC 87 over Cane Creek
-L- STA. 20+04.00 TO -L- STA. 22+34.00

Detail Showing Shoulder
Berm Gutter on Asphalt Base Course



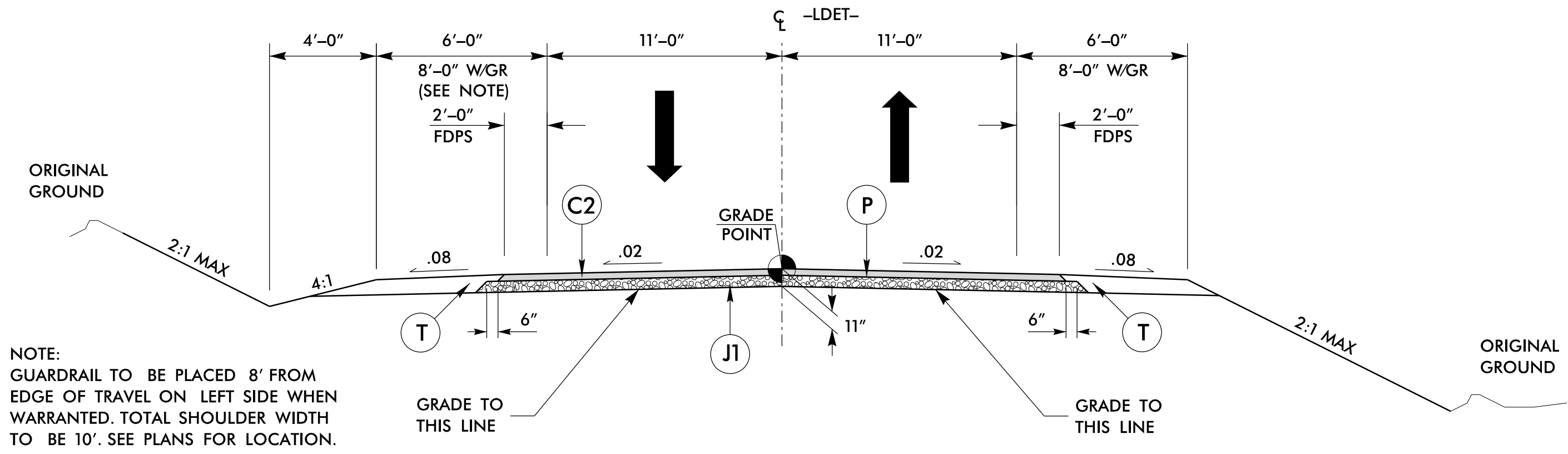
INSET DETAIL

TO BE USED IN CONJUNCTION WITH
TYPICAL SECTION No. 2 AS FOLLOWS
-L- STA. 22+48.17 TO -L- STA. 22+75.00 LT & RT



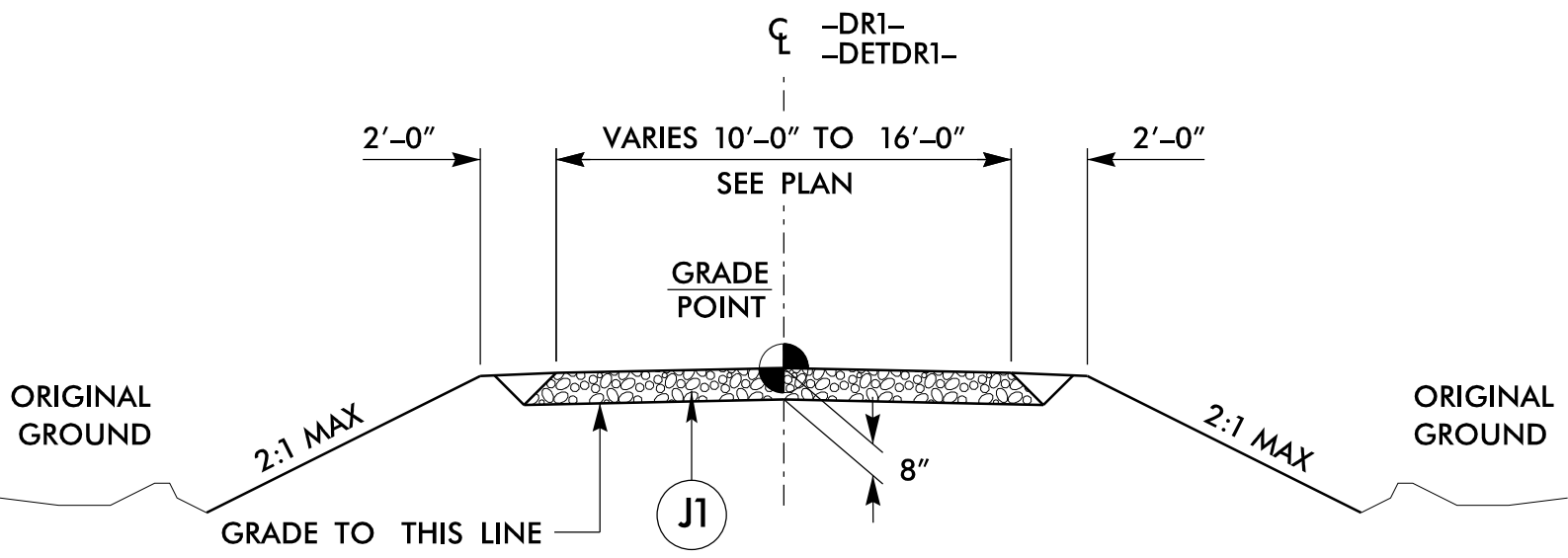
TYPICAL SECTION NO. 3

-LDET- STA. 12+88.00 TO -LDET- STA. 15+90.00
-LDET- STA. 32+30.00 TO -LDET- STA. 34+52.00 (SEE NOTE)



