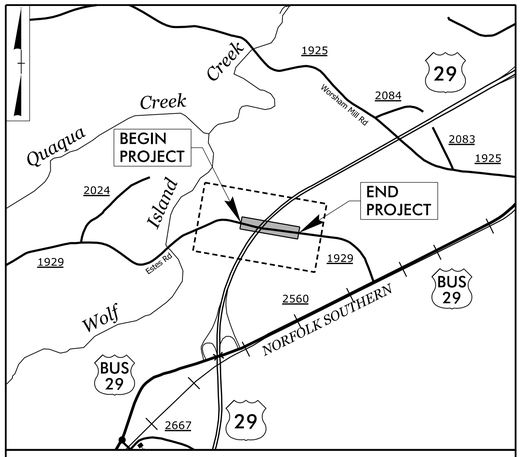
09/08/99

TIP PROJECT: BR-0097

CONTRACT: C204864

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



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROCKINGHAM COUNTY

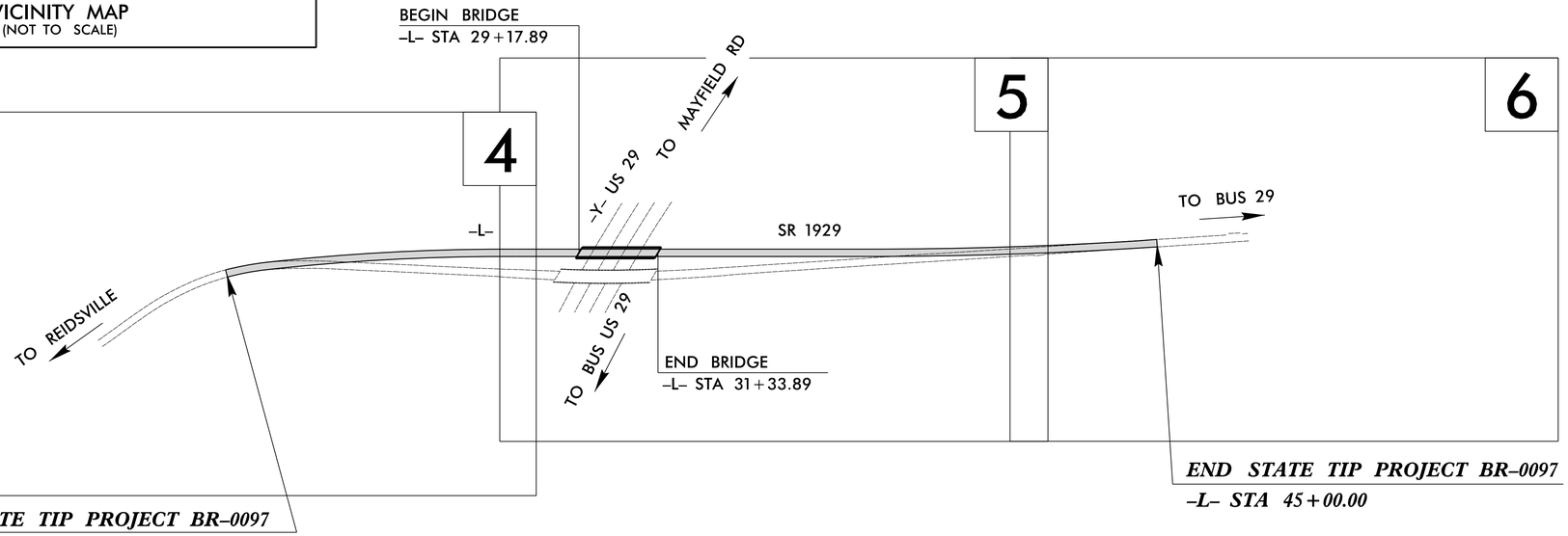
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0097	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
67097.1.1	N/A	PE
67097.2.1	N/A	ROW/UTIL
67097.3.1	N/A	CONST

LOCATION: BRIDGE NO. 780178 ON SR 1929 (ESTES RD) OVER US 29

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

NAD 83/NA 2011



BEGIN STATE TIP PROJECT BR-0097
–L– STA 19+50.00

END STATE TIP PROJECT BR-0097
–L– STA 45+00.00

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS SHOWN ON THE PLANS.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2024 = 240
ADT 2044 = 340
K = TBD %
D = TBD %
T = TBD % *
V = 60 MPH
* TTST =% DUAL %
FUNC CLASS =
LOCAL –
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR-0097	=	0.442
LENGTH STRUCTURE TIP PROJECT BR-0097	=	0.041
TOTAL LENGTH TIP PROJECT BR-0097	=	0.483

Prepared for NCDOT In the Office of:
moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License NO.: F-0105

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 27, 2023

LETTING DATE:
AUGUST 20, 2024

TRENT HUFFMAN, P.E.
PROJECT ENGINEER

GRAY MODLIN, P.E.
PROJECT DESIGN ENGINEER

DAVID STUTTS, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER
moffatt & nichol
DocuSigned by: Justin Davenport
SIGNATURE:
NORTH CAROLINA PROFESSIONAL SEAL 049969 ENGINEER JUSTIN M DAVENPORT P.E.

ROADWAY DESIGN ENGINEER
moffatt & nichol
DocuSigned by: Trent Huffman
SIGNATURE:
NORTH CAROLINA PROFESSIONAL SEAL 023912 ENGINEER TRENT E HUFFMAN P.E.

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

3/19/2024
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gmodlin

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
BR-0097	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029912 ENGINEER TRENTON E. HUFFMAN

6/4/2024

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INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-2	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2G-1 THRU 2G-4	GEOTECHNICAL DETAILS
3B-1	ROADWAY SUMMARIES
3D-1	DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
3P-1	PARCEL INDEX SHEET
4 THRU 8	PLAN AND PROFILE SHEET
RW-1 THRU RW-6	SURVEY CONTROL, EXISTING CENTERLINES RIGHT OF WAY, EASEMENT AND PROPERTY LINES
TMP-1 THRU TMP-16	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-5	PAVEMENT MARKING PLANS
EC-1 THRU EC-9	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-5	SIGNING PLANS
UO-1 THRU UO-4	UTILITIES BY OTHERS PLANS
X-1A	CROSS-SECTION SUMMARY SHEET
X-2 THRU X-15	CROSS-SECTIONS
S-1 THRU S-32	STRUCTURE PLANS

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
310.10	Driveway Pipe Construction
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
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.32	Brick Junction Box - 12" thru 66" Pipe
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - for B-77 and B-83 Anchor Units
865.01	Cable Guiderail
866.02	Woven Wire Fence - with Wood Post
876.01	Rip Rap in Channels and Ditches
876.02	Guide for Rip Rap at Pipe Outlets

GENERAL NOTES:

2024 SPECIFICATIONS
EFFECTIVE: 01-16-2024
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD 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 NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

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

DUKE ENERGY

AT&T

CHARTER SPECTRUM

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

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

6/4/2024
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amedlin

9/10/2021

PROJECT REFERENCE NO.	SHEET NO.
BR-0097	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

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

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
BR-0097	2A-1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 023912 BRENT E. HUFFMAN

6/4/2024

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044390 ANDREW D. WARGO

6/6/2024

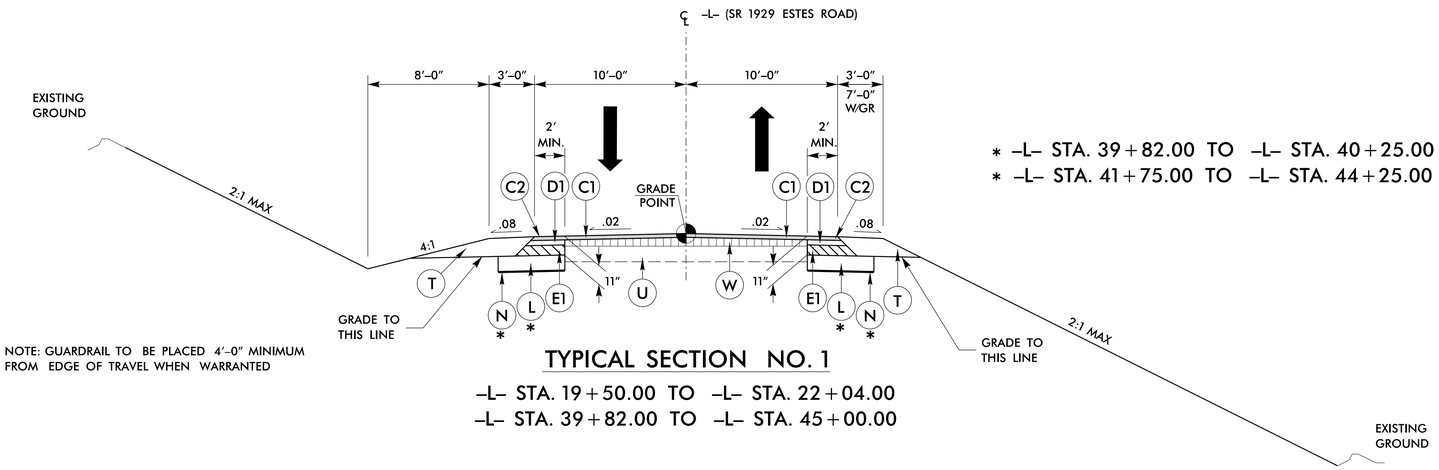
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4865 FAX
NC License NO.: F-0105

