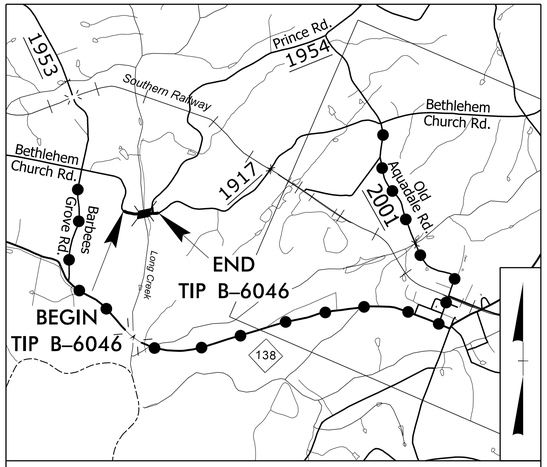
09/08/99

TIP PROJECT: B-6046

CONTRACT: 204830

See Sheet 1A For Index of Sheets



VICINITY MAP
(Not to Scale)

OFFSITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STANLY COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-6046	1	

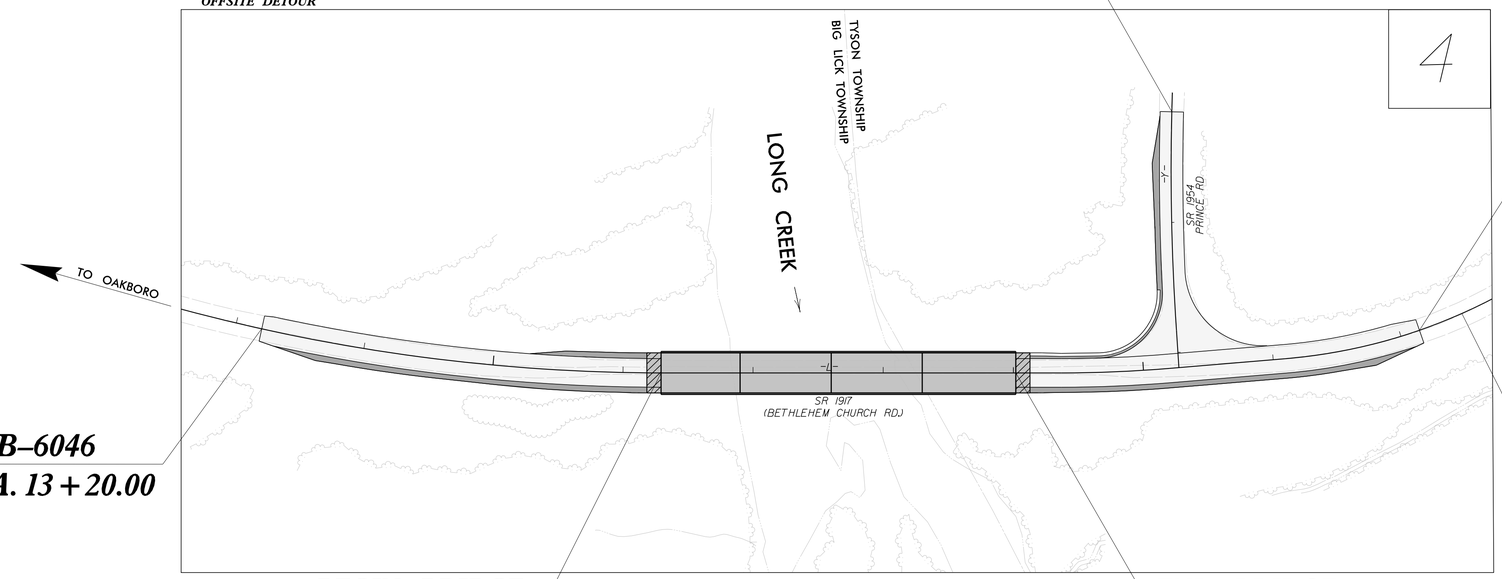
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
48409.1.1	BRZ-1917(003)	PE
48409.2.1	BRZ-1917(003)	R/W, UTIL
48409.3.1	BRZ-1917(003)	CONST

LOCATION: *REPLACE BRIDGE NO. 102 ON SR1917 (BETHLEHEM CHURCH ROAD) OVER LONG CREEK*

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

NAD 83/2011

BEGIN CONSTRUCTION
-Y- POC STA. 10+00.00



END TIP B-6046
-L- POC STA. 22+15.00

BEGIN TIP B-6046
-L- POC STA. 13+20.00

END CONSTRUCTION
-L- POC STA. 22+50.00

BEGIN BRIDGE
-L- STA. 16+29.26

END BRIDGE
-L- STA. 19+01.89

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

20 10 0 20 40
PLANS

5 2.5 0 5 10
PROFILE (HORIZONTAL)

5 2.5 0 5 10
PROFILE (VERTICAL)

DESIGN DATA

ADT 2023 = 200
ADT 2045 = 300
K = NOT PROVIDED
D = NOT PROVIDED
T = 3% *
V = 60 MPH (STAT.)
*TTST = 1% *DUAL = 2%
FUNC CLASS =
LOCAL RURAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-6046 = 0.118 MILES

LENGTH STRUCTURE TIP PROJECT B-6046 = 0.052 MILES

TOTAL LENGTH TIP PROJECT B-6046 = 0.170 MILES

Prepared In the Office of:
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ICE of Carolinas, PLLC
4505 Falls of Neuse Road, Suite 110
Raleigh, North Carolina 27609
Phone: 803-522-0333
License #: P-0999

Prepared for:
DIVISION OF HIGHWAYS
DIVISION 10
716 W. MAIN ST
ALBEMARLE, NC 28001

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
4/1/2022

LETTING DATE:
1/16/2024

BRIAN LUSK, PE
PROJECT ENGINEER

GARLAND HAYWOOD,PE,CPM
NCDOT PROJECT MANAGER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20754 ENGINEER WILLIAM T. STEPHENS, JR.

DocuSigned by: William T. Stephens, Jr.
SIGNATURE: P.E. 11/7/2023

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039183 ENGINEER BRIAN K. LUSK

DocuSigned by: Brian K. Lusk
SIGNATURE: P.E. 11/7/2023

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

8/17/99

INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS

PROJECT REFERENCE NO.	SHEET NO.
B-6046	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039183 ENGINEER

5CF1405B0B624E2...

11/3/2023

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License #: P-0999

INDEX OF SHEETS

GENERAL NOTES:

2024 SPECIFICATIONS
EFFECTIVE: 01-16-2024
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NOS. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

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.

