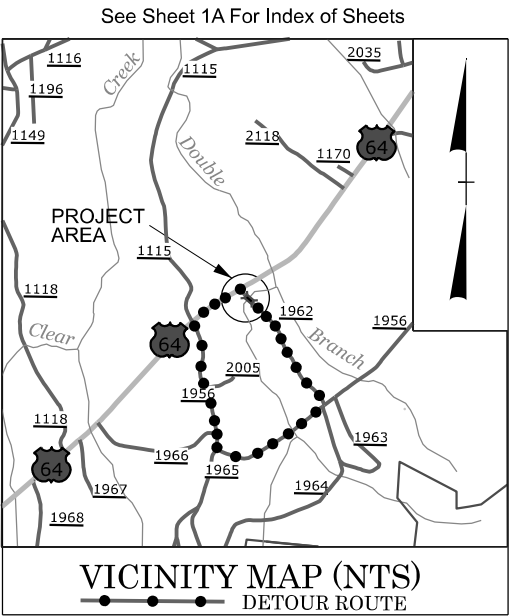


CONTRACT: DM00470 PROJECT ID: DF18313.2012023.PR

09/08/29



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

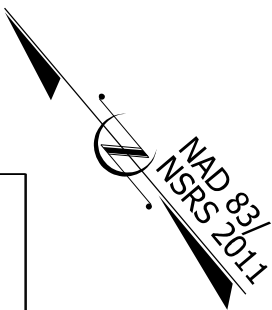
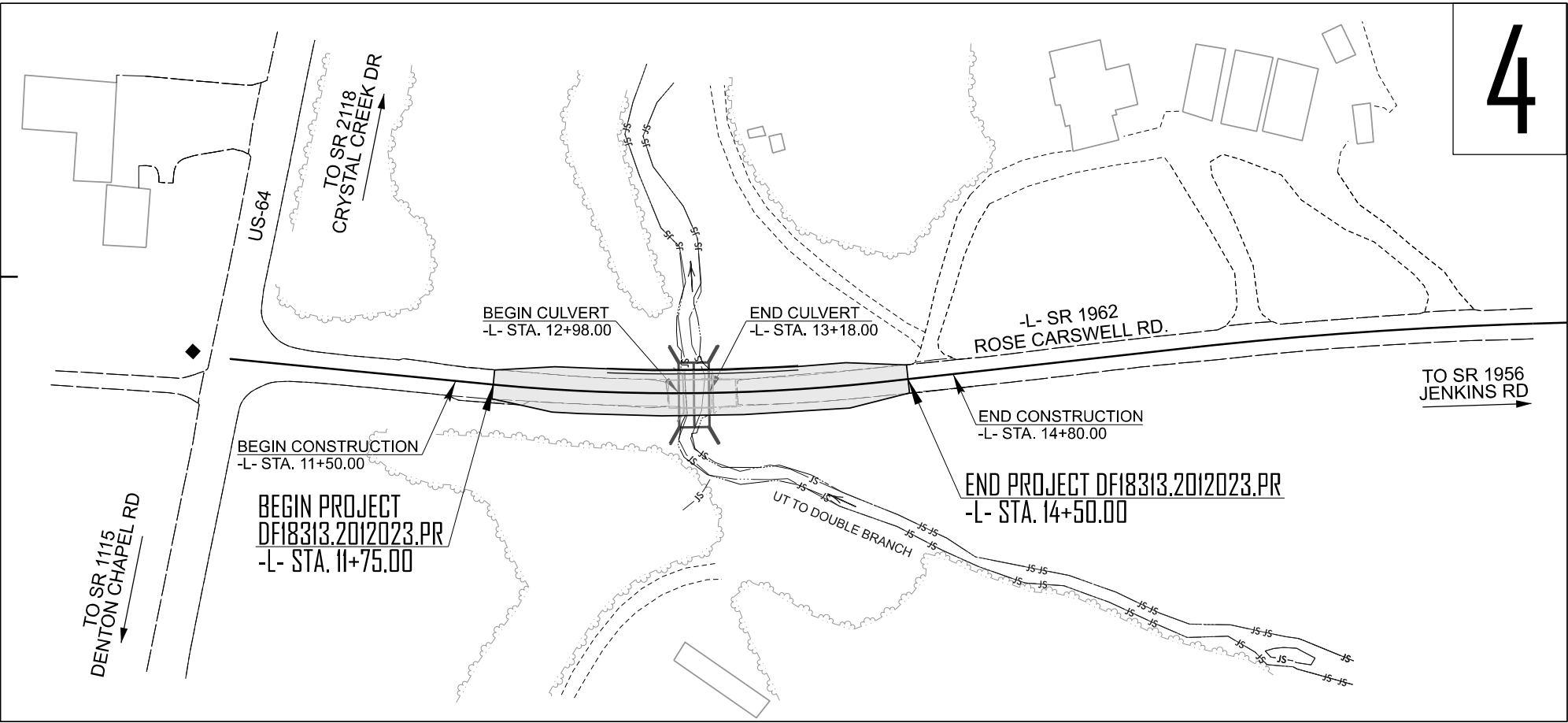
BURKE COUNTY

LOCATION: *REPLACE BRIDGE NO. 316 ON SR 1962 (ROSE CARSWELL RD)
OVER UT TO DOUBLE BRANCH*

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18313.2012023.PR	11	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
DF18313.2012023.PR		PE, R/W, UTILITIES & CONSTRUCTION	

FINAL PLANS



THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

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 2022 = 450

V = 40 MPH

FUNC CLASS =
RURAL LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT DF18313.2012023.PR = 0.048 MILES

LENGTH OF STRUCTURE PROJECT DF18313.2012023.PR = 0.004 MILES

TOTAL LENGTH PROJECT DF18313.2012023.PR = 0.052 MILES

Plans Prepared By:

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

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
APRIL 21, 2025

LETTING DATE:
AUGUST 19, 2026

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

MARK HILL
NCDOT PROJECT ENGINEER

DAVID JANOSKO
PROJECT ENGINEER

SKYLAR STULTZ
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

Signed by:
W. Herbert Turner, Jr.
P.E.
7/27/2026

ROADWAY DESIGN ENGINEER

DocuSigned by:
Dave Janosko
P.E.
7/27/2026

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	DETAIL IN LIEU OF STANDARD 1205.01
3B-1	ROADWAY SUMMARIES
3D-1	DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
4	PLAN AND PROFILE SHEET
RW01 THRU RW04	RIGHT-OF-WAY PLANS
TMP-1 THRU TMP-2A	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
RF-2 THRU RF-3	REFORESTATION PLANS
UC-1 THRU UC-4	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-2	UTILITY BY OTHER PLANS
X-1	CROSS-SECTION INDEX
X-1A	CROSS-SECTION SUMMARY SHEET
X-2 THRU X-8	CROSS-SECTIONS
TITLESHEET C1-01 THRU C1-06 STANDARD NOTES	CULVERT PLANS

GRADING AND SURFACING:

EFFECTIVE: 01-16-2024
REVISED:

STD.NO.

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:

TITLE

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

300.01 Method of Pipe Installation (Use Details in Lieu of Standard for Sheets 1 and 2 of 2)
310.10 Driveway Pipe Construction

560.01 Method of Shoulder Construction - High Side of Superelevated Curve - Method

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
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement (Use Details in Lieu of Standard for Sheets 4 and 6 of 15)
862.02	Guardrail Installation
876.01	Rip Rap in Channels and Ditches
876.02	Guide for Rip Rap at Pipe Outlets

SUBSURFACE DRAINS:

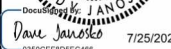
SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

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.

UTILITY OWNERS ON THIS PROJECT ARE BRENTWOOD WATER AND AT&T.
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT
AS SHOWN ON THE PLANS.

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

001A

ROADWAY DESIGN
ENGINEER

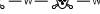
ms consultants, inc.
5444 Wado Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number : C-32

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UNLESS ALL SIGNATURES COMPLETED

REVISIONS

Note: Not to Scale

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	
RR Dismantled	

RIGHT OF WAY & PROJECT CONTROL:

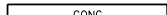
Primary Horiz Control Point	
Primary Horiz and Vert Control Point	
Secondary Horiz and Vert Control Point	
Vertical Benchmark	
Existing Right of Way Monument	
Proposed Right of Way Monument (Rebar and Cap)	
Proposed Right of Way Monument (Concrete)	
Existing Permanent Easement Monument	
Proposed Permanent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

ROADS AND RELATED FEATURES:

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

Woods Line	
Orchard	
Vineyard	

EXISTING STRUCTURES:

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

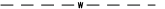
UTILITIES:

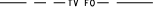
* SUE - Subsurface Utility Engineering
LOS - Level of Service - A,B,C or D (Accuracy)

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

TELEPHONE:

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

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

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

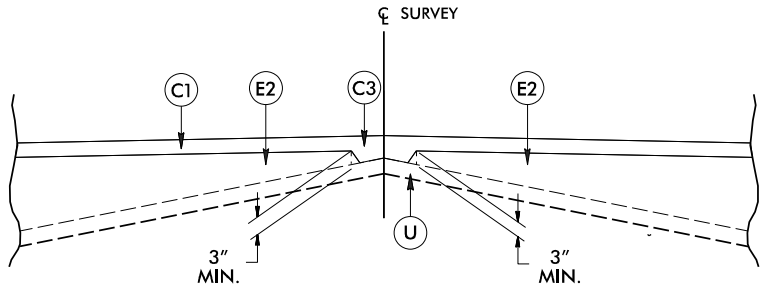
GAS:	
Gas Valve	
Gas Meter	
U/G Gas Line Test Hole (SUE - LOS A)*	
U/G Gas Line (SUE - LOS B)*	
U/G Gas Line (SUE - LOS C)*	
U/G Gas Line (SUE - LOS D)*	
Above Ground Gas Line	

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

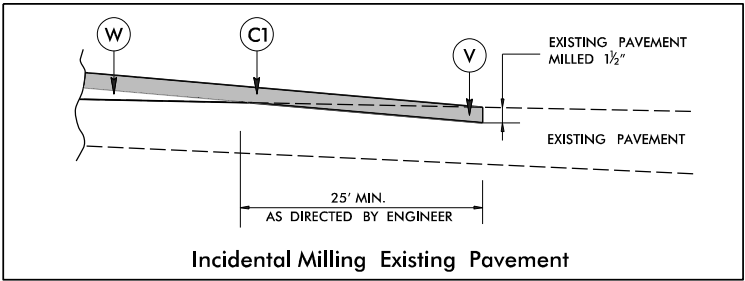
MISCELLANEOUS:	
Utility Pole	
Utility Pole with Base	
Utility Located Object	
Utility Traffic Signal Box	
Utility Unknown U/G Line (SUE - LOS B)*	
U/G Tank; Water, Gas, Oil	
Underground Storage Tank, Approx. Loc.	
A/G Tank; Water, Gas, Oil	
Geoenvironmental Boring	
Abandoned According to Utility Records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

FINAL PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, 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 LESS THAN 1" OR GREATER THAN 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	6" AGGREGATE BASE COURSE (OPTIONAL).
R	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLING
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL SHOWING METHOD OF WEDGING).

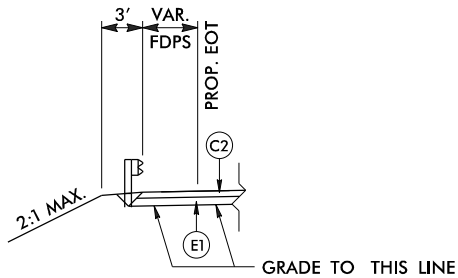
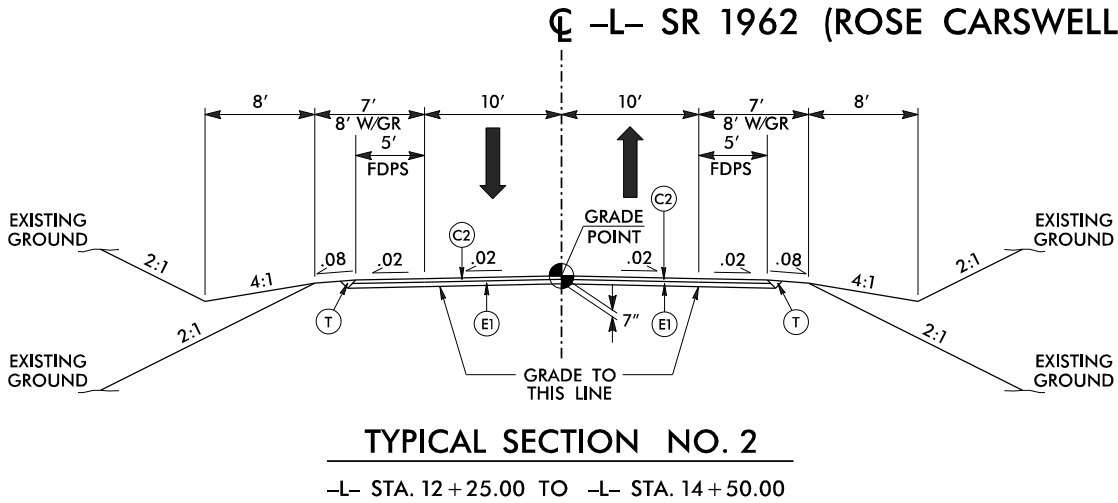
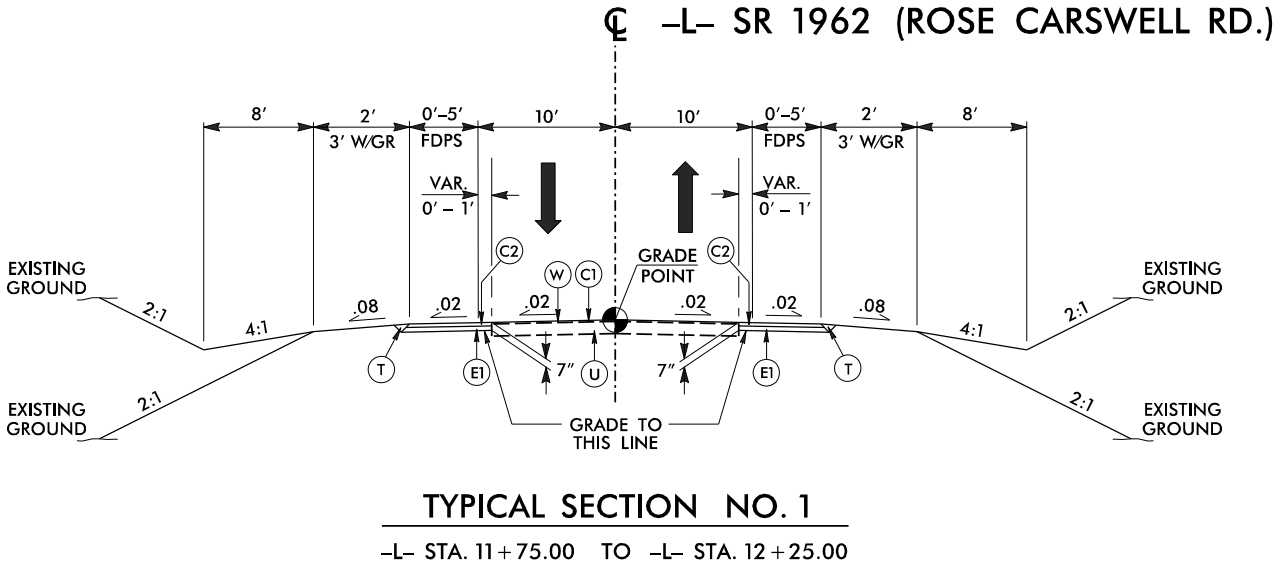
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



Detail Showing Method of Wedging

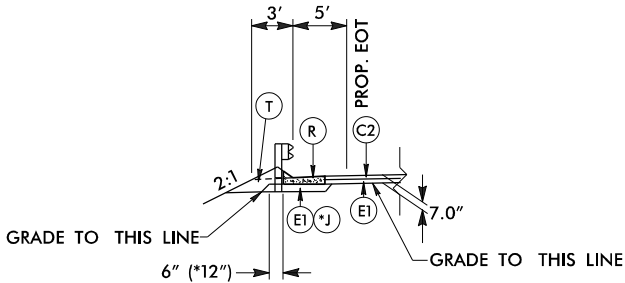


Incidental Milling Existing Pavement



GUARDRAIL DETAIL

SEE PLAN FOR LOCATIONS



SHOULDER BERM GUTTER DETAIL

SEE PLAN FOR SHOULDER BERM GUTTER LOCATIONS

*ALTERNATIVE AGGREGATE BASE OPTION

DF18313.2012023.PR

2A-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BURKE COUNTY

ROADWAY DESIGN UNIT
ROADWAY DESIGN
ENGINEER

PROFESSIONAL
SEAL
043023
ENGINEER
DAVID V. JANOSKO

David V. Janosko
7/25/2026

PROFESSIONAL
SEAL
038176
ENGINEER
SHIHAI ZHANG

Shihai Zhang
7/27/2026

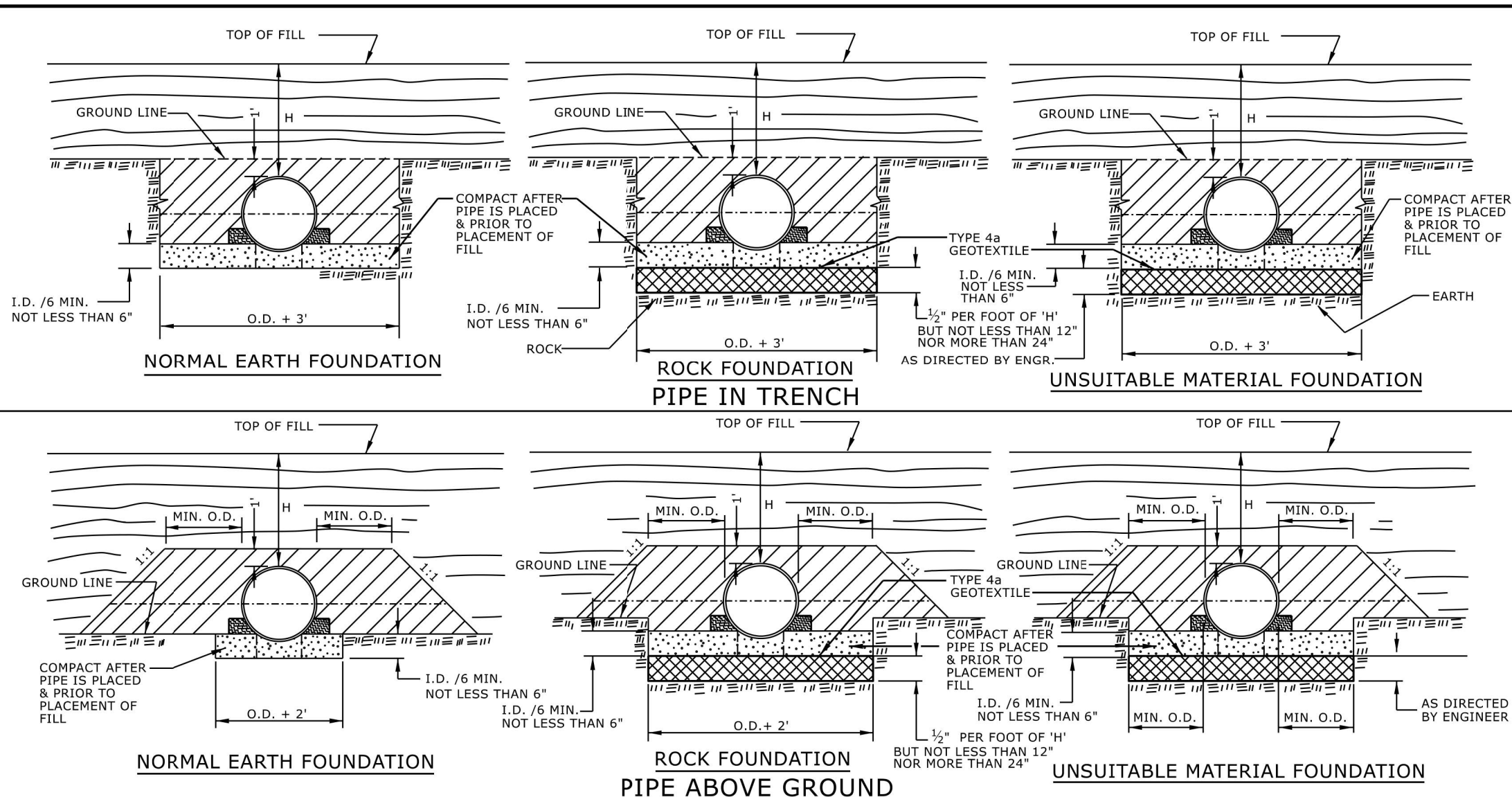
PREPARED BY

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

ms

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REVISIONS

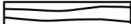


GENERAL NOTES:

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.

ROADWAY DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION FLEXIBLE PIPE	STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
SHEET 1 OF 2 300.01	



Sealed by:
Nicole M. Hackler

7/25/2026

SHEET 1 OF 2
300.01

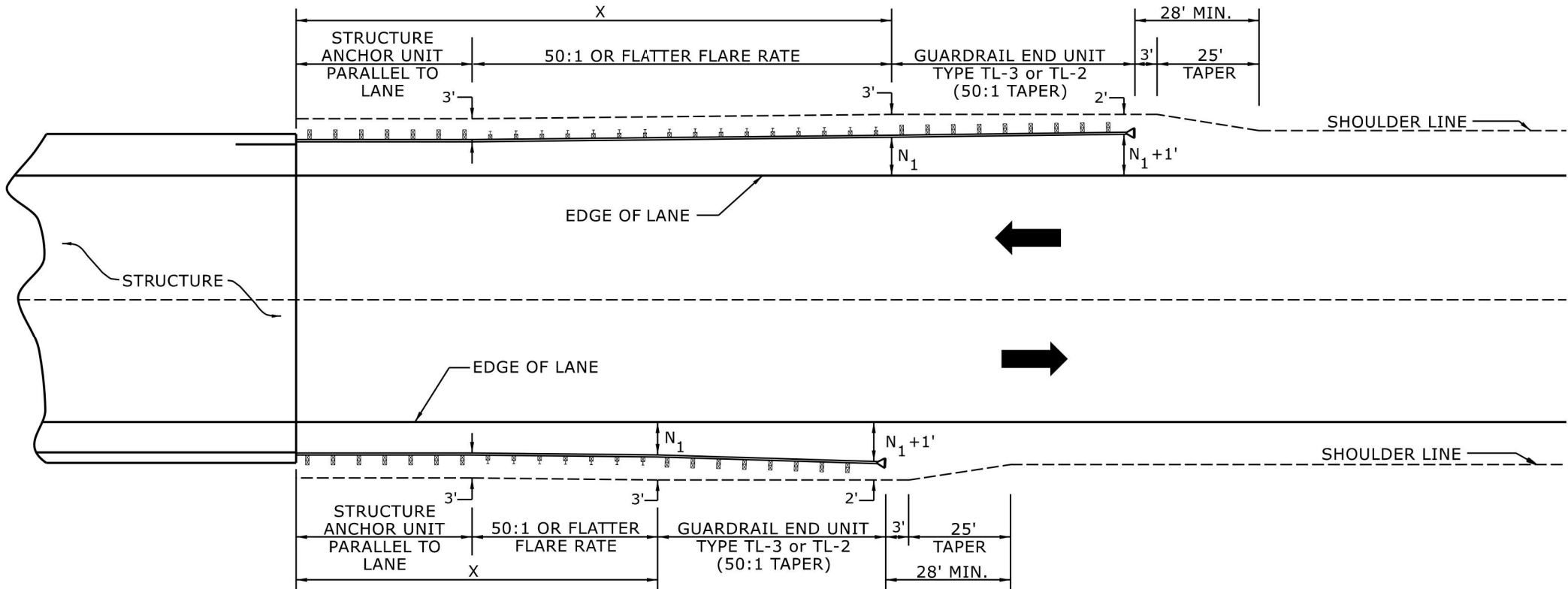
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**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

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

PROJECT REFERENCE NO.	SHEET NO.
DF18313.2012023.PR	2C-3



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

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

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

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

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



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

SHEET 4 OF 15
862D01

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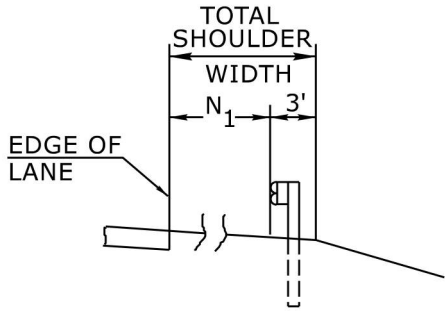
**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**

Office 919-707-6950 FAX 919-250-4119

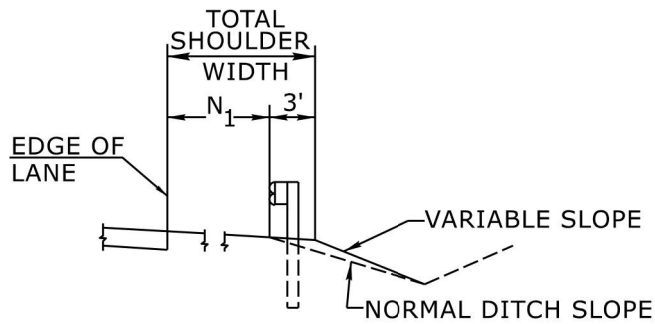
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ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.
DF18313.2012023.PR	2C-4

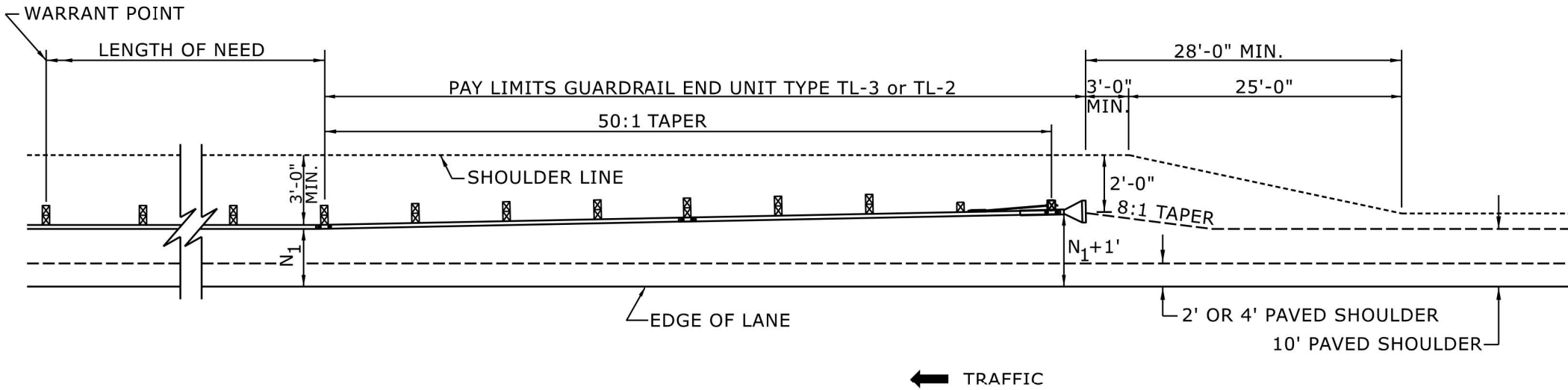


FILL SECTION



CUT SECTION

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



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

DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



SHEET 6 OF 15
862D01

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

SEE TITLE BLOCK

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

CONTINUOUS LINES EDGE LINE YELLOW OR WHITE 4" / 6" LANE LINE WHITE 4" / 6" CENTER LINE YELLOW 4" / 6" GORE LINE WHITE 8" / 12" DIAGONAL LINE YELLOW OR WHITE 12" 45 MPH OR HIGHER 8" LESS THAN 45 MPH 4"-6" FOR BICYCLE FACILITIES CROSSWALK LINE WHITE 8" TRANSVERSE 24" LONGITUDINAL RxR LINE WHITE 16" STOP OR TRANSVERSE BAR WHITE 24"	10'-30'/SP SKIP LINE UNLESS OTHERWISE SHOWN, USE 10'-30'/SP SKIPS FOR SKIP LANE LINES AND SKIP CENTER LINES. 10' 30' 4" / 6" YELLOW OR WHITE	2'-6'/SP MINI-SKIP LINE UNLESS OTHERWISE SHOWN, USE 2'-6'/SP MINI-SKIPS FOR LANE LINE EXTENSIONS THROUGH INTERSECTIONS, EDGE LINE EXTENSIONS THROUGH INTERSECTIONS AND BICYCLE LANE EXTENSIONS. 2' 6' 4" / 6" YELLOW OR WHITE	STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
	3'-3'/SP MINI-SKIP LINE UNLESS OTHERWISE SHOWN, USE 3'-3'/SP MINI-SKIPS FOR THE WHITE EDGE LINE EXTENSIONS AT ROUNDABOUTS. 3' 3' 8" / 12" WHITE	3'-9'/SP MINI-SKIP LINE UNLESS OTHERWISE SHOWN, USE 3'-9'/SP MINI-SKIPS FOR MINI-SKIP LANE LINES, LINE EXTENSIONS THROUGH TAPERS, AND MINI-SKIPS USED FOR BICYCLE LANE LINES. 3' 9' 4" / 6" WHITE	
GENERAL NOTES: 1- USE 6" LANE, EDGE, AND CENTER LINES ON ALL FULL CONTROL OF ACCESS FACILITIES AND OTHER ROUTES AS DIRECTED BY THE ENGINEER. 2- LANE LINES INDICATED AS "WIDE" ON THE ROADWAY STANDARD DRAWINGS SHALL BE AT LEAST TWICE THE WIDTH OF THE NORMAL LINE. 3- GORE LINES SHALL BE TWICE THE WIDTH OF THE NORMAL LINE.		ROADWAY DETAIL DRAWING FOR PAVEMENT MARKINGS LINE TYPES AND OFFSETS	
		SHEET 1 OF 2 1205D01	



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.: _____	

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

[illegible]

(9-17-24)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

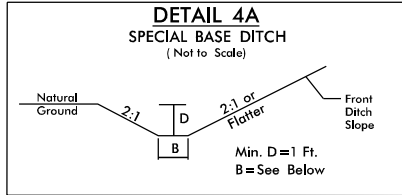
LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	100
				TOTAL LF:	100

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

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

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

*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)
*AST = Aggregate Stabilization
**Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Subgrade Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

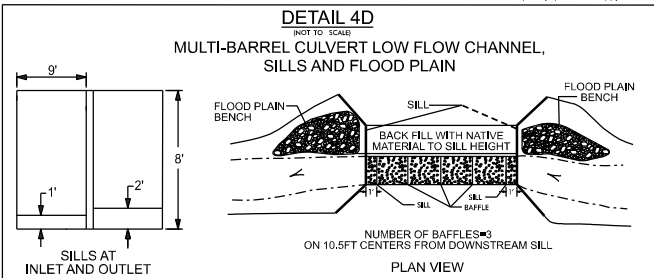


FROM L STA. 12+03 TO STA. 12+90 RT, B=2'
FROM L STA. 13+26 TO STA. 14+47 LT, B=3'

ROSE M. YOUNT
DB 572 PG 479
-L- POB 10+00.00

BEGIN PROJECT DF18313.2012023.PR
-L- POC STA 11+75.00

VERGIE WALKER
DB 516 PG 636



MAINTAIN EXISTING SIDE SLOPES
OF ADJACENT STREAM FOR BANK STABILIZATION.
DO NOT OBSTRUCT INCOMING STREAM.