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165.0 LBS. PER SQ. YD.	L	CLASS IV SUBGRADE STABILIZATION
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165.0 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	N	GEOTEXTILE FOR SUBGRADE STABILIZATION
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.	R1	SHOULDER BERM GUTTER
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT 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.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET 2A-2)

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

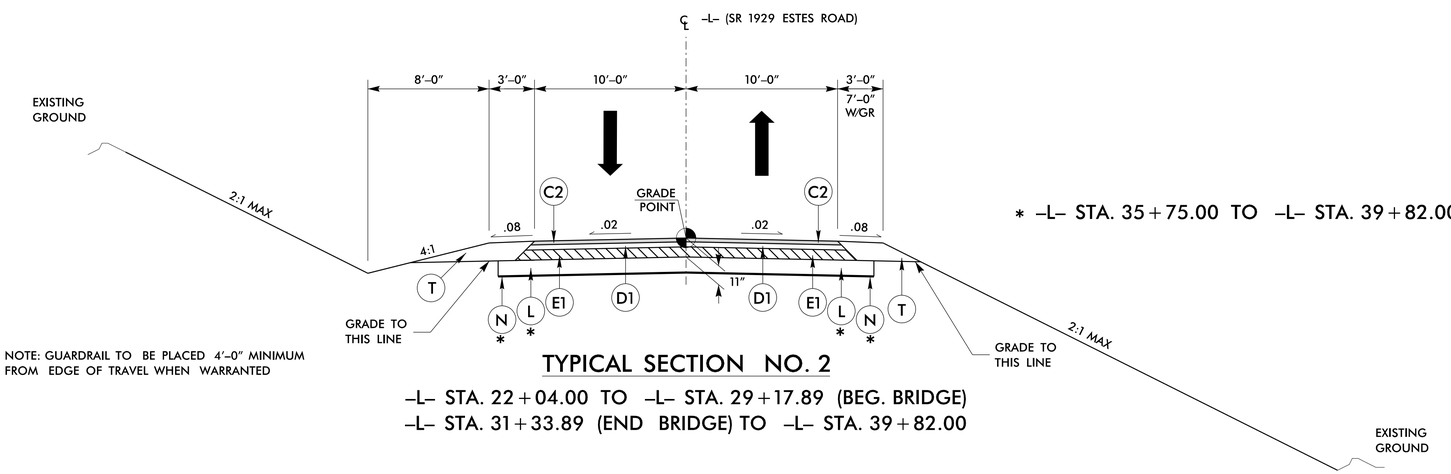


NOTE: GUARDRAIL TO BE PLACED 4'–0" MINIMUM FROM EDGE OF TRAVEL WHEN WARRANTED

TYPICAL SECTION NO. 1

–L– STA. 19+50.00 TO –L– STA. 22+04.00
–L– STA. 39+82.00 TO –L– STA. 45+00.00

* –L– STA. 39+82.00 TO –L– STA. 40+25.00
* –L– STA. 41+75.00 TO –L– STA. 44+25.00



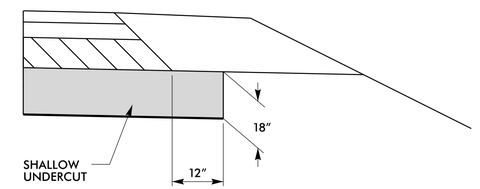
NOTE: GUARDRAIL TO BE PLACED 4'–0" MINIMUM FROM EDGE OF TRAVEL WHEN WARRANTED

TYPICAL SECTION NO. 2

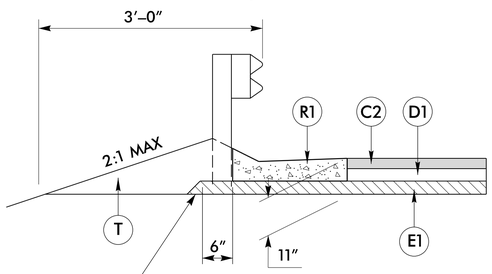
–L– STA. 22+04.00 TO –L– STA. 29+17.89 (BEG. BRIDGE)
–L– STA. 31+33.89 (END BRIDGE) TO –L– STA. 39+82.00

* –L– STA. 35+75.00 TO –L– STA. 39+82.00

Detail for Shallow Undercut Use in All Areas of Subgarde Stabilization



Detail Showing Shoulder Berm Gutter on Asphalt Base Course

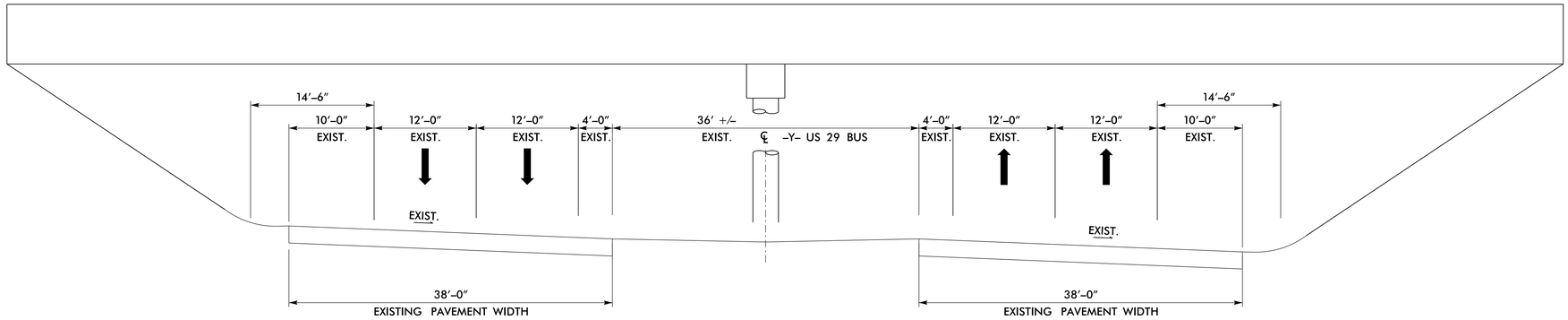


INSET DETAIL

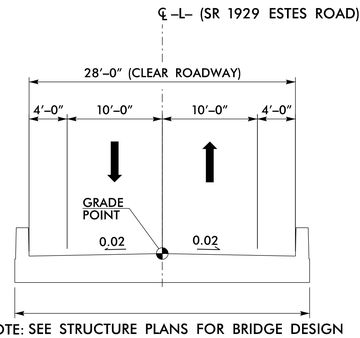
TO BE USED IN CONJUNCTION WITH TYPICAL SECTION No. 2 AS FOLLOWS
–L– STA. 28+79.00 TO –L– STA. 29+13.35 LT
–L– STA. 28+73.00 TO –L– STA. 29+00.75 RT

8/17/99

BRIDGE AT –L– STATION 30+17.89
OVER –Y– STATION 16+48.80



TYPICAL SECTION UNDER STRUCTURE

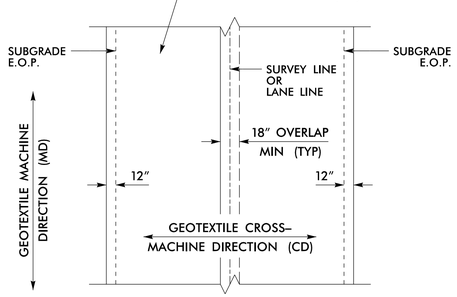


NOTE: SEE STRUCTURE PLANS FOR BRIDGE DESIGN

NOTE: 4′ SHOULDERS REQUIRED FOR HYDRAULIC SPREAD

BRIDGE TYPICAL

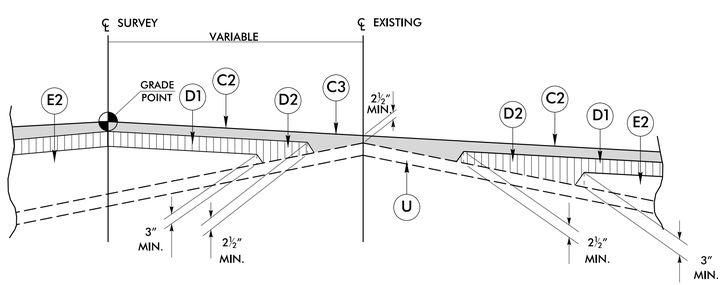
(–L–) SR 1929 over US 29
–L– STA. 29+17.89 TO –L– STA. 31+33.89



