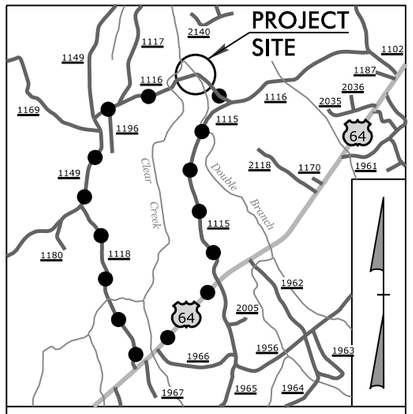
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09/08/99

TIP PROJECT: BP13-R033

CONTRACT: DM00429

See Sheet 1A For Index of Sheets



VICINITY MAP (NTS)

OFFSITE DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BURKE COUNTY

LOCATION: *BRIDGE NO. 254 ON SR 1116 (JEETER CARSWELL RD.) OVER DOUBLE BRANCH*

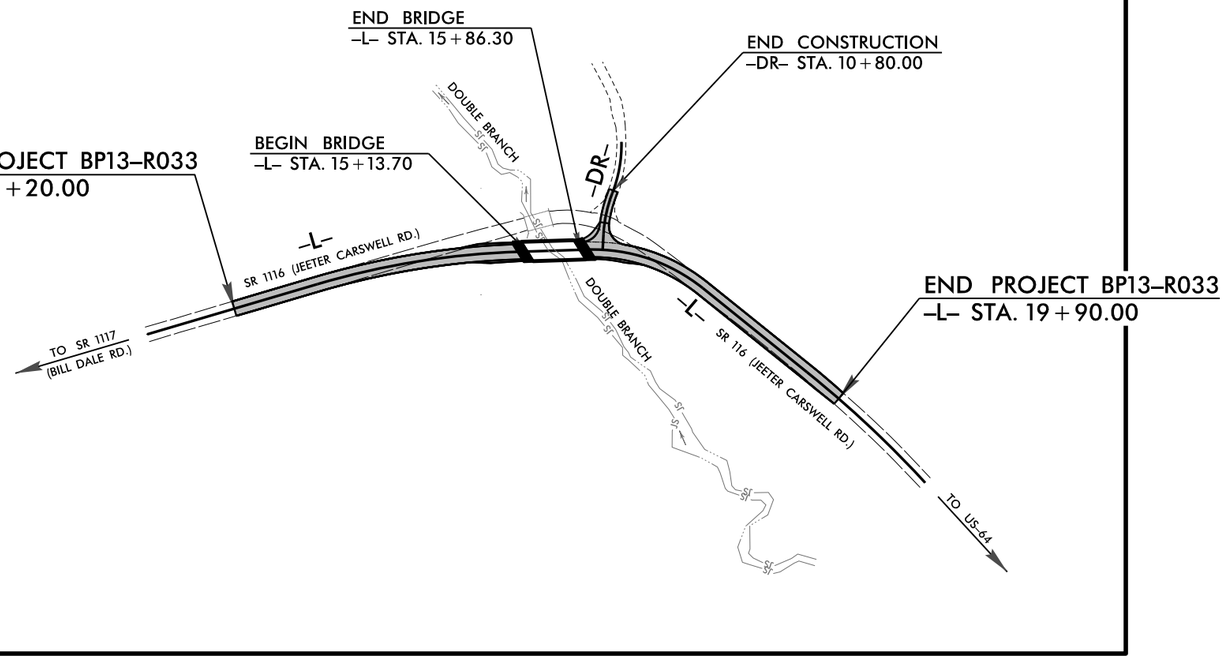
TYPE OF WORK: *GRADING, DRAINAGE, PAVING AND STRUCTURE*

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13-R033	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP13,R033,1		PE
BP13,R033,2		R/W & UTILITIES
BP13,R033,3		CONSTRUCTION

FINAL PLANS

4





DESIGN EXCEPTION FOR DESIGN SPEED, 30 MPH.

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 2025 = 500 (ESTIMATED)

V = 30 MPH

FUNC CLASS = RURAL LOCAL SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT BR13-R033	= 0.151	MI.
LENGTH STRUCTURE PROJECT BP13-R033	= 0.014	MI.
TOTAL LENGTH PROJECT BP13-R033	= 0.165	MI.

Prepared By:
ms consultants, inc.
5444 Wade Park Blvd
Suite 160
Raleigh, NC 27607
NC License Number : C-3239

Prepared For:
DIVISION OF HIGHWAYS DIVISION 13
55 Orange St., Asheville NC, 28801

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 31, 2024

LETTING DATE: NOVEMBER 19, 2025

MARK HILL
NCDOT PROJECT ENGINEER

TRAVIS POTTS
PROJECT ENGINEER

NYA BOAYUE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 021162 HERBERT TURNER, JR.

DocuSigned by: Herb Turner 4CB1821EEB284DF... SIGNATURE

9/2/2025 *P.E.*

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041453 M. TRAVIS POTTS

DocuSigned by: M. Travis Potts 4CB1821EEB284DF... SIGNATURE

9/2/2025 *P.E.*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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5/26/20

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1	DETAIL IN LIEU OF STANDARD 300.01 METHOD OF PIPE INSTALLATION (SHEET 1 OF 2)
2C-2	DETAIL IN LIEU OF STANDARD 300.01 METHOD OF PIPE INSTALLATION (SHEET 2 OF 2)
2C-3	DETAIL IN LIEU OF STANDARD 862.01 GUARDRAIL PLACEMENT (SHEET 4 OF 15)
2C-4	DETAIL IN LIEU OF STANDARD 862.01 GUARDRAIL PLACEMENT (SHEET 6 OF 15)
2C-5	TYPE III SHOP CURVED STRUCTURE ANCHOR UNIT
3B-1	ROADWAY SUMMARIES
3D-1	DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
4	PLAN SHEET
5	PROFILE SHEET
RW01 THRU RW04	RIGHT-OF-WAY PLANS
TMP-1 THRU TMP-4	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
RF-2 THRU RF-3	STREAMBANK REFORESTATION DETAILS
SIGN-1 THRU SIGN-3	SIGNING PLANS
X-1	CROSS-SECTION INDEX
X-1A	CROSS-SECTION SUMMARY SHEET
X-2 THRU X-19	CROSS-SECTIONS
S1-1 THRU S1-15	STRUCTURE PLANS

GENERAL NOTES: 2024 SPECIFICATIONS
EFFECTIVE: 01-16-2024
REVISED:

GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED 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 SUTIABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL:

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

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE BRENTWOOD WATER COMPANY, AT&T, RANDOLPH EMC, AND CHARTER COMMUNICATIONS.

RIGHT-OF-WAY MARKERS:

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

2024 ROADWAY ENGLISH STANDARD DRAWINGS EFF. 01-16-2024
REV.

The following Roadway Standards as appear in "Roadway Standard Drawings" Contracts Standards and Development Unit - N. C. Department of Transportation - Raleigh, N. C., Dated January 16, 2024 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation (Use Details in Lieu of Standard)
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
423.01	Bridge Approach Fills - Type I 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 8 - INCIDENTALS	
815.02	Subsurface Drain
840.00	Concrete Base Pad for Drainage Structures
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement (Use Details in Lieu of Standard for Sheets 4 and 6 of 15)
862.02	Guardrail Installation
862.03	Structure Anchor Units
866.04	Barbed Wire Fence - with Wood Posts (Contingency Item)
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

BP13-R033
1A

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BURKE COUNTY



ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER



DocuSigned by: 8/19/2025
M. Travis Potts
4CB1521EEB284DF...

PREPARED BY



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

9/21/21

BPI3-R033
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 — 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
- Existing Control of Access Line
- Proposed Control of Access Line
- Proposed ROW and CA Line
- Existing Easement Line
- Proposed Temporary Construction Easement — TCE
- 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 — PH
- 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 — PH
- 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:

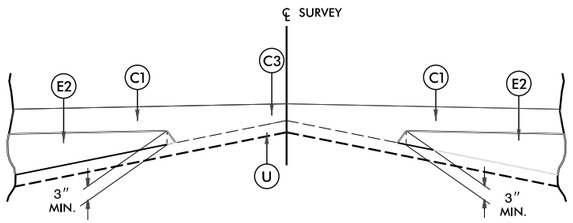
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line (SUE - LOS B)* — TUTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- Abandoned According to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

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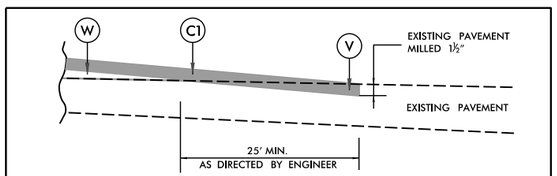
5/26/20

FINAL PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
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 TO EXCEED 1½" 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" OR GREATER THAN 5½" IN DEPTH.
J	8" AGGREGATE BASE COURSE
R	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLING
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL SHOWING METHOD OF WEDGING).

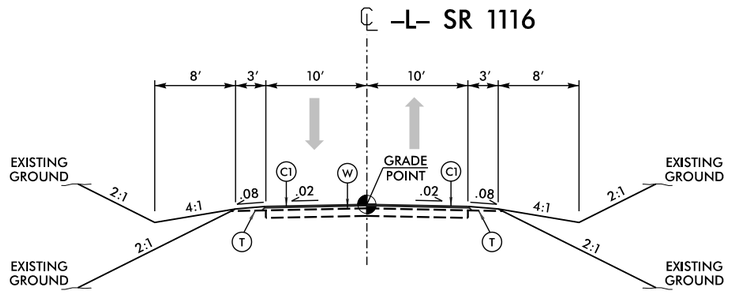
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



Detail Showing Method of Wedging

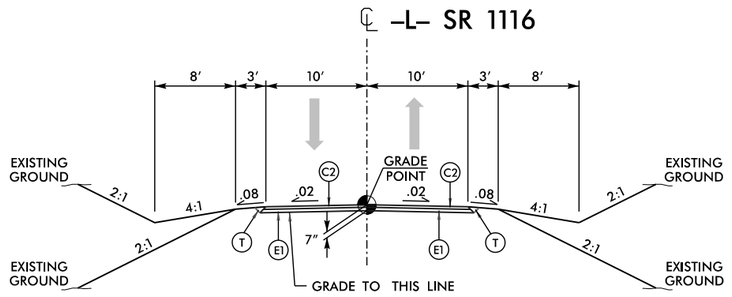


Incidental Milling Existing Pavement



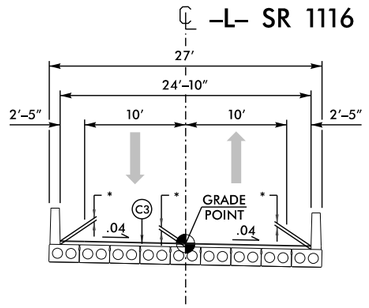
TYPICAL SECTION NO. 1

–L– STA. 11+20.00 TO –L– STA. 12+42.00



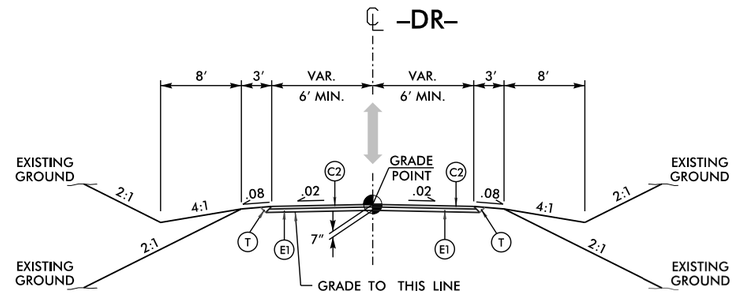
TYPICAL SECTION NO. 2

–L– STA. 12+42.00 TO –L– STA. 15+13.70 (BEGIN BRIDGE)
–L– STA. 15+86.30 (END BRIDGE) TO –L– STA. 19+90.00



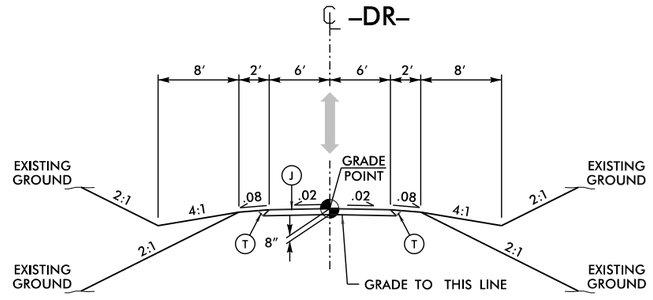
TYPICAL SECTION NO. 3

–L– STA 15+13.70 (BEGIN BRIDGE) TO –L– STA 15+86.30 (END BRIDGE)
*SEE STRUCTURE PLANS FOR ASPHALT WEARING SURFACE DEPTH



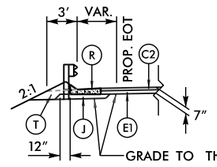
TYPICAL SECTION NO. 4

–DR– STA. 10+10.00 TO –DR– STA. 10+35.78



TYPICAL SECTION NO. 5

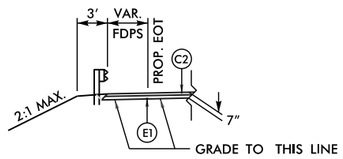
–DR– STA. 10+35.78 TO –L– STA. 10+80.00



SHOULDER BERM GUTTER DETAIL

(USE IN CONJUCTION WITH TYP. NO. 2)

–L– STA. 14+89 TO –L– STA. 14+97 LT
–L– STA. 14+93 TO –L– STA. 15+11 RT
–L– STA. 15+89 TO –L– STA 15+97 LT
–L– STA. 16+04 TO –L– STA. 16+12 RT



GUARDRAIL AND PAVED SHOULDER DETAIL

(USE IN CONJUCTION WITH TYP. NO. 2)

SEE PLAN FOR LOCATIONS

REVISIONS

BP13-R033
2A-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BURKE COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 041453 ENGINEER M TRAVIS POTTS
DocuSigned by: M Travis Potts 8/18/2025
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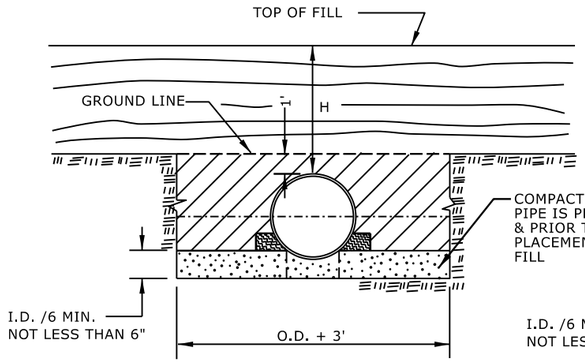
PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 044590 ENGINEER ANDREW D. WARGO
DocuSigned by: Andrew Wargo 8/18/2025
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PREPARED BY
rks consultants, inc.
5444 Wade Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number: C-3296

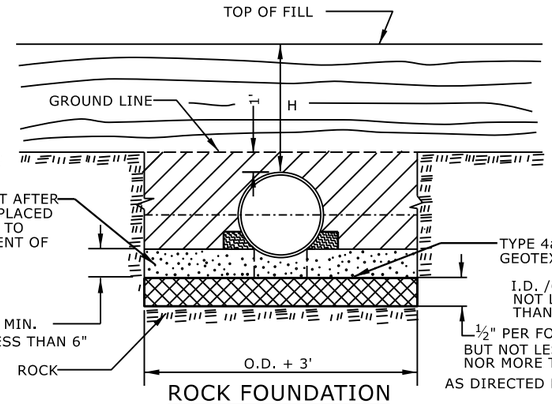
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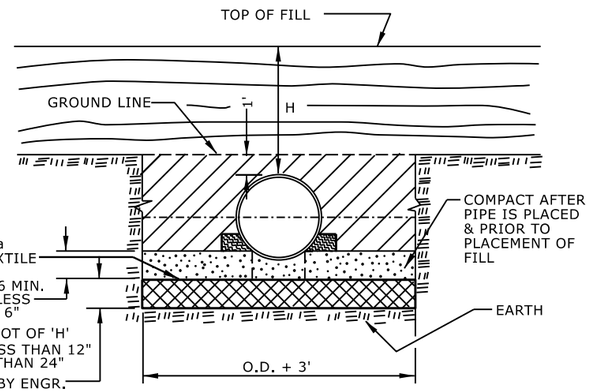
PROJECT REFERENCE NO.	SHEET NO.
BP13-R033	2C-1



NORMAL EARTH FOUNDATION

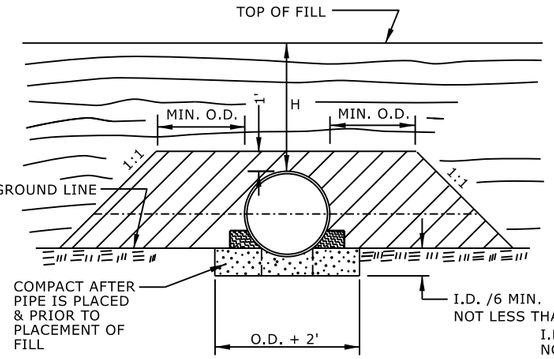


ROCK FOUNDATION

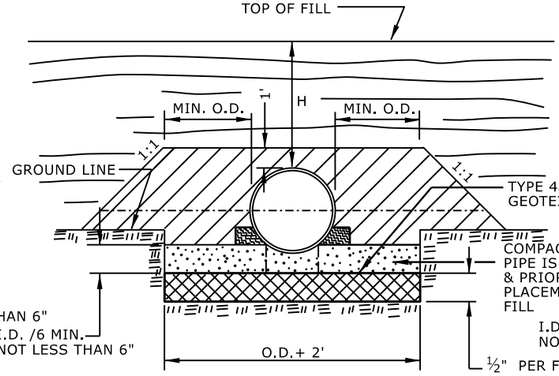


UNSUITABLE MATERIAL FOUNDATION

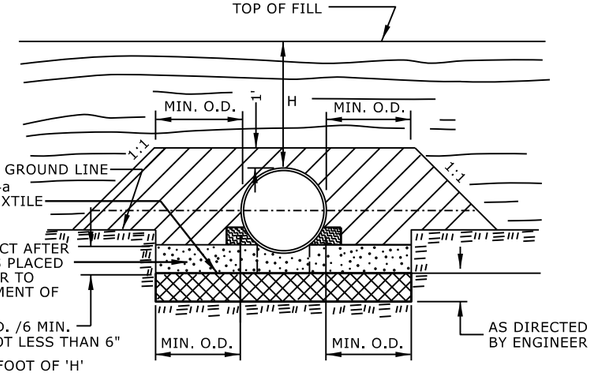
PIPE IN TRENCH



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
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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
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8/14/2025

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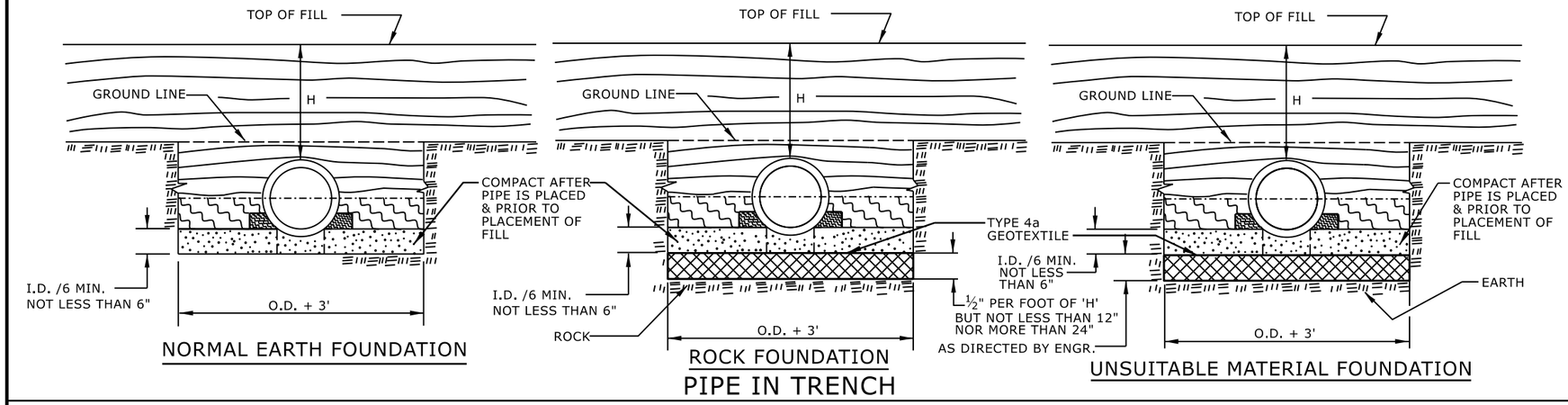
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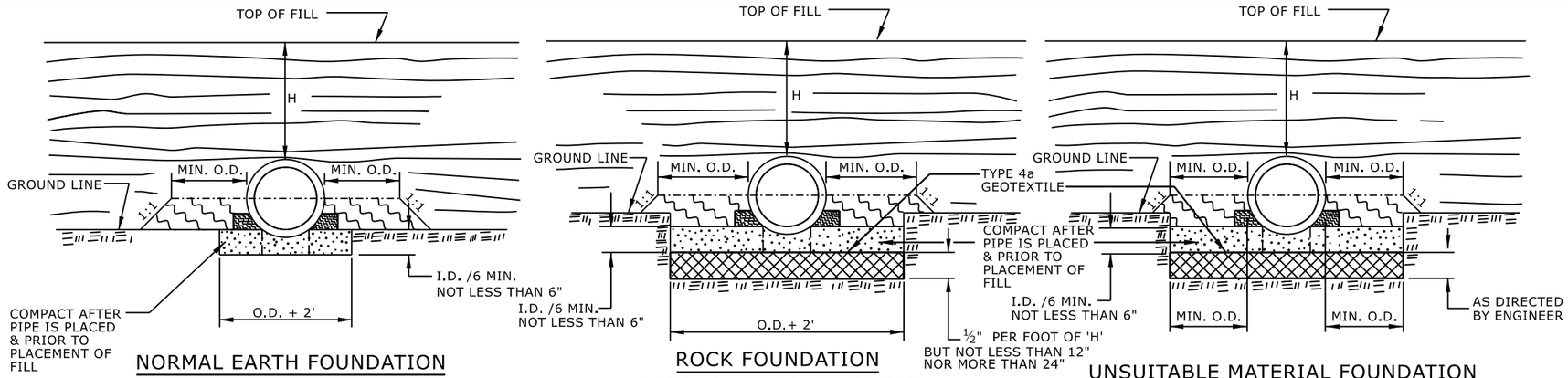
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FILE SPEC.: _____

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PROJECT REFERENCE NO.	SHEET NO.
BP13-R033	2C-2





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
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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
58043233D34164C5...
8/14/2025

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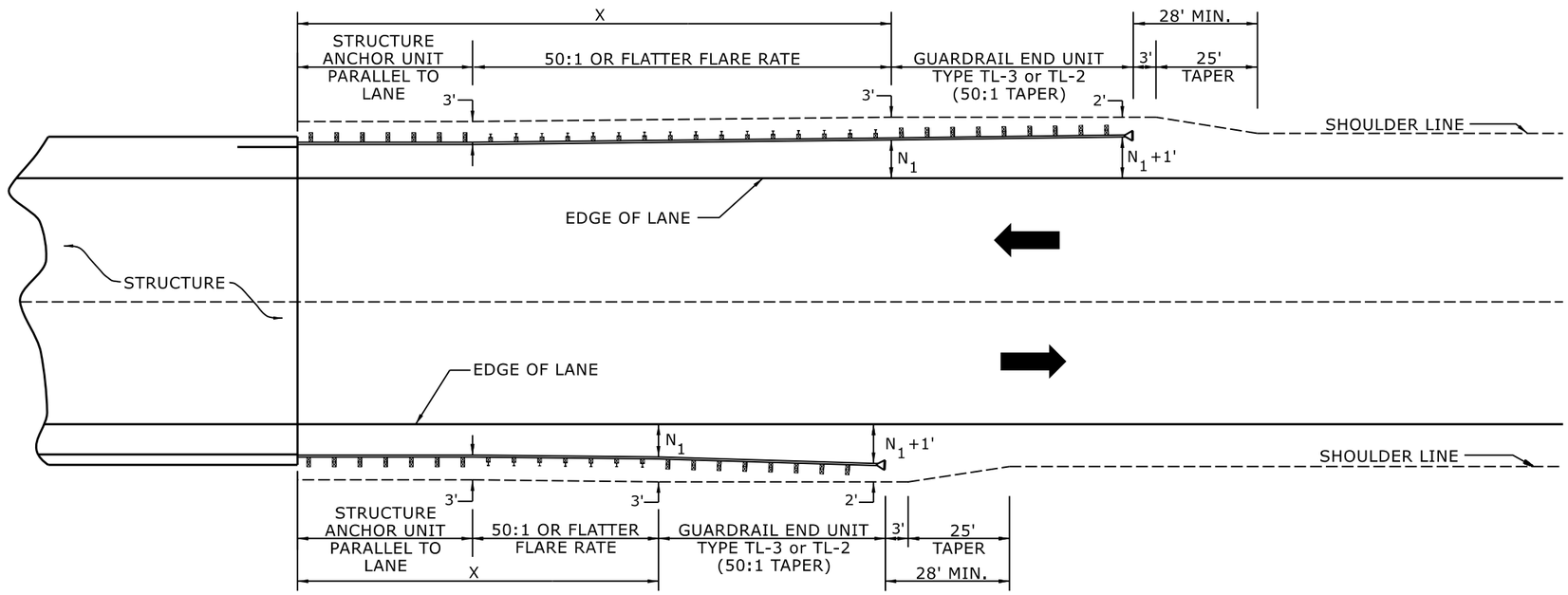
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PROJECT REFERENCE NO.	SHEET NO.
BP13-R033	2C-3



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
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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER

Signed by: Nicole M Hackler
8/14/2025

SHEET 4 OF 15

862D01

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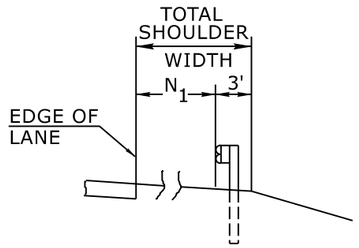
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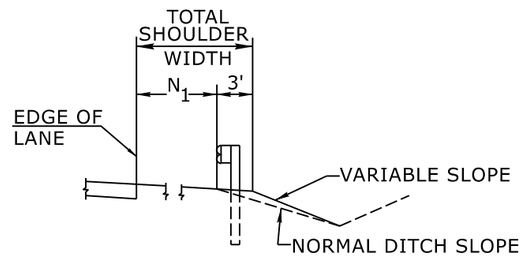
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PROJECT REFERENCE NO.	SHEET NO.
BP13-R033	2C-4

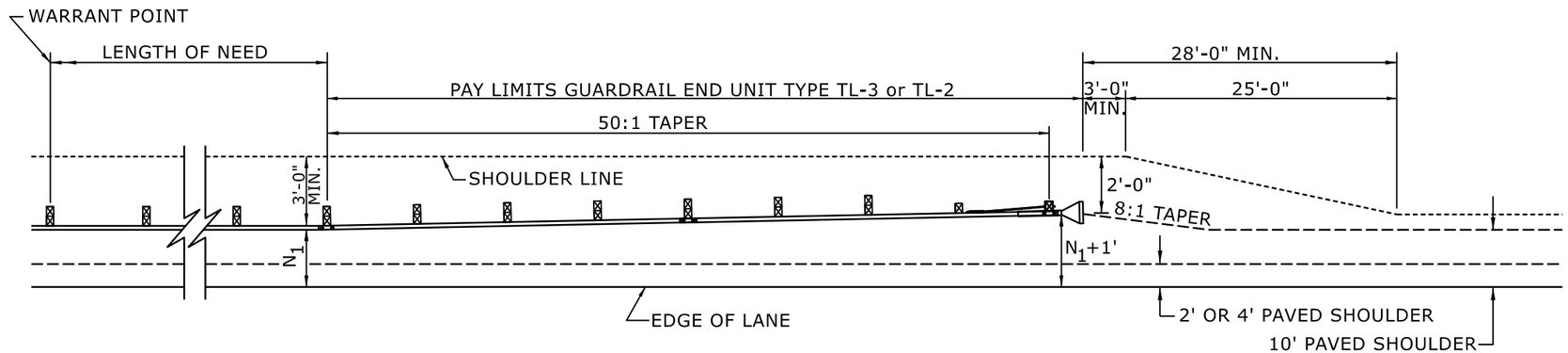


FILL SECTION



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
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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
5B8432D3D3414C5...
8/14/2025

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

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CHECKED BY: DATE:
FILE SPEC.:

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PROJECT REFERENCE NO.	SHEET NO.
BP13-R033	2C-5

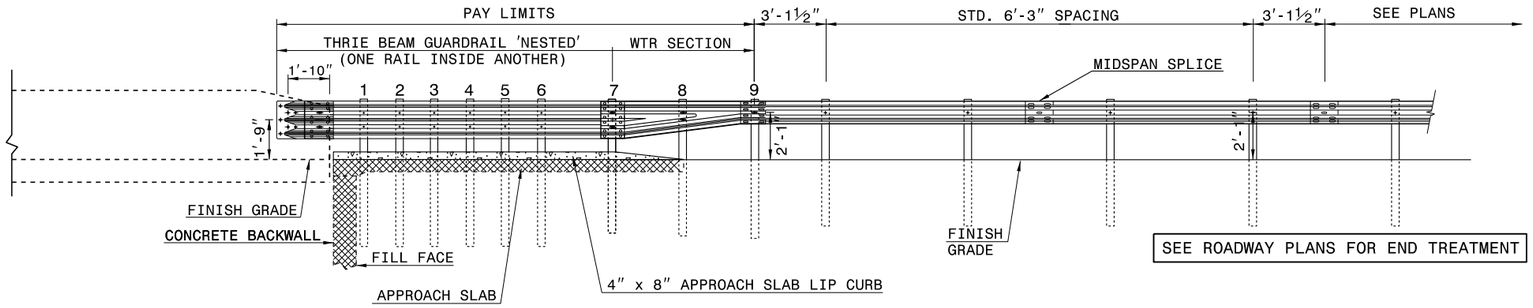
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

TYPE III - SHOP CURVED STRUCTURE ANCHOR UNIT

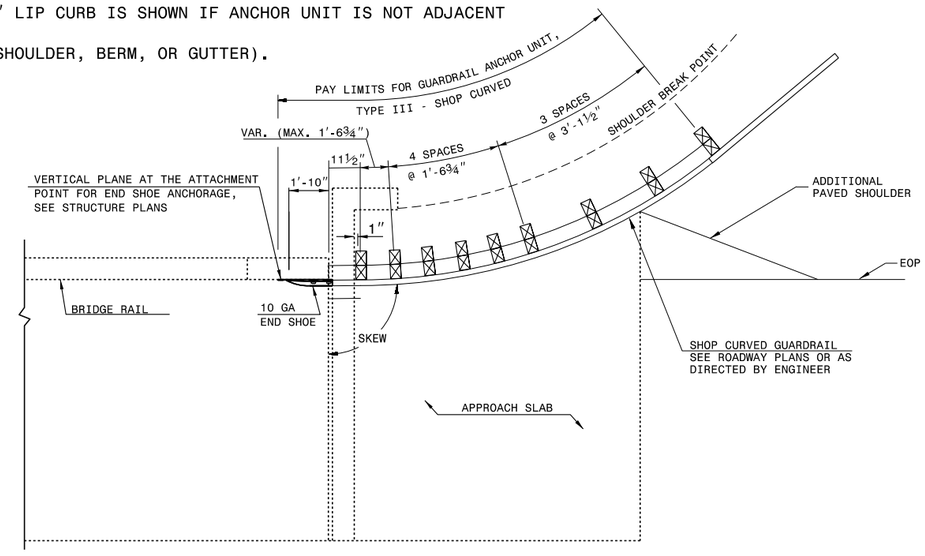
SHEET 1 OF 1

TYPE III SC



ELEVATION

NOTE:
 **POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
  *THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
  -SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
  -MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
  -USE NO STEEL POSTS WITHIN THE GUARDRAIL ANCHOR UNIT LIMITS.
  -LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
  -SEE STANDARD 862.03 SHEET 4 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

GUARDRAIL ANCHOR UNIT, TYPE III - SHOP CURVED FOR ATTACHMENT TO RAIL ON BRIDGE

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

ENGLISH DETAIL DRAWING FOR

TYPE III - SHOP CURVED STRUCTURE ANCHOR UNIT

SHEET 1 OF 1

TYPE III SC

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S:\Contracts\Contracts\Special Details\jhowerton\Guardrail\31 inch Guardrail\type_iii_sc.dgn
jhowerton
AT CSD-292595

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 33144 ENGINEER NICOLE M HACKLER

Signed by: Nicole M Hackler
8/14/2025

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

SEE PLATE FOR TITLE

ORIGINAL BY: E.E.Ward DATE: 4-4-02
MODIFIED BY: T.S.Spell DATE: 2-01-18
CHECKED BY: DATE:
FILE SPEC.: \jhowerton\guardrail\31inguardrail\typeiiisc.dgn

5/26/20

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BP13-R033
38-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BURKE COUNTY



ROADWAY DESIGN UNIT

SUMMARY OF EARTHWORK
VOLUME IN CUBIC YARDS

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
-L- 11+20.00	-L- 15+13.70	274	511	237	
	(BEGIN BRIDGE)				
SUBTOTAL:		274	511	237	
-L- 15+86.30	-L- 19+90.00	592	129		463
(END BRIDGE)					
-DR- 10+10.00	-DR- 10+80.00	30	35	5	
SUBTOTAL:		622	164	5	463
TOTAL:		896	675	242	463
LOSS DUE TO CLEARING AND GRUBBING		-70			-70
WASTE IN LIEU OF BORROW				-242	-242
PROJECT TOTAL:		826	675		151
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT					
GRAND TOTAL:		826	675		151
SAY:		900			

EST. DDE = 100 CY
EST. GEOTEXTILE FOR DRAINAGE = 350 SY
EST. UNDERCUT = 250 CY
EST. SELECT GRANULAR MATERIAL = 200 CY
EST. GEOTEXTILE FOR SOIL STABILIZATION = 200 SY

Earthwork quantities are calculated by ms consultants. 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, and removal of existing pavement will be paid for at the lump sum price for "Grading".

SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
-L-	12+42	15+17	CL /LT	587
-L-	15+46	19+90	LT /CL	959
		TOTAL:		1,546
		SAY:		1,550

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L- LT	14+89	14+97	8
-L- RT	14+93	15+11	18
-L- LT	15+89	15+97	8
-L- RT	16+04	16+12	8
		TOTAL:	42
		SAY:	45

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			REMOVE EXISTING GUARDRAIL	REMOVE AND RESET EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL-2	TYPE III	AT-1	TYPE III SHOP CURVED					EA	G	NG			
-L-	14+52	15+08	LT	56.25				15+08	4	7		25		0.5	1	1												
-L-	14+65	15+22	RT	56.25			15+22		4	7	25		0.5		1	1												
-L-	15+78	16+08	LT		62.50		15+78		4	7							1	1										
-L-	15+92	16+48	RT	56.25				15+92	4	7		25		0.5	1	1												
		SUBTOTAL		168.75	62.50																							
		ANCHOR DEDUCTIONS																										
		GREU TL-2	3 @ 25	-75.00																								
		TYPE III	3 @ 18.75	-56.25																								
		AT-1	1 @ 6.25		-6.25																							
		TYPE III SHOP CURVED	1 @ 18.75		-18.75																							
		PROJECT TOTAL		37.50	37.50										3	3	1	1										
		SAY		50.00	50.00																							
				EXTRA GUARDRAIL POSTS = 5 EA																									

PREPARED BY



REVISIONS

PROJECT NO.	SHEET NO.
BP13-R033	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 FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | THICKNESS OR GAUGE: DO NOT USE RCP | DO NOT USE CSP | DO NOT USE HDPE | DO NOT USE PPP | DO NOT USE PVC | R. C. PIPE CLASS IV 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 15" SIDE DRAIN PIPE | 18" SIDE DRAIN PIPE | 24" SIDE DRAIN PIPE | QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) A: 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. 852.06 | 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 | 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 | ## C.S. ELBOW | 15" DRAINAGE PIPE ELBOW | ## SIDE DRAIN PIPE ELBOW | ## SIDE DRAIN PIPE ELBOW | ## R.C. ELBOW | SPRING BOX STD. 840.41 | BERM DITCH OUTLET STD. 850.10 (PER EACH) | BERM DITCH OUTLET STD. 850.11 (PER EACH) | MODIFIED CONC. FLUME | PREFORMED SCOUR HOLE (PER EACH) | ENERGY DISSIPATION BASIN | FLOWABLE FILL CY | CONCRETE COLLARS CL. "B" STD. 840.72 CY | CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY | PIPE REMOVAL LIN.FT. | REMARKS |
|---|---|---

COMPUTED BY: CLAYTON ELLIOTT, PG DATE: 08/04/2025
CHECKED BY: SHANE C. CLARK, PE DATE: 08/04/25

(9-17-24)

PROJECT NO.	SHEET NO.
BP13-R033	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	100
				TOTAL LF:	100

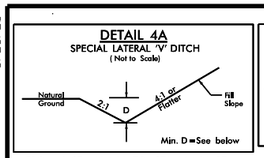
*UD = Underdrain

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

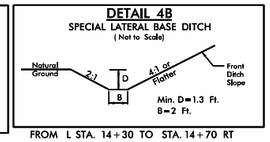
LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Subgrade Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU 1		50	100	150		
			TOTAL CY/TONS/SY:		50	100**	150**	0	0

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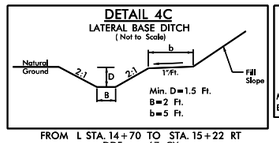
5/26/20



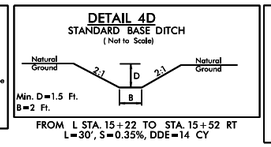
FROM L STA. 12+50 TO STA. 14+30 RT, Min d=1.4 Ft.
FROM DR STA. 10+48 TO STA. 10+75 RT, Min d=0.5 Ft.



