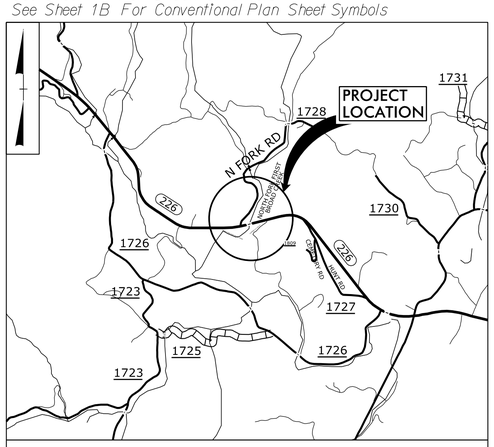
09/08/99

PROJECT: BR-0100

CONTRACT: C204883

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RUTHERFORD COUNTY

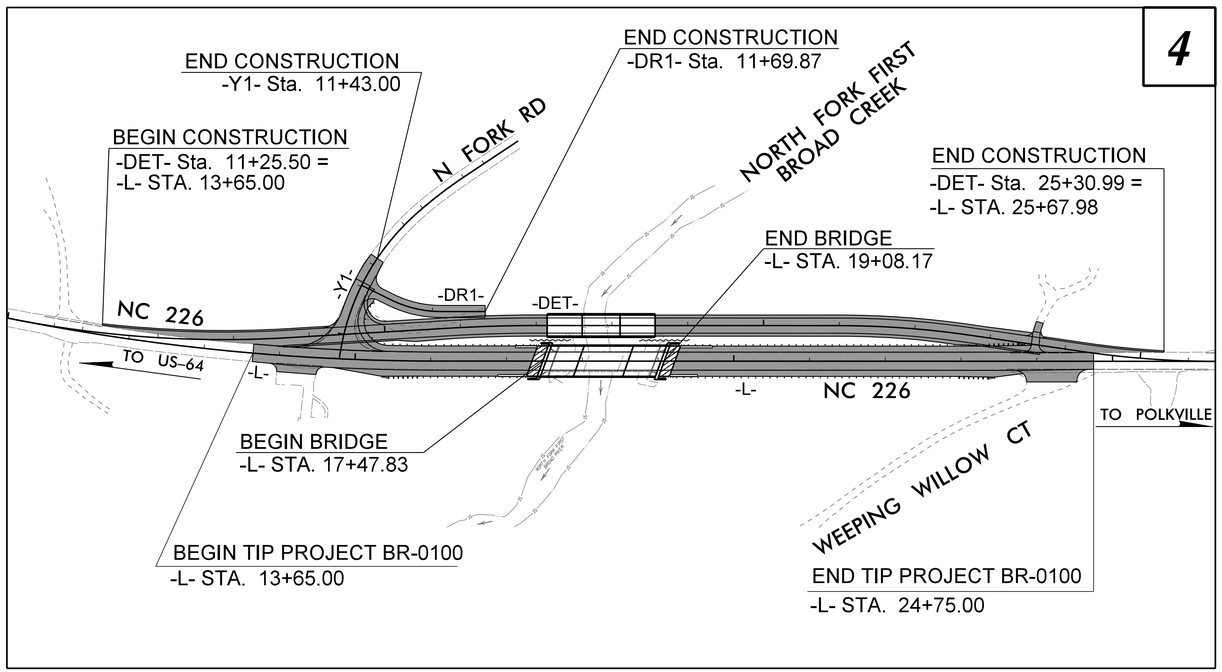
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0100	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
67100.1.1	N/A	PE
67100.2.1	N/A	RW & UTILITY
67100.3.1	N/A	CONSTRUCTION

LOCATION: ***REPLACE BRIDGE No. 800040 ON NC 226 OVER NORTH FORK FIRST BROAD CREEK***

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

NAD 83/2011



THIS PROJECT HAS NO CONTROL OF ACCESS.

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 = 2,160
ADT 2044 = 3,210
K = %
D = %
T = 13 % *
V = 60 MPH
* (TTST = 7% + DUAL = 6%)
FUNC CLASS =
RURAL, MAJOR COLLECTOR
REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT BR-0100 = 0.180 MI
LENGTH OF STRUCTURE TIP PROJECT BR-0100 = 0.030 MI
TOTAL LENGTH OF TIP PROJECT BR-0100 = 0.210 MI

PREPARED IN THE OFFICE OF:
WSP USA
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
FAX: 1.919.836.4099
LICENSE NO. F-0165
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 01, 2023

LETTING DATE: FEBRUARY 18, 2025

RONYELL THIGPEN, PE
PROJECT ENGINEER

ERIC MISAK
PROJECT DESIGN ENGINEER

NCDOT CONTACT: CLAUDIA LEE, PE
NCDOT DIVISION 13 PROJECT LEAD

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 043232 ENGINEER VIDYA MOHANDAS
DocuSigned by: Vidya Mohandas
SIGNATURE: P.E. 12/17/2024

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33290 ENGINEER RONYELL A. THIGPEN
DocuSigned by:
SIGNATURE: P.E. 12/17/2024

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

1:46:40 PM
BR-0000_rdy_tsh.dgn
12/20/2024

PROJECT REFERENCE NO.	SHEET NO.
BR-0100	1A

ROADWAY DESIGN ENGINEER
12/17/2024

NORTH CAROLINA PROFESSIONAL SEAL 33290 ENGINEER ROWELL A. THIGPEN

INDEX OF SHEETS

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
225.06	Method of Grading Sight Distance at Intersections
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
423.02	Bridge Approach Fills - Type 1A Alternate Approach Fill for Integral 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
815.03	Pipe Underdrain and Blind Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
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

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 EXITING 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

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.

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

STREET TURNOUT:

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

GUARDRAIL:

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

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC 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 AT&T AND

RUTHERFORD ELECTRIC MEMBERSHIP CORPERATION

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.

9/10/2021

PROJECT REFERENCE NO.	SHEET NO.
BR-0100	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)
- 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:

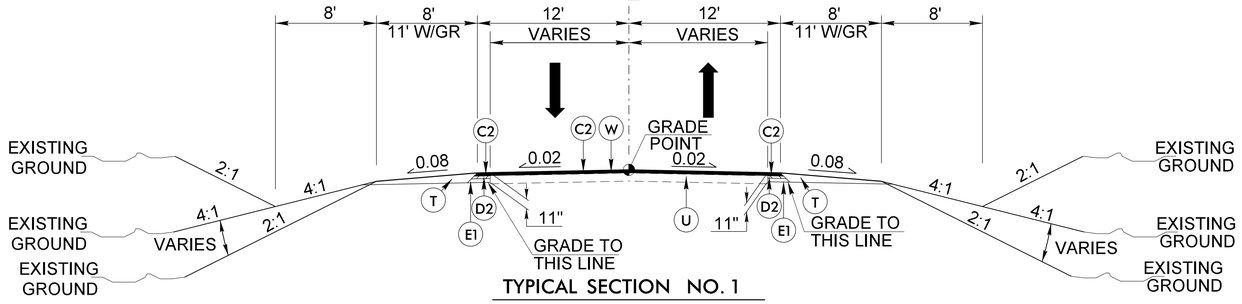
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line
- Above Ground Sanitary Sewer
- SS Force Main Line Test Hole (SUE – LOS A)*
- SS Force Main Line (SUE – LOS B)*
- SS Force Main Line (SUE – LOS C)*
- SS Force Main Line (SUE – LOS D)*

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 — AATUR
- End of Information — E.O.I.

6/2/99

℄ -L- (NC 226)



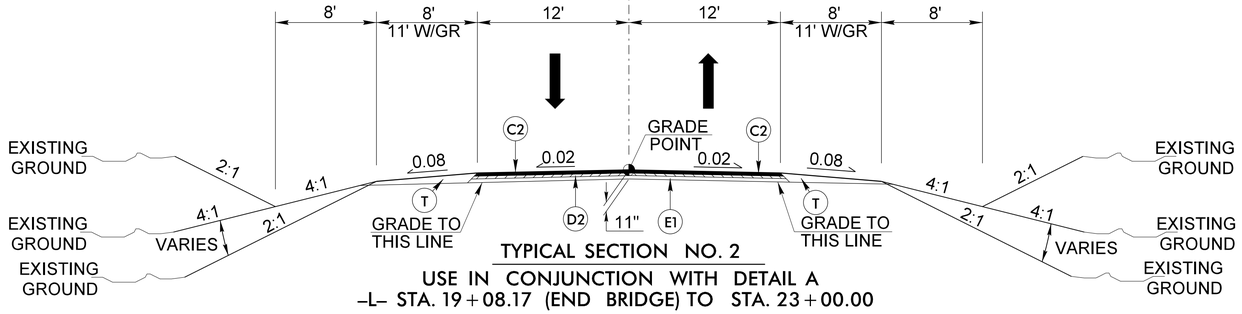
TYPICAL SECTION NO. 1

USE IN CONJUNCTION WITH DETAIL A

–L– STA. 13+65.00 TO STA. 17+47.83 (BEGIN BRIDGE)

–L– STA. 23+00.00 TO STA. 24+75.00

℄ -L- (NC 226)

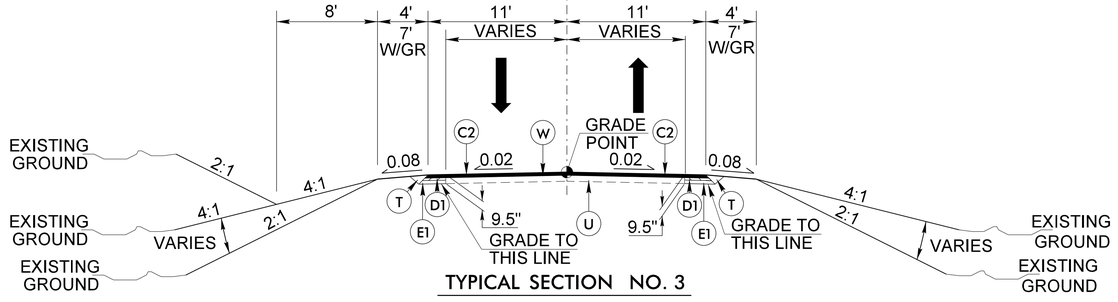


TYPICAL SECTION NO. 2

USE IN CONJUNCTION WITH DETAIL A

–L– STA. 19+08.17 (END BRIDGE) TO STA. 23+00.00

℄ -Y1- (N Fork Rd.)

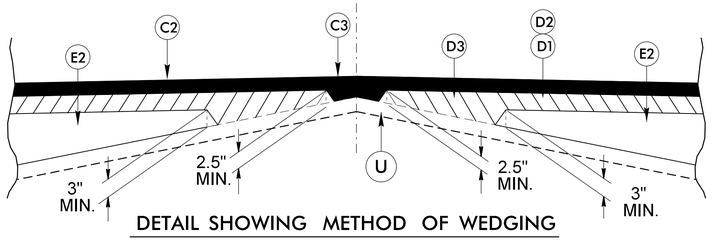


TYPICAL SECTION NO. 3

–Y1– STA. 10+12.07 TO STA. 11+43.00

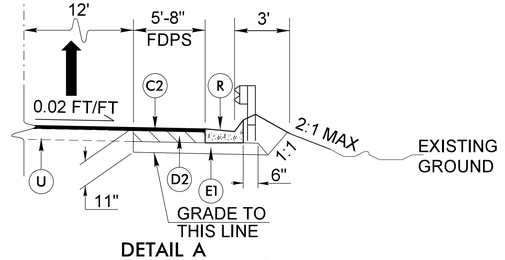
–Y1_DET– STA. 10+10.51 TO STA. 10+73.40

℄ -L- & -Y1-



DETAIL SHOWING METHOD OF WEDGING

℄ -L- (NC 226)



DETAIL A

SBG AT BRIDGE

–L– STA. 17+11.50 TO 17+40.15 (LT)

–L– STA. 16+88.50 TO 17+27.29 (RT)

–L– STA. 19+28.71 TO 19+72.00 (LT)

–L– STA. 19+15.85 TO 19+52.15 (RT)

WSP USA
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH NC 27601
TEL: 1.919.836.4040
FAX: 1.919.836.4099
LICENSE NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
BR-0100	2A-1

ROADWAY DESIGN ENGINEER
12/17/2024

NORTH CAROLINA PROFESSIONAL SEAL 33290 ENGINEER RONALD A. THIGPEN

PAVEMENT DESIGN ENGINEER
12/17/2024

NORTH CAROLINA PROFESSIONAL SEAL 044590 ENGINEER ANDREW D. WARGO

Andrew D. Wargo, P.E., PMP

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 2.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
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 LESS THAN 1″ IN DEPTH OR GREATER THAN 1½″ IN DEPTH.
C4	PROP. APPROX. 2.0″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
D1	PROP. APPROX. 2.5″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
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 2.5″ IN DEPTH OR GREATER THAN 4″ IN DEPTH.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. 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.
J1	PROP. 6″ AGGREGATE BASE COURSE.
J2	PROP. 8″ AGGREGATE BASE COURSE.
P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.
R	SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING (SEE DETAIL THIS SHEET).

