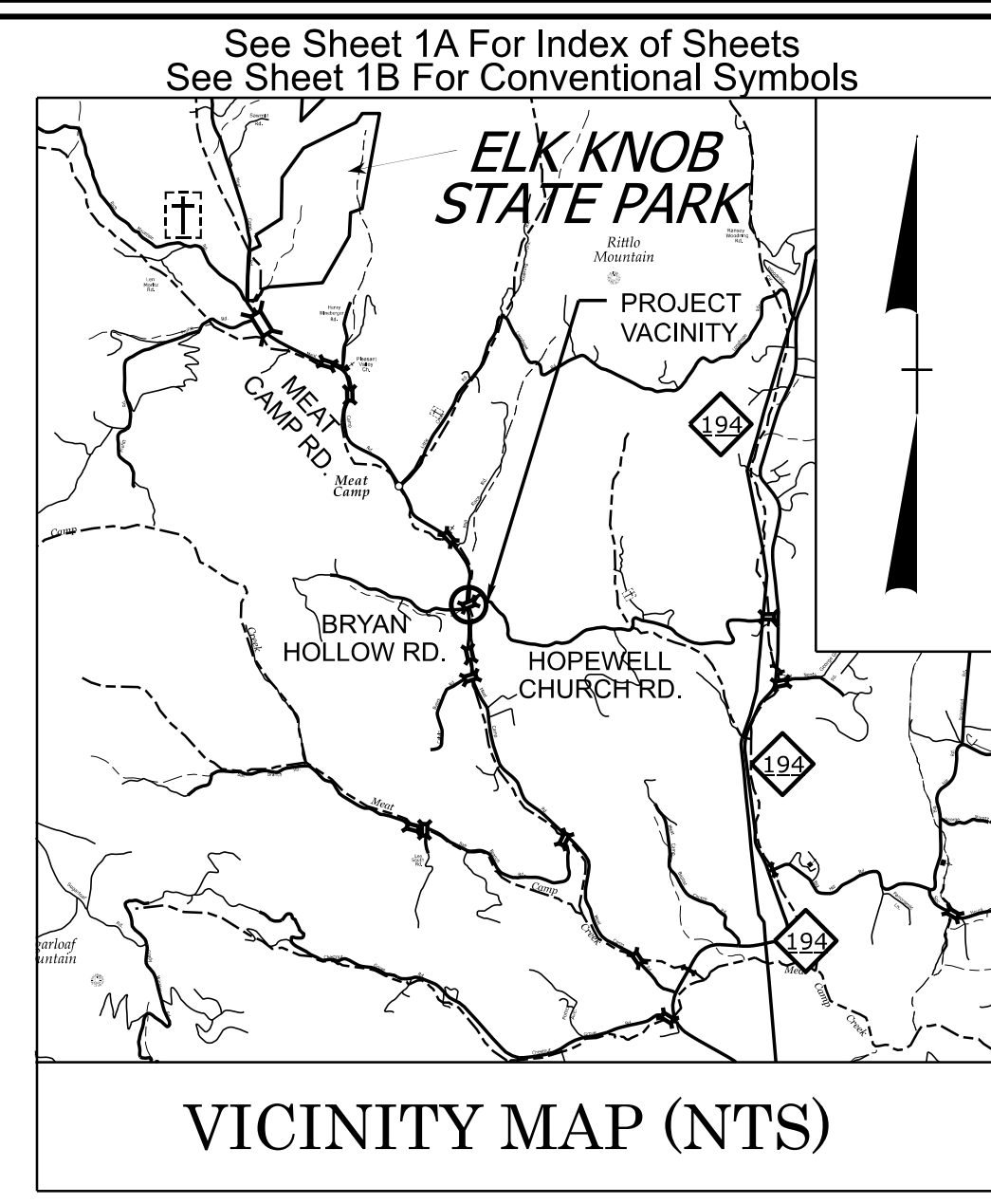


TIP PROJECT: DF18311.2095784

CONTRACT: DK00435



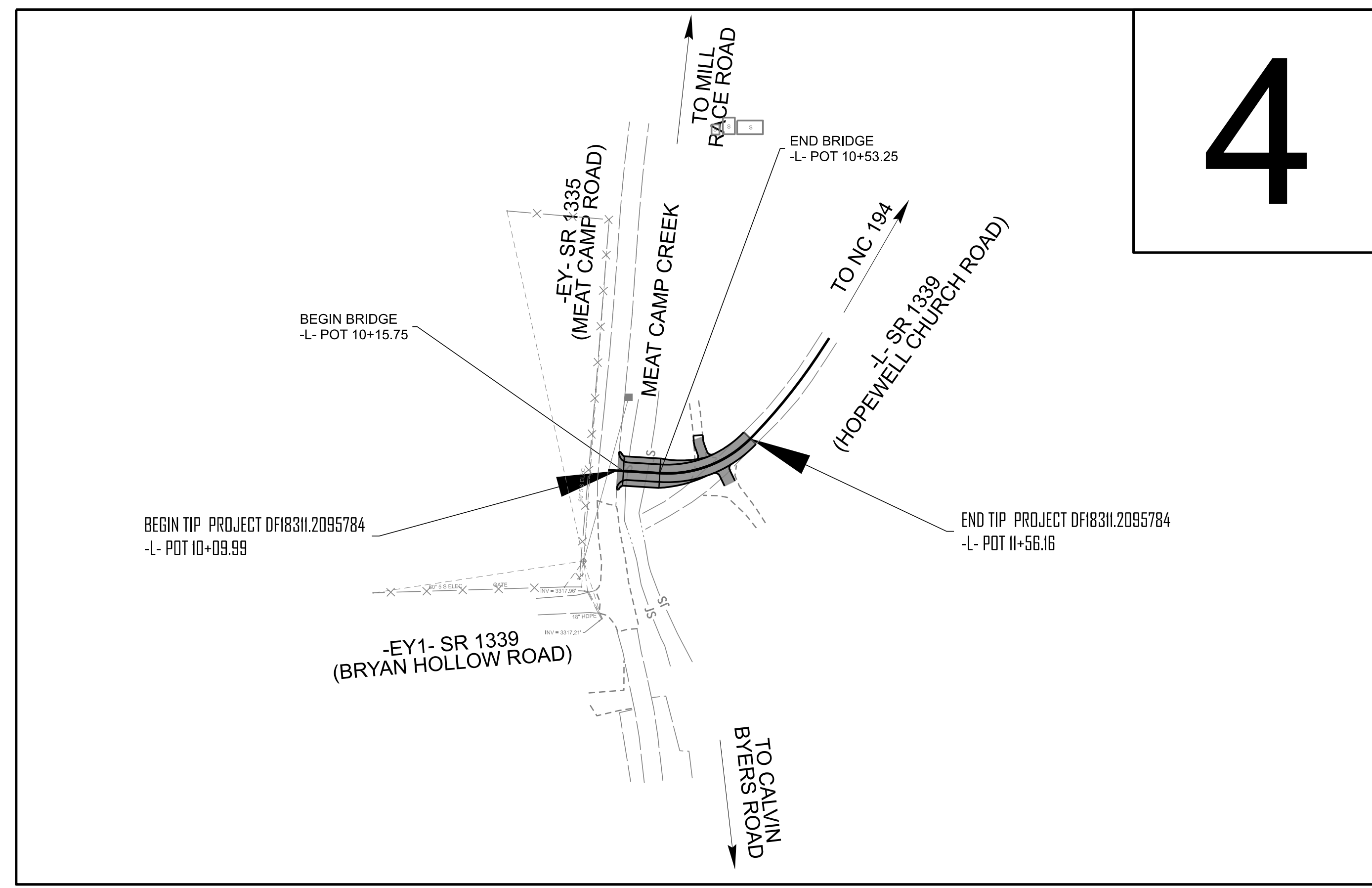
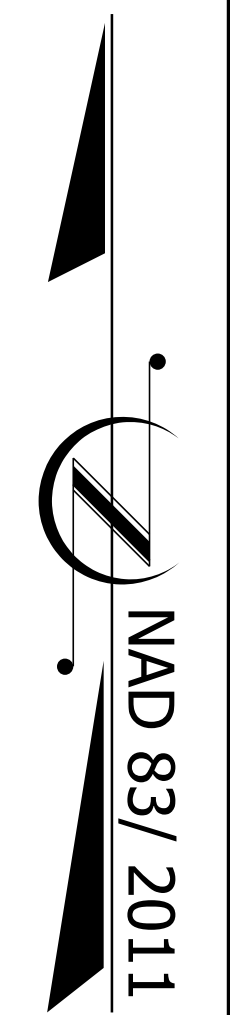
# STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