VERGIE WALKER
DB 561 PG 347

BEGIN CULVERT
-L- STA 12+98.00

SHOULDER BERM, GUTTER:
-L- STA. 12+50 TO -L- STA. 13+78 LT

*FOR GUARDRAIL OVER CULVERT, ALTERNATIVE POST SPACING REQUIRED, SEE 862.01 SHEET 10

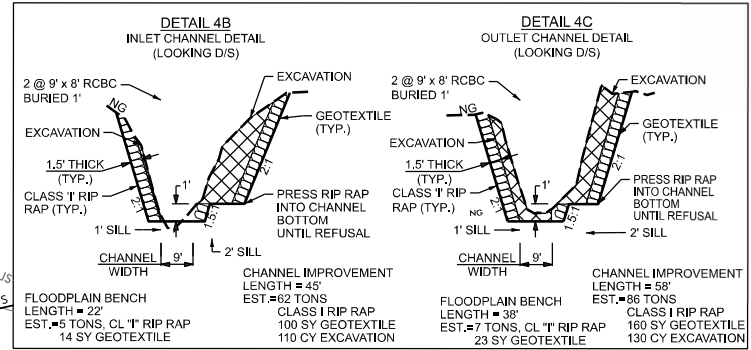
OUTLET PROTECTION
2 TONS, CL. "B" RIP RAP
7 SY GEOTEXTILE

KAREN C. WALKER
DB 2105 PG 302

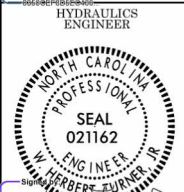
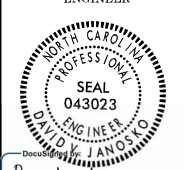
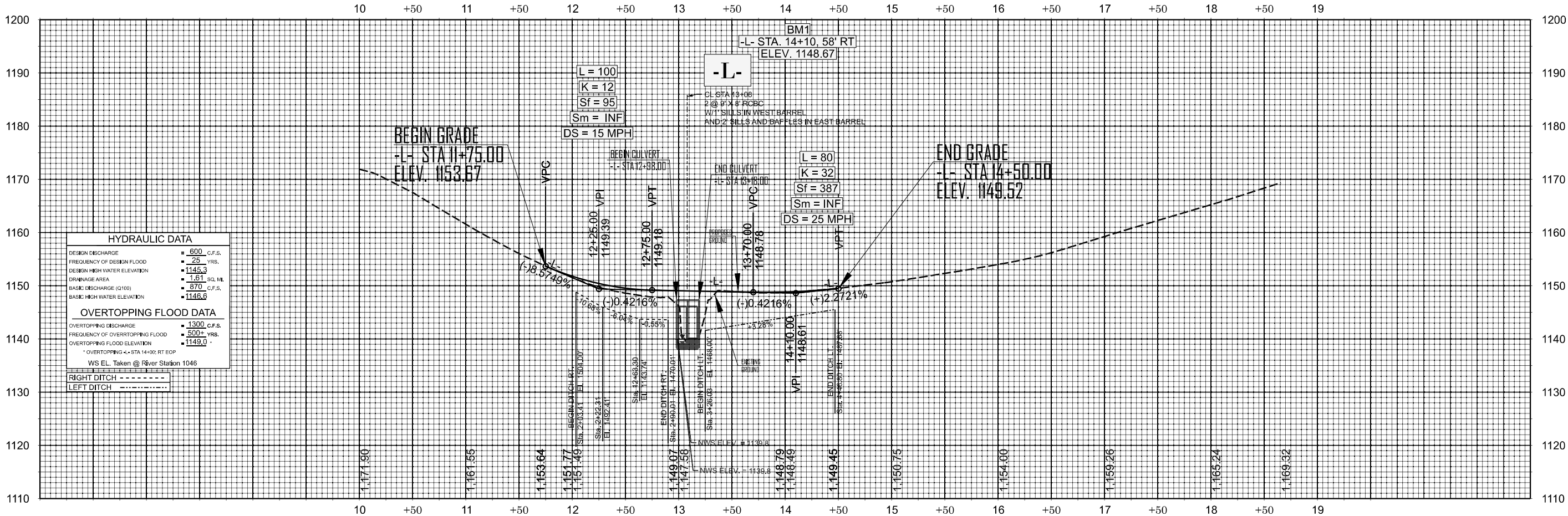
END PROJECT DF18313.2012023.PR
-L- POT STA 14+50.00

JOHN E. CARSWELL
DB 841 PG 725

END CULVERT
-L- STA 13+18.00

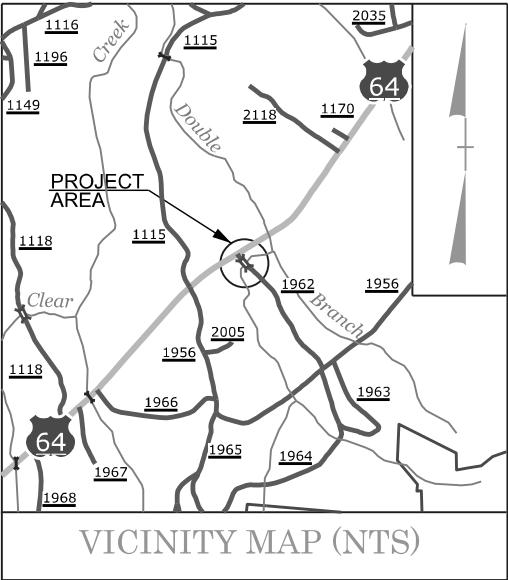


SEE SHEETS C1-1 THRU C1-6 FOR CULVERT PLANS



09/08/99

TIP PROJECT: DF18313.2012023.PR

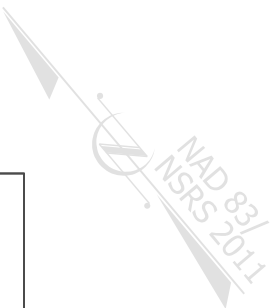
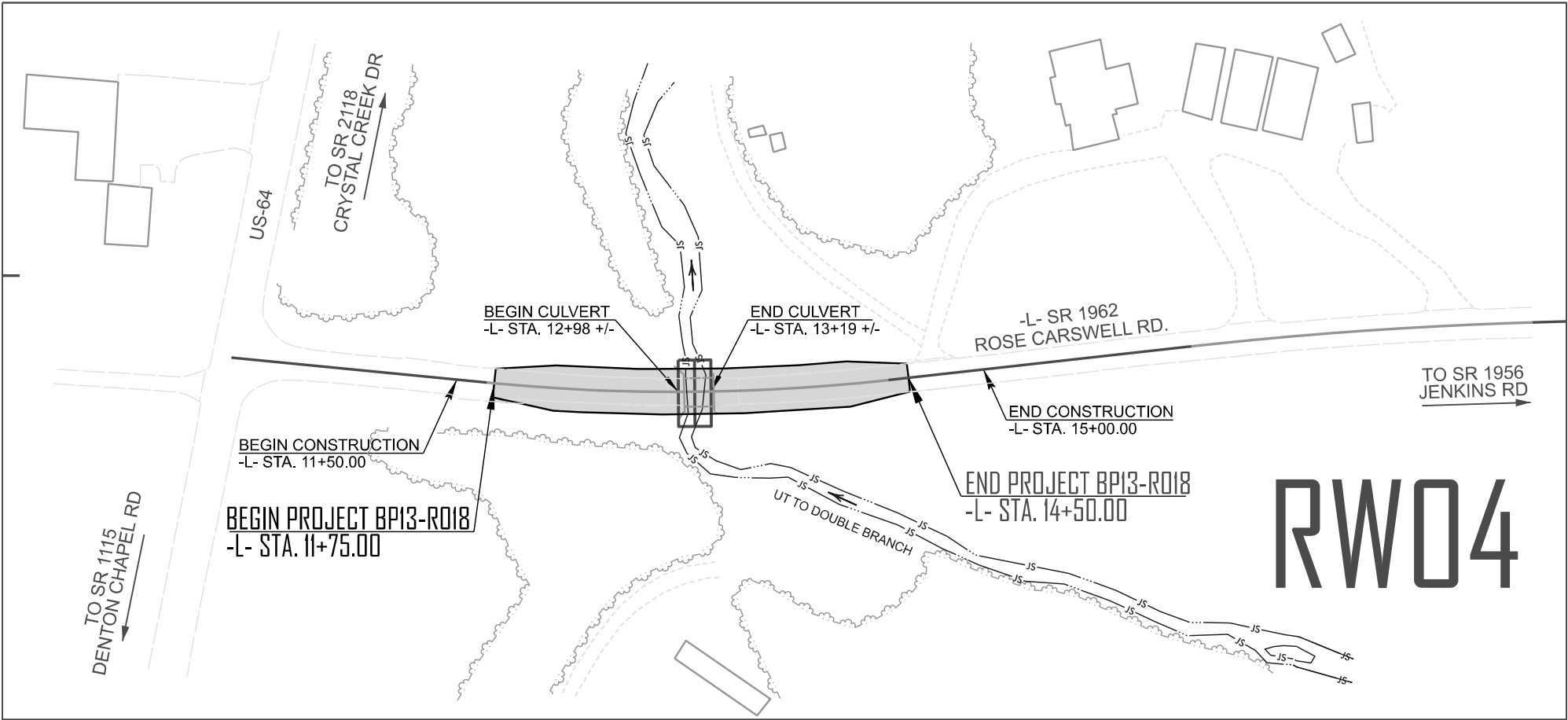


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

BURKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18313.2012023.PR	RW01	5



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
NCDOT FOR MONUMENT "316-1"
WITH NAD83/2011 STATE PLANE GRID COORDINATES OF
NORTHING: 707380.352 USFT EASTING: 1184219.263 USFT
ELEVATION: 1147.63 USFT
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.99984759
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

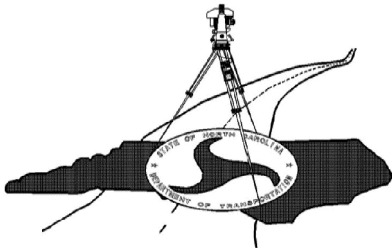
PROFESSIONAL LAND
SURVEYOR



Signature:
Matthew Cornwell
12/20/2023

5/11/2026

DATE:



REVISIONS

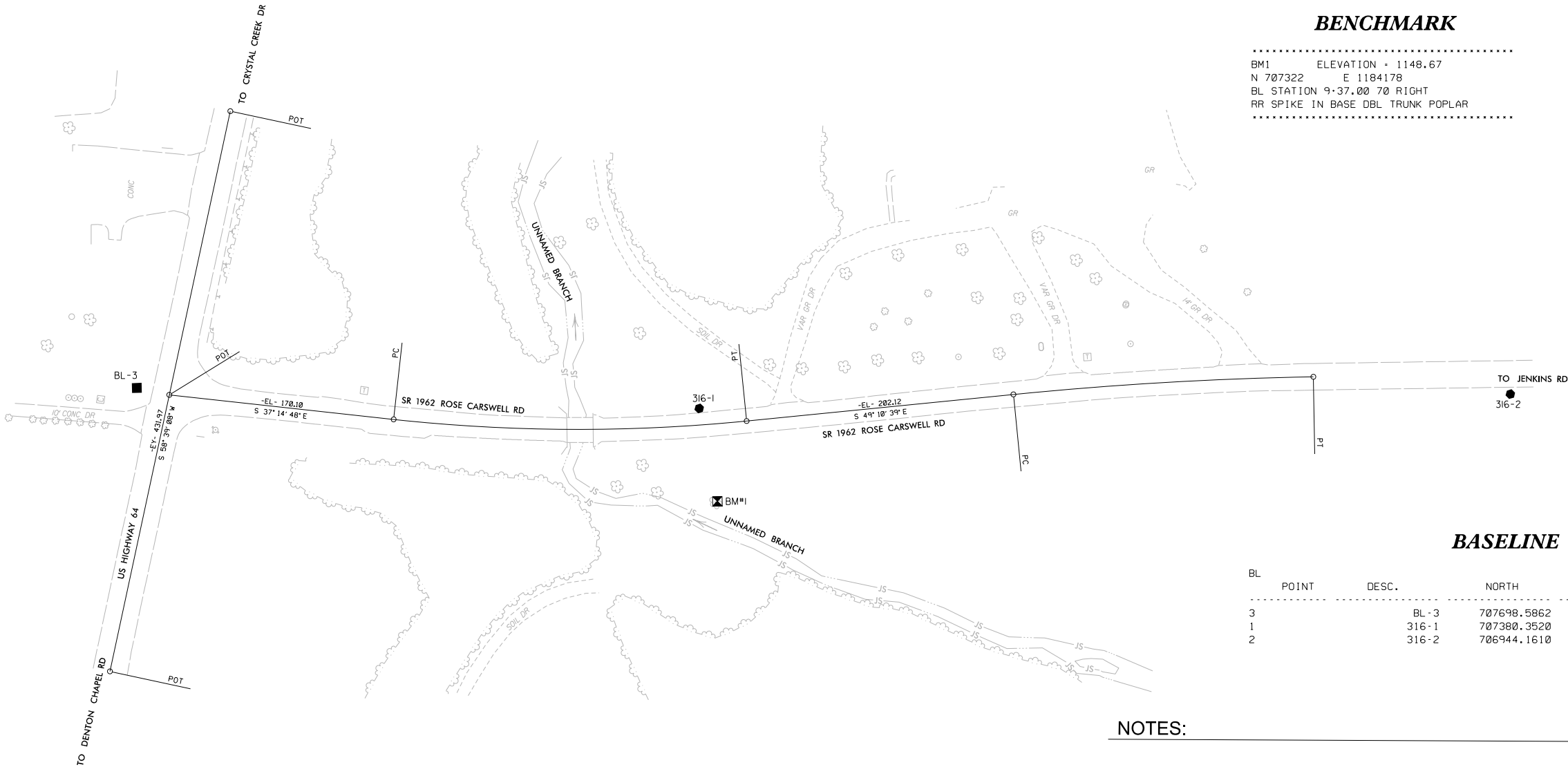
SURVEY CONTROL SHEET

W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

EXISTING CENTERLINE ALIGNMENTS

EL POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	707677.199	1183951.823	S 37°14'47.6" E	170.10					
LINE									
PC	707541.796	1184054.773	S 43°12'43.5" E	266.06	11°55'51.8"(LT)	04°28'34.4"	266.54	133.75	1280.00
CURVE									
PT	707347.884	1184236.946	S 49°10'39.4" E	202.12					
LINE									
PC	707215.753	1184389.900	S 46°51'06.1" E	226.46	04°39'06.7"(RT)	02°03'13.0"	226.52	113.32	2790.00
CURVE									
PT	707060.880	1184555.121							

EY POINT	N	E	BEARING	DIST
POT	707791.000	1184138.642		
LINE			S 58°39'08.1" W	431.97
POT	707566.275	1183769.728		



BENCHMARK

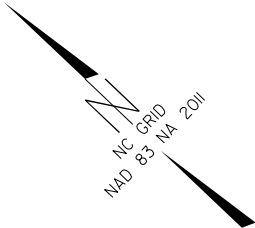
BM1 ELEVATION = 1148.67
N 707322 E 1184178
BL STATION 9+37.00 70 RIGHT
RR SPIKE IN BASE DBL TRUNK POPLAR

BASELINE

BL	POINT	DESC.	NORTH	EAST	ELEVATION
3		BL-3	707698.5862	1183938.7253	1171.80
1		316-1	707380.3520	1184219.2630	1147.63
2		316-2	706944.1610	1184647.8140	1177.20

NOTES:

- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
- 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.



PROJECT REFERENCE NO.
DF18313.2012023.PR

SHEET NO.
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

Signed by:

05/20/2011 11:47:06 AM

5/11/2026

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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: RTN
Localized around: 316-1
Northing: 707380.352
Easting: 1184219.263
Combined grid factor: 0.99984759
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 26, 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 5/11/2026

Signed by:

05/20/2011 11:47:06 AM
Professional Land Surveyor L-4775

PROPOSED ALIGNMENT CONTROL SHEET

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 5/11/2026

Matthew Cornwell
PROFESSIONAL LAND SURVEYOR L-4775

PROPOSED ALIGNMENT: L												
POINT	STATION	NORTHING	EASTING	BEARING	DIST	DELTA	D	L	T	R	LT	ST
START	10+00.00	707677.1989	1183951.8231	S37°14'47.6"E	170.10							
PC	11+70.10	707541.7955	1184054.7734	S43°12'43.5"E	266.06	11°55'51.8"	04°28'34.4"	266.54	133.75	1280.00		
PT	14+36.64	707347.8836	1184236.9458	S49°10'39.4"E	202.12							
PC	16+38.76	707215.7531	1184389.8996	S46°51'06.1"E	226.46	04°39'06.7"	02°03'13.0"	226.52	113.32	2790.00		
PT	18+65.28	707060.8804	1184555.1207	S44°31'32.7"E	100.00							
END	19+65.28	706989.5869	1184625.2437									

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.

DF18313.2012023.PR

R/W020-I

NORTH CAROLINA
DEPARTMENT
OF TRANSPORTATION



PROFESSIONAL LAND
SURVEYOR

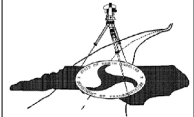


DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL SIGNATURES
ARE COMPLETED

2024 STANDARD
SPECIFICATIONS

TIP PROJECT: DF18313.2012023.PR
County: Burke

PREPARED FOR



LOCATION AND
SURVEYS UNIT

PREPARED BY

TGS ENGINEERS
201 WEST MARION ST.
SUITE 200
SHELBY, NC 28150
704-476-0093



RIGHT OF WAY & PERMANENT EASEMENT CONTROL SHEET

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 5/28/2025, 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 5/11/2026


PROFESSIONAL LAND SURVEYOR L-4775

PERMANENT ROW MARKER IRON PIN AND CAP: L			
STATION	OFFSET	NORTH	EAST
12+00.00	30.0000	707499.4945	1184049.6982
12+75.00	-30.0000	707481.0336	1184143.9293
12+75.00	-45.0000	707491.0593	1184155.0866
12+90.00	48.0000	707417.3853	1184096.3807
13+45.00	30.0000	707386.9786	1184148.6163
13+45.00	48.0000	707376.2339	1184135.9052
13+48.00	-45.0000	707440.0399	1184203.6311
14+36.64	-30.0000	707370.5858	1184256.5573

PERMANENT EASEMENT MARKER IRON PIN AND CAP: L			
STATION	OFFSET	NORTH	EAST
12+28.00	34.8467	707474.1867	1184064.0924
12+54.00	48.0000	707445.2245	1184071.4827
13+74.00	48.0000	707355.2300	1184157.4472
14+25.00	30.0000	707333.0093	1184208.3556

NOTES:

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

DF18313.2012023.PR

R/W03E-1

NORTH CAROLINA
DEPARTMENT
OF TRANSPORTATION



PROFESSIONAL LAND
SURVEYOR

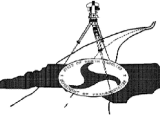


DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL SIGNATURES
ARE COMPLETED

2024 STANDARD
SPECIFICATIONS

TIP PROJECT: DF18313.2012023.PR
County: Burke

PREPARED FOR

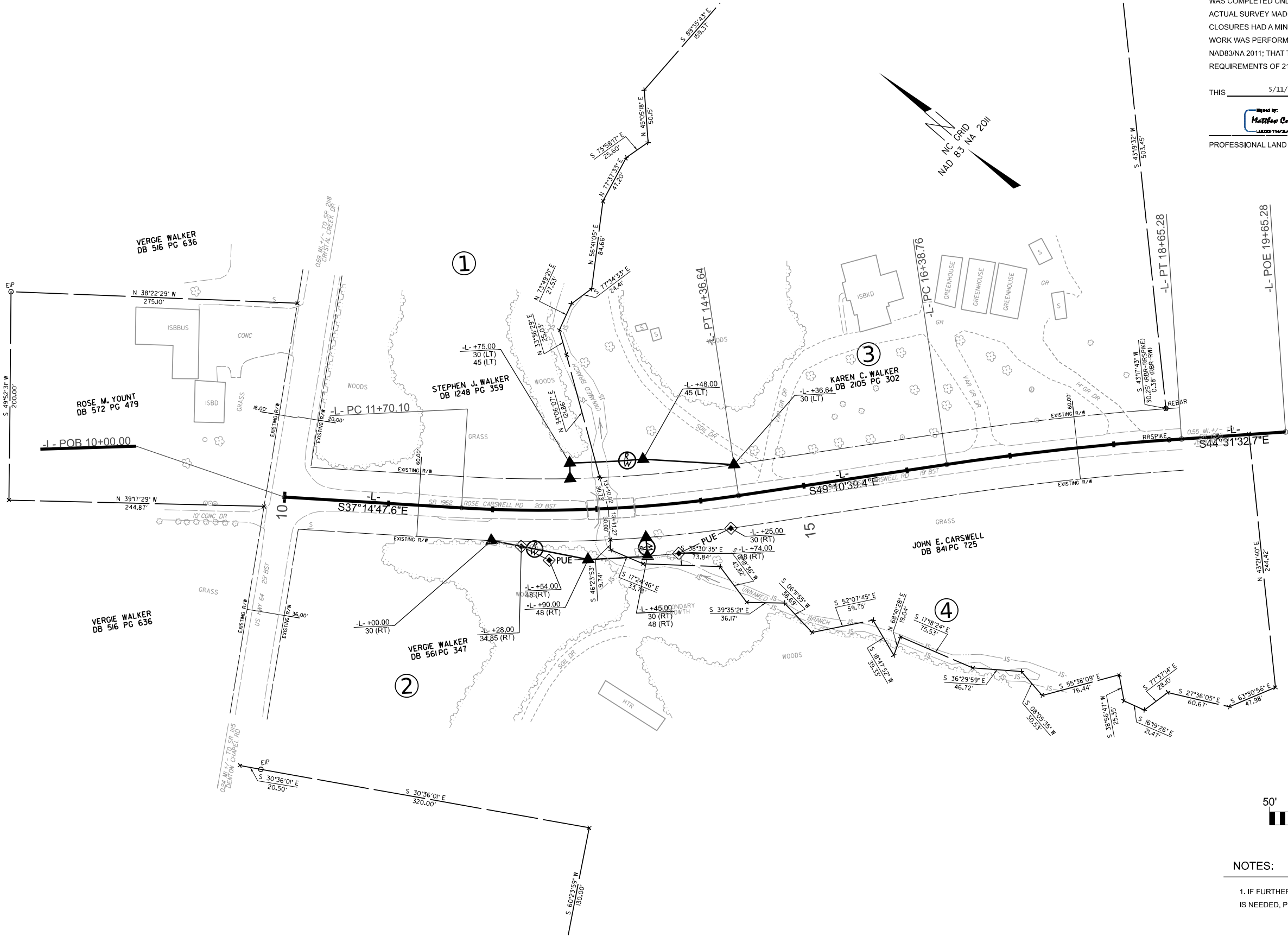


LOCATION AND
SURVEYS UNIT

PREPARED BY

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





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 5/28/2025, 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 5/11/2026

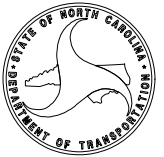
Matthew Cornwell
PROFESSIONAL LAND SURVEYOR L-4775

CUR DATA 1:
P/C 13+03.85
 $\Delta c = 11^{\circ}55'51.8''$ (LT)
D = $04^{\circ}28'34.4''$
Lc = 266.54
Tc = 133.75
R = 1.280
SE = 0.040

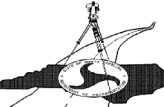
CUR DATA 2:
P/C 17+52.08
 $\Delta c = 04^{\circ}39'06.7''$ (RT)
D = $02^{\circ}03'13.0''$
Lc = 226.52
Tc = 113.32
R = 2.790
SE = 0.000

NOTES:

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



TIP PROJECT: DF18313.2012023.PR
County: Burke



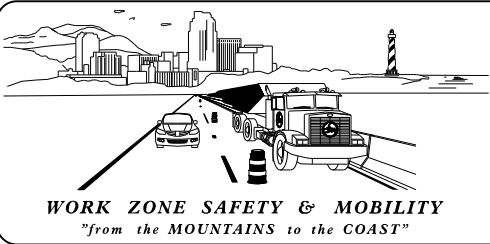
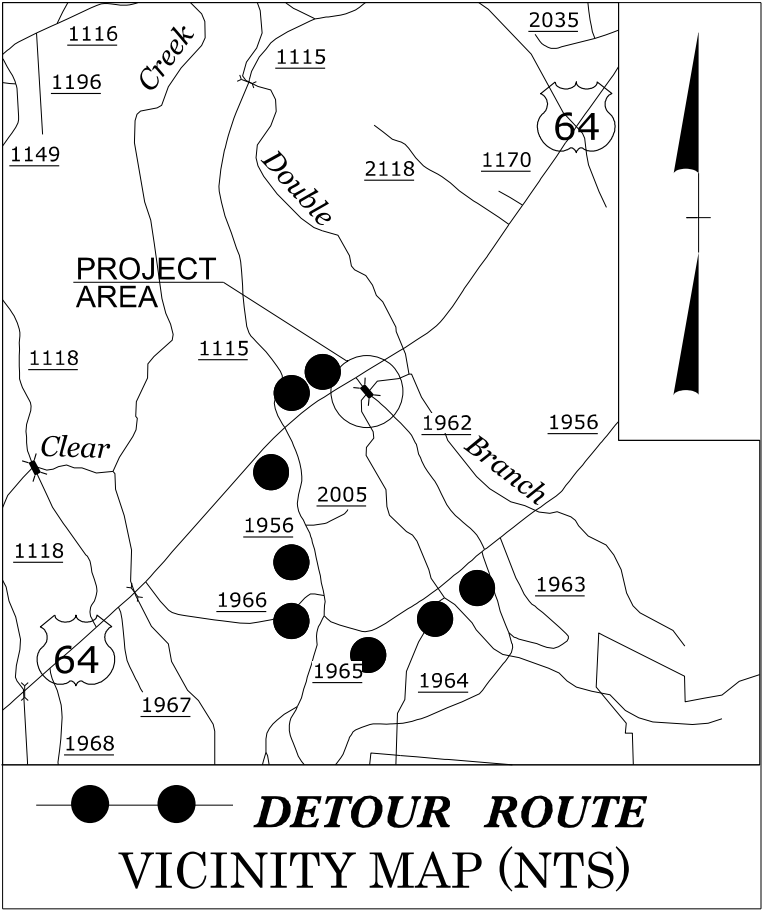
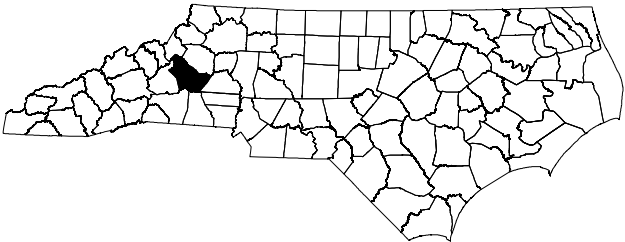
10/20/2025
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User: tgraves

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

BURKE COUNTY

REPLACE BRIDGE NO. 316 ON SR 1962 (ROSE CARSWELL RD)
OVER UT TO DOUBLE BRANCH



PLANS PREPARED BY:

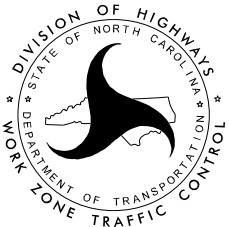
TYSON A. GRAVES, PE

PAYTON L. NELSON

NCDOT CONTACTS:

Mark Hill

NCDOT PROJECT ENGINEER

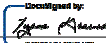


INDEX OF SHEETS

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

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

APPROVED: 
DATE: 10-21-2025

SEAL



SHEET NO.
TMP-1

DF18313.2012023.PR

TIP PROJECT:

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.