NOTES:
1. ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.

10-DEC-2024 13:19
\Roadway\Proj\BR-0100_rdy_2A-1.dgn
WSP

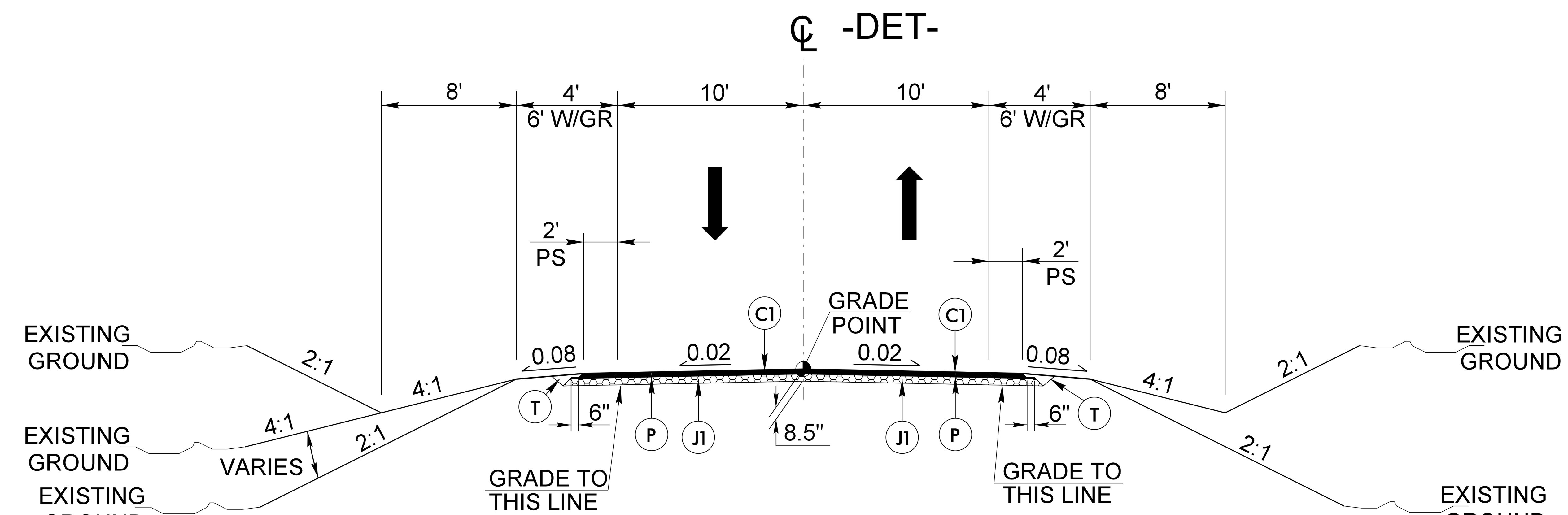
PROJECT REFERENCE NO.	SHEET NO.
BR-0100	2A-2

ROADWAY DESIGN ENGINEER 12/18/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 33290 RONYELL A. THIGPEN

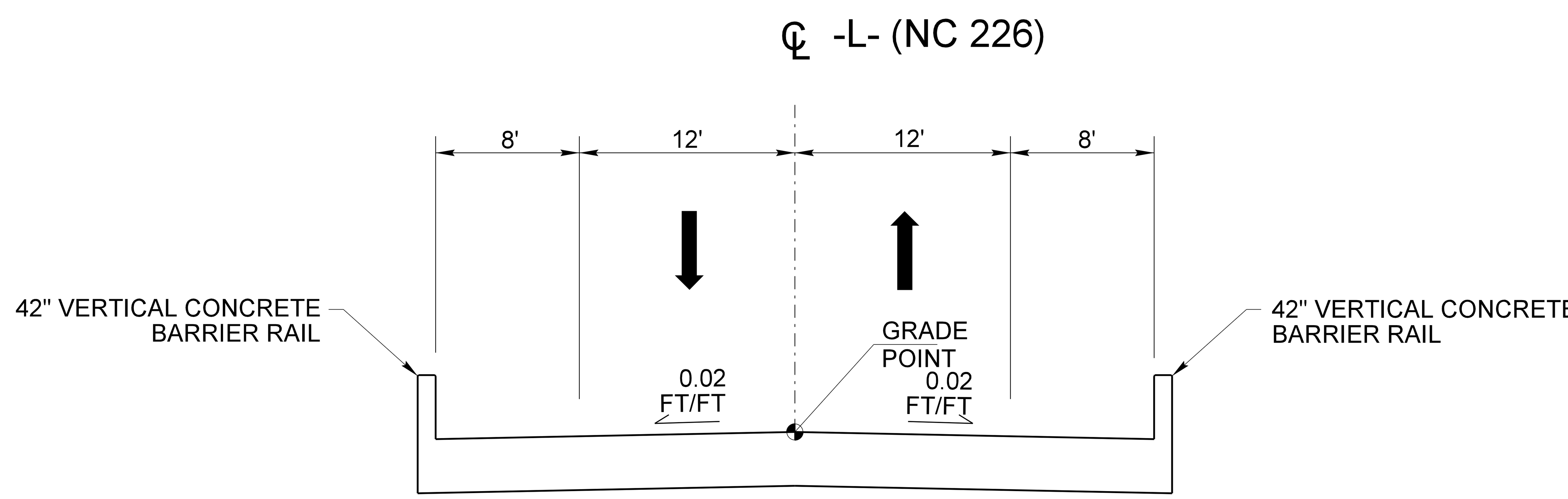
PAVEMENT DESIGN ENGINEER 12/17/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044590 ANDREW D. WARGO

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

WSP USA
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
FAX: 1.919.836.4099
LICENSE NO. F-0165



TYPICAL SECTION NO. 4
–DET– STA. 12+56.65 TO STA. 17+14.44 (BEGIN BRIDGE)
–DET– STA. 18+57.01 (END BRIDGE) TO STA. 24+32.01

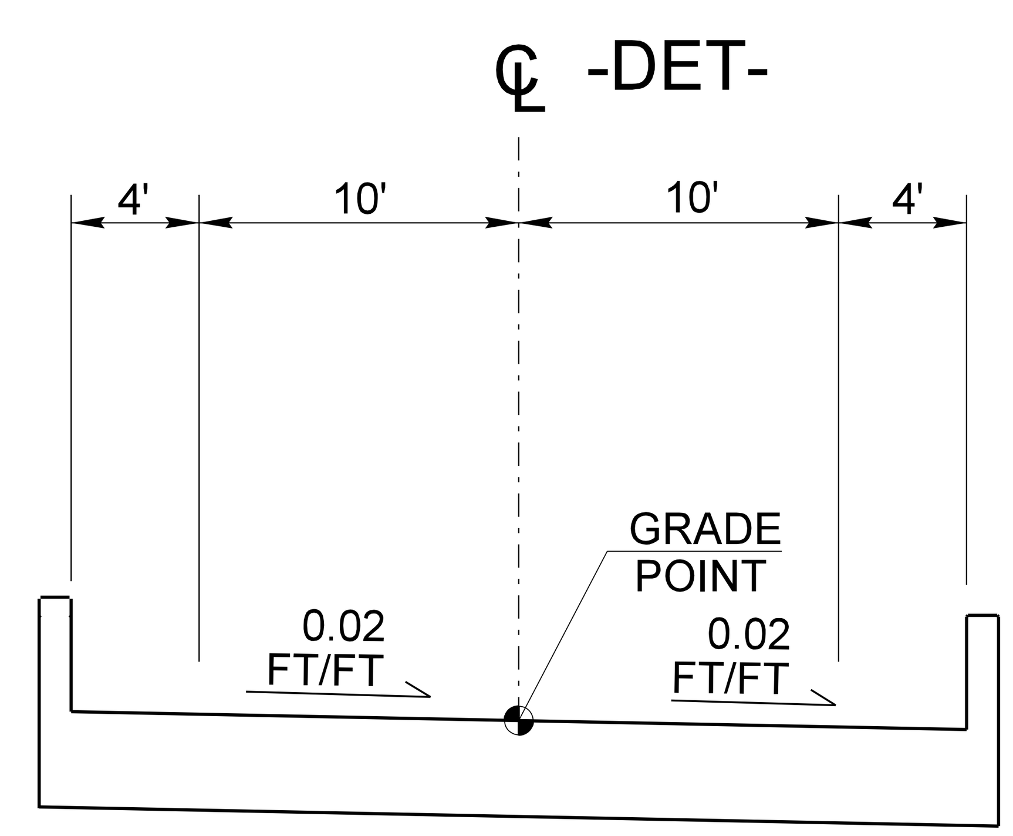


BRIDGE TYPICAL SECTION NO. 5
–L– STA. 17+47.83 TO STA. 19+08.17

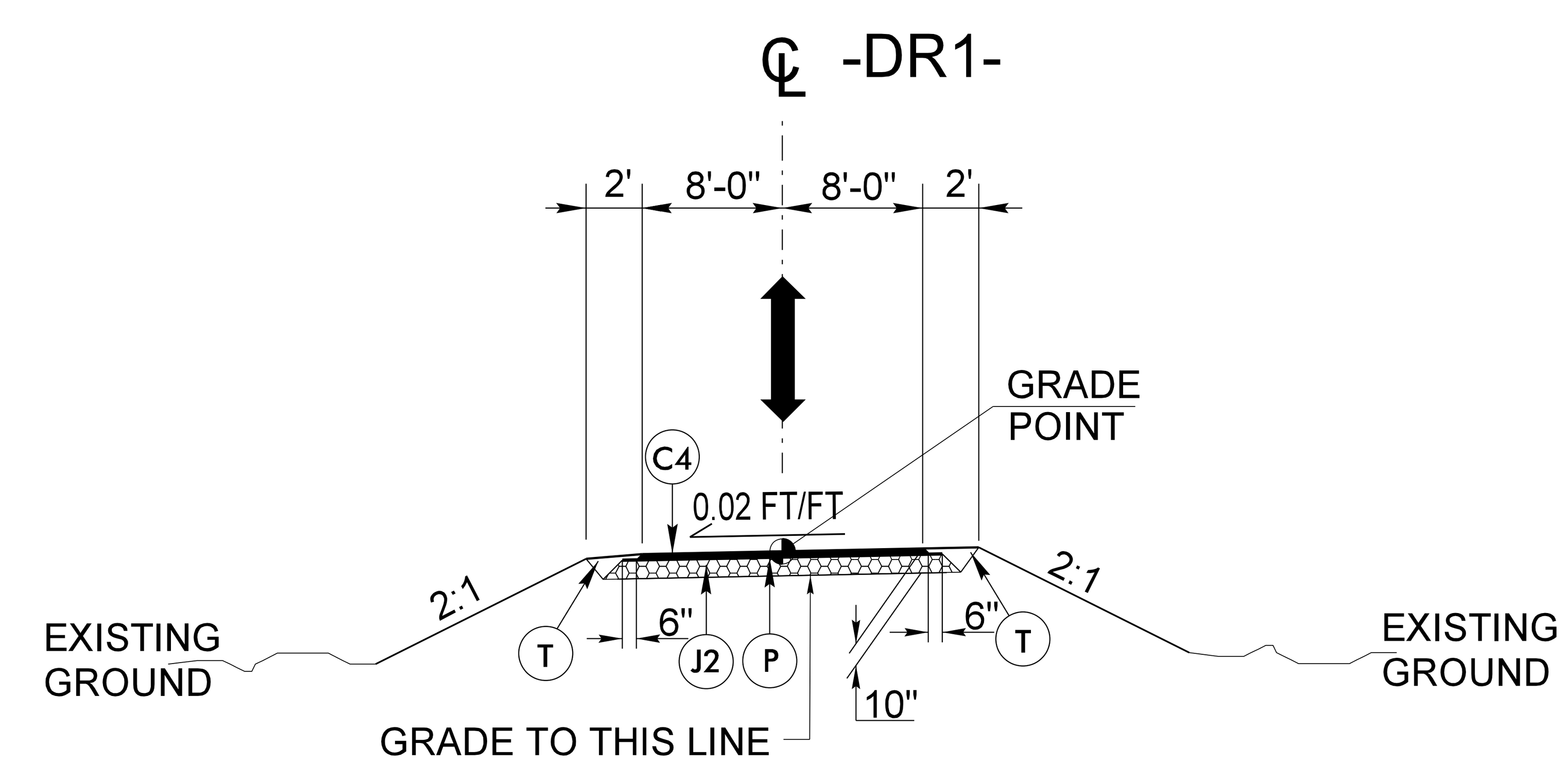
FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 2.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C4	PROP. APPROX. 2.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
J1	PROP. 6" AGGREGATE BASE COURSE.
J2	PROP. 8" AGGREGATE BASE COURSE.
P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.
T	EARTH MATERIAL.