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.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE PEIDMONT NATURAL GAS COMPANY. ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY:

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

EFF. 01-16-2024
REV.

2024 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.03	Cross Pipe End Section
DIVISION 4 - MAJOR STRUCTURES	
423.01	Bridge Approach Fills - Type 1 Approach Fill For Bridge Abutment
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
840.00	Concrete Base Pad For Drainage Structures
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
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
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap In Channels and Ditches
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
B-6046	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easment Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line — RW
- New Right of Way Line with Pin and Cap — RW
- New Right of Way Line with Concrete or Granite R/W Marker — RW
- New Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- New Control of Access — CA
- Existing Easement Line — E
- New Temporary Construction Easement — E
- New Temporary Drainage Easement — TDE
- New Permanent Drainage Easement — PDE
- New Permanent Drainage / Utility Easement — DUE
- New Permanent Utility Easement — PUE
- New Temporary Utility Easement — TUE
- New Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E.*) — W
- U/G Water Line LOS C (S.U.E.*) — W
- U/G Water Line LOS D (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Cable LOS B (S.U.E.*) — TV
- U/G TV Cable LOS C (S.U.E.*) — TV
- U/G TV Cable LOS D (S.U.E.*) — TV
- U/G Fiber Optic Cable LOS B (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS C (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS D (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) — G
- U/G Gas Line LOS C (S.U.E.*) — G
- U/G Gas Line LOS D (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
B-6046	2A-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 039183 ENGINEER BRIAN K. LUSK	NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER SHILIANG ZHANG
DocuSigned by: [illegible] 5CF14CDB58524E2... 10/30/2023	DocuSigned by: [illegible] 245D67F41811435... 10/27/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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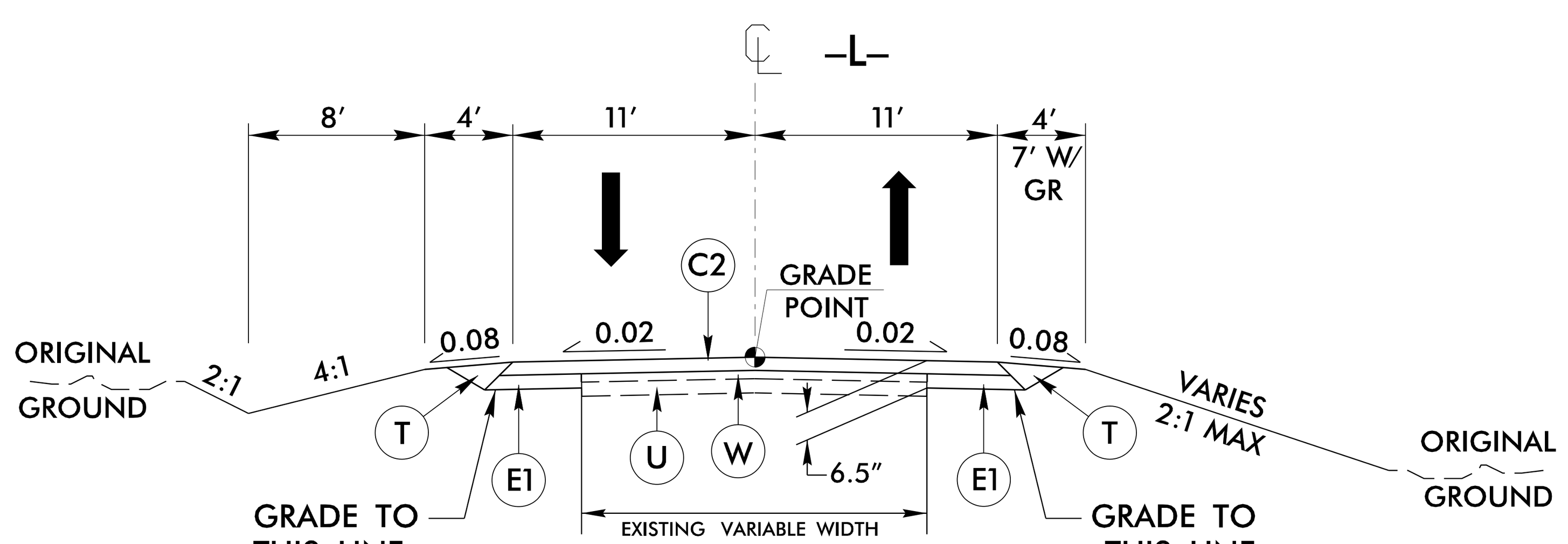
Raleigh, North Carolina 27609
Phone: 803-822-0333
License #: P-0999

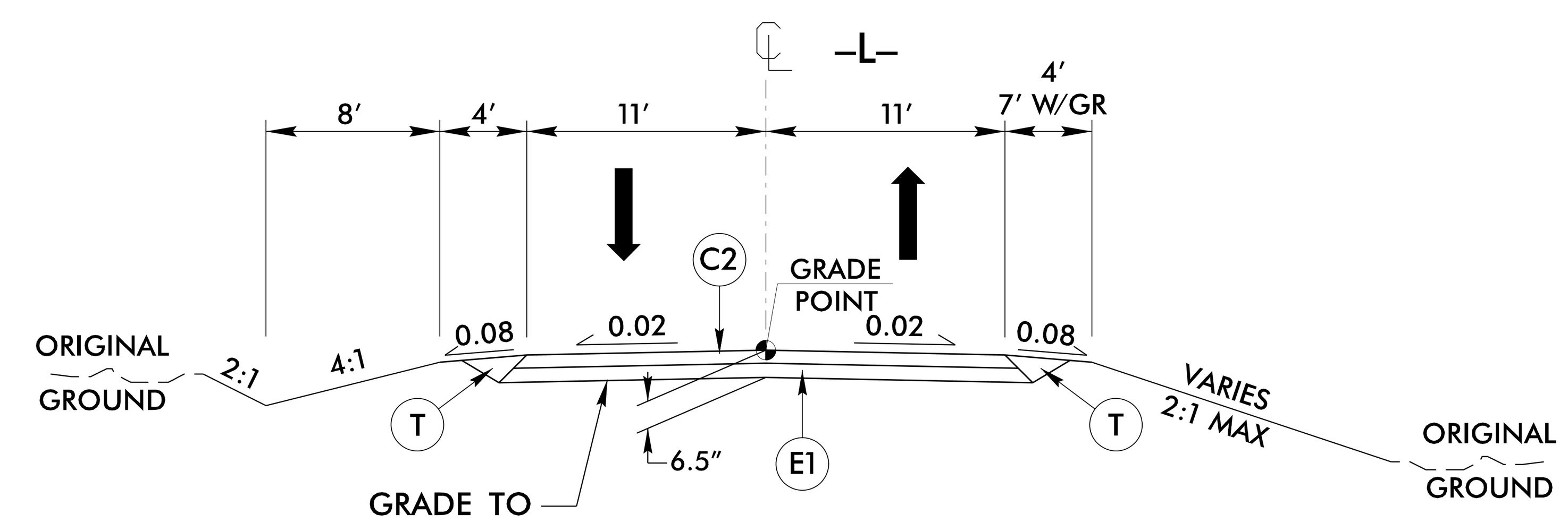
FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.25" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YARD.	R1	SHOULDER BERM GUTTER
C2	PROP. APPROX. 2.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YARD IN EACH OF TWO LAYERS.	T	EARTH MATERIAL
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YARD PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 2.0" IN DEPTH.	U	EXISTING PAVEMENT
E1	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YARD.	W	WEDGING
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5.5".	V	INCIDENTAL MILLING