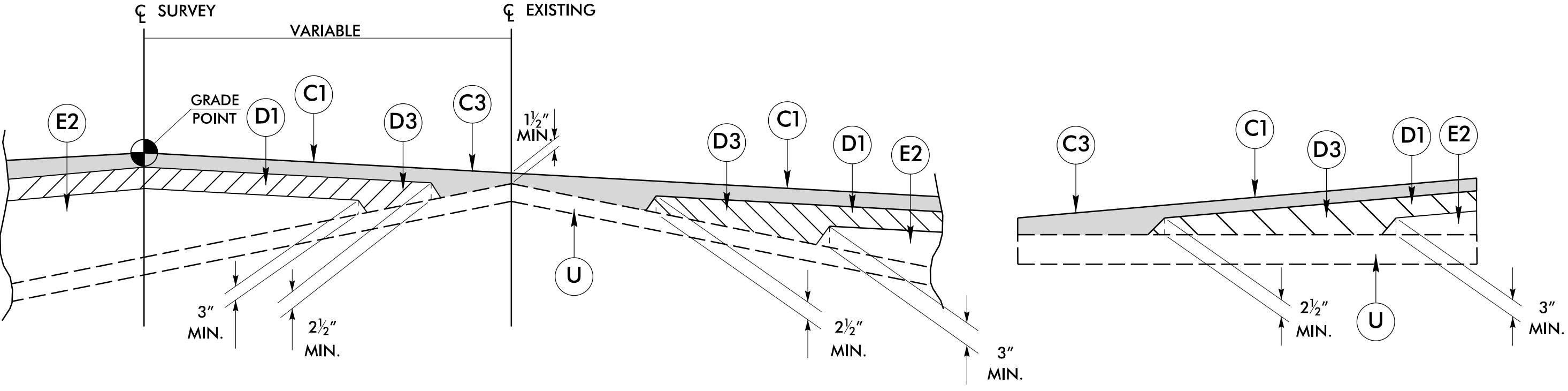
TYPICAL SECTION NO. 4

-LDET- STA. 15+90.00 TO -LDET- STA. 20+07 (BEG. BRIDGE)
-LDET- STA. 22+37 (END BRIDGE) TO -LDET- STA. 32+30.00 (SEE NOTE)

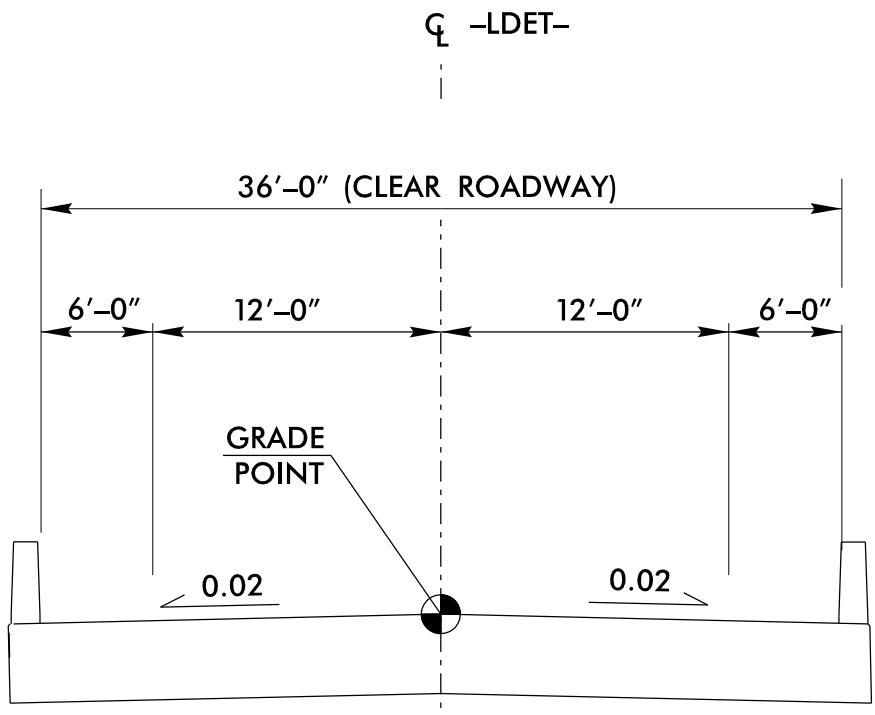


TYPICAL SECTION NO. 5

-DR1- STA. 10+90.00 TO -DR1- STA. 12+64.02
-DETDRI- STA. 10+05.00 TO -DETDRI- STA. 11+55.87



DETAIL SHOWING METHOD OF WEDGING (W1)