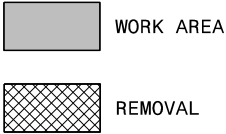
COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.

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

TRAFFIC CONTROL DEVICES

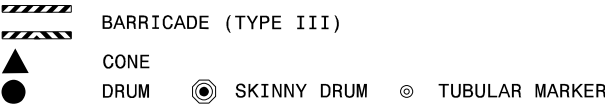
- F) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

GENERAL

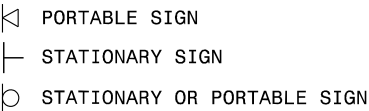


LEGEND

TRAFFIC CONTROL DEVICES

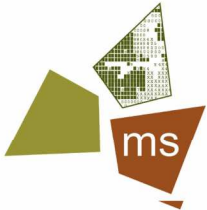


TEMPORARY SIGNING



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 & 2 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.

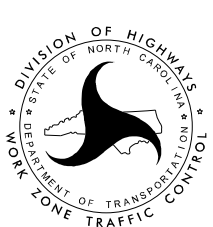


ms consultants, inc.
5444 Wade Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number : C-3239

APPROVED: 
DATE: 10-21-2025

SEAL





ROADWAY STANDARD
DRAWINGS, LEGEND,
GENERAL NOTES,
& PHASING

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

The diagram illustrates three methods for closing a road to traffic, each showing the placement of various traffic signs and barricades.

1. Full Road Closure (Two-Way Traffic): This method involves closing both directions of traffic. It uses two Type III Barricades, one R11-2 sign (48" x 30") for each direction, and two M4-10R/M4-10L signs (48" x 18") with "ROAD CLOSED" and "DETOUR" text. The detour signs point in the opposite direction of the closed road.

2. One-Way Road Closure (Traffic Detoured in One Direction): This method involves closing one direction of traffic. It uses one Type III Barricade, one R11-4 sign (60" x 30") with "ROAD CLOSED TO THRU TRAFFIC" and "DETOUR" text, and one M4-10L sign (48" x 18") with "ROAD CLOSED" and "DETOUR" text. The detour sign points in the opposite direction of the closed road.

3. One-Way Road Closure (Traffic Detoured in Opposite Direction): This method involves closing one direction of traffic. It uses one Type III Barricade, one R11-4 sign (60" x 30") with "ROAD CLOSED TO THRU TRAFFIC" and "DETOUR" text, and one M4-10R sign (48" x 18") with "ROAD CLOSED" and "DETOUR" text. The detour sign points in the opposite direction of the closed road.

4. One-Way Road Closure (Traffic Detoured in Opposite Direction): This method involves closing one direction of traffic. It uses one Type III Barricade, one R11-4 sign (60" x 30") with "ROAD CLOSED TO THRU TRAFFIC" and "DETOUR" text, and one M4-10L sign (48" x 18") with "ROAD CLOSED" and "DETOUR" text. The detour sign points in the opposite direction of the closed road.

5. One-Way Road Closure (Traffic Detoured in Opposite Direction): This method involves closing one direction of traffic. It uses one Type III Barricade, one R11-4 sign (60" x 30") with "ROAD CLOSED TO THRU TRAFFIC" and "DETOUR" text, and one M4-10R sign (48" x 18") with "ROAD CLOSED" and "DETOUR" text. The detour sign points in the opposite direction of the closed road.

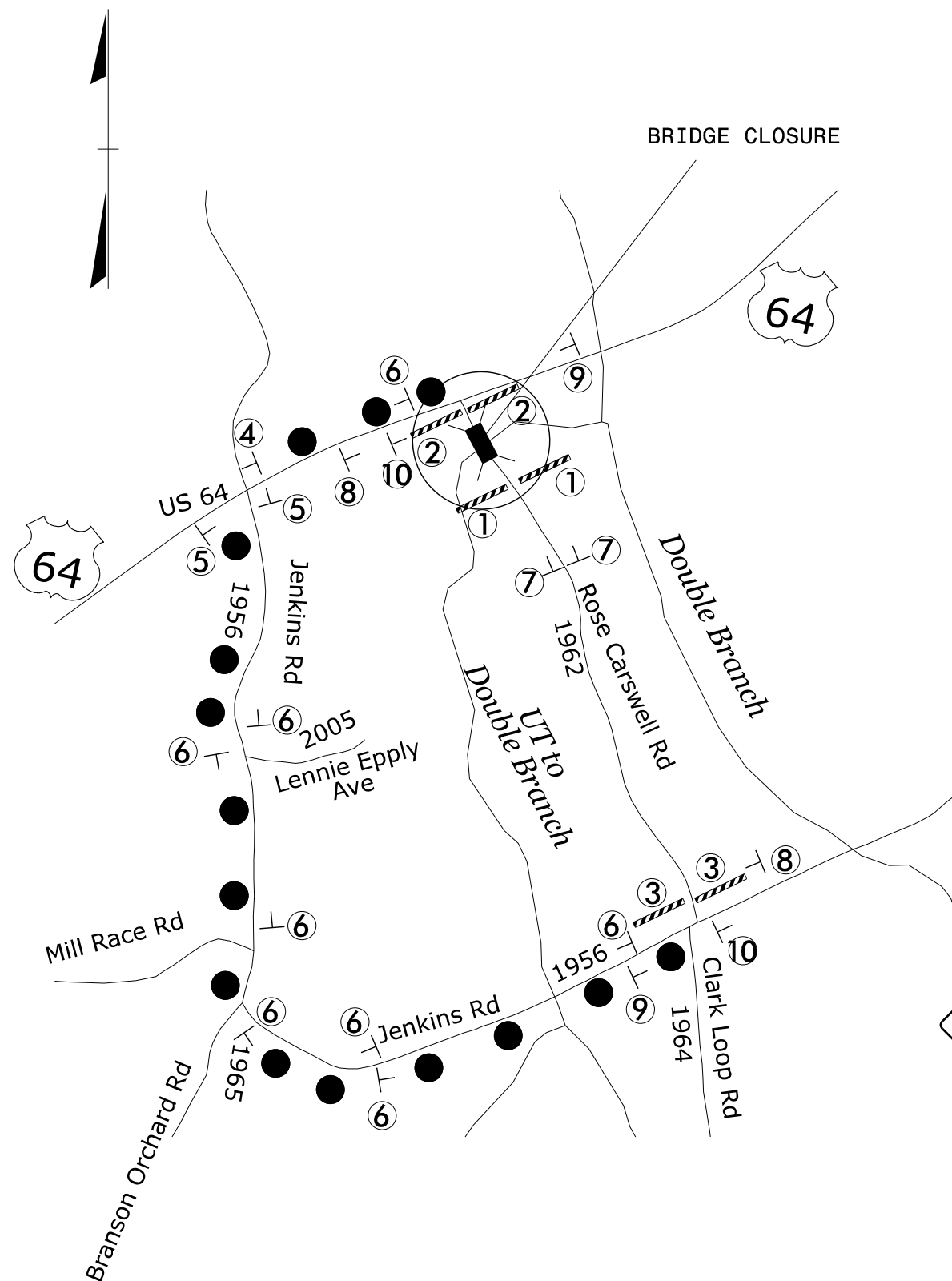
6. One-Way Road Closure (Traffic Detoured in Opposite Direction): This method involves closing one direction of traffic. It uses one Type III Barricade, one R11-4 sign (60" x 30") with "ROAD CLOSED TO THRU TRAFFIC" and "DETOUR" text, and one M4-10L sign (48" x 18") with "ROAD CLOSED" and "DETOUR" text. The detour sign points in the opposite direction of the closed road.

7. One-Way Road Closure (Traffic Detoured in Opposite Direction): This method involves closing one direction of traffic. It uses one Type III Barricade, one R11-4 sign (60" x 30") with "ROAD CLOSED TO THRU TRAFFIC" and "DETOUR" text, and one M4-10R sign (48" x 18") with "ROAD CLOSED" and "DETOUR" text. The detour sign points in the opposite direction of the closed road.

8. One-Way Road Closure (Traffic Detoured in Opposite Direction): This method involves closing one direction of traffic. It uses one Type III Barricade, one R11-4 sign (60" x 30") with "ROAD CLOSED TO THRU TRAFFIC" and "DETOUR" text, and one M4-10L sign (48" x 18") with "ROAD CLOSED" and "DETOUR" text. The detour sign points in the opposite direction of the closed road.

9. One-Way Road Closure (Traffic Detoured in Opposite Direction): This method involves closing one direction of traffic. It uses one Type III Barricade, one R11-4 sign (60" x 30") with "ROAD CLOSED TO THRU TRAFFIC" and "DETOUR" text, and one M4-10R sign (48" x 18") with "ROAD CLOSED" and "DETOUR" text. The detour sign points in the opposite direction of the closed road.

10. One-Way Road Closure (Traffic Detoured in Opposite Direction): This method involves closing one direction of traffic. It uses one Type III Barricade, one R11-4 sign (60" x 30") with "ROAD CLOSED TO THRU TRAFFIC" and "DETOUR" text, and one M4-10L sign (48" x 18") with "ROAD CLOSED" and "DETOUR" text. The detour sign points in the opposite direction of the closed road.



● ● *DETOUR ROUTE*



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

APPROVED: _____ DATE: 10-21-2025		
SEAL DETOUR ROUTE AND SIGNS		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

DESIGN BY: TAG CHECKED BY: DVJ November 19, 2024
PROJECT ID: BP13-R018 LOCATION: DIV: 13

[illegible]

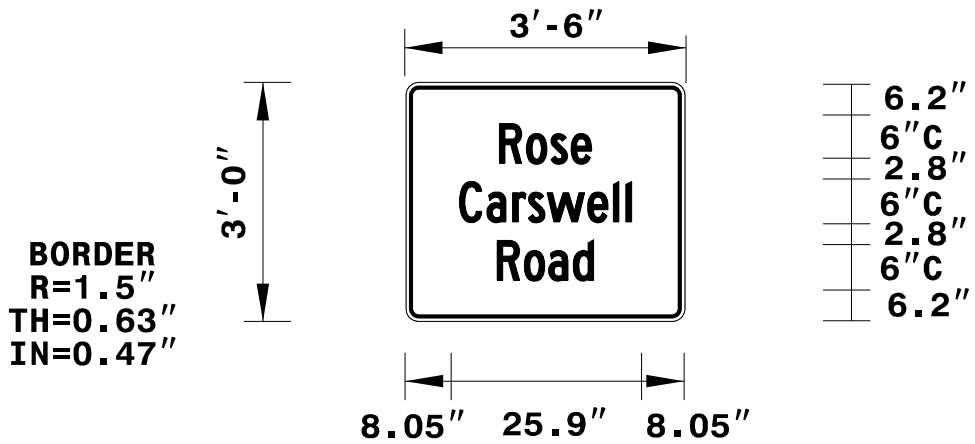
BORDER TYPE: INSET
RECESS: 0.47"
WIDTH: 0.63"
RADII: 1.5"

NO. **Z BARS:** **MAT L:** 0.080 (2.0 mm) ALUMINUM
 LENGTH:

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.



Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

[illegible]

FILENAME: Work Zone_2_Rose_Carswell_Road

NORTH CAROLINA D.O.T. SIGN DETAIL



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

APPROVED: _____
DATE: 10-21-2025

SEAL



**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**



SIGN DESIGN

10/20/2025
P:\ncdot-pub\entleg\comncdot-pw-01\Documents\Division.13\DF18313.2012023.PR Burke 316/Signing and Delineation/Pavement Marking/Design\BP13R018.SGN_PMP_Title
User:tygraves

T.I.P.: DF18313.2012023.PR

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN
BURKE COUNTY

REPLACE BRIDGE NO. 316 ON SR 1962 (ROSE CARSWELL RD)
OVER UT TO DOUBLE BRANCH

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN TITLE AND SCHEDULE SHEET
PMP-2	FINAL PAVEMENT MARKINGS

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

PAVEMENT MARKING SCHEDULE

	PAINT(4")
P1	WHITE EDGELINE
P13	YELLOW DOUBLE CENTER

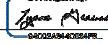
PLAN SUBMITTED TO:

Mark Hill NCDOT PROJECT ENGINEER



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 | NONE |
- 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.
- E) APPLY TWO (2) COATS OF PAINT.

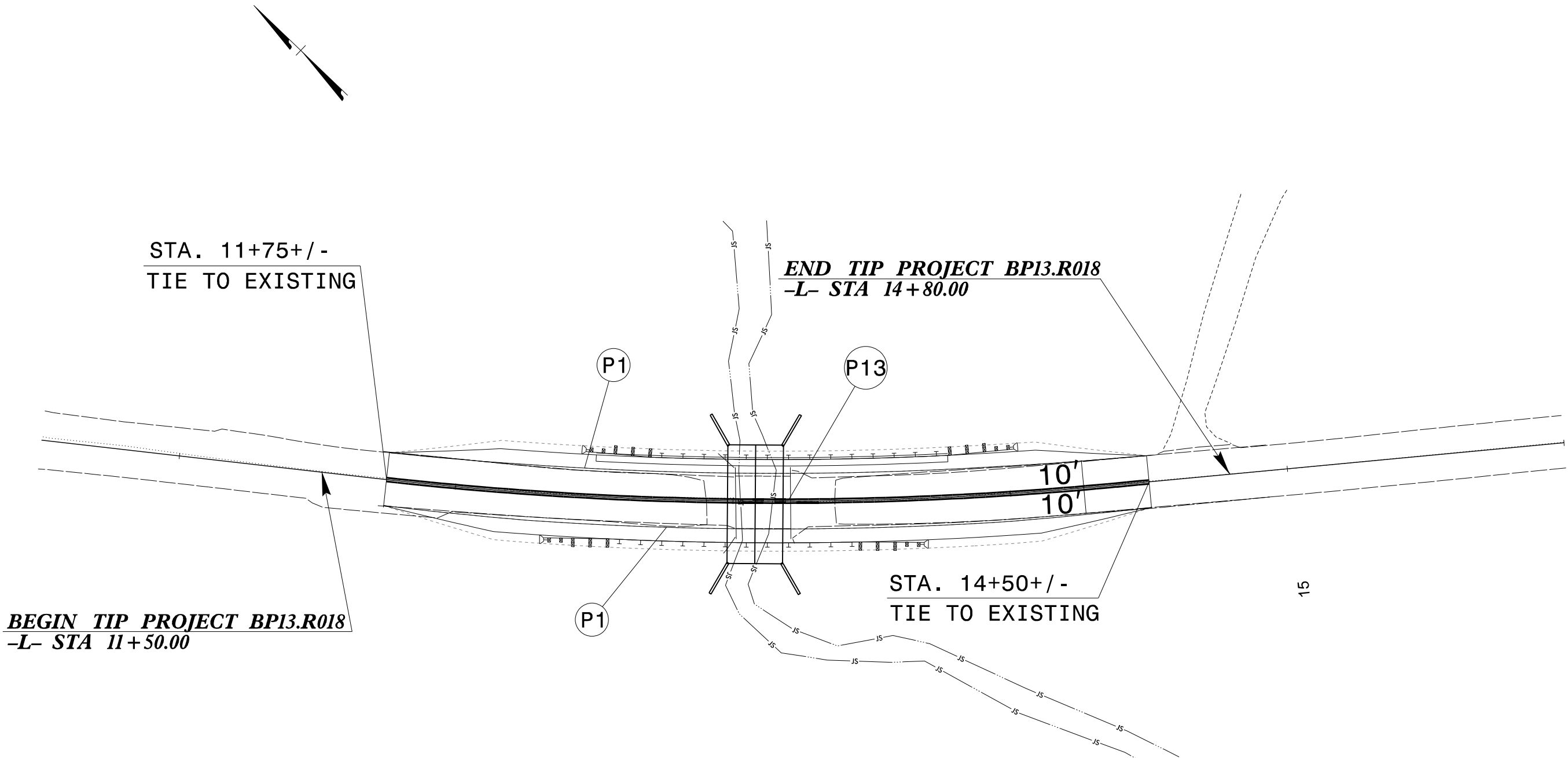
TIP NO.	SHEET NO.
DF18313.2012023.PR	PMP-1
APPROVED:  TYSON A. GRAVES	
DATE: 10-21-2025	
SEAL 	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PLAN PREPARED BY: ms consultants, inc.

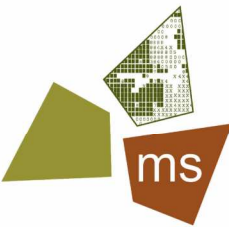
Tyson A. Graves, PE Project Engineer
Payton L. Nelson Project Design Engineer



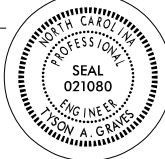
ms consultants, inc.
5444 Wade Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number : C-3239

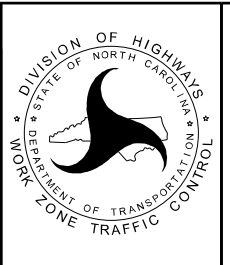


10/20/2025
pw:/ncdot-pw.bentley.com/ncdot-pw-01/Documents/Division_13/DF18313.2012023.PR Burke 316/Signing and Delineation/Pavement Marking/Design/BP13R018_SGN_PMP_PMT.dgn
User:graves



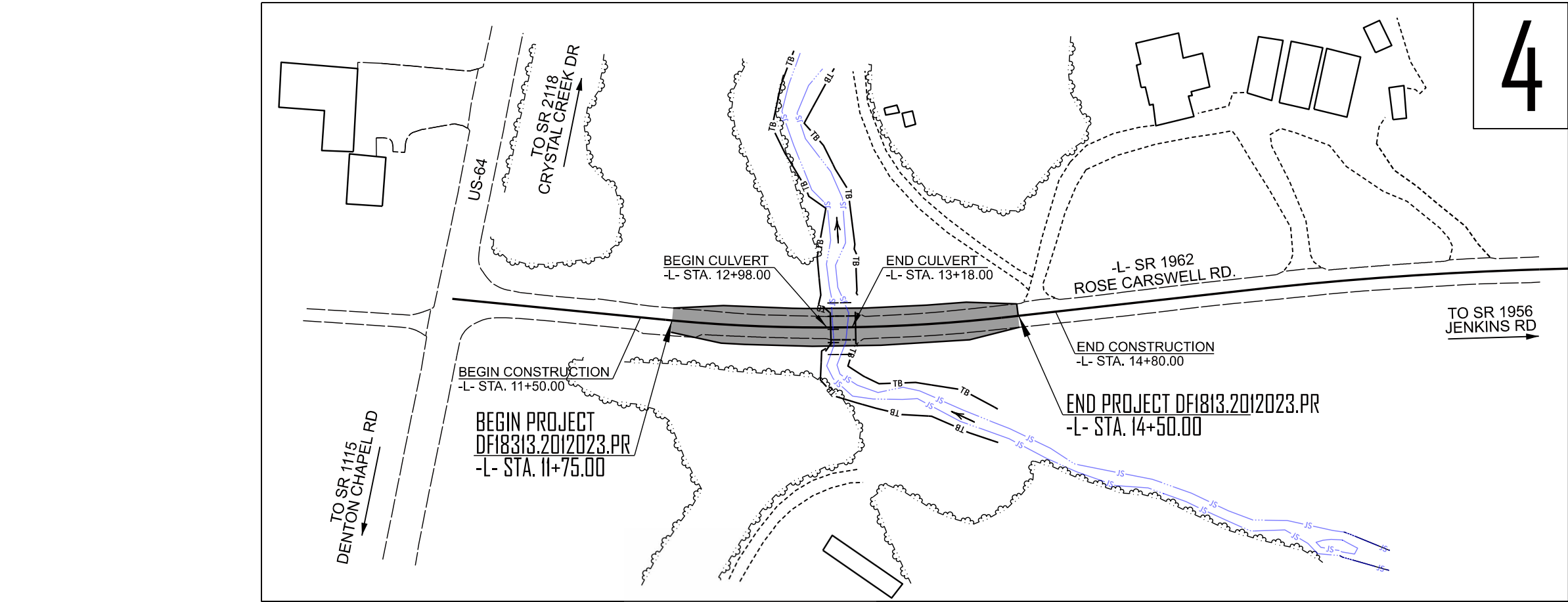
ms consultants, inc.
5444 Wade Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number : C-3239

APPROVED: 
DATE: 10-21-2025
SEAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



FINAL PAVEMENT MARKINGS

11/12/2025
 pw:/ncdot-pw/bentley.comncdot-pw-0/Documents/Division_13/DFB33.202023.PR Burke 316/Roadside Environmental/Erosion Control/Design/BP3R018_ECOL_TSH_LCD.dgn
 MI ENGINEERING, RALEIGH N.C



KAREN HEFNER, PE	3824
NAME	LEVEL III CERTIFICATION NO.

Roadway Standard Drawings

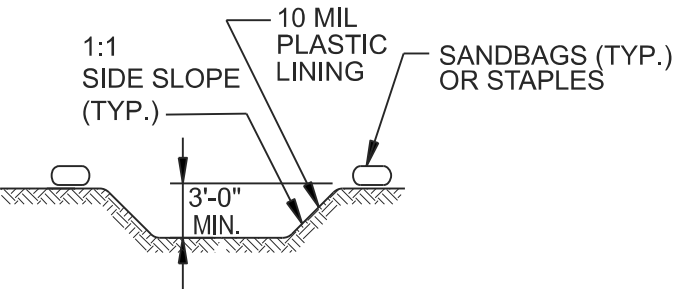
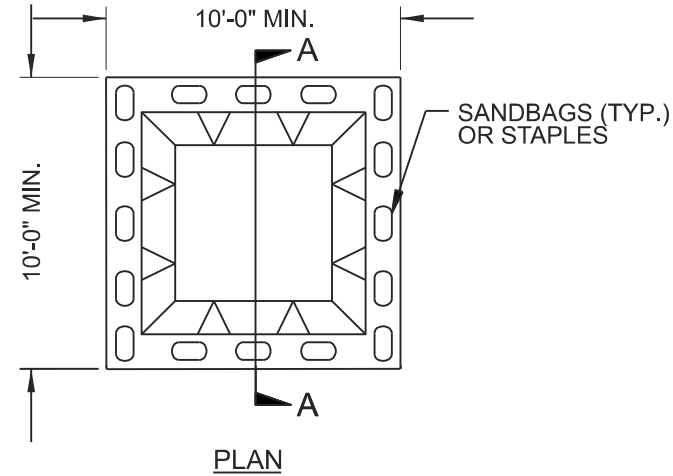
The "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2024 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

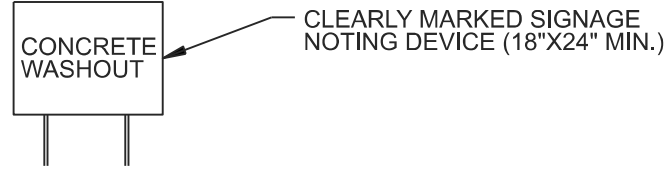
EROSION & SEDIMENT CONTROL LEGEND

Std. #	Description	Symbol	Std. #	Description	Symbol
1605.01	Temporary Silt Fence		1633.01	Temporary Rock Silt Check Type A	
1606.01	Special Sediment Control Fence		1633.02	Temporary Rock Silt Check Type B	
1622.01	Temporary Berms and Slope Drains		1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1630.02	Silt Basin Type B		1634.01	Temporary Rock Sediment Dam Type A	
1630.03	Temporary Silt Ditch		1634.02	Temporary Rock Sediment Dam Type B	
1630.04	Stilling Basin		1635.01	Rock Pipe Inlet Sediment Trap Type A	
1630.05	Temporary Diversion		1635.02	Rock Pipe Inlet Sediment Trap Type B	
1630.06	Special Stilling Basin		1636.01	Excelsior Wattle Check	
1630.07	Skimmer Basin		1636.01	Excelsior Wattle Check with Flocculant	
1630.08	Tiered Skimmer Basin		1636.01	Coir Fiber Wattle Check	
1630.09	Earthen Dam with Skimmer		1636.01	Coir Fiber Wattle Check with Flocculant	
	Infiltration Basin		1636.02	Silt Fence Excelsior Wattle Break	
	Rock Inlet Sediment Trap:			Silt Fence Coir Fiber Wattle Break	
1632.01	Type A		1636.03	Excelsior Wattle Barrier	
1632.02	Type B		1636.03	Coir Fiber Wattle Barrier	
1632.03	Type C				

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER

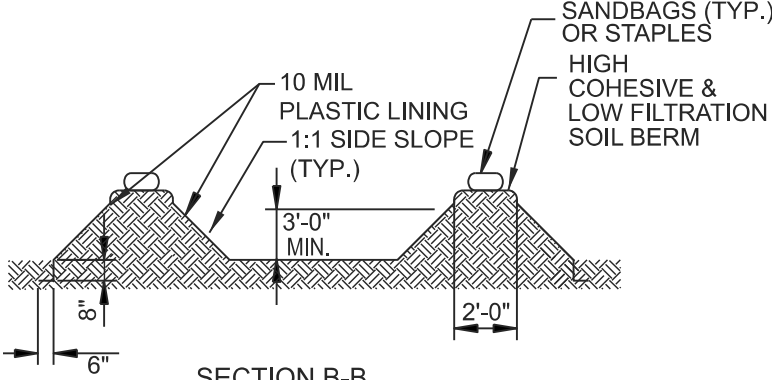
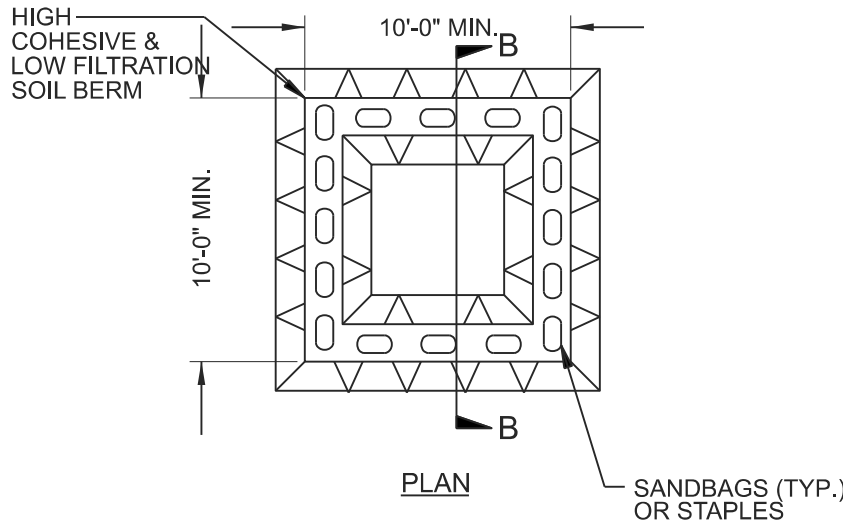


SECTION A-A

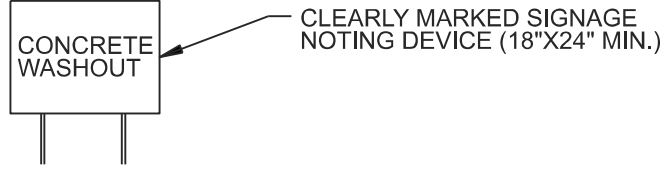


BELOW GRADE WASHOUT STRUCTURE
NOT TO SCALE

- 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.