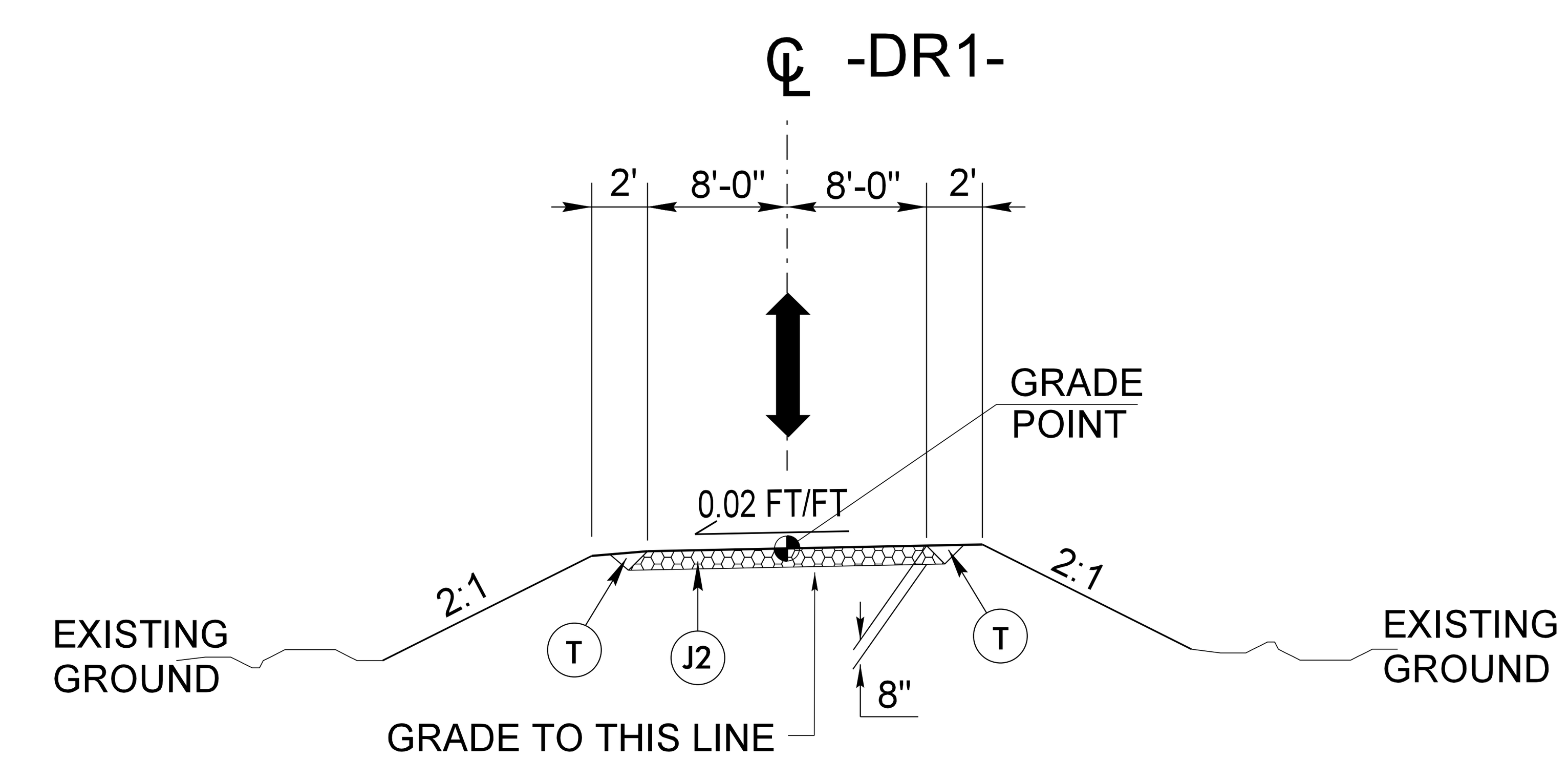
NOTES:
1. ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.



BRIDGE TYPICAL SECTION NO. 6
–DET– STA. 17+14.44 TO STA. 18+57.01



TYPICAL SECTION NO. 7
–DR1– STA. 10+11.00 TO STA. 10+61.00



TYPICAL SECTION NO. 8
–DR1– STA. 10+61.00 TO STA. 11+69.87

6/2/99
20-NOV-2024 14:12
R:\Roadway\Proj\BR-0100_rdy_2A-1.dgn
WSP

8/17/99

REVISIONS

-Y1_DET- CURVE DATA

PI Sta 10+97.24	PI Sta 12+28.82
Δ = 34° 49' 49.1" (RT)	Δ = 8° 01' 57.9" (RT)
D = 18° 28' 57.0"	D = 9° 57' 52.1"
L = 188.45'	L = 80.61'
T = 97.24'	T = 40.37'
R = 310.00'	R = 575.00'
DS = EXIST	DS = EXIST

-DET- CURVE DATA

PI Sta 11+87.61	PI Sta 21+86.01
Δ = 14° 44' 41.2" (LT)	Δ = 8° 15' 57.1" (RT)
D = 3° 57' 05.2"	D = 4° 46' 28.7"
L = 373.15'	L = 173.12'
T = 187.61'	T = 86.71'
R = 1,450.00'	R = 1,200.00'
RO = 95'	RO = 95'
DS = 45 MPH	DS = 45 MPH
SE = 0.05	SE = 0.05
PI Sta 16+44.73	**PI Sta 25+12.63**
Δ = 3° 24' 28.5" (RT)	Δ = 8° 15' 57.1" (LT)
D = 3° 06' 50.0"	D = 4° 46' 28.7"
L = 109.44'	L = 173.12'
T = 54.74'	T = 86.71'
R = 1,840.00'	R = 1,200.00'
RO = 76'	RO = 95'
DS = 45 MPH	DS = 45 MPH
SE = 0.04	

NAD 83/2011

PROJECT REFERENCE NO.	SHEET NO.
BR-0100	2B-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER 12/17/2024 — NORTH CAROLINA PROFESSIONAL SEAL 33290 ENGINEER RONALD A. THIGPEN — Docusigned by: Ronald A Thigpen

HYDRAULICS ENGINEER 12/17/2024 — NORTH CAROLINA PROFESSIONAL SEAL 043232 ENGINEER VIDYA MELVANDAS — Docusigned by: Vidya Melvandas

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:

WSP USA
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
FAX: 1.919.836.4099
LICENSE NO. F-0165

-Y1_DET- POT Sta. 13+54.10

-Y1_DET- PT Sta. 12+69.06

-Y1_DET- PCC Sta. 11+88.45

-DET-PC Sta.10+00.00 =-L-PC Sta.10+37.81=

1 JOHNNY MCCURRY DB 389 PG 623 DB 532 PG 671

BEGIN CONSTRUCTION -L- POC Sta.11+62.88 = -DET- Sta. 11+25.50 OFFSET = 12.71'

END CONSTRUCTION -Y1_DET- STA. 10+73.40

SPECIAL LATERAL V DITCH W/CLASS B RIPRAP SEE DETAIL B EST 10 TONS EST 39 SY GF

-DET- PC Sta. 14+45.79 = -Y1_DET- PC Sta. 10+00.00

-DET- PT Sta. 13+73.15

SPECIAL CUT V DITCH SEE DETAIL A

BEGIN GRADE -DET- Sta. 12+56.65

JOHNNY MCCURRY DB 389 PG 623 DB 532 PG 671

2 TIMOTHY J. HOYLE DB 1108 PG 447

NOTE: SEE SHEET 2D-1 FOR DITCH DETAILS

3 DON C. MELTON LESLIE W. MELTON DB 873 PG 704

RIPRAP AT EMBANKMENT SEE DETAIL H

BEGIN BRIDGE -DET- Sta. 17+14.44

-DET- PT Sta. 16+99.44

CLASS I RIPRAP EST 3 TONS EST 7 SY GF

LATERAL 4' BASE DITCH EST 74 CY DDE

-DET- PC Sta. 15+89.99

CLASS I RIPRAP EST 3 TONS EST 7 SY GF

4 MICHAEL D. MELTON DON C. MELTON DB 2024 PG 3469

MEDIAN V DITCH SEE DETAIL K

SLOPE STABILIZATION W/CLASS B RIPRAP SEE DETAIL N

TEMP SHORING

END BRIDGE -DET- Sta. 18+57.01

5 ROBERT E. MCCURRY TAMMY L. MCCURRY DB 591 PG 775

6 MARILYN A. MCCURRY ROBERT E. MCCURRY DB 450 PG 59 DB 578 PG 620

LATERAL 4' BASE DITCH SEE DETAIL C EST 131 CY DDE

LATERAL 4' BASE DITCH W/CLASS I RIPRAP SEE DETAIL F EST 18 TONS EST 39 SY GF EST 48 CY DDE

-DET- PC Sta. 20+99.30

-DET- PT Sta. 22+72.42

MEDIAN V DITCH W/CLASS B RIPRAP SEE DETAIL J EST 31 TONS EST 68 SY GF

7 PETER G. LINK ESTATE FILE 10E PG 50 DB 624 PG 340

END GRADE -DET- Sta. 24+32.01

-DET- PT Sta. 24+25.92

END CONSTRUCTION -DET- Sta. 25+30.99 OFFSET = 11.91' -L- POT Sta.25+67.98=

SPECIAL LATERAL 2' BASE DITCH W/CLASS I RIPRAP SEE DETAIL B EST 48 TONS EST 102 SY GF

-DET- PT Sta. 25+99.04= -L- Sta.26+35.42

8 CHERRY MOUNTAIN VOLUNTEER FIRE DEPARTMENT DB 467 PG 513

LEGEND:
- MED DITCHLINE
- LT DITCHLINE

-DET-

BEGIN GRADE -DET- STA. 12+56.65 EL. = 1,109.55'

PI = 13+40.00 EL = 1,108.88' VC = 135' K = 88

PI = 14+75.00 EL = 1,109.87' VC = 135' K = 546

PI = 16+50.00 EL = 1,110.73' VC = 125' K = 664

BEGIN MEDIAN V DITCH -DET- STA. 15+25 MED EL. 1107.64

END BRIDGE -DET- STA. 18+57.01

END MEDIAN V DITCH -DET- STA. 17+00 MED EL. 1106.87

BEGIN BRIDGE -DET- STA. 17+14.44

BEGIN MEDIAN V DITCH -DET- STA. 18+75 MED EL. 1106.15

PI = 20+92.00 EL = 1,112.05' VC = 467' K = 79

PROPOSED GRADE

END MEDIAN V DITCH -DET- STA. 22+75 MED EL. 1122.56

STA. 19+50 EL. 1106.80

STA. 21+00 EL. 1110.70

STA. 22+00 EL. 1116.02

STA. 24+50 EL. 1127.50

STA. 25+00 EL. 1129.50

(-)0.8000% -0.50% (+)0.7352% (+)0.4882% (+)0.3000% +0.50% -1.88% -0.30% +0.86% EXISTING GROUND (+)0.3000% +2.60% (+)6.2035% +6.23% +8.72% +6.00% +4.00% +8.00% +9.00% +2.17%

BEGIN SP CUT DITCH -DET- STA. 12+75 LT EL. 1107.96

END SP CUT DITCH -DET- STA. 14+25 LT EL. 1107.21

BEGIN LATERAL 4' BASE DITCH -DET- STA. 15+25 LT EL. 1096.17

STA. 15+50 EL. 1095.70

STA. 16+00 EL. 1095.45

END LATERAL 4' BASE DITCH -DET- STA. 17+60 LT EL. 1094.97

BEGIN LATERAL 4' BASE DITCH -DET- STA. 18+15 LT EL. 1095.48

STA. 19+50 EL. 1096.16

NORMAL WSEL 1092.1' (SURVEYED 08052021)

STA. 22+00 EL. 1101.58

BEGIN LATERAL 2' BASE DITCH -DET- STA. 23+85 LT EL. 1123.60

END GRADE -DET- STA. 24+32.01 EL. = 1,133.15'

END LATERAL 2' BASE DITCH -DET- STA. 25+25 LT EL. 1131.50

END LATERAL 4' BASE DITCH -DET- STA. 22+50 LT EL. 1106.08

HYDRAULIC DATA

DESIGN DISCHARGE	= 2000 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 10 YRS.
DESIGN HIGH WATER ELEVATION	= 1098.6'
DRAINAGE AREA	= 14.2 SQ. MI.
BASIC DISCHARGE (Q100)	= 3800 C.F.S.
BASIC HIGH WATER ELEVATION	= 1100.7'
WS EL Taken @ River Station 3242	