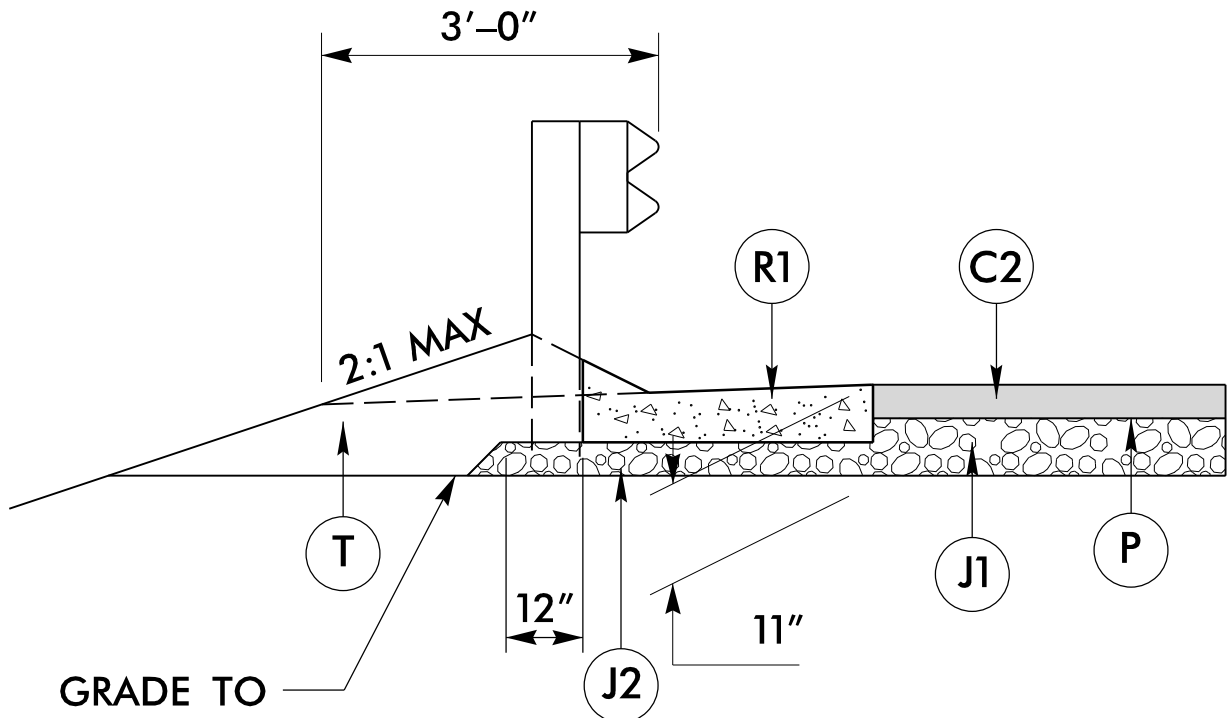


NOTE: USE 36' BRIDGE FOR HYDRAULIC SPREAD

DETOUR BRIDGE TYPICAL

(-LDET-) NC 87 over Cane Creek
-LDET- STA. 20+07 TO -LDET- STA. 22+37

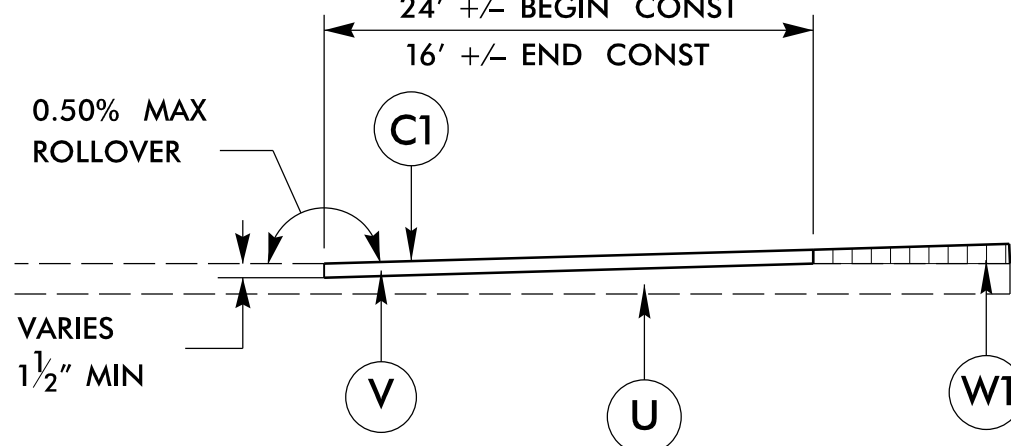
Detail Showing Shoulder Berm Gutter on Aggregate Base Course



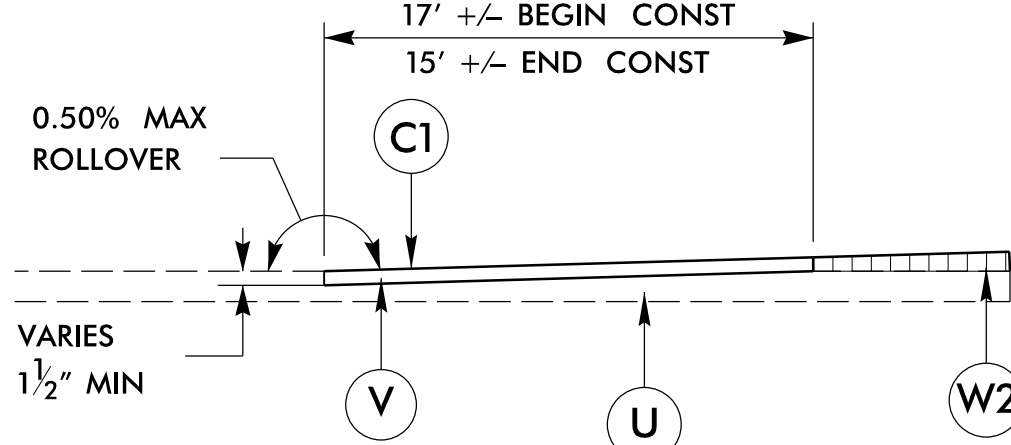
INSET DETAIL

TO BE USED IN CONJUNCTION WITH
TYPICAL SECTION No. 4 AS FOLLOWS

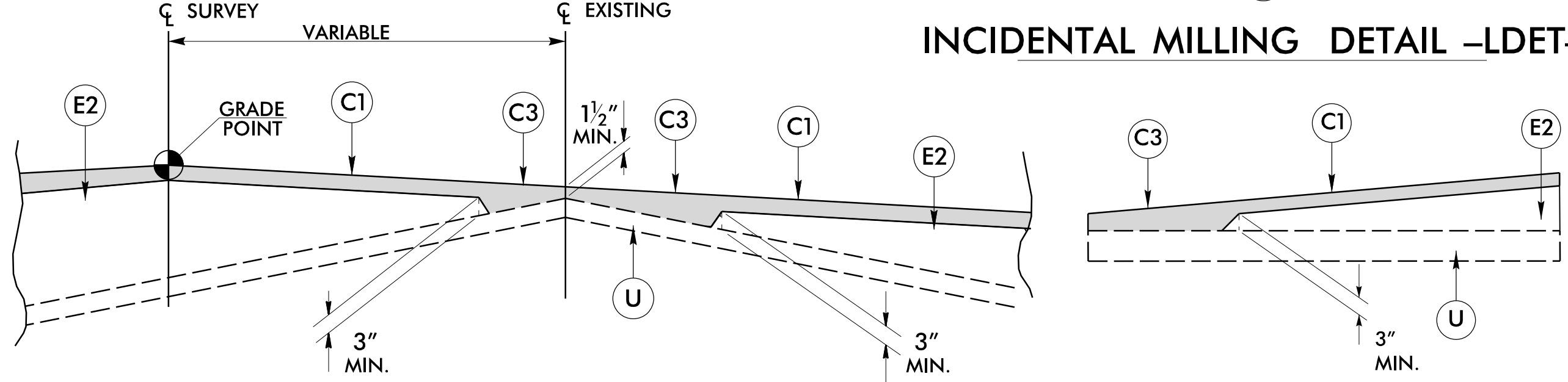
-LDET- STA. 22+37.00 TO -LDET- STA. 22+61.00 LT
-LDET- STA. 22+37.00 TO -LDET- STA. 22+55.00 RT