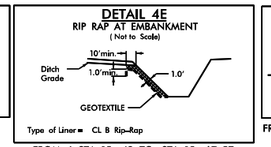
FROM L STA. 14+30 TO STA. 14+70 RT



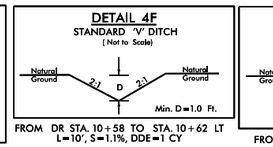
FROM L STA. 14+70 TO STA. 15+22 RT
DDE = 67 CY



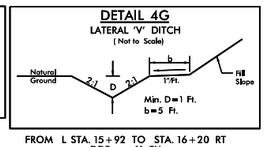
FROM L STA. 15+22 TO STA. 15+52 RT
L=30', S=0.35%, DDE=14 CY



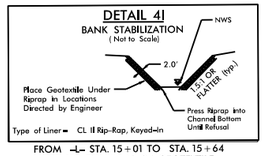
FROM L STA. 15+42 TO STA. 15+67 RT
11 TONS, CL Geotextile=29sy
FROM L STA. 15+74 TO STA. 16+02 RT
13 TONS, CL Geotextile=33sy



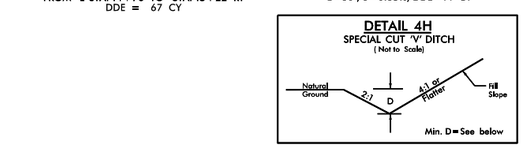
FROM DR STA. 10+58 TO STA. 10+62 LT
L=10', S=1.1%, DDE=1 CY



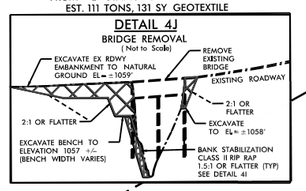
FROM L STA. 15+92 TO STA. 16+20 RT
DDE = 11 CY



FROM –L– STA. 15+01 TO STA. 15+64
EST. 118 TONS, 146 SY GEOTEXTILE
FROM –L– STA. 15+34 TO STA. 15+85
EST. 111 TONS, 131 SY GEOTEXTILE



FROM L STA. 17+00 TO STA. 19+90 LT, Min. D=0.7 Ft.
FROM L STA. 16+20 TO STA. 16+50 RT, Min. D=0.5 Ft.
FROM DR STA. 10+30 TO STA. 10+48 RT, Min. D=0.5 Ft.



CUR DATA -L-
PIc 13+70.33
Δc = 14°38'07.7" (RT)
D = 05°24'18.9"
Lc = 270.76
Tc = 136.12
R = 1,060
SE = 06
RO = SEE PLANS
DS = 55 MPH

CUR DATA -L-
PIc 16+80.52
Δc = 40°37'36.9" (RT)
D = 24°48'12.1"
Lc = 163.80
Tc = 85.51
R = 231
SE = 06
RO = 120
DS = 30 MPH*

CUR DATA -L-
PIc 20+42.84
Δc = 08°32'50.7" (RT)
D = 04°00'24.1"
Lc = 213.33
Tc = 106.86
R = 1,430

* DESIGN EXCEPTION REQUIRED

CUR DATA -DR-
PIc 10+48.71
Δc = 18°10'09.1" (RT)
D = 33°06'53.5"
Lc = 54.87
Tc = 27.67
R = 173.02

CUR DATA -DR-
PIc 11+11.12
Δc = 22°28'16.9" (LT)
D = 32°19'34.0"
Lc = 69.51
Tc = 35.21
R = 177.24

NAD 83
NA 2011

BEGIN PROJECT BP13.R033
–L– STA. 11+20.00

-L- POT 10+00.00

-L- PC 12+34.21

-L- PT 15+04.98
BRG AHD=
N88°12'11.2"E

-L- PC 15+95.01

-DR- POE 11+45.42
END CONST.
–DR– 10+80.00
-DR- PRC 10+75.91

-DR- PC10+21.04
N03°09'53.9"E

-DR- POT 10+00.00 =
-L- POC 16+15.01

-L- PT 17+58.80

-L- PC 19+35.98

S51°10'11.9"E

END PROJECT BP13.R033
–L– STA. 19+90.00

-L- PT 21+49.30

N73°34'03.5"E

REX CHAPMAN
DB 1889 PG 125

BERKLEY H. ASBURY
SHEILA Y. ASBURY
DB 1748 PG 818

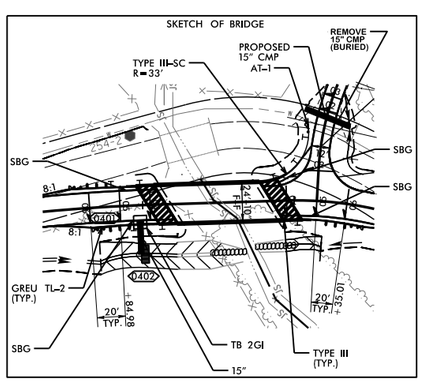
STONE

NOTE TO CONTRACTOR:
–L– STA. 17+00 TO END.
GROUND COVER OVER EXISTING WATER LINE WILL BE REDUCED TO LESS THAN 3' – EXERCISE CAUTION DURING EXCAVATION

SHOULDER BERM GUTTER:
–L– STA. 14+89 TO –L– STA. 14+97 LT
–L– STA. 14+93 TO –L– STA. 15+11 RT
–L– STA. 15+89 TO –L– STA. 15+97 LT
–L– STA. 16+04 TO –L– STA. 16+12 RT

NO DECK DRAINS REQUIRED

BRIDGE AND APPROACH SLAB:
–L– STA. 15+03.00 BEGIN APPROACH SLAB
–L– STA. 15+13.70 BEGIN BRIDGE
–L– STA. 15+86.30 END BRIDGE
–L– STA. 15+97.00 END APPROACH SLAB



SEE SHEET 5 FOR PROFILES

BP13-R033
004

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BURKE COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 041453 ENGINEER TRAVIS POTTS
DocuSigned by: M. Travis Potts 3/2025
4CB1B21EEB284DF...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 021162 ENGINEER W. HERBERT TURNER JR.
DocuSigned by: Herb Turner 8/18/2025
C0E6A8B89BC0247...

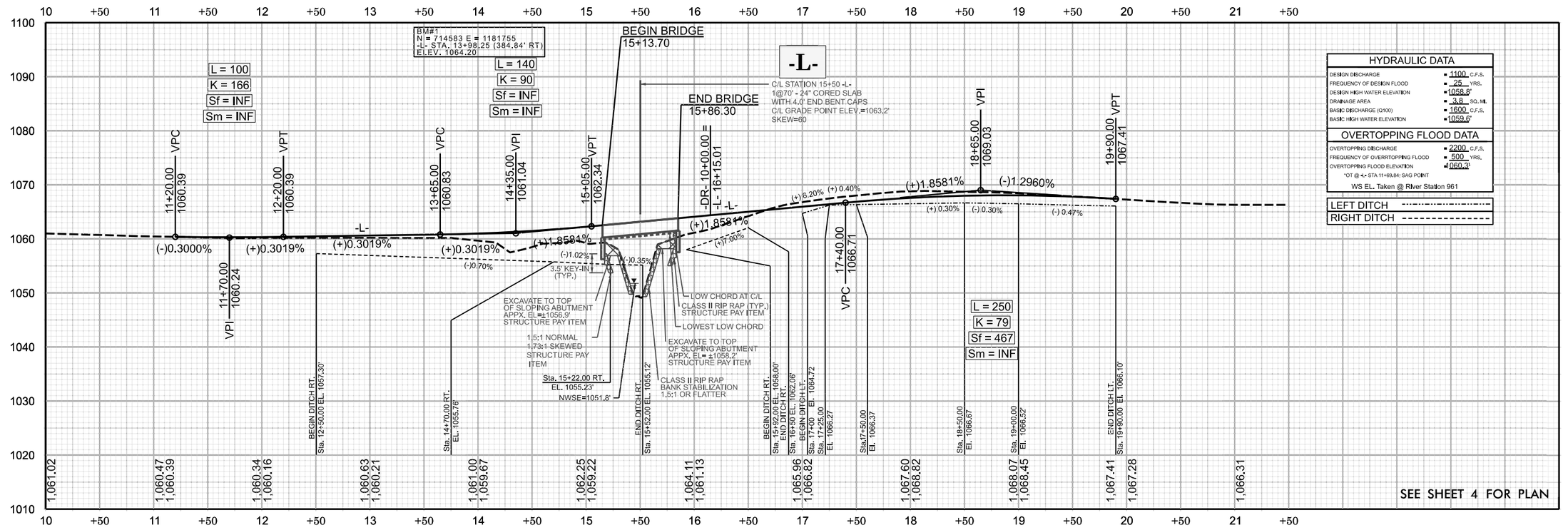
PREPARED BY
rks consultants, inc.
5444 Wade Park Blvd
Suite 160
Raleigh, NC 27607
NC License Number: C-3296

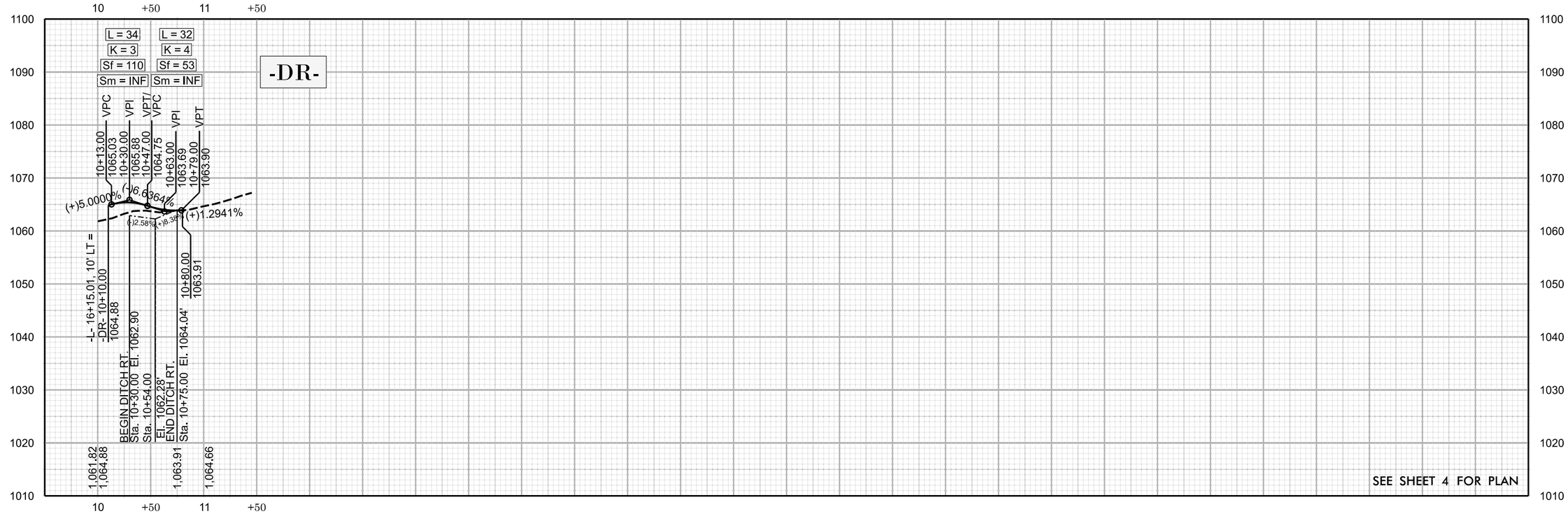
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

Docusign Envelope ID: 82CAF8D7-CE96-4FCA-B06C-53F6155191D2

5/26/20





BP13-R033
005

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BURKE COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 041453 ENGINEER TRAVIS POTTS
DocuSigned by: M. Travis Potts 8/18/2025
4CB1521EEB284DF...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 021162 ENGINEER W. HERBERT TURNER, III
DocuSigned by: Herb Turner 8/18/2025
C0E6A8B89CC247D...

PREPARED BY
rks consultants, inc.
5444 Wade Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number: C-3296

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

09/08/99

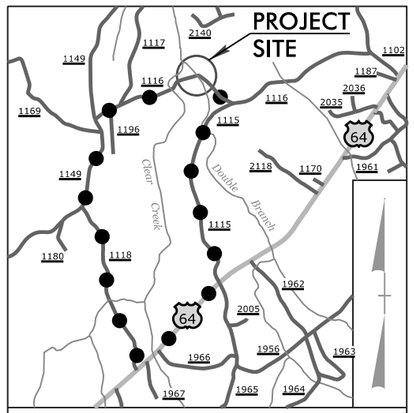
TIP PROJECT: BP13-R033

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13–R033	RW01	5

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

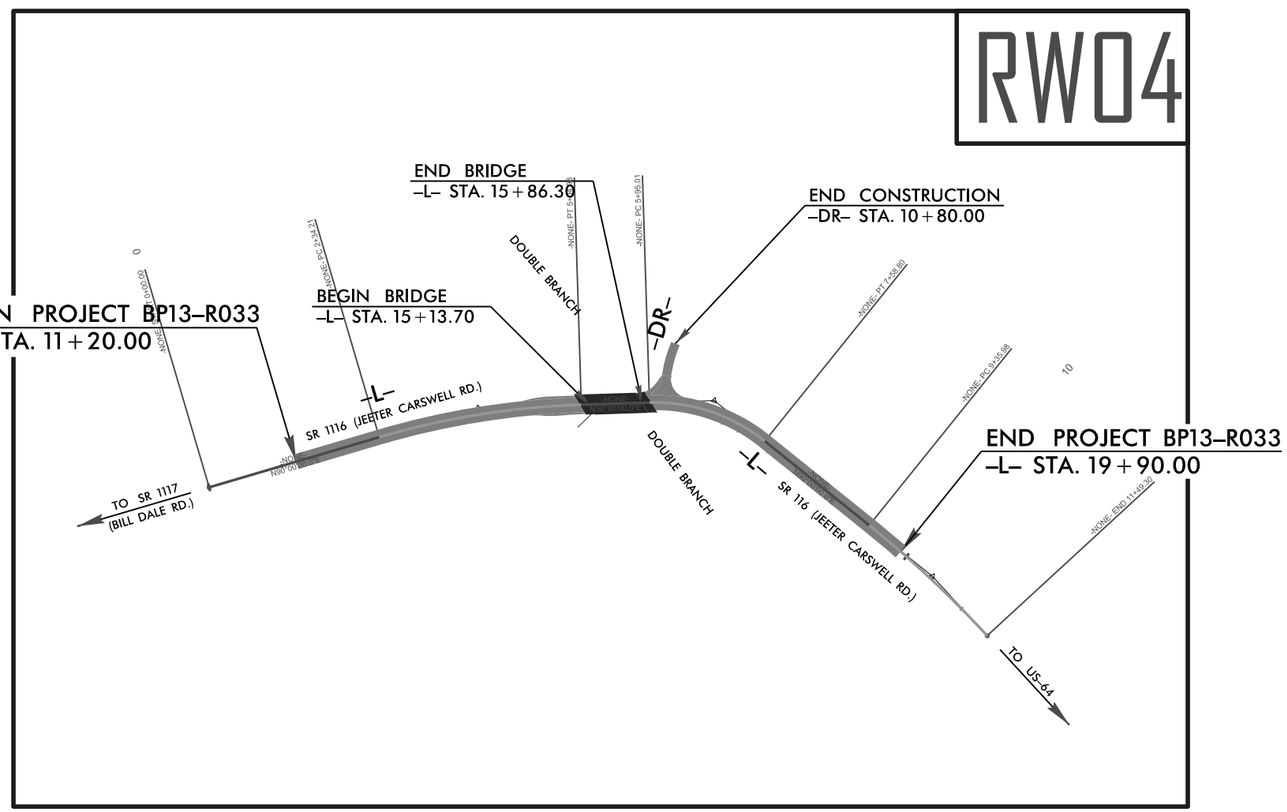
BURKE COUNTY



VICINITY MAP (NTS)

OFFSITE DETOUR ROUTE

RW04



NAD 83/ NA 2011

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

100' 50' 0' 100' 200'

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "254-2"
WITH NAD83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 715,019.257' EASTING: 1,181,797.833'
ELEVATION: 1059.47'
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99985502
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:

TGS ENGINEERS
201 WEST MARION STREET
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: 8/30/2024

LETTING DATE: 11/19/2025

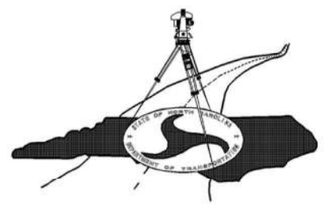
PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4775 LAND SURVEYOR MATTHEW T. CORNWELL

Signed by: Matthew Cornwell EBD36F1147 3E475...

9/3/2025

SIGNATURE: *DATE:*



DocuSign Envelope ID: 83143F00-4B11-435B-B846-1B0A83C048ED

10/2022

REVISIONS

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
110254	RW02C-1

Location and Surveys

TGS ENGINEERS
201 WEST MARION STREET
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT SURVEYOR

DocuSigned by: Matthew Cornwell EB03BF11473E475...

10/21/2022

NORTH CAROLINA PROFESSIONAL SEAL L-4775 LAND SURVEYOR MATTHEW T. CORNWELL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

N
NC GRID
NAD 83 NA 2011

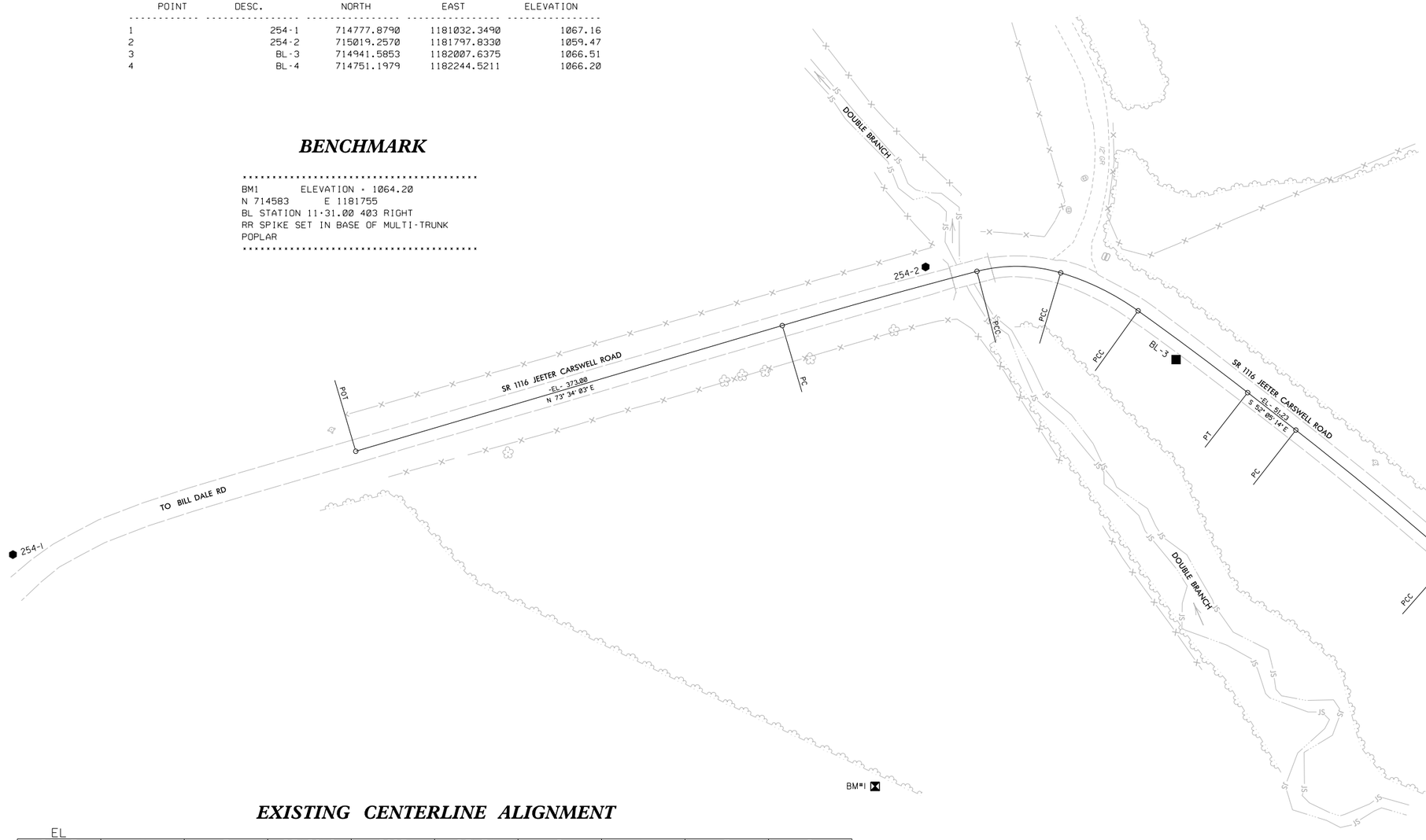
BASELINE

BL

POINT	DESC.	NORTH	EAST	ELEVATION
1	254-1	714777.8790	1181032.3490	1067.16
2	254-2	715019.2570	1181797.8330	1059.47
3	BL-3	714941.5853	1182007.6375	1066.51
4	BL-4	714751.1979	1182244.5211	1066.20

BENCHMARK

BM1 ELEVATION - 1064.20
N 714583 E 1181755
BL STATION 11+31.00 403 RIGHT
RR SPIKE SET IN BASE OF MULTI-TRUNK
POPLAR



EXISTING CENTERLINE ALIGNMENT

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R	EL
POT	714864.565	1181319.883								
LINE			N 73°34'03.5" E	373.00						
PC	714970.081	1181677.649								
CURVE			N 74°26'32.6" E	169.46	01°44'58.3"(RT)	01°01'56.5"	169.47	84.74	5550.00	
PCC	715015.532	1181840.902								
CURVE			S 88°59'31.6" E	70.32	31°22'53.3"(RT)	44°04'25.2"	71.20	36.52	130.00	
PCC	715014.295	1181911.207								
CURVE			S 63°50'49.7" E	72.27	18°54'30.6"(RT)	26°02'36.7"	72.60	36.63	220.00	
PCC	714982.438	1181976.082								
CURVE			S 53°14'24.3" E	114.68	02°18'20.1"(RT)	02°00'37.4"	114.68	57.35	2850.00	
PT	714913.809	1182067.954								
LINE			S 52°05'14.3" E	51.23						
PC	714882.330	1182108.373								
CURVE			S 50°23'13.4" E	169.12	03°24'01.7"(RT)	02°00'37.4"	169.15	84.60	2850.00	
PCC	714774.499	1182238.659								
CURVE			S 45°39'16.9" E	151.28	06°03'51.4"(RT)	04°00'24.1"	151.35	75.75	1430.00	
PT	714668.755	1182346.847								

I, Matthew T. Cornwell, PLS, certify that the Project Control was performed under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: ***AA***
Type of GPS field procedure: RTN
Dates of survey: September 2022
Datum/Epoch: NAD83/2011
Published/Fixed-control use: N/A
Localized around: 254-2
Northing: 715019.257
Easting: 1181797.833
Combined grid factor: 0.99985502
Geoid model: GEOID18
Units: US Survey Feet

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed September 19, 2022, and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 10/21/2022

DocuSigned by: Matthew Cornwell EB03BF11473E475...

Professional Land Surveyor L-4775

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

21-OCT-2022 13:42
S:\Surveys\Projects\LIB_2022\110254\MTC\CONTROL SHEET\110254_ls_rw02c-1.dgn
mcornwell AT MCORNWELLLAPTOP

Docusign Envelope ID: 1154AD16-AD91-4C92-B235-498C75BAA8C7

5/26/20

PROPOSED ALIGNMENT CONTROL SHEET

PROPOSED ALIGNMENT: L												
POINT	STATION	NORTHING	EASTING	BEARING	DIST	DELTA	D	L	T	R	LT	ST
START	10+00.00	714864.5648	1181319.8831	N73°34'03.5"E	234.2118							
PC	12+34.21	714930.8194	1181544.5283	N80°53'07.3"E	270.0278	14°38'07.7"	05°24'18.9"	270.7633	136.1226	1060.0000		
PT	15+04.98	714973.5945	1181811.1466	N88°12'11.2"E	90.0301							
PC	15+95.01	714976.4176	1181901.1324	S71°29'00.4"E	160.3861	40°37'36.9"	24°48'12.1"	163.7960	85.5112	231.0000		
PT	17+58.80	714925.4824	1182053.2156	S51°10'11.9"E	177.1749							
PC	19+35.98	714814.3916	1182191.2365	S46°53'46.6"E	213.1305	08°32'50.7"	04°00'24.1"	213.3283	106.8624	1430.0000		
END	21+49.30	714668.7549	1182346.8469									

PROPOSED ALIGNMENT: DR												
POINT	STATION	NORTHING	EASTING	BEARING	DIST	DELTA	D	L	T	R	LT	ST
START	10+00.00	714976.1788	1181921.1296	N03°09'53.9"E	21.0419							
PC	10+21.04	714997.1887	1181922.2913	N12°14'58.5"E	54.6376	18°10'09.1"	33°06'53.5"	54.8672	27.6658	173.0213		
PRC	10+75.91	715050.5823	1181933.8838	N10°05'54.6"E	69.0699	22°28'16.9"	32°19'34.0"	69.5146	35.2098	177.2431		
END	11+45.42	715118.5821	1181945.9946									

I, MATTHEW T. CORNWELL, PLS, CERTIFY THAT THE DATA COMPILED CAME FROM AVAILABLE SURVEYS/MAPPING PERFORMED BY OTHERS AND PROVIDED TO ME BY NCDOT AND DO NOT CERTIFY TO THE ACCURACY OR QUALITY OF THE INDIVIDUAL DATA SOURCES.

THIS 11/4/2024

DocuSigned by:
Matthew Cornwell
E8D36F11473E475...

PROFESSIONAL LAND SURVEYOR L-4775

NOTES:

1. THE PROPOSED ALIGNMENT CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

BP13-R033

R/W | D2D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4775 LAND SURVEYOR MATTHEW T. CORNWELL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

2024 STANDARD SPECIFICATIONS

TIP PROJECT: BP13-R033

County: Burke

PREPARED FOR

LOCATION AND SURVEYS UNIT

PREPARED BY

TGS ENGINEERS
201 WEST MARION ST.
SUITE 200
SHELBY, NC 28150
704-476-0003

Docusign Envelope ID: 0DA5C6BB-BC16-4E26-9154-B4A3AAE939B9

5/26/20

RIGHT OF WAY CONTROL SHEET

PERMANENT ROW MARKER IRON PIN AND CAP: L			
STATION	OFFSET	NORTH	EAST
11+20,00	25,0000	714874,5319	1181442,0537
11+20,00	35,0000	714864,9404	1181444,8825
11+20,00	-25,0000	714922,4896	1181427,9095
12+34,21	35,0000	714897,2490	1181554,4292
12+34,21	-25,0000	714954,7982	1181537,4562
13+50,00	40,0000	714918,0781	1181664,2189
13+69,07	-33,8407	714994,0594	1181670,5767
15+04,98	40,0000	714933,6142	1181812,4008
15+04,98	-59,4616	715033,0268	1181809,2820
15+30,46	-65,3537	715039,7151	1181834,5654
15+63,00	-69,2441	715044,6240	1181866,9717
15+95,01	40,0000	714936,4373	1181902,3867
15+95,01	-66,3297	715042,7147	1181899,0525
16+45,00	+49,7162	715021,4539	1181960,0308
16+73,75	-39,0663	715002,7641	1181990,6375
17+58,80	-24,7912	714944,7950	1182068,7600
17+58,80	40,0000	714894,3220	1182028,1351
17+77,20	-25,1447	714933,5330	1182083,3159
18+10,00	35,0000	714866,1147	1182071,1545
18+28,43	-25,9649	714902,0536	1182123,7344
19+35,98	35,0000	714787,1262	1182169,2911
19+35,98	-25,6750	714834,3927	1182207,3351
19+90,00	-25,0111	714798,6088	1182249,0789
19+90,00	35,0000	714753,3141	1182209,7123
19+90,00	24,9891	714760,8700	1182216,2794

I , MATTHEW T. CORNWELL, PLS, CERTIFY THAT THE RIGHT OF WAY AND PERMANENT EASEMENT MONUMENTATION FOR THIS PROJECT SHOWN HEREIN WAS COMPLETED UNDER MY DIRECT AND RESPONSIBLE CHARGE FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; THAT ALL HORIZONTAL CLOSURES HAD A MINIMUM RATIO OF PRECISION OF 1:10,000 (CLASS A). FIELD WORK WAS PERFORMED FROM 10/28/2024 TO 10/29/2024, AND ALL COORDINATES ARE BASED ON NAD83/NA 2011; THAT THIS SURVEY WAS PERFORMED TO MEET THE REQUIREMENTS OF 21NCAC 56.1600 AS APPLICABLE.

THIS 11/4/2024

DocuSigned by:
Matthew Cornwell
E8D36F11473E475...

PROFESSIONAL LAND SURVEYOR L-4775

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

BP13–R033

R/W | 03E-I

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4775 LAND SURVEYOR MATTHEW T. CORNWELL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

2024 STANDARD SPECIFICATIONS

TIP PROJECT: BP13-R033

County: Burke

PREPARED FOR

LOCATION AND SURVEYS UNIT

PREPARED BY

TGS ENGINEERS
201 WEST MARION ST.
SUITE 200
SHELBY, NC 28150
704-476-0003

Docusign Envelope ID: 232BCF51-FA08-4CAF-9345-52F0422B2025

5/26/20

RIGHT OF WAY CONTROL SHEET

CUR DATA -L-
PIc 13+70.33
Δc = 14°38'07.7" (RT)
D = 05°24'18.9"
Lc = 270.76
Tc = 136.12
R = 1,060

CUR DATA -L-
PIc 16+80.52
Δc = 40°37'36.9" (RT)
D = 24°48'12.1"
Lc = 163.80
Tc = 85.51
R = 231

CUR DATA -L-
PIc 20+42.84
Δc = 08°32'50.7" (RT)
D = 04°00'24.1"
Lc = 213.33
Tc = 106.86
R = 1,430

NC GRID
NAD 83 NA 2011

CUR DATA -DR-
PIc 10+48.71
Δc = 18°10'09.1" (RT)
D = 33°06'53.5"
Lc = 54.87
Tc = 27.67
R = 173.02

CUR DATA -DR-
PIc 11+11.12
Δc = 22°28'16.9" (LT)
D = 32°19'34.0"
Lc = 69.51
Tc = 35.21
R = 177.24

I, MATTHEW T. CORNWELL, PLS, CERTIFY THAT THE RIGHT OF WAY AND PERMANENT EASEMENT MONUMENTATION FOR THIS PROJECT SHOWN HEREIN WAS COMPLETED UNDER MY DIRECT AND RESPONSIBLE CHARGE FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; THAT ALL HORIZONTAL CLOSURES HAD A MINIMUM RATIO OF PRECISION OF 1:10,000 (CLASS A). FIELD WORK WAS PERFORMED FROM 10/28/2024 TO 10/29/2024, AND ALL COORDINATES ARE BASED ON NAD83/NA 2011; THAT THIS SURVEY WAS PERFORMED TO MEET THE REQUIREMENTS OF 21NCAC 56.1600 AS APPLICABLE.

THIS 11/5/2024

DocuSigned by: Matthew Cornwell ESC30F114736475...

PROFESSIONAL LAND SURVEYOR L-4775

-L- PC 15+95.01
-L- PT 15+04.98
BRG AHD= N88°12'11.2"E
-DR- POE 11+45.42
-DR- PRC 10+75.91
-DR- PC10+21.04
N03°09'53.9"E
-DR- POT 10+00.00 =
-L- POC 16+15.01
-L- PT 17+58.80
-L- PC 12+34.21
-L- POT 10+00.00
N73°34'03.5"E
S51°10'11.9"E
-L- PC 19+35.98
-L- PT 21+49.30
S 25°37'52" E 59.40'
S 48°29'29" E 30.64'
① S 31°14'57" E, 16.10'
② S 52°19'24" E, 19.71'
REX CHAPMAN DB 1889 PG 125
BERKLEY H. ASBURY SHEILA Y. ASBURY DB 1748 PG 818
PASTURE
WOODS
GRASS
SOIL
STONE
DOUBLE BRANCH
EXISTING R/W
SR 1154 MITO SR 1157 BULL DALE RD
SR 1155 JEETER CARSWELL RD
SR 1155 JEETER CARSWELL RD EXT
SR 1154 MITO SR 1157 BULL DALE RD

50' 25' 0' 50' 100'

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

BP13–R033
R/W 04

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL LAND SURVEYOR
NORTH CAROLINA PROFESSIONAL SEAL L-4775 LAND SURVEYOR MATTHEW T. CORNWELL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES ARE COMPLETED

2024 STANDARD SPECIFICATIONS

TIP PROJECT: BP13-R033
County: Burke

PREPARED FOR

LOCATION AND SURVEYS UNIT

PREPARED BY

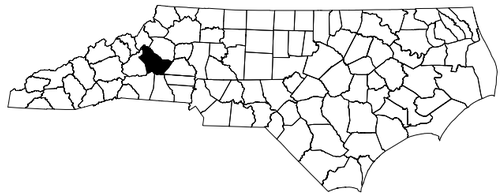
TGS ENGINEERS
201 WEST MARION ST.
SUITE 200
SHELBY, NC 28150
704-476-0003

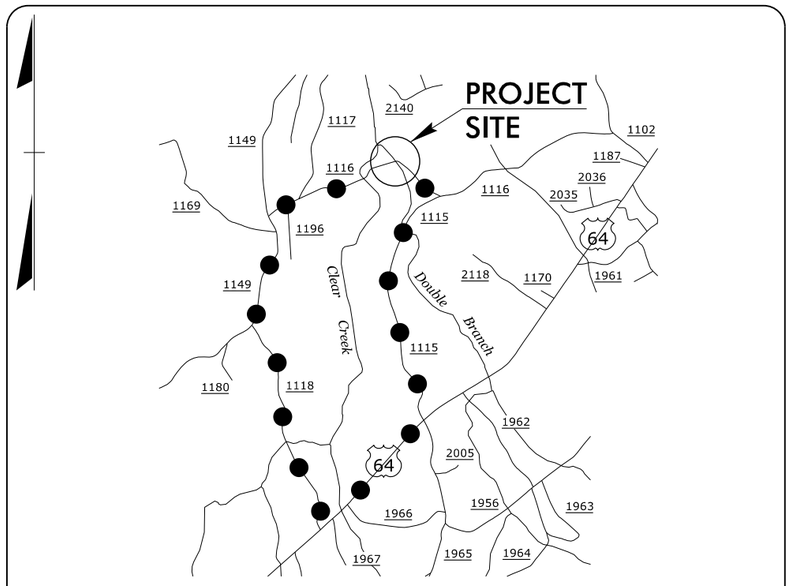
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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

BURKE COUNTY





VICINITY MAP

DETOUR ROUTE

NOT TO SCALE

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, GENERAL NOTES, PHASING, AND LEGEND
TMP-2	DETOUR ROUTE AND SIGNING
TMP-3	WORK ZONE SIGN DESIGN

SHEET NO.
TMP-1

BP13.R033

TIP PROJECT:



WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

PLANS PREPARED BY:

TYSON A. GRAVES, PE

PAYTON L. NELSON

NCDOT CONTACTS:

Sheena N. Green
PROJECT ENGINEER

Tadeus M. Kelly, EIT

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

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ms consultants, inc.
5444 Wake Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number : C-3239

APPROVED: DocuSigned by: Tyson Graves 94C02A344C034F6...

DATE: 8-07-2025

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 021080 ENGINEER TYSON A. GRAVES

8/7/2025
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User:tgraves

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PROJ. REFERENCE NO.	SHEET NO.
BP13.R033	TMP-1A

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE WARNING SIGNS
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN STANDARDS
1110.01	STATIONARY WORK ZONE SIGNS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

TRAFFIC PATTERN ALTERATIONS

A) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

B) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 10 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

C) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.

PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.

D) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.

COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.

E) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

TRAFFIC CONTROL DEVICES

F) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

LEGEND

GENERAL

WORK AREA

REMOVAL

TRAFFIC CONTROL DEVICES

BARRICADE (TYPE III)

CONE

DRUM SKINNY DRUM TUBULAR MARKER

TEMPORARY SIGNING

PORTABLE SIGN

STATIONARY SIGN

STATIONARY OR PORTABLE SIGN

PHASING

STEP 1 - INSTALL ADVANCE WARNING SIGNS ACCORDING TO ROADWAY STANDARD DRAWING 1101.01 (SHEET 3 OF 3).

STEP 2 - INSTALL DETOUR SIGNS AS SHOWN ON TMP-2, AND COVER.

STEP 3 - USING ROADWAY STANDARD DRAWING 1101.03 (SHEET 1 OF 9) , INSTALL TYPE III BARRICADES AS SHOWN ON TMP-2, UNCOVER DETOUR SIGNS, AND CLOSE ROAD.

STEP 4 - CONSTRUCT BRIDGE AND APPROACHES.

STEP 5 - INSTALL PERMANENT PAVEMENT MARKINGS AND MARKERS.