-Y1_DET-

BEGIN GRADE -DET- STA. 14+49.01 = -Y1_DET- STA. 10+10.51 EL. = 1,110.02'

PI = 10+40.00 EL = 1,110.15' VC = 50' K = 29 DS = 25 MPH

PROPOSED GRADE

END GRADE -Y1_DET- STA. 10+73.40 EL. = 1,110.89'

(+)2.2000%

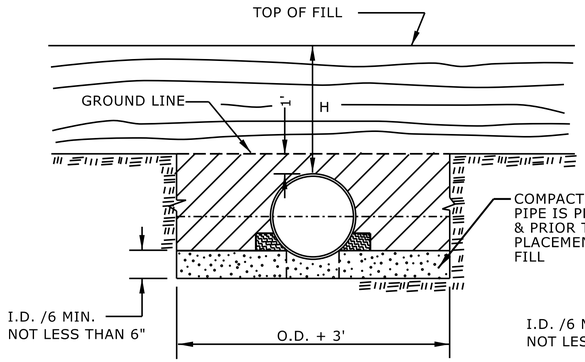
(+)0.4550% @ 6.88%

EXISTING GROUND

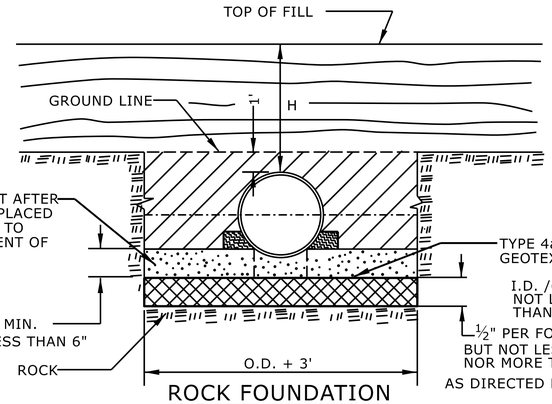
END SP LATERAL 2' BASE DITCH -Y1 DET- STA. 10+50 LT EL. 1109.62

BEGIN SP LATERAL 2' BASE DITCH -Y1 DET- STA. 10+15 LT EL. 1107.21

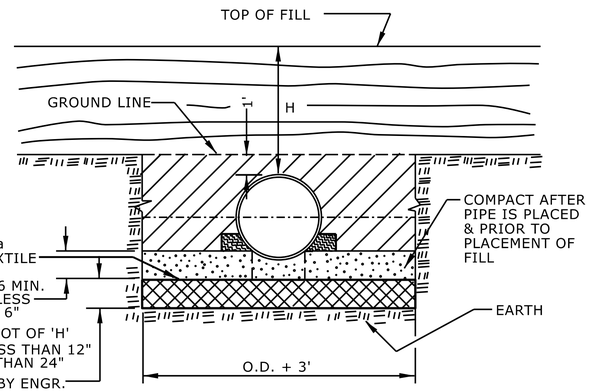
PROJECT REFERENCE NO.	SHEET NO.
BR-0100	2C-1



NORMAL EARTH FOUNDATION

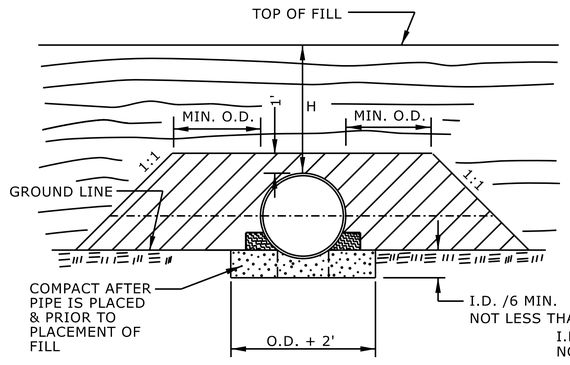


ROCK FOUNDATION

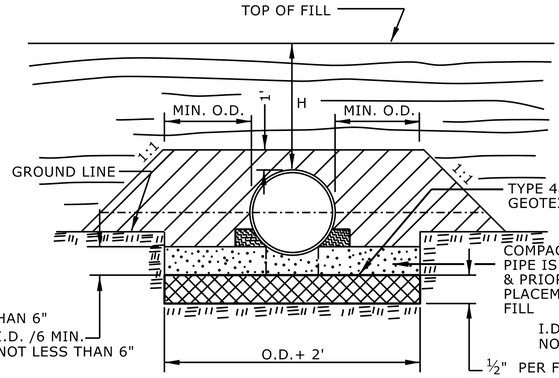


UNSUITABLE MATERIAL FOUNDATION

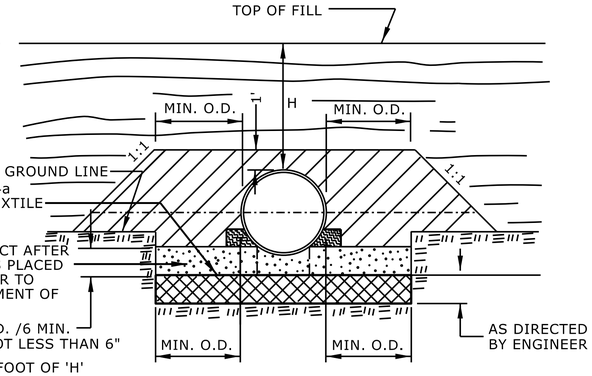
PIPE IN TRENCH



NORMAL EARTH FOUNDATION



ROCK FOUNDATION



UNSUITABLE MATERIAL FOUNDATION

PIPE ABOVE GROUND

GENERAL NOTES:

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

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

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

APPROVED SUITABLE LOCAL MATERIAL.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

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

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

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

SPRINGLINE OF PIPE

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

UNDISTURBED EARTH MATERIAL

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

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

ROADWAY DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

SHEET 1 OF 2

300.01

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER

Signed by: Nicole M. Hackler
12/18/2024

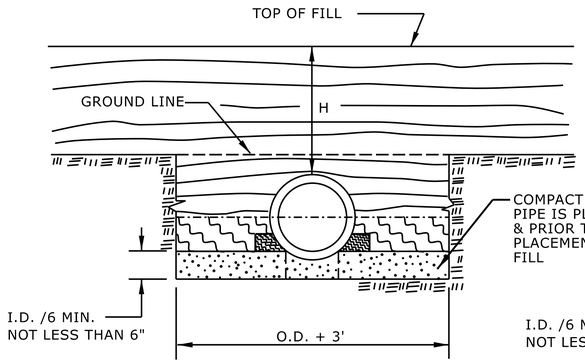
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

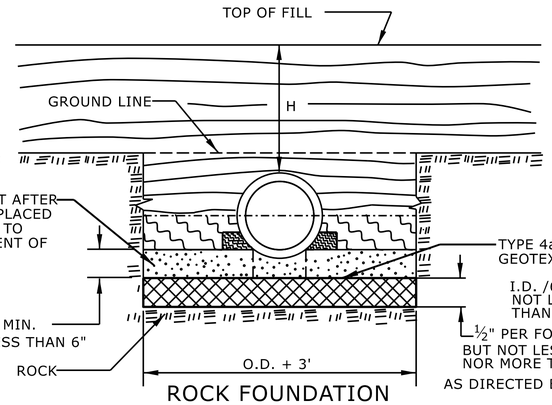
SEE TITLE BLOCK

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

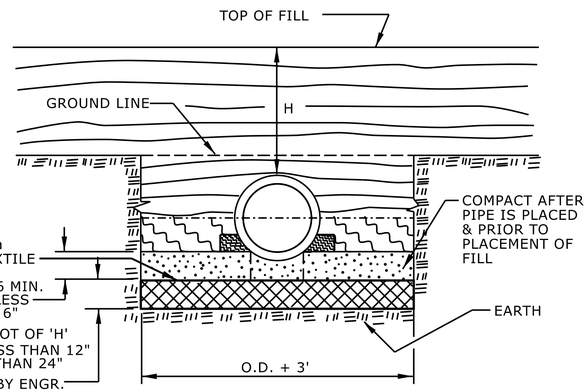
PROJECT REFERENCE NO.	SHEET NO.
BR-0100	2C-2



NORMAL EARTH FOUNDATION

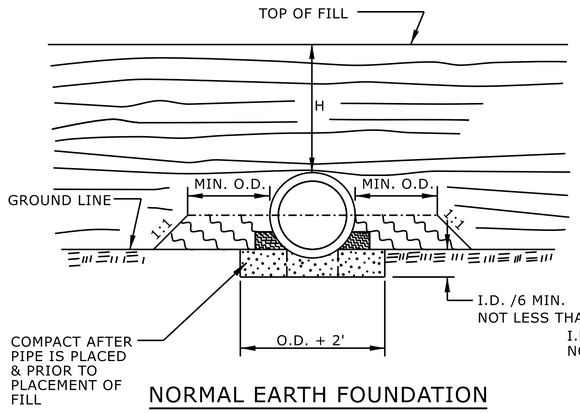


ROCK FOUNDATION

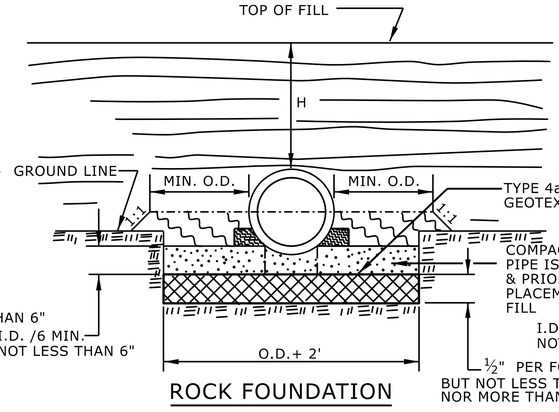


UNSUITABLE MATERIAL FOUNDATION

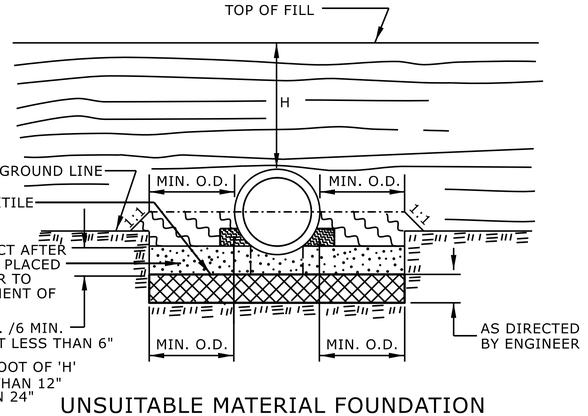
PIPE IN TRENCH



NORMAL EARTH FOUNDATION



ROCK FOUNDATION



UNSUITABLE MATERIAL FOUNDATION

PIPE ABOVE GROUND

GENERAL NOTES:

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

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

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

APPROVED SUITABLE LOCAL MATERIAL.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

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

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

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

SPRINGLINE OF PIPE

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

UNDISTURBED EARTH MATERIAL

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

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

ROADWAY DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

RIGID PIPE

SHEET 2 OF 2

300.01

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER

Signed by: Nicole M. Hackler
DocuSigned by: 12/18/2024

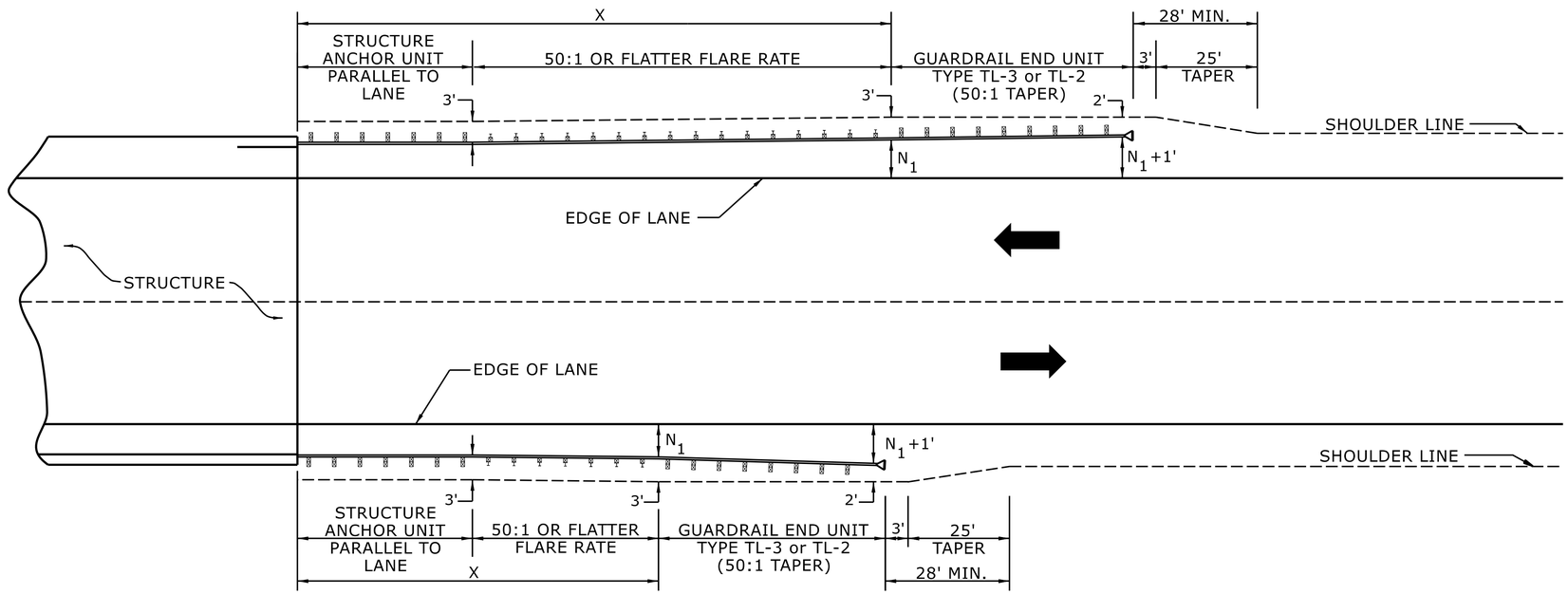
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE BLOCK

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

PROJECT REFERENCE NO.	SHEET NO.
BR-0100	2C-3



USE FLARE RATE AS THE CONTROL IF THE "N_1" DISTANCE IS NOT OBTAINED.
("N_1" 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.