INCIDENTAL MILLING DETAIL -L-



INCIDENTAL MILLING DETAIL -LDET-

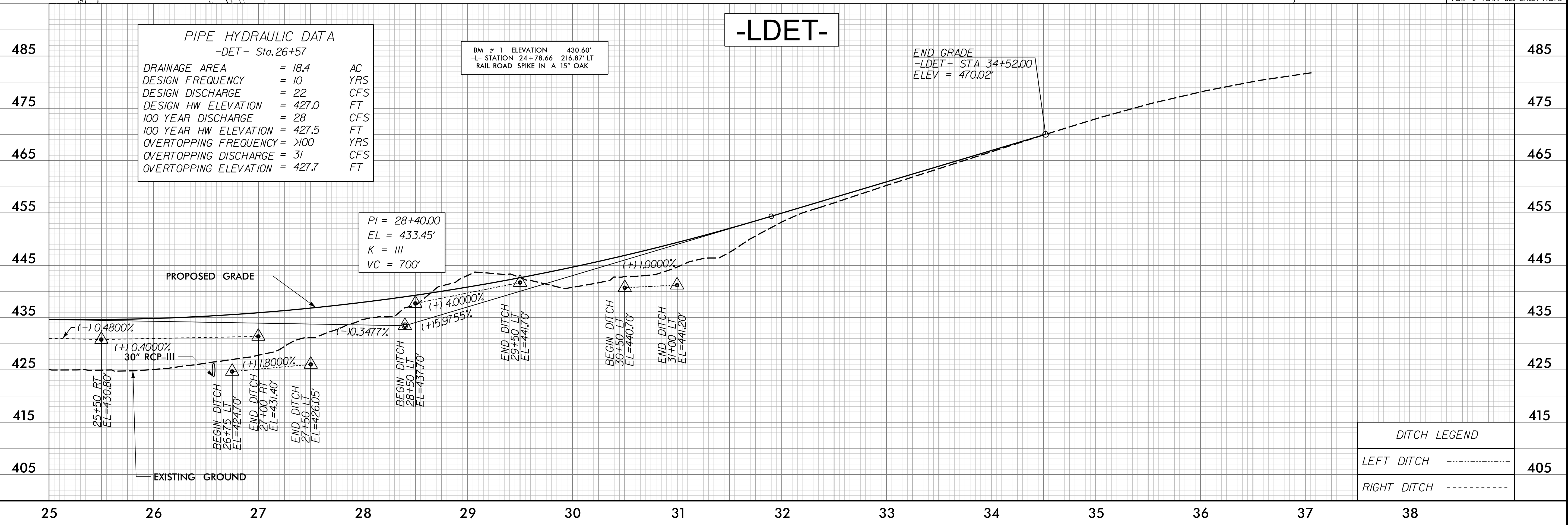
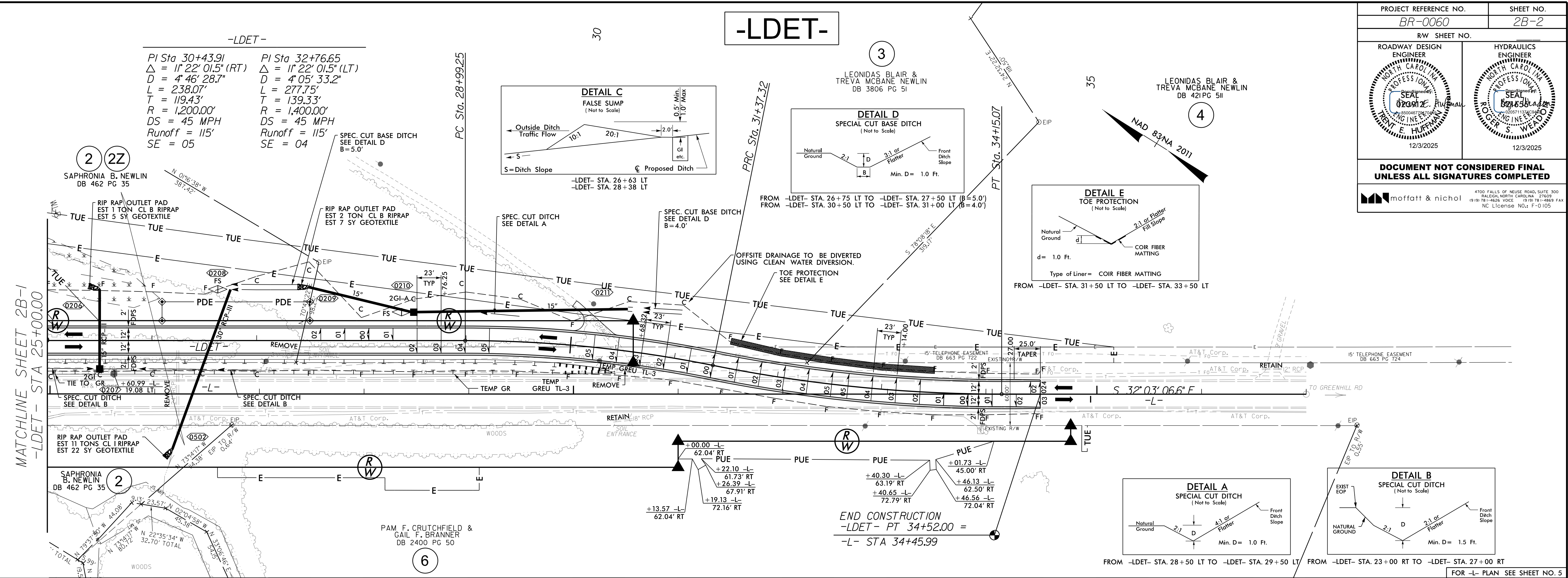