STEP 6 - OPEN ROAD TO TRAFFIC.

ms consultants, inc.
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Raleigh, NC 27607
NC License Number : C-3239

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DATE: 8-07-2025

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 021080 ENGINEER TYSON A. GRAVES

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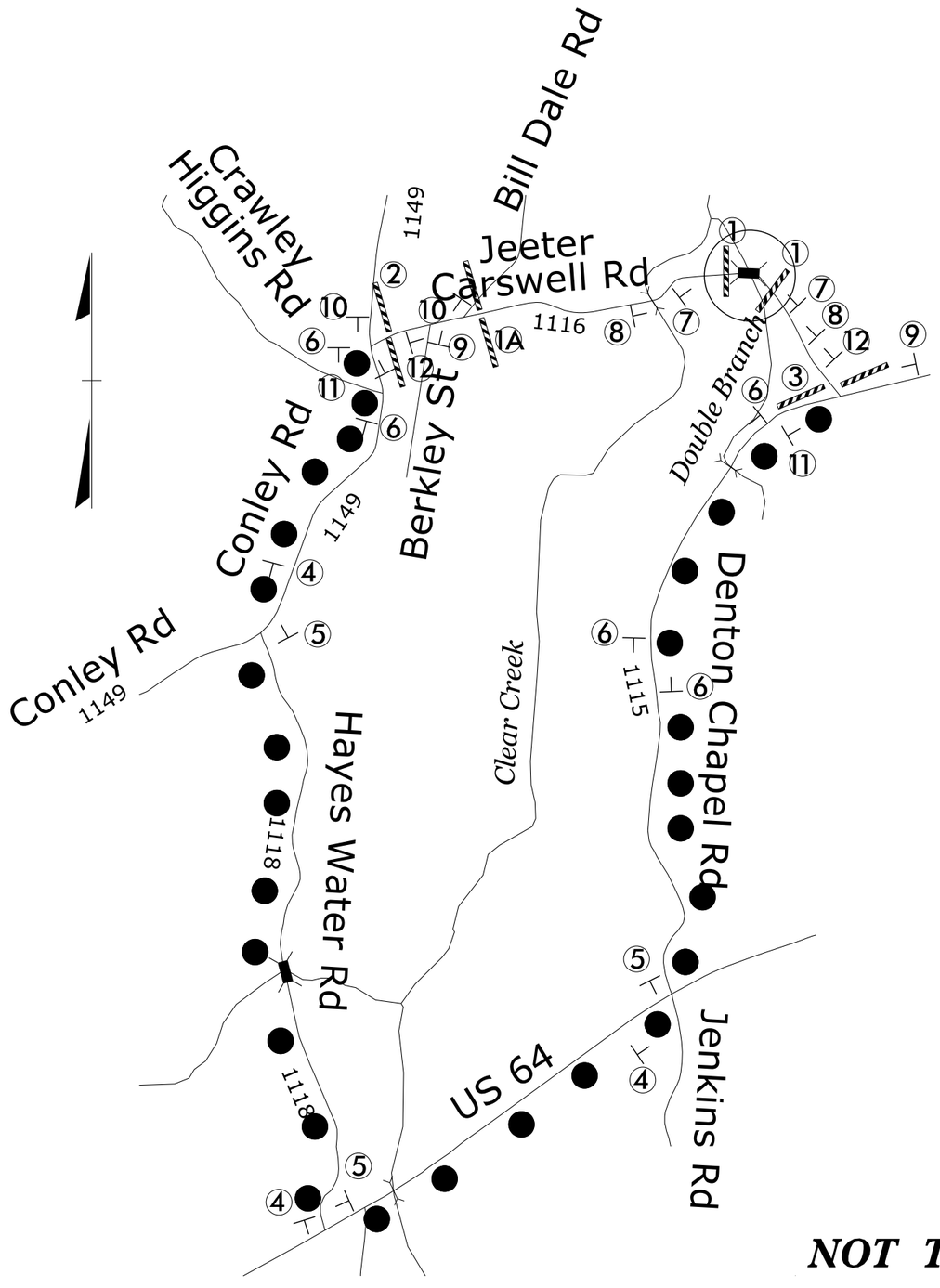
DIVISION OF HIGHWAYS • STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION • WORK ZONE TRAFFIC CONTROL

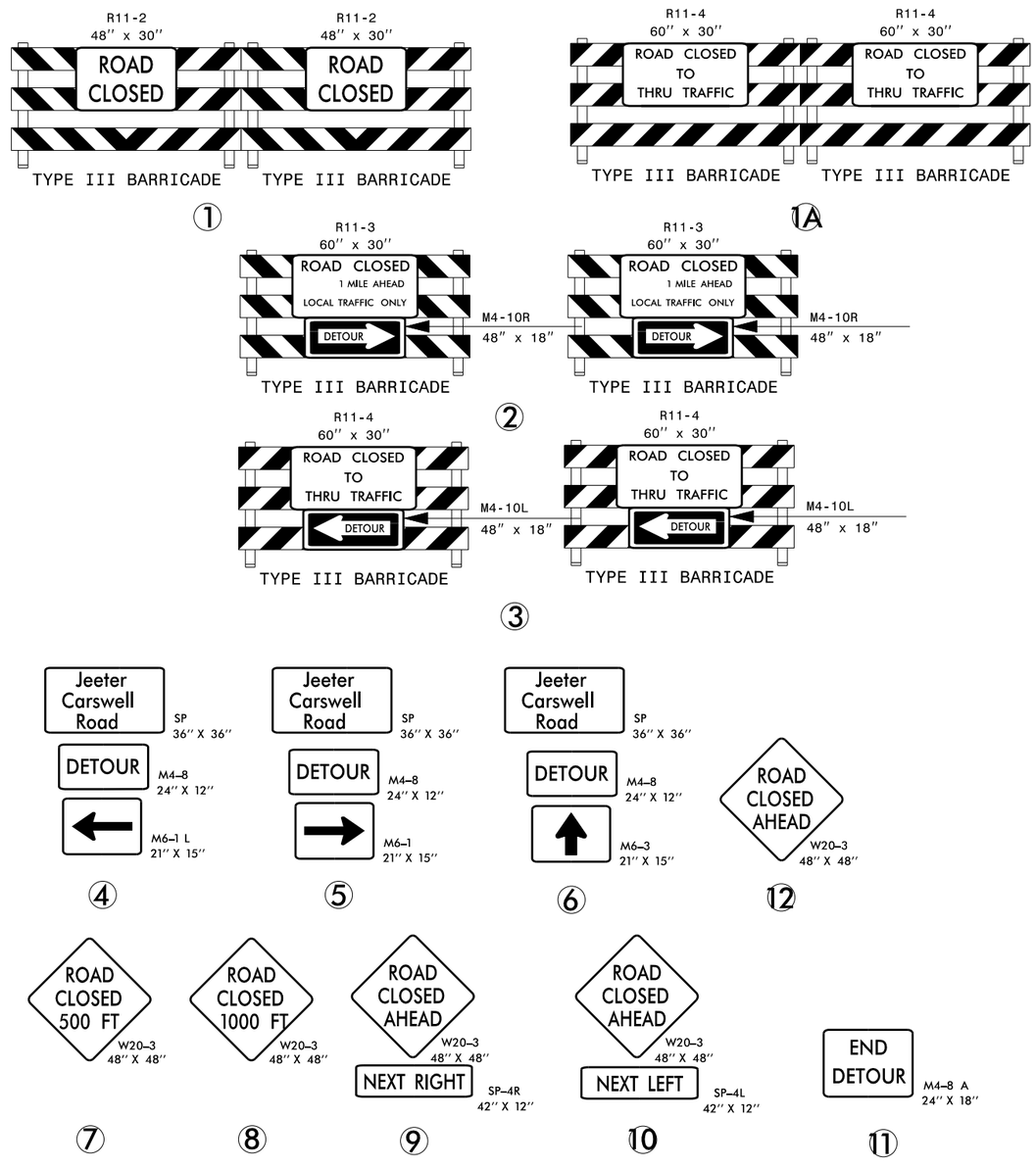
ROADWAY STANDARD DRAWINGS, LEGEND, GENERAL NOTES, & PHASING

8/7/2025
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PROJ. REFERENCE NO.	SHEET NO.
BP13.R033	TMP-2





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Suite 160
Raleigh, NC 27607
NC License Number : C-3239

APPROVED: DocuSigned by: Tyson Graves 84C02A344C094F6...

DATE: 8-07-2025

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 021080 ENGINEER TYSON A. GRAVES

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

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DETOUR ROUTE AND SIGNS

8/7/2025
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PROJ. REFERENCE NO.	SHEET NO.
BP13.R033	TMP-3

SIGN NUMBER: SP
TYPE: STATIONARY
QUANTITY: SEE PLANS

SIGN WIDTH: 3′-0″
HEIGHT: 3′-0″
TOTAL AREA: 9.0 Sq.Ft.

BORDER TYPE: INSET
RECESS: 0.47″
WIDTH: 0.63″
RADII: 1.5″

NO. Z BARS:
LENGTH:

BACKG COLOR: Fluorescent Orange
COPY COLOR: Black

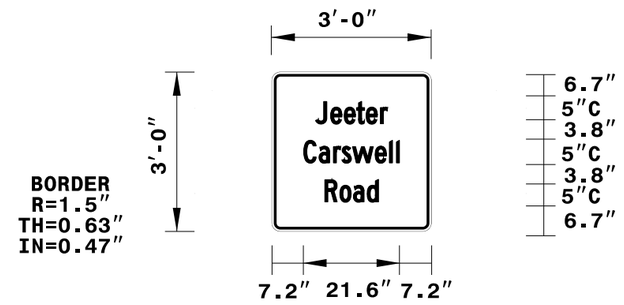
SYMBOL	X	Y	WID	HT

MAT′L: 0.080″ (2.0 mm) ALUMINUM

USE NOTES: 1,2

1. Legend and border shall be direct applied black non-reflective sheeting.
2. Background shall be NC GRADE B fluorescent orange retroreflective sheeting.

DESIGN BY: TAG
PROJECT ID: ID
CHECKED BY: DVJ
LOCATION:
August 20, 2024
DIV: 13



Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are panel edge to lower left corner																										Series/Size Text Length
	J	e	e	t	e	r																				C 2000
	9.9	13.3	16.3	19.1	21.3	24.5																				16.3
	C	a	r	s	w	e	l	l																		C 2000
	7.2	10.7	13.9	15.9	18.2	23.3	26.5	28.1																		21.6
	R	o	a	d																						C 2000
	12	15.4	18.4	21.5																						12.1

FILENAME: SIGN DESIGNS - Work Zone_2

NORTH CAROLINA D.O.T. SIGN DETAIL

ms consultants, inc.
5444 Wake Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number : C-3239

APPROVED: DocuSigned by: Jason Graves 84C02A344C0344F6...
DATE: 8-07-2025
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 021080 ENGINEER JASON A GRAVES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

WORK ZONE
SIGN DESIGN

8/7/2025
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN
BURKE COUNTY

TIP NO.	SHEET NO.
BP13-R033	PMP-1

APPROVED: Digitally signed by Tyson A Graves — 10-28-2025

DATE: 10-28-2025

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 021080 ENGINEER TYSON A GRAVES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT: DM00429 T.I.P.: BP13-R033

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN TITLE AND SCHEDULE SHEET
PMP-1A	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
PMP-1B	DETAIL OF INLAID RAISED PAVEMENT MARKER
PMP-2	PAVEMENT MARKING DETAIL

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

GENERAL NOTES

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
SR 1512	PAINT	RAISED (INLAID)

B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

D) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

PAVEMENT MARKING SCHEDULE

	PAINT(4")
P1	WHITE EDGELINE
P5	2 FT.-6 FT./SP WHITE MINISKIP
P13	YELLOW DOUBLE CENTER
	MARKERS
	PERMANENT RAISED (INLAID)
MA	YELLOW

PLAN SUBMITTED TO:

Kelvin Jordan Signing and Delineation Regional Engineer

Ashley K. Matthews, PE Project Design Engineer

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

PLAN PREPARED BY: ms consultants, inc.

Tyson A. Graves, PE Project Engineer

_____ Project Design Engineer

ms consultants, inc.
5444 Wake Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number : C-3239

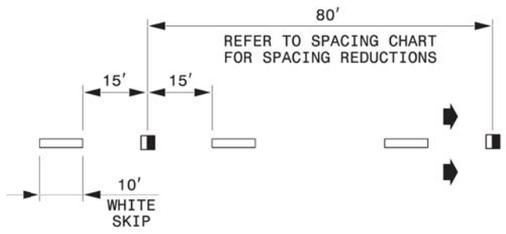
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tsgraves

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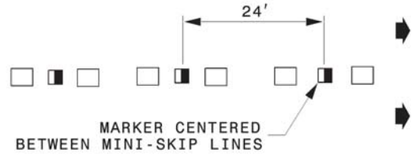
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BP13-R033	PMP-1A
DATE: 10-28-2025	

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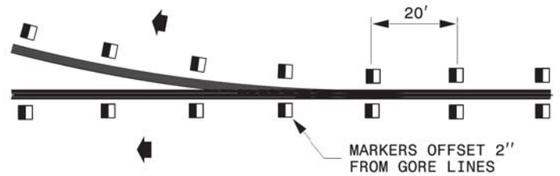
10′-30′/SP SKIP LINE



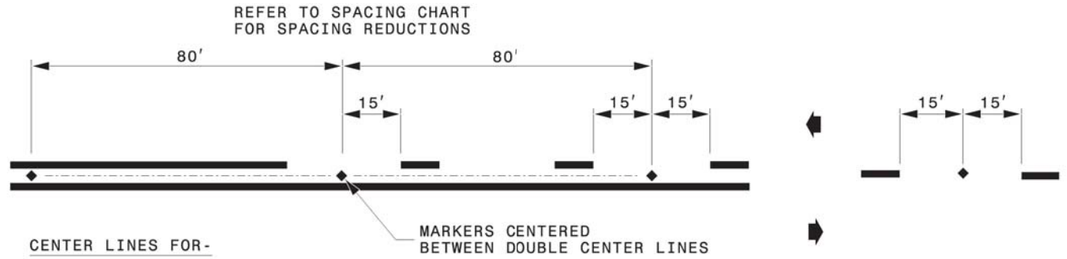
3′-9′/SP MINI-SKIP LINE



GORE LINES



YELLOW CENTER LINES



CENTER LINES FOR-

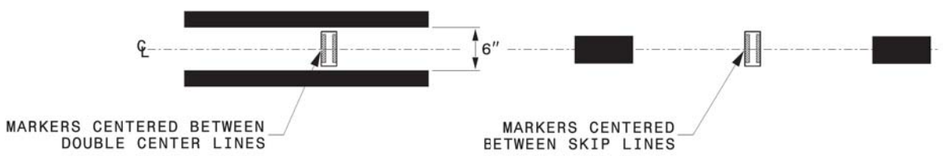
TWO-LANE, TWO-WAY ROADWAYS
UNDIVIDED ROADWAYS
TWO-WAY LEFT TURN LANES

LEGEND

- CRYSTAL/RED PAVEMENT MARKER
- YELLOW/YELLOW PAVEMENT MARKER
- DIRECTION OF TRAFFIC FLOW

DETAIL OF PAVEMENT MARKER PLACEMENT

RAISED REFLECTIVE PAVEMENT MARKERS



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

ROADWAY DETAIL DRAWING FOR

RAISED PAVEMENT MARKERS

INSTALLATION SPACING

SHEET 2 OF 3

1250D01

NORTH CAROLINA PROFESSIONAL SEAL 042546 ENGINEER MATTHEW V. SPRINGER

Signed by: Matthew V. Springer, PE

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

SEE TITLE BLOCK

ORIGINAL BY: M.V. SPRINGER DATE: 2-15-24
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

10/28/2025
pw://ncdot-pw.bentley.com:ncdot-pw-01/Documents/Division_13/BP13.R033/Signing and Delineation/Pavement Marking/Design/BP13R033_PMP_1A
User: gjones

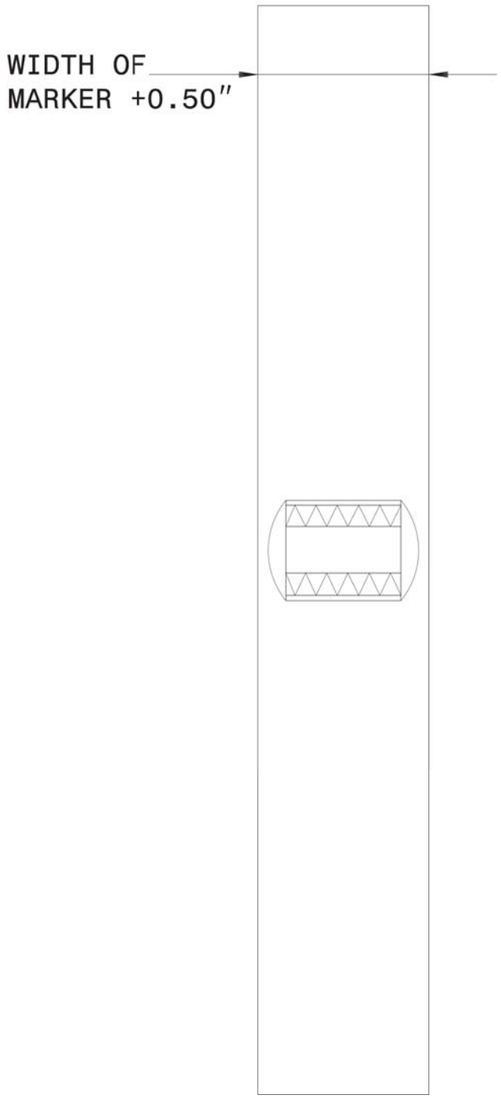
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TIP NO.	SHEET NO.
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DATE: 10-28-2025	

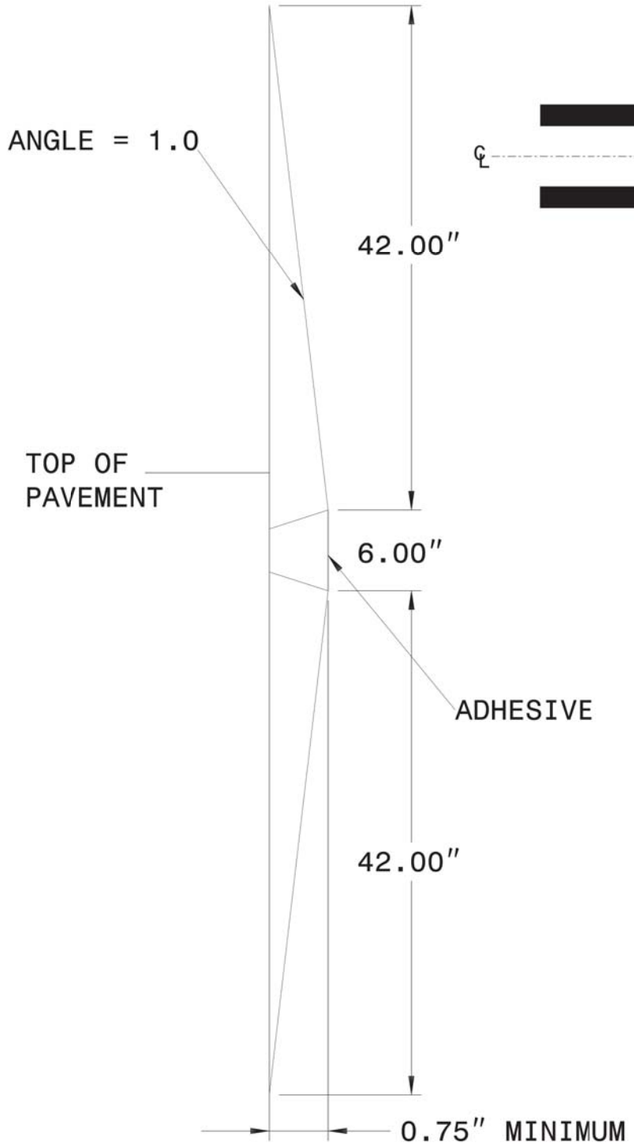
T.I.P.: BP13.R033

CONTRACT: DM00429

PLAN VIEW



SECTION VIEW



MARKER SPACING



NORTH CAROLINA PROFESSIONAL SEAL 042546 ENGINEER MATTHEW V. SPRINGER

Signed by:
Matthew V. Springer, PE

NOTES:

1. THE PAVEMENT SHALL BE SAW CUT TO THE DIMENSIONS SHOWN.
2. THE SAW CUT AREA MUST BE DRY AND FREE OF DUST. DIRT OR ANY MATERIAL WHICH WILL ADVERSELY AFFECT THE BOND OF THE ADHESIVE.
3. INSTALL MARKERS WITH APPROVED ADHESIVE. ADHESIVE SHOULD NOT BE ALLOWED TO BUILD UP IN FRONT OF MARKER LENS.
4. THE MARKER AND THE ADHESIVE PAD SHALL NOT EXCEED THE TOP OF THE PAVEMENT SURFACE. DEPTH = 0.75″ MINIMUM.
5. RECESSED MARKERS INSTALLED ON CONCRETE PAVEMENT SHOULD BE INSTALLED A MINIMUM OF 2″ FROM THE PAVEMENT JOINT OR EDGE

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

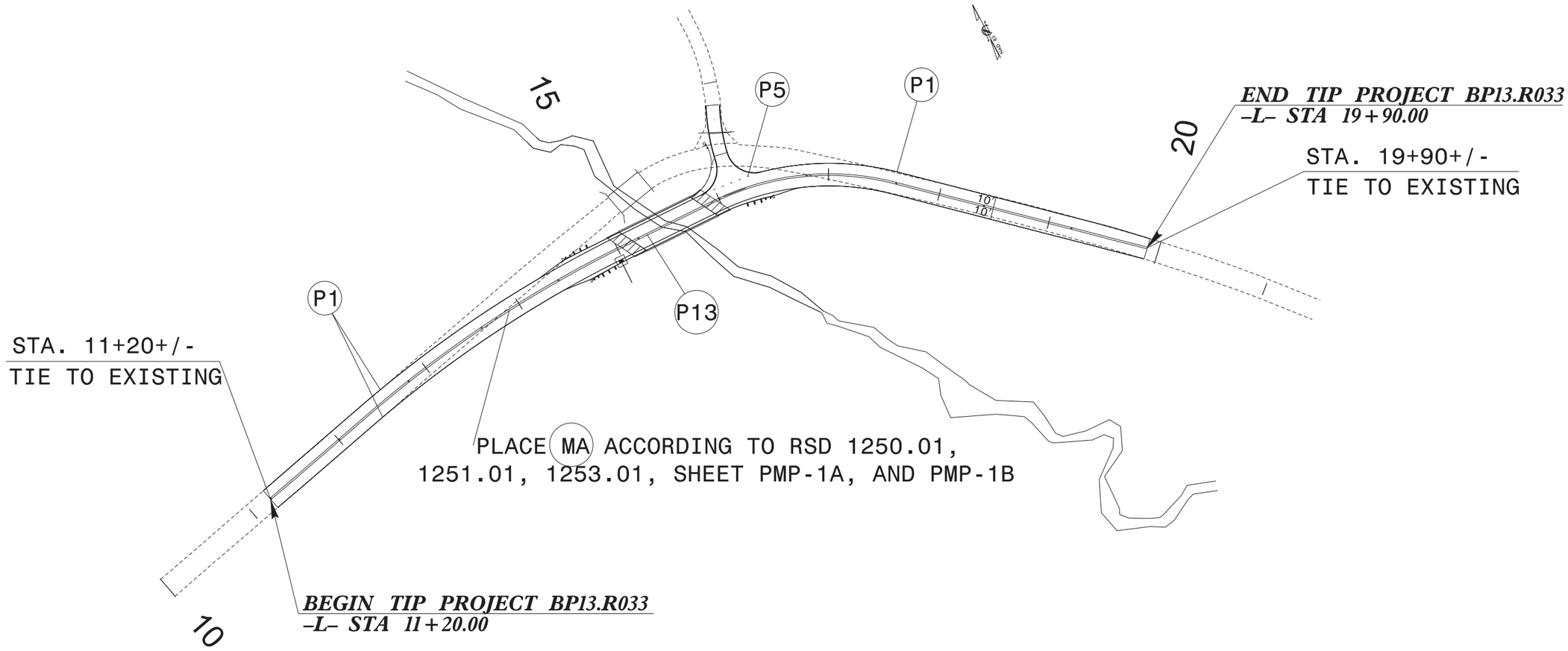
DETAIL OF INLAID RAISED PAVEMENT MARKER

ORIGINAL BY:	rgwatson	DATE:	02-06-2024
MODIFIED BY:		DATE:	
CHECKED BY:		DATE:	
FILE SPEC.:			

10/28/2025
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User:rgraves

Docusign Envelope ID: C3757930-E7AB-43A4-93D8-7F53DB16A16A

PROJ. REFERENCE NO.	SHEET NO.
BP13-R033	PMP-2



ms consultants, inc.
5444 Wake Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number : C-3239

APPROVED: _____

DATE: 10-28-2025

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 021080 ENGINEER TYRON A. GRAVES

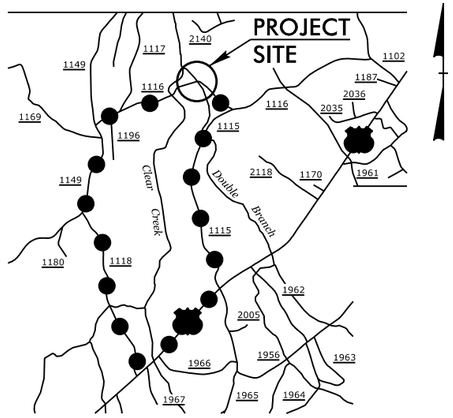
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DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

FINAL PAVEMENT MARKINGS

10/28/2025
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User:tgraves

TIP PROJECT: BP13–R033



VICINITY MAP
NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

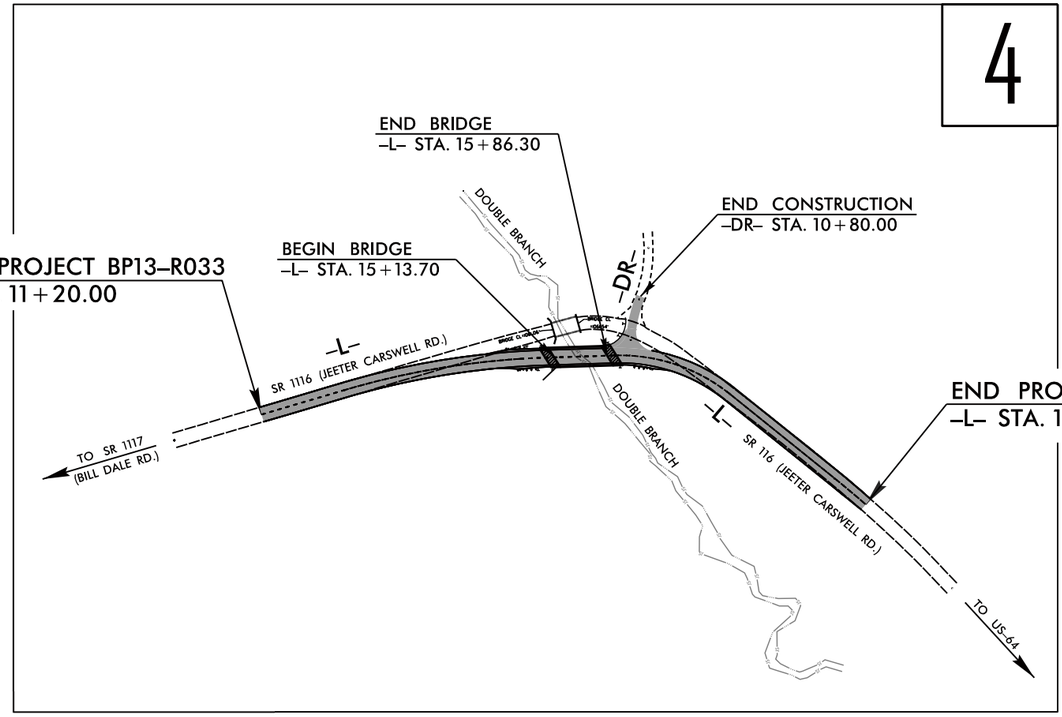
BURKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13-R033	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION

THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

LOCATION: BRIDGE NO. 254 ON SR 1116 (JEETER CARSWELL RD.) OVER DOUBLE BRANCH
TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURES



NAD 83/ NA 2011

GRAPHIC SCALE

50 25 0 50 100
PLANS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG 010000 GENERAL STORMWATER CONSTRUCTION PERMIT ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF ENERGY, MINERAL, AND LAND RESOURCES.



Prepared in the Office of:
MI ENGINEERING, PLLC
1011 SCHAUB DR, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

Designed by:

KAREN HEFNER, PE ***3824***
NAME *LEVEL III CERTIFICATION NO.*

Roadway Standard Drawings

The "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2024 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

8/20/2025
\\mi-raleigh.micromicro.com\data\projects\Division_13\BP13_R033\Roadside Environment\Erosion Control\Design\BP13R033_EC_TSH
MI ENGINEERING, RALEIGH, N.C.

PROJECT REFERENCE NO.	SHEET NO.
BP13-R033	EC-02

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

EROSION & SEDIMENT CONTROL LEGEND

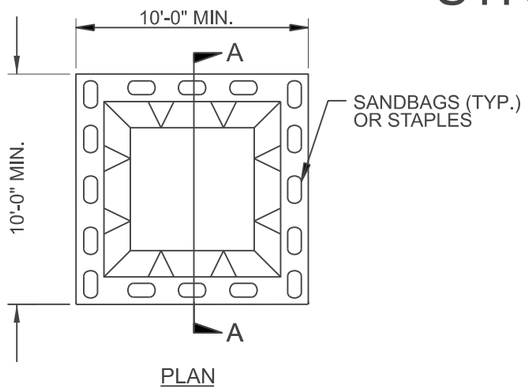
Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1630.03	Temporary Silt Ditch	TSD
1630.04	Stilling Basin	
1630.05	Temporary Diversion	TD
1630.06	Special Stilling Basin	
1630.07	Skimmer Basin	
1630.08	Tiered Skimmer Basin	
1630.09	Earthen Dam with Skimmer	
	Infiltration Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C

Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet Sediment Trap Type A	A
1635.02	Rock Pipe Inlet Sediment Trap Type B	B
1636.01	Excelsior Wattle Check	
1636.01	Excelsior Wattle Check with Flocculant	
1636.01	Coir Fiber Wattle Check	
1636.01	Coir Fiber Wattle Check with Flocculant	
1636.02	Silt Fence Excelsior Wattle Break	EW
	Silt Fence Coir Fiber Wattle Break	CFW
1636.03	Excelsior Wattle Barrier	—EW—EW—EW—
1636.03	Coir Fiber Wattle Barrier	—CFW—CFW—CFW—

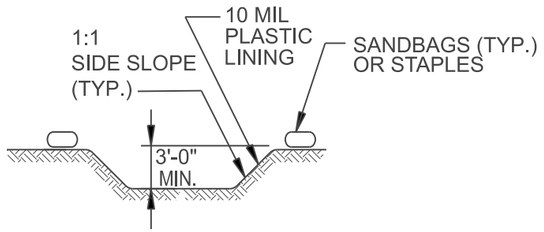
8/20/2025
DW:/ncdot-pw.bentley.com:ncdot-pw-01/Documents/Division_13/BP13_R033/Roadside Environmental/Erosion Control/Design/BP13R033_EC_TSH
BENTLEY SYSTEMS, INC.

PROJECT REFERENCE NO.	SHEET NO.
BP13-R033	EC-02A

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A



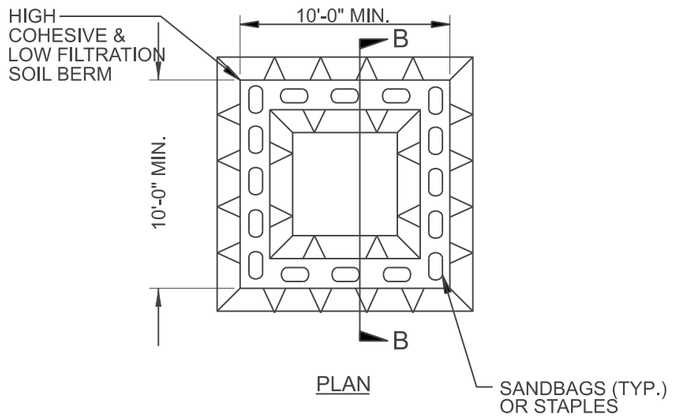
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

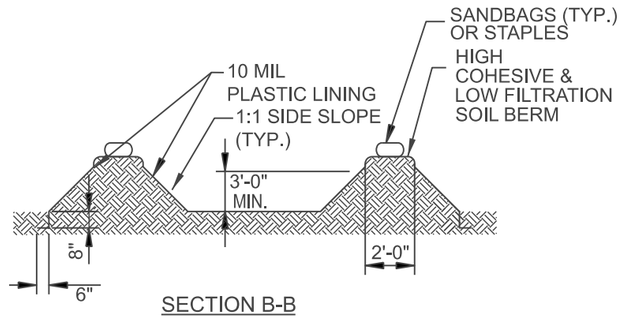
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE

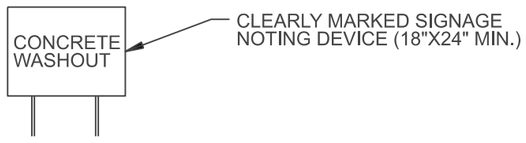
NOT TO SCALE



PLAN



SECTION B-B



NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.

ABOVE GRADE WASHOUT STRUCTURE

NOT TO SCALE

8/20/2025
pw://ncdot-pw.bentley.com:ncdot-pw-01/Documents/Division_13/BP13_R033/Roadside Environmental/Erosion Control/Design/BP13R033_EC_DETAILS
M ENGINEERING, RALEIGH NC

PROJECT REFERENCE NO.	SHEET NO.
BP13-R033	EC-03

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	*STABILIZATION TIME*	*TIMEFRAME EXCEPTIONS*
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 TO 4:1	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH WITH SLOPES STEEPER THAN 4:1. 7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES

8/20/2025
pw://ncdot-pw.bentley.comncdot-pw-01/Documents/Division_13/BP13_R033/Roadside Environmental/Erosion Control/Design/BP13R033_EC_DETAILS
M ENGINEERING, RALEIGH N.C

PROJECT REFERENCE NO.	SHEET NO.
BP13-R033	EC-03A

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

STRAW MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	12+50	15+72	RT	310
4	-L-	17+50	18+00	RT	60
				SUBTOTAL	465
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					8,025
				TOTAL	8,490
				SAY	8,500

EXCELSIOR MATTING FOR EROSION CONTROL

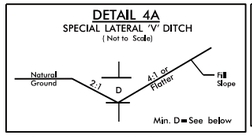
CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-DRV-	10+30	10+75	RT	25
4	-L-	15+92	16+50	RT	10
4	-L-	17+00	17+50	RT	60

8/20/2025
pw://ncdot-pw.bentley.comncdot-pw-01/Documents/Division_13/BP13_R033/Roadside Environmental/Erosion Control/Design/BP13R033_EC_DETAILS
M ENGINEERING, RALEIGH N.C

PROJECT REFERENCE NO.	SHEET NO.
BP13,R033	EC-04/CONST.04
R/W SHEET NO.	
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER	

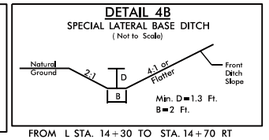
CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04

DETAIL 4A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



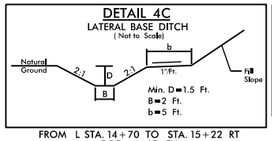
FROM L STA. 12+50 TO STA. 14+30 RT,
Min d = 1.4 Ft.
FROM DR STA. 10+48 TO STA. 10+75 RT,
Min d = 0.5 Ft.

DETAIL 4B
SPECIAL LATERAL BASE DITCH
(Not to Scale)



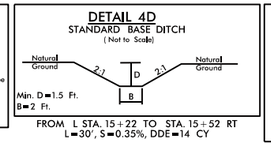
FROM L STA. 14+30 TO STA. 14+70 RT

DETAIL 4C
LATERAL BASE DITCH
(Not to Scale)



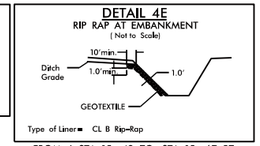
FROM L STA. 14+70 TO STA. 15+22 RT
DDE = 67 CY

DETAIL 4D
STANDARD BASE DITCH
(Not to Scale)



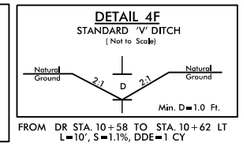
FROM L STA. 15+22 TO STA. 15+52 RT
L = 30', S = 0.35%, DDE = 14 CY

DETAIL 4E
RIP RAP AT EMBANKMENT
(Not to Scale)



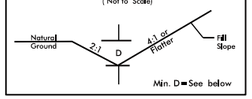
FROM L STA. 15+42 TO STA. 15+67 RT
11 TONS, CL Geotextile = 29sy
FROM L STA. 15+74 TO STA. 16+02 RT
13 TONS, CL Geotextile = 33sy

DETAIL 4F
STANDARD 'V' DITCH
(Not to Scale)



FROM DR STA. 10+58 TO STA. 10+62 LT
L = 10', S = 1.1%, DDE = 1 CY

DETAIL 4H
SPECIAL CUT 'V' DITCH
(Not to Scale)



FROM L STA. 17+00 TO STA. 19+90 LT,
Min. D = 0.7 Ft.
FROM L STA. 16+20 TO STA. 16+50 RT,
Min. D = 0.5 Ft.
FROM DR STA. 10+30 TO STA. 10+48 RT,
Min. D = 0.5 Ft.

NC GRID
NAD 83_NA 2011

CUR DATA -L-
PIc 13+70.33
Δc = 14°38'07.7" (RT)
D = 05°24'18.9"
Lc = 270.76
Tc = 136.12
R = 1,060
SE = 06
RO = SEE PLANS
DS = 55 MPH

CUR DATA -L-
PIc 16+80.52
Δc = 40°37'36.9" (RT)
D = 24°48'12.1"
Lc = 163.80
Tc = 85.51
R = 231
SE = 06
RO = 120
DS = 30 MPH*

CUR DATA -L-
PIc 20+42.84
Δc = 08°32'50.7" (RT)
D = 04°00'24.1"
Lc = 213.33
Tc = 106.86
R = 1,430

* DESIGN EXCEPTION REQUIRED

CUR DATA -DR-
PIc 10+48.71
Δc = 18°10'09.1" (RT)
D = 33°06'53.5"
Lc = 54.87
Tc = 27.67
R = 173.02

CUR DATA -DR-
PIc 11+11.12
Δc = 22°28'16.9" (LT)
D = 32°19'34.0"
Lc = 69.51
Tc = 35.21
R = 177.24

BEGIN PROJECT BP13.R033
-L- STA. 11+20.00

-L- POT 10+00.00

-L- PC 12+34.21

-L- PT 15+04.98

-L- PC 15+95.01

-DR- POE 11+45.42

END CONST.
-DR- 10+80.00

-DR- PRC 10+75.91

-DR- PC 10+21.04

-DR- POT 10+00.00 =
-L- POC 16+15.01
-L- PT 17+58.80

-L- PC 19+35.98

END PROJECT BP13.R033
-L- STA. 19+90.00

-L- PT 21+49.3

REX CHAPMAN
DB 1889 PG 125

BERKLEY H. ASBURY
SHEILA Y. ASBURY
DB 1748 PG 818

EXCAVATE TO ELEVATION 1058.0'
SEE DETAIL '4J'

CLASS II RIP RAP BANK STABILIZATION
SEE DETAIL '4I'

EXCAVATE TO FLOODPLAIN ELEVATION ±1059.0'
SEE DETAIL '4J'

SPECIAL LATERAL 'V' DITCH
SEE DETAIL 4A

SPECIAL LATERAL 2' BASE DITCH
SEE DETAIL 4B

LATERAL 2' BASE DITCH
SEE DETAIL 4C

CL "B" RIP RAP
2 Tons 7 Sq. Yds.

EXCAVATE TO ELEVATION 1056.9'

STD 2' BASE DITCH
SEE DETAIL 4D

RIP RAP AT EMBANKMENT
SEE DETAIL 4E

LATERAL 'V' DITCH
SEE DETAIL 4G

SPECIAL CUT 'V' DITCH
SEE DETAIL 4H

STD 'V' DITCH
SEE DETAIL 4F

SPECIAL LATERAL 'V' DITCH
SEE DETAIL 4A

SPECIAL CUT 'V' DITCH
SEE DETAIL 4H

EXCAVATE TO ELEVATION 1058.2'

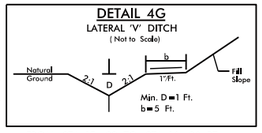
REMOVE END PAVING -DR- 10+35.78

TO SR-1117 BILL DALE RD

SR 1117 BILL DALE RD

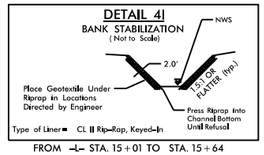
RETAIN

DETAIL 4G
LATERAL 'V' DITCH
(Not to Scale)



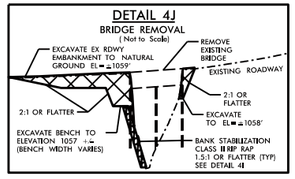
FROM STA. 15+92 TO STA. 16+20 RT

DETAIL 4I
BANK STABILIZATION
(Not to Scale)



FROM -L- STA. 15+01 TO STA. 15+64
EST. 118 TONS, 146 SY GEOTEXTILE
FROM -L- STA. 15+34 TO STA. 15+85
EST. 111 TONS, 131 SY GEOTEXTILE

DETAIL 4J
BRIDGE REMOVAL
(Not to Scale)



SHOULDER BERM GUTTER:
-L- STA. 14+89 TO -L- STA. 14+97 LT
-L- STA. 14+93 TO -L- STA. 15+11 RT
-L- STA. 15+89 TO -L- STA. 15+97 LT
-L- STA. 16+04 TO -L- STA. 16+12 RT

BRIDGE AND APPROACH SLAB:
-L- STA. 15+03.00 BEGIN APPROACH SLAB
-L- STA. 15+13.70 BEGIN BRIDGE
-L- STA. 15+86.30 END BRIDGE
-L- STA. 15+97.00 END APPROACH SLAB

NOTE:
SEE EC-04A AND EC-04B FOR CONSTRUCTION SEQUENCING FOR STREAMBANK GRADING AND BANK STABILIZATION INSTALLATION AT NEW AND EXISTING BRIDGE LOCATIONS

NOTE: ALL EROSION CONTROL DEVICES SHOWN ARE LOCATED WITHIN EXISTING R/W OR EASEMENT.