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

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 4 OF 15

862D01

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER

Signed by: Nicole M. Hackler
12/18/2024

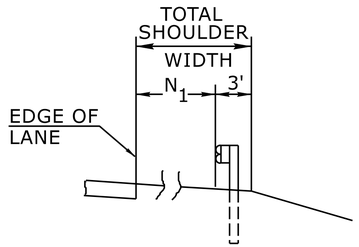
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

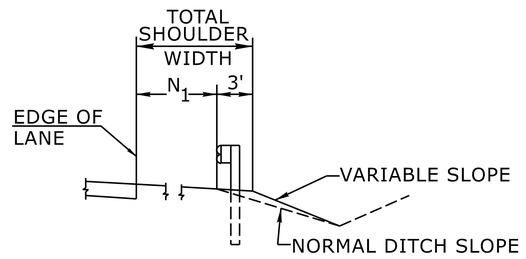
SEE TITLE BLOCK

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

PROJECT REFERENCE NO.	SHEET NO.
BR-0100	2C-4

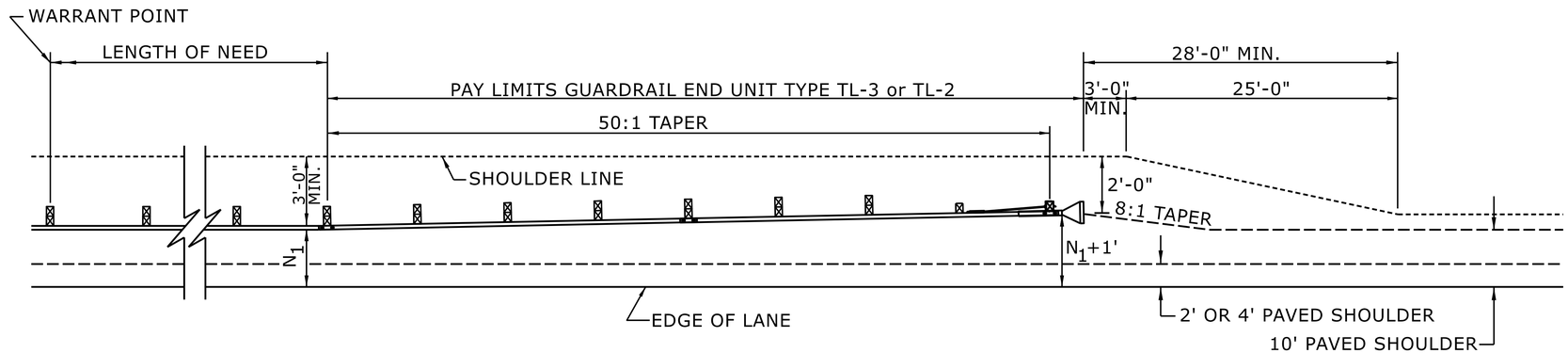


FILL SECTION



CUT SECTION

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



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

DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 6 OF 15

862D01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033144 NICOLE M. HACKLER

Signed by: Nicole M. Hackler
12/18/2024

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

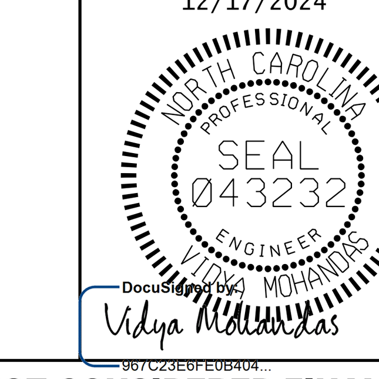
CONTRACTS STANDARDS
AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

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

PROJECT REFERENCE NO.	SHEET NO.
BR-0100	2D-1

HYDRAULICS ENGINEER 12/17/2024

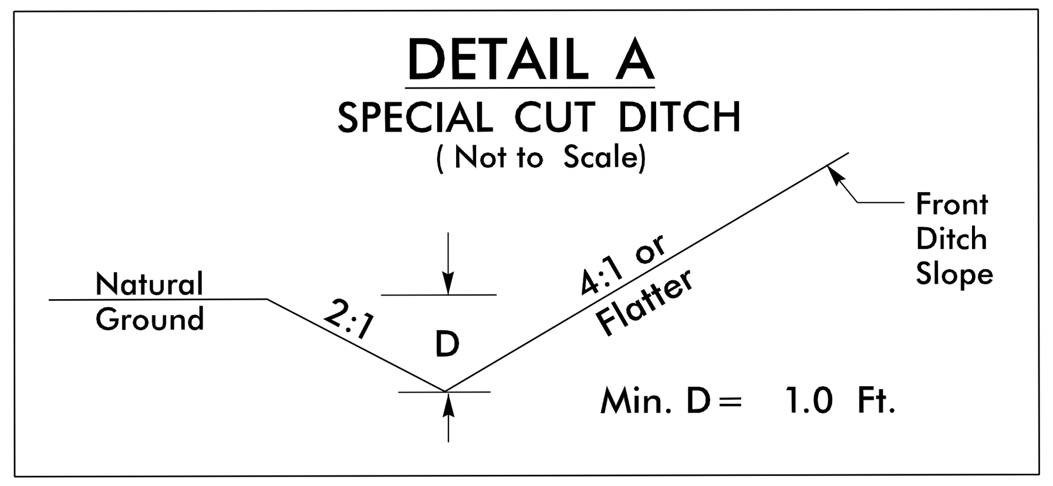


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

8/17/99

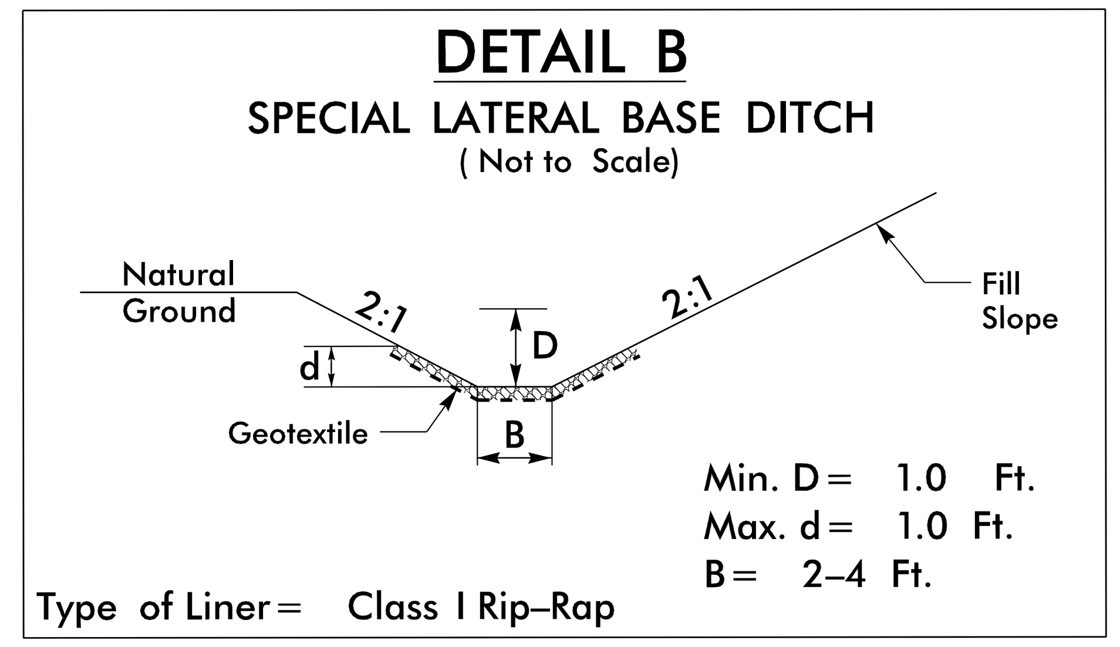
REVISIONS

DETAIL A



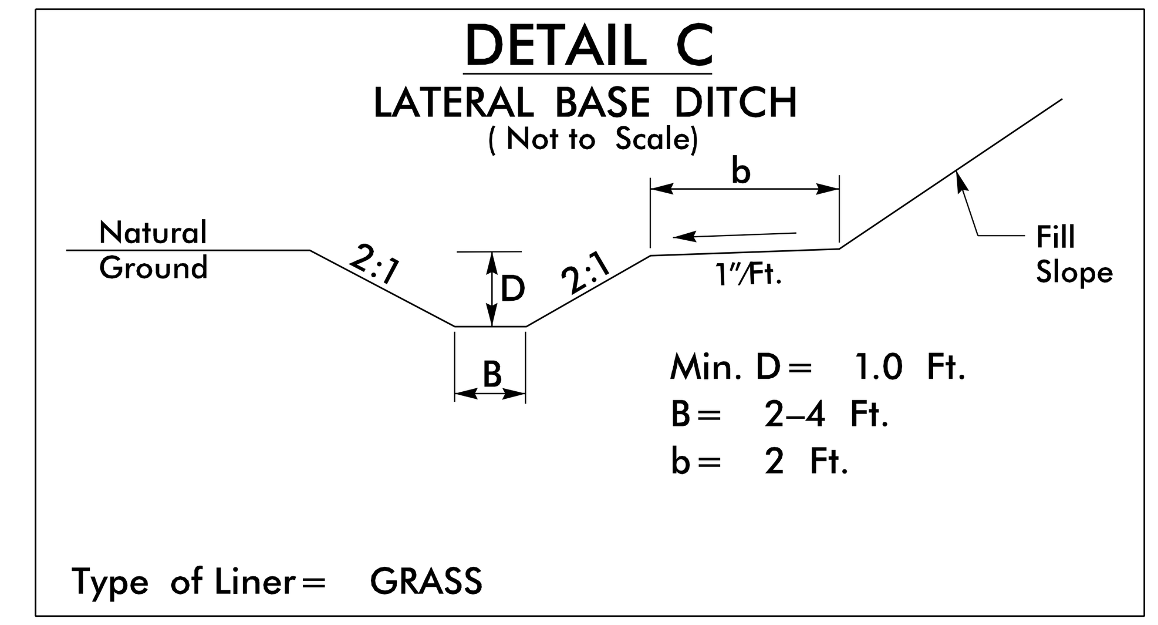
FROM STA. 13+75 TO STA. 14+40 –L– LT
FROM STA. 12+75 TO STA. 14+25 –DET– LT