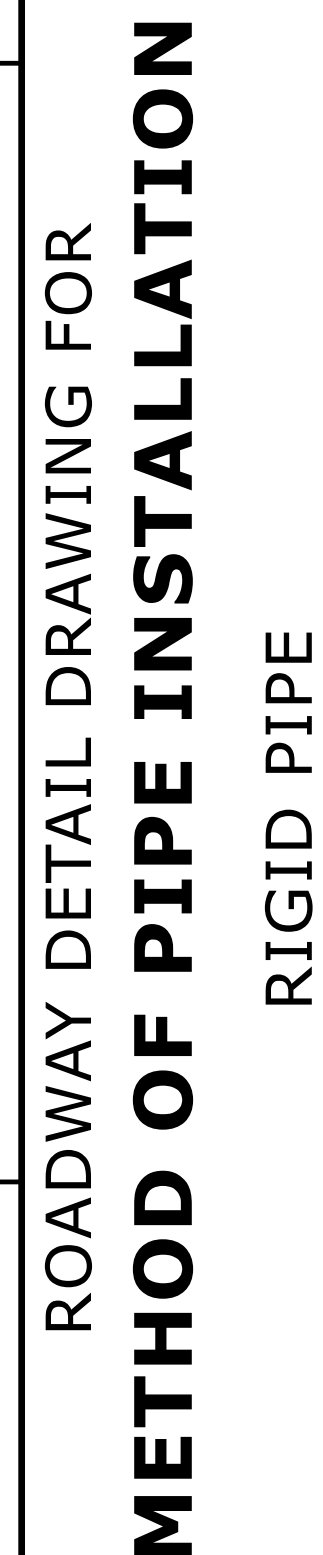
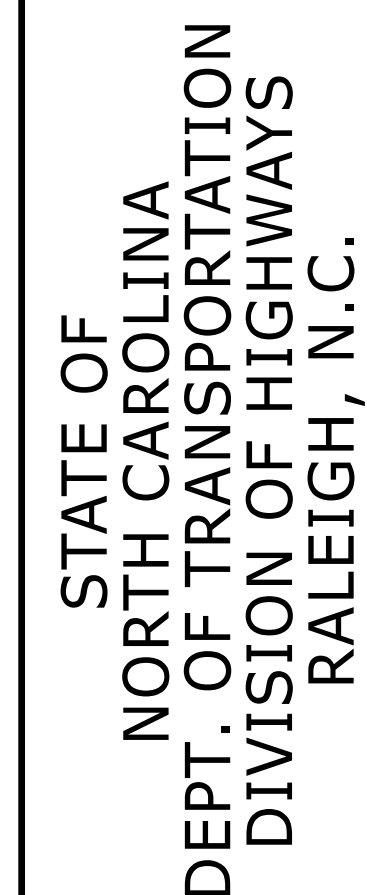
DETAIL SHOWING METHOD OF WEDGING (W2)

PROJECT REFERENCE NO.		SHEET NO.
BR-0060		2A-2
ROADWAY DESIGN ENGINEER SEAL 023012 JIMMY E. HUFFMAN 11/25/2025	PAVEMENT DESIGN ENGINEER SEAL 027313 SHIHAI ZHANG 11/25/2025	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
moffatt & nichol		
C1	1 1/2" S9.5C	
C2	3" S9.5C	
C3	VARIABLE DEPTH S9.5C	
D1	2 1/2" I19.0C	
D2	4" I19.0C	
D3	VARIABLE DEPTH I19.0C	
E1	4" B25.0C	
E2	VARIABLE DEPTH B25.0C	
J1	8" ABC	
J2	4" ABC	
P	PRIME COAT	
R1	SHOULDER BERM GUTTER	
T	EARTH MATERIAL	
U	EXIST PAVEMENT	
V	INCIDENTAL MILLING	
W1	WEDGING	
W2	WEDGING	

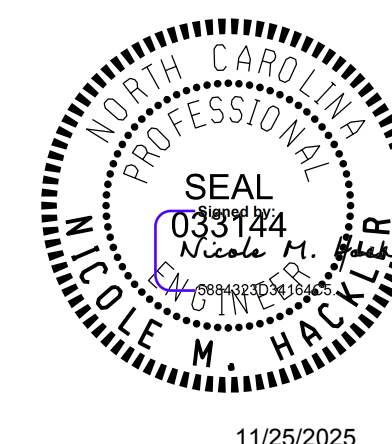
PAVEMENT EDGE SLOPES ARE 1:1
UNLESS SHOWN OTHERWISE.







	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.



11/25/2025

SHEET 2 OF 2
300.01

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**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**

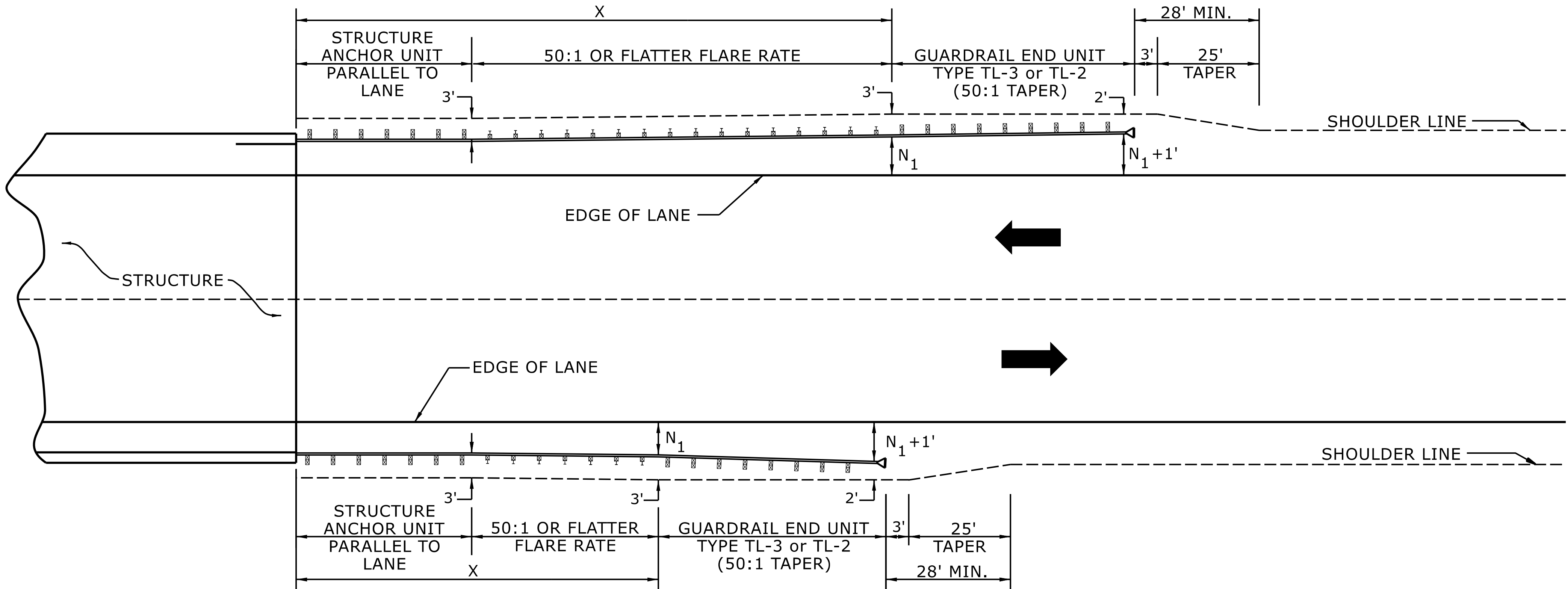
Office 919-707-6950

MENT UNIT
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.
BR-0060	2C-2



USE FLARE RATE AS THE CONTROL IF THE "N₁" DISTANCE IS NOT OBTAINED.
("N₁" IS BASED ON SHOULDER WIDTHS IN THE ROADWAY DESIGN MANUAL)

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

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

GUARDRAIL LENGTH OF NEED (X) IS CALCULATED BASED ON THE AASHTO ROADSIDE DESIGN GUIDE.