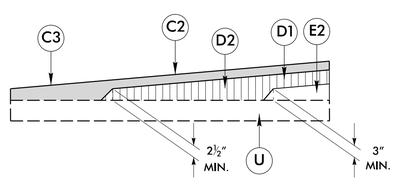
GEOTEXTILE FOR SUBGARDE STABILIZATION PLACEMENT (PLAN VIEW)

(100% COVERAGE REQUIRED)

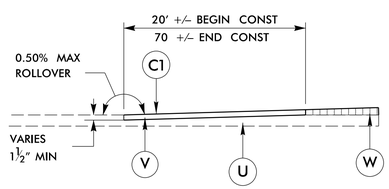
*INSTALL GEOTEXTILE FOR SUBGARDE STABILIZATION WITH MINIMUM ROLL WIDTH UNDER ROADWAY EDGES AND SHOULDERS ADJACENT TO FILL SLOPES



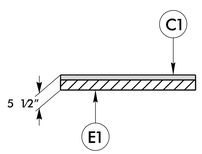
DETAIL SHOWING METHOD OF WEDGING (W1)



WEDGING DETAIL FOR RESURFACING



MILLING DETAIL



TEMPORARY PAVEMENT

TEMPORARY PAVEMENT SECITON
ONLY FOR USE DURING TMP
ONLY FOR PLACEMENT OF PCB

PROJECT REFERENCE NO.	SHEET NO.
BR-0097	2A-2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029912 TREVOR E. HURTMAN

6/4/2024

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044598 ANDREW D. WARGO

6/6/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

C1	1½″ S9.5B
C2	3″ S9.5B
C3	VARIABLE DEPTH S9.5B
D1	4″ I19.0C
D2	VARIABLE DEPTH I19.0C
E1	4″ B25.0C
E2	VARIABLE DEPTH B25.0C
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXIST PAVEMENT
V	INCIDENTAL MILLING
W	WEDGING

PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

6/4/2024
q:\r\10011-110\br-0097\roadway\prj\BR-0097_rdy_typ.dgn
amedlin

PROJECT REFERENCE NO.	SHEET NO.
BR-0097	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 01/24/2024 F760CAEB96FC4D3...

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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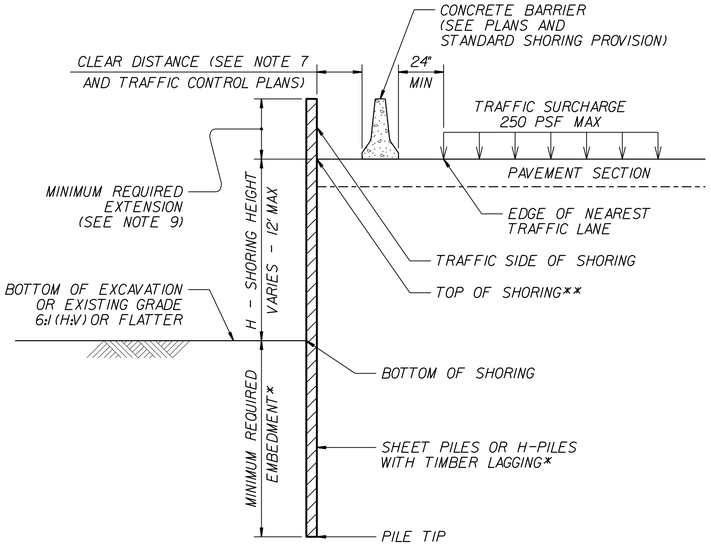
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN^3/FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)			MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN^3/FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)		
				HP 10x42	HP 12x53	HP 14x73			HP 10x42	HP 12x53	HP 14x73
GROUNDWATER ELEVATION BEWTEEN BOTTOM OF SHORING AND PILE TIP	< 6	11.5	4.5	11.5	11.5	11.5	16.0	12.0	13.0	13.0	13.0
	7	13.0	7.0	13.0	13.0	13.0	17.0	14.5	14.5	14.5	14.5
	8	15.0	10.0	--	15.0	15.0	18.0	17.0	--	15.5	15.5
	9	17.0	14.0	--	17.0	17.0	19.0	20.0	--	17.0	17.0
	10	18.5	19.5	--	--	18.5	20.0	23.5	--	--	18.5
	11	20.5	26.0	--	--	--	21.0	28.0	--	--	20.0
	12	22.5	33.0	--	--	--	22.0	33.0	--	--	21.5
GROUNDWATER ELEVATION BELOW PILE TIP	< 6	7.5	3.0	8.0	8.0	8.0	11.0	10.0	9.5	9.5	9.5
	7	8.5	4.5	9.5	9.5	9.5	12.0	12.0	10.5	10.5	10.5
	8	10.0	6.5	10.5	10.5	10.5	12.5	14.0	11.5	11.5	11.5
	9	11.0	9.5	--	12.0	12.0	13.5	16.5	--	12.5	12.5
	10	12.5	13.0	--	--	13.5	14.0	19.5	--	13.5	13.5
	11	13.5	17.0	--	--	14.5	15.0	22.5	--	--	14.5
	12	15.0	21.5	--	--	16.0	16.0	25.5	--	--	15.5

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

*DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".

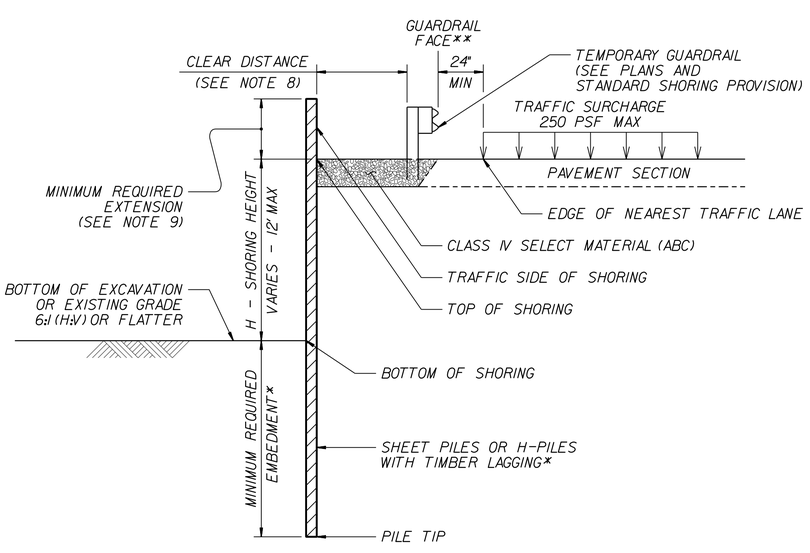
NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 PCF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 PSF
4. DO NOT USE STANDARD TEMPORARY SHORING IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS WITHIN THE EMBEDMENT DEPTH.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, USE "GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP" FOR GROUNDWATER CONDITION. DO NOT USE STANDARD TEMPORARY SHORING IF GROUNDWATER IS ABOVE BOTTOM OF SHORING.
7. AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN THE MINIMUM REQUIRED FOR CONCRETE BARRIER, SET BARRIER NEXT TO AND UP AGAINST TRAFFIC SIDE OF PILES AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
8. AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN 4' FOR TEMPORARY GUARDRAIL, ATTACH GUARDRAIL TO TRAFFIC SIDE OF PILES AS SHOWN IN THE PLANS AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
9. MINIMUM REQUIRED EXTENSION IS 6" FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32" FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".
10. MINIMUM REQUIRED EMBEDMENT FOR H-PILES WITH TIMBER LAGGING IS BASED ON DRIVEN H-PILES AT MAXIMUM 6' SPACING. AT THE CONTRACTOR'S OPTION, EMBEDMENT DEPTHS MAY BE REDUCED BY 25% FOR DRILLED-IN H-PILES.
11. SUBMIT A "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY SHORING CONSTRUCTION. UP TO 3 SHORING LOCATIONS MAY BE INCLUDED ON EACH FORM. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
12. CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.