DETAIL B



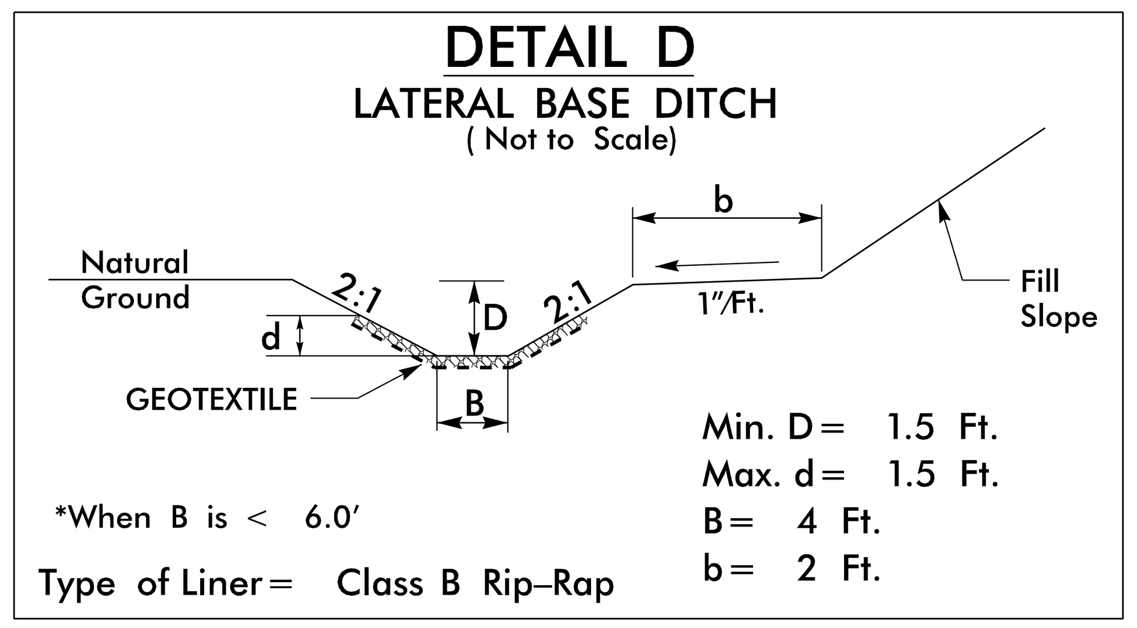
FROM STA. 22+00 TO STA. 23+50 –L– RT.
FROM STA. 10+15 TO STA. 10+50 –Y1_DET– LT.
FROM STA. 23+85 TO STA. 25+25 –DET– LT.

DETAIL C



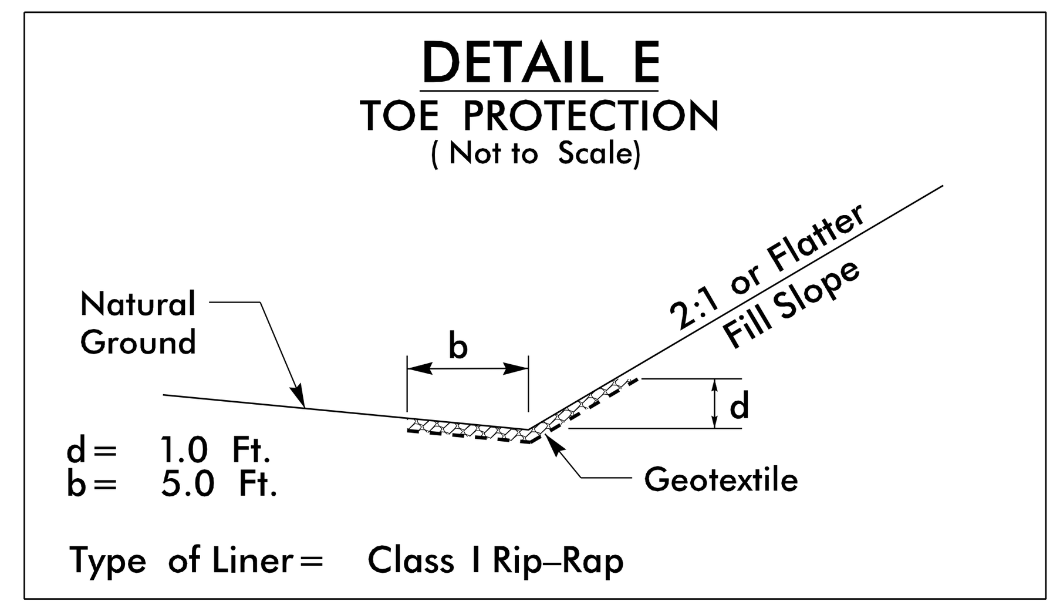
FROM STA. 16+75 TO STA. 17+95 –L– LT
FROM STA. 15+25 TO STA. 17+50 –DET– LT
FROM STA. 18+15 TO STA. 22+00 –DET– LT

DETAIL D



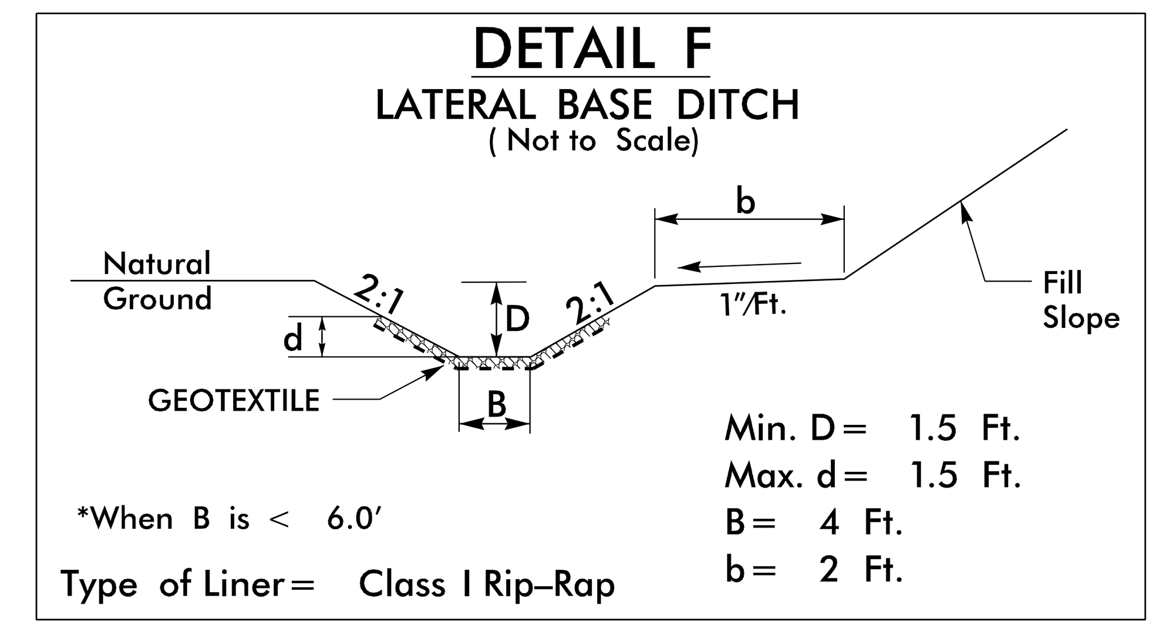
FROM STA. 18+50 TO STA. 22+50 –L– LT
FROM STA. 24+25 TO STA. 24+75 –L– LT

DETAIL E



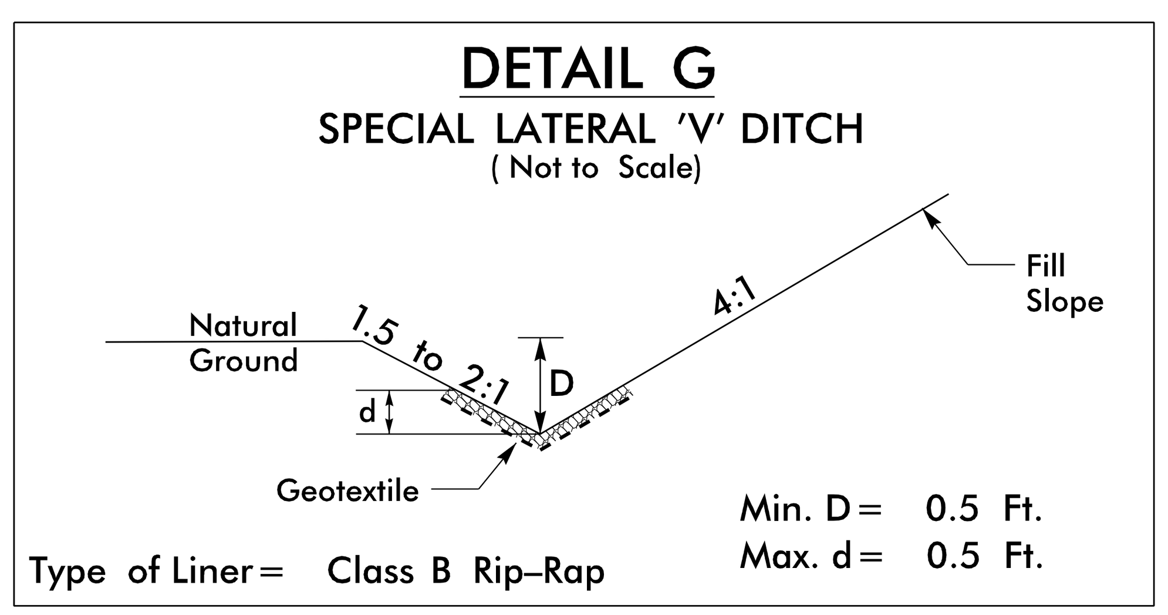
FROM STA. 22+50 TO STA. 23+75 –L– LT
FROM STA. 15+00 TO STA. 16+50 –L– RT

DETAIL F



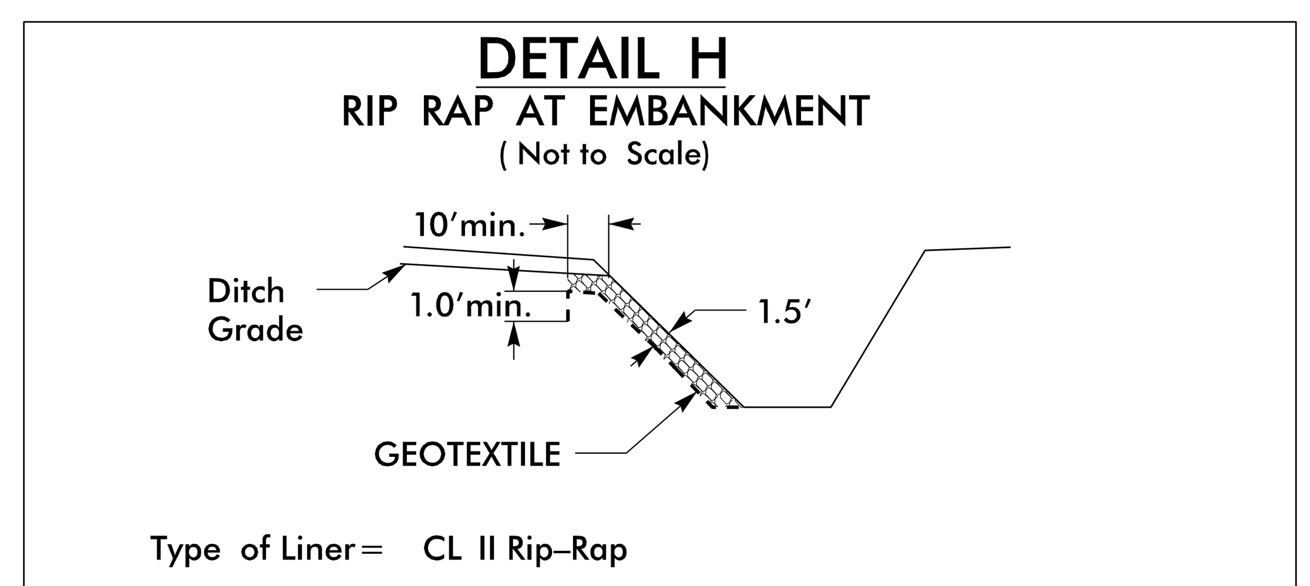
FROM STA. 18+50 TO STA. 22+95 –L– RT
FROM STA. 22+00 TO STA. 22+50 –DET– LT
FROM STA. 22+44 TO STA. 22+95 –L_PHASING– LT