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



LENGTHS AND OFFSETS FOR PROPOSED GUARDRAIL AT TWO LANE - TWO WAY LOCATIONS

SHEET 4 OF 15
862D01

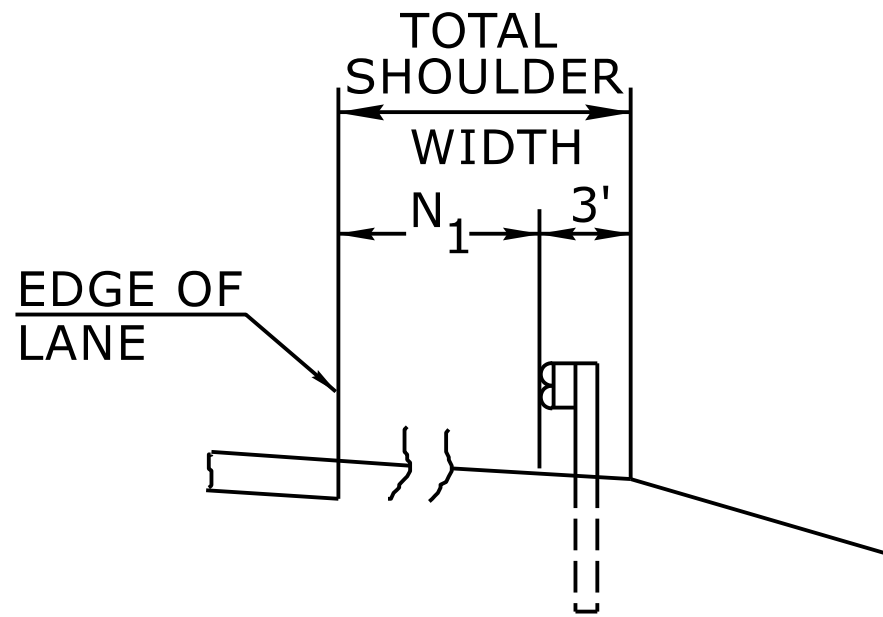
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**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**
Office 919-707-6950 FAX 919-250-4119

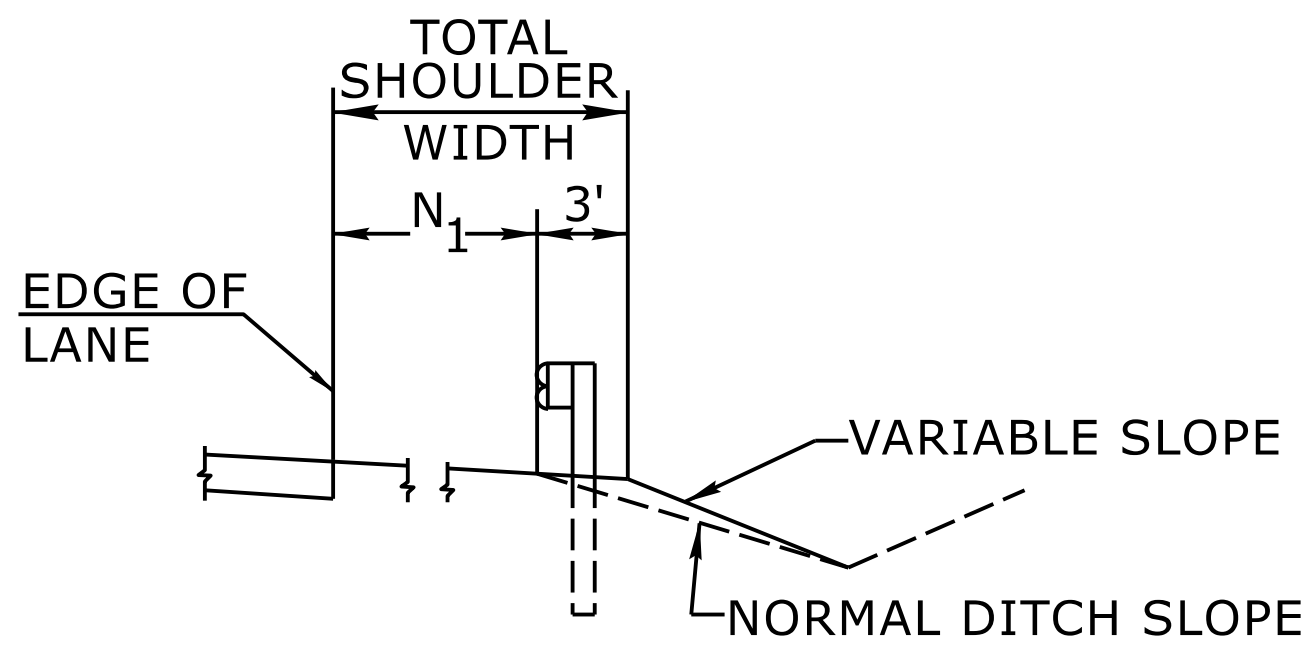
SEE TITLE BLOCK

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

PROJECT REFERENCE NO.	SHEET NO.
BR-0060	2C-3

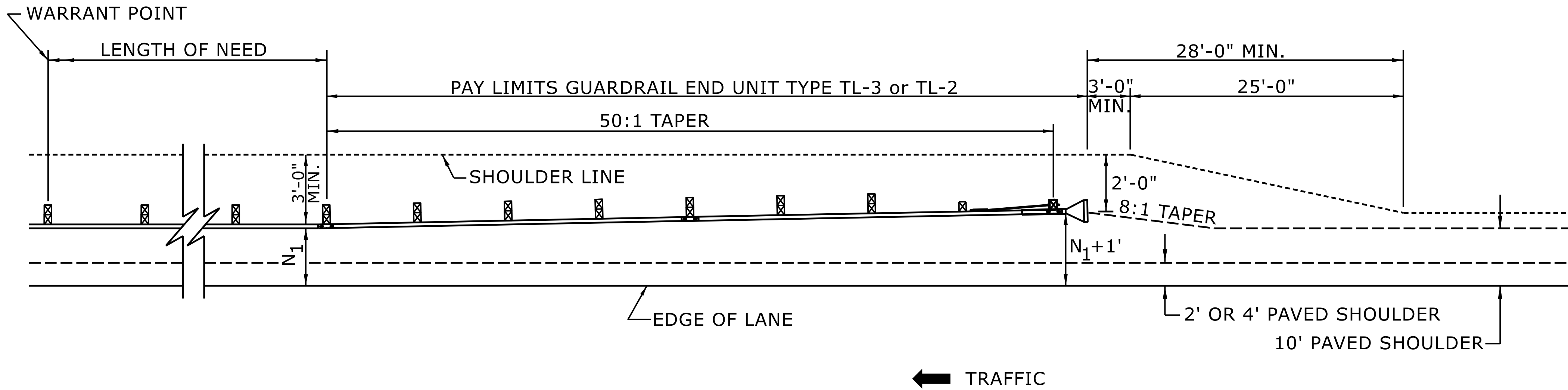


FILL SECTION



CUT SECTION

"N₁"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.