SECTION B-B



ABOVE GRADE WASHOUT STRUCTURE
NOT TO SCALE

- 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.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

DITCH MATTING (EXCELSIOR) FOR EROSION CONTROL

[illegible]

DITCH MATTING (STRAW) FOR EROSION CONTROL

[illegible]

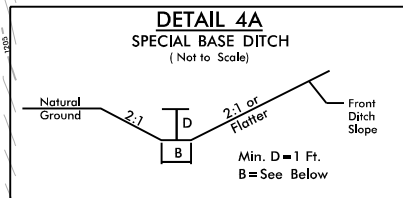
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

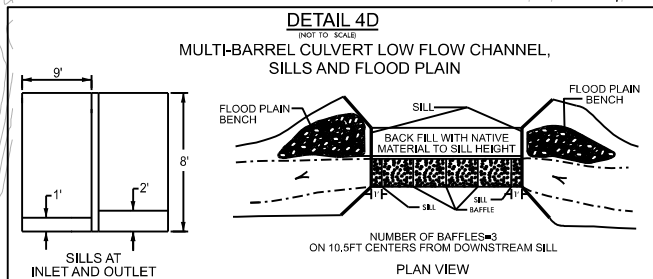
SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 TO 4:1	14 DAYS	7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



PREPARED BY



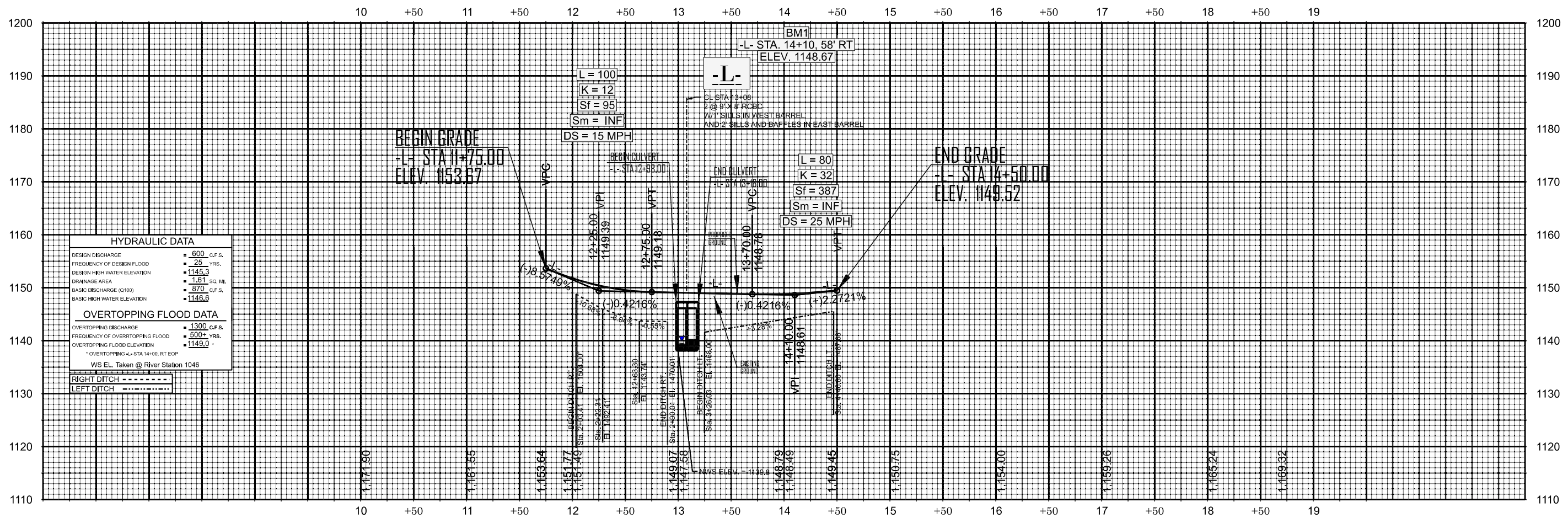
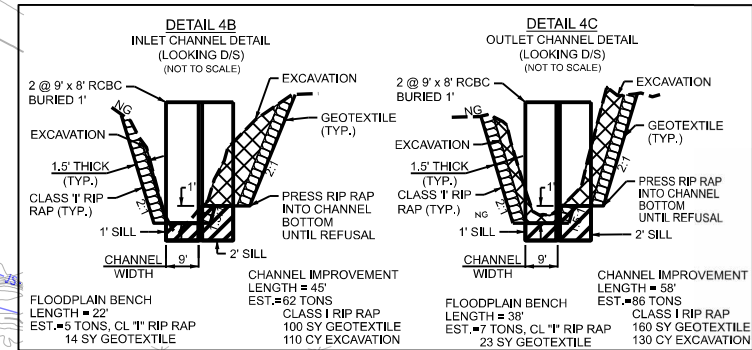
BEGIN TIP PROJECT DF1813.2012023.PR
-L- POC STA 11+75.00



*FOR GUARDRAIL OVER CULVERT, ALTERNATIVE POST SPACING REQUIRED, SEE 862.01 SHEET 10

STA. 13+08 -L-, 2 @ 9' x 8' RBCB, FOR
CONSTRUCTION SEQUENCE, SEE SHT. EC-4A

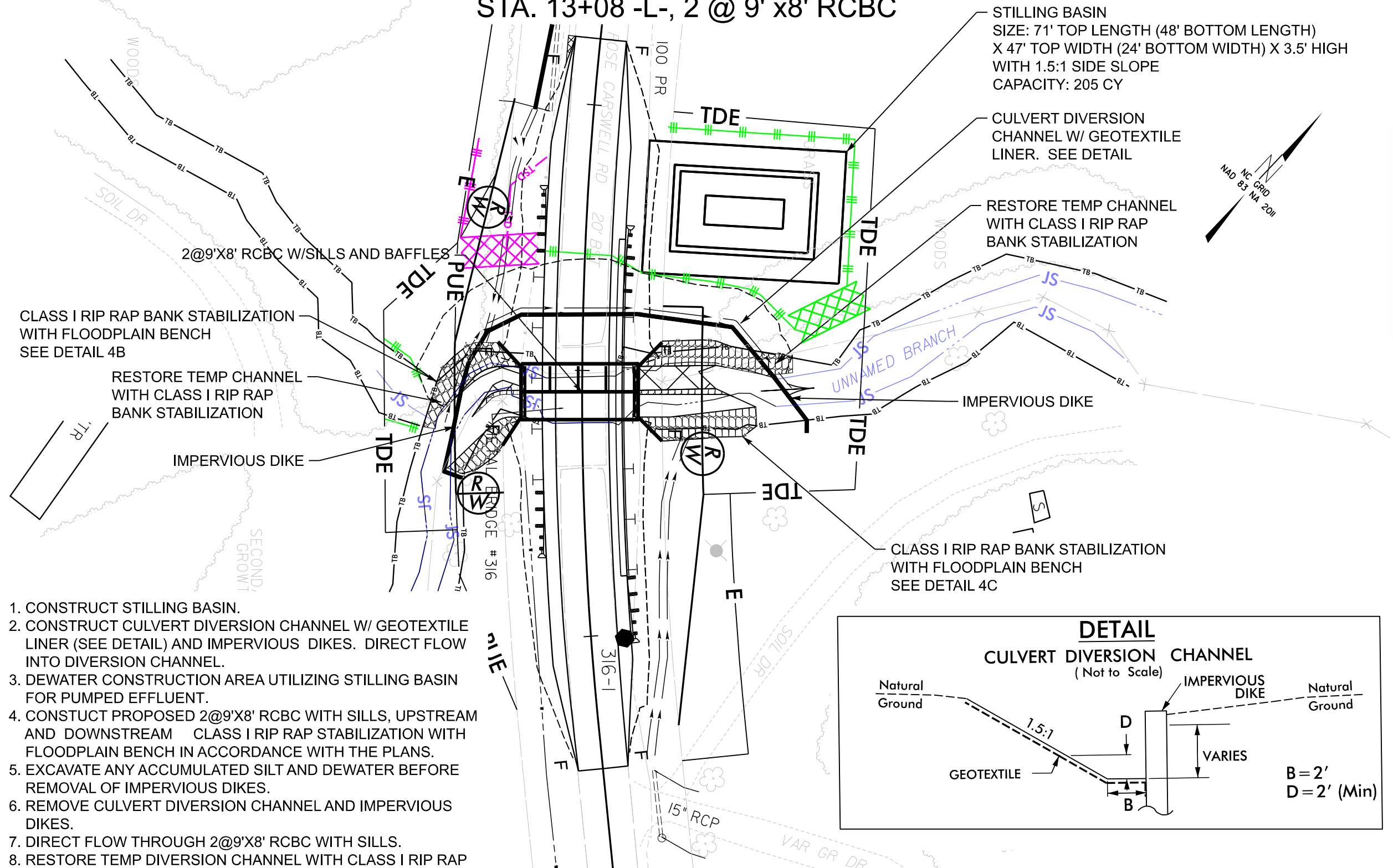
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-L- POT STA 14+50.00



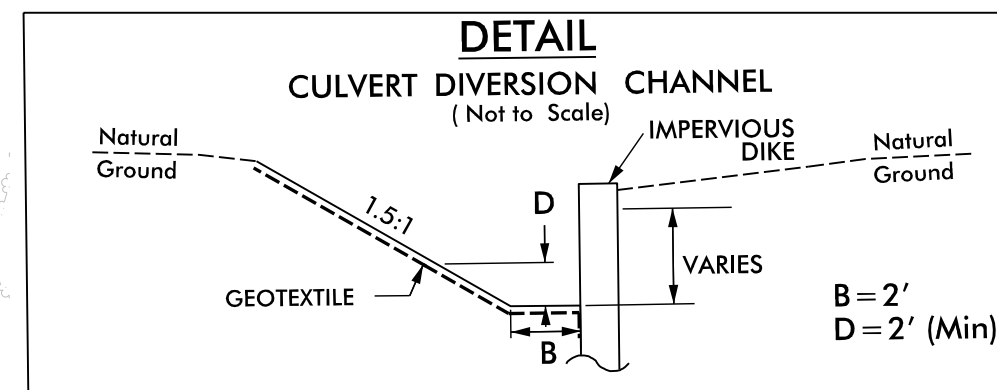
REVISIONS



CULVERT CONSTRUCTION SEQUENCE STA. 13+08 -L-, 2 @ 9' x8' RCBC

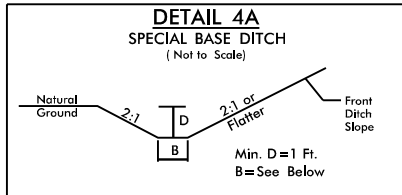


1. CONSTRUCT STILLING BASIN.
2. CONSTRUCT CULVERT DIVERSION CHANNEL W/ GEOTEXTILE LINER (SEE DETAIL) AND IMPERVIOUS DIKES. DIRECT FLOW INTO DIVERSION CHANNEL.
3. DEWATER CONSTRUCTION AREA UTILIZING STILLING BASIN FOR PUMPED EFFLUENT.
4. CONSTRUCT PROPOSED 2@9'X8' RCBC WITH SILLS, UPSTREAM AND DOWNSTREAM CLASS I RIP RAP STABILIZATION WITH FLOODPLAIN BENCH IN ACCORDANCE WITH THE PLANS.
5. EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKES.
6. REMOVE CULVERT DIVERSION CHANNEL AND IMPERVIOUS DIKES.
7. DIRECT FLOW THROUGH 2@9'X8' RCBC WITH SILLS.
8. RESTORE TEMP DIVERSION CHANNEL WITH CLASS I RIP RAP



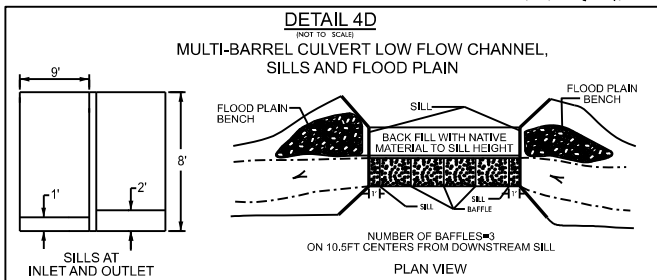
FOR -CHAIN-PROFILE, SEE SHEET ??

REVISIONS



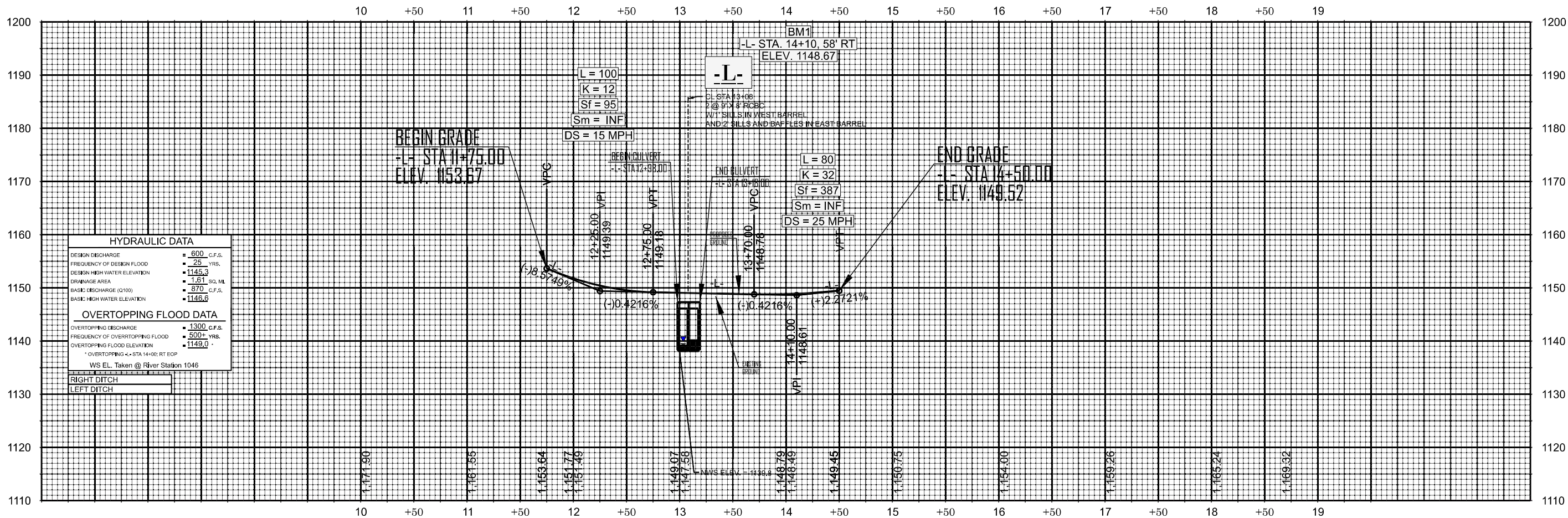
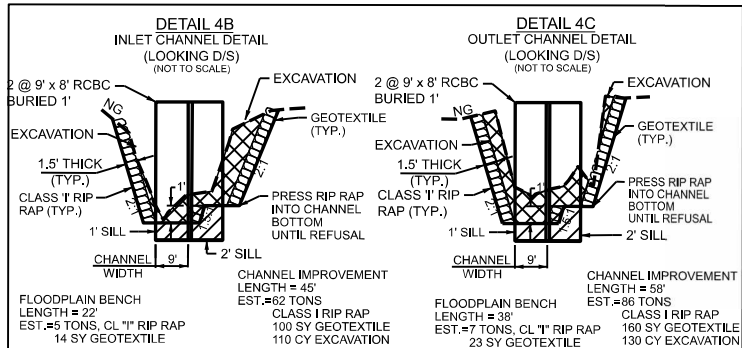
FROM L STA. 12+03 TO STA. 12+90 RT, B=2'
FROM L STA. 13+26 TO STA. 14+47 LT, B=3'

BEGIN TIP PROJECT DF1813.2012023.PR
-L- POC STA 11+75.00



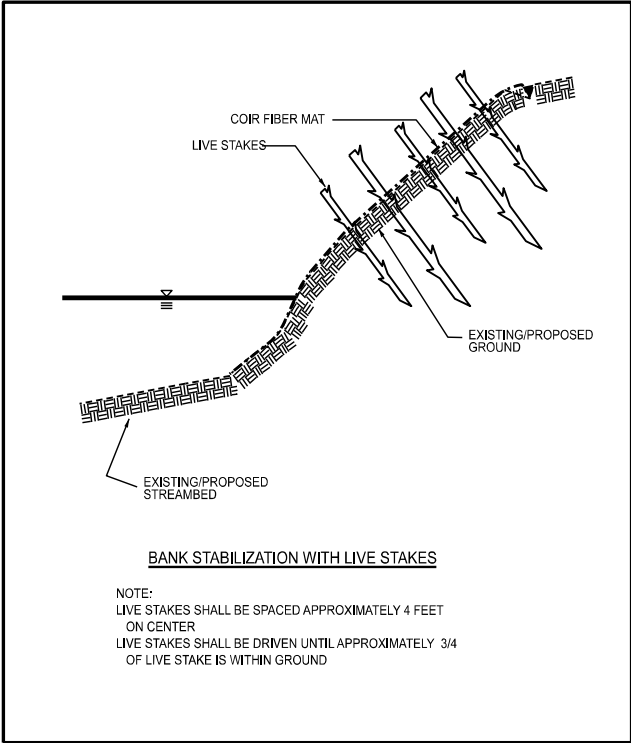
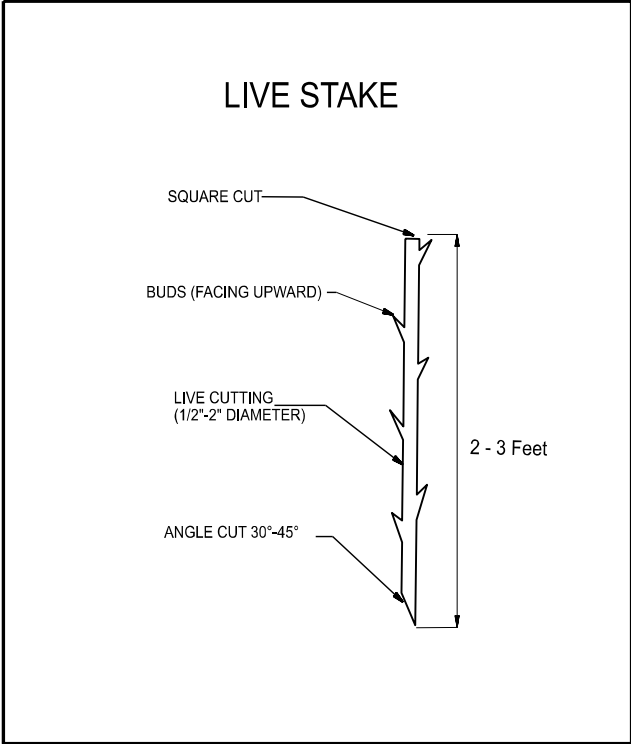
STA. 13+08 -L-, 2 @ 9' x 8' RCBC, FOR
CONSTRUCTION SEQUENCE, SEE SHT. EC-4A

END TIP PROJECT DF1813.2012023.PR
-L- POT STA 14+50.00



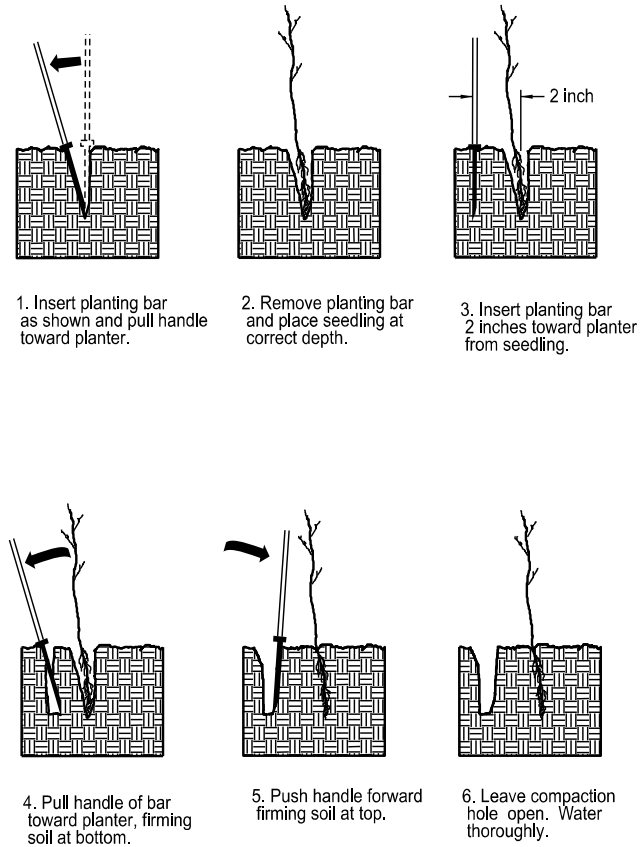
PLANTING DETAILS

LIVE STAKES PLANTING DETAIL



BAREROOT PLANTING DETAIL

DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



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.

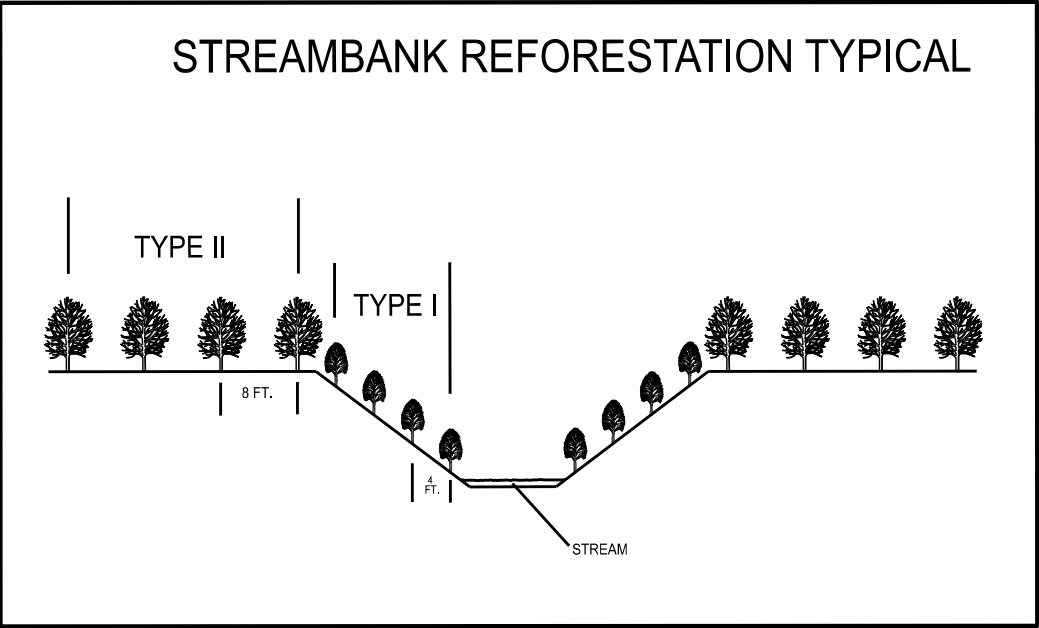


KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.



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

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

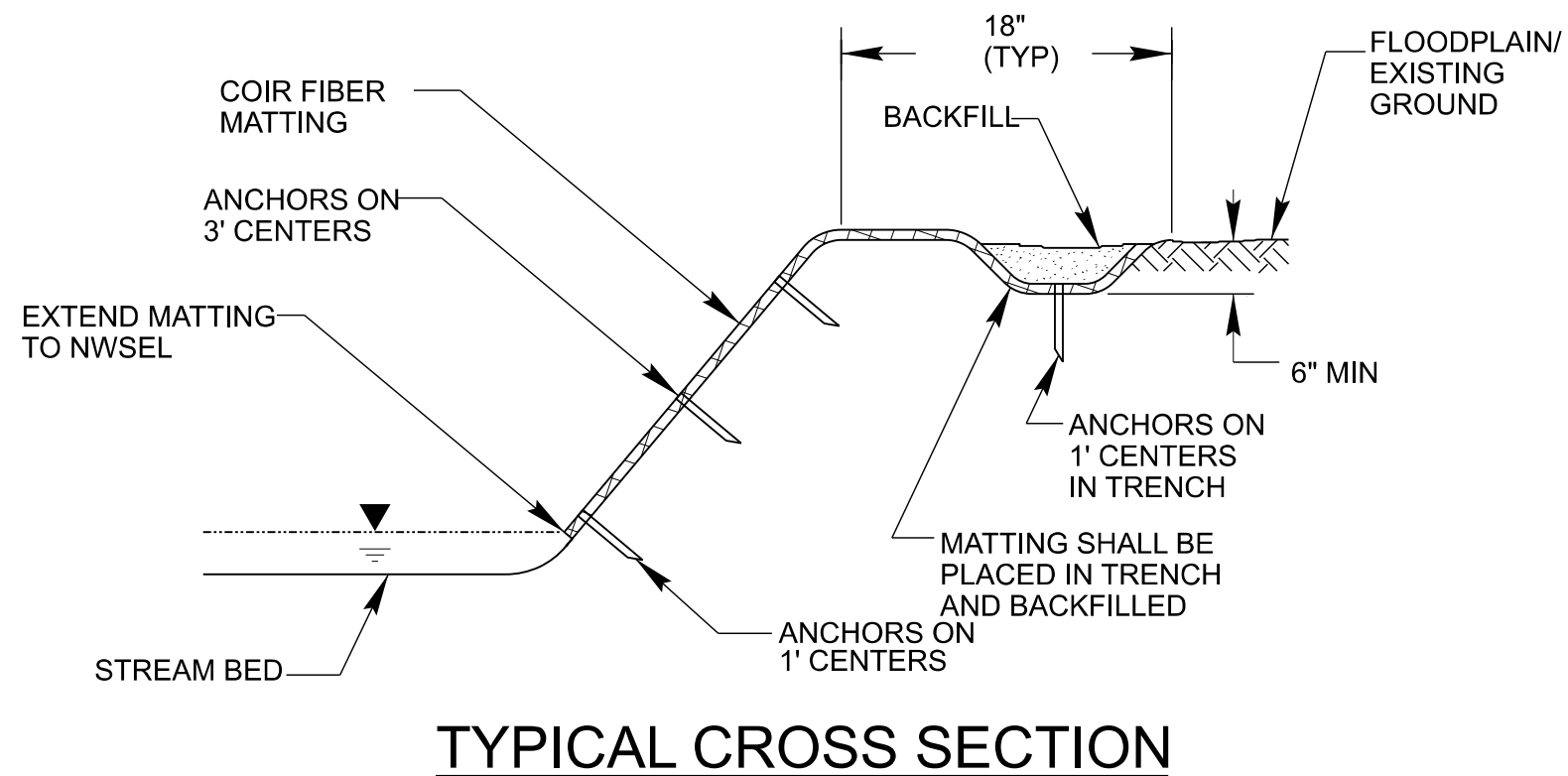
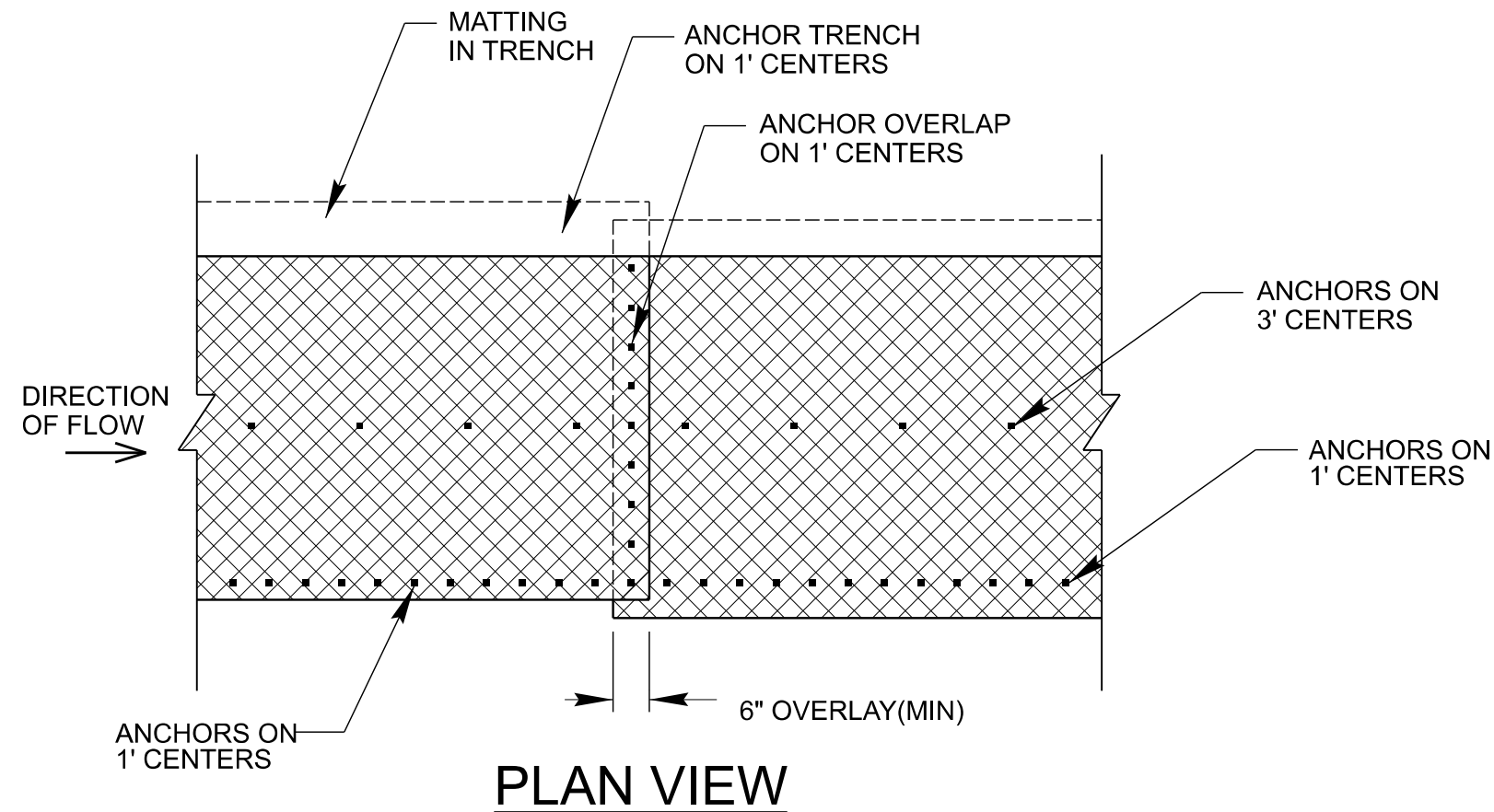
TYPE 1