DETAIL G



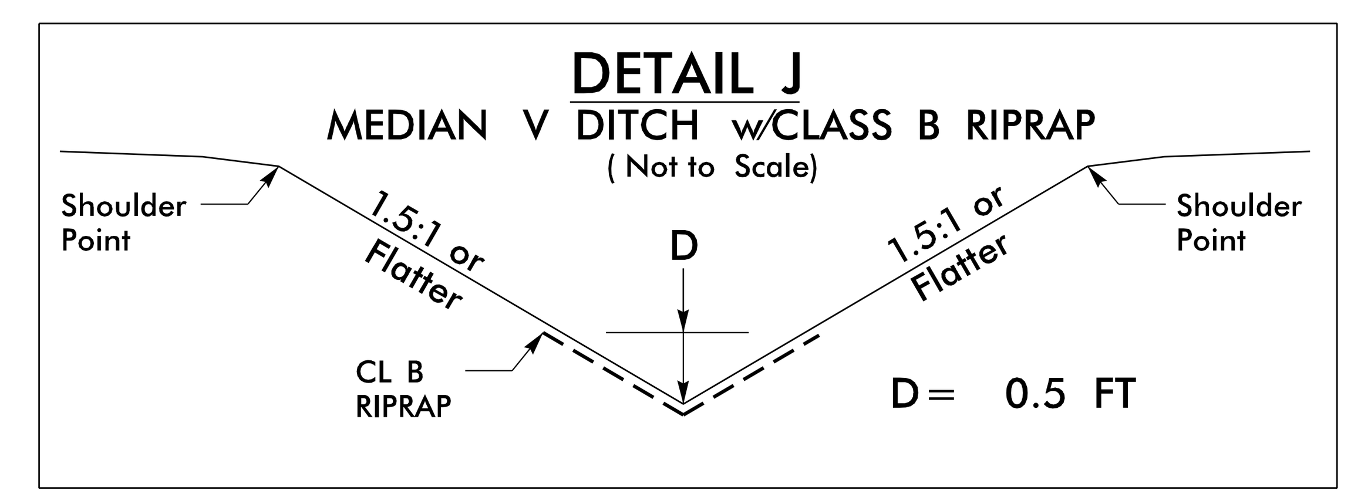
FROM STA. 10+25 TO STA. 11+25 –Y1– LT

DETAIL H



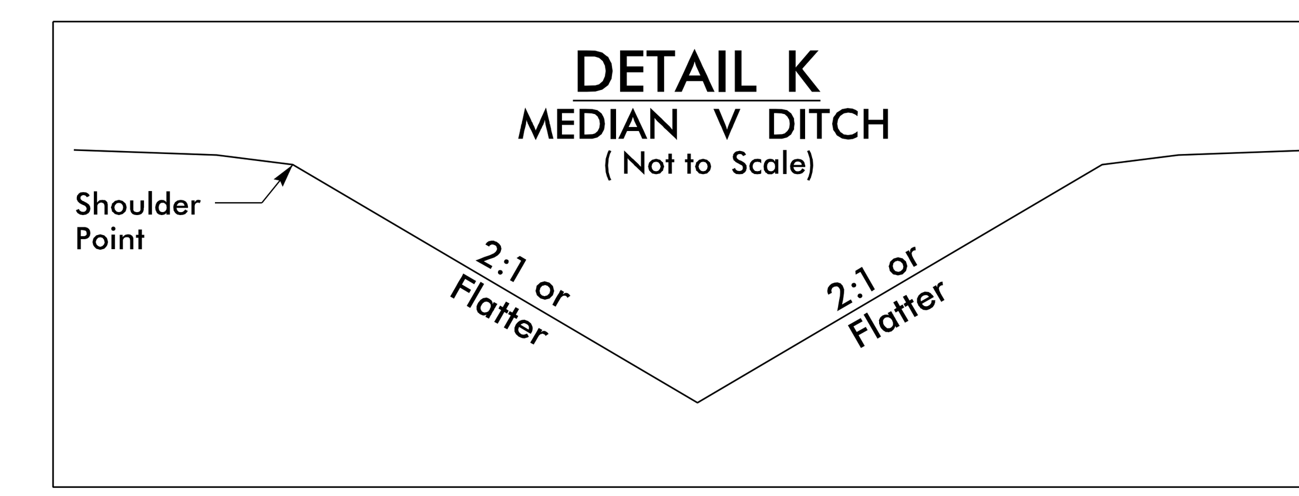
ALN	FROM STA.	TO STA.	RIP-RAP (TONS)	GEOTEXTILE (SY)
–L–	17+95	18+03	8	11
–L–	18+32	18+45	18	24
–L–	18+30	18+50	15	21
–DET–	17+56	17+64	5	7
–DET–	17+93	18+00	15	20

DETAIL J



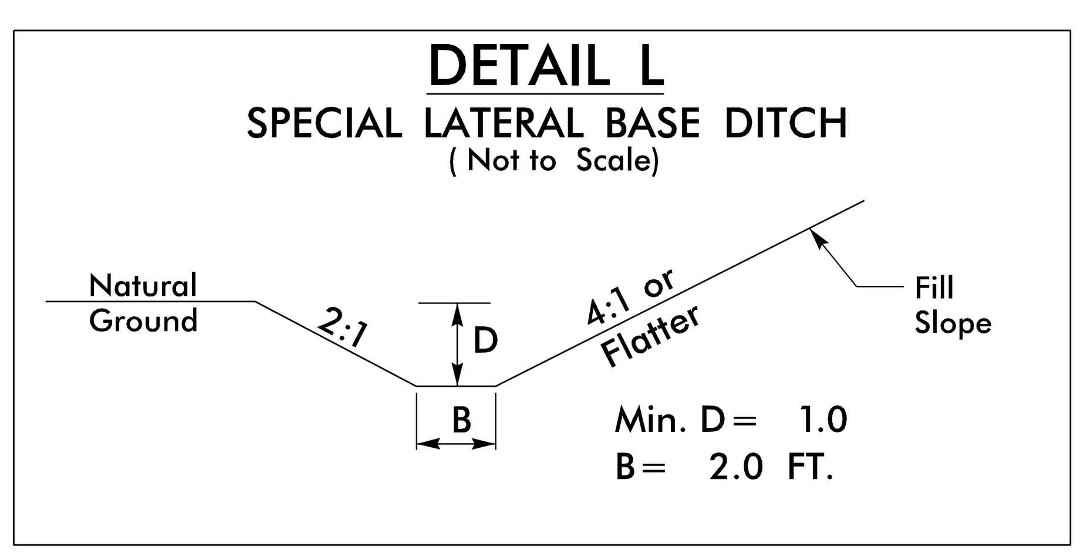
FROM STA. 21+25 TO STA. 22+75 –DET– MED
FROM STA. 21+50 TO STA. 23+00 –L_PHASING– MED

DETAIL K



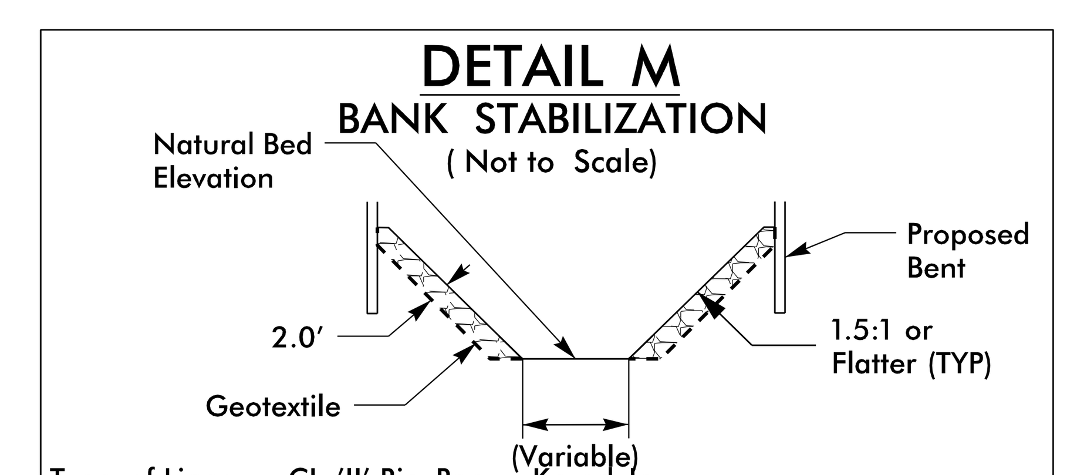
FROM STA. 15+25 TO STA. 17+00 –DET– MED
FROM STA. 18+75 TO STA. 21+25 –DET– MED
FROM STA. 15+50 TO STA. 17+50 –L_PHASING– MED
FROM STA. 19+25 TO STA. 21+50 –L_PHASING– MED

DETAIL L



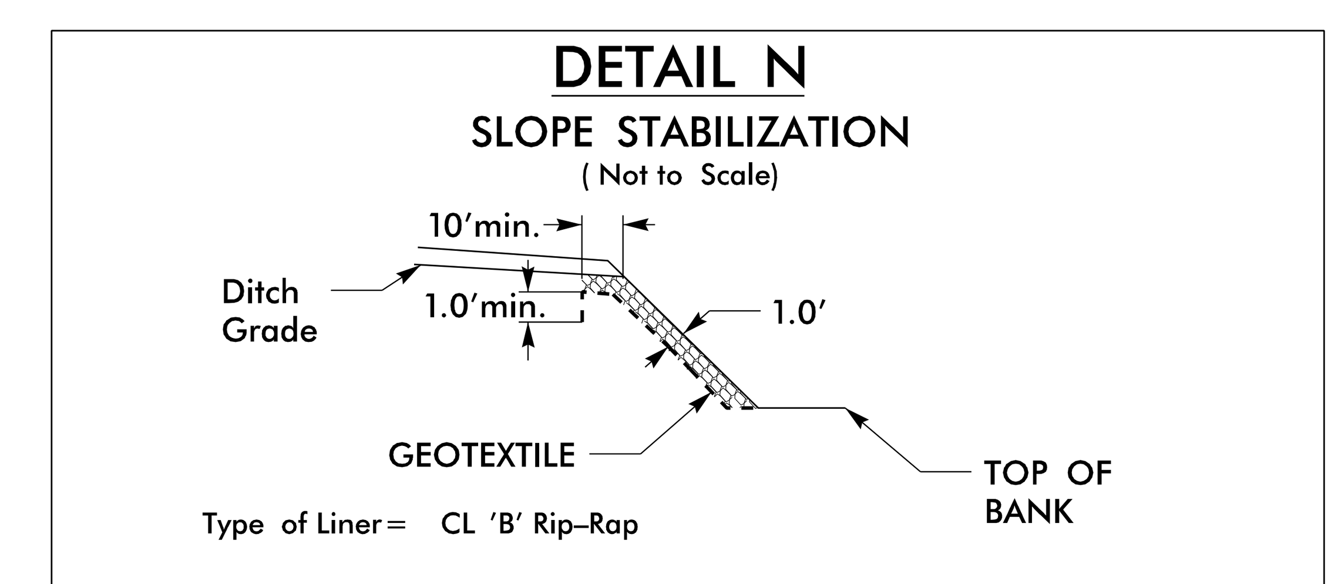
FROM STA. 15+50 TO STA. 16+75 –L– LT.

DETAIL M



FROM STA.	TO STA.	RIP-RAP (TONS)	GEOTEXTILE (SY)
18+03	18+15	30	31
18+38	18+45	21	21

DETAIL N



ALN	FROM STA.	TO STA.	RIP-RAP (TONS)	GEOTEXTILE (SY)
–L–	15+22	15+45	22	49
–DET–	18+03	18+65	30	61
–DET–	17+00	17+62	21	48

12/06/07

COMPUTED BY: HEC DATE: 7/27/22
CHECKED BY: EDM DATE: 6/28/24

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
BR-0100	3B-1

PLANS PREPARED BY:
WSP USA
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
FAX: 1.919.836.4099
LICENSE NO. F-0165

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
L	–L– 17+33.72	–L– 17+61.43		74.50
L	–L– 18+96.49	–L– 19+22.28		67.31
L	–L– 22+50.00	–L– 23+00.00		126.11
DET	–DET– 11+26.00	–DET– 14+42.00		449.86
DET	–DET– 14+83.00	–DET– 17+14.00		812.79
DET	–DET– 18+57.00	–DET– 25+31.00		1777.51
			TOTAL:	3308.09
			SAY:	3310

SUMMARY OF BREAKING EXISTING ASPHALT PAVEMENT

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
L	–L– 19+22.28	–L– 22+50.00		818.83
			TOTAL:	818.83
			SAY:	820

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
–L–LT	17+11.50	17+40.15	28.65
–L–RT	16+88.50	17+27.29	38.79
–L–LT	19+28.71	19+72.00	43.29
–L–RT	19+15.85	19+52.15	36.3
		TOTAL:	147.03
		SAY:	150

SUMMARY OF EARTHWORK
IN CUBIC YARDS

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
–DET– 11+25.50	–DET– 17+14.43	1069	5412	4343	
–DET– 18+57.01	–DET– 25+30.99	80	12337	12257	
–Y1_DET– 10+10.51	–Y1_DET– 10+73.40		16	16	
SUBTOTALS:		1149	17765	16616	
–L– 13+65.00	–L– 17+47.83	5	1374	1369	
–L– 19+08.17	–L– 24+75.00	261	4469	4208	
–Y1– 10+12.07	–L– 11+43.00		36	36	
–DR1– 10+11.00	–DR1– 11+69.87		426	426	
SUBTOTALS:		266	6304	6038	
DETOUR REMOVAL		12465	746		11719
SUBTOTALS:		12465	746		11719
PROJECT TOTALS:		13880	24815	22654	11719
REPLACE SOIL ON BORROW PIT				1142	
MATERIAL FOR SHOULDER CONSTRUCTION			184	184	
GRAND TOTALS:		13880	24999	23980	11719
SAY:		14,000		24,900	

DRAINAGE DITCH EXCAVATION = 1080 CY.