NOTE: PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

NOTE: PRIOR TO INSTALLATION OF EROSION CONTROL DEVICES, CONTRACTOR SHALL VERIFY BOUNDARIES OF JURISDICTIONAL AREAS AND DELINEATE WITH SAFETY FENCE OR FLAGGING.

NOTE: CONTRACTOR SHALL PROVIDE GROUND COVER ON EXPOSED SLOPES IN ACCORDANCE WITH THE "SOIL STABILIZATION TIMEFRAMES", SEE EC-3.

NOTE: PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

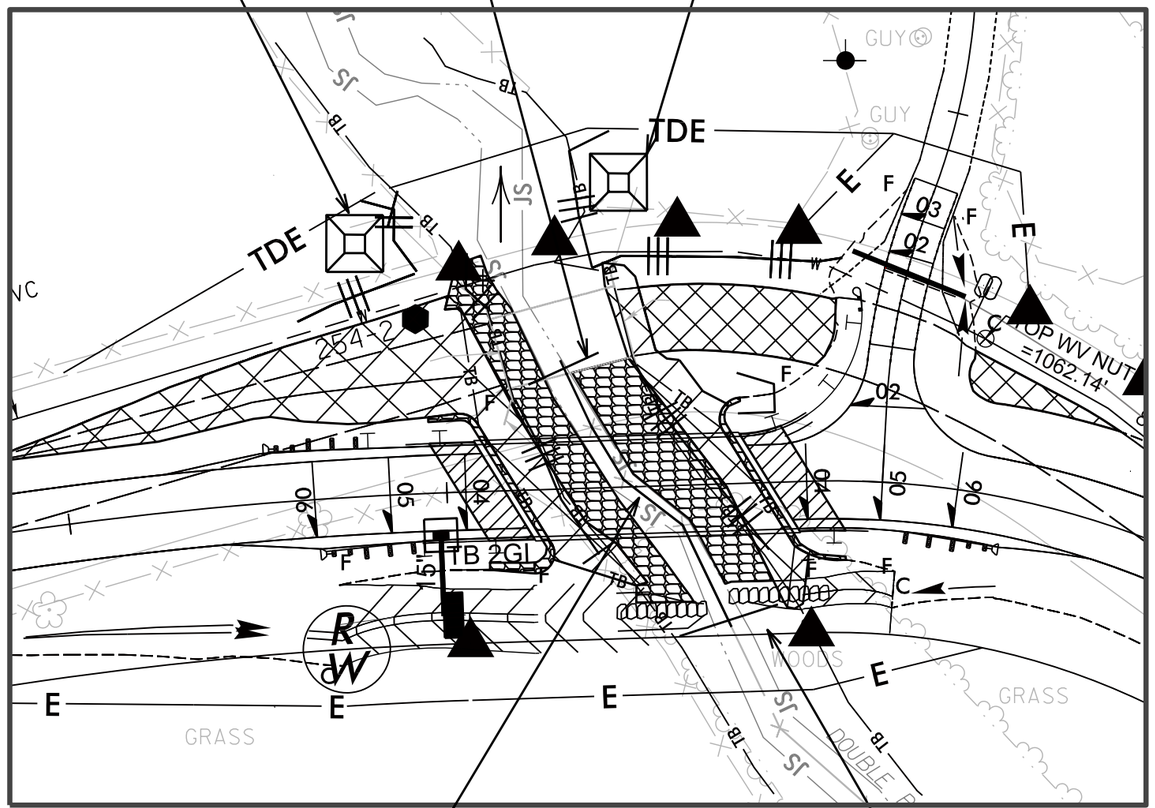
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MENGINEERING, RALEIGH, N.C

PROJECT REFERENCE NO.	SHEET NO.
BP13-R033	EC-04A/CONST.04
R/W SHEET NO.	

IMPERVIOUS DIKE(S)
*SEE NOTES

UTILIZE SPECIAL STILLING BASIN(S) TO DEWATER WORK AREA

UTILIZE SPECIAL STILLING BASIN(S) TO DEWATER WORK AREA



42 INCH TEMPORARY PIPE
*SEE NOTES

IMPERVIOUS DIKE(S)
*SEE NOTES

NOTES – BANK STABILIZATION:

1) DURING STREAM BANK GRADING AND INSTALLATION OF BANK STABILIZATION, UTILIZE IMPERVIOUS DIKES, TEMPORARY DIVERSION PIPE, AND SPECIAL STILLING BASINS.

2) BASED ON SITE CONDITIONS, FLOATING TURBIDITY CURTAIN, IN LIEU OF IMPERVIOUS DIKE(S) AND SPECIAL STILLING BASIN(S), MAY BE UTILIZED ALONG SHORELINE AND BANK STABILIZATION INSTALLATION, AS DIRECTED BY ENGINEER.

CONSTRUCTION SEQUENCE – PHASE 1
GRADING AND BANK STABILIZATION INSTALLATION AT THE NEW BRIDGE LOCATION

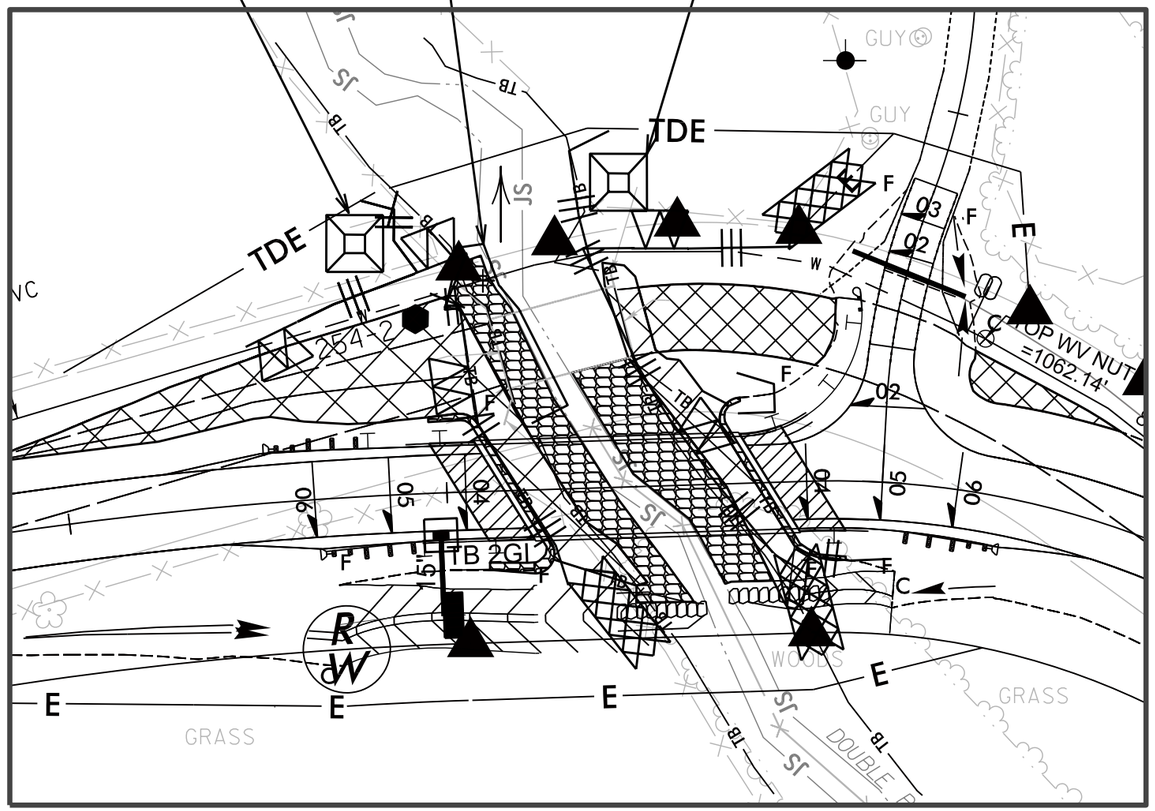
8/20/2025
pw://ncdot-pw.bentley.com:ncdot-pw-01/Documents/Division_13/BP13_R033/Roadside Environmental/Erosion Control/Design/BP13_R033_EC_DSN_phase_1.dgn
M ENGINEERING, RALEIGH N.C

PROJECT REFERENCE NO.	SHEET NO.
BP13-R033	EC-04B/CONST.04
R/W SHEET NO.	

IMPERVIOUS DIKE(S)
*SEE NOTES

UTILIZE SPECIAL STILLING BASIN(S) TO DEWATER WORK AREA

UTILIZE SPECIAL STILLING BASIN(S) TO DEWATER WORK AREA



NC GRID
NAD 83_NA 2011

NOTES – BANK STABILIZATION:

1) DURING STREAM BANK GRADING AND INSTALLATION OF BANK STABILIZATION, UTILIZE IMPERVIOUS DIKES, TEMPORARY DIVERSION PIPE, AND SPECIAL STILLING BASINS.

2) BASED ON SITE CONDITIONS, FLOATING TURBIDITY CURTAIN, IN LIEU OF IMPERVIOUS DIKE(S) AND SPECIAL STILLING BASIN(S), MAY BE UTILIZED ALONG SHORELINE AND BANK STABILIZATION INSTALLATION, AS DIRECTED BY ENGINEER.

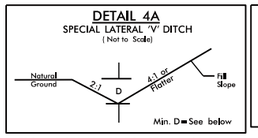
CONSTRUCTION SEQUENCE – PHASE 2
GRADING AND BANK STABILIZATION INSTALLATION AT THE EXISTING BRIDGE LOCATION

8/20/2025
Dwg://ncdot-pw.bentley.comncdot-pw-01/Documents/Division_13/BP13_R033/Roadside Environmental/Erosion Control/Design/BP13_R033_EC_DSN_phase_2.dgn
MENGINEERING, RALEIGH N.C

PROJECT REFERENCE NO.	SHEET NO.
BP13,R033	EC-05/CONST.04
R/W SHEET NO.	
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER	

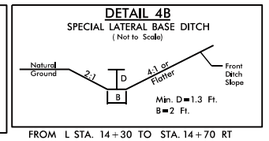
FINAL EROSION CONTROL FOR CONSTRUCTION SHEET 04

DETAIL 4A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



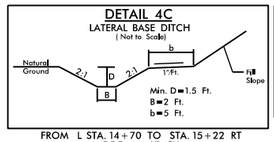
FROM L STA. 12+50 TO STA. 14+30 RT,
Min d = 1.4 Ft.
FROM DR STA. 10+48 TO STA. 10+75 RT,
Min d = 0.5 Ft.

DETAIL 4B
SPECIAL LATERAL BASE DITCH
(Not to Scale)



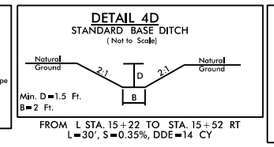
FROM L STA. 14+30 TO STA. 14+70 RT

DETAIL 4C
LATERAL BASE DITCH
(Not to Scale)



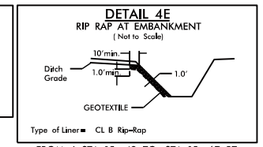
FROM L STA. 14+70 TO STA. 15+22 RT
DDE = 67 CY

DETAIL 4D
STANDARD BASE DITCH
(Not to Scale)



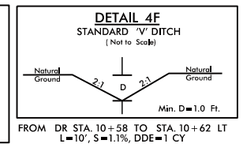
FROM L STA. 15+22 TO STA. 15+52 RT
L = 30', S = 0.35%, DDE = 14 CY

DETAIL 4E
RIP RAP AT EMBANKMENT
(Not to Scale)



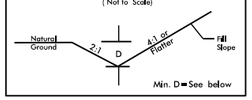
FROM L STA. 15+42 TO STA. 15+67 RT
11 TONS, CL Geotextile = 29sy
FROM L STA. 15+74 TO STA. 16+02 RT
13 TONS, CL Geotextile = 33sy

DETAIL 4F
STANDARD 'V' DITCH
(Not to Scale)



FROM DR STA. 10+58 TO STA. 10+62 LT
L = 10', S = 1.1%, DDE = 1 CY

DETAIL 4H
SPECIAL CUT 'V' DITCH
(Not to Scale)



FROM L STA. 17+00 TO STA. 19+90 LT,
Min. D = 0.7 Ft.
FROM L STA. 16+20 TO STA. 16+50 RT,
Min. D = 0.5 Ft.
FROM DR STA. 10+30 TO STA. 10+48 RT,
Min. D = 0.5 Ft.

CUR DATA -L-
PIc 13+70.33
Δc = 14°38'07.7" (RT)
D = 05°24'18.9"
Lc = 270.76
Tc = 136.12
R = 1,060
SE = 06
RO = SEE PLANS
DS = 55 MPH

CUR DATA -L-
PIc 16+80.52
Δc = 40°37'36.9" (RT)
D = 24°48'12.1"
Lc = 163.80
Tc = 85.51
R = 231
SE = 06
RO = 120
DS = 30 MPH*

CUR DATA -L-
PIc 20+42.84
Δc = 08°32'50.7" (RT)
D = 04°00'24.1"
Lc = 213.33
Tc = 106.86
R = 1,430

* DESIGN EXCEPTION REQUIRED

CUR DATA -DR-
PIc 10+48.71
Δc = 18°10'09.1" (RT)
D = 33°06'53.5"
Lc = 54.87
Tc = 27.67
R = 173.02

CUR DATA -DR-
PIc 11+11.12
Δc = 22°28'16.9" (LT)
D = 32°19'34.0"
Lc = 69.51
Tc = 35.21
R = 177.24

BEGIN PROJECT BP13.R033
–L– STA. 11+20.00

-L- POT 10+00.00

-L- PC 12+34.21

-L- PT 15+04.98

-L- PC 15+95.01

-DR- POE 11+45.42

END CONST.
–DR– 10+80.00

-DR- PRC 10+75.91

-DR- PC 10+21.04

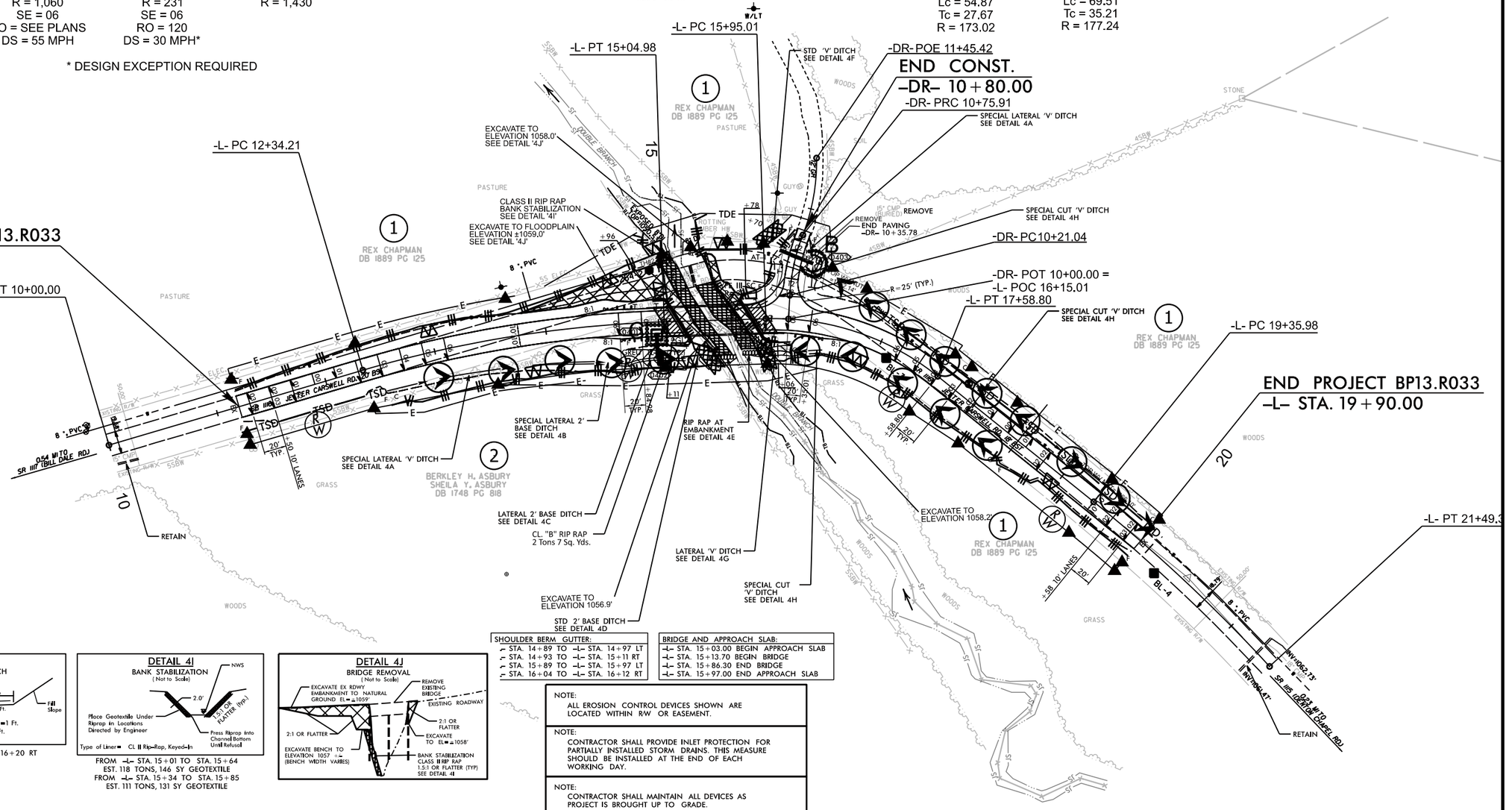
-DR- POT 10+00.00 =
-L- POC 16+15.01

-L- PT 17+58.80

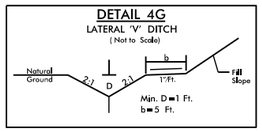
-L- PC 19+35.98

END PROJECT BP13.R033
–L– STA. 19+90.00

-L- PT 21+49.3



DETAIL 4G
LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 15+92 TO STA. 16+20 RT

DETAIL 4I
BANK STABILIZATION
(Not to Scale)

FROM –L– STA. 15+01 TO STA. 15+64
EST. 118 TONS, 146 SY GEOTEXTILE
FROM –L– STA. 15+34 TO STA. 15+85
EST. 111 TONS, 131 SY GEOTEXTILE

DETAIL 4J
BRIDGE REMOVAL
(Not to Scale)

SHOULDER BERM GUTTER:
–L– STA. 14+89 TO –L– STA. 14+97 LT
–L– STA. 14+93 TO –L– STA. 15+11 RT
–L– STA. 15+89 TO –L– STA. 15+97 LT
–L– STA. 16+04 TO –L– STA. 16+12 RT

BRIDGE AND APPROACH SLAB:
–L– STA. 15+03.00 BEGIN APPROACH SLAB
–L– STA. 15+13.70 BEGIN BRIDGE
–L– STA. 15+86.30 END BRIDGE
–L– STA. 15+97.00 END APPROACH SLAB

NOTE:
ALL EROSION CONTROL DEVICES SHOWN ARE LOCATED WITHIN R/W OR EASEMENT.

NOTE:
CONTRACTOR SHALL PROVIDE INLET PROTECTION FOR PARTIALLY INSTALLED STORM DRAINS. THIS MEASURE SHOULD BE INSTALLED AT THE END OF EACH WORKING DAY.

NOTE:
CONTRACTOR SHALL MAINTAIN ALL DEVICES AS PROJECT IS BROUGHT UP TO GRADE.

NOTE:
INSTALL MATTING FOR EROSION CONTROL IN ALL PROPOSED DITCH LINES EXCEPT WHERE PERMANENT LINERS ARE SPECIFIED ON THE PLANS OR DIRECTED OTHERWISE BY THE ENGINEER.

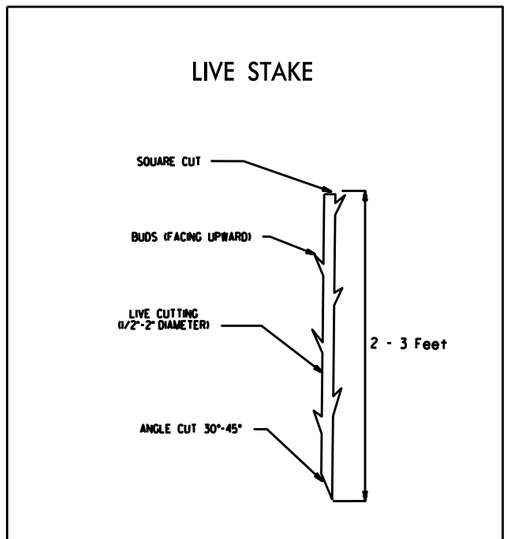
NOTE:
CONTRACTOR SHALL PROVIDE GROUND COVER ON EXPOSED SLOPES IN ACCORDANCE WITH THE "SOIL STABILIZATION TIMEFRAMES", SEE EC-3.

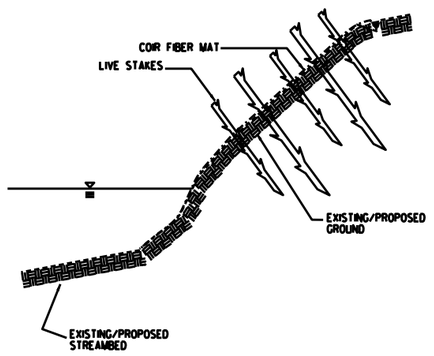
8/20/2025
D:\\ncdot-pw.bentley.com\ncdot-pw-01\Documents\Division_13\BP13.R033\Roadside Environmental\Erosion Control\Design\BP13.R033_EC_05_FINAL.dgn
MENGINEERING, RALEIGH, N.C

PROJECT REFERENCE NO.	SHEET NO.
BPI3-R033	RF-2

PLANTING DETAILS

LIVE STAKES PLANTING DETAIL

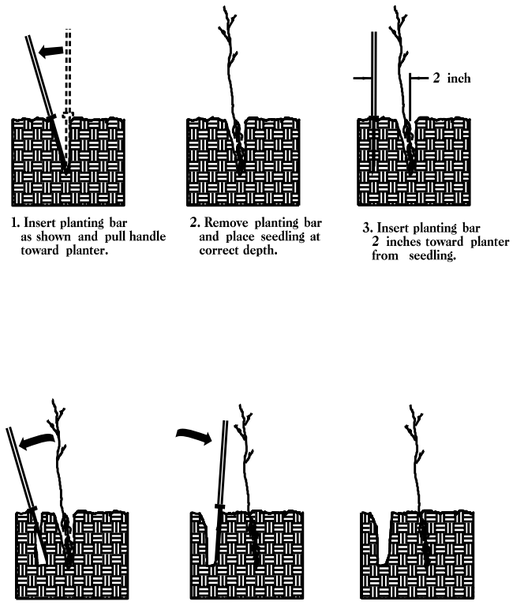




BANK STABILIZATION WITH LIVE STAKES

NOTE:
LIVE STAKES SHALL BE SPACED APPROXIMATELY 4 FEET ON CENTER
LIVE STAKES SHALL BE DRIVEN UNTIL APPROXIMATELY 3/4 OF LIVE STAKE IS WITHIN GROUND

BAREROOT PLANTING DETAIL
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



1. Insert planting bar as shown and pull handle toward planter.
2. Remove planting bar and place seedling at correct depth.
3. Insert planting bar 2 inches toward planter from seedling.
4. Pull handle of bar toward planter, firming soil at bottom.
5. Push handle forward firming soil at top.
6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING BAG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.



KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.



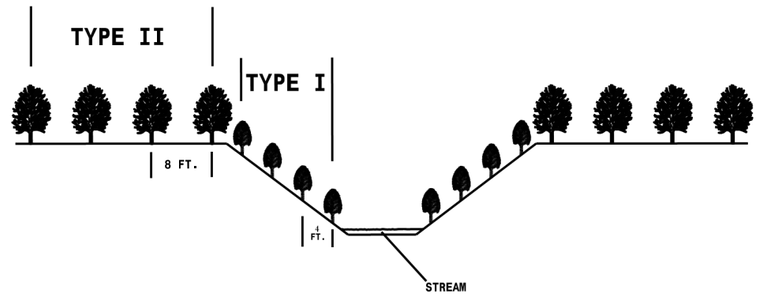
ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

☐ TYPE 1 STREAMBANK REFORESTATION SHALL BE PLANTED 3 FT. TO 5 FT. ON CENTER, RANDOM SPACING, AVERAGING 4 FT. ON CENTER, APPROXIMATELY 2724 PLANTS PER ACRE.

☐ TYPE 2 STREAMBANK REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

☐ NOTE: TYPE 1 AND TYPE 2 STREAMBANK REFORESTATION SHALL BE PAID FOR AS "STREAMBANK REFORESTATION"

STREAMBANK REFORESTATION TYPICAL



STREAMBANK REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

TYPE 1		
50% SALIX NIGRA	BLACK WILLOW	2 ft - 3 ft LIVE STAKES
50% CORNUS AMOMUM	SILKY DOGWOOD	2 ft - 3 ft LIVE STAKES
TYPE 2		
25% LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in - 18 in BR
25% PLATANUS OCCIDENTALIS	SYCAMORE	12 in - 18 in BR
25% PRUNUS SEROTINA	BLACK CHERRY	12 in - 18 in BR
25% BETULA NIGRA	RIVER BIRCH	12 in - 18 in BR

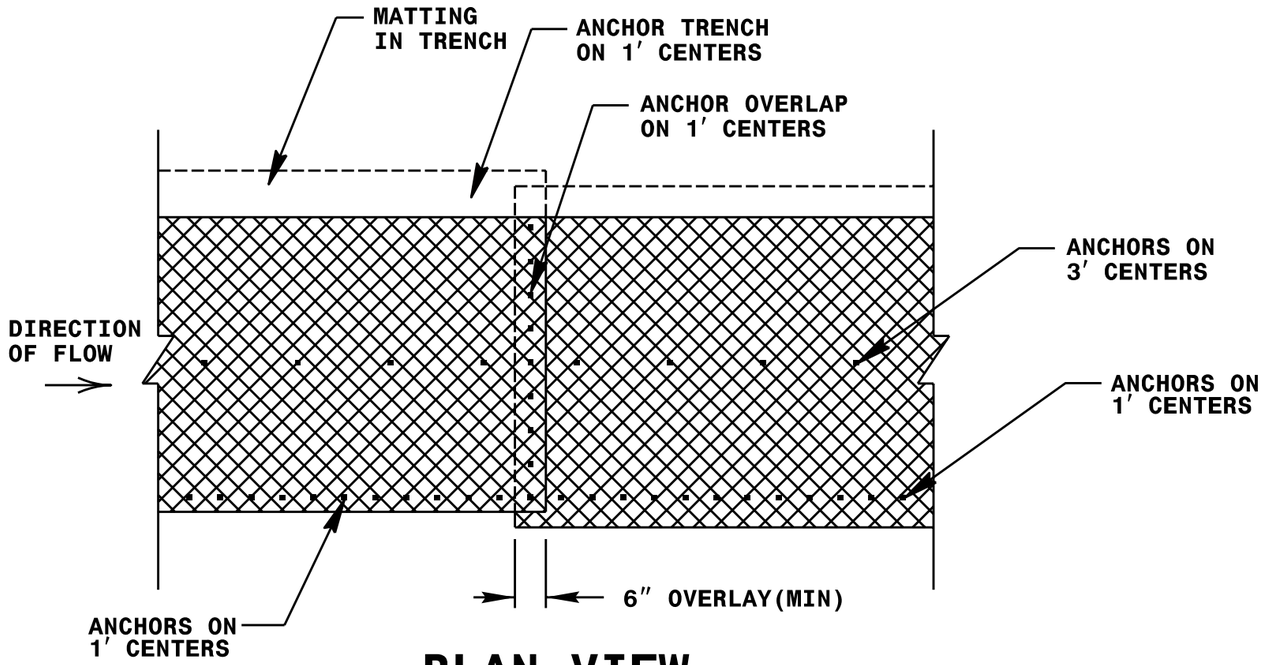
☐ SEE PLAN SHEETS FOR AREAS TO BE PLANTED

STREAMBANK REFORESTATION
DETAIL SHEET 1 OF 2

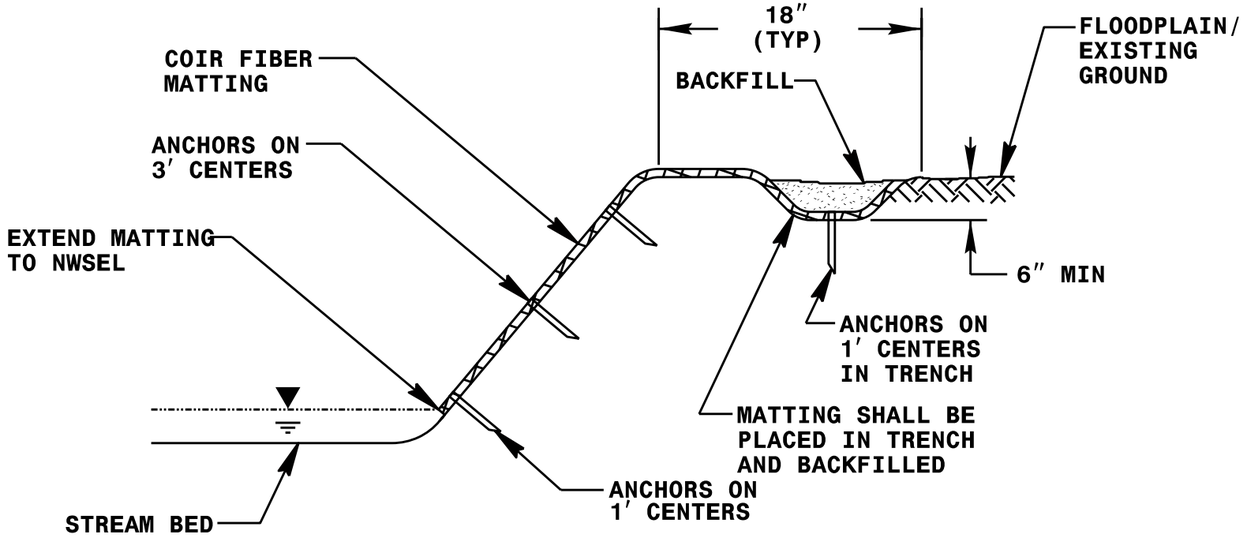
N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

$$$$$$$SYSTIME$$$$$$
$$$$$$$

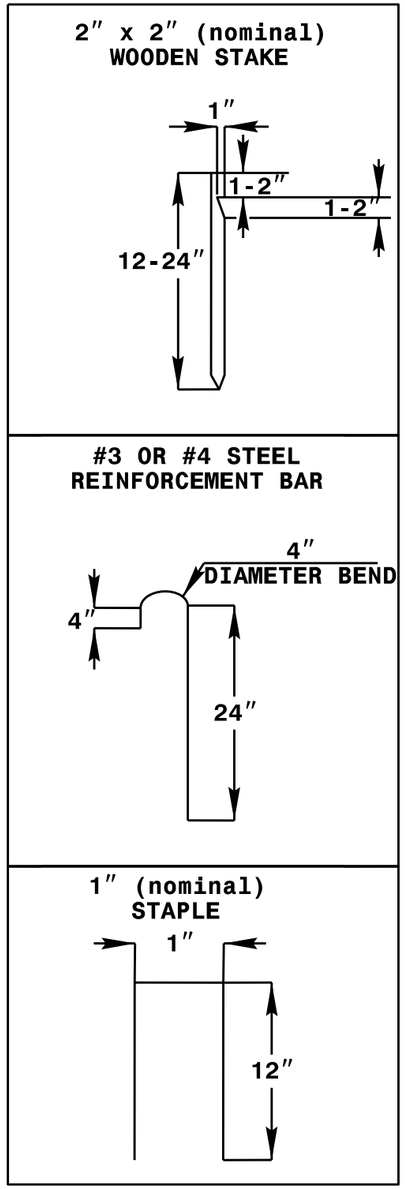
PROJECT REFERENCE NO.	SHEET NO.
BPI3-R033	RF-3



PLAN VIEW



TYPICAL CROSS SECTION



ANCHOR OPTIONS

COIR FIBER MATTING DETAIL

NOT TO SCALE

STREAMBANK REFORESTATION
DETAIL SHEET 2 OF 2
N.C.D.O.T.- ROADSIDE ENVIRONMENTAL UNIT

$$$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
$$$$$$$$$$$$$$$$$$USERNAME$$$$

5/26/20

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SIGNING PLAN
BURKE COUNTY

LOCATION: BRIDGE No. 254 ON SR 1116 (JEETER CARSWELL RD.) OVER DOUBLE BRANCH

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE `D', `E' AND `F' SIGNS ON `U' CHANNEL POSTS

GENERAL NOTES

. SIGNS FURNISHED BY CONTRACTOR

. IF REMOVAL OR RELOCATION OF SIGNS ON PRIVATE STREET (NON-STATE MAINTAINED) IS REQUIRED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL INFORM THE ENGINEER. THE WORK WILL BE COMPLETED BY OTHERS.

. WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' AND 'F' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER

. ALL EXISTING SIGNS ON "U" CHANNEL POST WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS.

. WHEN EXISTING SIGNS ARE REMOVED AND INSTALLED ON NEW SUPPORTS, THE RE-ERECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL.

. THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.

. SEE ROADWAY PLANS FOR GUARD/GUIDE RAIL DETAILS.

SUMMARY OF QUANTITIES

ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4025000000	901	CONTRACTOR FURNISHED, TYPE E SIGN	58.50	S.F.
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	200.00	L.F.
4102000000	904	SIGN ERECTION, TYPE E	16.00	EA.