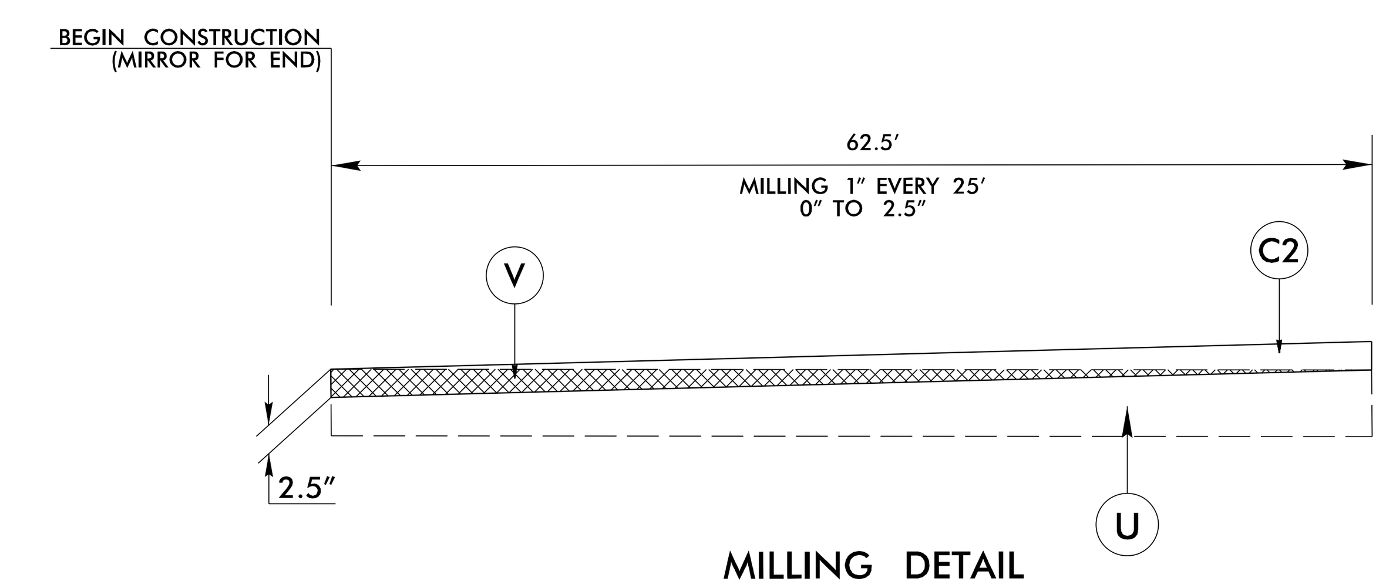
TYPICAL SECTION NO. 1

-L- STA. 13+20.00 TO STA. 15+50.00
-L- STA. 21+00 TO STA. 22+15.00



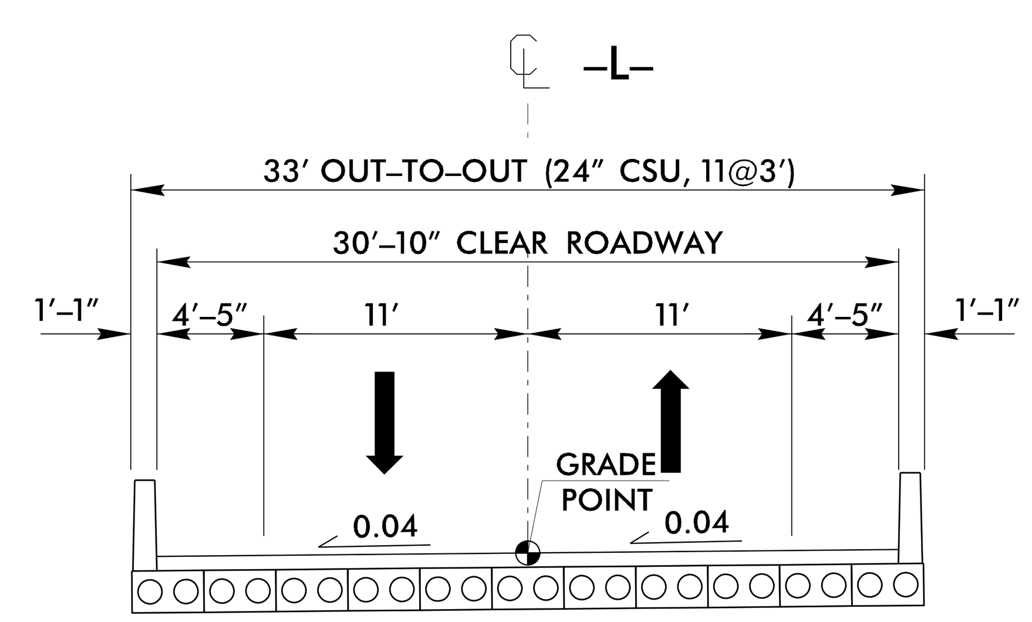
TYPICAL SECTION NO. 2

-L- STA. 15+50.00 TO STA. 16+29.26 (BEGIN BRIDGE)
-L- STA. 19+01.89 (END BRIDGE) TO STA. 21+00.00



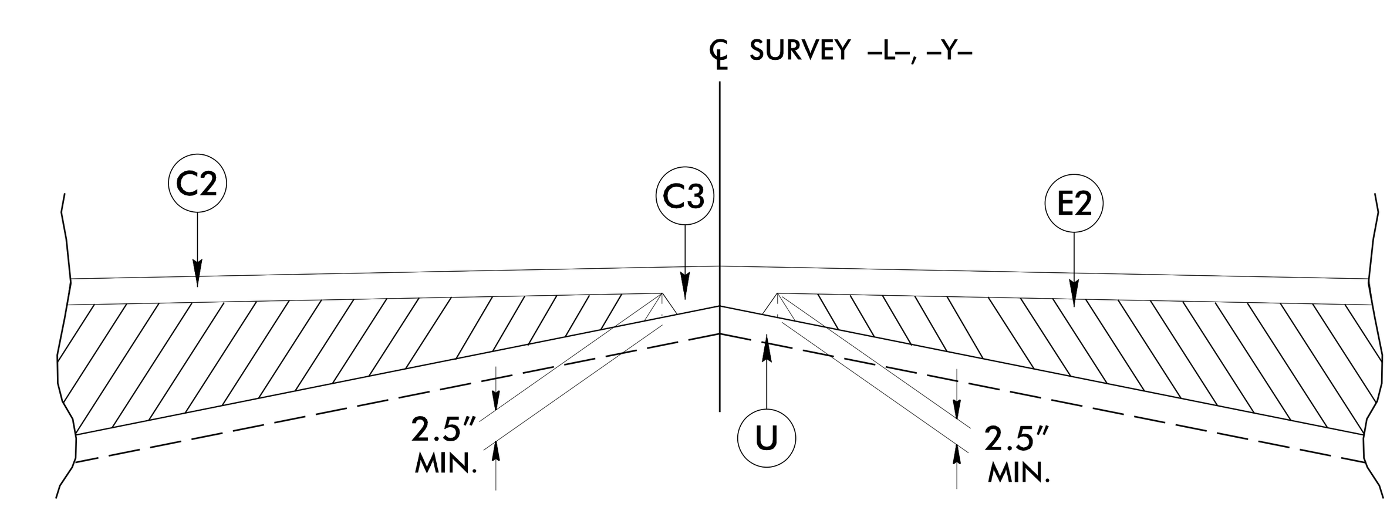
MILLING DETAIL

USE MILLING DETAIL AT CONSTRUCTION TIES



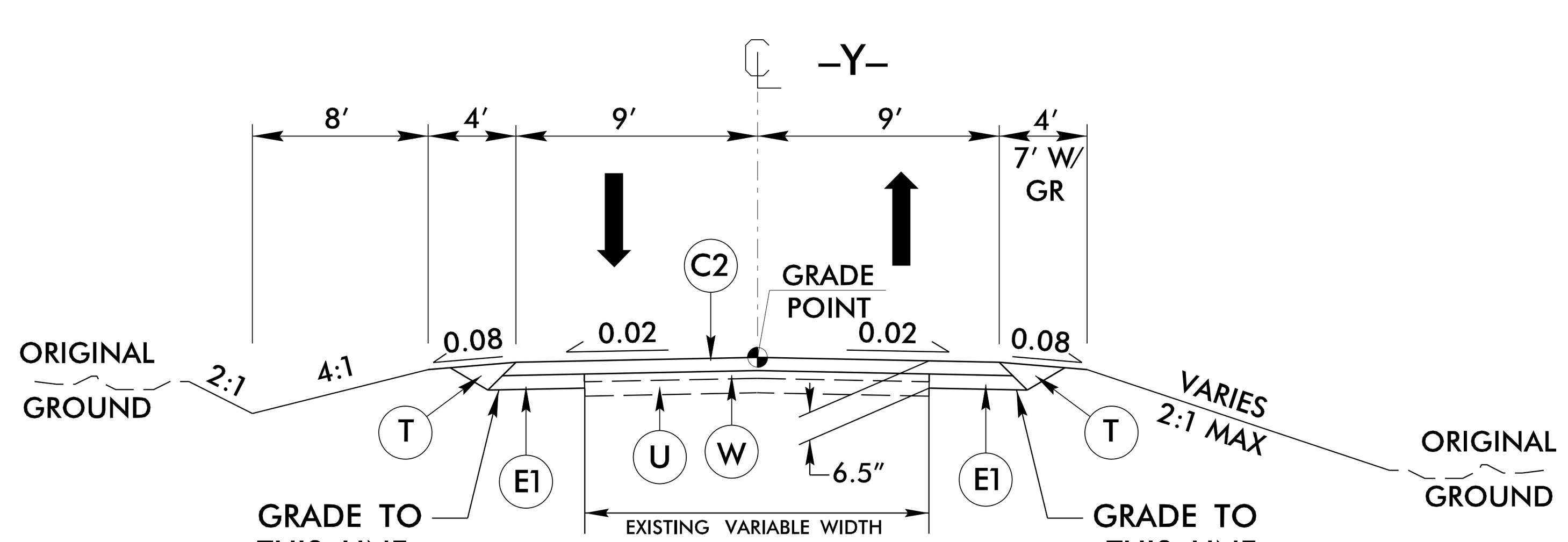
TYPICAL SECTION NO. 3

-L- STA. 16+29.26 TO STA. 19+01.89



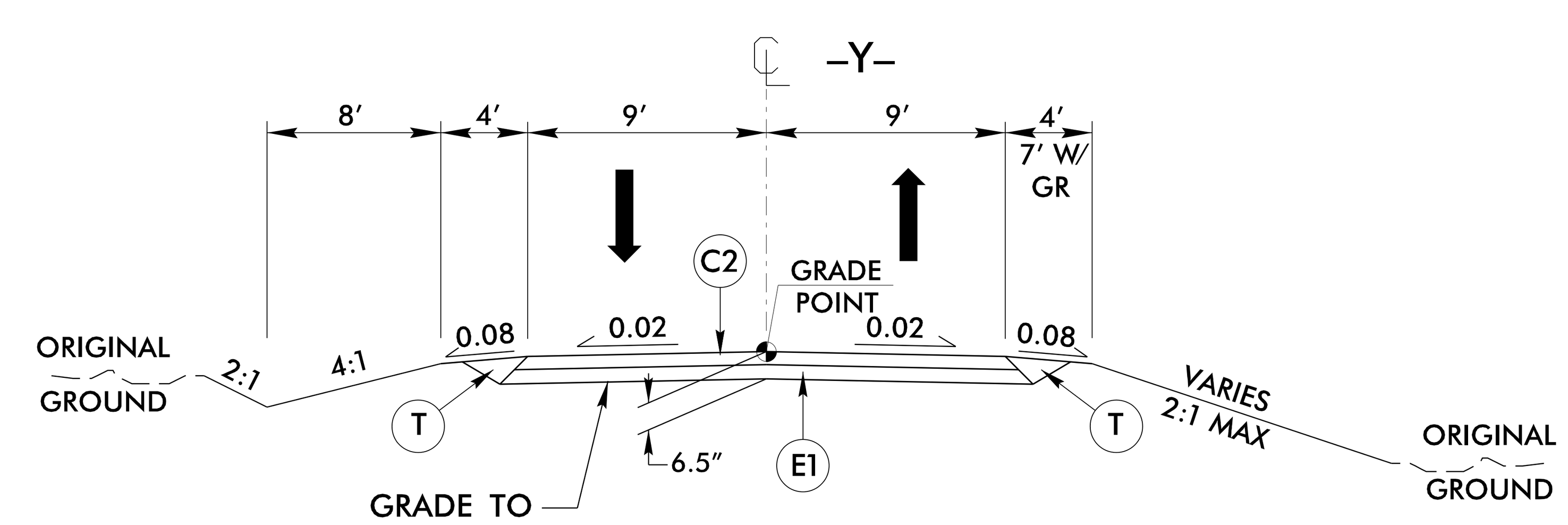
WEDGING DETAIL

USE FOR TYPICAL SECTIONS 1 & 4



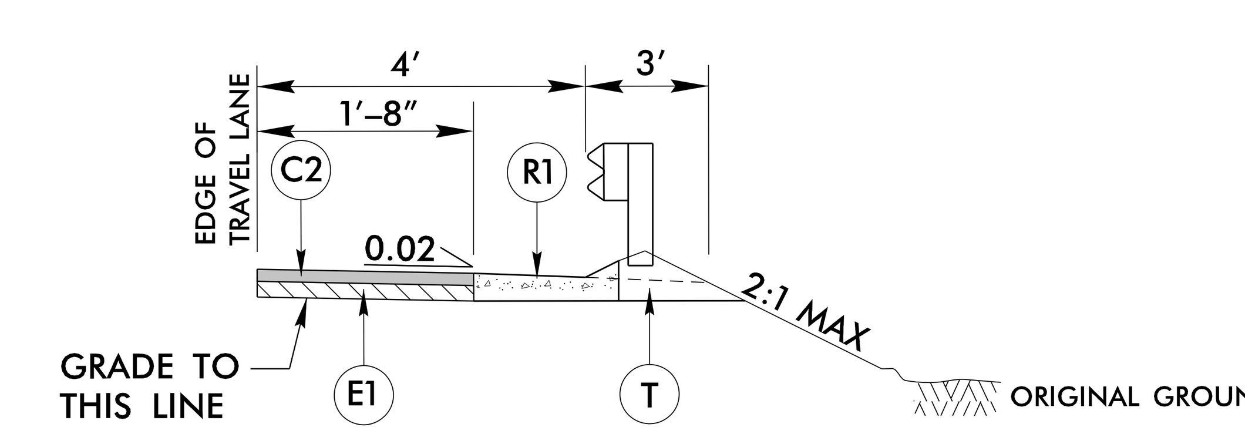
TYPICAL SECTION NO. 4

-Y- STA. 10+15.00 TO STA. 11+00.00



TYPICAL SECTION NO. 5

-Y- STA. 11+00.00 TO STA. 12+00.71



SHOULDER BERM GUTTER DETAIL

-L- STA. 19+12.76 TO -Y- STA. 11+51.34

PROJECT REFERENCE NO.	SHEET NO.
B-6046	3B-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

SUMMARY OF EARTHWORK IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT +%	BORROW	WASTE
–L– STA 13+50 TO 16+29.26 (BEGIN BRIDGE)	431	0	1,398	967	—
–L– STA 19+01.89 (END BRIDGE) TO 22+50	289	0	1178	889	—
–Y– STA 10+00 TO 12+00	82	0	802	720	—
SUBTOTAL	802	0	3378	2576	—
MATERIAL FOR SHOULDER CONSTRUCTION	—		12	12	
LOSS DUE TO CLEARING AND GRUBBING				—	
ADDITIONAL UNDERCUT		200			