CONTINGENCY: EST. UNDERCUT = 450 CY.
EST. GEOTEXTILE FOR SOIL STABILIZATION = 700 SY.
EST. SELECT GRANULAR MATERIAL = 400 CY.

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

Approximate Quantities Only. Unclassified Excavation, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement and Removal of Existing Pavement will be paid for at the Lump Sum Price for "GRADING."

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	TYPE III	GREU TL–3	GREU TL–2	XIII	CAT–1	VI MOD	BIC	AT–1	EA	G	NG				
L	15+39.17	17+40.55	RT	206.25			–L– 17+40.55 (BRIDGE)		8′–0″	11′–0″	50′–0″		1′–0″			1	1												
L	15+20.09	17+55.11	LT	218.75	81.25			–L– 17+55.11 (BRIDGE)	8′–0″	11′–0″						1							1						
L	19+00.89	23+41.38	RT	443.75				–L– 19+00.89 (BRIDGE)	8′–0″	11′–0″		50′–0″		1′–0″		1	1												
L	19+15.45	23+80.94	LT	468.75			–L– 19+15.45 (BRIDGE)		8′–0″	11′–0″	50′–0″		1′–0″			1	1												
			SUBTOTAL	1337.5	81.25																								
			LESS DEDUCTIONS																										
			GREU TL–3 (3 x 50)=	150′																									
			AT–1 (1 x 6.25′)=		6.25′																								
			TYPE III (4 x 18.75)=	75′																									
			SUBTOTAL	225′	6.25′		ADDITIONAL GUARDRAIL	POSTS = 10								4	3						1						
			TOTALS	1112.5′	75′											4	3						1						
			SAY	1112.5′	75′																								
										TEMPORARY GUARDRAIL SUMMARY																				
DET	14+88.61	17+14.44	LT	218.75	68.75			–DET– 17+14.44 (BRIDGE)	4′–0″	7′–0″						1							1					287.5		TEMPORARY GUARDRAIL
DET	15+42.42	17+14.44	RT	181.25			–DET– 17+14.44 (BRIDGE)		4′–0″	7′–0″	25′–0″		0′–6″			1		1										181.25		TEMPORARY GUARDRAIL
DET	18+57.01	22+53.99	RT	406.25				–DET– 18+57.01 (BRIDGE)	4′–0″	7′–0″		25′–0″		0′–6″		1		1										406.25		TEMPORARY GUARDRAIL
DET	18+57.01	23+41.52	LT	493.75			–DET– 18+57.01 (BRIDGE)		4′–0″	7′–0″	25′–0″		0′–6″			1		1										493.75		TEMPORARY GUARDRAIL
			SUBTOTAL	1300	68.75																								
			LESS DEDUCTIONS																										
			GREU TL–2 (3 x 25)=	75′																									
			AT–1 (1 x 6.25′)=		6.25′																								
			TYPE III (4 x 18.75)=	75′																									
			SUBTOTAL	150′	6.25′		ADDITIONAL GUARDRAIL	POSTS = 10								4		3					1					1368.75		
			TOTALS	1150′	62.5′											4		3					1					1368.75		
			SAY	1150′	62.5′																								

10:13:49 AM
BR-0100_rdy_3B-1.dgn
2/11/2024

7LMV213

COMPUTED BY:	Victoria Fyfe	DATE:	3/13/2024
CHECKED BY:	Vidya Mohandas	DATE:	3/13/2024

PROJECT NO.	SHEET NO.
BR-0100	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	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE)										C. S. PIPE					R. C. PIPE CLASS III					ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE MASONRY
SIZE								15	18	24	30	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	12	15	18	24	30	12	15	18	24	30			
THICKNESS OR GAUGE		FROM	TO	FT.	FT.	FT.	%											.064	.064	.064	.064	.079						CY	CY	CY
L 14+52	39 LT	0401		1106.4																										
		0401	0402		1103.2	1099.3																			96					
L 16+97	19 RT	0403		1110.6																										
		0403	0404		1107.6	1096.7													40											
L 17+20	19 LT	0405		1110.7																										
		0405	0406		1107.7	1095.8													40											
L 19+46	19 RT	0407		1112.4																										
		0407	0408		1109.4	1096.2													36											
L 19+65	19 LT	0409		1112.8																										
		0409	0410		1109.8	1095.6													36											
L 24+28	55 LT	0411		1127.0																								1.500		
		0411	0412		1123.6	1106.1	1.2														136									
Y1 10+30	29 LT																													
DW VAR GR DR	33 LT																													
DW WW	56 RT																													
L 23+85	52 RT	0413	0414		1127.5	1121.2															52									
DET 14+28	24 LT	0420		1107.2																										
		0420	0421		1102.7	1096.2																		100						
DET 17+00	27 LT	0422		1108.4																										
		0422	0423		1103.0	1096.3		68				X																		
SHEET TOTALS								68											152		188			100	96			1.500		
PROJECT TOTALS								68											152		188			100	96			1.500		

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

LINE & STATION	OFFSET	FROM	TO	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	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54
L 14+52	39 LT	0401		1												1	1																						
		0401	0402																																				
L 16+97	19 RT	0403		1															1			1																	
		0403	0404																																				
L 17+20	19 LT	0405		1															1			1																	
		0405	0406																																				
L 19+46	19 RT	0407		1															1			1																	
		0407	0408																																				
L 19+65	19 LT	0409		1															1			1																	
		0409	0410																																				
L 24+28	55 LT	0411																																					
		0411	0412																																				
Y1 10+30	29 LT																																						
DW VAR GR DR	33 LT																																						
DW WW	56 RT																																						
L 23+85	52 RT	0413	0414																																				
DET 14+28	24 LT	0420		1															1				1																
		0420	0421																																				
DET 17+00	27 LT	0422		1	0.3														1				1																
		0422	0423																																				
SHEET TOTALS				7	0.3											1	1		6			4	2																
PROJECT TOTALS				7	0.3											1	1		6			4	2																

LINE & STATION	OFFSET	FROM	TO	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" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	MODIFIED CONC. FLUME	PREFORMED SCOUR HOLE (PER EACH)	ENERGY DISSIPATION BASIN		FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
L 14+52	39 LT	0401																					
		0401	0402																				
L 16+97	19 RT	0403																					
		0403	0404							2													
L 17+20	19 LT	0405																					
		0405	0406							2													
L 19+46	19 RT	0407																					
		0407	0408							2													
L 19+65	19 LT	0409																					
		0409	0410							2													
L 24+28	55 LT	0411																					
		0411	0412									2											
Y1 10+30	29 LT																					57	18" pipe removal
DW VAR GR DR	33 LT																					36	24" Pipe removal
DW WW	56 RT																					26	18" Pipe removal
L 23+85	52 RT	0413	0414									2											
DET 14+28	24 LT	0420																					
		0420	0421																			100	Remove system after detour phase
DET 17+00	27 LT	0422																					
		0422	0423																			68	Remove system after detour phase
SHEET TOTALS										8		4										287	
PROJECT TOTALS										8		4										287	

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: DMM____ DATE: 11/28/2022__
CHECKED BY: DCE____ DATE: 11/28/2022__
UPDATEED BY: SCC___ DATE: 6/5/2024

(2-3-23)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
BR-0100	3G-1

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				UD	750
CONTINGENCY				SD	200
				TOTAL LF:	950

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

SUMMARY OF GEOTEXTILE FOR PAVEMENT STABILIZATION

LINE	Station	Station	Geotextile for Pavement Stabilization SY	Class IV Subgrade Stabilization TONS
CONTINGENCY				
		TOTAL SY/TONS:	0	0*

***Total tons of "Class IV Subgrade Stabilization" is only the estimated quantity for pavement stabilization and may only represent a portion of the subgrade stabilization quantity shown in the Item Sheets of the Proposal.**

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 Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			1		100	200	500		
				TOTAL CY/TONS/SY:	100	200**	500**	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.**

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
BR-0100	4
RW SHEET NO.	

ROADWAY DESIGN ENGINEER 12/17/2024 — NORTH CAROLINA PROFESSIONAL SEAL 33290 ENGINEER RONNIE A. THIGPEN — Docusigned by: Ronnie A. Thigpen

HYDRAULICS ENGINEER 12/17/2024 — NORTH CAROLINA PROFESSIONAL SEAL 043232 ENGINEER VIJAYA MOHANDAS — Docusigned by: Vijaya Mohandas

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:

WSP USA
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
FAX: 1.919.836.4099
LICENSE NO. F-0165

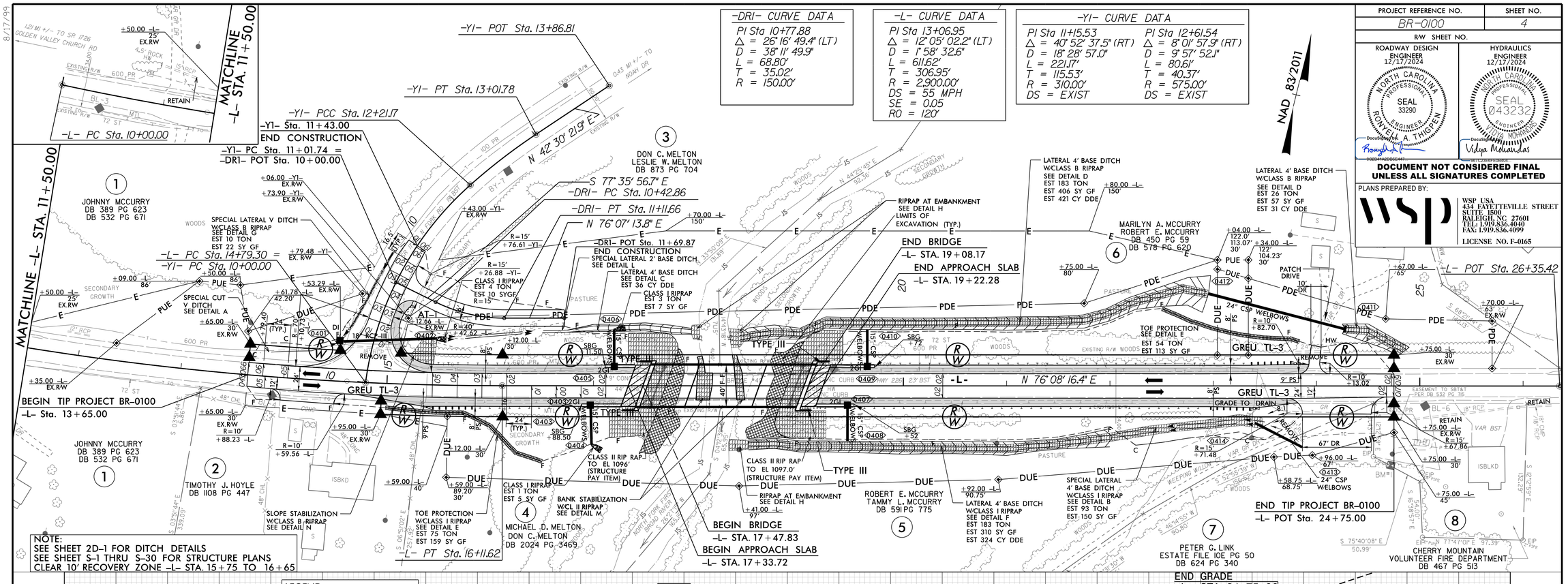
NAD 83/2011

-DRI- CURVE DATA
PI Sta 10+77.88
Δ = 26° 16' 49.4" (LT)
D = 38° 11' 49.9"
L = 68.80'
T = 35.02'
R = 150.00'

-L- CURVE DATA
PI Sta 13+06.95
Δ = 12° 05' 02.2" (LT)
D = 1° 58' 32.6"
L = 611.62'
T = 306.95'
R = 2,900.00'
DS = 55 MPH
SE = 0.05
RO = 120'

-Y1- CURVE DATA
PI Sta 11+15.53
Δ = 40° 52' 37.5" (RT)
D = 18° 28' 57.0"
L = 221.17'
T = 115.53'
R = 310.00'
DS = EXIST

PI Sta 12+61.54
Δ = 8° 01' 57.9" (RT)
D = 9° 57' 52.1"
L = 80.61'
T = 40.37'
R = 575.00'
DS = EXIST



LEGEND:
RIGHT DITCHLINE
LEFT DITCHLINE