INDEX

SHEET NO.	DESCRIPTION
SIGN-1	TITLE SHEET
SIGN-2	TYPE E SIGNS
SIGN-3	SIGNING PLAN SHEET

PLAN PREPARED BY: N.C.D.O.T. SIGNING AND DELINEATION UNIT

K. L. JORDAN — SIGNING & DELINEATION REGIONAL ENGINEER

5/26/20

(401) QUANTITY REQ'D 1



36 X 36
W1-10R

ONE "U" POST PER SIGN

(402) QUANTITY REQ'D 1



36 X 36
W1-10L

ONE "U" POST PER SIGN

(403) QUANTITY REQ'D 2



18 X 18
W13-1P

MOUNT BELOW SIGN 401
IN 1 INSTALLATIONS

MOUNT BELOW SIGN 402
IN 1 INSTALLATIONS

(404) QUANTITY REQ'D 6



18 X 24
W1-8R

ONE "U" POST PER SIGN

(405) QUANTITY REQ'D 6



18 X 24
W1-8L

5/26/20

JEETER CARSWELL RD
SR 1116

JEETER CARSWELL RD
SR 1116

2 SIGNS
405

405

405

2 SIGNS
405

2 SIGNS
404

3 SIGNS
404

404

402

25 MPH
403

25 MPH
403

401

N

PROJ. REFERENCE NO.	SHEET NO.
BP13-R033	X-1

CROSS SECTION INDEX

X-1	*CROSS SECTION INDEX*
X-1A	*CROSS SECTION SUMMARY*
X-2 THRU X-15	*-L- SECTIONS*
X-16 THRU X-19	*-DR- SECTIONS*

PROJ. REFERENCE NO.	SHEET NO.
BP13-R033	X-1A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

Approximate quantities only. Unclassified excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
11+20.00	0	0
11+50.00	5	2
12+00.00	2	14
12+50.00	3	20
13+00.00	16	28
13+50.00	20	36
14+00.00	27	51
14+50.00	66	84
15+00.00	106	154
15+13.70	29	55

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
15+86.30	0	0
16+00.00	3	37
16+50.00	17	70
17+00.00	86	1
17+50.00	120	1
18+00.00	129	0
18+50.00	108	0
19+00.00	67	0
19+50.00	40	2
19+90.00	22	1

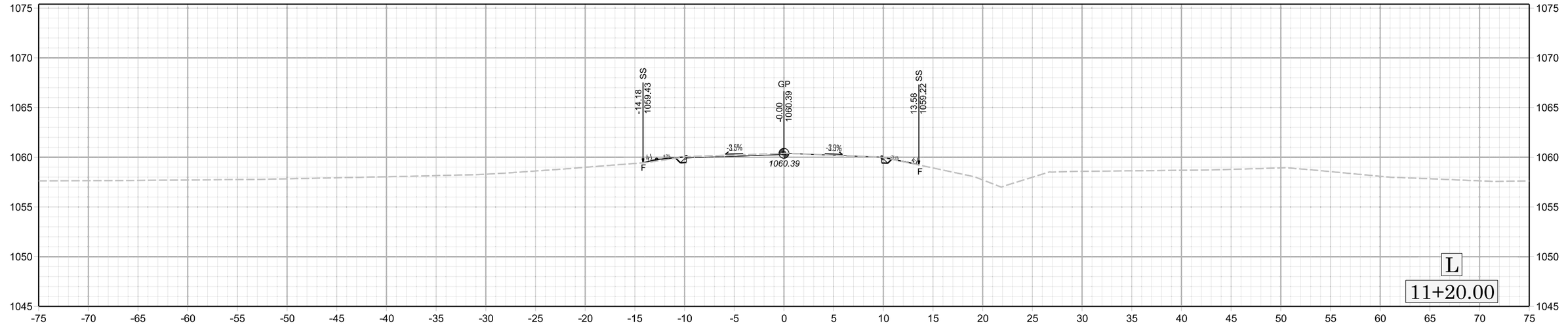
Station DR	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+25.00	5	10
10+50.00	8	16
10+75.00	13	4
10+80.00	4	0

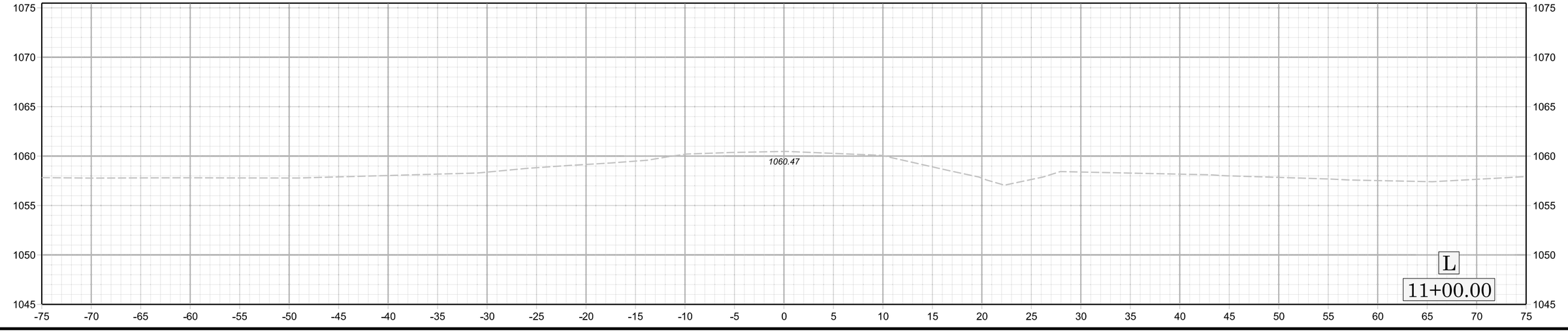
5/26/20

0 5 10

BP13-R033
X 2

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

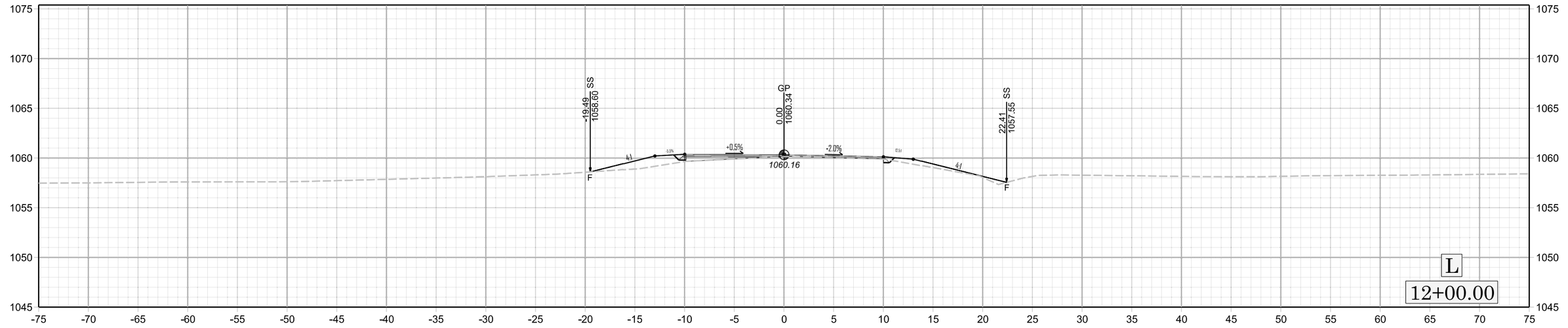


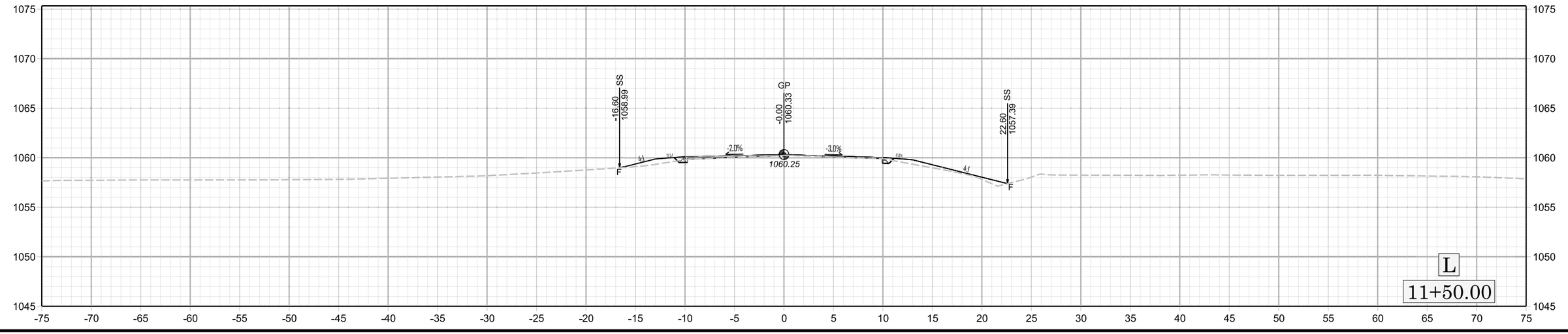


5/26/20

0 5 10

BP13-R033
X | 3

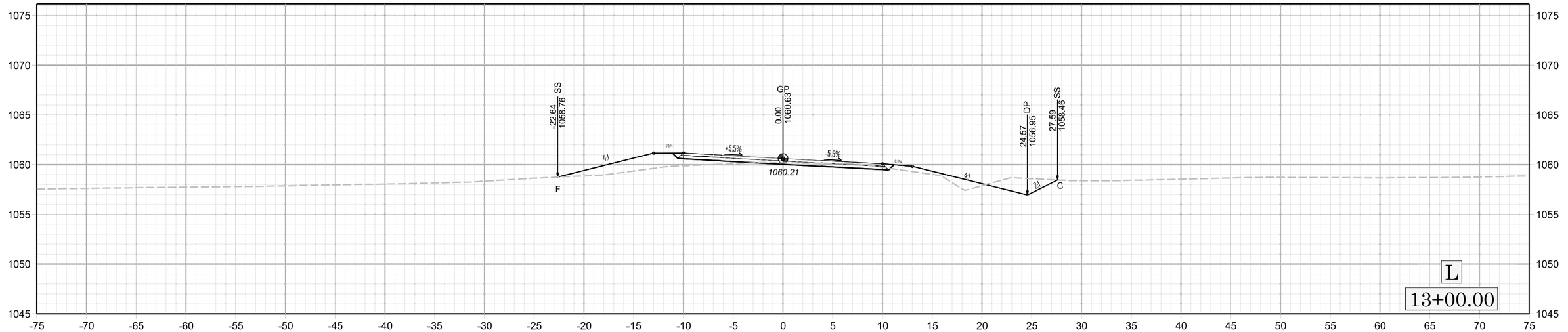


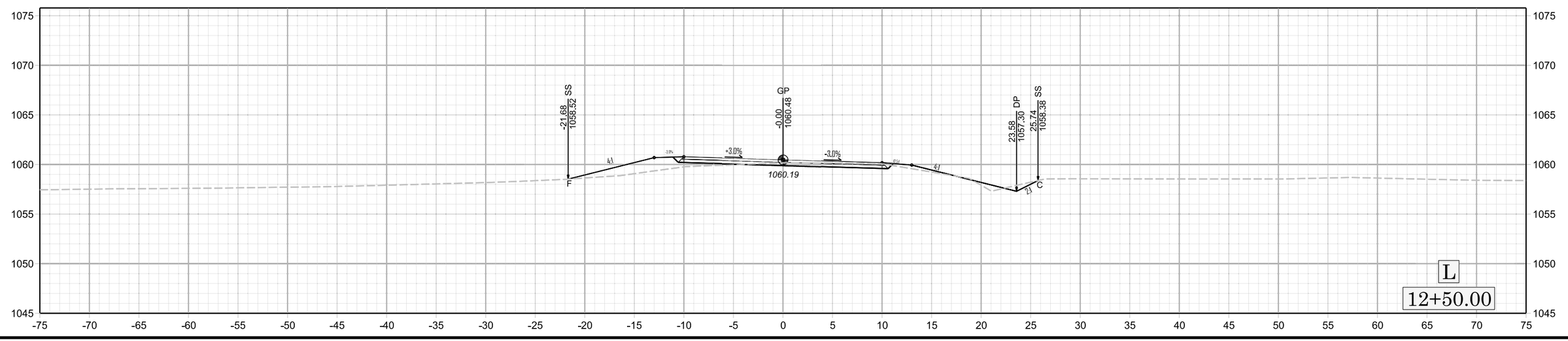


5/26/20

0 5 10

BP13-R033
X | 4

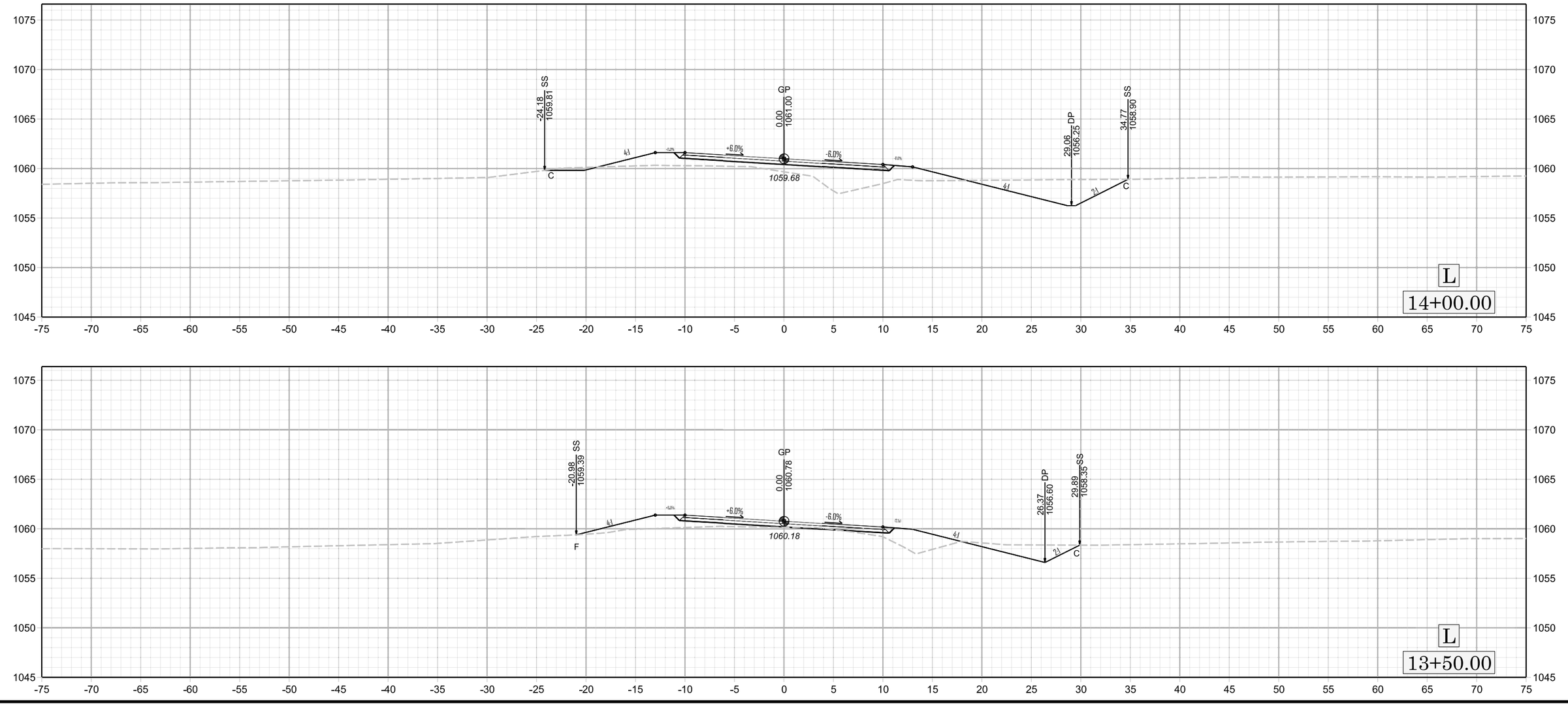




5/26/20

0 5 10

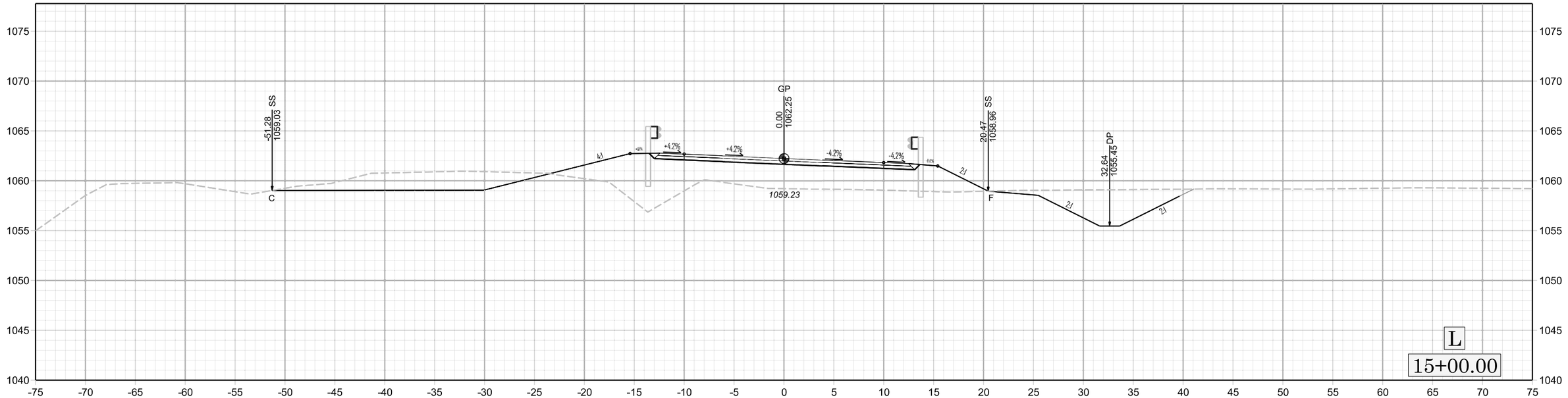
BP13-R033
X 5

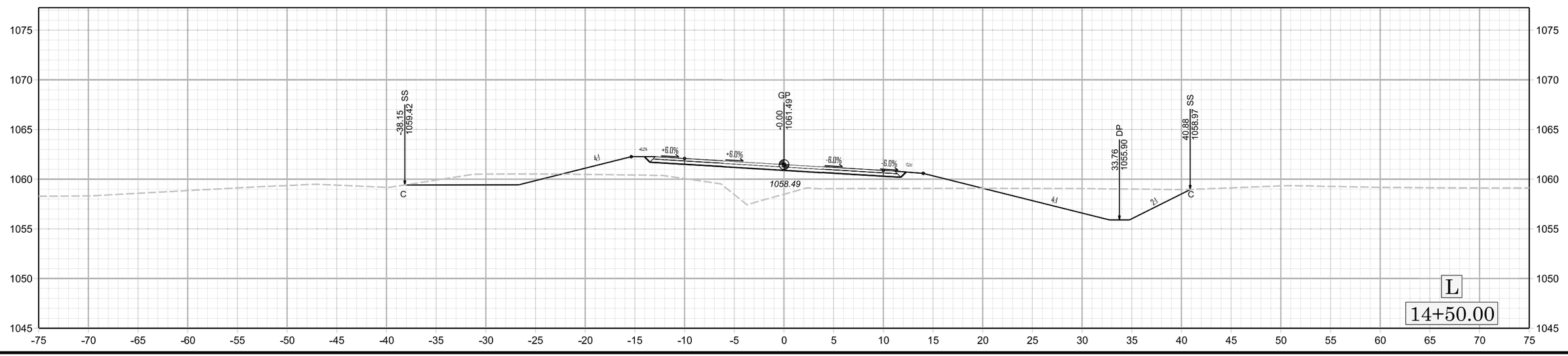


5/26/20

0 5 10

BP13-R033
X | 6

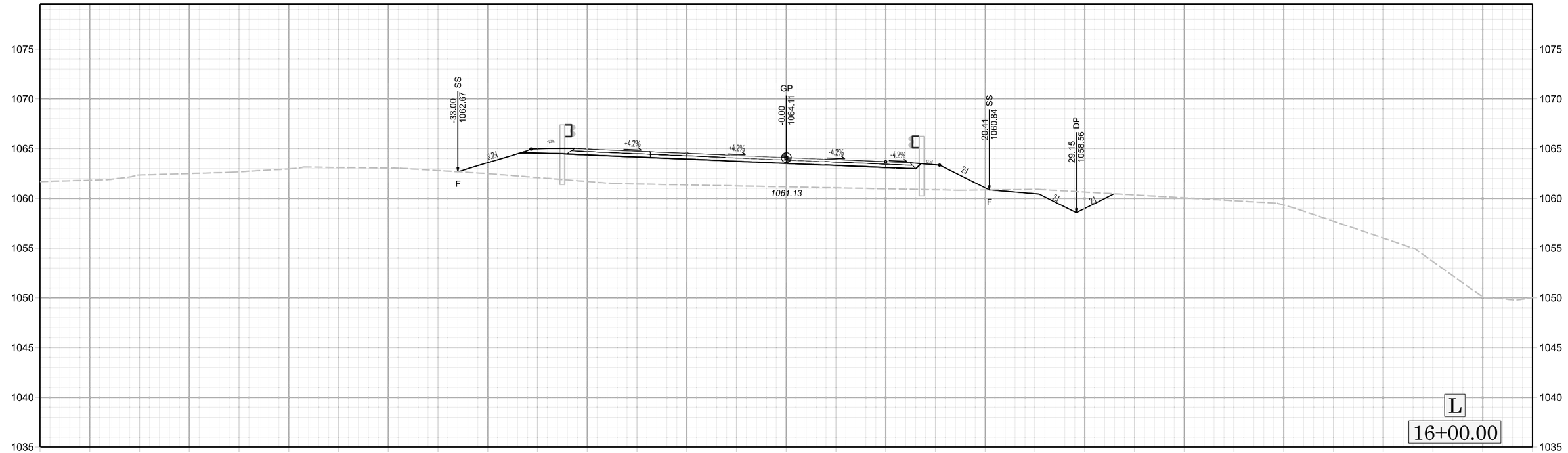


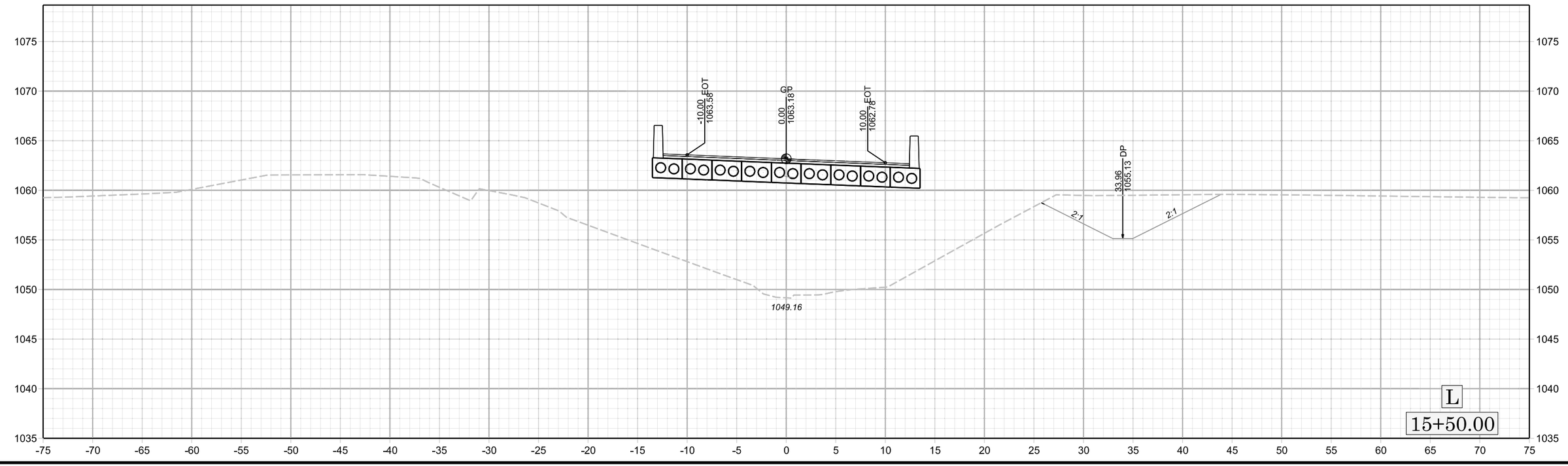


5/26/20

BP13-RD33
X | 7

0 5 10

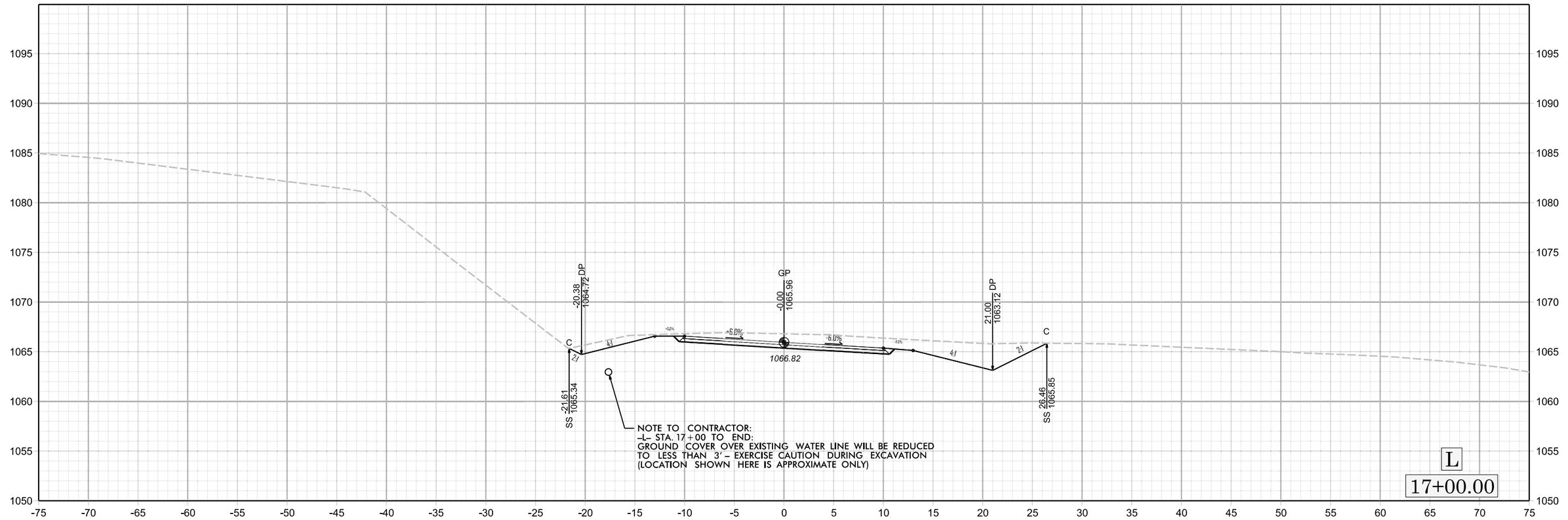


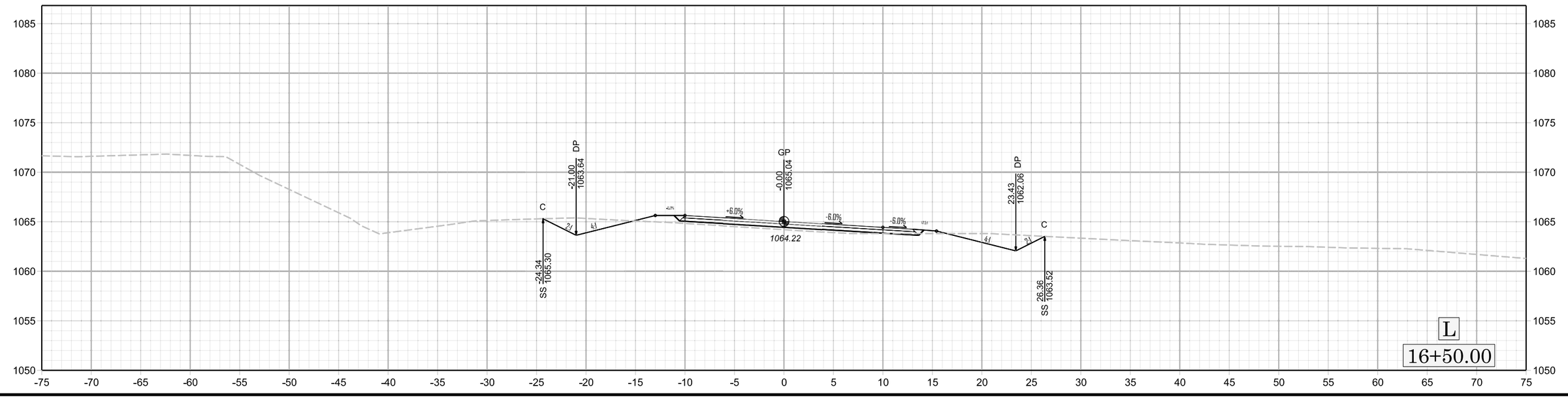


5/26/20

0 5 10

BP13-R033
X 8

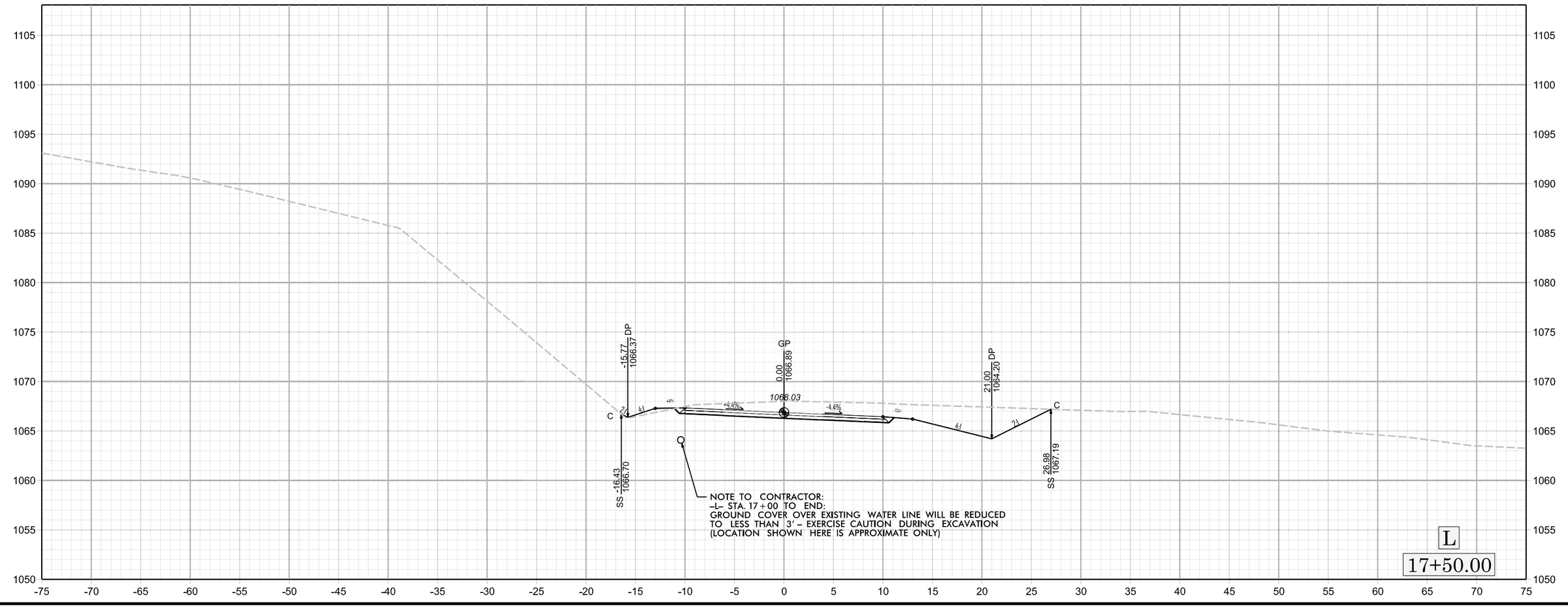




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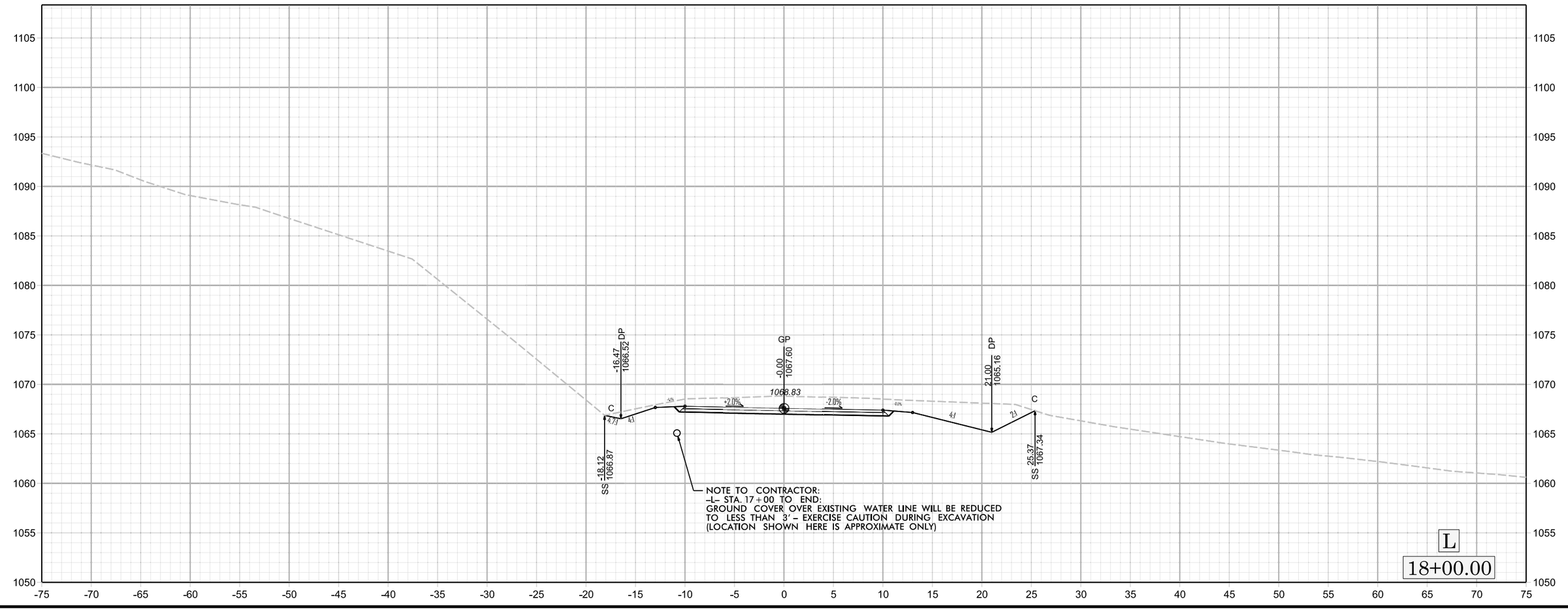
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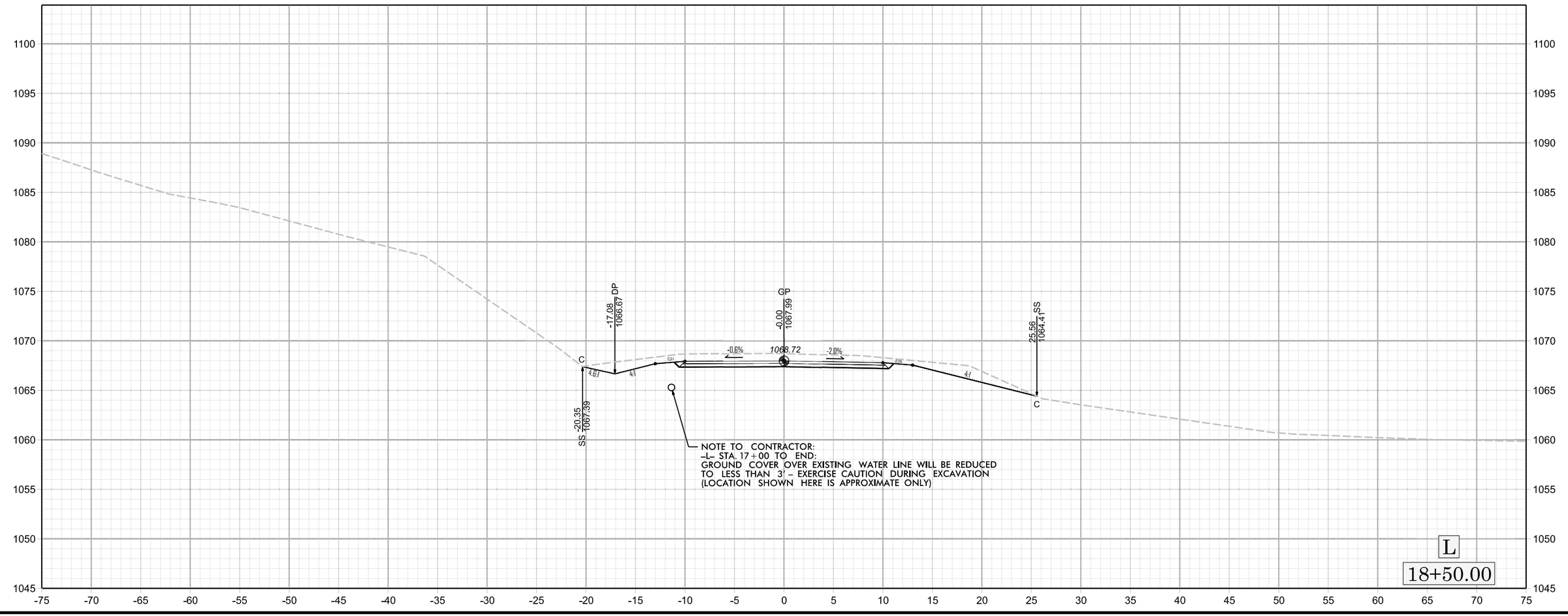
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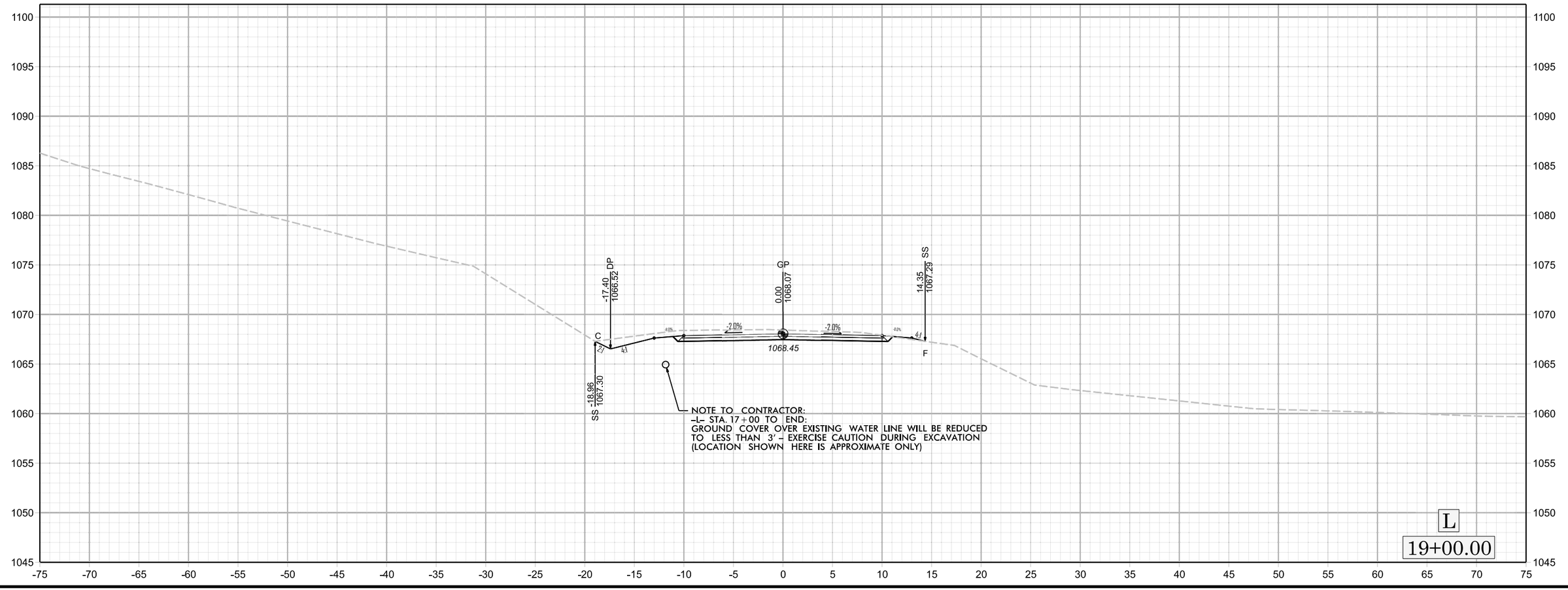
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X | II



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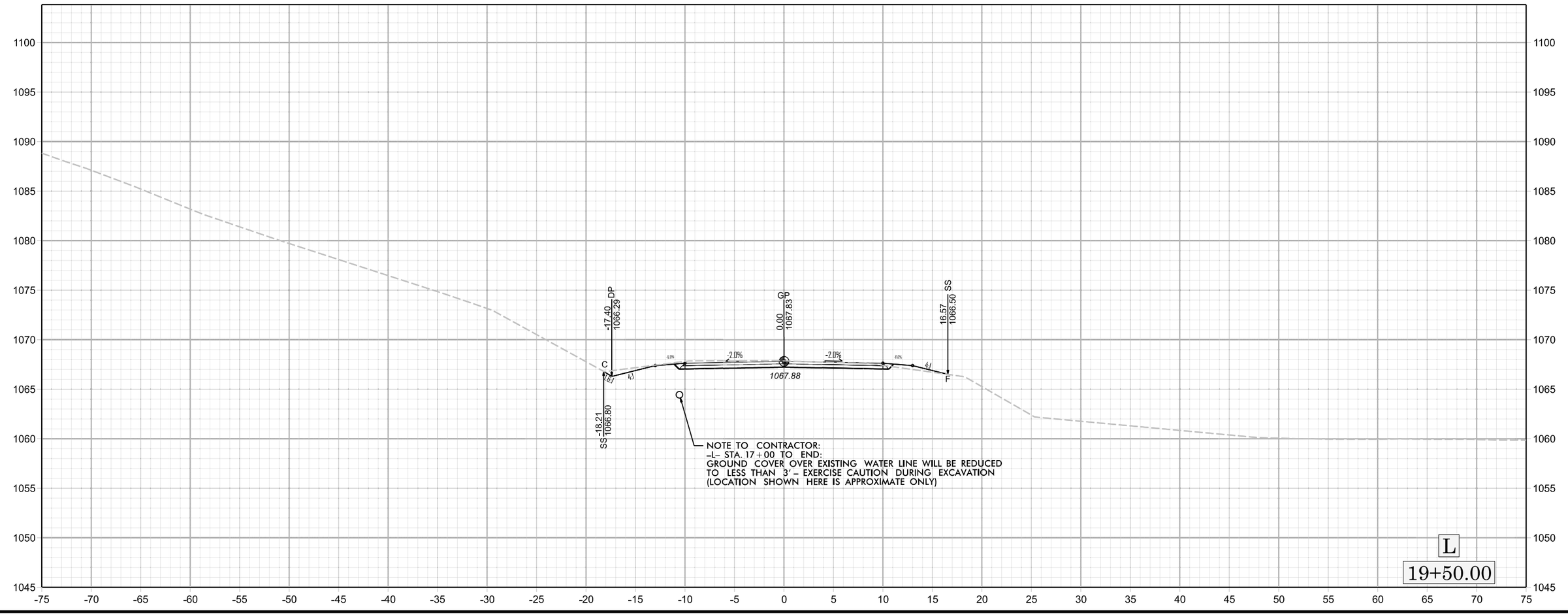
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5/26/20