ROCK WASTE TO REPLACE BORROW	—				
ADJUST FOR ROACK WASTE	—				
WASTE IN LIEU OF BORROW					—
PROJECT TOTAL	802	200	3390	2588	—
EST. 5% TO REPL. TOP SOIL ON BORROW PIT				129	
GRAND TOTAL	802	200	3390	2717	—
SAY	805			2720	

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

NOTE: Approximate quantities only, unclassified excavation, borrow excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the contract lump sum price for grading.

SHOULDER BERM GUTTER SUMMARY

LINE	BEG. STA.	END STA.	LENGTH (FT)
–L– /–Y–	–L– 19+12.76	–Y– 11+51.34	130.14
		TOTAL	130.14
		SAY	131

PAVEMENT REMOVAL SUMMARY

LINE	BEG. STA.	END STA.	LOCATION (LT/RT)	ASPHALT REMOVAL	
–L–	15+50	16+40	LT & RT	123	
–L–	18+93	21+00	LT & RT	422	
–Y–	11+00	11+95	RT	298	
			TOTAL	842 SY	
			SAY	850 SY	

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 CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GREU TL–2	GREU TL–3	TYPE III	CAT–1	VI MOD	BIC	AT–1	EA	G	NG				
–L–	13+29.26	16+29.26	RT	300.00			16+29.26		4.5	7.5								1	1										
–L–	15+54.26	16+29.26	LT	75.00				16+29.26	4.5	7.5								1	1										
–L–	19+01.89	22+01.89	RT	300.00				19+01.89	4.5	7.5								1	1										
–L–	19+01.89		LT	66.14			19+01.89		4.5	7.5									1										
–Y–		11+96.30	RT	100.00	73.17				4.5	7.5								1											
			TOTAL	841.14	73.17																								
		ANCHOR DEDUCTIONS																											
		TYPE III	@18.75'	4																									
		GREU TL–3	@50.00'	4																									
			TOTAL	566.14	73.17																								
			SAY	575	75																								
		ADDITIONAL POSTS		5																									

"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

3N444J3

COMPUTED BY:	ICE-BDB	DATE:	01/13/2022
CHECKED BY:	ICE-WTS	DATE:	10/20/2023

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
B-6046	3D-1

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE) 12	15	18	24	30	36	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	DO NOT USE PP PIPE	R. C. PIPE CLASS III 12	15	18	24	30	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY
L 19+21	12 LT	0402		294.7																										
		0402	0403		291.7	281.6			28					X																
Y 11+12	21 LT	0404		290.9																										
		0404	404A		287.9	285.7	0.4																52							
L 15+50	23 LT	0405		295.0																										
		0405	0406		292.0	285.5	0.7		80																					
Y1 11+55	13 RT	0407		295.4																										
		0407	0408		290.7	289.8			16																					
SHEET TOTALS									124														52							
PROJECT TOTALS									124														52							