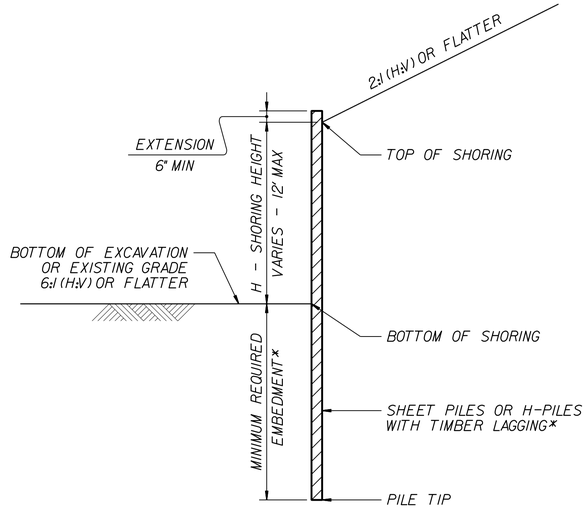
CONCRETE BARRIER

**TOP OF SHORING = EDGE OF PAVEMENT



TEMPORARY GUARDRAIL

**GUARDRAIL FACE = EDGE OF PAVEMENT



STANDARD TEMPORARY SHORING

(SLOPE CASE)

*SEE TABLE ABOVE.

STANDARD TEMPORARY SHORING

(SURCHARGE CASE)

*SEE TABLE ABOVE.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
BR-0097	2G-2

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

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ENGINEER

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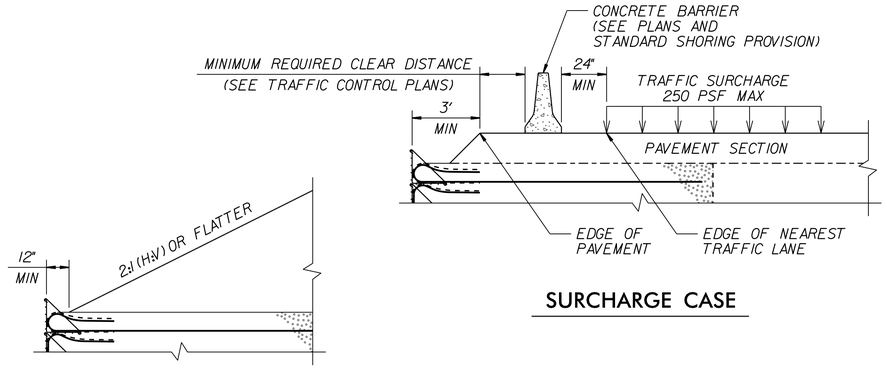
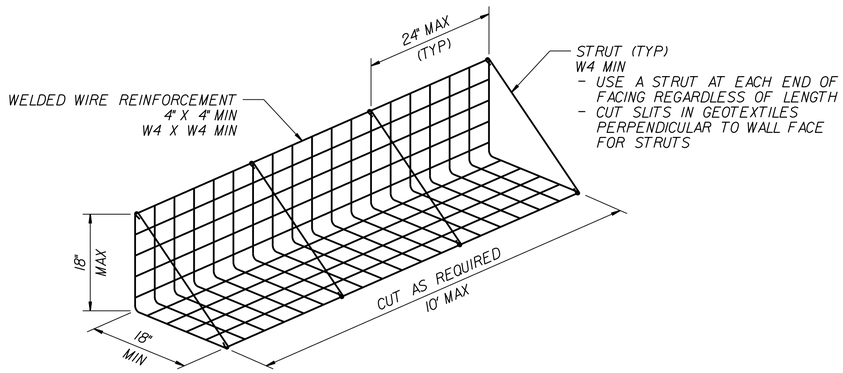
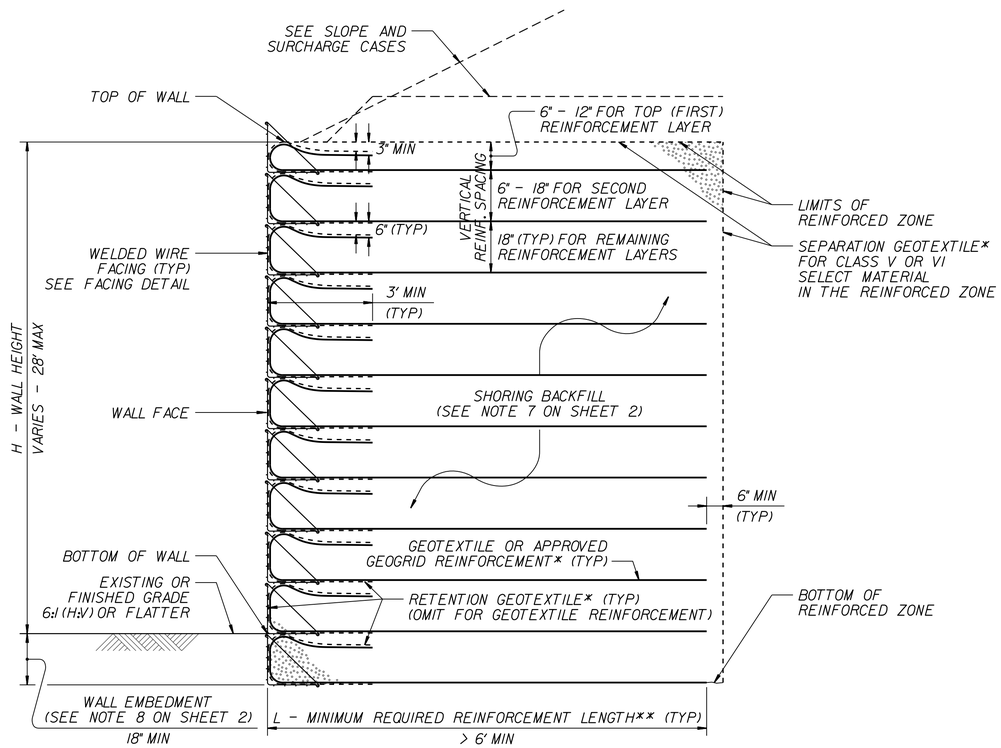


SURCHARGE CASE

SLOPE CASE

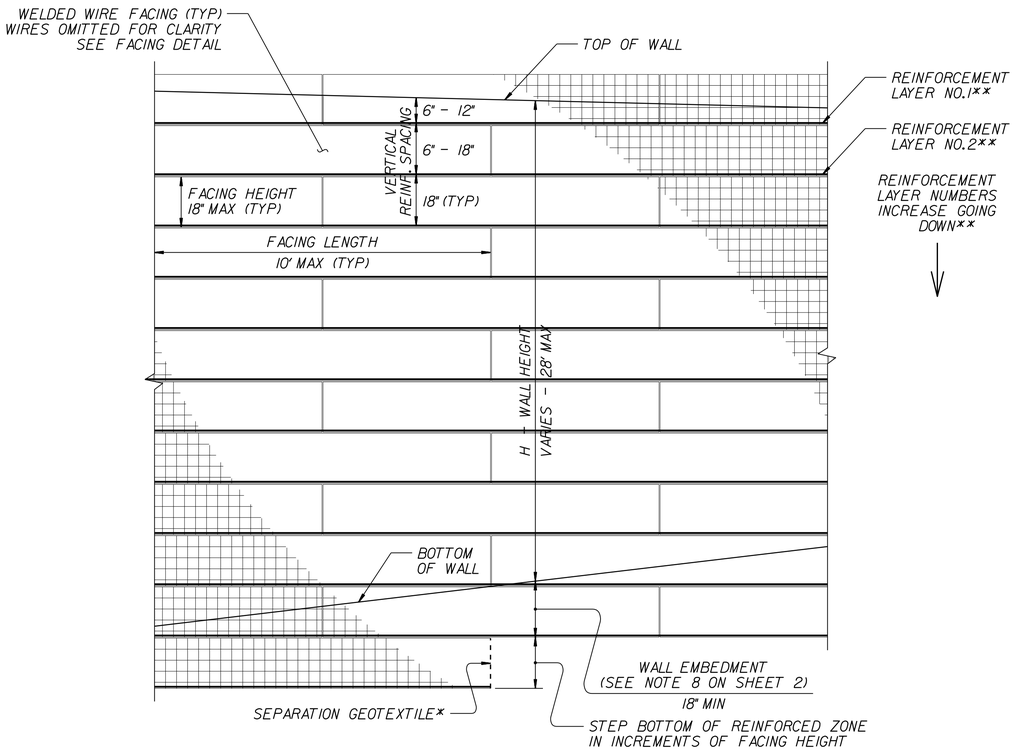


FACING DETAIL



STANDARD TEMPORARY WALL

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)
*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.