## WATAUGA COUNTY

LOCATION: *REPLACE BRIDGE 187 ON SR 1339  
(HOPEWELL CHURCH RD.)  
OVER MEAT CAMP CREEK*

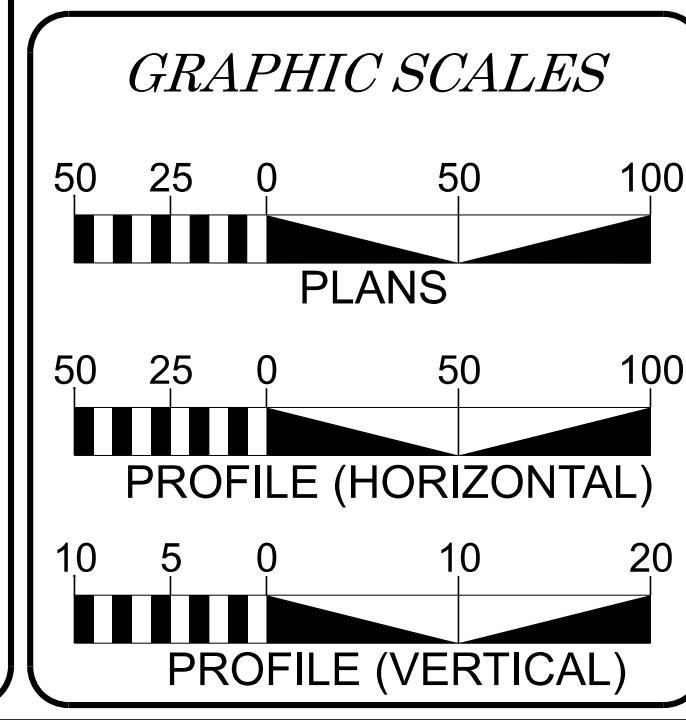
TYPE OF WORK: *PAVING, GRADING,  
DRAINAGE, & STRUCTURES*

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18311.2095784	11	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
DF18311.2095784	N/A	PE	
DF18311.2095784	N/A	ROW & UTILITY	
DF18311.2095784	N/A	CONSTRUCTION	



# 4

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2025 =	250
ADT 2026 =	250
K =	N/A %
D =	N/A %
T =	N/A % *
V =	30 MPH
* TTST = N/A DUAL N/A	
FUNC CLASS = LOCAL	
AASHTO	
LOW VOLUME ROADS	
DESIGN GUIDELINES	

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT DF18311.2095784 =	0.021 MILES
LENGTH OF STRUCTURE TIP PROJECT DF18311.2095784 =	0.007 MILES
TOTAL LENGTH OF TIP PROJECT DF18311.2095784 =	0.028 MILES

Prepared in the Office of:

VHB Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
JUNE 10, 2025

LETTING DATE:  
MARCH 19, 2026

THAD DUNCAN, PE  
PROJECT ENGINEER

DANIEL GLEASON, PE  
PROJECT DESIGN ENGINEER

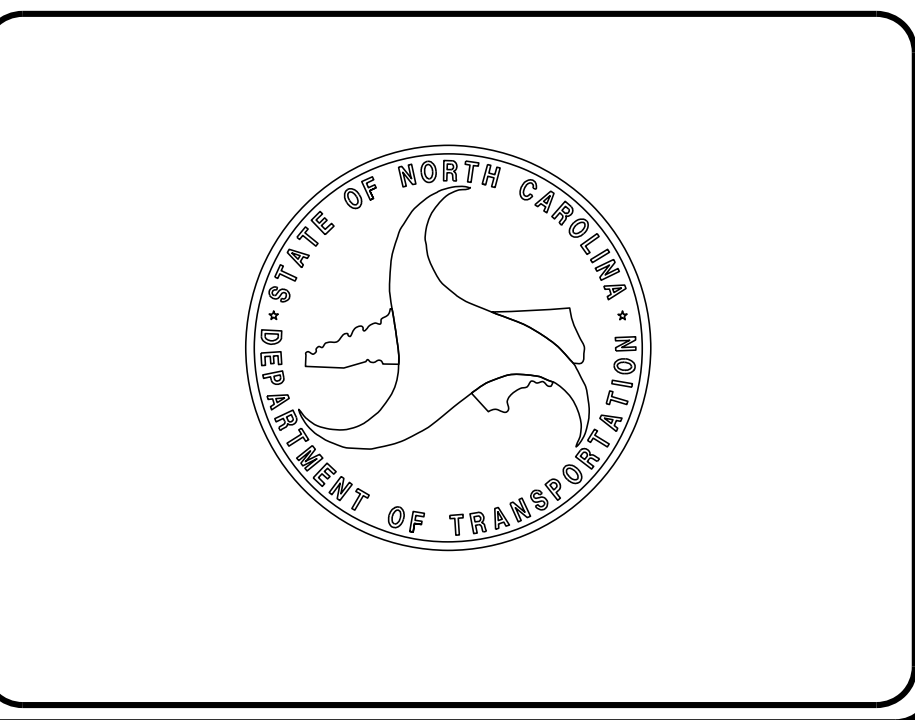
ROB WEISZ, PE  
NCDOT CONTACT

HYDRAULICS ENGINEER  
2/4/2026

Signed by:  
*James R. Hopson, Jr.*  
SEAL 44499  
NORTH CAROLINA PROFESSIONAL ENGINEER  
JAMES R. HOPSON, JR.

ROADWAY DESIGN ENGINEER  
2/3/2026

DocuSigned by:  
*Shad Duncan*  
SEAL 25477  
NORTH CAROLINA PROFESSIONAL ENGINEER  
THAD F. DUNCAN



INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1	SPECIAL DETAILS
3D-1	DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
4 THRU 5	PLAN AND PROFILE SHEET
RW-1 THRU RW-2	SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENT AND PROPERTY TIES
TMP-1 THRU TMP-4	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1	CROSS-SECTION SUMMARY SHEET
X-2 THRU X-6	CROSS-SECTIONS
S-1 THRU S-18	STRUCTURE PLANS

EFF. 01-16-2024  
REV.