LINE & STATION	FROM	TO	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	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35
L 19+21	0402		1																							1						1
	0402	0403																														
Y 11+12	0404																															
	0404	404A																														
L 15+50	0405		1															1							1								
	0405	0406																														
Y1 11+55	0407		1																							1						1
	0407	0408																														
SHEET TOTALS			3														1							1		2						2
PROJECT TOTALS			3														1							1		2						2

LINE & STATION	FROM	TO	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING C.B. TO D.I.	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO D.I.	ADJUST C.B.	ADJUST D.I.	15" DRAINAGE PIPE ELBOW	BERM DITCH OUTLET STD. 850.10 (PER EACH)	BERM DITCH OUTLET STD. 850.11 (PER EACH)	MODIFIED CONC. FLUME	PREFORMED SCOUR HOLE (PER EACH)	ENERGY DISSIPATION BASIN	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
L 19+21	0402																				
	0402	0403									2										
Y 11+12	0404																				
	0404	404A																		40	
L 15+50	0405																				
	0405	0406																			
Y1 11+55	0407																				
	0407	0408																			
SHEET TOTALS											2									40	
PROJECT TOTALS											2									40	

ABBREVIATIONS

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

COMPUTED BY: Eddie Beverly DATE: November 17, 2021
CHECKED BY: Shane Clark, PE DATE: November 17, 2021

(12-17-19)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
48409.1.1(B-6046)	3G-1

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			ASU(1)	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 Soil 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.

PROJECT REFERENCE NO.	SHEET NO.
B-6046	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 039183 ENGINEER BRIAN K. LUSK DocuSigned by: [illegible] 5CF14CDB58524E2... 10/30/2023	NORTH CAROLINA PROFESSIONAL SEAL 20754 ENGINEER WILLIAM J. STEPHENS, JR. DocuSigned by: William J. Stephens Jr. 7D18C5F72199474... 10/30/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ICE of CAROLINAS, PLLC

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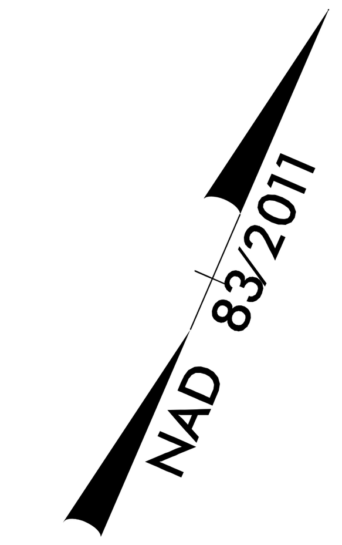
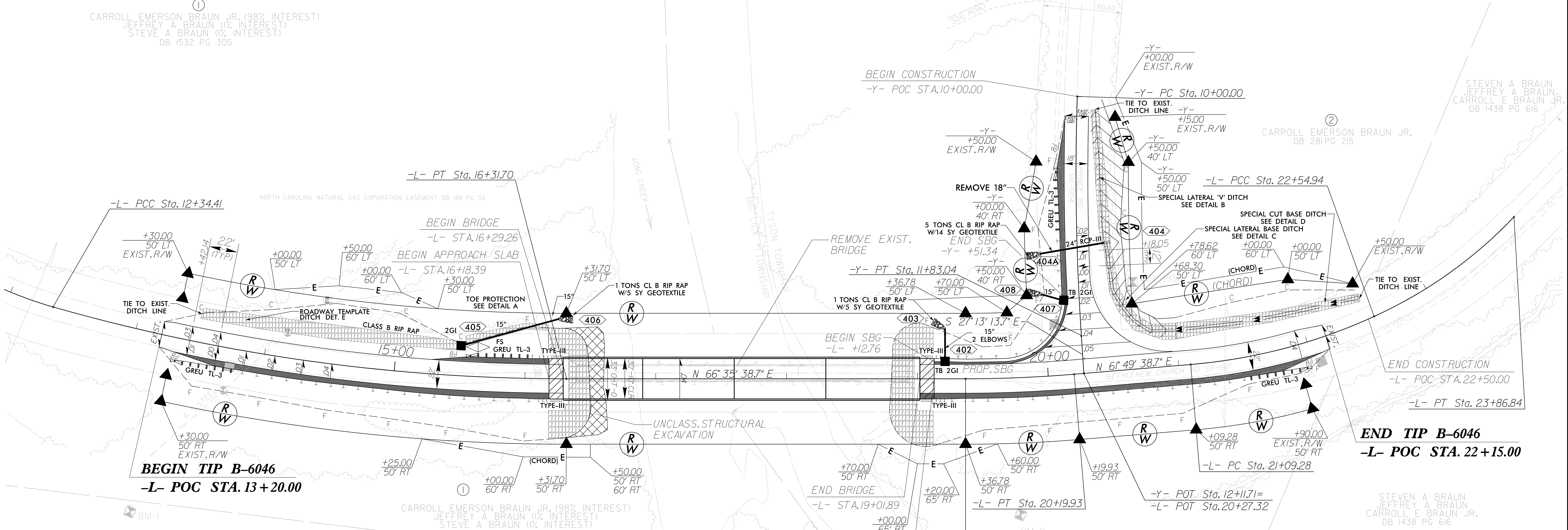
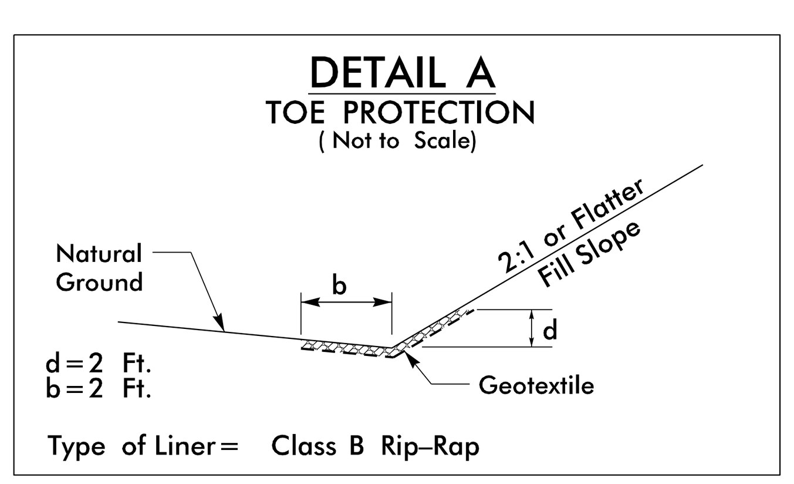
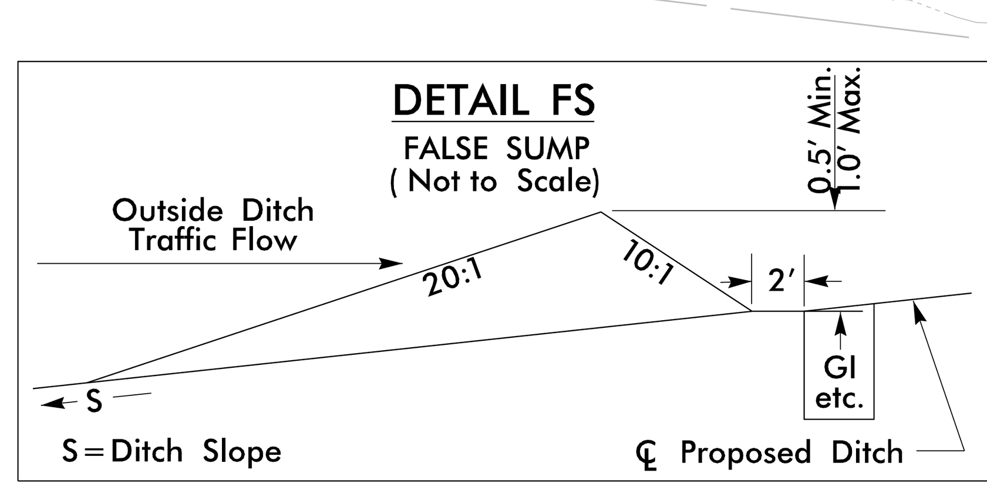
Phone: 803-822-0333
License #: P-0999