STANDARD TEMPORARY WALL – PARTIAL ELEVATION

*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 1 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
BR-0097	2G-3

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

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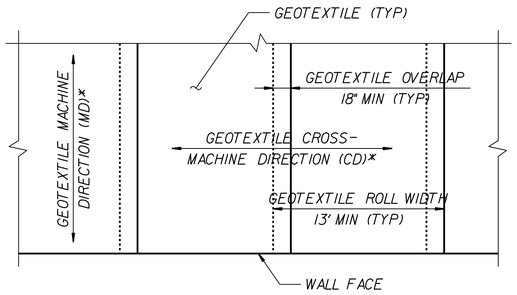
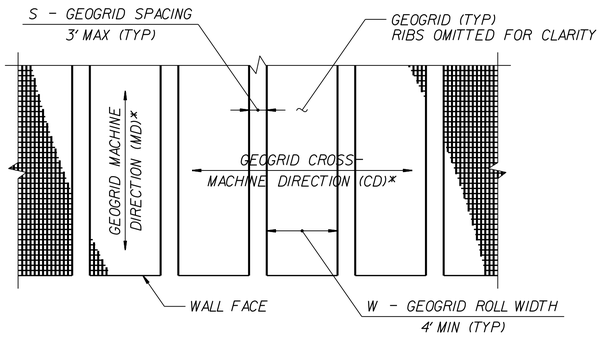


GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

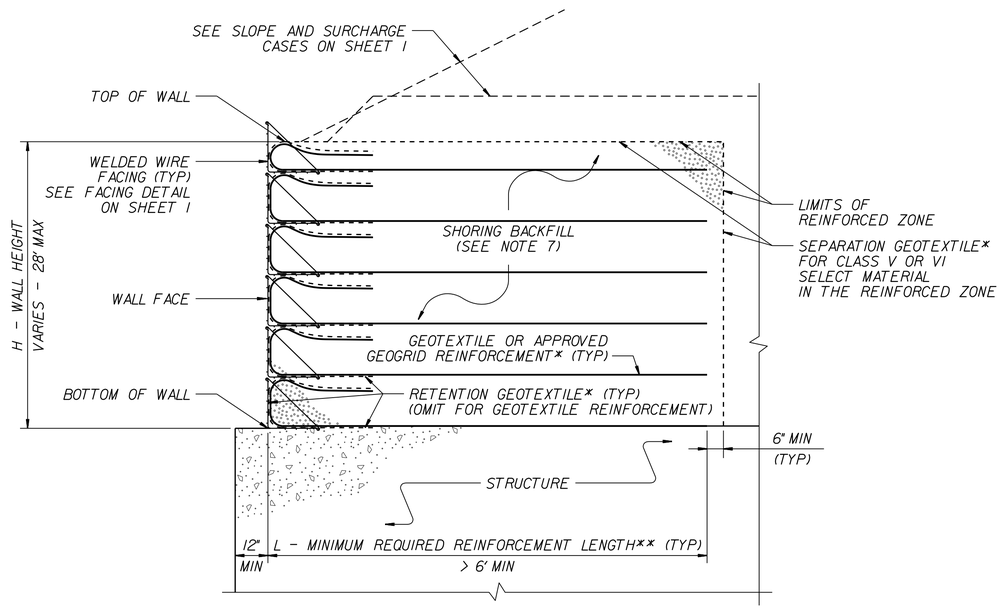


GEOGRID PLACEMENT

(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT – $\frac{W}{W+S}$ x 100 $\geq$ 80%, SEE NOTE 11)

GEOSYNTHETIC PLACEMENT DETAILS

(PLAN VIEW)
*SEE NOTE 12.



TEMPORARY WALL ON STRUCTURE DETAIL

*SEE GEOSYNTHETIC PLACEMENT DETAILS.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 PCF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 PSF
4. DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER OR FLOOD ELEVATION IS ABOVE BOTTOM OF REINFORCED ZONE.
7. DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
8. WALL EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
9. DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
10. GEOGRIDS FOR GEOGRID REINFORCEMENT ARE APPROVED FOR SHORT TERM DESIGN STRENGTHS (3-YEAR DESIGN LIFE) IN THE MD AND CD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Products.aspx
    DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE I OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

11. FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
12. AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH OF THE FOLLOWING CONDITIONS OCCUR:
    - W (REINFORCEMENT ROLL WIDTH) $\geq$ (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
    - REINFORCEMENT STRENGTH IN CD $\geq$ MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
13. SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
14. DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
15. FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
16. DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
17. CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
18. FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
19. FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL
SHEET 2 OF 3

DATE: 10-19-21

PROJECT REFERENCE NO.	SHEET NO.
BR-0097	2G-4

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

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ENGINEER

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SLOPE OR SURCHARGE CASE	GROUNDWATER DEPTH BELOW BOTTOM OF REINFORCED ZONE (SEE NOTE 6 ON SHEET 2) (FT)	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)	H - WALL HEIGHT (FT)																								
			< 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
SLOPE CASE	> 0	CLASS II,TYPE I, CLASS III,CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	8	9	11	12	13	13	14	15	16	17	18	19	20	21	22	23	24	24	25	26	27	27
SURCHARGE CASE	> 0 TO 7 FOR H < 20' > 0 TO 10 FOR H ≥ 20'	ALL SHORING BACKFILL TYPES	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	17	17	18	19	19	20	21	22
	> 7 FOR H < 20' > 10 FOR H ≥ 20'	A-2-4 SOIL	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21
		CLASS II,TYPE I OR CLASS III SELECT MATERIAL	6	6	7	7	8	8	9	10	10	11	11	12	12	13	14	15	15	16	16	17	17	18	18	19	20
		CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	7	7	8	8	9	9	10	10	11	12	13	13	14	14	15	15	16	17	17	18	19	19

L – MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)

(FOR ALL REINFORCEMENT TYPES)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	2400
2	2400	2400	2400	2400	2400
3	2400	2400	2400	2400	2400
4	2400	2400	2500	2400	2400
5	2500	2400	3000	2400	2400
6	3000	2400	3500	2800	2400
7	3500	2700	4000	3200	2600
8	4000	3100	4500	3600	2900
9	4500	3500	5000	4000	3200
10	5000	3900	5500	4400	3500
11	5500	4300	6000	4800	3800
12	6000	4700	6500	5200	4100
13	6500	5100	7000	5600	4400
14	7000	5400	7500	6000	4700
15	7500	5800	8000	6400	5000
16	8000	6200	8500	6800	5300
17	8500	6600	9000	7200	5600
18	9000	7000	9500	7600	5900
19	9500	7400	10000	8000	6200
20	10000	7800	10500	8400	6500

GEOTEXTILE REINFORCEMENT
ULTIMATE TENSILE STRENGTH (LB/FT)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL
1	240	200	340	290	240
2	380	310	520	430	350
3	530	420	700	570	460
4	690	550	870	720	570
5	860	690	1050	860	680
6	1030	830	1220	1000	790
7	1200	970	1400	1150	900
8	1370	1110	1580	1290	1010
9	1550	1240	1750	1430	1120
10	1720	1380	1930	1580	1230
11	1890	1520	2100	1720	1340
12	2060	1660	2280	1860	1450
13	2240	1800	2450	2010	1560
14	2410	1940	2630	2150	1670
15	2580	2080	2800	2290	1780
16	2750	2220	2980	2440	1890
17	2930	2360	3160	2580	2000
18	3100	2500	3330	2720	2110
19	3270	2640	3510	2860	2220
20	3440	2780	3690	3000	2330

GEOGRID REINFORCEMENT
SHORT–TERM DESIGN STRENGTH (LB/FT)
(SEE NOTE 10 ON SHEET 2.)

WALL HEIGHT (H) + WALL EMBEDMENT (FT)	NUMBER OF REINFORCEMENT LAYERS*
2.5 - 4	3
4 - 5.5	4
5.5 - 7	5
7 - 8.5	6
8.5 - 10	7
10 - 11.5	8
11.5 - 13	9
13 - 14.5	10
14.5 - 16	11
16 - 17.5	12
17.5 - 19	13
19 - 20.5	14
20.5 - 22	15
22 - 23.5	16
23.5 - 25	17
25 - 26.5	18
26.5 - 28	19
28 - 29.5	20

*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD

(SEE NOTE 9 ON SHEET 2.)
*SEE PARTIAL ELEVATION ON SHEET 1
FOR REINFORCEMENT LAYER NUMBERING.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 3 OF 3

DATE: 11-19-13

12/06/07

COMPUTED BY: Z.LIU DATE: 12/12/2023
CHECKED BY: G.MODLIN DATE: 12/12/2023

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
BR-0097	3B-1

SUMMARY OF EARTHWORK

IN CUBIC YARDS

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Asphalt 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.