50% SALIX NIGRA	BLACK WILLOW	2 ft - 3 ft LIVE STAKES
50% CORNUS AMOMUM	SILKY DOGWOOD	2 ft - 3 ft LIVE STAKES

TYPE 2

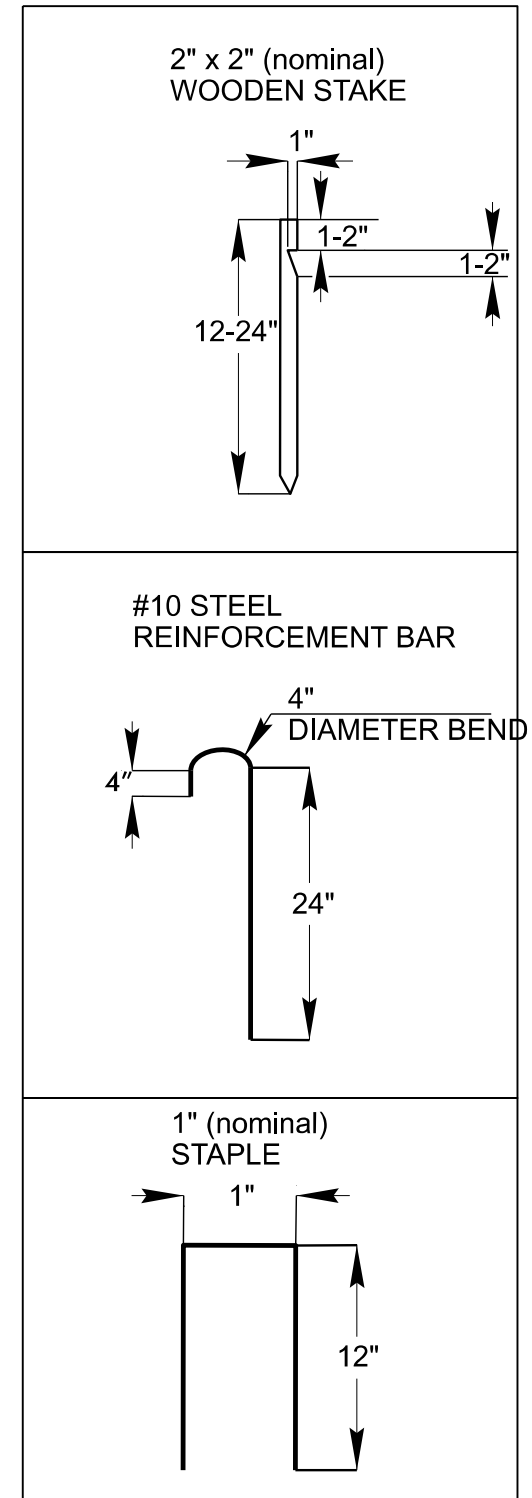
25% LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in - 18 in BR
25% PLATANUS OCCIDENTALIS	SYCAMORE	12 in - 18 in BR
25% PRUNUS SEROTINA	BLACK CHERRY	12 in - 18 in BR
25% BETULA NIGRA	RIVER BIRCH	12 in - 18 in BR

- ☐ SEE PLAN SHEETS FOR AREAS TO BE PLANTED



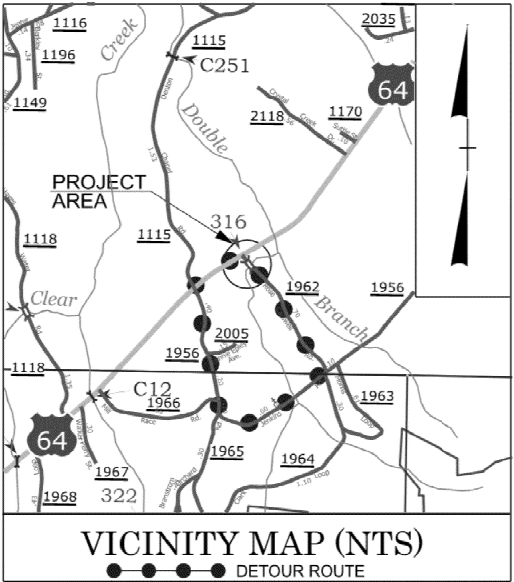
COIR FIBER MATTING DETAIL

NOT TO SCALE



TIP PROJECT: DF18313.2012023.PR

CONTRACT: -----

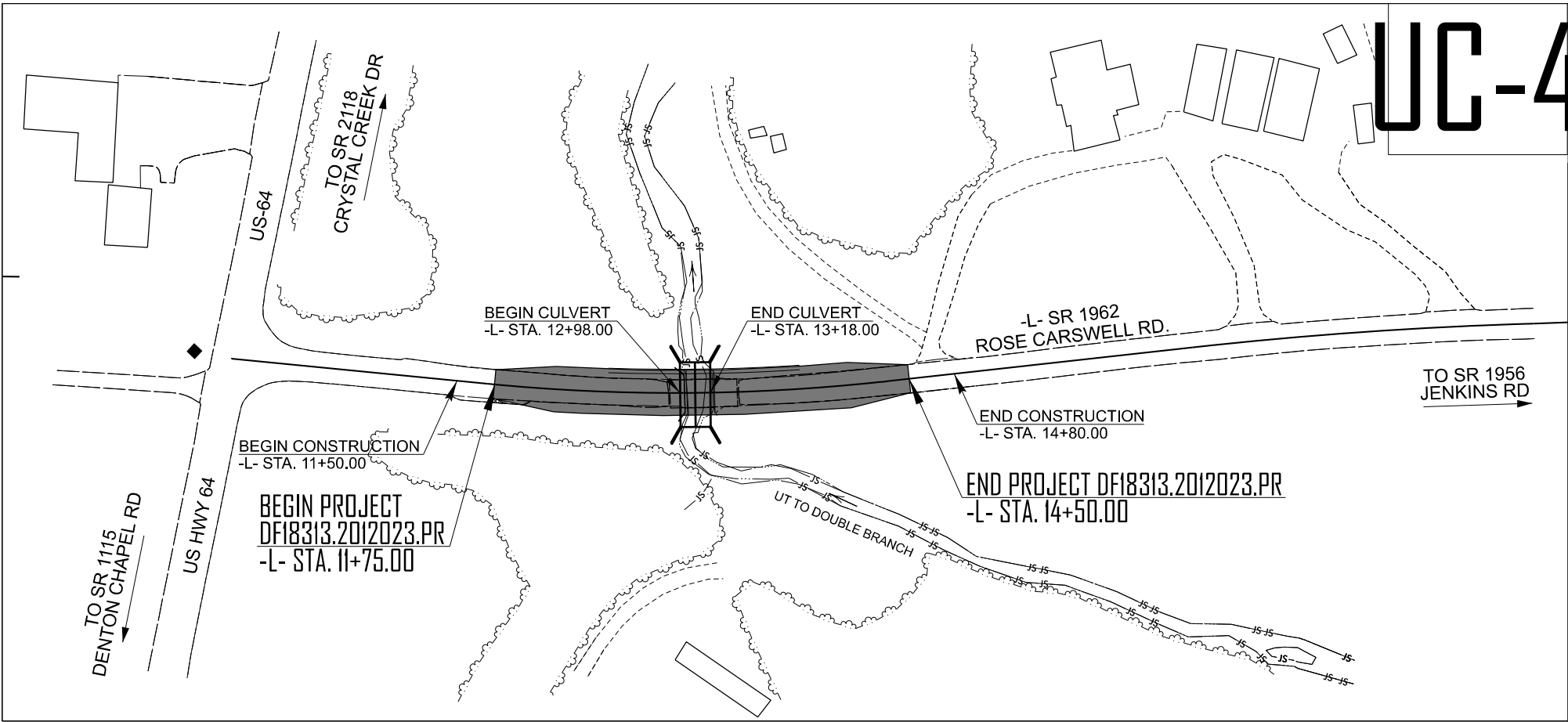


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

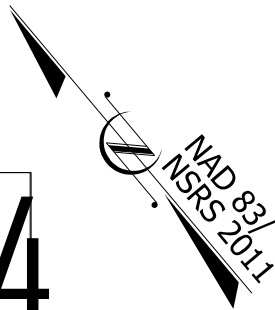
UTILITY CONSTRUCTION PLANS
BURKE COUNTY

LOCATION: REPLACE BRIDGE NO. 316 ON SR 1962 (ROSE CARSWELL RD)
OVER UT TO DOUBLE BRANCH

TYPE OF WORK: WATER LINE CONSTRUCTION



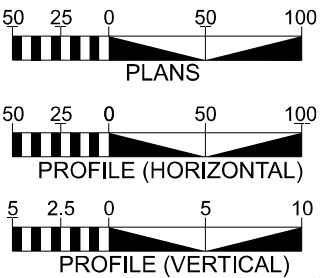
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18313.2012023.PR	UC-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
DF18313.2012023.PR	-----	PE, R/W, UTILITIES & CONSTRUCTION	
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UC-4

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



INDEX OF SHEETS

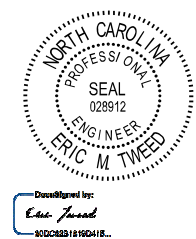
SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3	NOTES & DETAILS
UC-4	WATER PLAN & PROFILE SHEET

WATER AND SEWER
OWNERS ON PROJECT

(A) WATER BRENTWOOD WATER CORPORATION

SEAL

9/29/2025



PREPARED IN THE OFFICE OF



PENNONI ASSOCIATES INC.
5430 WADE PARK BLVD., SUITE 106,
RALEIGH, NC 27607 PHONE: 919.929.1173
FAX: 919.493.6548 NC LICENSE #F-1267

ERIC TWEED, PE	UTILITY DESIGN ENGINEER
LEVI SMITH	UTILITY DESIGNER
BRIAN WILES, PE	PROJECT MANAGER



DIVISION OF HIGHWAYS
DIVISION 13
55 ORANGE STREET
ASHEVILLE, NC 28801
PHONE (828) 250-3000
FAX (828) 251-6394

KEITH RADCLIFF	DIVISION UTILITIES ENGINEER
JOHN METCALF	DIV. UTILITIES COORDINATOR
MARK HILL	DIV. BRIDGE PROGRAM MGR.
SHANE CLARK, PE	REGIONAL DESIGN ENGINEER

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

Water Line (Sized as Shown)	
11¼ Degree Bend	
22½ Degree Bend	
45 Degree Bend	
90 Degree Bend	
Plug	
Tee	
Cross	
Reducer	
Gate Valve	
Butterfly Valve	
Tapping Valve	
Line Stop	
Line Stop with Bypass	
Blow Off	
Fire Hydrant	
Relocate Fire Hydrant	
Remove Fire Hydrant	
Water Meter	
Relocate Water Meter	
Remove Water Meter	
Water Pump Station	
RPZ Backflow Preventer	
DCV Backflow Preventer	
Relocate RPZ Backflow Preventer	
Relocate DCV Backflow Preventer	

PROPOSED SEWER SYMBOLS

Gravity Sewer Line (Sized as Shown)	
Force Main Sewer Line (Sized as Shown)	
Manhole (Sized per Note)	
Sewer Pump Station	

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

Power Pole	
Telephone Pole	
Joint Use Pole	
Telephone Pedestal	
Utility Line by Others (Type as Shown)	
Trenchless Installation	
Encasement Method	
Encasement	

Thrust Block	
Air Release Valve	
Utility Vault	
Concrete Pier	
Steel Pier	
Plan Note	
Pay Item Note	

EXISTING UTILITIES SYMBOLS

Power Pole	
Telephone Pole	
Joint Use Pole	
Utility Pole	
Utility Pole with Base	
H-Frame Pole	
Power Transmission Line Tower	
Water Manhole	
Power Manhole	
Telephone Manhole	
Sanitary Sewer Manhole	
Hand Hole for Cable	
Power Transformer	
Telephone Pedestal	
CATV Pedestal	
Gas Valve	
Gas Meter	
Located Miscellaneous Utility Object	
Abandoned According to Utility Records	
End of Information	

*Underground Power Line	
*Underground Telephone Cable	
*Underground Telephone Conduit	
*Underground Fiber Optics Telephone Cable	
*Underground TV Cable	
*Underground Fiber Optics TV Cable	
*Underground Gas Pipeline	
Aboveground Gas Pipeline	
*Underground Water Line	
Aboveground Water Line	
*Underground Gravity Sanitary Sewer Line	
Aboveground Gravity Sanitary Sewer Line	
*Underground SS Forced Main Line	
Underground Unknown Utility Line	
SUE Test Hole	
Water Meter	
Water Valve	
Fire Hydrant	
Sanitary Sewer Cleanout	

*For Existing Utilities	
Utility Line Drawn from Record (Type as Shown)	
Designated Utility Line (Type as Shown)	

UC-2

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BURKE COUNTY

UTILITY DESIGN UNIT

UTILITY CONSTRUCTION
PLANS ONLY

ALL PROPOSED UTILITY
WORK SHOWN ON THIS
SHEET WILL BE DONE
BY OTHERS. NO PAYMENT
WILL BE MADE TO THE
CONTRACTOR FOR
UTILITY WORK SHOWN ON
THIS SHEET.

DESIGNED BY: EMT

DRAWN BY: LMS

CHECKED BY: BAW

APPROVED BY:

REVISED:

UTILITIES ENGINEERING SEC.
PHONE: (919) 707-6690
FAX: (919) 250-4151

UTILITY CONSTRUCTION

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2024.

2. THE EXISTING UTILITIES BELONG TO BRENTWOOD WATER CORPORATION.

3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.

4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.

5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.

7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.

8. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

PROJECT SPECIFIC NOTES:

1. PROPOSED WATER LINE FROM WL STA 0+50 TO WL STATION 1+70 SHALL BE D.I. BALL & SOCKET PIPE.

2. CONTRACTOR'S ATTENTION IS DIRECTED TO SECTIONS 102, 107, AND 1550 OF THE STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. IT IS CONTRACTOR'S RESPONSIBILITY TO HAVE BORE DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER. NO DAMAGE IS ALLOWED TO RIVER, WETLANDS, OR BUFFER ZONES.

3. THE EXISTING VALVE ON ROSE CARSWELL ROAD AT HWY 64 IS NORMALLY CLOSED AND SEPARATES TWO PRESSURE ZONES. ONCE THE NEW VALVE IS INSTALLED ON THE EXISTING PIPE AND THE BRIDGE AREA IS ISOLATED, THE WATER LINE AT THE BRIDGE CAN BE LEFT OUT OF SERVICE FOR 90 DAYS.

4. NEW VALVE TO ISOLATE THE WORK ZONE SHALL BE SET AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.

UTILITY CONSTRUCTION

DF18313.2012023.PR

UC-3

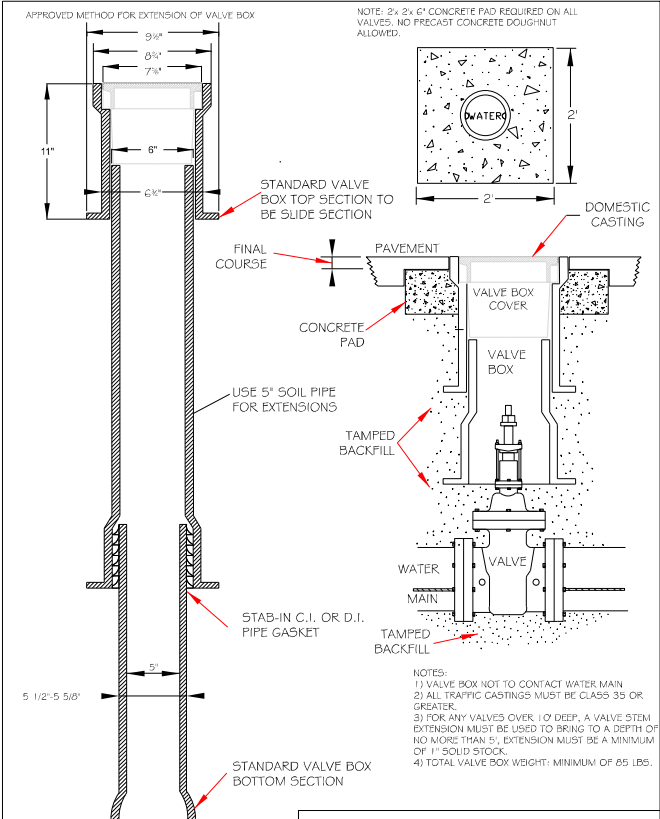
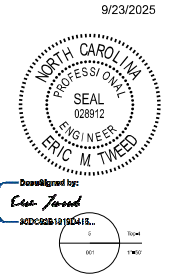
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY



UTILITY DESIGN UNIT
UTILITY CONSTRUCTION
PLANS ONLY

INCOMPLETE PLANS
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

DESIGNED BY: EMT
DRAWN BY: EMT
CHECKED BY:
APPROVED BY:
REVISED:
UTILITIES ENGINEERING SEC.
PHONE: (919) 707-6690
FAX: (919) 250-4151

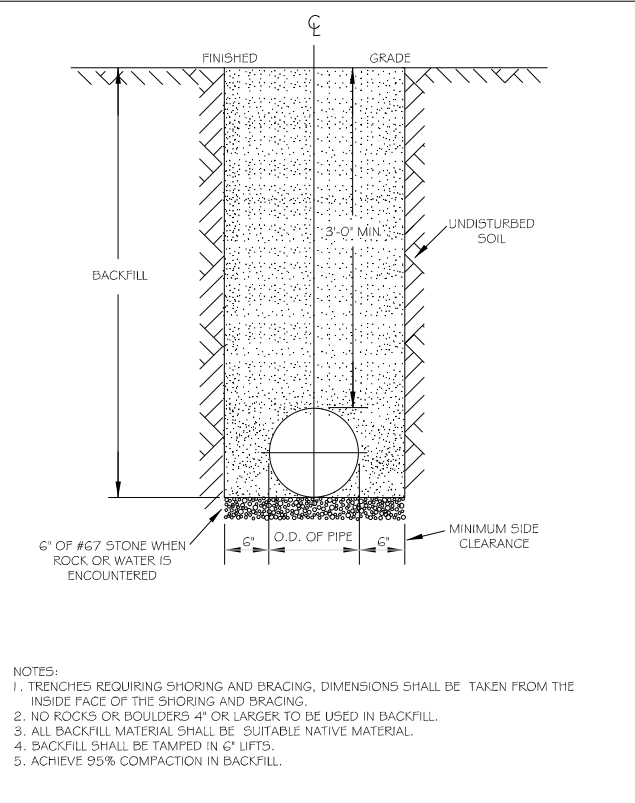
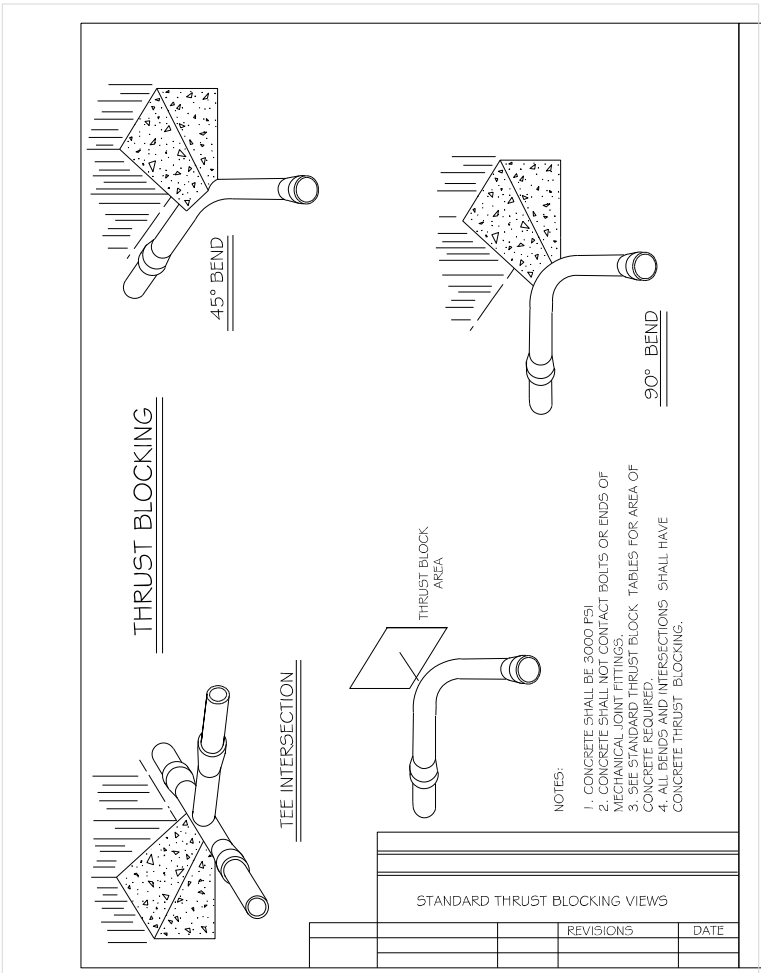


VALVE BOX INSTALLATION AND EXTENSION DETAIL			
	REVISIONS	DATE	

REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS
BASED ON TEST PRESSURE OF 200 P.S.I.

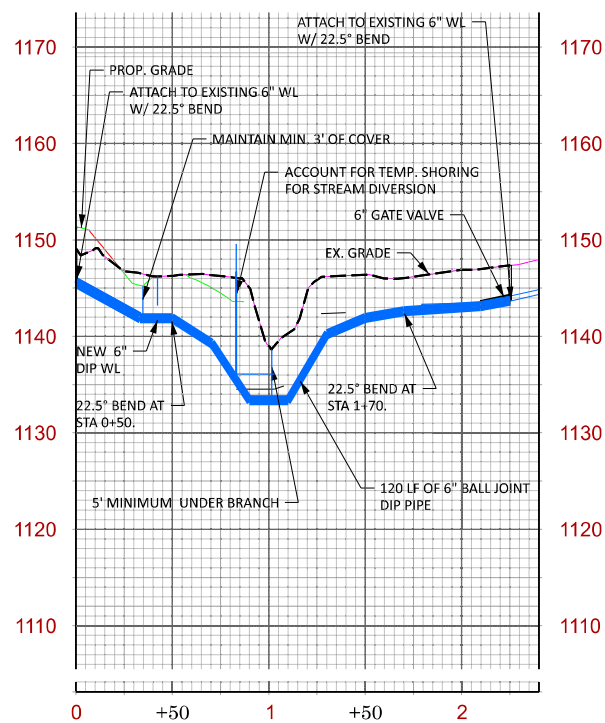
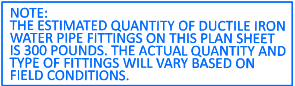
ALL AREAS GIVEN IN SQUARE FEET.									
SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MODIFIED DRY CLAY - 400 LB/FT ²	SOFT CLAY - 2000 LB/FT ²	100 LB/FT ² GRAVEL / CORRE SAND	800 LB/FT ² DRY CLAY - ALWAYS DRY	SAND - COMPACT FIRM 2000 LB/FT ²	SAND - CLEAN DRY 1000 LB/FT ²	SOIL 100 LB/FT ² QUICK SAND - VERY POOR	ROCK - POOR TO GOOD LB/FT ²
6"									
11 1/4°	1,108	1	1	1	1	1	2	1	
22 1/2°	2,207	1	2	2	1	1	3	1	
45°	4,328	2	3	3	1	1	2	5	1
90°	7,996	2	4	5	1	1	2	8	1
PLUG	5,655	2	3	4	1	1	2	6	1
8"									
11 1/4°	1,970	1	1	2	1	1	1	2	1
22 1/2°	3,922	1	2	3	1	1	1	4	1
45°	7,694	2	4	5	1	1	2	8	1
90°	14,215	4	8	9	2	2	4	15	2
PLUG	10,053	3	5	6	2	2	3	10	1
12"									
11 1/4°	4,433	2	3	3	1	1	2	5	1
22 1/2°	8,826	3	5	6	2	2	3	9	1
45°	17,312	5	9	11	3	3	5	18	2
90°	31,983	8	16	19	4	4	8	32	4
PLUG	22,619	6	12	14	3	3	6	23	3
16"									
11 1/4°	7,881	2	4	5	1	1	2	8	1
22 1/2°	15,691	4	8	10	2	2	4	16	2
45°	30,779	8	16	19	4	4	8	31	4
90°	56,861	15	29	35	8	8	15	57	6
PLUG	40,213	10	21	25	5	5	10	41	5

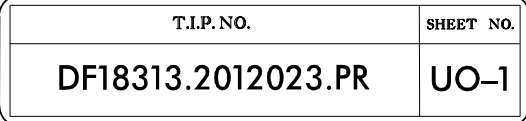
REACTION BEARING AREAS ARE IN SQUARE FEET MEASURED IN A VERTICAL PLANE IN THE TRENCH SIDE AT AN ANGLE OF 90° TO THE THRUST VECTOR.			
THRUST BLOCKING DESIGN QUANTITY TABLE			
USE 6" - 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.	REVISIONS	DATE	