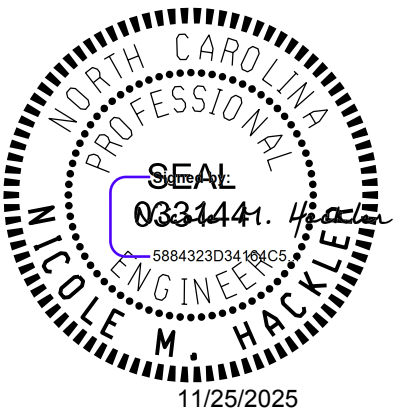


FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



SHEET 6 OF 15
862D01

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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.: DATE:

PROJECT REFERENCE NO.	SHEET NO.
BR-0060	2C-4

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 5 OF 9

862D02



11/25/2025

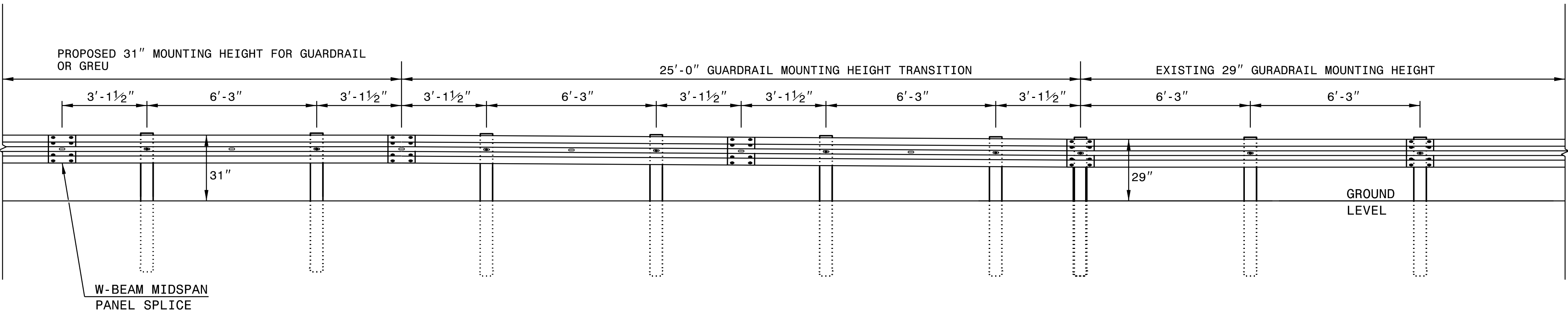
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**
Office 919-707-8950 FAX 919-250-4119

SEE TITLE BLOCK

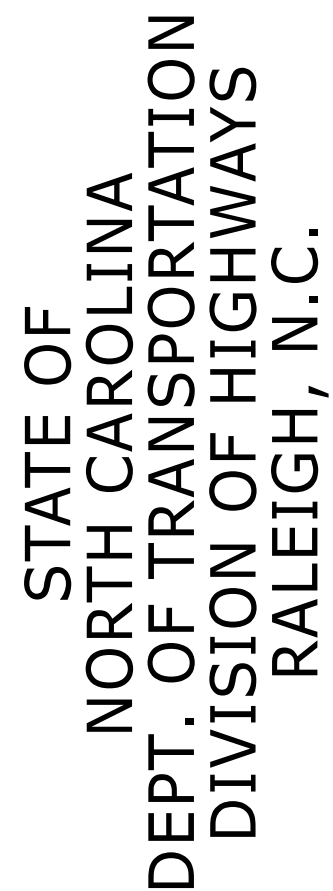
ORIGINAL BY: K. Aldridge DATE: 02-25
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

**NOTE: IF EXISTING GUARDRAIL IS LOWER THAN 29", USE AN ADDITIONAL 12'-6" LONG SECTION OF GUARDRAIL,
FOR EVERY 1" OF HEIGHT DIFFERENCE, TO TRANSITION FROM EXISTING GUARDRAIL TO PROPOSED 31" GUARDRAIL.**



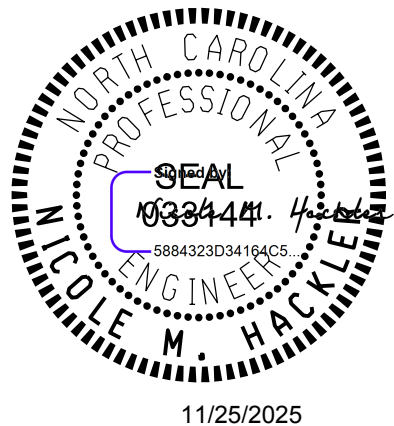
ELEVATION VIEW

TRANSITION FROM 29" TO 31" W-BEAM GUARDRAIL MOUNTING HEIGHT



ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS TEMPORARY ANCHOR UNIT TYPE THRIE-BEAM

SHEET 8 OF 9
862D03



**DOCUMENT NOT CONSIDERED FINAL
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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.: _____

12/06/07

COMPUTED BY: Z.LIU	DATE: 10/10/2022
CHECKED BY: G. MODLIN	DATE: 10/10/2022

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
BR-0060	3B-1

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

NOTE: Earthwork Quantities are calculated by the roadway designer. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