STATION	STATION	UNCL. EXCAV.	UNDERCUT	EMBANK. +%	BORROW	WASTE
–L–						
19+50	29+17.89	567		3,000	2,433	
31+33.89	45+00	530		5,753	5,223	
SUBTOTALS:		1,097		8,753	7,656	
TOTAL:		1,097		8,753	7,656	
MATERIAL FOR SHOULDER CONSTRUCTION				528	528	
LOSS DUE TO CLEARING AND GRUBBING		–550			550	
PROJECT TOTALS:		547		9,281	8,734	
EST 5% TO REPLACE TOP SOIL ON BORROW PIT					437	
GRAND TOTALS:		547		9,281	9,171	
SAY:		600		9,600	9,500	

EST. UNCL. EXCAV. ACCEPTABLE BUT NOT TO BE USED IN THE TOP 3–FT OF EMBANKMENT OR BACKFILL = 280 CY
EST. UNDERCUT EXCAVATION = 400 CY
EST. SELECT GRANULAR MATERIAL = 200 CY
EST. SHALLOW UNDERCUT = 200 CY
SHALLOW UNDERCUT –L– 35+75 TO 40+25 = 350 CY
SHALLOW UNDERCUT –L– 41+75 TO 44+25 = 70 CY
EST. DDE = 80 CY

CABLE GUIDERAIL SUMMARY

SURVEY LINE	STATION	STATION	LENGTH	END ANCHOR UNIT	REMOVAL	COMMENTS
–Y–	12+74.97	15+08.85	233.9′	1		
–Y–	17+82.31	18+63.72	81.4′	1		
–Y–	12+74.97	15+98.97			324.0′	
		SUBTOTAL:	315.3′	2		
LESS TERMINAL ANCHOR UNITS			–48′			
		GRAND TOTALS:	267.3′	2		
		SAY:	275′	2	330′	
EXTRA GUIDERAIL POSTS 6						

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
–L– LT	28+79.00	29+13.35	34.35 LF
–L– RT	28+73.00	29+00.75	27.75 LF
		TOTAL:	62.10 LF
		SAY:	63 LF

SUMMARY OF REMOVAL ASPHALT PAVEMENT

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	SY
–L–	21+15	28+66	RT	1,543.29
–L–	31+15	43+31	RT	2,091.78
–Y–	10+00	19+75	RT	325.72
–Y–	13+75	22+29	LT	270.66
			TOTAL:	4,231.44
			SAY:	4,240

"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 TL–3			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH BEGIN	TRAILING BEGIN			APPROACH BEGIN	TRAILING BEGIN	APPROACH BEGIN	TRAILING BEGIN		GREU TL–2	GREU TL–3	CAT–1	AT–1	B–77			EA	G	NG				
–L–	28+28.27	29+26.15	LT	97.875′			29+26.15		4′			50′		1′			1			1								BRIDGE
–L–	31+42.15	32+65.02	LT	122.875′				31+42.15	4′		50′		1′				1			1								BRIDGE
–L–	26+74.24	29+09.62	RT	235.375′				29+09.62	4′		50′		1′				1			1								BRIDGE
–L–	31+25.62	33+23.49	RT	197.875′			31+25.62		4′			50′		1′			1			1								BRIDGE
–Y–	16+36.39	17+41.58	LT	105.20′					18′									1				1	X					BRIDGE PIER
–Y–	16+16.34	17+41.58	RT	125.24′					18′																			
–Y–	15+48.80	16+16.34	RT			67.55′			18′													1	X					BRIDGE PIER
–L–	27+79.84	28+69.03	LT																								90.37′		
–L–	31+33.96	32+34.59	LT																								100.76′		
–L–	27+22.31	28+46.60	RT																								124.47′		
–L–	31+12.26	33+37.47	RT																								225.37′		
–Y–	16+29.73	18+19.18	LT																								157.05′		
–Y–	14+83.87	18+19.18	RT																								273.50′		
TOTAL				884.44′		67.55′											4			4		2				971.52′		
LESS ANCHOR DEDUCTIONS																													
GREU TL–3			4 @ 50.00′	–200.00′																									
B–77			4 @ 22.875′	–91.50′																									
CAT–1			1 @ 6.25′	–6.25′																									
SUB TOTAL				586.69′		67.55′											4			4		2				971.52′		
SAY				600.00′		75.00′											4	1		4		2				980′		
ADDITIONAL GUARDRAIL POSTS			5																										

6/17/2024
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smodlin

RA-2204

COMPUTED BY:	EB	DATE:	5/22/2024
CHECKED BY:	JMD	DATE:	5/22/2024

PROJECT NO.	SHEET NO.
BR-0097	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 %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE) 12	Side Drain Pipe 15	Side Drain Pipe 18		DO NOT USE RCP	DO NOT USE PP PIPE	C. S. PIPE 12 .064	C. S. PIPE 15 .064	C. S. PIPE 18 .064		R. C. PIPE CLASS III 12	R. C. PIPE CLASS III 15	R. C. PIPE CLASS III 18		R. C. PIPE CLASS V 12	R. C. PIPE CLASS V 15	R. C. PIPE CLASS V 18	R. C. PIPE CLASS V 24	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	GRATE TYPE F	GRATE TYPE G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	CONCRETE TRANSITIONAL SECTION C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	##" SPRING BOX PIPE	SPRING BOX STD. 840.41		M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54			##" PIPE END SECTION	##" PIPE END SECTION	##" PIPE END SECTION	##" PIPE END SECTION	ADJUST D.I.		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 21+07	22 RT	0401							28																																																																										
L 23+57	48 RT	0402		610.6																									1															1							1																																	
		0402	0403		606.6	600.9													72																																																																		
L 22+85	25 RT	0403		603.6																									1															1							1																																	
		0403	0404		600.6	597.6														60																																																																
L 22+54	24 LT	0404		600.6																									1															1							1																																	
		0404	0405		597.6	595.5														136																																																																
L 21+15	12 LT	0405		600.2																									1																									1						1																									
		0405	0406		595.5	595.2																		72																																																														
L 28+86	10 LT	0501		635.6																									1																		1												1																												
		0501	0502		631.1	630.4														24																																																																	
L 28+80	12 RT	0502		635.4																									1																		1												1																												
		0502	0503		630.4	629.3														36																																																																	
L 33+15	35 LT	0504		641.0																									1															1			1																																										
		0504	0505		638.0	637.2														60																																																																	
L 33+15	24 RT	0505		646.1																									1	3.9																											1											1																		
		0505	0506		637.2	633.4	0.6													164																																																																	
L 31+52	34 RT	0506		637.5																									1															1					1																																						
L 33+93	33 LT	0508							48																																																																																
L 35+56	15 RT	0509		652.3																									1	0.9																											1											1																		
L 35+69	25 LT	0511		650.5																																																																																				
		0511	0509		648.5	646.4														44																																																																	
Y 16+05	0 CL	0512		611.7																																						1																																		1										
Y 14+68	71 LT	0513		610.3																									1																1						1																																			
		0513	0514		608.2	608.0														28																																																																	
Y 14+98	72 LT	0514		610.2																									1																1						1																																			
		0514	0515		608.0	607.2														56																																																																	
Y 15+55	73 LT	0515		612.0																									1																												1																														SLAB LID
L 37+85	40 RT	0518							32																																																																																	
L 40+28	29 RT	0519							28																																																																																
L 40+47	20 LT	0520							32																																																																																
L 41+87	24 RT	0601							56																																																																															
L 42+60	23 LT	0602							32																																																																																
L 44+37	21 RT	0603							44																																																																																
L 23+28	3 RT	0000																																																																																					19	
L 23+49	26 RT	0000																																																																																					46	
L 22+15	8 LT	0000																																																																																					21	
L 24+43	17 RT	0000																																																																																					21	
L 26+03	31 RT	0000																																																																																					22	
L 27+65	32 RT	0000																																																																																				37	
L 35+56	14 RT	0000																																																																																				4	
SHEET TOTALS									300										72	608				72					13	4.8												1		5	2		3		1		5		1			3			3								2							1									170	
PROJECT TOTALS									300										72	608				72					13	4.8												1		5	2		3		1		5		1			3			3								2							1									170	

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: D. KUBINSKI	DATE: 5/24/2024
CHECKED BY: J. FREGOSI	DATE: 5/24/2024

(2-3-23)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
BR-0097	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
-L-	35+75	40+25	ASU (1)	18	350	1220	1250		
-L-	41+75	44+25	ASU (1)	18	70	220	220		
CONTINGENCY			ASU (1)	18	200	725	725		
			TOTAL CY/TONS/SY:		620	2165**	2195**	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 BRIDGE WAITING PERIODS

Bridge Description	End Bent/ Bent No.	MONTHS
Bridge No. 178 on SR 1929 (Estes Road) over US 29	End Bent 1	1
Bridge No. 178 on SR 1929 (Estes Road) over US 29	End Bent 2	1

PROJ. REFERENCE NO.	SHEET NO.
BR-0097	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

NOTE: " * " INDICATES PRIORITY PARCEL

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4,5	WILLIAM T. EVANS III
2	4	DANIEL W. & PATSY H. EVANS SR
3	4,5	JASON C. BRAY
*4	5	WILLIAM T. EVANS III
*4A	5	WILLIAM T. EVANS III
*5	5	MICHAEL K. WILSON
6	5	LARRY MCRADDOCK
7	5,6	MELODY M. PORTER
8	5,6	ROBERT W. SMITH
9	6	RUFFIN STACEY BAPTIST CHURCH
10	6	TONY S. JAMES
11	6	HUEL T. HOVATTER
*12	5	KEITH B. JAMES
13	5	MICHAEL K. WILSON

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
BR-0097	4
R/W SHEET NO.	