TRENCH BOTTOM DIMENSIONS + BACKFILLING REQUIREMENTS FOR DUCTILE IRON			
REVISIONS	DATE		

REVISIONS





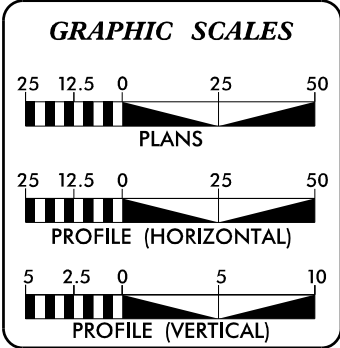
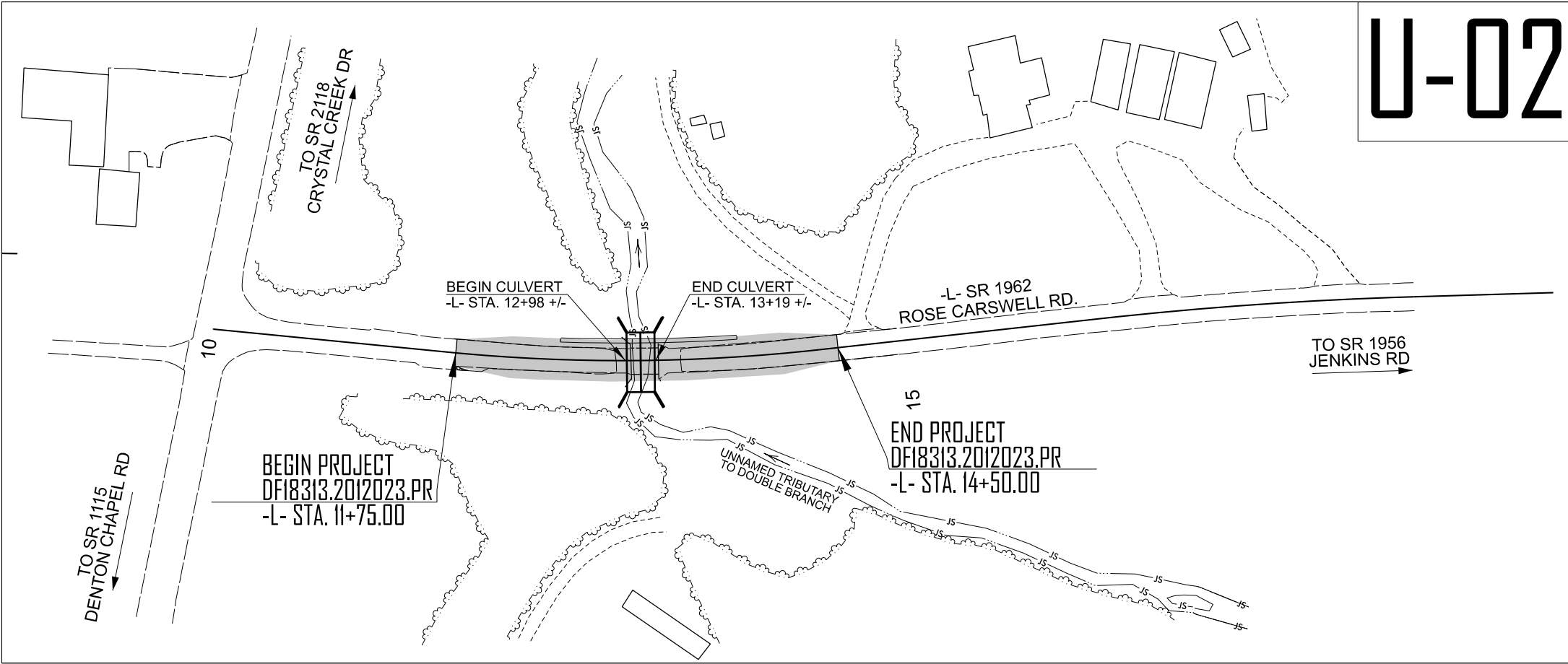
NOTE:
ALL UTILITY WORK SHOWN ON THIS
SHEET WILL BE DONE BY OTHERS.
NO PAYMENT WILL BE MADE TO
THE CONTRACTOR FOR UTILITY WORK
SHOWN ON THIS SHEET.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BURKE COUNTY

LOCATION: REPLACE BRIDGE NO. 316 ON SR 1962 (ROSE CARSWELL RD)
OVER UNNAMED TRIBUTARY TO DOUBLE BRANCH

TYPE OF WORK: UTILITIES BY OTHERS



<i>INDEX OF SHEETS</i>	
<i><u>SHEET NO.:</u></i>	<i><u>DESCRIPTION:</u></i>
<i>UO-1</i>	<i>TITLE SHEET</i>
<i>UO-2</i>	<i>UBO PLAN SHEETS</i>

UTILITY OWNERS WITH CONFLICTS

(A) COMMUNICATION - AT&T

PREPARED IN THE OFFICE OF:



PENNONI ASSOCIATES INC.
5430 WADE PARK BLVD., SUITE 106,
RALEIGH, NC 27607 PHONE: 919.929.1173
FAX: 919.493.6548 NC LICENSE #F-1267

<u>BRIAN WILES, PE</u>	UTILITY PROJECT MANAGER
<u>ERIC TWEED, PE</u>	PROJECT UTILITY COORDINATOR



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

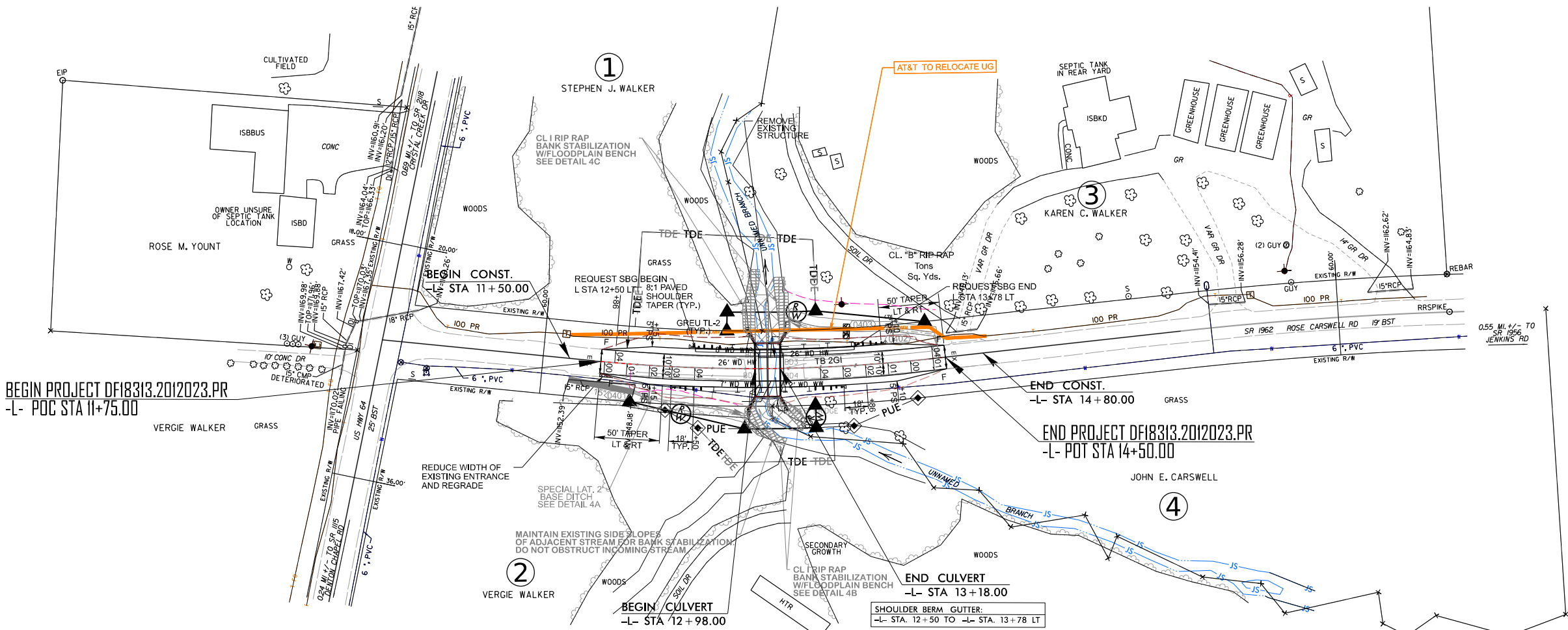
DIVISION OF HIGHWAYS
DIVISION 13

55 ORANGE STREET
ASHEVILLE, NC 28801
PHONE (828) 250-3000
FAX (828) 251-6394

<u>KEITH RADCLIFF</u>	<i>DIVISION UTILITIES ENGINEER</i>
<u>JOHN METCALF</u>	<i>DIV. UTILITIES COORDINATOR</i>
<u>MARK HILL</u>	<i>DIV. BRIDGE PROGRAM MGR.</i>
<u>SHANE CLARK, PE</u>	<i>REGIONAL DESIGN ENGINEER</i>



PENNONI ASSOCIATES INC.
5430 WADE PARK BLVD., SUITE 106,
RALEIGH, NC 27607 PHONE: 919.929.1173
FAX: 919.493.6548 NC LICENSE #F-1267



*FOR GUARDRAIL OVER CULVERT, ALTERNATIVE POST SPACING REQUIRED, SEE 862.01 SHEET 10

CROSS SECTION INDEX

<i>X-1</i>	<i>CROSS SECTION INDEX</i>
<i>X-1A</i>	<i>CROSS SECTION SUMMARY</i>
<i>X-2 THRU X-8</i>	<i>-L- SECTIONS</i>

STATE OF NORTH CAROLINA	PROJ. REFERENCE NO.	SHEET NO.
	DF18313.2012023.PR	X-1A

STATE OF NORTH CAROLINA	PROJ. REFERENCE NO.	SHEET NO.
	DF18313.2012023.PR	X-1A

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS	PROJ. REFERENCE NO. DF18313.2012023.PR	SHEET NO. X-1A
	Approximate quantities only. Unclassified excavation, borrow excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".	

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

CROSS-SECTION SUMMARY

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS	PROJ. REFERENCE NO. DF18313.2012023.PR	SHEET NO. X-1A
	Approximate quantities only. Unclassified excavation, borrow excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".	

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

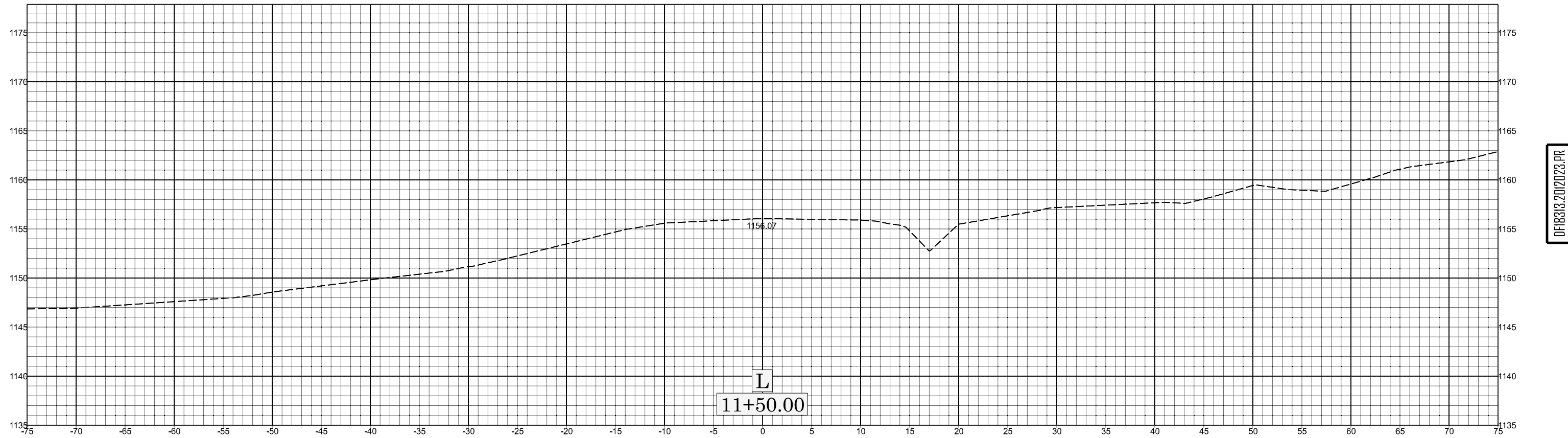
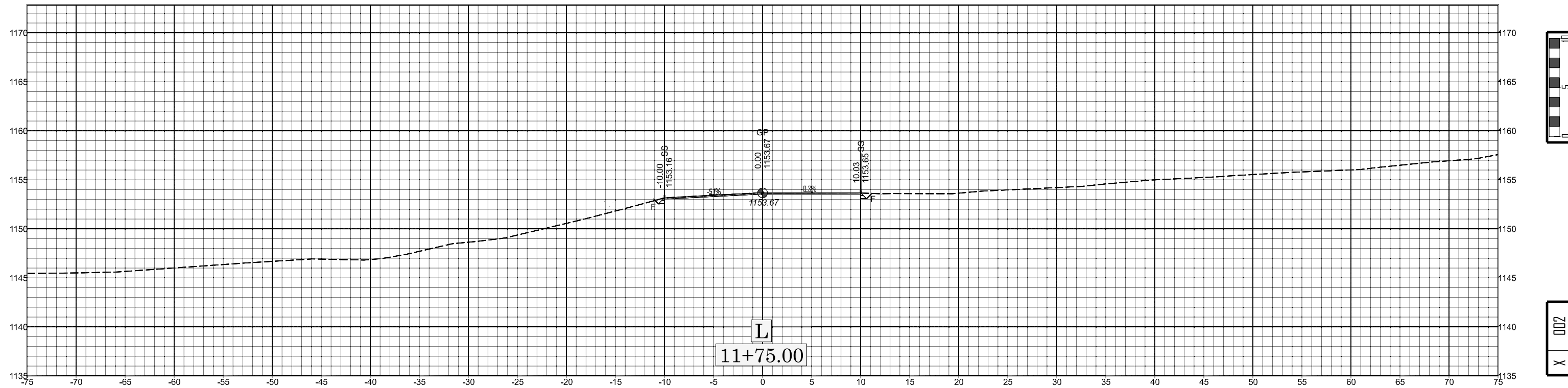
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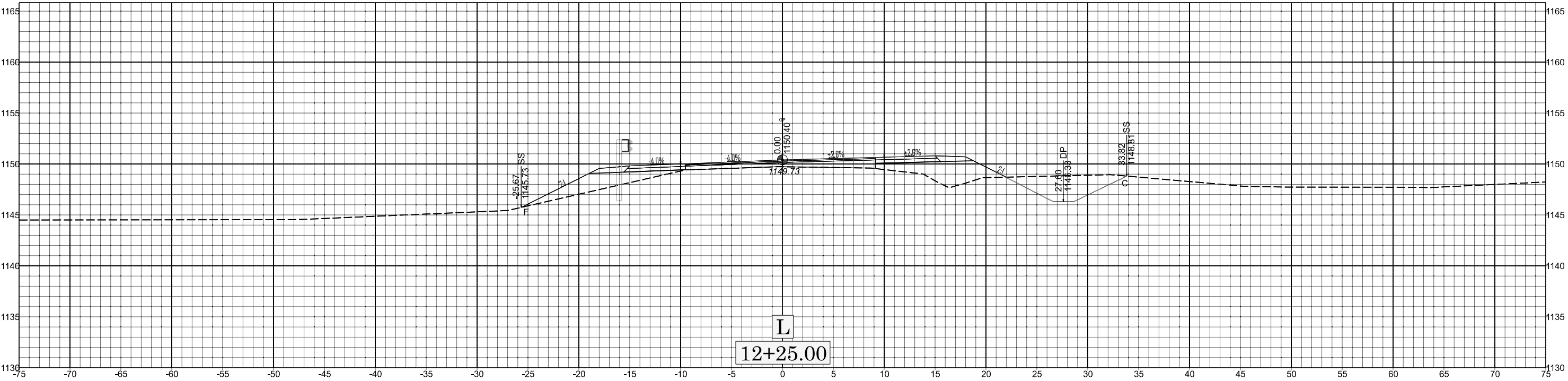
STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS	PROJ. REFERENCE NO. DF18313.2012023.PR	SHEET NO. X-1A
	Approximate quantities only. Unclassified excavation, borrow excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".	

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

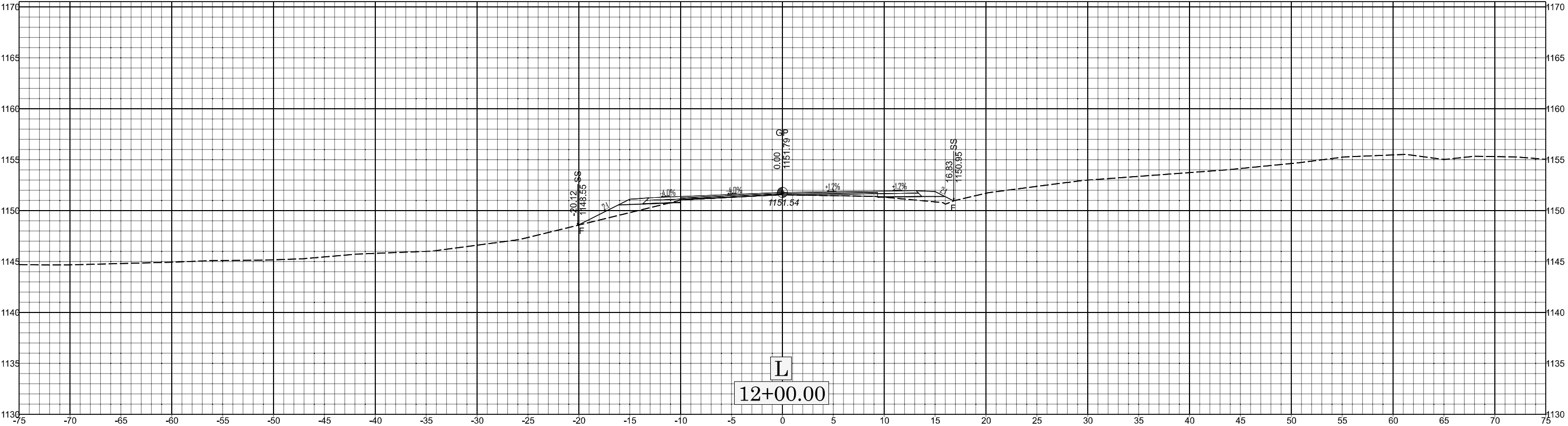
CROSS-SECTION SUMMARY

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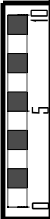
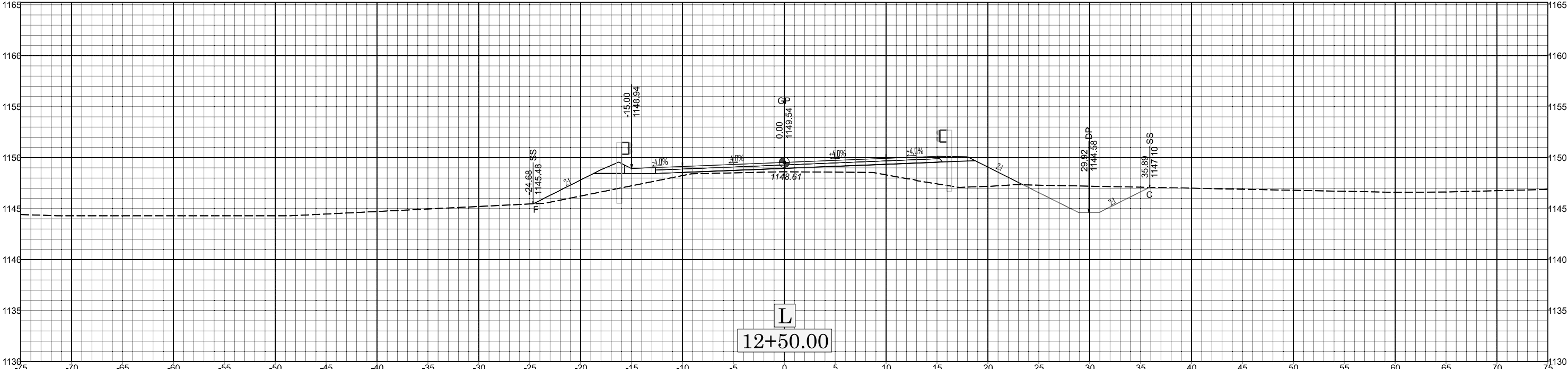
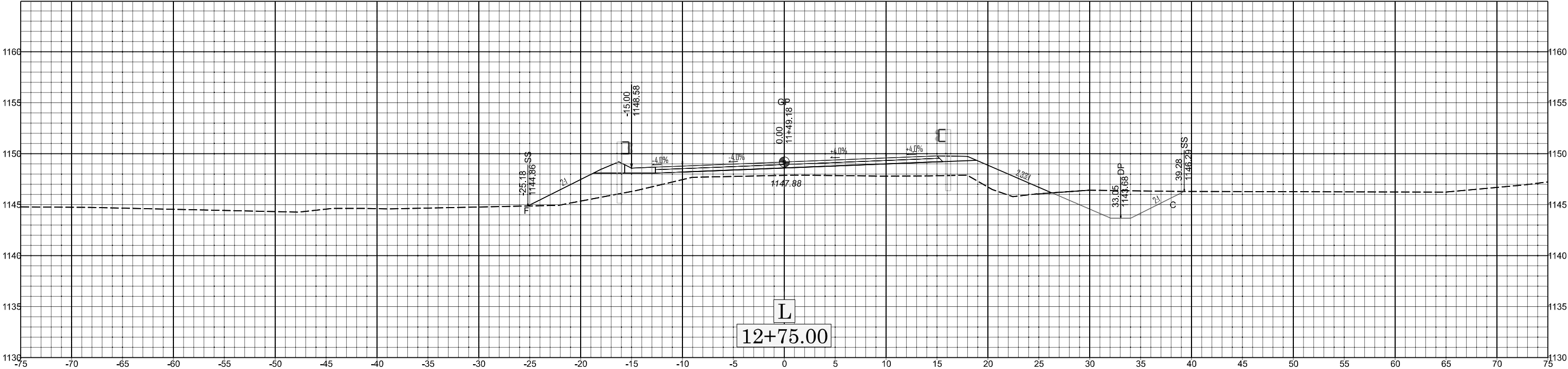




X 003

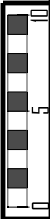
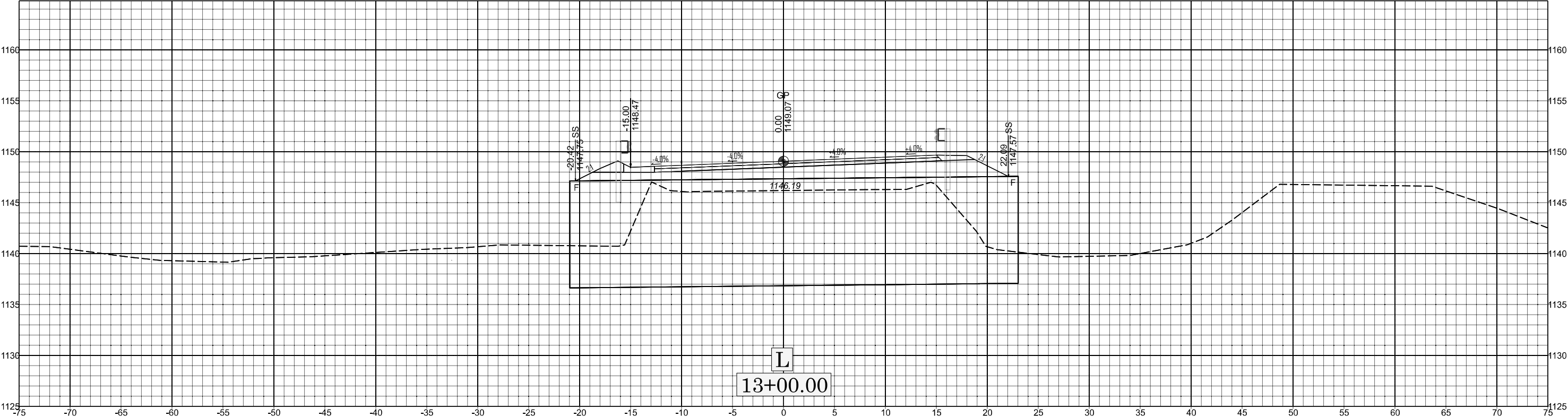
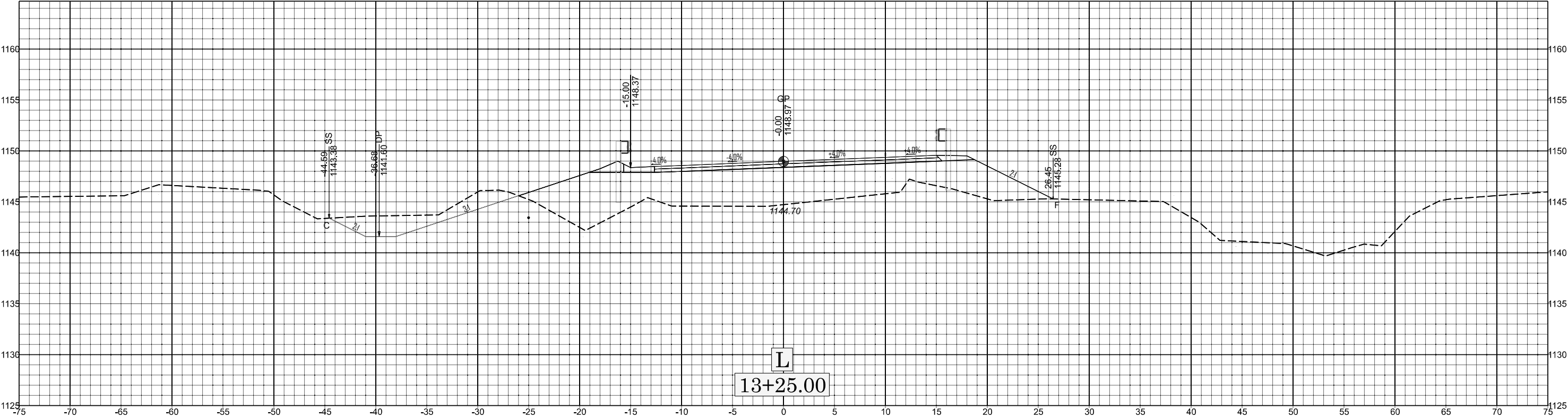


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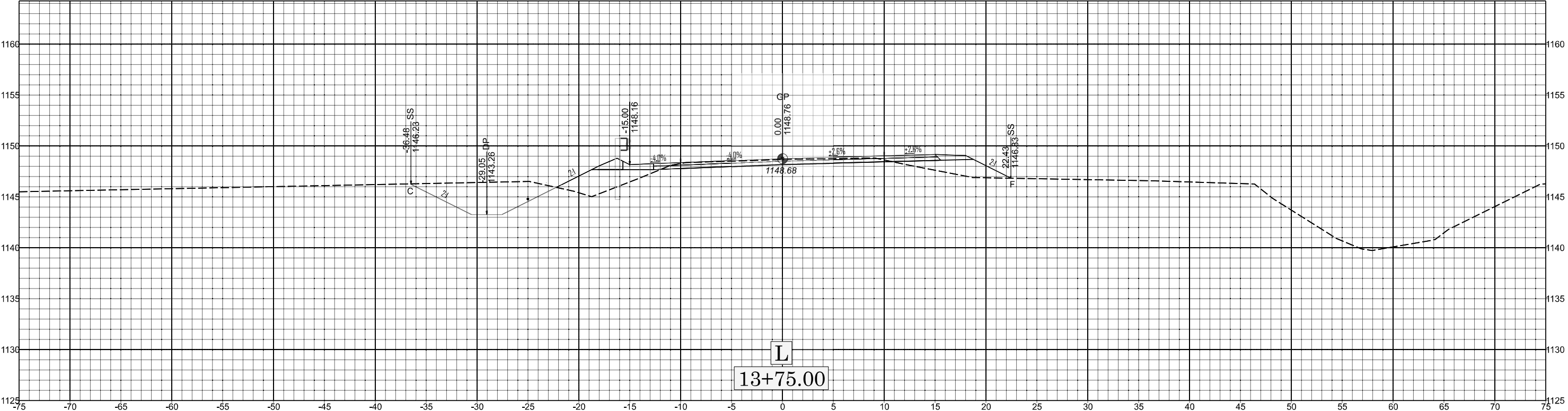
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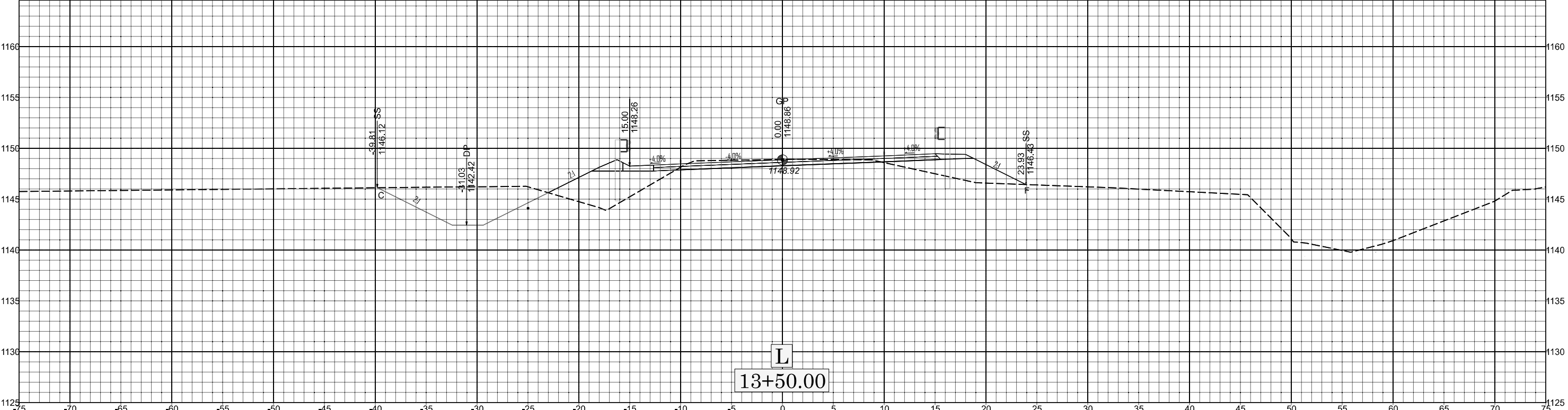