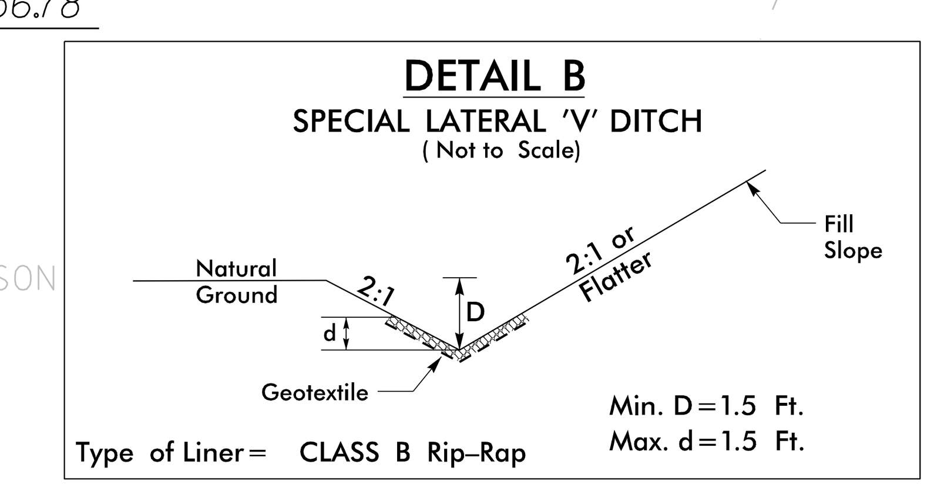




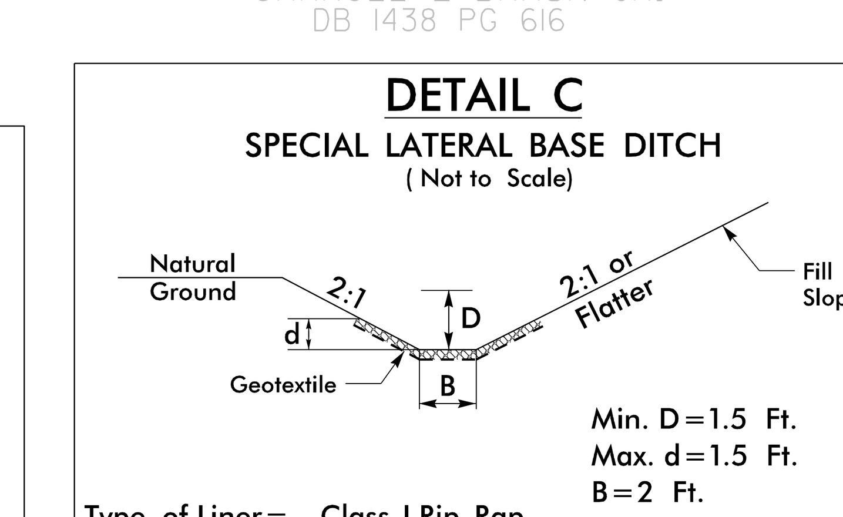
-L- STA. 15+53 TO 16+17 LT
EST. 37 TONS CLASS B RIP RAP
EST. 99 SY GF