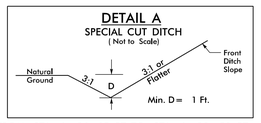
ROADWAY DESIGN ENGINEER
SEAL 023912
Kent E. Hufmann
6/17/2024

HYDRAULICS ENGINEER
SEAL 041998
Justin M. Davenport
6/17/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

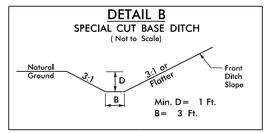
moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE
(919) 781-4865 FAX
NC License NO.: F-0105

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



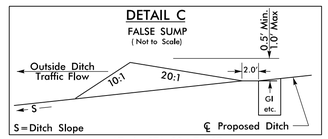
FROM STA. -L- 26+15 RT TO STA. -L- 28+50 RT

DETAIL B
SPECIAL CUT BASE DITCH
(Not to Scale)



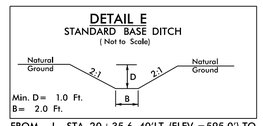
FROM STA. -L- 21+21 RT TO STA. -L- 26+15 RT

DETAIL C
FALSE SUMP
(Not to Scale)



AT -L- STA. 22+75 RT
AT -L- STA. 23+57 RT

DETAIL E
STANDARD BASE DITCH
(Not to Scale)



FROM -L- STA. 20+35.6 40'LT (ELEV. =595.0') TO -L- STA. 20+44.0 23'LT (ELEV. =595.2')

NAD 83/NA 2011

-L-

PI Sta 18+80.69	PI Sta 23+88.75
△ = 29° 14' 43.3" (RT)	△ = 6° 20' 51.4" (RT)
D = 7° 54' 10.3"	D = 0° 58' 16.0"
L = 370.06'	L = 653.64'
T = 189.15'	T = 327.16'
R = 725.00'	R = 5,900.00'
e = EXIST	e = 03
	R0 = 60.00'

BEGIN TIP PROJECT BR-0097
-L- POC Sta.19+50.00

-L- PC Sta.16+91.53

-L- PT Sta. 27+15.23

-L- PCC Sta. 20+61.59

MATCHLINE -L- 27+50.00
SEE SHEET 05

1 WILLIAM T EVANS III
DB 1409 PG 231
PB 29 PG 20

2 DANIEL W & PATSY H EVANS SR
DB 884 PG 151
PB 29 PG 19

3 3Z JASON C BRAY
DB 1353 PG 2220
PB 29 PG 19

WILLIAM T EVANS JR
DB 881 PG 2492-2493
PB 29 PG 20

LARRY R & PATRICIA A GROFF
DB 835 PG 782
PB 20 PG 41

SAMUEL P & WENDY S MOSS
DB 1254 PG 46
PB 29 PG 19

SAMUEL P & WENDY S MOSS
DB 1079 PG 767
PB 20 PG 41

DONALD D LIGON
DB 878 PG 146
PB 20 PG 41

JOESPH V PRIESTLEY
DB 1355 PG 1448
PB 20 PG 41

KENNETH W WILLARD
DB 1274 PG 30
DB 813 PG 16
DB 770 PG 968
PB 20 PG 41

KENNETH W WILLARD
DB 1274 PG 30
DB 813 PG 16
DB 770 PG 968
PB 20 PG 41

BL-11 +49.90 -L- 15.23' LT

BL-10 +35.45 -L- 15.69' LT

BL-12 +69.19 -L- 15.85' RT

BL-13 +39.06 -L- 39.78' RT

+61.59 -L- 30.00' LT
+58 -L- 54' LT
CHORD
+45 -L- 46' LT
+45.00 -L- 30.04' LT
+30 -L- 46' LT 30.13' LT
+71 -L- 54' LT
+98 -L- 30' LT
+88 -L- 30' LT
+16 -L- 60' LT
+54 -L- 67' LT
+59 -L- 30' LT
+48 -L- 30' LT
+97 -L- 61' LT
+32 -L- 61' LT
+46 -L- 30' LT
+15.23 L 30.00' LT
+55 -L- 30' LT
+95.23

RIP RAP OUTLET PAD
EST 3 TONS CL B RIPRAP
EST 10 SY GEOTEXTILE
DAYLIGHT DITCH
AT ELEV. = 595.0'

50' TAPER

2' BASE DITCH
SEE DETAIL E
EST 2 CY DDE

FALSE SUMP
SEE DETAIL C

SPECIAL CUT DITCH W/3' BASE
SEE DETAIL B

SPECIAL CUT DITCH
SEE DETAIL A

GRADE TO DRAIN

DO NOT DISTURB WELL

RETAIN

REMOVE

18" RCP-III
18" RCP-V
15" RCP-III
15" RCP

GTD
2GI
FS
TB 2GI

S 78° 42' 33.1" E

S 63°39' 37" E

S 12°47'45" W 5,500.75'

S 12°43'40" W 760.07'

N 66°40'41" W 547.79'

N 87°09'00" E 75.70'

N 87°17'57" W 837.67'

N 12°27'55" W 904.01'

S 12°27'55" E 912.20'

N 29°20'07" W 986.21'

N 65° 41' 52.2" E

TO GUAQUA CREEK RD

PAVEMENT REMOVAL

ALL DRIVE RADIUS RETURNS 5' UNLESS SHOWN OTHERWISE

FOR -L- PROFILE SEE SHEET NO. 7

6/17/2024
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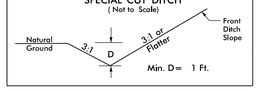
amedina

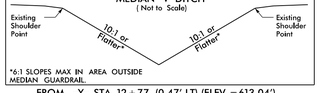
8/17/99

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. –L– 26+15 RT TO STA. –L– 28+50 RT
FROM STA. –L– 33+15 LT TO STA. –L– 40+32 LT
FROM STA. –L– 40+62 LT TO STA. –L– 42+44 LT

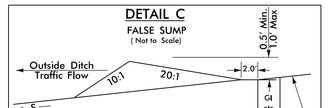
DETAIL D
MEDIAN V DITCH
(Not to Scale)



FROM –Y– STA. 12+77 (0.47' LT) (ELEV. = 613.04')
TO –Y– STA. 16+04.5 (0.47' LT) (ELEV. = 611.66')

*USE 6:1 MAX DITCH SLOPES AND VARIABLE WIDTH SHOULDER –Y– STA 12+77 TO –Y– STA 15+25 +/–

DETAIL C
FALSE SUMP
(Not to Scale)



AT –L– STA. 31+40 RT
AT –L– STA. 33+10 LT
AT –L– STA. 35+68 LT

4A
WILLIAM T EVANS III
DB 1255 PG 1181
PB 29 PG 20

1
WILLIAM T EVANS III
DB 1409 PG 231
PB 29 PG 20

–Y–
PI Sta 16+17.97
△ = 15° 21' 23.7" (LT)
D = 1° 15' 00.0"
L = 1,228.53'
T = 617.97'
R = 4,583.66'

–Y– PC Sta. 10+00.00

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
BR-0097	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 023912 ENGINEER REMY E. HUFFMAN
6/17/2024

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 049969 ENGINEER JUSTIN M. DAVENPORT
DocuSigned by: CE8B5D9C0C3F4F2...
6/17/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE
(919) 781-4865 FAX
NC License NO.: F-0105

MATCHLINE –L– 27+50.00
SEE SHEET 04

MATCHLINE –L– 41+50.00
SEE SHEET 06

–L–
PI Sta 40+97.47
△ = 3° 43' 00.2" (LT)
D = 0° 28' 38.9"
L = 778.43'
T = 389.35'
R = 12,000.00'
e = NC