SUMMARY OF EARTHWORK
IN CUBIC YARDS

STATION	STATION	UNCL EXCAV.	UNDERCUT	EMBANK. + %	BORROW	WASTE
-LDET-						
12 + 88	20 + 07	3,654		671		2,983
22 + 37	34 + 52	1,357		13,207	11,850	
SUBTOTALS:		5,011		13,878	11,850	2,983
-L-						
12 + 16.55	20 + 04	1,338		1,926	588	
22 + 79	34 + 64	461		10,592	10,131	
SUBTOTALS:		1,799		12,518	10,719	
-LDET- DETOUR REMOVAL						
12 + 16.55	20 + 04	458				458
22 + 79	34 + 52	8,944		154		8,790
SUBTOTALS:		9,402		154		9,248
TOTAL:		16,212		26,550	22,569	12,231
LOSS DUE TO CLEARING & GRUBBING		-1,275			1,275	
MATERIAL FOR SHOULDER CONSTRUCTION				690	690	
ADDITIONAL UNDERCUT			920			920
WASTE IN LIEU OF BORROW					-2,983	-2,983
PROJECT TOTALS:		14,937		27,240	21,551	10,168
EST 5% TO REPLACE TOP SOIL ON BORROW PIT					1,078	
GRAND TOTALS:		14,937		27,240	22,628	10,168
SAY:		16,000		29,000	24,000	11,000
*UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN TOP 3' OF EMBANKMENT OR BACKFILL -L- 12 + 49 TO 15 + 75 LT & RT = 480 CY -LDET- 12 + 88 TO 15 + 75 LT = 440 CY -LDET- 17 + 25 TO 18 + 75 LT = 270 CY PER GEOTECH						

CONTINGENCY ITEMS
SHALLOW UNDERCUT = 150 CY
SELECT GRANULAR MATERIAL = 200 CY
GEOTEXTILE FOR SOIL STABILIZATION = 900 SY
CLASS IV SUBGRADE STABILIZATION = 450 TONS
GEOTEXTILE FOR SUBGRADE STABILIZATION = 450 SY

SUMMARY OF BREAKING
EXISTING ASPHALT PAVEMENT

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	SY
-L-	23 + 05	31 + 90	CL	2,701.24
			TOTAL:	2,701.24
			SAY:	2,710

SUMMARY OF REMOVAL
EXISTING ASPHALT PAVEMENT

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	SY
-LDET-	12 + 88	20 + 07	CL	1383.40
-LDET-	22 + 37	34 + 52	CL	3135.98
-L-	19 + 50	20 + 73	CL	410.48
-L-	22 + 50	23 + 05	CL	171.93
			TOTAL:	5,101.80
			SAY:	5,110

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-LDET- LT	22 + 37.00	22 + 61.00	24.0 LF
-LDET- RT	22 + 37.00	22 + 55.00	18.0 LF
-L- LT	22 + 48.17	22 + 75.00	26.8 LF
-L- RT	22 + 48.17	22 + 75.00	26.8 LF
TOTAL:			95.6 LF
SAY:			98.0 LF

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS										IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END		GREU TL-2	GREU TL-3	B-77	AT-1	TYPE III	TEMPORARY CRASH CUSHION										
-L-	14 + 12.49	20 + 04.00	LT	591.50'			20 + 04.00		10'	13'	50'		1'					1	1										147.00'		BRIDGE - SHOULDER VARIES TO MATCH GR TAPER
-L-	22 + 34.00	25 + 94.33	LT	360.375'			22 + 34.00		10'	13'	50'		1'					1	1										296.50'		BRIDGE - SHOULDER VARIES TO MATCH GR TAPER
-L-	27 + 25.00	29 + 72.75	LT	247.75'			27 + 75.00	29 + 22.75	10'	13'	50'	50'		1'	1'			2													FILL HEIGHT WARRANT - CUT DITCH
-L-	16 + 93.62	20 + 04.00	RT	310.375'			20 + 04.00		10'	13'	50'		1'					1	1										297.00'		BRIDGE - SHOULDER VARIES TO MATCH GR TAPER
-L-	22 + 34.00	29 + 06.88	RT	672.875'			22 + 34.00		10'	13'	50'		1'	4'				1	1										246.50'		BRIDGE - SHOULDER VARIES TO MATCH GR TAPER
TOTAL				2182.875'														6	4										987.00'		
LESS ANCHOR DEDUCTIONS																															
GREU TL-3				6 @ 50.00'																											
B-77				4 @ 22.875'																											
SUB TOTAL				1791.375'																											
SAY				1800'														6	4										990.00'		
ADDITIONAL GUARDRAIL POSTS				10																											

TEMPORARY GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS	
				STRAIGHT	SHOP CURVED	FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL-2	GREU TL-3	CAT-1	AT-1	TYPE III	TEMPORARY CRASH CUSHION			EA	G	NG					
-LDET-	18+57.00	20+07.00	LT	150.00'			20+07.00		7'	9'	50'		1'				1			1										
-LDET-	22+37.00	24+25.00	LT	188.00'			22+37.00		7'	9'	50'		1'				1			1										
-LDET-	18+07.00	20+07.00	RT	200.00'			20+07.00		7'	9'	50'		1'				1			1										
-LDET-	22+37.00	30+37.00	RT	800.00'			22+37.00		7'	9'	50'		1'				1			1										
-L-	17+97.00	19+59.50	LT	162.50'			17+97.00		7'	9'	50'		1'				1													
-L-	25+02.00	30+39.50	LT	537.50'			30+39.50		7'	9'	50'		1'				1													
TOTAL				2038.00'													6			4										
LESS ANCHOR DEDUCTIONS																														
GREU TL-3				6 @ 50.00'			-300.00'																							
SUB TOTAL				1738.00'																										
SAY				1738.00'													6			4								2038.00'		DETOUR REMOVAL
ADDITIONAL GUARDRAIL POSTS				10																										

12/06/2025
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COMPUTED BY: T. Wells DATE: 9/2/2022 CHECKED BY: X. Barrett DATE: 9/2/22 REVISED BY: M. J. Alexander DATE: 2/1/2024						(12-17-19) STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS						PROJECT NO. BR-0060		SHEET NO. 3G-1			
SUMMARY OF SUBSURFACE DRAINAGE										SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION							
LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF	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				SD	200												
				TOTAL LF:	200				ASU (1)	12	150	450	450				
									TOTAL CY/TONS/SY:		150	450**	450**	0	0		
*UD = Underdrain *BD = Blind Drain *SD = Subsurface Drain																	
*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 BRIDGE WAITING PERIODS																	
Bridge Description													End Bent/ Bent No.	MONTHS			
Bridge No. 14 on NC 87 over Cane Creek													EB1	1			
Bridge No. 14 on NC 87 over Cane Creek													EB2	1			

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