0 5 10

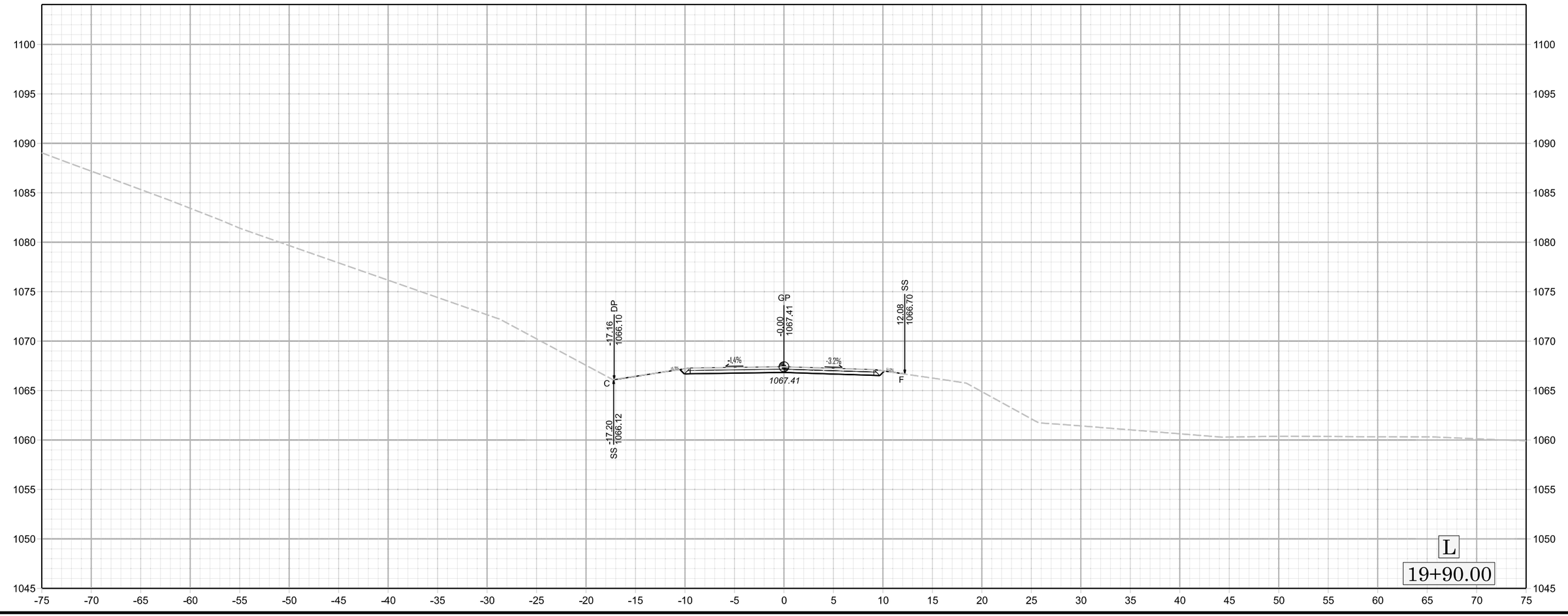
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X | 13



5/26/20

0 5 10

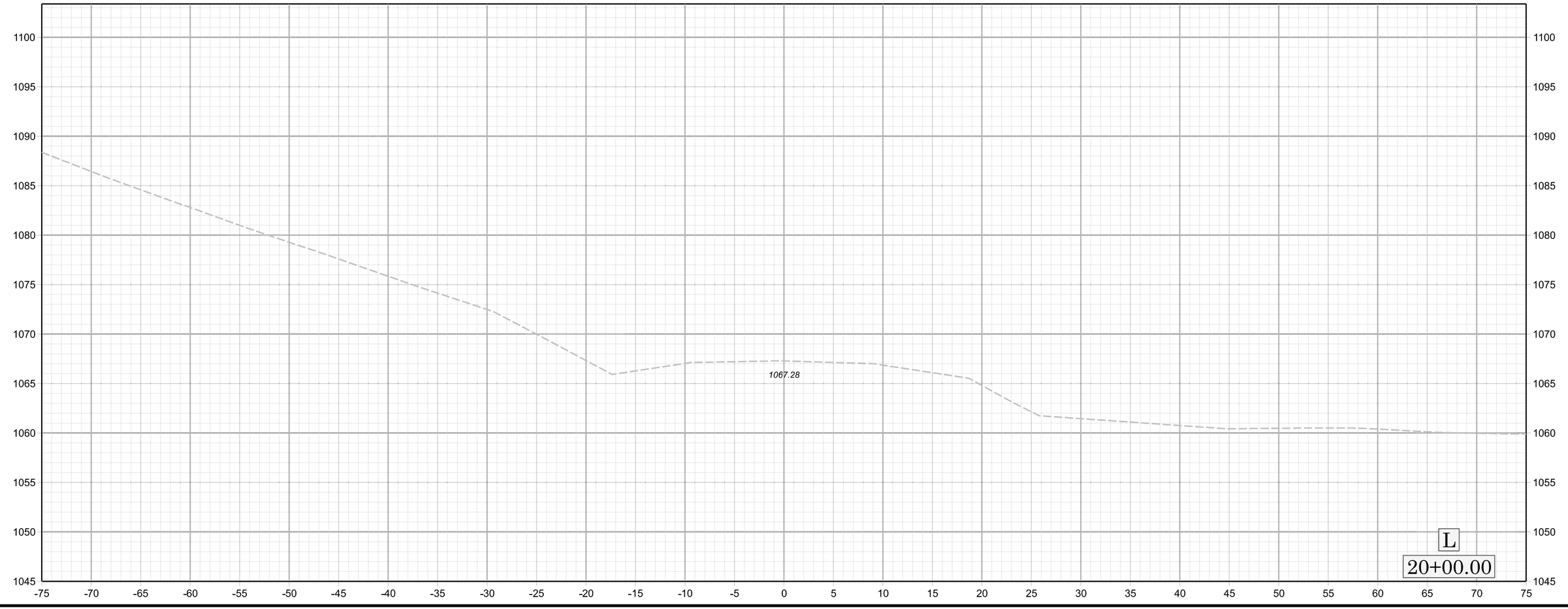
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5/26/20

0 5 10

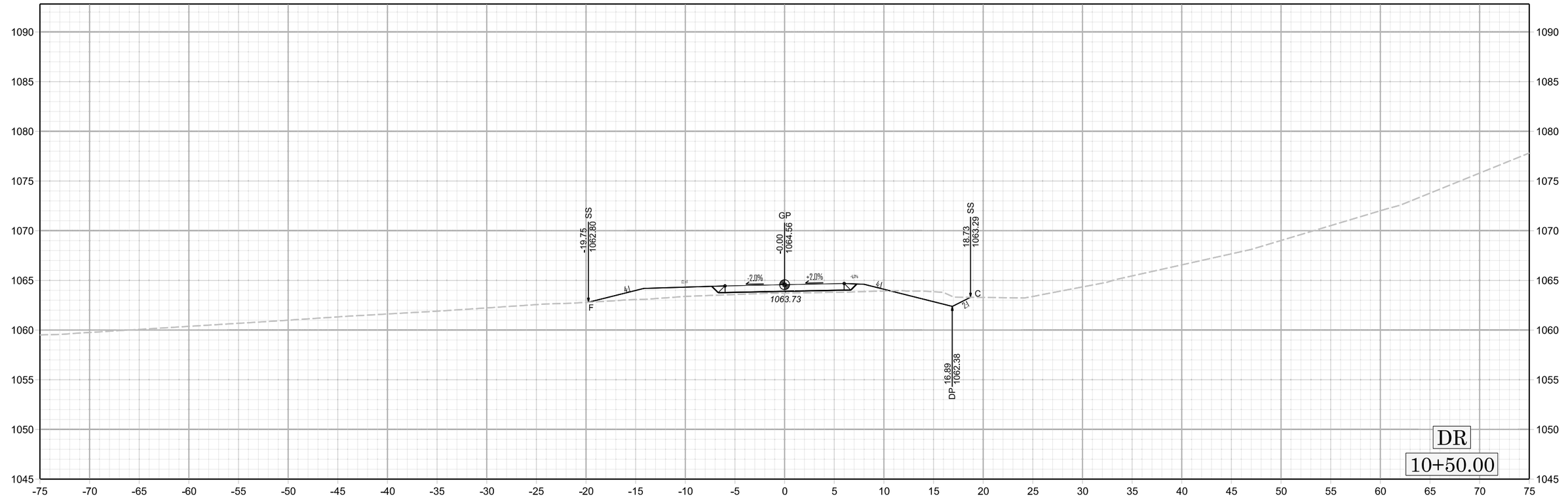
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X | 15

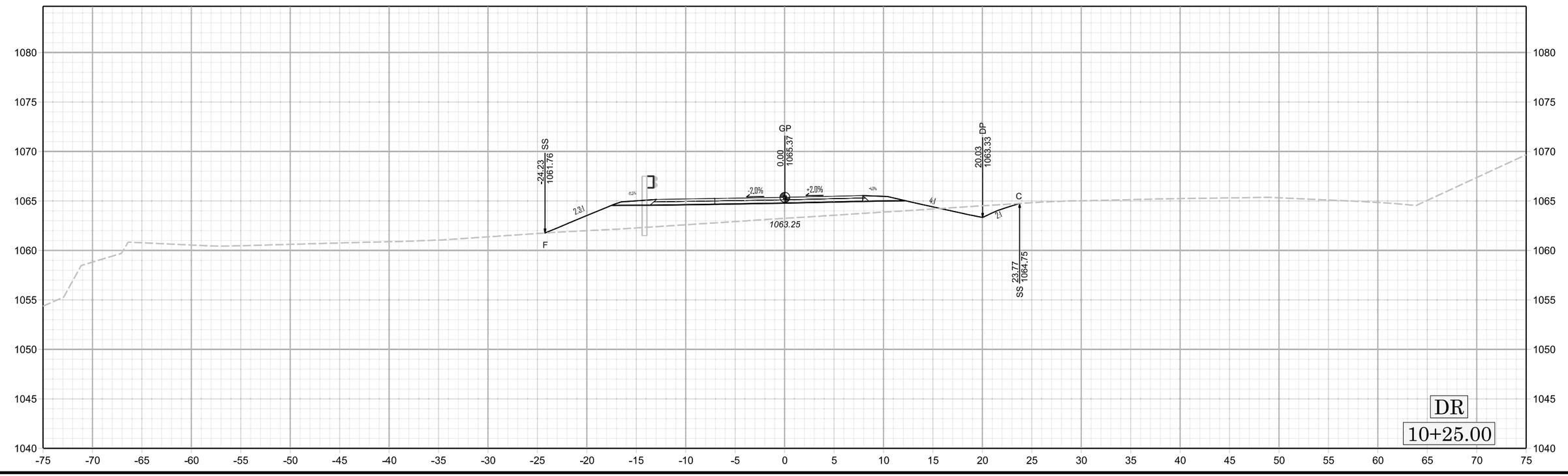


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0 5 10

BP13-R033
X | 16

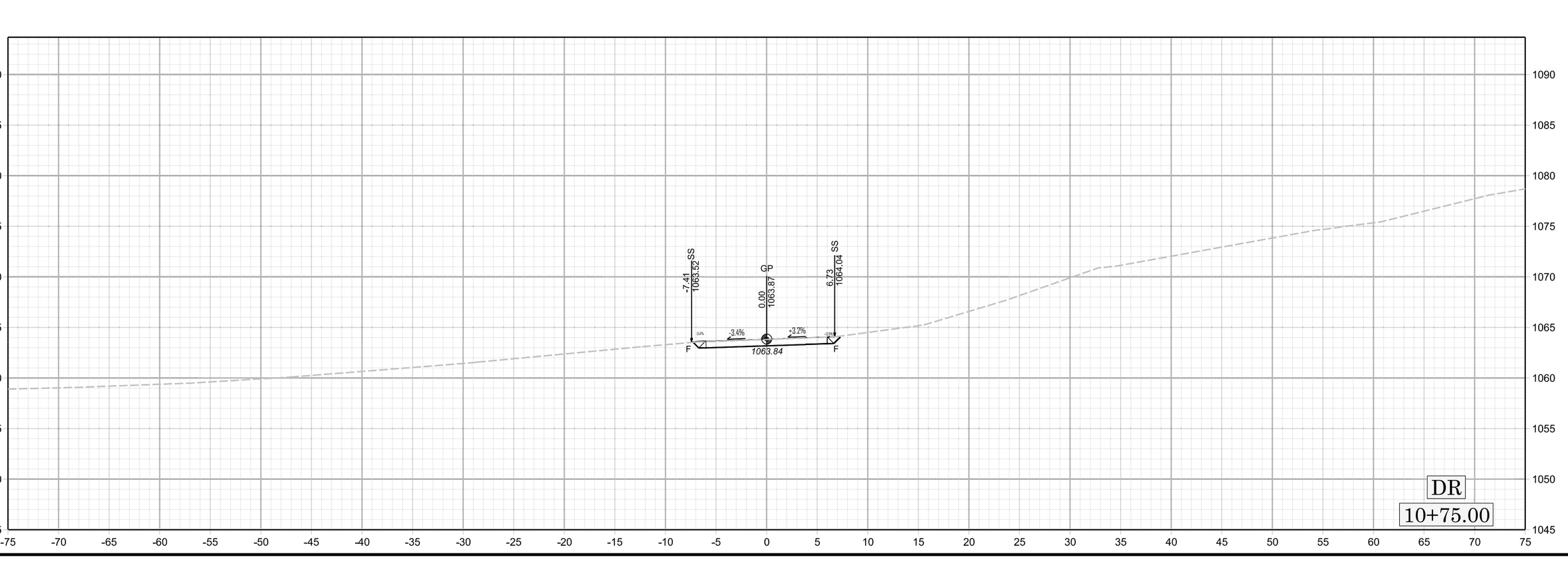




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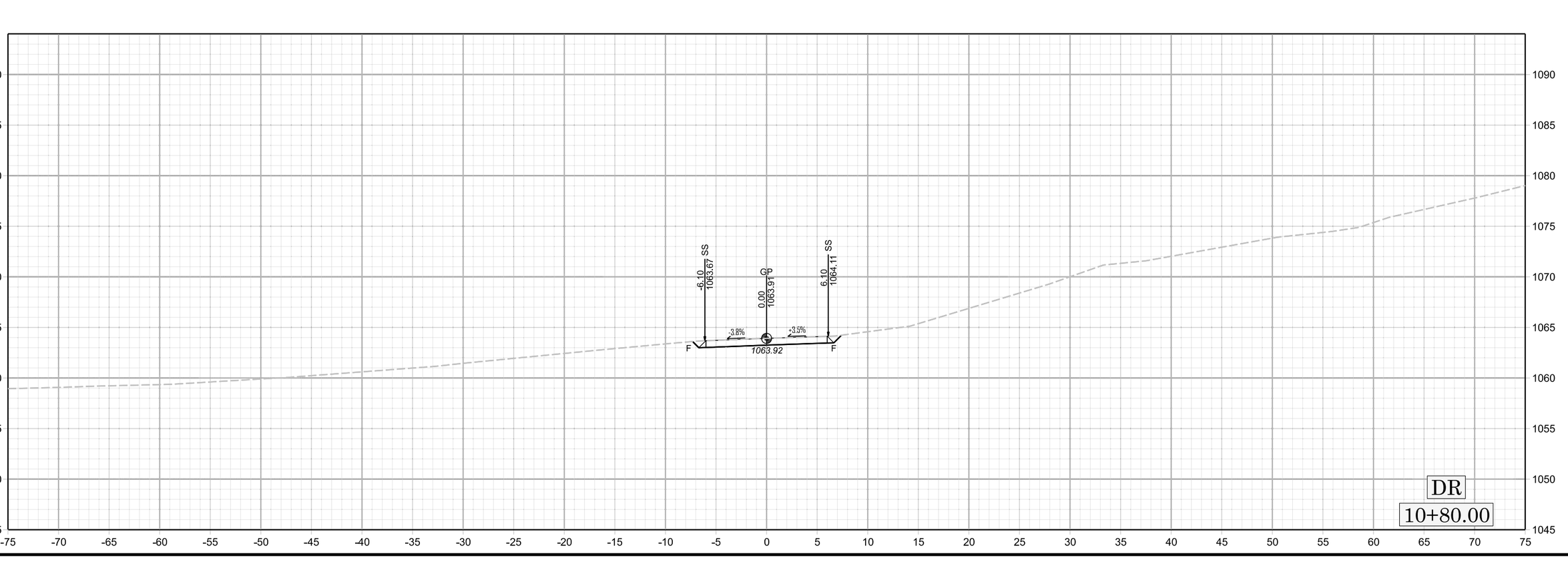
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X | 17



5/26/20

0 5 10

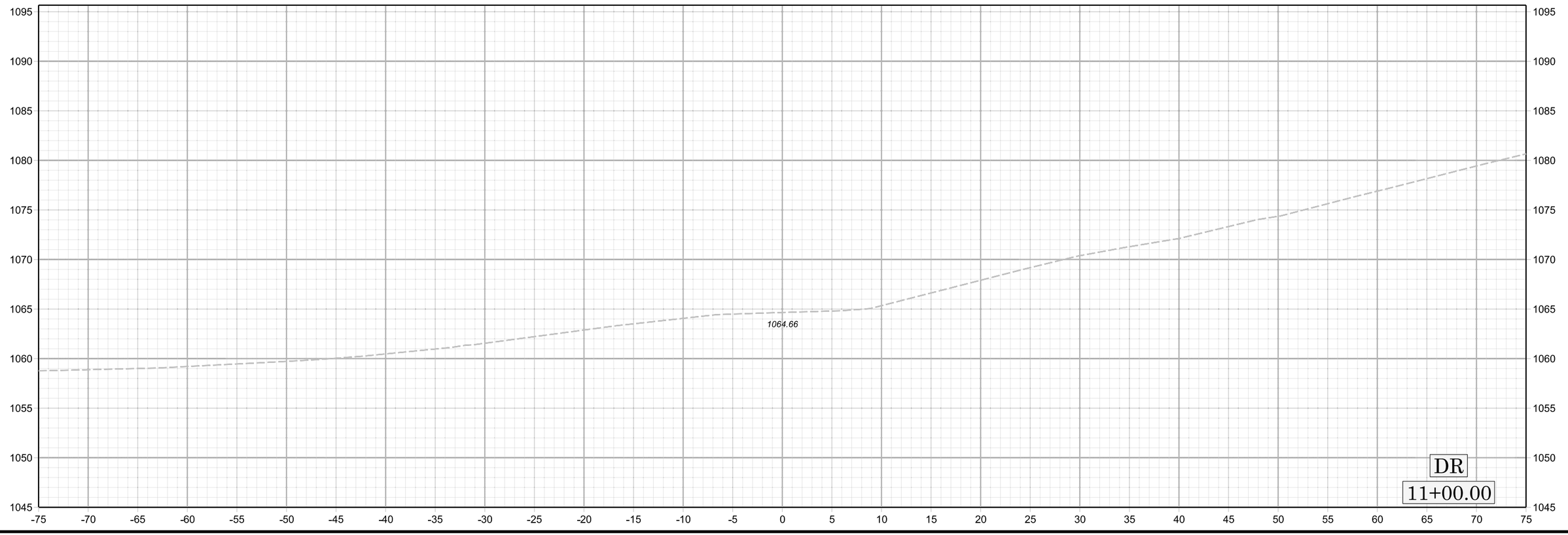
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5/26/20

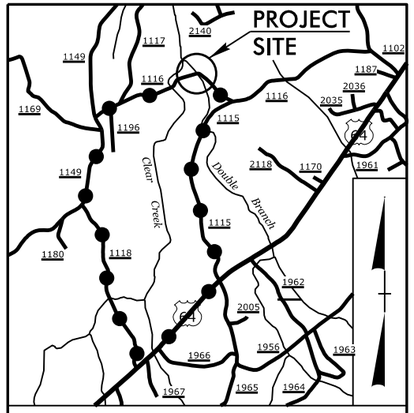
0 5 10

BP13-R033
X | 19



TIP PROJECT: BP13–R033

CONTRACT: DM00429



VICINITY MAP (NTS)

OFFSITE DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BURKE

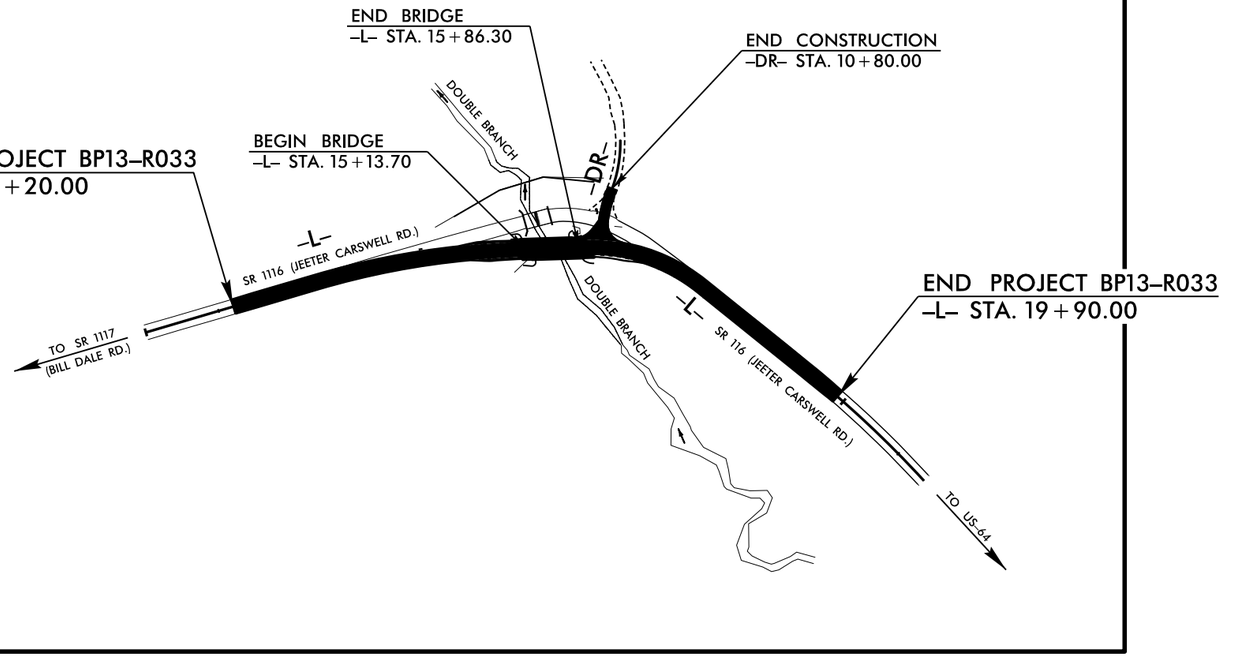
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13–R033	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP13.R033.1	–	P.E.
BP13.R033.2	–	R/W & UTILITIES
BP13.R033.3	–	CONSTRUCTION

LOCATION: BRIDGE NO. 254 ON SR 1116 (JEETER CARSWELL RD.) OVER DOUBLE BRANCH

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

4



STRUCTURES

DESIGN DATA

ADT (2025)= 500 (ESTIMATED)

V = 30 MPH

FUNC CLASS= RURAL LOCAL

SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BP13–R033 = 0.151 MILES

LENGTH STRUCTURE TIP PROJECT BP13–R033 = 0.014 MILES

TOTAL LENGTH TIP PROJECT BP13–R033 = 0.165 MILES

Prepared In the Office of:

DIVISION OF HIGHWAYS

STRUCTURES MANAGEMENT UNIT

1000 BIRCH RIDGE DR.

RALEIGH, N.C. 27610

2024 STANDARD SPECIFICATIONS

LETTING DATE :

NOVEMBER 19, 2025

JOEL DAVIS

NCDOT PROJECT ENGINEER

JEFFREY KEPICH

PROJECT DESIGN ENGINEER

Docusign Envelope ID: F65FDF18-710E-4ABF-B2FA-117B2027701C

9/26/24

15+00 15+50 16+00

SPAN A

1070 1060 1050 1040 1030

FILL FACE @ END BENT NO. 1
STA. 15+13.70 -L-
G.P. ELEV. 1062.50

1'-7" MIN. BERM (TYP.)

1'-0" MIN. EARTH BERM (TYP.)

BEGIN FRONT SLOPE
STA. 15+07.53 -L-
G.P. ELEV. 1062.39

FIX

LOW CHORD ELEV. 1059.85

UNCLASSIFIED STRUCTURE EXCAVATION (TYP.)

BASE HIGH WATER ELEV. 1060 ± (100-YR)

DESIGN HIGH WATER ELEV. 1059 ± (25-YR)

NWS ELEV. 1052 ± (05/05/23)

1'-6" TO LIMIT OF UNCLASSIFIED STRUCTURE EXCAVATION (TYP.)

FILL FACE @ END BENT NO. 2
STA. 15+86.30 -L-
G.P. ELEV. 1063.85

BEGIN FRONT SLOPE
STA. 15+93.52 -L-
G.P. ELEV. 1063.99

LOW CHORD ELEV. 1061.13

FIX

APPROXIMATE EXISTING GROUND ELEVATION

EL. 1059 ±

1'-0" (TYP.)

3'-6" KEY-IN (TYP.)

EL. 1058 ±

EL. 1049

EL. 1059 ±

2'-0" (TYP.)

EL. 1061 ±

(+) 0.3019% (+) 1.8581%

P.I. STA. = 14+35.00 -L-
EL. 1061.04
V.C. = 140'

GRADE DATA

HP 12 X 53 STEEL PILES

GRADE TO DRAIN ELEV. 1056.90 ±

CLASS II RIP RAP SLOPE 1½:1 (NORMAL) (TYP.)

END BENT 1

GRADE TO DRAIN ELEV. 1058.20 ±

CLASS II RIP RAP BANK STABILIZATION 1½:1 OR FLATTER (TYP.)

HP 12 X 53 STEEL PILES

END BENT 2

(+) 1.8581% (-) 1.2960%

P.I. STA. = 18+65.00 -L-
EL. 1069.03
V.C. = 250'

GRADE DATA

SECTION ALONG -L-

HORIZONTAL CURVE DATA

P.I. STA. = 13+70.33 -L-	P.I. STA. = 16+80.52 -L-
Δ = 14°-38'-07.7" (RT)	Δ = 40°-37'-36.9" (RT)
D = 05°-24'-18.9"	D = 24°-48'-12.1"
L = 270.76'	L = 163.80'
T = 136.12'	T = 85.51'
R = 1060'	R = 231'

CLASS II RIP RAP

1'-0" MIN. EARTH BERM (TYP.)

CLASS II RIP RAP BANK STABILIZATION (ROADWAY DETAIL & PAY ITEM) (TYP.)

EARTH BERM ELEV. 1055.68

DOUBLE BRANCH

EARTH BERM ELEV. 1056.94

TO SR 1117 (BILL DALE RD.)

FILL FACE @ END BENT 1

BEGIN FRONT SLOPE
STA. 15+07.53 -L-

15+00

-L- (SR 1116)

BRIDGE ID
STA. 15+50.00 -L-

FILL FACE @ END BENT 2

-L- PC 15+95.01

END APPROACH SLAB
STA. 15+97.00 -L-

-DR-

-DR- POT 10+(

-L- POC 16+1

16+00

BEGIN APPROACH SLAB
STA. 15+03.00 -L-

-L- PT 15+04.98

W.P. #1
STA. 15+13.70 -L-

60°-00'-00" (TYP.)

W.P. #2
STA. 15+86.30 -L-

BEGIN FRONT SLOPE
STA. 15+93.52 -L-

TO US-64

EARTH BERM ELEV. 1054.67

EARTH BERM ELEV. 1055.93

36'-3 9/16"

72'-7 3/16"

TOTAL LENGTH OF BRIDGE (FILL FACE TO FILL FACE)

PLAN ALONG -L-

(PILES NOT SHOWN FOR CLARITY)

PROJECT NO. BP13.R033

BURKE COUNTY

BRIDGE NO. 15+50.00 -L-

SHEET 1 of 5 REPLACES BRIDGE NO. 110254

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE 254 ON SR 1116
OVER DOUBLE BRANCH
BETWEEN SR 1117 AND US-64

NORTH CAROLINA PROFESSIONAL SEAL 037903 ENGINEER JEFFREY M KEPICH

Signed by: Jeffrey Kepich 8/13/2025

ms consultants, inc.
5444 Wade Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number : C-3239

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2			4			15

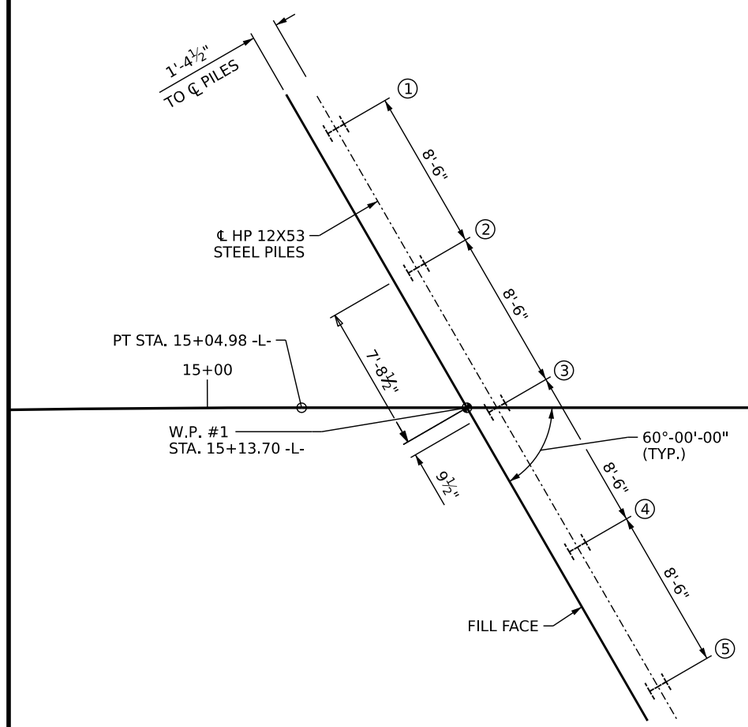
DRAWN BY : J. KEPICH DATE : 11/05/24
CHECKED BY : J. PAPCIAK DATE : 06/02/25
DESIGN ENGINEER OF RECORD: J. KEPICH DATE : 11/05/24

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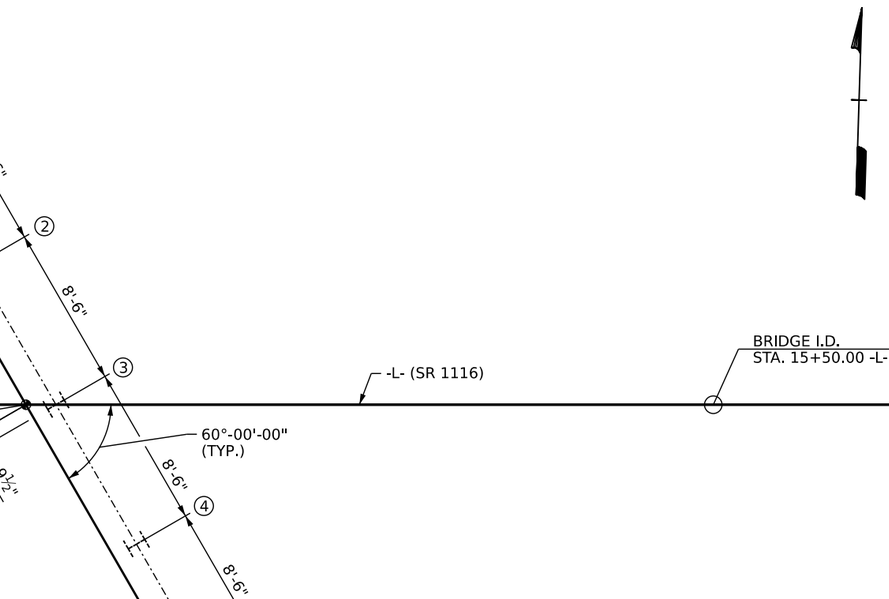
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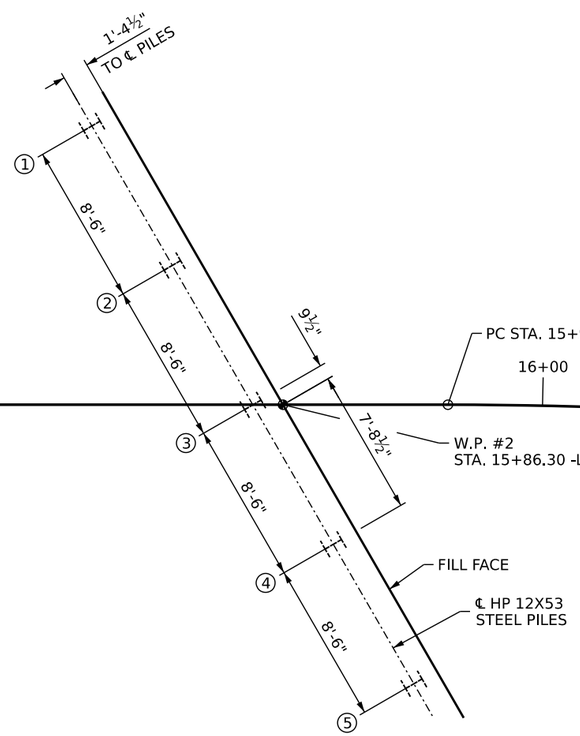
NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS



END BENT 1





END BENT 2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO CENTERLINE

PROJECT NO. **BP13.R033**

BURKE COUNTY

BRIDGE NO. **15+50.00 -L-**

SHEET 2 of 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE 254 ON SR 1116
OVER DOUBLE BRANCH
BETWEEN SR 1117 AND US-64

DRAWN BY :	J. KEPICH	DATE :	11/05/24
CHECKED BY :	J. PAPCIAK	DATE :	06/02/25
DESIGN ENGINEER OF RECORD:	J. KEPICH	DATE :	11/05/24

ms consultants, inc.
5444 Wade Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number : C-3239

NORTH CAROLINA PROFESSIONAL SEAL 037903 ENGINEER JEFFREY M KEPICH

Signed by: Jeffrey Kepich 8/13/2025

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2			4			15

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8/26/21

SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Number of Piles per Line	Factored Resistance per Pile KIPS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles **			Drilled-In Piles		
						Minimum Pile Tip (Tip No Higher Than) Elevation FT	Required Driving Resistance (RDR)* per pile KIPS	Pile Redrives Quantity EACH	Predrilling Length per Pile LIN FT	Predrilling Elevation (Elevation Not To Predrill Below) FT	Maximum Predrilling Diameter INCHES	Pile Excavation (Bottom of Hole) Elevation FT	Pile Excavation Not In Soil per Pile LIN FT	Pile Excavation In Soil per Pile LIN FT
End Bent No. 1, Piles 1-5	5	185	1057.16	30			310							
End Bent No. 2, Piles 1-5	5	185	1058.44	30			310							
TOTAL QUANTITY:														

$$^{*}RDR = \frac{Factored\ Resistance + Factored\ Drag\ Load + Factored\ Dead\ Load}{Dynamic\ Resistance\ Factor} + Nominal\ Drag\ Load\ Resistance + Nominal\ Resistance\ from\ Scourable\ Material$$

** Predrilling for Piles is required for end bents/bents with a predrilling length and at the Contractor's option for end bents/bents with predrilling information but no predrilling length.

PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile KIPS	Factored Drag Load per Pile KIPS	Factored Dead Load * per Pile KIPS	Dynamic Resistance Factor	Nominal Drag Resistance per Pile KIPS	Nominal Scour Resistance per Pile KIPS
End Bent No. 1, Piles 1-5	184			0.60		
End Bent No. 2, Piles 1-5	184			0.60		

* Factored Dead Load is factored weight of pile above the ground line.

SUMMARY OF PILE ACCESSORIES

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Pipe Pile Plates EACH	Steel Pile Points		
		Pipe Pile Cutting Shoes EACH	Pipe Pile Conical Points EACH	H-Pile Points EACH
TOTAL QUANTITY:				

SUMMARY OF DPT/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Dynamic Pile Testing (DPT)		
End Bent / Bent No (e.g., "Bent 1 - Bent 3")	DPT Test Pile Length FT	DPT Testing Quantity EACH
TOTAL QUANTITY:		

Pile Order Lengths for Concrete Piles	
End Bent / Bent No (e.g., "Bent 1 - Bent 3")	Pile Order Length Basis* EST or DPT

* EST = Pile order lengths from estimated pile lengths; DPT = Pile order lengths based on Dynamic Pile Testing. For groups of end bents/bents with pile order lengths based on DPT testing, the first end bent/bent no. listed for each group is the representative end bent/bent with the DPT.

NOTES:

1. THE PILE FOUNDATION TABLES ARE BASED ON THE BRIDGE SUBSTRUCTURE DESIGN AND FOUNDATION RECOMMENDATIONS SEALED BY A NORTH CAROLINA PROFFESIONAL ENGINEER (STEPHEN C. CROCKETT, #048207) ON 01-25-2025.
2. TOTAL PILE DRIVING EQUIPMENT SETUP QUANTITY (NOT SHOWN IN PILE FOUNDATION TABLES) EQUALS THE NUMBER OF DRIVEN PILES, I.E., THE NUMBER OF PILES WITH A REQUIRED DRIVING RESISTANCE.
3. THE ENGINEER MAY ADJUST THE QUANTITY FOR DPT TESTING AND PIPE PILE PLATES WHEN NECESSARY.