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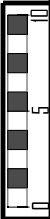
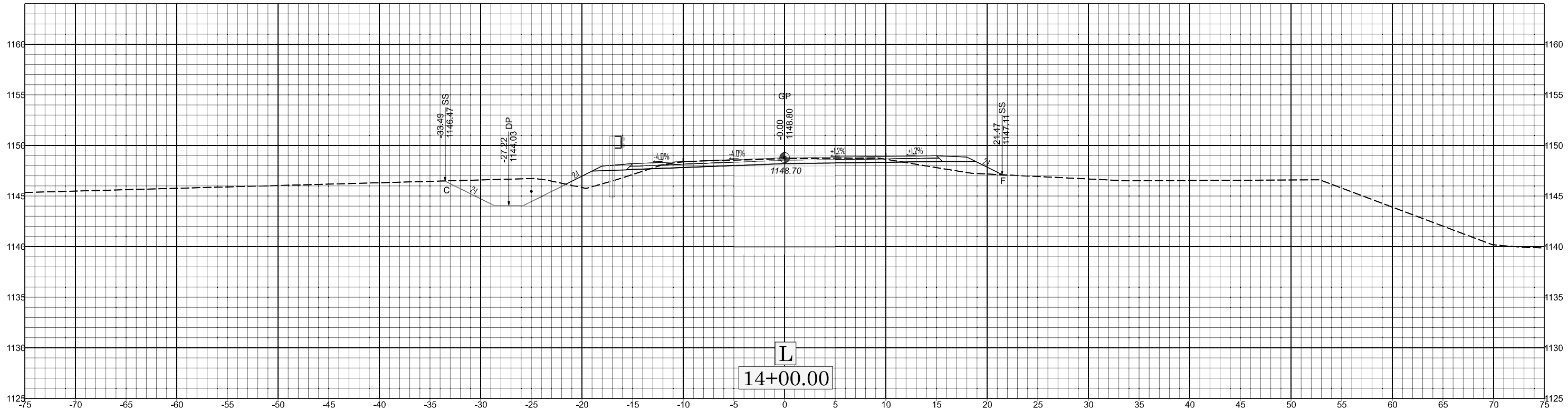
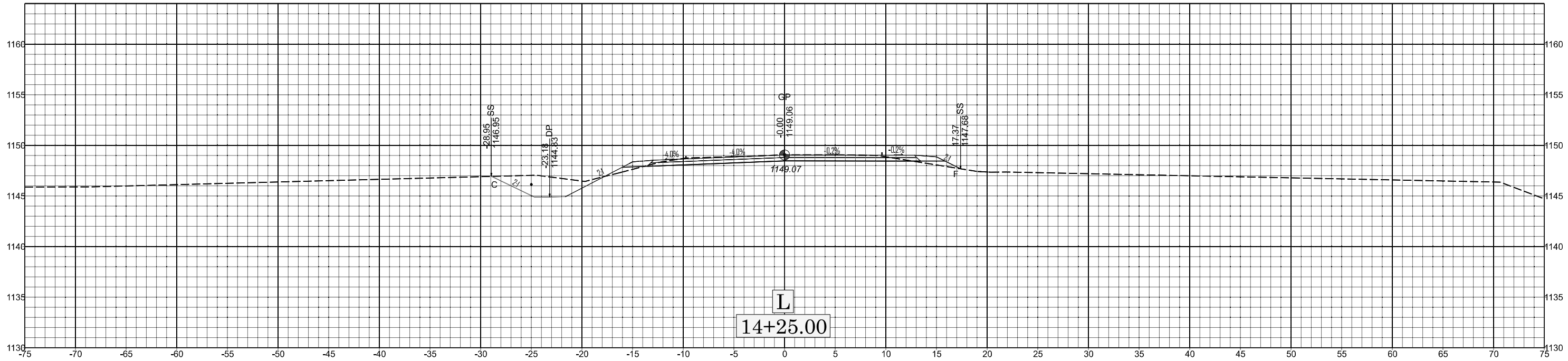
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X 006

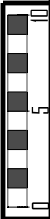
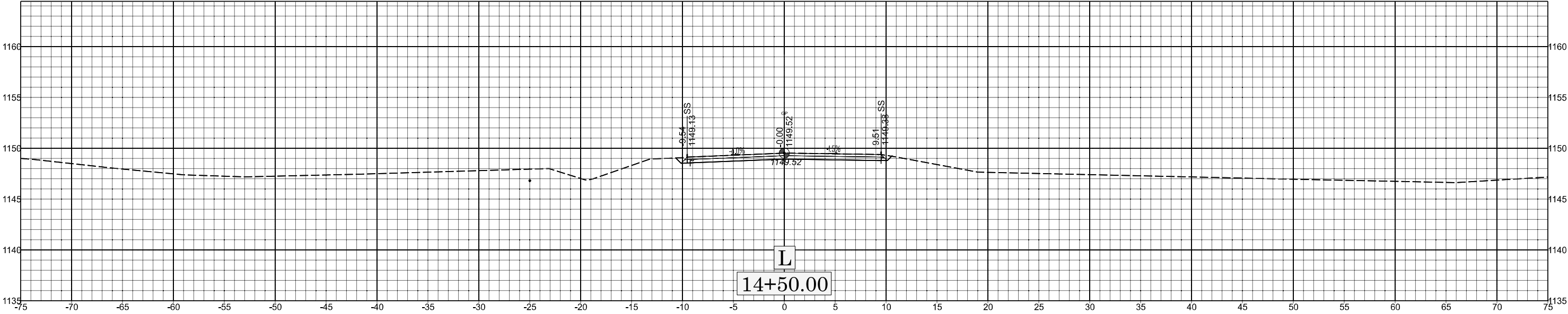
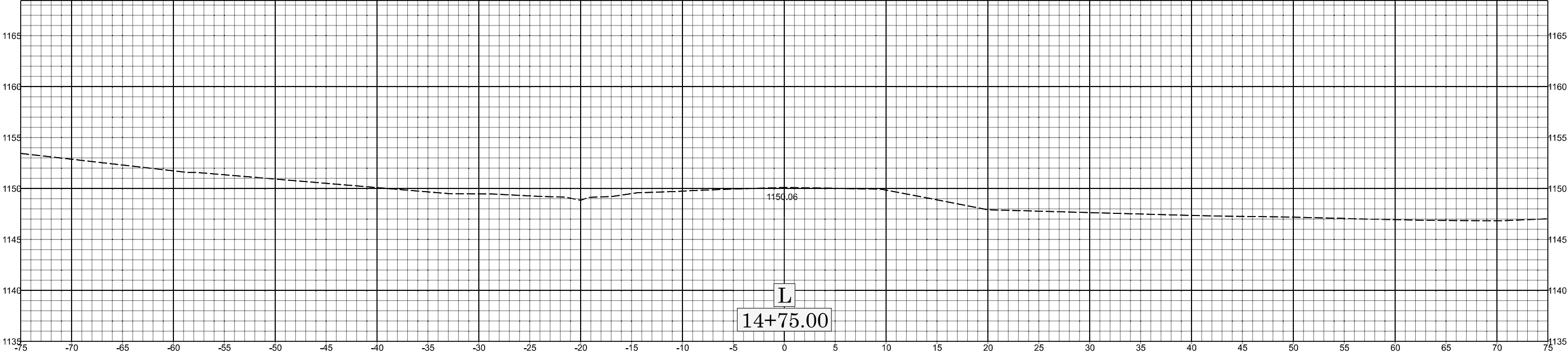


DFB313.2012023.PR



X 007

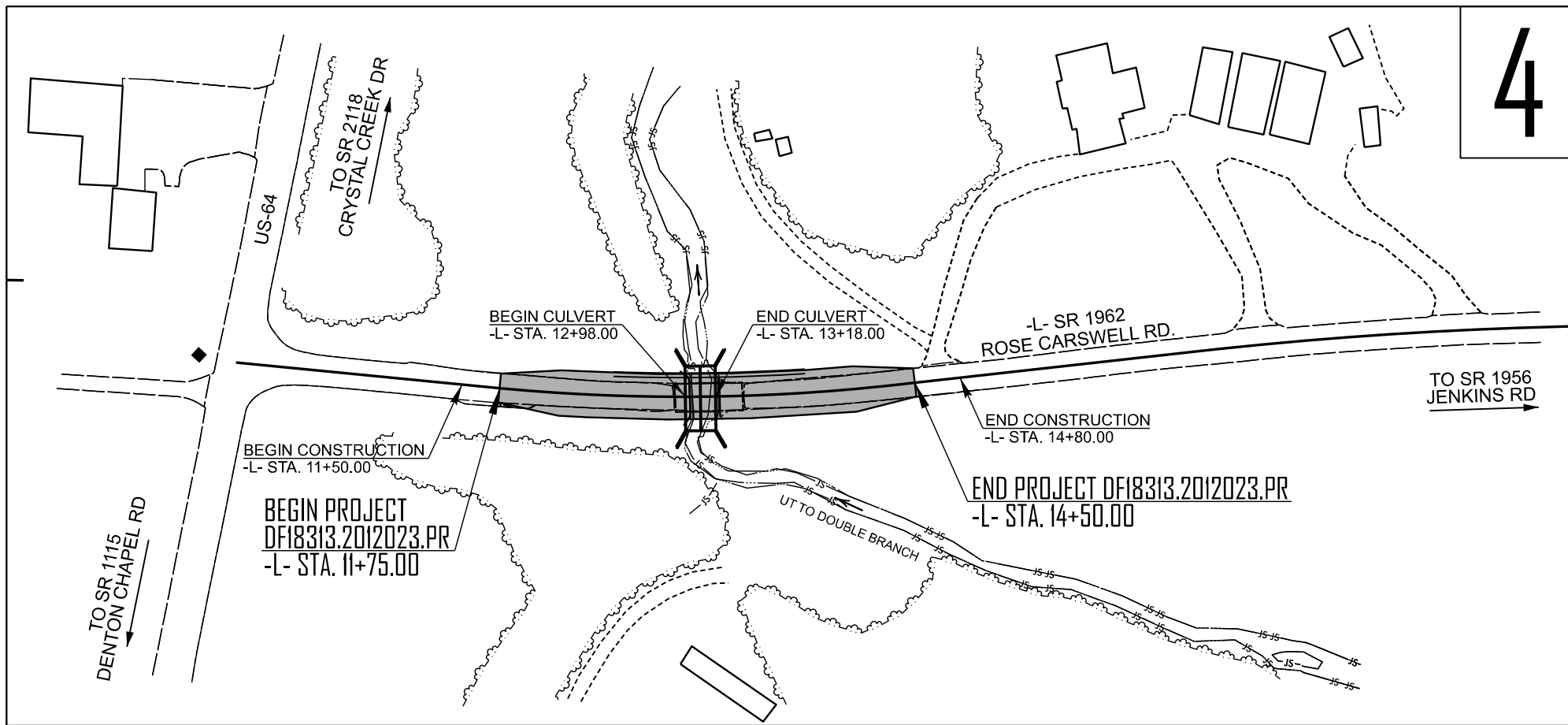
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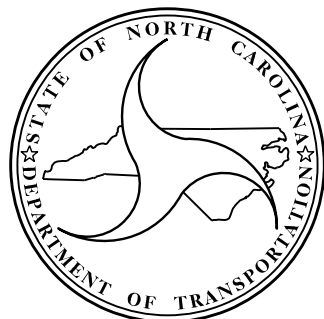
X 008

DFB313.2012023.PR

CONTRACT: DM00470



STRUCTURES


$$\begin{aligned} \text{ADT (2022)} &= 450 \\ V &= 40 \text{ MPH} \end{aligned}$$

FUNC CLASS=RURAL LOCAL
SUBREGIONAL TIER

LENGTH ROADWAY TIP PROJECT DF18313.2012023.PR	=	0.048 MILES
LENGTH STRUCTURE TIP PROJECT DF18313.2012023.PR	=	0.004 MILES
TOTAL LENGTH TIP PROJECT DF18313.2012023.PR	=	0.052 MILES



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

Prepared in the Office of:
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

2024 STANDARD SPECIFICATIONS

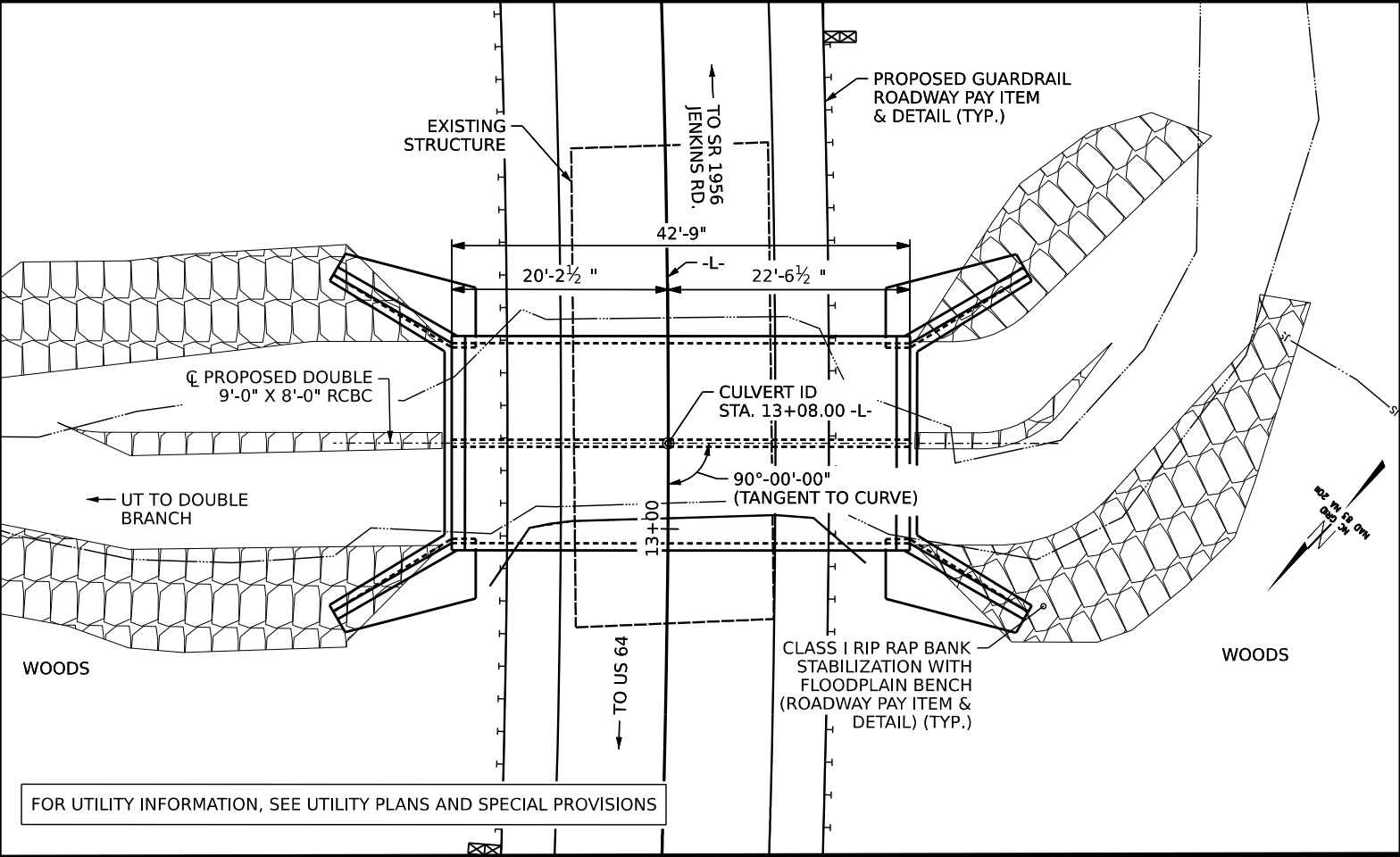
LETTING DATE :

AUGUST 19, 2026

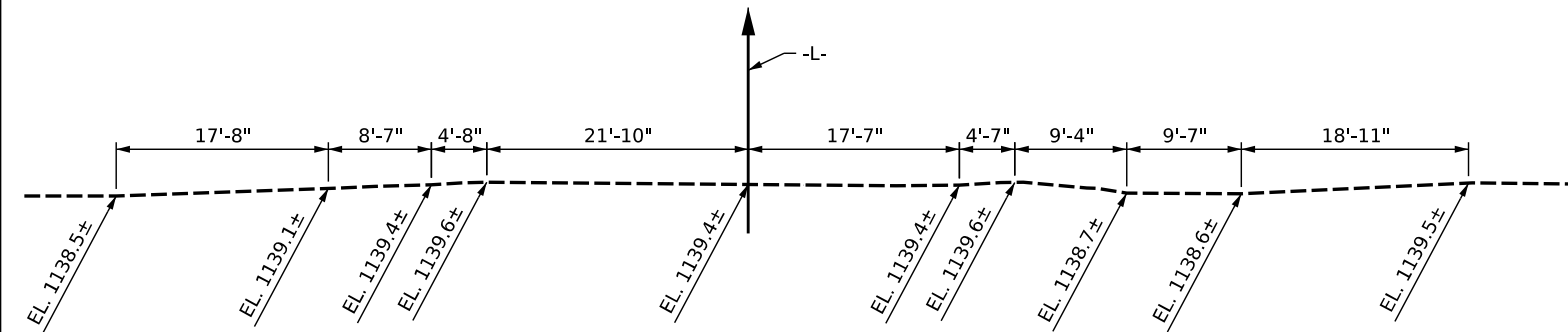
MARK HILL
PROJECT ENGINEER

JEFFREY KEPICH
PROJECT DESIGN ENGINEER

BM #1 RAILROAD SPIKE IN BASE DOUBLE TRUNK POPLAR
STA. 14+09.91, 58.38' RT., EL. 1148.67



LOCATION SKETCH



PROFILE ALONG Q CULVERT

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	1300 CFS.
FREQUENCY OF OVERTOPPING FLOOD	500+ YRS.
OVERTOPPING FLOOD ELEVATION	1149.0

*OVERTOPPING STATION 14+00.00 -L-;RT. EDGE OF PAVEMENT
WS EL. TAKEN @ RIVER STATION 1046

HYDRAULIC DATA

DESIGN DISCHARGE	600 CFS.
FREQUENCY OF DESIGN FLOOD	25 YRS.
DESIGN HIGH WATER ELEVATION	1145.3
DRAINAGE AREA	1.61 SQ. MI.
BASIC DISCHARGE (Q100)	870 CFS.
BASIC HIGH WATER ELEVATION	1146.6

ROADWAY DATA

GRADE PT. ELEVATION @ STA. 13+08.00 -L-	1149.04
BED ELEVATION @ STA. 13+08.00 -L-	1137.93
ROADWAY SLOPES	2:1

NOTES

ASSUME LIVE LOAD = HL-93

DESIGN FILL = MAX. 3.75', MIN 2.00'

FOR OTHER DESIGN DATA AND NOTES, SEE SHEET SN.

3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH SPECIFICATIONS.

THE EXISTING STRUCTURE CONSISTING OF A (2) TEMPORARY RAILROAD FLAT CARS FOR A SINGLE 36'-0" SPAN; 15'-0" CLEAR ROADWAY SUIPORTED ON RC CONCRETE CAPS AT THE SAME LOCATION AS THE 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 STRUCTURE, A LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE ENTIRE COST OF WORK REQUIRED TO PLACE EXCAVATED OR SUPPLEMENTAL MATERIAL AS SHOWN ON THE PLANS SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR CULVERT EXCAVATION.

STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES WILL BE PAID BY THE CONTRACTOR.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

ONE PERMITTED CONSTRUCTION JOINT WILL BE ALLOWED IN THE END CURTAIN WALL.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

EXCAVATE FOUNDATION A MINIMUM OF 3 FEET BELOW CULVERT BEARING ELEVATION. PLACE 3 FEET OF CLASS VI FOUNDATION CONDITIONING MATERIAL ENCAPSULATED IN TYPE II GEOTEXTILE IN ACCORDANCE WITH SECTION 414 OF THE STANDARD SPECIFICATIONS.

OVEREXCAVATE ADDITIONAL LOOSE/SOFT OR ORGANIC MATERIAL IF PRESENT TO SUITABLE BEARING MATERIALS AND REPLACE WITH ADDITIONAL CLASS VI FOUNDATION CONDITIONING MATERIAL.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF THE CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

THIS BARREL STANDARD TO BE USED ONLY ON CULVERT ON 90° SKEW AND TO BE USED WITH STANDARD WING SHEET WITH THE SAME SKEW AND VERTICAL CLEARANCE.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.

AT THE CONTRACTOR'S OPTION, THE VERTICAL REINFORCING STEEL MAY BE SPLICED IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPlice LENGTH SHALL BE AS PROVIDED IN THE SPlice LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. 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 SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

INASMUCH AS THE PAINT SYSTEM OF 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 EXISITNG STRUCTURE."

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:

1. WING FOORINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.

AT THE CONTRACTOR'S OPTION, A SUBMISSION MAY BE MADE TO THE ENGINEER FOR APPROVAL. DESIGN AND DETAIL DRAWINGS FOR A PRECAST REINFORCED CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE CULVERT SHOWN ON THE PLANS. THE DESIGN SHALL PROVIDE THE SAME SIZE AND NUMBER OF BARRELS AS USED ON THE CAST-IN-PLACE DESIGN. FOR OPTIONAL PRECAST REINFORCED CONCRETE BOX CULVERT, SEE SPECIAL PROVISIONS.

FOR GUIDELINES REGARDING REMOVAL OF EXISTING RAILCAR STRUCTURE, SEE REMOVAL OF EXISTING STRUCTURE AT STA. 13+08.00 -L- SPECIAL PROVISION.

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE		
BARREL @	2.15	CY/FT
WINGS ETC.		91.7 C.Y.
SILLS		26.2 C.Y.
TOTAL		3.0 C.Y.
		120.9 C.Y.

REINFORCING STEEL	
BARRELS	13045 LBS.
WINGS ETC.	1462 LBS.
SILLS	57 LBS.
TOTAL	14564 LBS.

CULVERT EXCAVATION	
@ STATION 13+08.00 -L-	LUMP SUM

REMOVAL OF EXISTING STRUCTURE	LUMP SUM
-------------------------------	----------

FOUNDATION COND. MAT'L	73 TONS
------------------------	---------

ASBESTOS ASSESSMENT	LUMP SUM
---------------------	----------

I HEREBY CERTIFY THESE PLANS
ARE THE AS-BUILT PLANS

PROJECT NO. DF18313.2012023.PR

BURKE COUNTY

STATION: 13+08.00 -L-

SHEET 1 OF 6

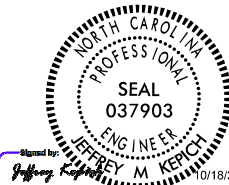
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 9'-0" X 8'-0"
CONCRETE BOX CULVERT
90° SKEW

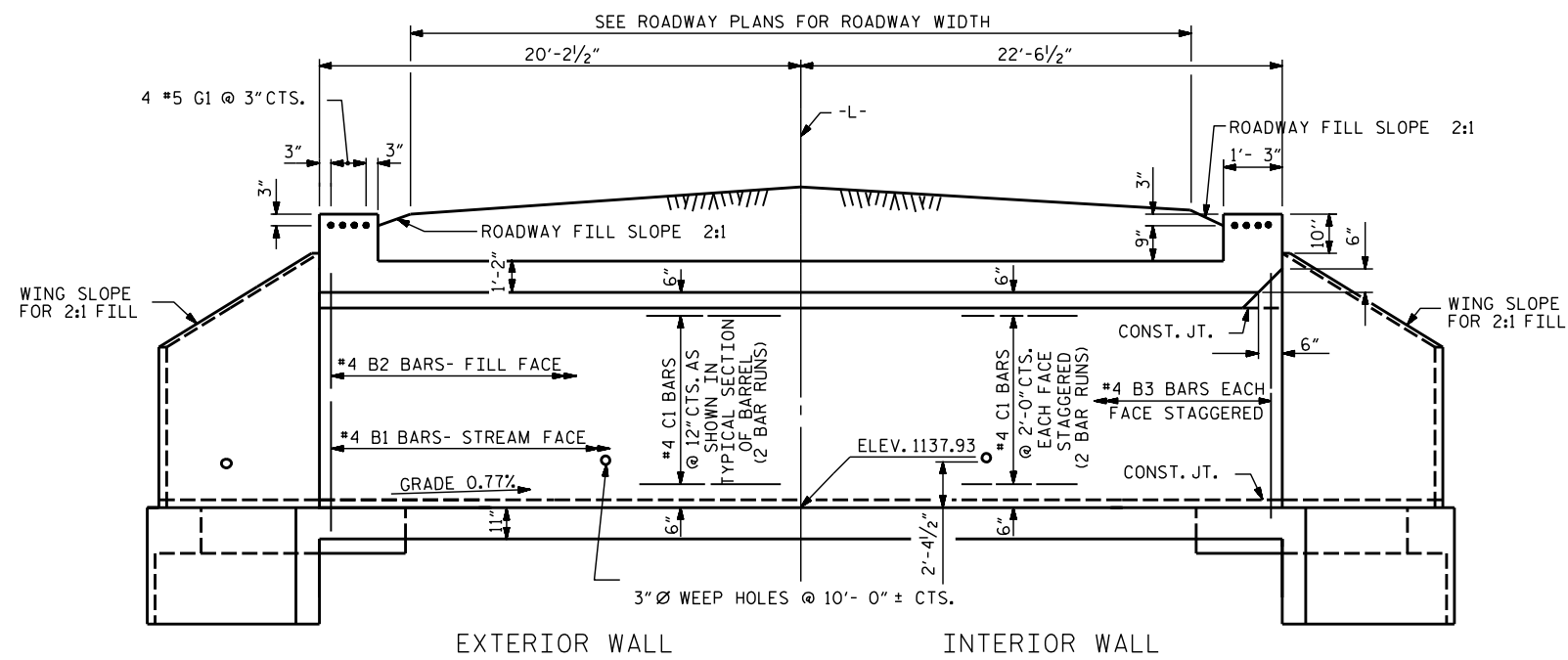
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	
1			3		C1-01
2			4		TOTAL SHEETS 06

DRAWN BY : J.M. KEPICH DATE : 06/2025
CHECKED BY : J. PAPCIAK DATE : 07/2025
DESIGN ENGINEER OF RECORD: J.M. KEPICH DATE : 06/2025

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

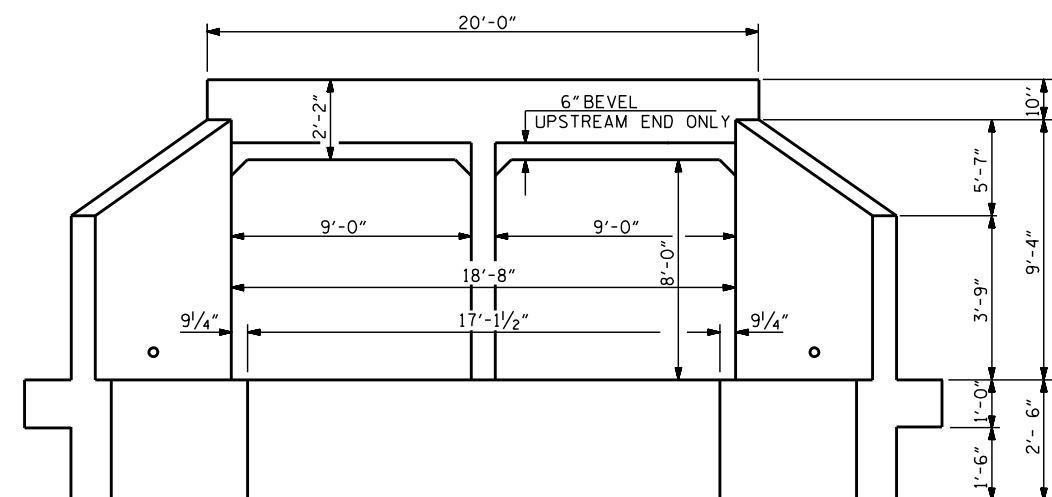


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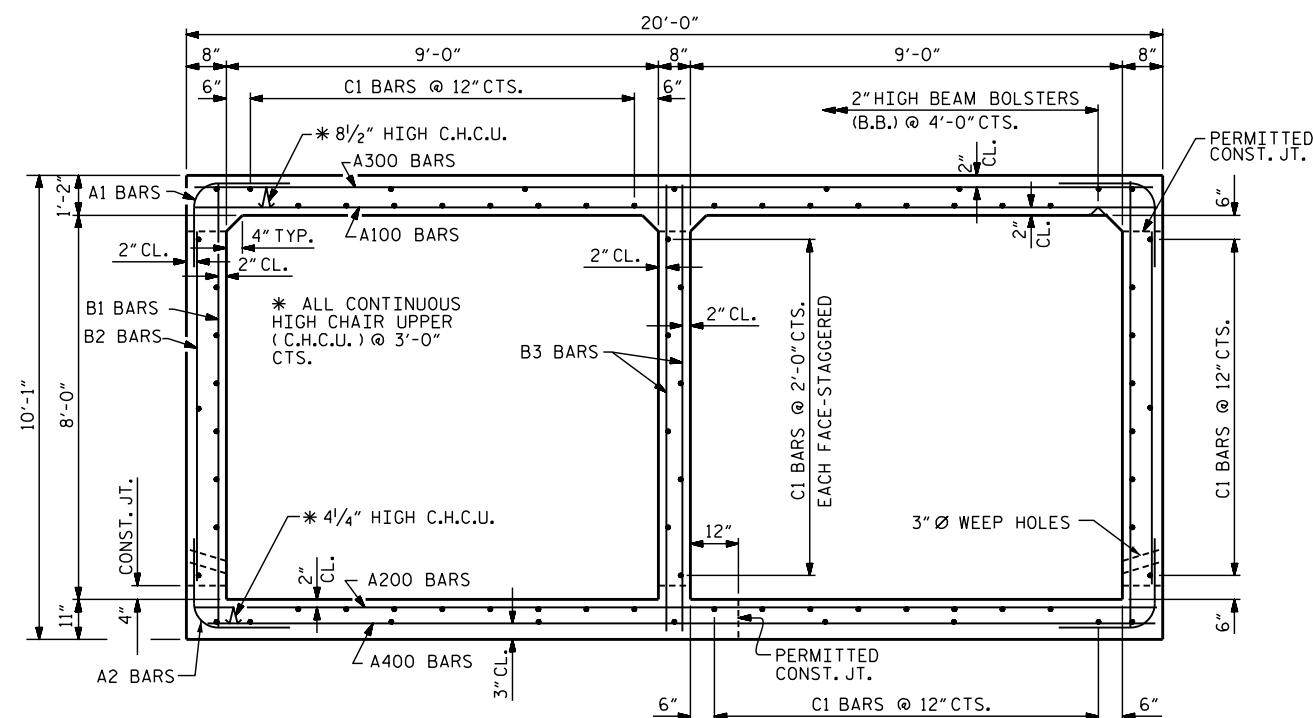
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CULVERT SECTION NORMAL TO ROADWAY

(AT STATION 13+08.00 -L-)



END ELEVATION



RIGHT ANGLE SECTION OF BARREL

THERE ARE 76 "C" BARS IN SECTION OF BARREL.