–L– PC Sta. 37+08.12

3 3Z
JASON C BRAY
DB 1353 PG 2220
PB 29 PG 19

4
WILLIAM T EVANS III
DB 1254 PG 43
PB 32 PG 2

5
MICHAEL K WILSON
DB 897 PG 170

6
LARRY MCRADDOCK
DB 1098 PG 357
PB 20 PG 21

7
MELODY M PORTER
DB 1306 PG 190
PB 20 PG 21

8
ROBERT W SMITH
DB 814 PG 804
PB 20 PG 21

12
KEITH B JAMES
DB 1439 PG 559
PB 20 PG 21

13
MICHAEL K WILSON
DB 812 PG 975
PB 20 PG 21

GARY M BROWN
DB 1057 PG 2304
DB 680 PG 265
DB 748 PG 571
PB 20 PG 21

PAVEMENT REMOVAL

FOR –L– PROFILE SEE SHEET NO. 7
FOR STRUCTURE PLANS SEE SHEETS S–1 THRU S–32
FOR TEMPORARY SHORING SEE TMP PLANS
ALL DRIVE RADIUS RETURNS 5' UNLESS SHOWN OTHERWISE

6/17/2024
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mmallin

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
BR-0097	6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
SEAL 032672 ENGINEER REMY E. HUFFMAN
6/4/2024

HYDRAULICS ENGINEER
SEAL 049769 ENGINEER JUSTIN M. DAVENPORT
6/5/2024

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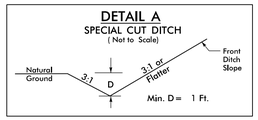
moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License NO.: F-0105

NAD 83NA 2011

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. -L- 40+62 LT TO STA. -L- 42+44 LT
FROM STA. -L- 42+74 LT TO STA. -L- 43+50 LT

MATCHLINE -L- 41+50.00
SEE SHEET 05

9
RUFFIN STACEY BAPTIST CHURCH
DB 745 PG 826
PB 20 PG 21

-L-
PI Sta 40+97.47
△ = 3° 43' 00.2" (LT)
D = 0° 28' 38.9"
L = 778.43'
T = 389.35'
R = 12,000.00'
e = NC

7
MELODY M PORTER
DB 1306 PG 190
PB 20 PG 21

N 86°59'14" E
216.73'

S 07°31'47" W
187.80'

TRAILER
DECK
CARPORT
DO NOT DISTURB WELL
SPECIAL CUT DITCH SEE DETAIL A
+00 -L- 36' LT
+70 -L- 45' LT
+96.32 -L- 30.00' LT
+96.34 -L- 28.50' LT
+00 -L- 29.69' LT
50' TAPER
20.0' TYP
+ 80.00
16' GR
EP R/W
EP R/W
15"
Ø602 REM.
Ø601
REM.
15" RCP
Ø603
+69 -L- 30.01' RT
+51 -L- 39' RT
+07 -L- 30.26' RT
+21 -L- 39' RT
+38 -L- 32.58' RT REMOVE
+07 -L- 49' RT
+87 -L- 49' RT
+71 -L- 34.16' RT
48" RCP
24" GR
T.F. CONC
WOODS
GRASS
DO NOT DISTURB WELL
9" WOOD
25' BST
EXISTING R/W
BL-14
+65.62 -L-
16.27' LT
TO US BUSINESS 29
S 82° 25' 33.3" E
SR 1929 ESTES RD 2F BST
AT&T Corp.
60.00'
EXISTING R/W
-L- POT Sta. 52+00.00
END TIP PROJECT BR-0097
-L- Sta. 45+00.00
-L- PT Sta. 44+86.54

ROBERT W SMITH
DB 814 PG 804
PB 20 PG 21
8

N 12°07'50" E
348.16'

S 12°24'18" W
955.63'

N 12°27'06" E
966.34'

S 09°33'35" W
947.53'

10
TONY S JAMES, TRUSTEE
DB 1434 PG 1000
PB 20 PG 21

11
HUEL T HOVATTER, JR
DB 1108 PG 773
PB 20 PG 21

HUEL T HOVATTER, JR
DB 1108 PG 882
PB 20 PG 21

PAVEMENT REMOVAL

ALL DRIVE RADIUS RETURNS 5' UNLESS SHOWN OTHERWISE
FOR -L- PROFILE SEE SHEET NO. 8

3/9/2024
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emedlin

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
BR-0097	7

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042911 ENGINEER BRENT E. HUFFMAN

6/4/2024

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 049967 ENGINEER JUSTIN M. DAVENPORT

6/5/2024

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-L-

PI = 26+50.00
EL = 628.38'
VC = 400'
K = 158
DS = 61 MPH

PI = 21+50.00
EL = 599.91'
VC = 400'
K = 141
DS = 61 MPH

BEGIN GRADE
-L- STA.19+50.00
ELEV = 594.21'

EXIST.(+)2.3785%

(+)2.8500%

(+)15.6935%

(+)3.1600%

PROPOSED GRADE

(+) 4.0000%

(+) 6.0870%

(+)5.6935%

(+) 5.4222%

(+) 3.0200%

EXISTING GROUND

BEGIN DITCH
21+21.00 RT
596.84'

22+75.00 RT
603.00'

23+90.00 RT
610.00'

26+15.00 RT
622.20'

DITCH LEGEND

LEFT DITCH

RIGHT DITCH

FOR PLAN VIEW SEE SHEET 4

-L-

BM # 1 ELEVATION = 618.59'
-L- STATION 29+82.65 344.25' RT
RAILROAD SPIKE IN 15" MAPLE

BEGIN BRIDGE
STA 29+17.89

-L- PT Sta. 30+17.89
-Y- PC Sta. 16+48.80
SKEW = 120°33'37"

END BRIDGE
STA 31+33.89

PI = 33+30.00
EL = 649.87'
VC = 300'
K = 160
DS = 61 MPH

PI = 40+30.00
EL = 658.85'
VC = 900'
K = 299
DS = 80+ MPH

(+)3.1600%

(+)11.2842%

PROPOSED GRADE

(+)11.2842%

(+)4.2990%

(+) 3.1176%

(+) 2.3904%

(+) 2.9528%

18" RCP III

(+) 3.0200%

END DITCH
28+50.00 RT
629.30

℄ -Y- US 29 BUS

EX. PS
EX. EOP
EX. EOP
EX. PS
EX. PS
EX. EOP
EX. EOP
EX. PS

EXISTING GROUND

BEGIN DITCH
33+15.00 LT
641.00'

35+69.00 LT
648.50

END DITCH
40+32.00 LT
659.57'

BEGIN DITCH
40+62.00 LT
660.11'

PIPE HYDRAULIC DATA

18" RCP Sta. 35+69 -L-

DRAINAGE AREA	= 0.7	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 2.4	CFS
DESIGN HW ELEVATION	= 649.3	FT
100 YEAR DISCHARGE	= 2.7	CFS
100 YEAR HW ELEVATION	= 649.4	FT
OVERTOPPING FREQUENCY	= 500 +	YRS
OVERTOPPING DISCHARGE	= 16	CFS
OVERTOPPING ELEVATION	= 653.2	FT

DITCH LEGEND

LEFT DITCH

RIGHT DITCH

FOR PLAN VIEW SEE SHEET 5

6/4/2024
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5/28/99

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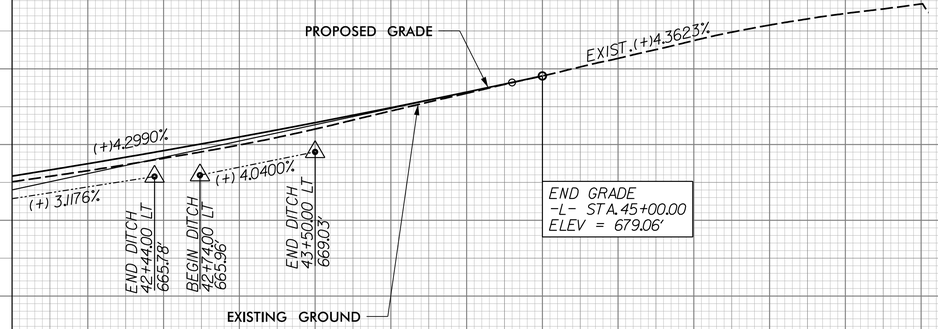

PROJECT REFERENCE NO.	SHEET NO.
BR-0097	8

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042912 ENGINEER TRENT E. HUFFMAN

6/4/2024

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 049161 ENGINEER JUSTIN M. DAVENPORT

6/5/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DITCH LEGEND
LEFT DITCH
RIGHT DITCH

FOR PLAN VIEW SEE SHEET 6

6/4/2024
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