NORTH CAROLINA PROFESSIONAL SEAL 037903 ENGINEER JEFFREY M KEPICH

Signed by: Jeffrey Kepich 8/13/2025

DRAWN BY : J. KEPICH DATE : 11/05/24
CHECKED BY : J. PAPCIAK DATE : 06/02/25
DESIGN ENGINEER OF RECORD: J. KEPICH DATE : 11/05/24

ms consultants, inc.
5444 Wade Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number : C-3239

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PROJECT NO. BP13.R033
BURKE COUNTY
BRIDGE NO. 15+50.00 -L-

SHEET 3 of 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE FOUNDATION TABLES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-03
1			3			TOTAL SHEETS
2			4			15

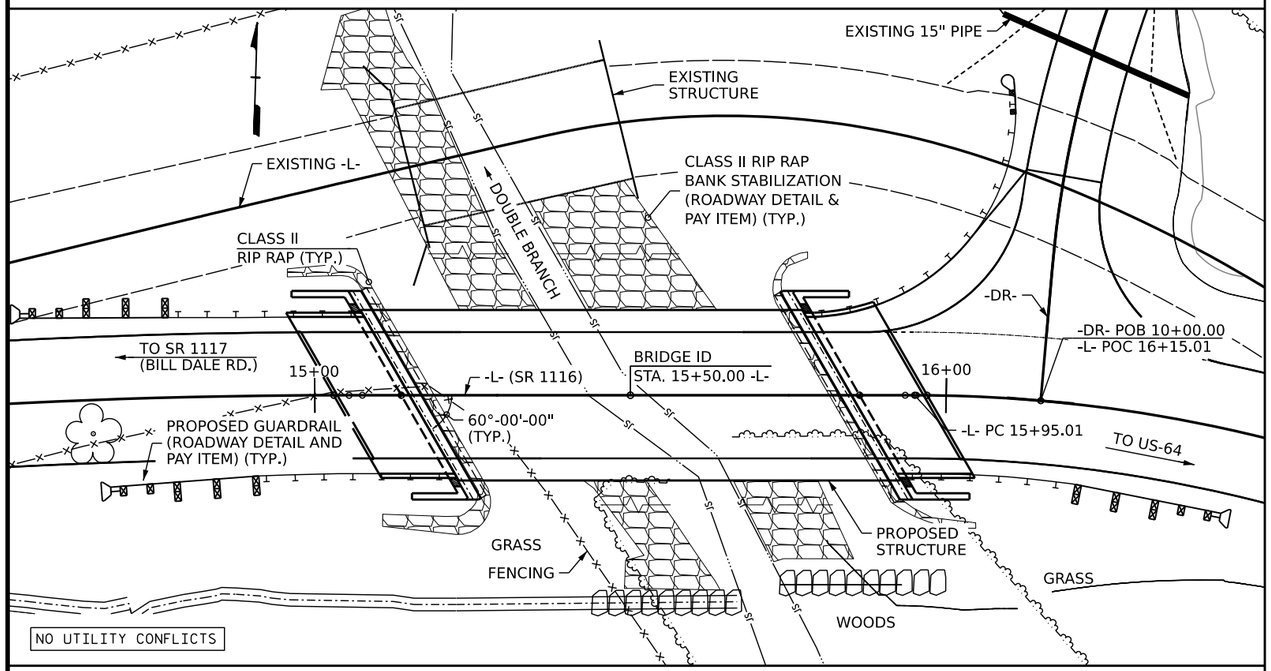
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8/26/21

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE @ STA. 15+50.00 -L-	ASBESTOS ASSESSMENT	UNCLASSIFIED STRUCTURE EXCAVATION AT STATION 15+50.00 -L-	CLASS A CONCRETE	BRIDGE APPROACH SLABS AT STATION 15+50.00 -L-	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP12X53 STEEL PILES	HP 12 X 53 STEEL PILES		VERTICAL CONCRETE BARRIER RAIL	PLAIN RIP RAP CLASS II (2'-0'' THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0'' X 2'-0'' PRESTRESSED CONCRETE CORED SLABS	
	LUMP SUM	LUMP SUM	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	EA.	NO.	LIN.FT.	LIN.FT.	TONS	SQ.YDS.	LUMP SUM	NO.	LIN.FT.
SUPERSTRUCTURE					LUMP SUM								LUMP SUM		
										140.29				9	630.00
END BENT NO. 1				21.10		2584	5	5	150		44.00	49.00			
END BENT NO. 2				21.10		2584	5	5	150		43.00	48.00			
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	42.20	LUMP SUM	5168	10	10	300	140.29	87.00	97.00	LUMP SUM	9	630.00

BM. #1 - RAILROAD SPIKE IN BASE OF MULTI-TRUNK POPLAR, 384.85' RT. OF -L- STA. 13+98.25 EL. 1064.20



LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE	= 1100 C.F.S.
FREQUENCY OF DESIGN DISCHARGE	= 25 YRS.
DESIGN HIGH WATER ELEVATION	= 1058.8
DRAINAGE AREA	= 3.8 SQ. MI.
BASE DISCHARGE (Q100)	= 1600 C.F.S.
BASE HIGH WATER ELEVATION	= 1059.6

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 2200 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	= 500 YRS.
OVERTOPPING FLOOD ELEVATION	= 1060.30
SAG POINT AT STA. 11+69.84 -L-	

DRAWN BY : J. KEPICH DATE : 11/05/24
CHECKED BY : J. PAPCIAK DATE : 06/02/25
DESIGN ENGINEER OF RECORD: J. KEPICH DATE : 11/05/24

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR SUBMITTAL OR WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPEICAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 15+50.00 -L-."

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 60 FT ON THE NORTH SIDE AND 35 FT ON THE SOUTH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF SINGLE SPAN (34'-8") OF SALVAGED STEEL I-BEAMS WITH A CLEAR ROADWAY WIDTH OF 20'-4" ON A TIMBER FLOOR ON TIMBER CAPS AND PILES LOCATED 45'-0" DOWNSTREAM FROM PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH ``HEC 18-EVALUATING SCOUR AT BRIDGES.''

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

FOR GUIDELINES REGARDING REMOVAL OF EXISTING STRUCTURE STEEL SALVAGE BEAMS, SEE REMOVAL OF EXISTING STRUCTURE AT STA. 15+50.00 -L- SPECIAL PROVISION.

PROJECT NO. BP13.R033
BURKE COUNTY
BRIDGE NO. 15+50.00 -L-

SHEET 4 of 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE 254 ON SR 1116
OVER DOUBLE BRANCH
BETWEEN SR 1117 AND US-64

NORTH CAROLINA PROFESSIONAL SEAL 037903 ENGINEER JEFFREY M. KEPICH

Signed by: Jeffrey Kepich 8/13/2025
25DF8C0B8CCC472...

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Raleigh, NC 27607
NC License Number : C-3239

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8/26/21

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LOAD TYPE		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVE-LOAD FACTORS (γ LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD		HL-93 (INVENTORY)	N/A	1	1.060	--	1.75	0.248	1.14	70'	EL	34.423	0.655	1.06	70'	EL	6.885	0.80	0.248	1.11	70'	EL	34.423	
		HL-93 (OPERATING)	N/A		1.374	--	1.35	0.248	1.48	70'	EL	34.423	0.655	1.37	70'	EL	6.885	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	2	1.320	47.508	1.75	0.248	1.48	70'	EL	34.423	0.655	1.32	70'	EL	6.885	0.80	0.248	1.44	70'	EL	34.423	
		HS-20 (OPERATING)	36.000		1.711	61.585	1.35	0.248	1.91	70'	EL	34.423	0.655	1.71	70'	EL	6.885	N/A	--	--	--	--	--	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		3.204	43.258	1.4	0.248	4.12	70'	EL	34.423	0.655	3.90	70'	EL	6.885	0.80	0.248	3.20	70'	EL	34.423	
		SNGARBS2	20.000		2.403	48.063	1.4	0.248	3.09	70'	EL	34.423	0.655	2.78	70'	EL	6.885	0.80	0.248	2.40	70'	EL	34.423	
		SNAGRIS2	22.000		2.282	50.210	1.4	0.248	2.94	70'	EL	34.423	0.655	2.58	70'	EL	6.885	0.80	0.248	2.28	70'	EL	34.423	
		SNCOTTS3	27.250		1.595	43.463	1.4	0.248	2.05	70'	EL	34.423	0.655	1.95	70'	EL	6.885	0.80	0.248	1.59	70'	EL	34.423	
		SNAGGRS4	34.925		1.339	46.755	1.4	0.248	1.72	70'	EL	34.423	0.655	1.62	70'	EL	6.885	0.80	0.248	1.34	70'	EL	34.423	
		SNS5A	35.550		1.309	46.526	1.4	0.248	1.68	70'	EL	34.423	0.655	1.65	70'	EL	6.885	0.80	0.248	1.31	70'	EL	34.423	
		SNS6A	39.950		1.203	48.069	1.4	0.248	1.55	70'	EL	34.423	0.655	1.50	70'	EL	6.885	0.80	0.248	1.20	70'	EL	34.423	
		SNS7B	42.000		1.146	48.129	1.4	0.248	1.47	70'	EL	34.423	0.655	1.48	70'	EL	6.885	0.80	0.248	1.15	70'	EL	34.423	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.468	48.444	1.4	0.248	1.89	70'	EL	34.423	0.655	1.79	70'	EL	6.885	0.80	0.248	1.47	70'	EL	34.423	
		TNT4A	33.075		1.475	48.790	1.4	0.248	1.90	70'	EL	34.423	0.655	1.74	70'	EL	6.885	0.80	0.248	1.48	70'	EL	34.423	
		TNT6A	41.600		1.208	50.272	1.4	0.248	1.55	70'	EL	34.423	0.655	1.58	70'	EL	6.885	0.80	0.248	1.21	70'	EL	34.423	
		TNT7A	42.000		1.216	51.061	1.4	0.248	1.56	70'	EL	34.423	0.655	1.55	70'	EL	6.885	0.80	0.248	1.22	70'	EL	34.423	
		TNT7B	42.000		1.261	52.955	1.4	0.248	1.62	70'	EL	34.423	0.655	1.44	70'	EL	6.885	0.80	0.248	1.26	70'	EL	34.423	
		TNAGRIT4	43.000		1.197	51.476	1.4	0.248	1.54	70'	EL	34.423	0.655	1.40	70'	EL	6.885	0.80	0.248	1.20	70'	EL	34.423	
		TNAGT5A	45.000		1.128	50.745	1.4	0.248	1.45	70'	EL	34.423	0.655	1.39	70'	EL	6.885	0.80	0.248	1.13	70'	EL	34.423	
		TNAGT5B	45.000	3	1.113	50.088	1.4	0.248	1.43	70'	EL	34.423	0.655	1.33	70'	EL	6.885	0.80	0.248	1.11	70'	EL	34.423	
EMERGENCY VEHICLE (EV)		EV2	28.750		1.198	57.432	1.3	0.248	2.32	70'	EL	34.423	0.655	2.08	70'	EL	6.885	0.80	0.248	1.20	70'	EL	34.423	
		EV3	43.000	4	1.306	56.170	1.3	0.248	1.52	70'	EL	34.423	0.655	1.41	70'	EL	6.885	0.80	0.248	1.31	70'	EL	34.423	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γDC	γDW
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

(#) CONTROLLING LOAD RATING

1. DESIGN LOAD RATING (HL-93)
2. DESIGN LOAD RATING (HS-20)
3. LEGAL LOAD RATING * *
4. EMERGENCY VEHICLE LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY
FOR SPAN "A"

PROJECT NO. BP13.R033
BURKE COUNTY
STATION: 15+50.00 -L-

SHEET 5 of 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

LRFR SUMMARY FOR 70' CORED SLAB UNIT 60° SKEW & 120° SKEW

(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-05
1			3			TOTAL SHEETS
2			4			15

NORTH CAROLINA PROFESSIONAL SEAL 037903 ENGINEER JEFFREY M KEPICH

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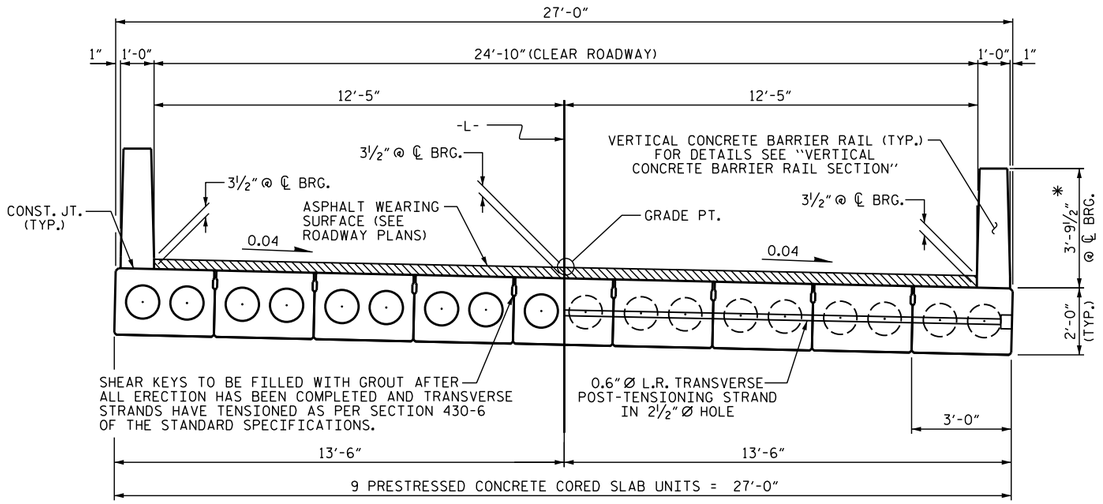
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ASSEMBLED BY: J.M. KEPICH		DATE : 12/17/24	
CHECKED BY : J. PAPCIAK		DATE : 06/02/25	
DRAWN BY : CVC	6/10	REV. BY : BNB/AKP	06/23
CHECKED BY : DNS	6/10	.	

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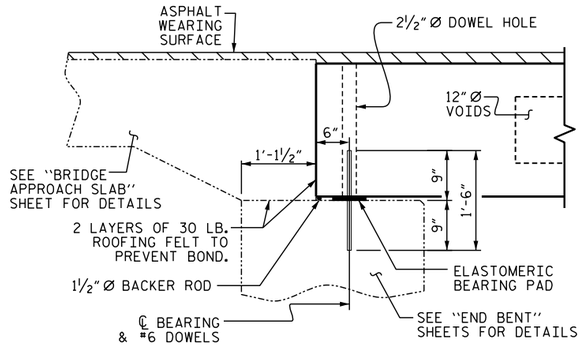
HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

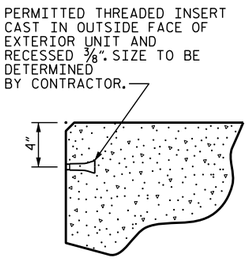
TYPICAL SECTION

* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE ″VERTICAL CONCRETE BARRIER RAIL SECTION″ DETAIL.

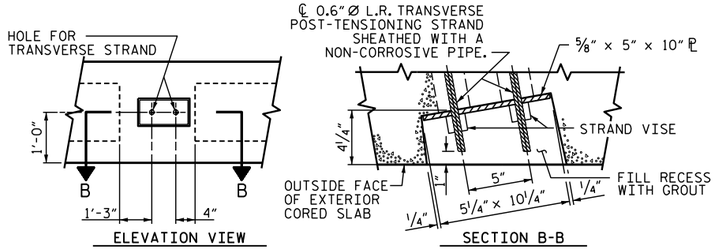
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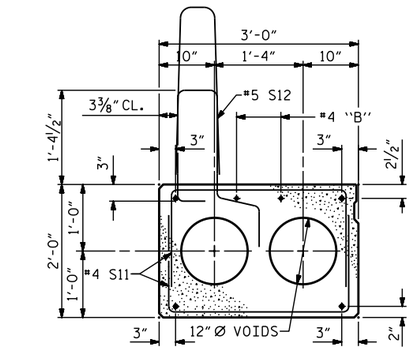
SECTION AT END BENT



THREADED INSERT DETAIL

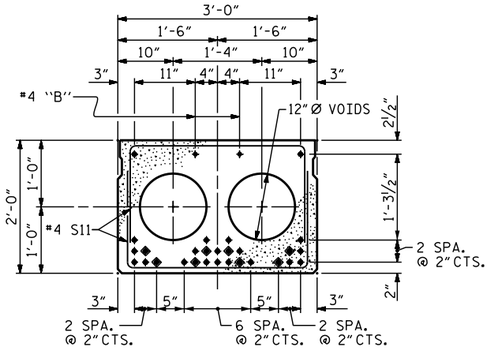


GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS



EXTERIOR SLAB SECTION

(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)



INTERIOR SLAB SECTION (70′ UNIT)

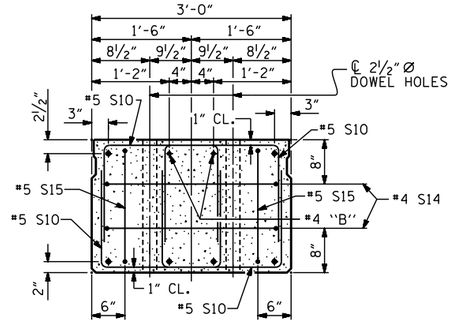
(28 STRANDS REQUIRED)

0.6″ Ø LOW RELAXATION STRAND LAYOUT

◈ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 12′-0″ FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

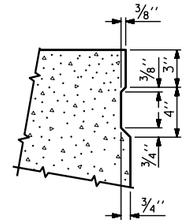
◉ OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND



END ELEVATION

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.



SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.

PROJECT NO. BP13.R033

BURKE COUNTY

STATION: 15+50.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3′-0″ X 2′-0″ PRESTRESSED CONCRETE CORED SLAB UNIT

ASSEMBLED BY : J.M. KEPICH	DATE : 12/17/24
CHECKED BY : J. PAPCIAK	DATE : 06/02/25
DRAWN BY : MAA 6/10	REV. 8/14 MAA/TMG
CHECKED BY : MKT 7/10	

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NORTH CAROLINA PROFESSIONAL SEAL 037903 ENGINEER JEFFREY M KEPICH

Signed by: Jeffrey Kepich 8/13/2025

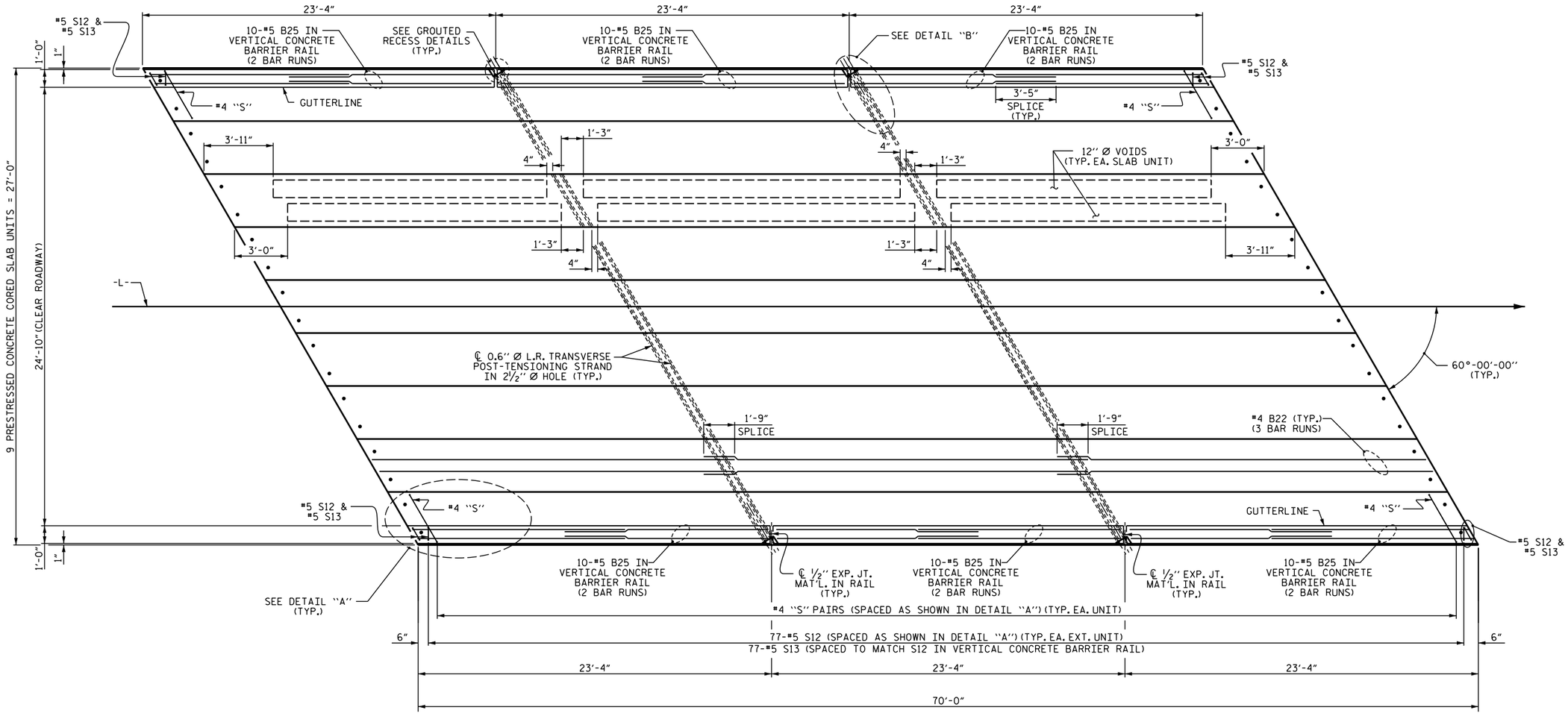
ms consultants, inc.
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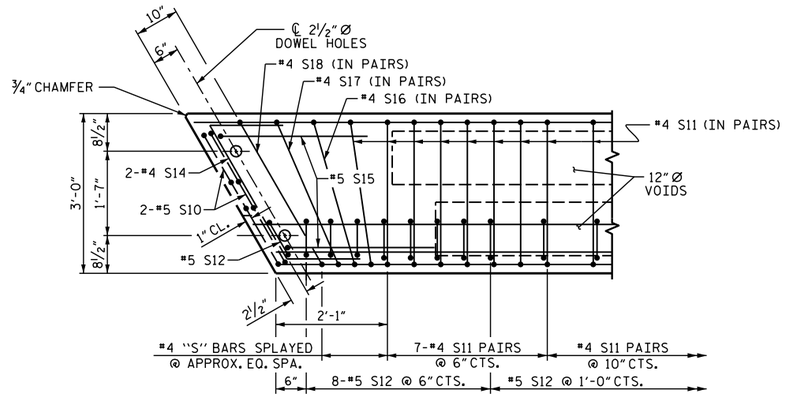
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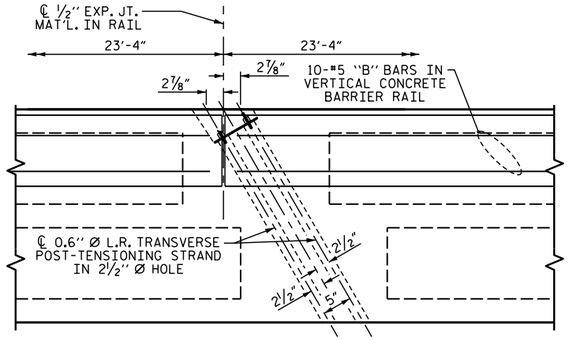


PLAN OF UNIT



DETAIL "A"

(SIMILAR EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.



DETAIL "B"

#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2½" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

PROJECT NO. **BP13.R033**

BURKE COUNTY

STATION: **15+50.00 -L-**

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 70' UNIT 24'-10" CLEAR ROADWAY 60° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 037903 ENGINEER JEFFREY M KEPICH

Signed by: Jeffrey Kepich 8/13/2025

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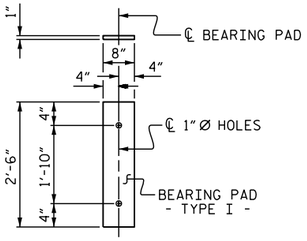
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2			4			15

ASSEMBLED BY : J.M. KEPICH		DATE : 12/17/24	
CHECKED BY : J. PAPCIAK		DATE : 06/02/25	
DRAWN BY : MAA 6/10	REV. 12/5/11	MAA/AAC	
CHECKED BY : MKT 7/10	REV. 8/14	MAA/TMG	

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FIXED END
(TYPE I - 18 REQ'D)

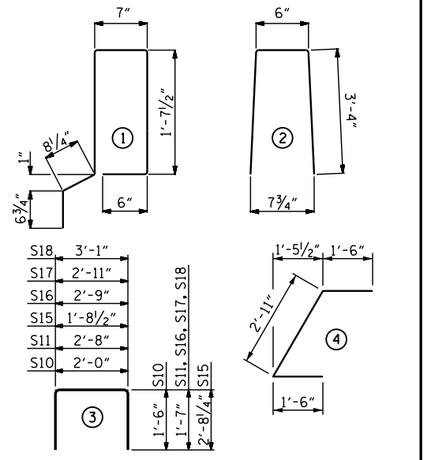
ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

BILL OF MATERIAL FOR ONE 70' CORED SLAB UNIT

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B22	6	#4	STR	24'-6"	98	24'-6"	98
S10	8	#5	3	5'-0"	42	5'-0"	42
S11	170	#4	3	5'-10"	662	5'-10"	662
✱S12	79	#5	1	5'-7"	460		
S14	4	#4	4	5'-11"	16	5'-11"	16
S15	4	#5	3	7'-1"	30	7'-1"	30
S16	4	#4	3	5'-11"	16	5'-11"	16
S17	4	#4	3	6'-1"	16	6'-1"	16
S18	4	#4	3	6'-3"	17	6'-3"	17
REINFORCING STEEL LBS.					897		897
✱EPOXY COATED REINFORCING STEEL LBS.					460		
7000 P.S.I. CONCRETE CU. YDS.					12.0		12.0
0.6"Ø L.R. STRANDS No.					28		28

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2½"Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

ALL REINFORCING STEEL IN VERTICAL CONCRETE BARRIER RAILS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM.

THE #4 S11 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	70' UNIT					
✱B25	120	120	#5	STR	13'-8"	1711
✱S13	158	158	#5	2	7'-2"	1181
✱EPOXY COATED REINFORCING STEEL				LBS.		2892
CLASS AA CONCRETE				CU.YDS.		18.1
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		140.29

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
70' UNIT			
EXTERIOR C.S.	2	70'-0"	140'-0"
INTERIOR C.S.	7	70'-0"	490'-0"
TOTAL	9		630'-0"

GRADE 270 STRANDS

	0.6"Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950

DEAD LOAD DEFLECTION AND CAMBER

	3'-0"x 2'-0"
70' CORED SLAB UNIT	0.6"Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2¼" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD✱✱	¾" ↓
FINAL CAMBER	1½" ↑

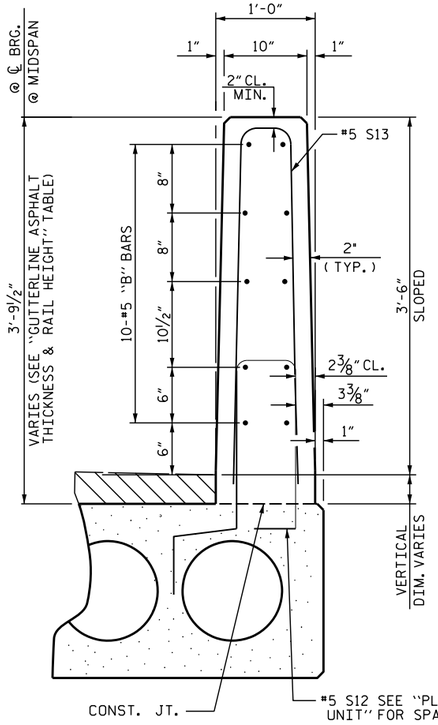
✱✱ INCLUDES FUTURE WEARING SURFACE

CONCRETE RELEASE STRENGTH

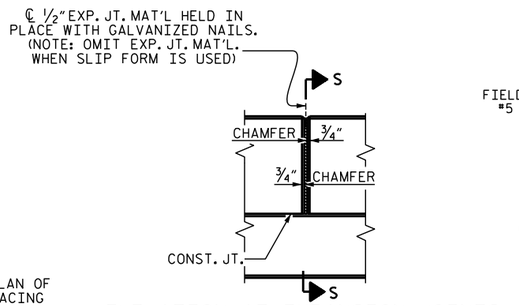
UNIT	PSI
70' UNITS	5500

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

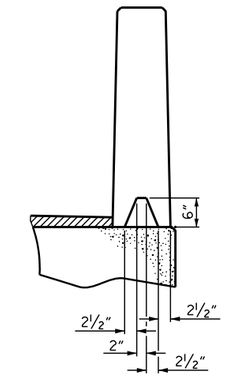
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
70' UNITS	2"	3'-8"



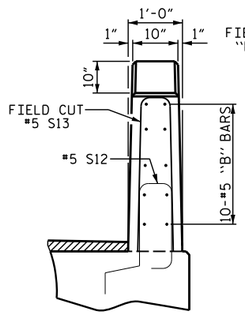
SECTION THRU RAIL



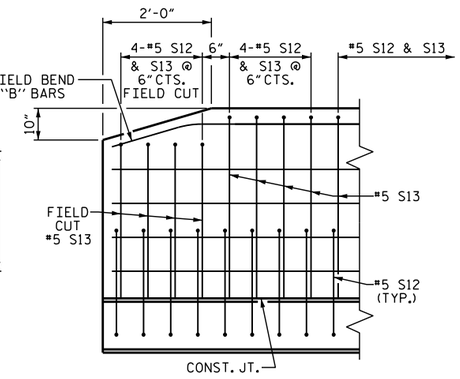
ELEVATION AT EXPANSION JOINTS



SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



END VIEW



SIDE VIEW

VERTICAL CONCRETE BARRIER RAIL DETAILS

END OF RAIL DETAILS

PROJECT NO. BP13.R033
BURKE COUNTY
STATION: 15+50.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0"X 2'-0"
PRESTRESSED CONCRETE
CORED SLAB UNIT

NORTH CAROLINA PROFESSIONAL SEAL 037903 ENGINEER JEFFREY M KEPICH

Signed by: Jeffrey Kepich 25DF8C099CCC472... 8/13/2025

ms consultants, inc.
5444 Wade Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number : C-3239

ASSEMBLED BY : J.M. KEPICH	DATE : 12/17/24
CHECKED BY : J. PAPCIAK	DATE : 06/02/25
DRAWN BY : MAA 6/10	REV. 5/18 MAA/THC
CHECKED BY : MKT 7/10	

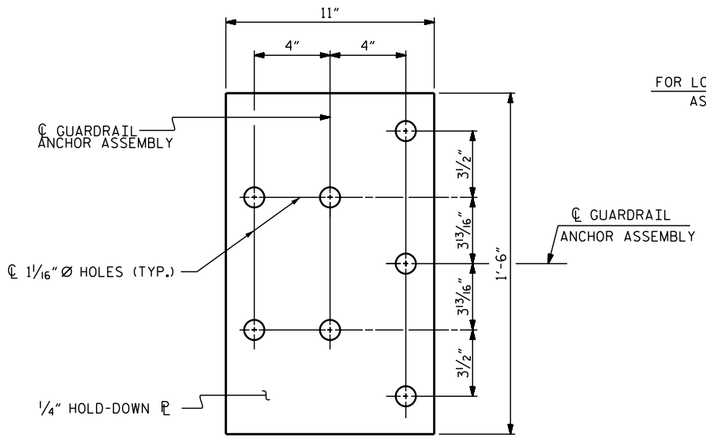
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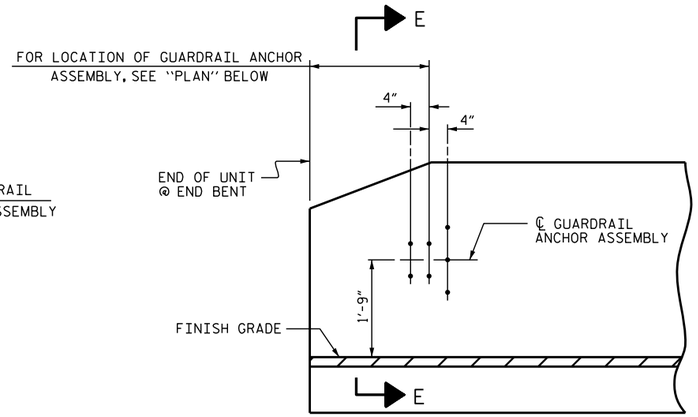
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PLAN



ELEVATION

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

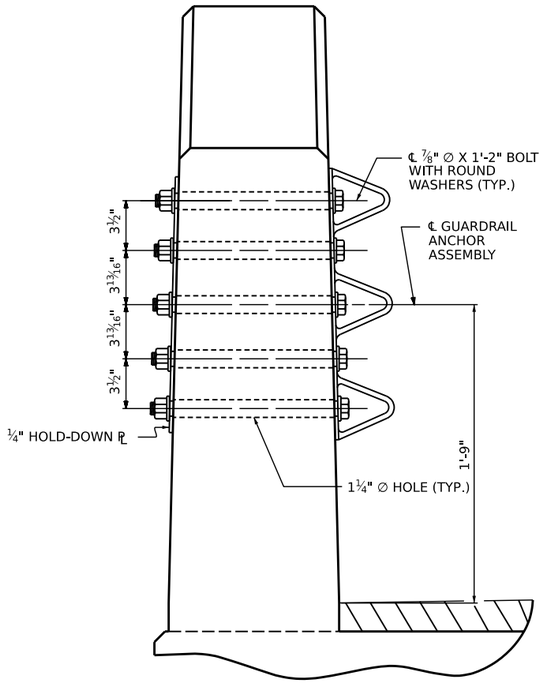
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

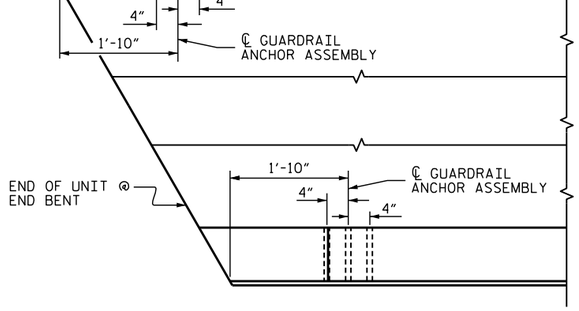
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



SECTION E-E



PLAN



SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

GUARDRAIL ANCHOR ASSEMBLY DETAILS

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR

PROJECT NO. **BP13.R033**

BURKE COUNTY

STATION: **15+50.00 -L-**

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE DETAILS
FOR VERTICAL CONCRETE BARRIER RAIL

ASSEMBLED BY : J.M. KEPICH	DATE : 12/17/24
CHECKED BY : J. PAPCIAK	DATE : 06/02/25
DRAWN BY : MAA 5/10	REV. 1/15 MAA/TMG
CHECKED BY : GM 5/10	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

NORTH CAROLINA PROFESSIONAL SEAL 037903 ENGINEER JEFFREY M. KEPICH

Signed by: Jeffrey Kepich 8/13/2025

ms consultants, inc.
5444 Wade Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number : C-3239

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(SHT 1b) STD. NO. GRA3

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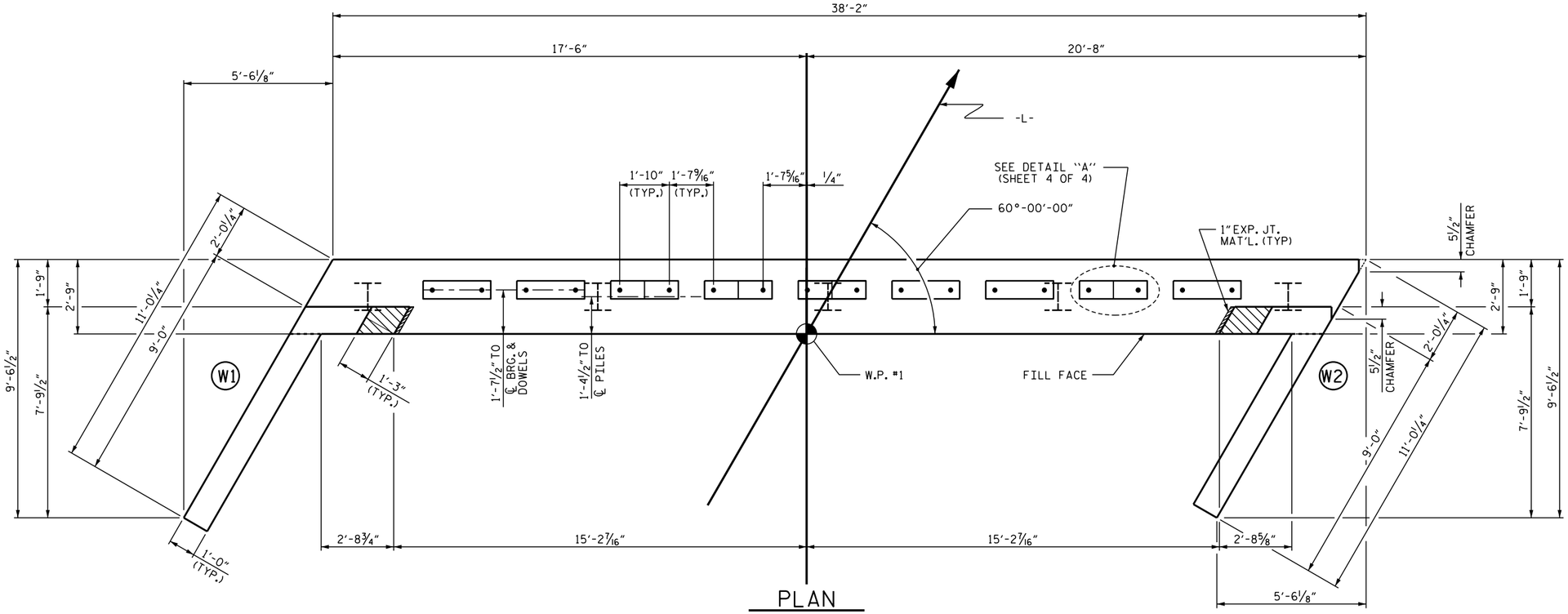
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

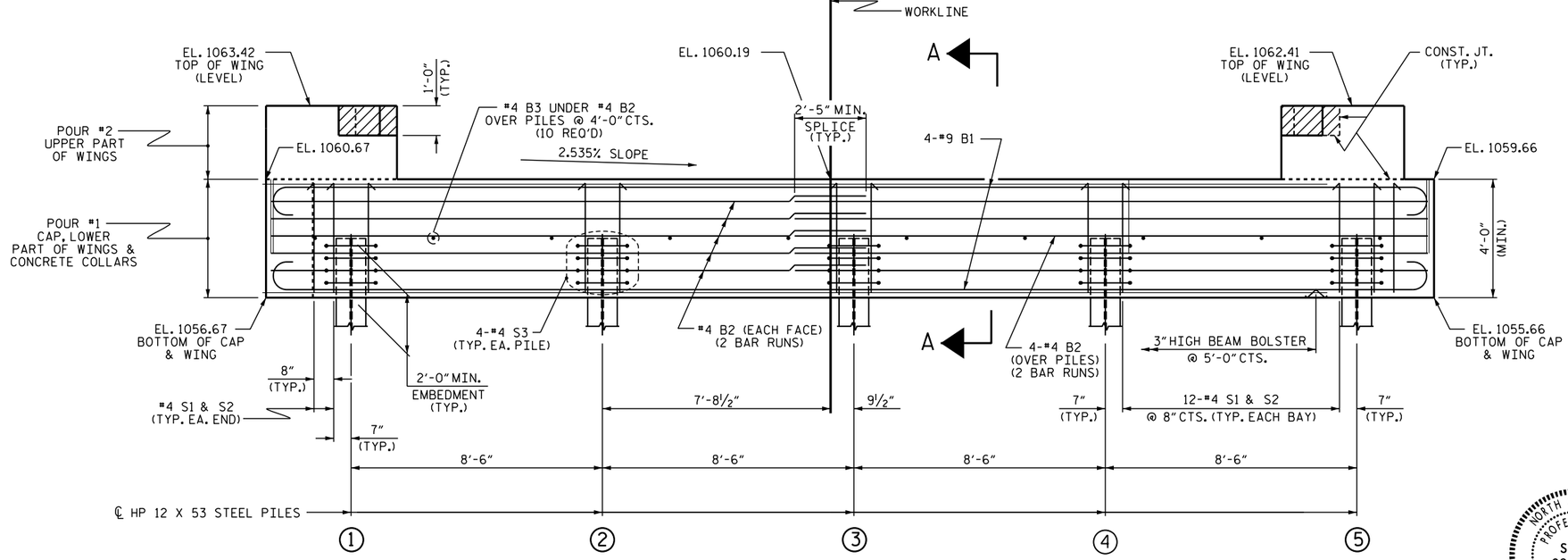
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