ASSEMBLED BY :	J.M. KEPICH	DATE :	06/2025
CHECKED BY :	J. PAPIAK	DATE :	07/2025
DRAWN BY :	TSS II/90	REV. 6/19	MAA/THC
CHECKED BY :	ARB II/90		



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NC License Number : C-3239



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REVISIONS						SHEET NO. C1-02
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 06
2			4			

PROJECT NO. DF18313.2012023.PR

BURKE COUNTY

STATION: 13+08.00 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL STANDARD
DOUBLE 9 FT. X 8 FT.
CONCRETE BOX CULVERT
90° SKEW

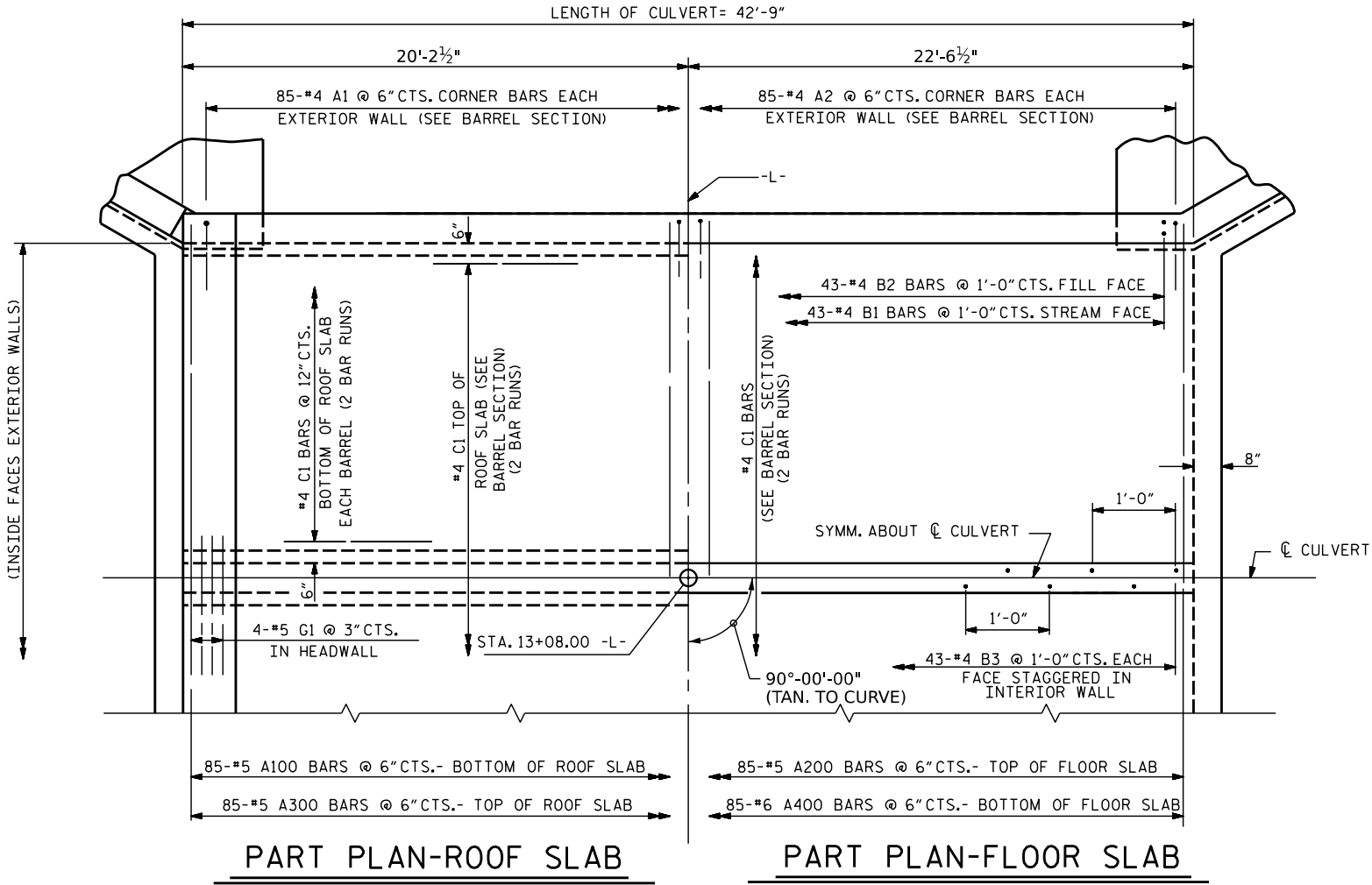
REVISIONS	SHEET
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TE:	NO.	BY:	DATE:
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		3			TOTAL SHEET
--	--	---	--	--	----------------

4		
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STD. NO. CB90_2



BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	170	#4	1	5'-10"	663
A2	170	#4	1	5'-11"	672
A100	85	#5	STR	19'-8"	1744
A200	85	#5	STR	19'-8"	1744
A300	85	#5	STR	19'-8"	1744
A400	85	#6	STR	19'-8"	2511
B1	86	#4	STR	9'-8"	555
B2	86	#4	STR	7'-4"	421
B3	86	#4	STR	9'-7"	551
C1	152	#4	STR	22'-5"	2276
G1	8	#5	STR	19'-8"	164
REINFORCING STEEL TOTAL					13,045 LBS
CLASS A CONCRETE 2 BARRELS					91.7 CY
TOTAL					91.7 CY

SPLICE LENGTH CHART		
BAR	SIZE	SPLICE LENGTH
B1	#4	1'-10"
B3	#4	1'-10"
C1	#4	2'-5"
A300	#5	2'-4"
A400	#6	2'-9"

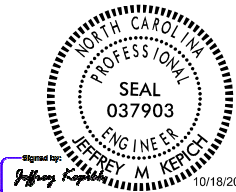
PROJECT NO. DF18313.2012023.PR
BURKE COUNTY
STATION: **13+08.00 -L-**

SHEET 3 OF 6

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BARREL STANDARD DOUBLE 9 FT. X 8 FT. CONCRETE BOX CULVERT 90° SKEW					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS 06					C1-03

ASSEMBLED BY :	J.M. KEPICH	DATE :	06/2025
CHECKED BY :	J. PAPCIAK	DATE :	07/2025
DRAWN BY :	TSS	II/90	REV. 6/19
CHECKED BY :	ARB	II/90	MAA/THC

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NC License Number : C-3239



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9'-0" (TYP.)

1'-0"

LOW FLOW SILL

2'-0"

HIGH FLOW SILL

2 LAYERS OF 30 LB. ROOFING FELT TO PREVENT BOND (TYP.)

1'-0" (TYP.)

3 - 4-#6 D1 @ 3'-6" CTS.

3 - 4-#6 D2 @ 3'-6" CTS.

1'-0" (TYP.)

ELEVATION

THE ENGINEER, IN CONSULTATION WITH DEO STAFF, SHALL REVIEW ALL MATERIAL TO BE USED AS BACKFILL PRIOR TO CONDUCTING THE BACKFILL ACTIVITY. BACKFILL SHALL CONSIST OF NATIVE MATERIAL ONLY UNLESS THE ENGINEER, IN CONSULTATION WITH DEO STAFF, DETERMINES THAT (1) THE NATIVE MATERIAL IS UNSUITABLE, OR (2) ADDITIONAL MATERIAL IS REQUIRED TO SUPPLEMENT THE NATIVE MATERIAL. THE CHOSEN BACKFILL MATERIAL SHALL NOT HAVE ADVERSE EFFECTS TO AQUATIC LIFE, AQUATIC LIFE PASSAGE, OR WATER QUALITY. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION.

BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
D1	15	#6	STR.	1'-6"	34
D2	6	#6	STR.	2'-6"	23
REINFORCING STEEL TOTAL					57 LBS
CLASS A CONCRETE					3.0 CY



BURKE COUNTY

SHEET 4 OF 6

DOUBLE 9 FT. X 8 FT.
CONCRETE BOX CULVERT
90° SKEW

REVISONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C1-04
1			3			TOTAL SHEETS 06
2			4			

DRAWN BY :
CHECKED BY :

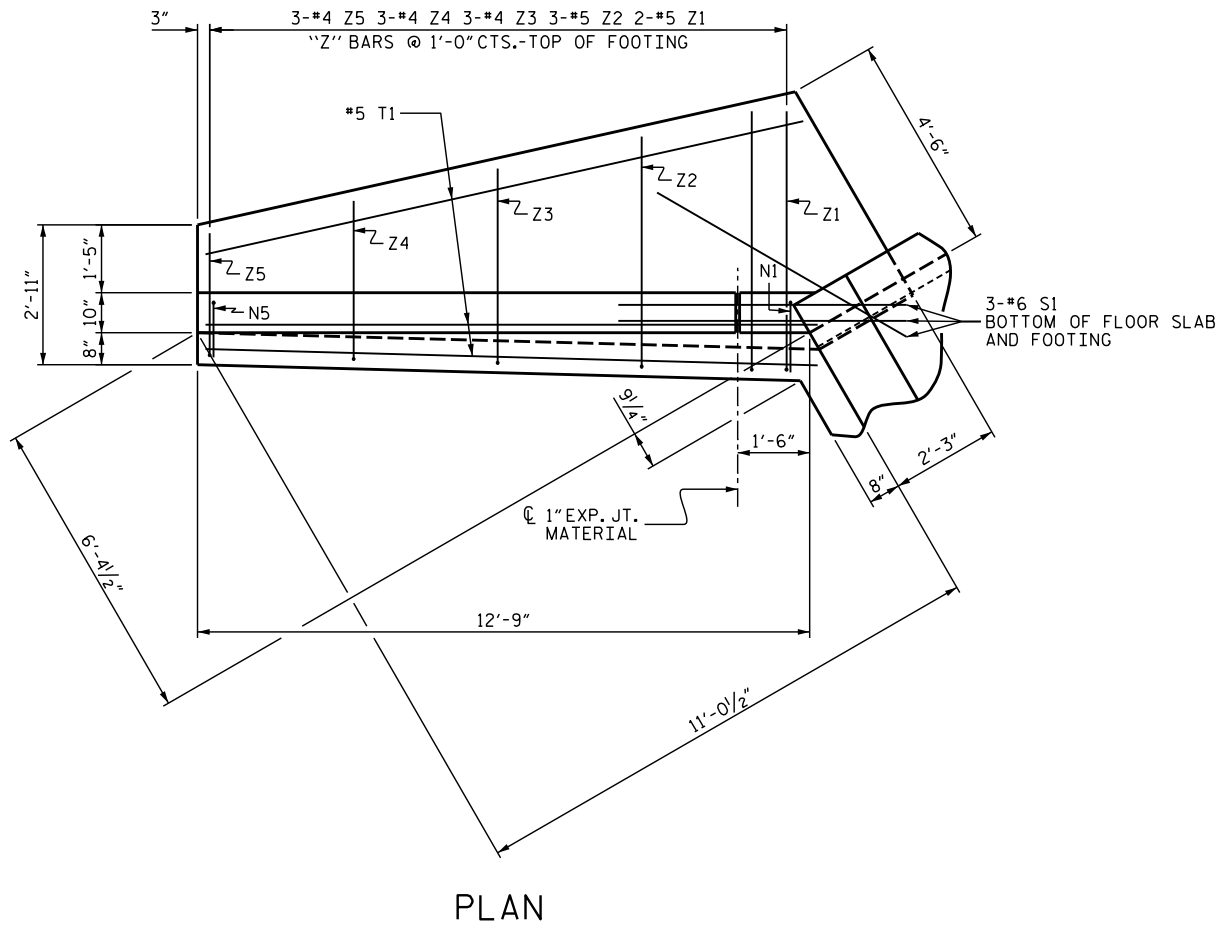
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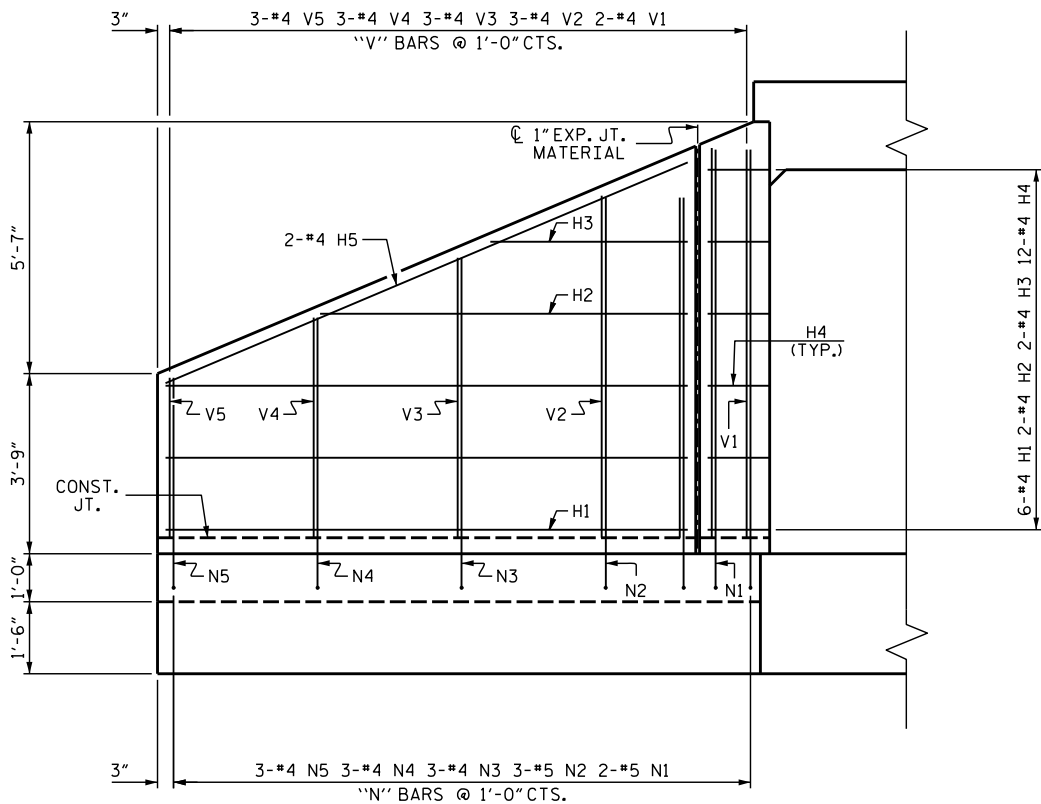
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5444 Wade Park Blvd.
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Raleigh, NC 27607
NC License Number : C-3239



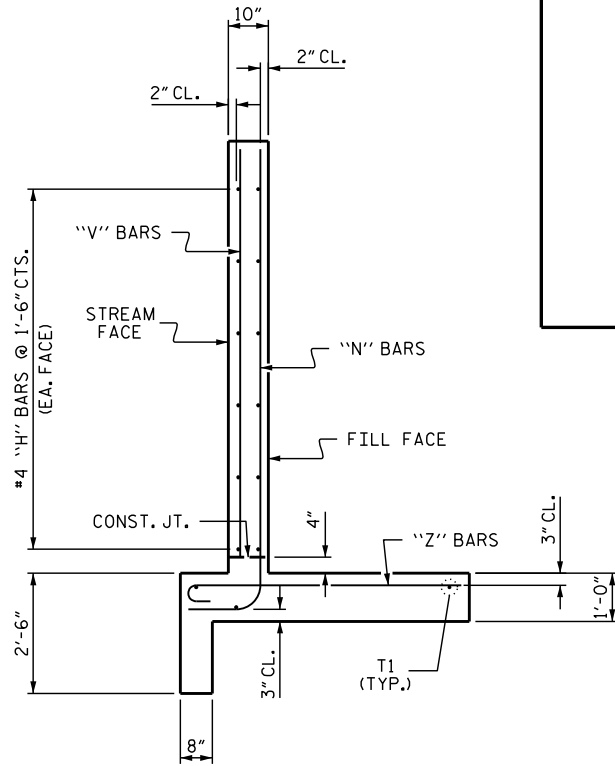
Signed by: Jeffrey Kaprielian 10/18/2025
 7292710BEE24ES
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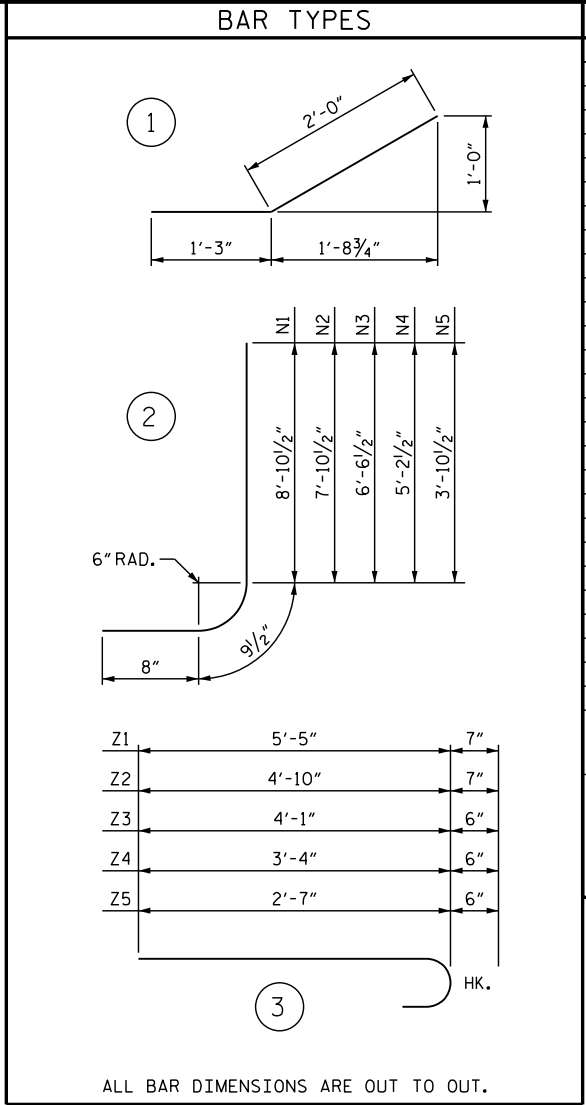
PLAN



ELEVATION



TYPICAL WING SECTION



PROJECT NO. **DF18313.2012023.PR**
BURKE COUNTY
STATION: **13+08.00 -L-**

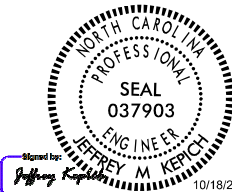
SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD WINGS
FOR
CONCRETE BOX CULVERT
H = 8'-0" SLOPE = 2:1
90° SKEW

REVISIONS					SHEET NO. C1-05
NO.	BY:	DATE:	NO.	BY:	
1			3		TOTAL SHEETS
2			4		06

ASSEMBLED BY :	J.M. KEPICH	DATE :	06/2025
CHECKED BY :	J. PAPCIAK	DATE :	07/2025
DRAWN BY :	CCJ	10/99	REV. 6/19 MAA/THC
CHECKED BY :	RWW	03/00	

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NC License Number : C-3239



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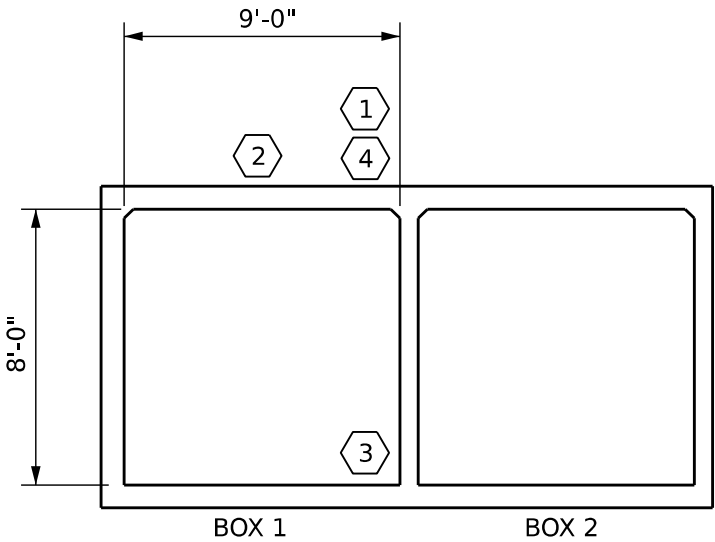
STD. NO. CW9008

8/26/21

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LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS																
LOAD TYPE	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING Ⓢ	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE									COMMENT NUMBER	
						LIVE-LOAD FACTORS (γLL)	MOMENT				SHEAR					
							RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)		
DESIGN LOAD	HL-93 (INVENTORY)	N/A	Ⓢ1	1.44	--	1.75	1.52	1	TOP SLAB	4.50	1.44	1	TOP SLAB	9.00		
	HL-93 (OPERATING)	N/A		1.86	--	1.35	1.98	1	TOP SLAB	4.50	1.86	1	TOP SLAB	9.00		
	HS-20 (INVENTORY)	36.000	Ⓢ2	1.59	57.240	1.75	1.59	1	TOP SLAB	4.50	1.62	1	BOTTOM SLAB	9.00		
	HS-20 (OPERATING)	36.000		2.06	74.160	1.35	2.06	1	TOP SLAB	4.50	2.09	1	BOTTOM SLAB	9.00		
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		2.90	39.150	1.40	2.90	1	TOP SLAB	4.50	3.05	1	TOP SLAB	9.00	
		SNGARBS2	20.000		2.71	54.200	1.40	2.71	1	TOP SLAB	4.50	2.85	1	TOP SLAB	9.00	
		SNAGRIS2	22.000		2.90	63.800	1.40	2.90	1	TOP SLAB	4.50	2.95	1	BOTTOM SLAB	9.00	
		SNCOTTS3	27.250		1.74	47.415	1.40	2.06	1	TOP SLAB	4.50	1.74	1	TOP SLAB	9.00	
		SNAGGRS4	34.925		1.87	65.310	1.40	2.50	1	BOTTOM SLAB	9.00	1.87	1	BOTTOM SLAB	9.00	
		SNS5A	35.550		1.94	68.967	1.40	2.57	1	TOP SLAB	4.50	1.94	1	TOP SLAB	9.00	
		SNS6A	39.950		1.91	76.305	1.40	2.53	1	TOP SLAB	4.50	1.91	1	TOP SLAB	9.00	
		SNS7B	42.000		1.91	80.220	1.40	2.52	1	TOP SLAB	9.00	1.91	1	TOP SLAB	9.00	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.11	69.630	1.40	2.83	1	TOP SLAB	9.00	2.11	1	BOTTOM SLAB	9.00	
		TNT4A	33.075		2.01	66.481	1.40	2.46	1	TOP SLAB	4.50	2.01	1	TOP SLAB	9.00	
		TNT6A	41.600		1.96	81.536	1.40	2.55	1	TOP SLAB	4.50	1.96	1	TOP SLAB	9.00	
		TNT7A	42.000		1.98	83.160	1.40	2.50	1	TOP SLAB	4.50	1.98	1	TOP SLAB	9.00	
		TNT7B	42.000		1.94	81.480	1.40	2.46	1	TOP SLAB	4.50	1.94	1	TOP SLAB	9.00	
		TNAGRIT4	43.000		1.95	83.850	1.40	2.27	1	TOP SLAB	9.00	1.95	1	TOP SLAB	9.00	
		TNAGT5A	45.000		1.91	85.950	1.40	2.27	1	TOP SLAB	9.00	1.91	1	BOTTOM SLAB	9.00	
		TNAGT5B	45.000	Ⓢ3	1.56	70.200	1.40	2.12	1	BOTTOM SLAB	9.00	1.56	1	BOTTOM SLAB	9.00	
EMERGENCY VEHICLE (EV)	EV2	28.750		2.05	58.938	1.30	2.05	1	TOP SLAB	4.50	2.16	1	TOP SLAB	9.00		
	EV3	43.000	Ⓢ4	1.51	64.930	1.30	1.79	1	TOP SLAB	4.50	1.51	1	TOP SLAB	9.00		



LRFR SUMMARY
(LOOKING DOWNSTREAM)

LOAD FACTORS:

DESIGN LOAD RATING FACTORS		
LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	--
WA	1.00	--

NOTES:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATES.

COMMENTS:

-
-
-
-

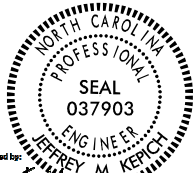
Ⓢ	CONTROLLING LOAD RATING
Ⓢ1	DESIGN LOAD RATING (HL-93)
Ⓢ2	DESIGN LOAD RATING (HS-20)
Ⓢ3	LEGAL LOAD RATING **
Ⓢ4	EMERGENCY VEHICLE LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	

ASSEMBLED BY: J.M. KEPICH		DATE : 06/2025	
CHECKED BY : J. PAPCIAK		DATE : 07/2025	
DRAWN BY : WMC	7/11	REV. 10/1/11	MAA/GM
CHECKED BY : GM	7/11	REV. 12/17	MAA/THC
		REV. 04/23	BNB/AAI

10/18/2025
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jkepich



ms consultants, inc.
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NO. 1	BY: 1	DATE: 1	NO. 3	BY: 3	DATE: 3
2			4		

PROJECT NO. DF18313.2012023.PR
BURKE COUNTY
STATION: **13+08.00 -L-**

SHEET 6 OF 6

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS (NON-INTERSTATE TRAFFIC)						SHEET NO. C1-06
REVISIONS						TOTAL SHEETS 06
NO. 1	BY: 1	DATE: 1	NO. 3	BY: 3	DATE: 3	
2			4			

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" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞"Ø STUDS FOR 4 - ¾" Ø 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 ⅝" 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 ⅛" 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. FINIS 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.