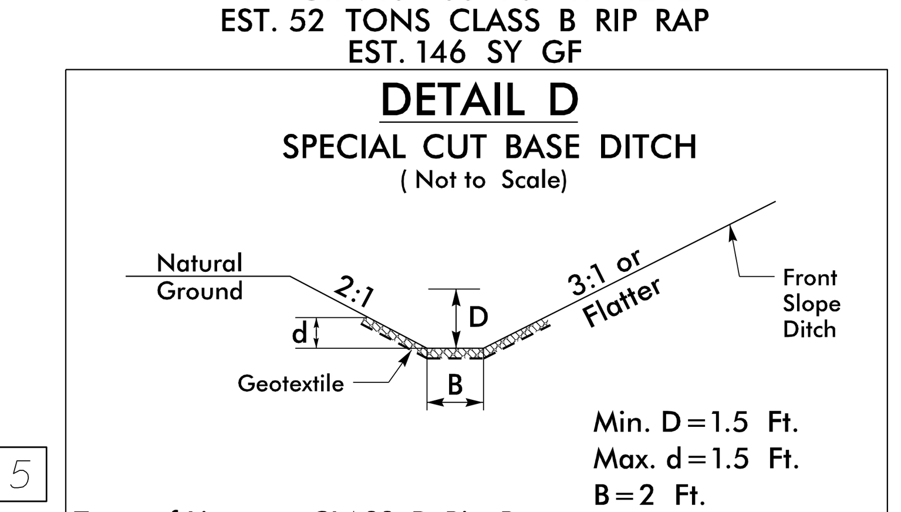
-L- STA. 15+55 LT



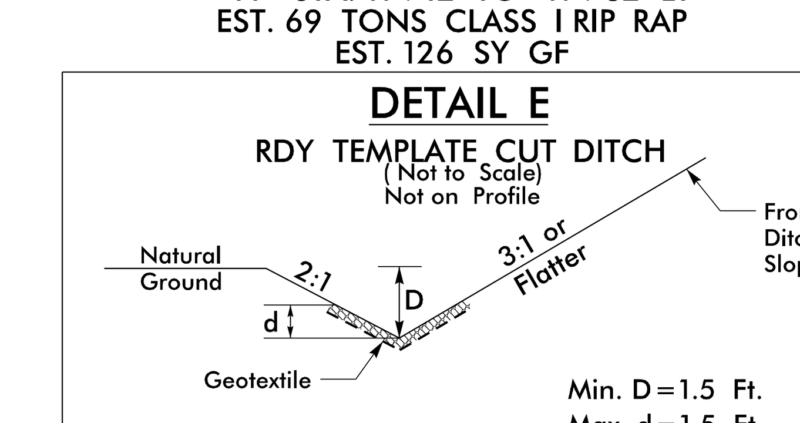
-Y1- STA. 10+00 TO 11+12 LT
EST. 52 TONS CLASS B RIP RAP
EST. 146 SY GF



-Y1- STA. 11+12 TO 11+82 LT
EST. 69 TONS CLASS I RIP RAP
EST. 126 SY GF



-L- STA. 21+00 TO 22+50 LT
EST. 84 TONS CLASS B RIP RAP
EST. 228 SY GF



-L- STA. 13+50 TO 15+50 LT
EST. 92 TONS CLASS B RIP RAP
EST. 259 SY GF

-L- CURVE DATA

PI Sta 10+63.17	PI Sta 11+77.63	PI Sta 14+34.34	PI Sta 19+78.38	PI Sta 21+82.85	PI Sta 23+21.72
△ = 46° 04′ 12.6″ (LT)	△ = 21° 41′ 19.4″ (LT)	△ = 15° 55′ 04.7″ (LT)	△ = 4° 45′ 50.3″ (LT)	△ = 19° 53′ 01.2″ (LT)	△ = 22° 09′ 11.2″ (LT)
D = 38° 34′ 05.7″	D = 18° 51′ 58.3″	D = 4° 00′ 24.1″	D = 5° 43′ 46.5″	D = 13° 39′ 04.6″	D = 16° 47′ 44.2″
L = 119.45′	L = 114.96′	L = 397.28′	L = 83.15′	L = 145.65′	L = 131.90′
T = 63.17′	T = 58.18′	T = 199.93′	T = 41.60′	T = 73.57′	T = 66.78′
R = 148.56′	R = 303.70′	R = 1,430.00′	R = 1,000.00′	R = 419.71′	R = 341.14′
SE = EXIST.	SE = .04	SE = .04	SE = .04	SE = .04	SE = EXIST.
	DS = 30 MPH**	DS = 50 MPH*	DS = 50 MPH*	DS = 35 MPH**	

-Y- CURVE DATA

PI Sta 10+91.60
△ = 5° 40′ 39.5″ (LT)
D = 3° 06′ 06.4″
L = 183.04′
T = 91.60′
R = 1,847.19′
SE = EXIST.

* MEETS SUBREGIONAL TIER DESIGN GUIDELINES

** TYING TO EXISTING ALIGNMENT

FOR -L- PROFILE SEE SHEET 5
FOR -Y- PROFILE SEE SHEET 5
FOR STRUCTURE PLANS SEE SHEETS S-1 THRU S-26

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License #: P-0999

PROJECT REFERENCE NO.	SHEET NO.
B-6046	5

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039183 ENGINEER

10/30/2023

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20754 ENGINEER WILLIAM STEPHENS JR.

10/30/2023

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5/14/99

—L—

PI = 14+85.00
EL = 296.54'
VC = 330'
K = 36
DS = 25 MPH

BEGIN GRADE
-L- STA.13+20.00
EL.312.30

EXIST. GRADE
(-)9.9902

(-)9.5497%

(-)10.3000%

BEGIN BRIDGE
-L- STA.16+29.26

END BRIDGE
-L- STA.19+01.89

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 13,000	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 283.7	FT
BASE DISCHARGE	= 18,000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 286.7	FT
OVERTOPPING DISCHARGE	= 39,000	CFS
OVERTOPPING FREQUENCY	= 500 +	YRS
OVERTOPPING ELEVATION	= 295.7	FT
DATE OF SURVEY	= 10/6/2021	
W.S.ELEVATION AT DATE OF SURVEY	= 270.4	FT

EXIST. GROUND

UNCLASS. STRUCTURAL EXCAVATION

CLASS II RIP RIP (24" THICK TYP)

WSEL 270.4' 10/6/2021

UNCLASS. STRUCTURAL EXCAVATION

CLASS II RIP RIP (24" THICK TYP)

PI = 20+35.00
EL = 294.89'
VC = 240'
K = 20
DS = 20 MPH

PROP. GRADE

-L- STA.20+27.32 =
-Y- STA.12+11.17

BMI ELEVATION = 286.93'
N 538766.1 E 1624268.9
-L- STATION 19+74.86 104.62' RT

PI = 21+85.00
EL = 312.04'
VC = 60'
K = 94
DS = 50 MPH

END GRADE
-L- STA.22+15.00
EL.315.28

(+)10.8000%

EXIST. GRADE

(+)7.1150%

(+)11.4361%

(+)12.3000%

BEG.SP.CUT DITCH
STA.21+00 LT
ELEV.= 298.50

END SP.CUT DITCH
STA.22+50 LT
ELEV.= 316.95

LEFT DITCH

FOR -L- PLAN SEE SHEET 4

—Y—

PI = 10+75.00
EL = 292.50'
VC = 97'
K = 27
DS = 25 MPH

BEGIN GRADE
-Y- STA.10+15.00
EL.292.24

END GRADE
-Y- STA.12+00.71
EL.297.56

PROP. GRADE

EXIST. GROUND

(+)10.4405%

(+)14.0206%

(+)5.3700%

(-)12.8304%

(+)5.5263%

BEGIN SP.LAT.'V' DITCH
STA.10+00 LT
ELEV.= 291.07

PI
STA.11+50 LT
ELEV.= 290.00

END SP.LAT.'V' DITCH
BEG.SP.LAT.BASE DITCH
STA.11+12 LT
ELEV.= 287.91

END SP.LAT.BASE DITCH
STA.11+82 LT
ELEV.= 298.50

LEFT DITCH

FOR -Y- PLAN SEE SHEET 4