TOP OF PILE ELEVATIONS	
1	1058.60
2	1058.38
3	1058.16
4	1057.95
5	1057.73

PROJECT NO. BP13.R033
BURKE COUNTY
STATION: 15+50.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

ASSEMBLED BY : J.M. KEPICH	DATE : 12/18/24
CHECKED BY : J. PAPCIAK	DATE : 06/02/25
DRAWN BY : WJH 12/11	REV. 4/15 MAA/TMG
CHECKED BY : AAC 12/11	

NORTH CAROLINA PROFESSIONAL SEAL 037903 ENGINEER JEFFREY M KEPICH
Signed by: Jeffrey Kepich 8/13/2025

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Suite 160
Raleigh, NC 27607
NC License Number : C-3239

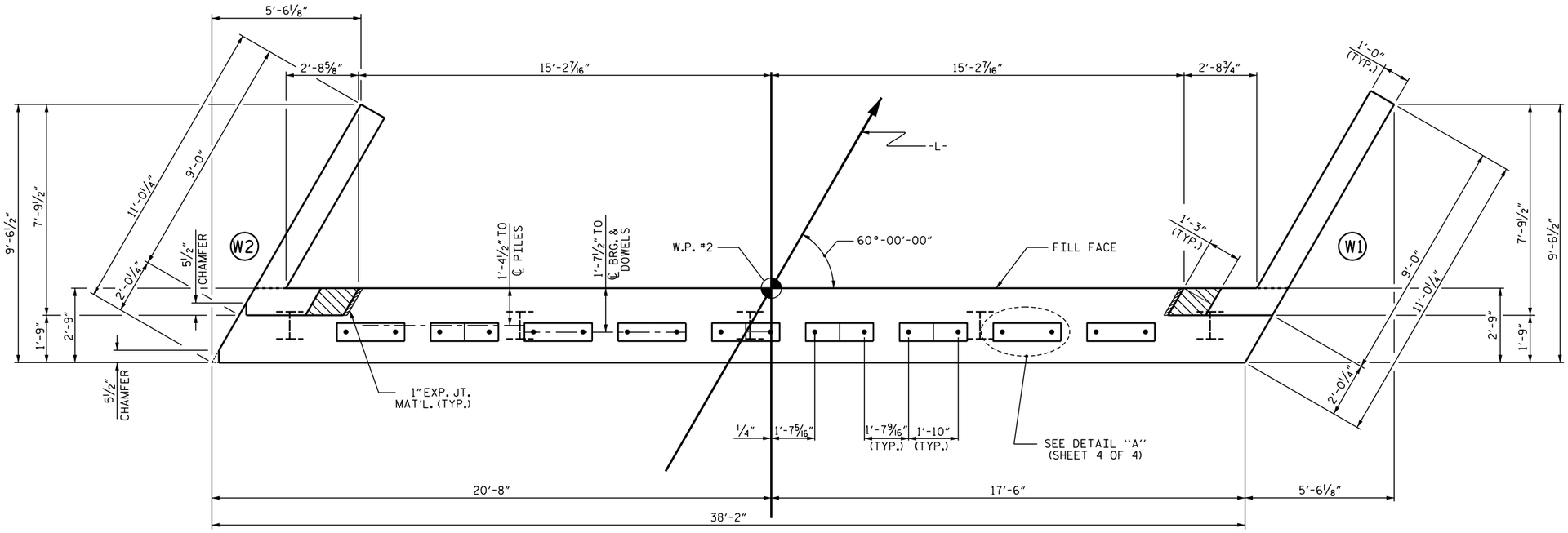
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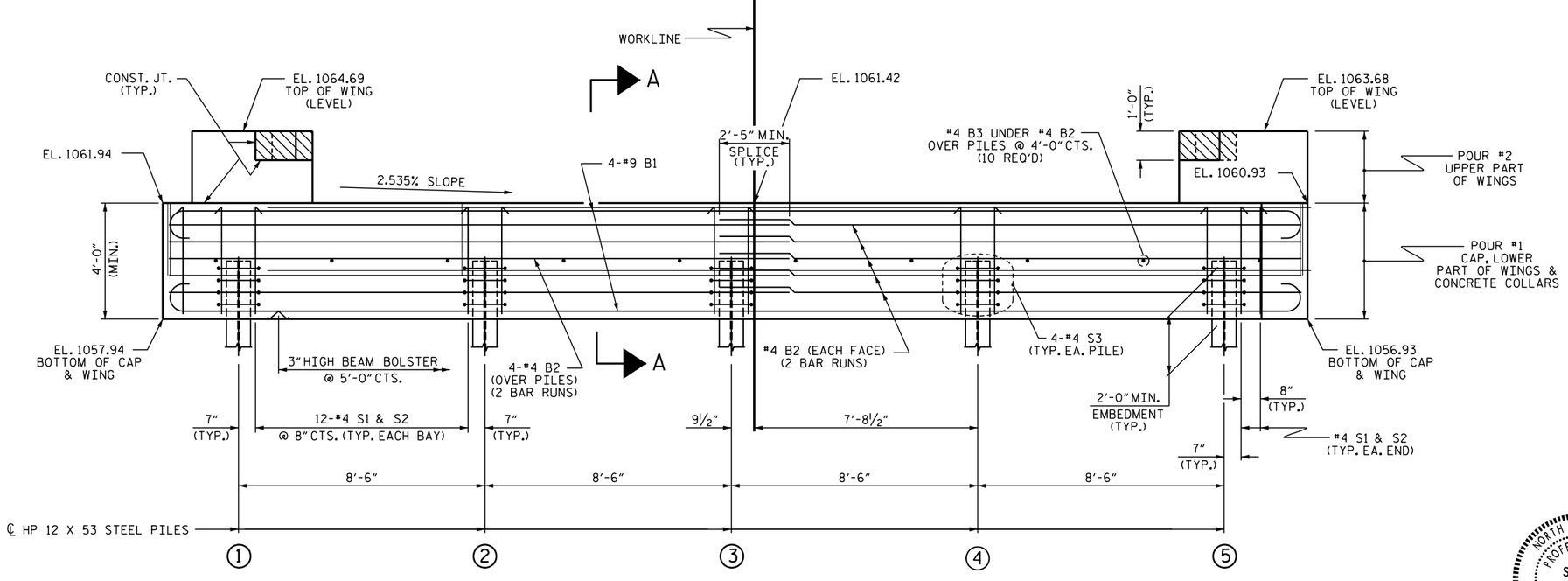
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PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

TOP OF PILE ELEVATIONS

①	1059.87
②	1059.65
③	1059.44
④	1059.22
⑤	1059.00

PROJECT NO. BP13.R033
BURKE COUNTY
STATION: 15+50.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 2

NORTH CAROLINA PROFESSIONAL SEAL 037903 ENGINEER JEFFREY M KEPICH

Signed by: Jeffrey Kepich 8/13/2025

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Suite 160
Raleigh, NC 27607
NC License Number : C-3239

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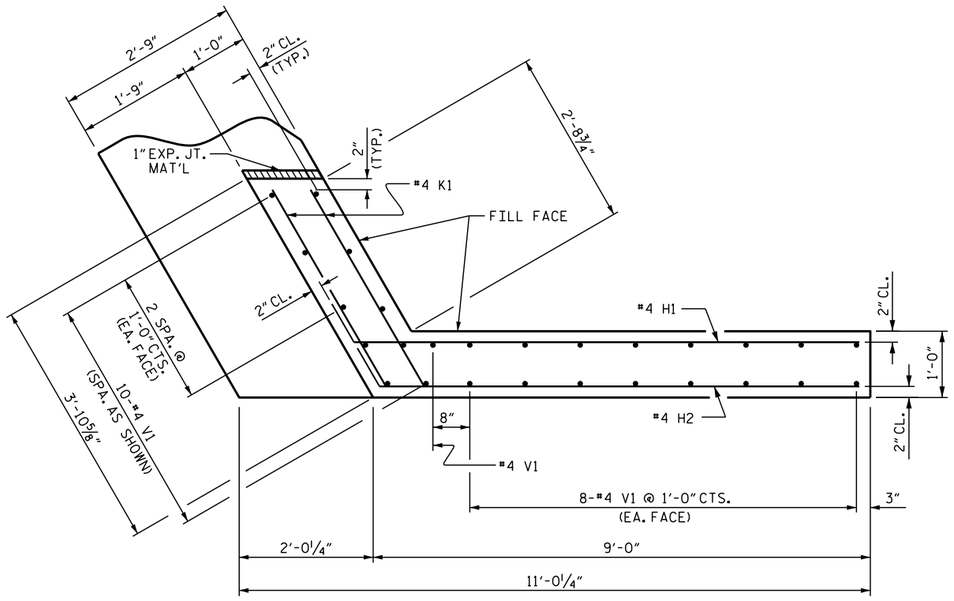
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ASSEMBLED BY : J.M. KEPICH		DATE : 12/17/24
CHECKED BY : J. PAPCIAK		DATE : 06/02/25
DRAWN BY : WJH 12/11	REV. 4/15 MAA/TMG	
CHECKED BY : AAC 12/11		

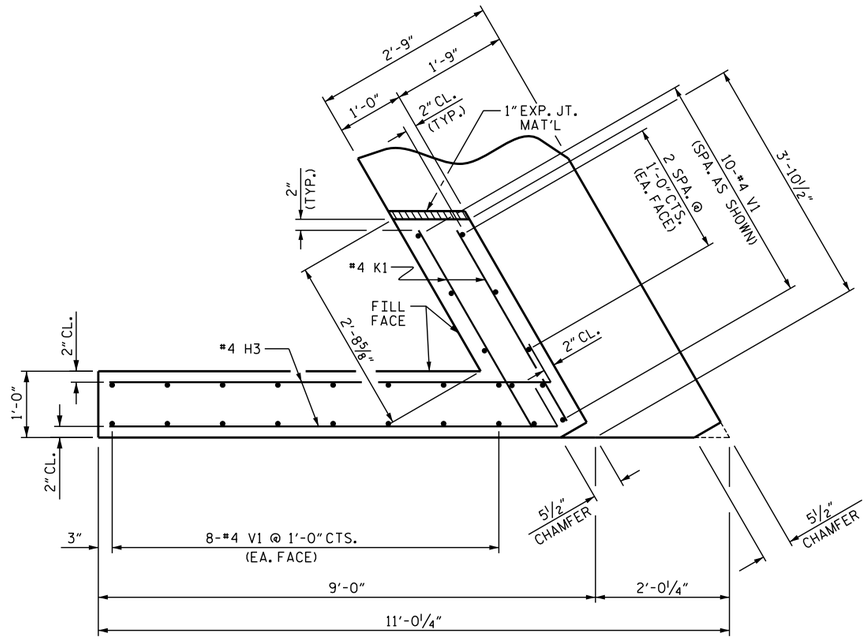
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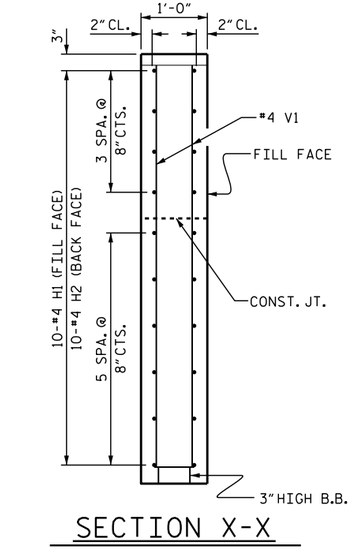
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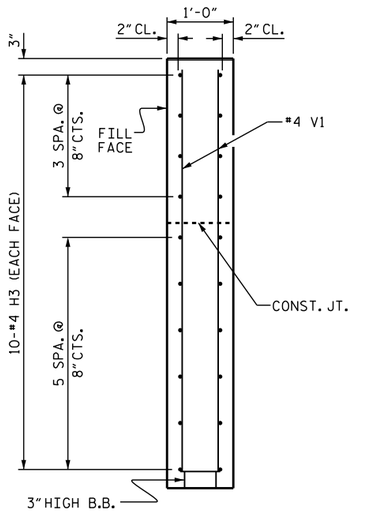
PLAN OF WING (W1)



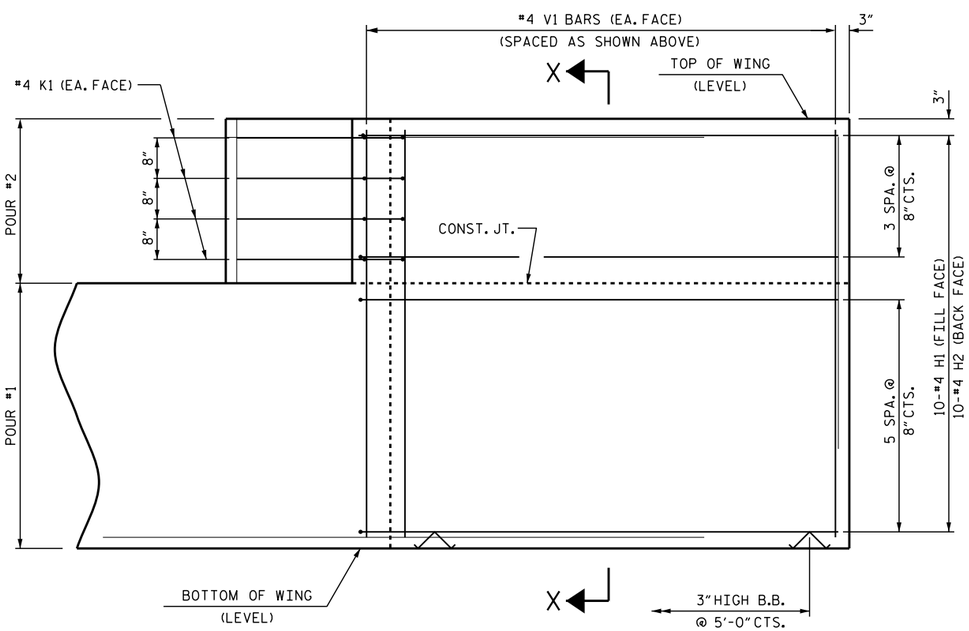
PLAN OF WING (W2)



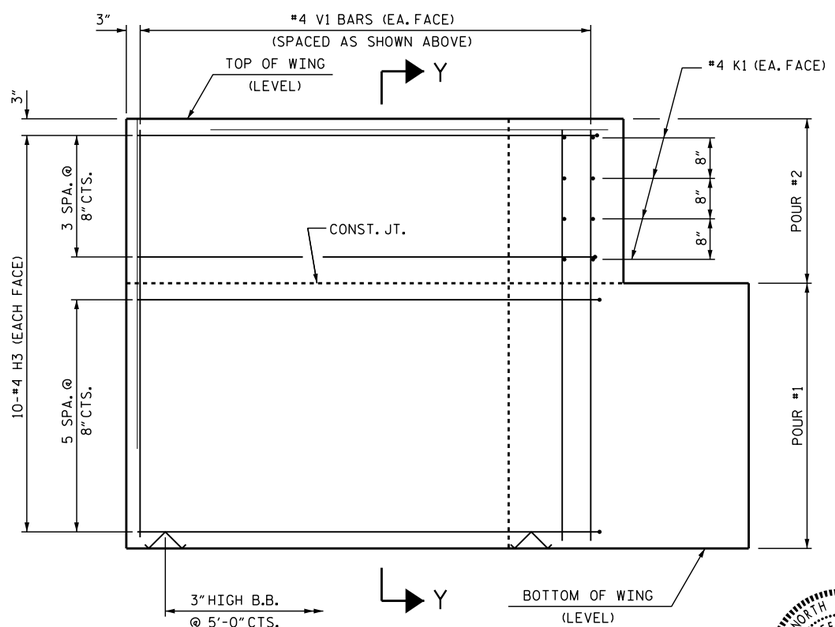
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

PROJECT NO. BP13.R033

BURKE COUNTY

STATION: 15+50.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT
WING DETAILS

ASSEMBLED BY : J.M. KEPICH		DATE : 12/17/24	
CHECKED BY : J. PAPCIAK		DATE : 06/02/25	
DRAWN BY : WJH 12/11	REV. 4/15 MAA/TMG		
CHECKED BY : AAC 12/11			

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ms consultants, inc.
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Raleigh, NC 27607
NC License Number : C-3239

NORTH CAROLINA PROFESSIONAL SEAL 037903 ENGINEER JEFFREY M KEPICH

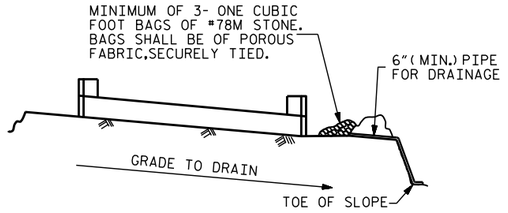
Signed by: Jeffrey Kepich 25CF6C096CCC472... 8/13/2025

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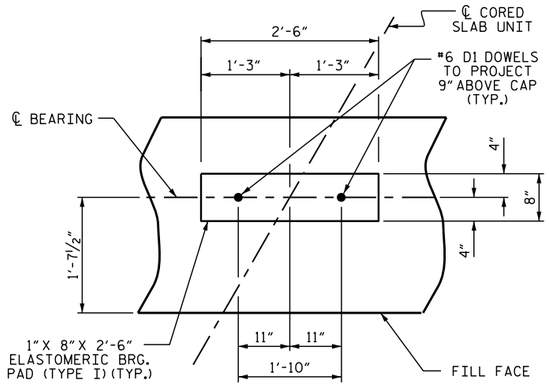


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

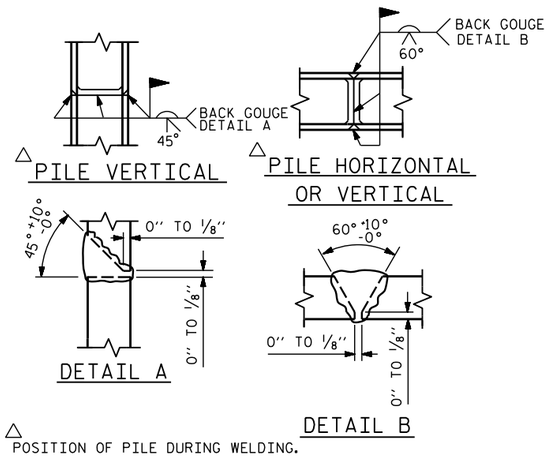
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



DETAIL "A"

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)

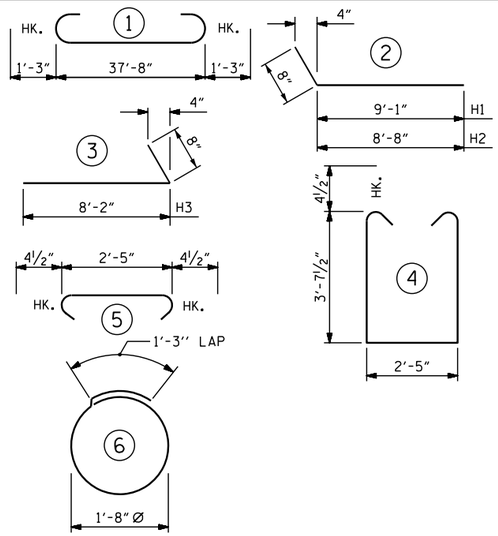


△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

SCALE- 7/16" = 1'-0"

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT No. 1	END BENT No. 2
HP 12 X 53 STEEL PILES NO: 5 LIN. FT.= 150	HP 12 X 53 STEEL PILES NO: 5 LIN. FT.= 150
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 5	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 5

BILL OF MATERIAL
FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	40'-2"	1093
B2	28	#4	STR	20'-2"	377
B3	10	#4	STR	2'-5"	16
D1	18	#6	STR	1'-6"	41
H1	10	#4	2	9'-9"	65
H2	10	#4	2	9'-4"	62
H3	20	#4	3	8'-10"	118
K1	16	#4	STR	3'-3"	35
S1	52	#4	4	10'-5"	362
S2	52	#4	5	3'-2"	110
S3	20	#4	6	6'-6"	87
V1	53	#4	STR	6'-2"	218

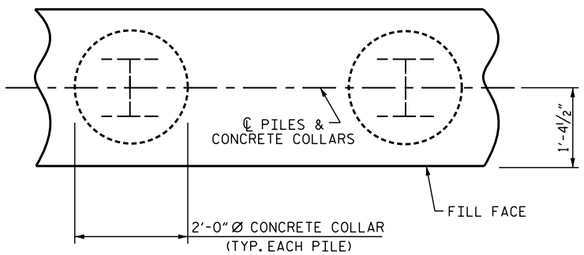
REINFORCING STEEL (FOR ONE END BENT) 2584 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

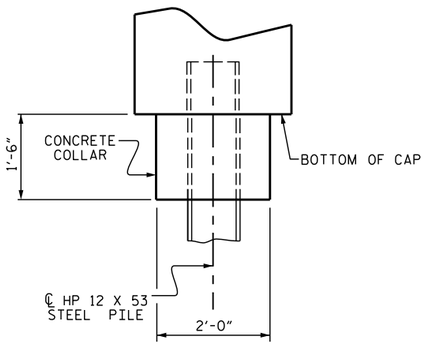
POUR #1 CAP, LOWER PART OF WINGS & COLLARS 18.7 C.Y.

POUR #2 UPPER PART OF WINGS 2.4 C.Y.

TOTAL CLASS A CONCRETE 21.1 C.Y.



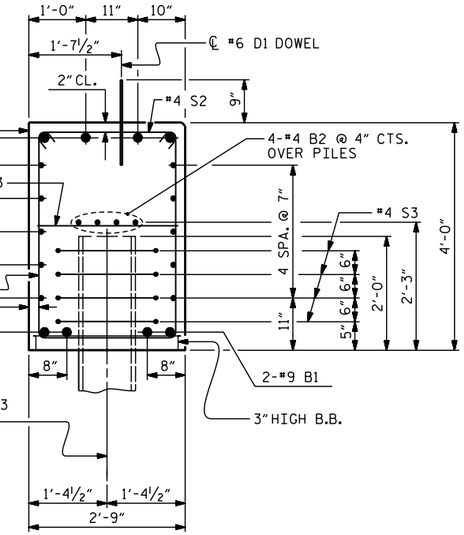
PLAN



ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

PROJECT NO. BP13.R033

BURKE COUNTY

STATION: 15+50.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1 & 2 DETAILS

ASSEMBLED BY : J.M. KEPICH	DATE : 12/17/24
CHECKED BY : J. PAPCIAK	DATE : 06/02/25
DRAWN BY : WJH 12/11	REV. 4/17 MAA/THC
CHECKED BY : AAC 12/11	

ms consultants, inc.
5444 Wade Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number : C-3239

NORTH CAROLINA PROFESSIONAL SEAL 037903 ENGINEER JEFFREY M KEPICH

Signed by: Jeffrey Kepich 2BDF8C09ACCC472... 8/13/2025

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-13
1			3			TOTAL SHEETS
2			4			15

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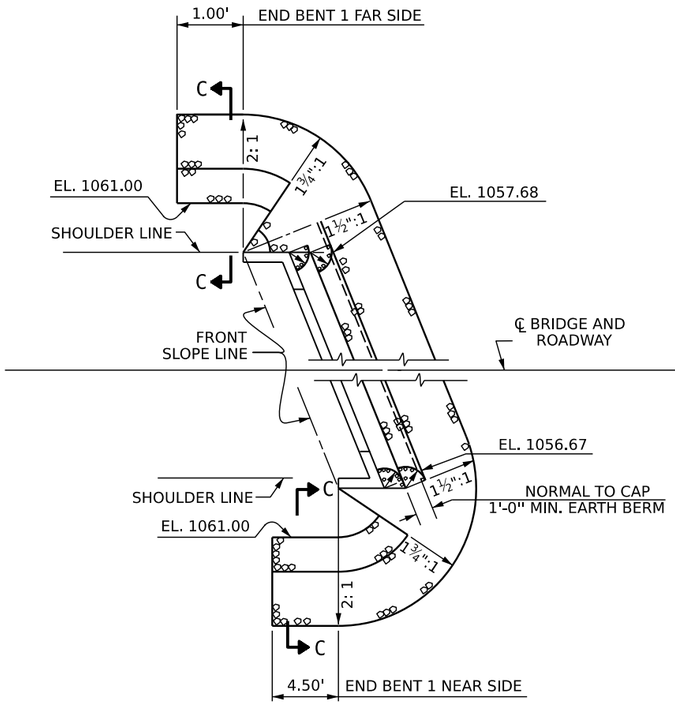
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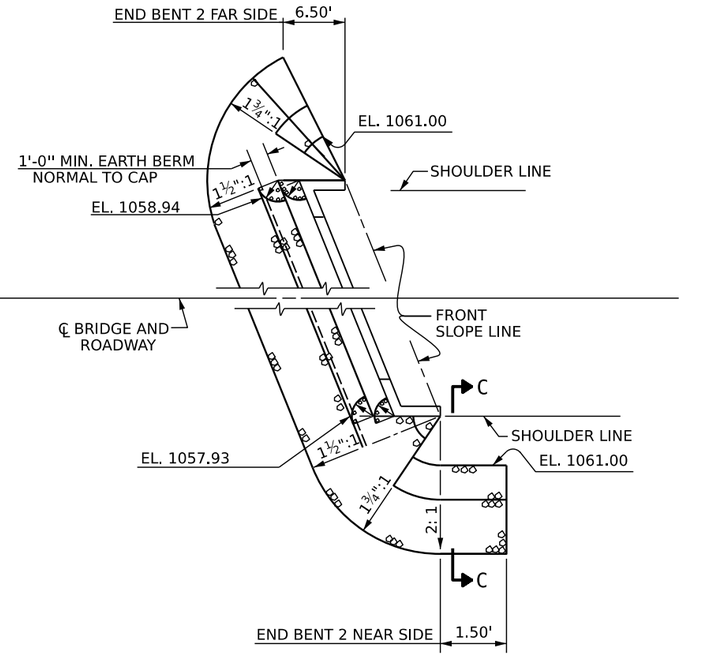
8/26/21

NOTES :

FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

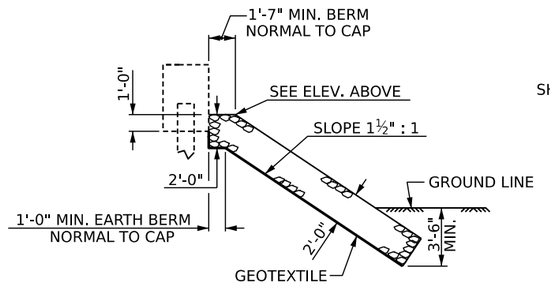


END BENT 1

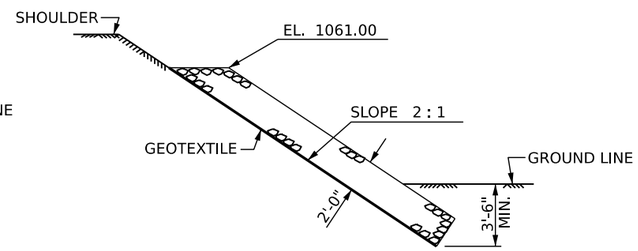


END BENT 2

ESTIMATED QUANTITIES		
BRIDGE @ STA. 15+50.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	44	49
END BENT 2	43	48



℄ SECTION



SECTION C-C

PROJECT NO. BP13.R033

BURKE COUNTY

STATION: 15+50.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 037903 ENGINEER JEFFREY M KEPICH

Signed by: Jeffrey Kepich 215EF8C09BCCC472 8/13/2025

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5444 Wade Park Blvd.
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Raleigh, NC 27607
NC License Number : C-3239

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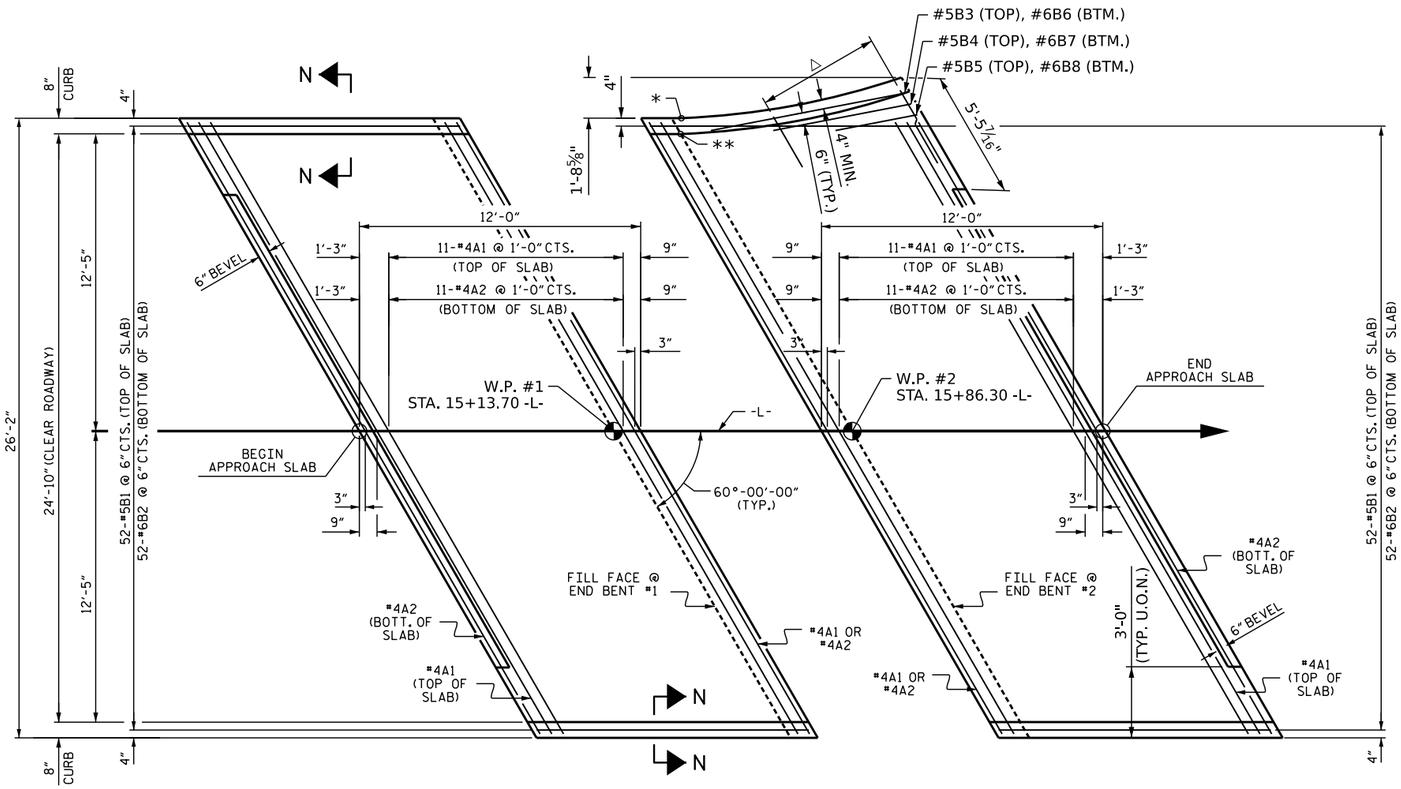
ASSEMBLED BY : J.M. KEPICH	DATE : 12/17/24
CHECKED BY : J. PAPCIAK	DATE : 06/02/25
DRAWN BY : REK 1/84	REV. 10/1/11 MAA/GM
CHECKED BY : RDU 1/84	REV. 12/21/11 MAA/GM
	REV. 12/17 MAA/THC

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STD. NO. RR1 Sht. 1

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8/26/21



PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

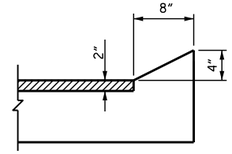
FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

* BEGIN CURVE @ STA. 15+79.16 -L-, OFFSET LT. 13'-1", RADIUS = 33'-3½"
** BEGIN CURVE @ STA. 15+79.13 -L-, OFFSET LT. 12'-5", RADIUS = 33'-11½"

△ 7 - #4A3 @ 1'-0" CTS. (TOP OF SLAB)
7 - #4A4 @ 1'-0" CTS. (BOTTOM OF SLAB)



SECTION N-N

CURB DETAILS

BILL OF MATERIAL

APPROACH SLAB AT EB #1

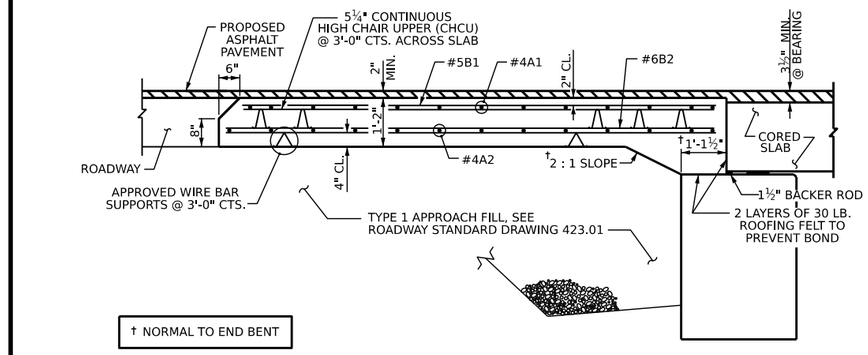
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	13	#4	STR	29'-9"	258
A2	13	#4	STR	29'-9"	258
✱ B1	52	#5	STR	11'-1"	601
B2	52	#6	STR	11'-7"	905
REINFORCING STEEL				LBS.	1163
✱ EPOXY COATED REINFORCING STEEL				LBS.	859
CLASS AA CONCRETE				C.Y.	16.2

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	13	#4	STR	29'-9"	258
A2	13	#4	STR	29'-9"	258
✱ A3	7	#4	STR	3'-6"	16
A4	7	#4	STR	3'-6"	16
✱ B1	52	#5	STR	11'-1"	601
B2	52	#6	STR	11'-7"	905
✱ B3	1	#5	STR	8'-4"	9
✱ B4	1	#5	STR	5'-11"	6
✱ B5	1	#5	STR	3'-6"	4
B6	1	#6	STR	8'-4"	13
B7	1	#6	STR	5'-11"	9
B8	1	#6	STR	3'-6"	5
REINFORCING STEEL				LBS.	1206
✱ EPOXY COATED REINFORCING STEEL				LBS.	894
CLASS AA CONCRETE				C.Y.	16.4

SPLICE LENGTHS

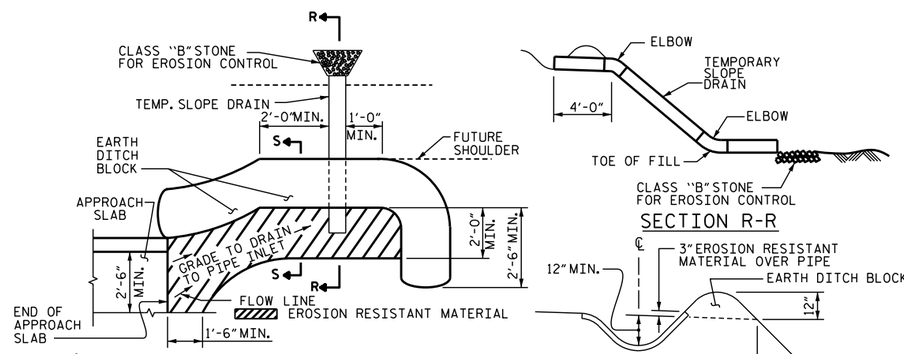
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"



† NORMAL TO END BENT

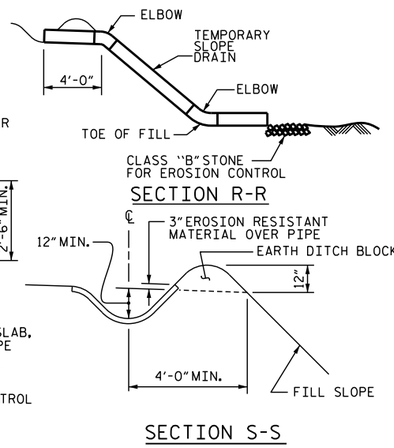
SECTION THRU SLAB

(TYPE I - APPROACH FILL)



NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

PLAN VIEW

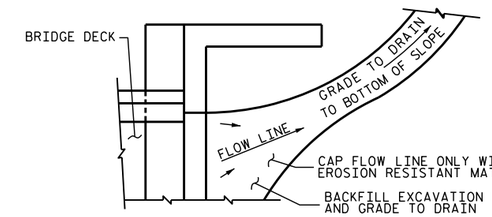


SECTION R-R

SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL

PROJECT NO. **BP13.R033**

BURKE COUNTY

BRIDGE NO. **15+50.00 -L-**

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED (SUB-REGIONAL TIER) 60 °SKEW

NORTH CAROLINA PROFESSIONAL SEAL 037903 ENGINEER JEFFREY M KEPICH

Signed by: Jeffrey Kepich 25DF8C098CCC472...
8/13/2025

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Suite 160
Raleigh, NC 27607
NC License Number : C-3239

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ASSEMBLED BY: J.M. KEPICH	DATE : 12/17/24
CHECKED BY : J. PAPCIAK	DATE : 06/02/25
DRAWN BY : SHS/MAA 5-09	.REV. 12-17 MAA/THC
CHECKED BY : BCH 5-09	.REV. 08-19 BNB/THC

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STD. NO. BAS_27_60S

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8/26/21

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	AASHTO (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE AASHTO
STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE AASHTO
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2024 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE ⅞" ∅ SHEAR STUDS FOR THE ¾" ∅ STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" ∅ STUDS FOR 4 - ¾" ∅ STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" ∅ STUDS ALONG THE BEAM AS SHOWN FOR ¾" ∅ STUDS BASED ON THE RATIO OF 3 - ⅞"∅ STUDS FOR 4 - ¾" ∅ STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16" OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.