2024 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
423.02	Bridge Approach Fills - Type 1A Alternate Approach Fill for Integral Bridge Abutment
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I

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

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

SUBSURFACE DRAINS:

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

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

END BENTS:

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

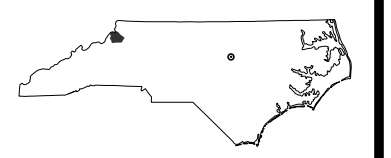
UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE:  
POWER - BLUE RIDGE EMC, CATV - SPECTRUM

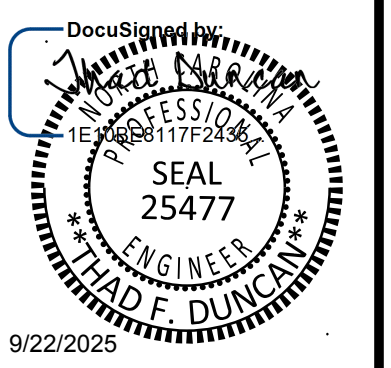
DF18311.2095784

4RD1 IA

NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
WATAUGA COUNTY



ROADWAY DESIGN UNIT  
ROADWAY DESIGN  
ENGINEER



9/22/2025

PREPARED BY



REVISIONS

Note: Not to Scale

# STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS CONVENTIONAL PLAN SHEET SYMBOLS

DF18311.2095784  
4R01 | IB

### BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin (EIP)	○ EIP
Computed Property Corner	×
Existing Concrete Monument (ECM)	◻ ECM
Parcel / Sequence Number	⑫③
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	▣
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	-w-lb-
Proposed Wetland Boundary	-w-lb-
Existing Endangered Animal Boundary	-eab-
Existing Endangered Plant Boundary	-epb-
Existing Historic Property Boundary	-hpb-
Known Contamination Area: Soil	-s-s-
Potential Contamination Area: Soil	-s-s-
Known Contamination Area: Water	-w-w-
Potential Contamination Area: Water	-w-w-
Contaminated Site: Known or Potential	☠ ?

### BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○ S
Well	○ W
Small Mine	✕
Foundation	▭
Area Outline	▭
Cemetery	▭ +
Building	▭
School	▭
Church	▭
Dam	▭

### HYDROLOGY:

Stream or Body of Water	~~~~~
Hydro, Pool or Reservoir	▭
Jurisdictional Stream	-js-
Buffer Zone 1	-bz 1-
Buffer Zone 2	-bz 2-
Flow Arrow	←
Disappearing Stream	→
Spring	○
Wetland	⌵
Proposed Lateral, Tail, Head Ditch	← FLOW
False Sump	◊

### RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○ MILEPOST 35
Switch	▭ SWITCH
RR Abandoned	-----
RR Dismantled	-----

### RIGHT OF WAY & PROJECT CONTROL:

Primary Horiz Control Point	◻
Primary Horiz and Vert Control Point	●
Secondary Horiz and Vert Control Point	◆
Vertical Benchmark	⊠
Existing Right of Way Monument	△
Proposed Right of Way Monument (Rebar and Cap)	▲
Proposed Right of Way Monument (Concrete)	▲
Existing Permanent Easement Monument	◇
Proposed Permanent Easement Monument (Rebar and Cap)	◇
Existing C/A Monument	△
Proposed C/A Monument (Rebar and Cap)	▲
Proposed C/A Monument (Concrete)	▲
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Existing Control of Access Line	-----
Proposed Control of Access Line	-----
Proposed ROW and CA Line	-----
Existing Easement Line	-----
Proposed Temporary Construction Easement	-----
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	-c-
Proposed Slope Stakes Fill	-f-
Proposed Curb Ramp	CR
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	⊠
VEGETATION:	
Single Tree	☼
Single Shrub	☼
Hedge	~~~~~

Woods Line	~~~~~
Orchard	☼ ☼ ☼ ☼
Vineyard	▭ Vineyard

### EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	▭ CONC
Bridge Wing Wall, Head Wall and End Wall	▭ CONC WW
MINOR:	
Head and End Wall	▭ CONC HW
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	▭ CB
Paved Ditch Gutter	-----
Storm Sewer Manhole	⊕
Storm Sewer	-----

### UTILITIES:

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

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

### TELEPHONE:

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

### WATER:

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

### TV:

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

### GAS:

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

### SANITARY SEWER:

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

### MISCELLANEOUS:

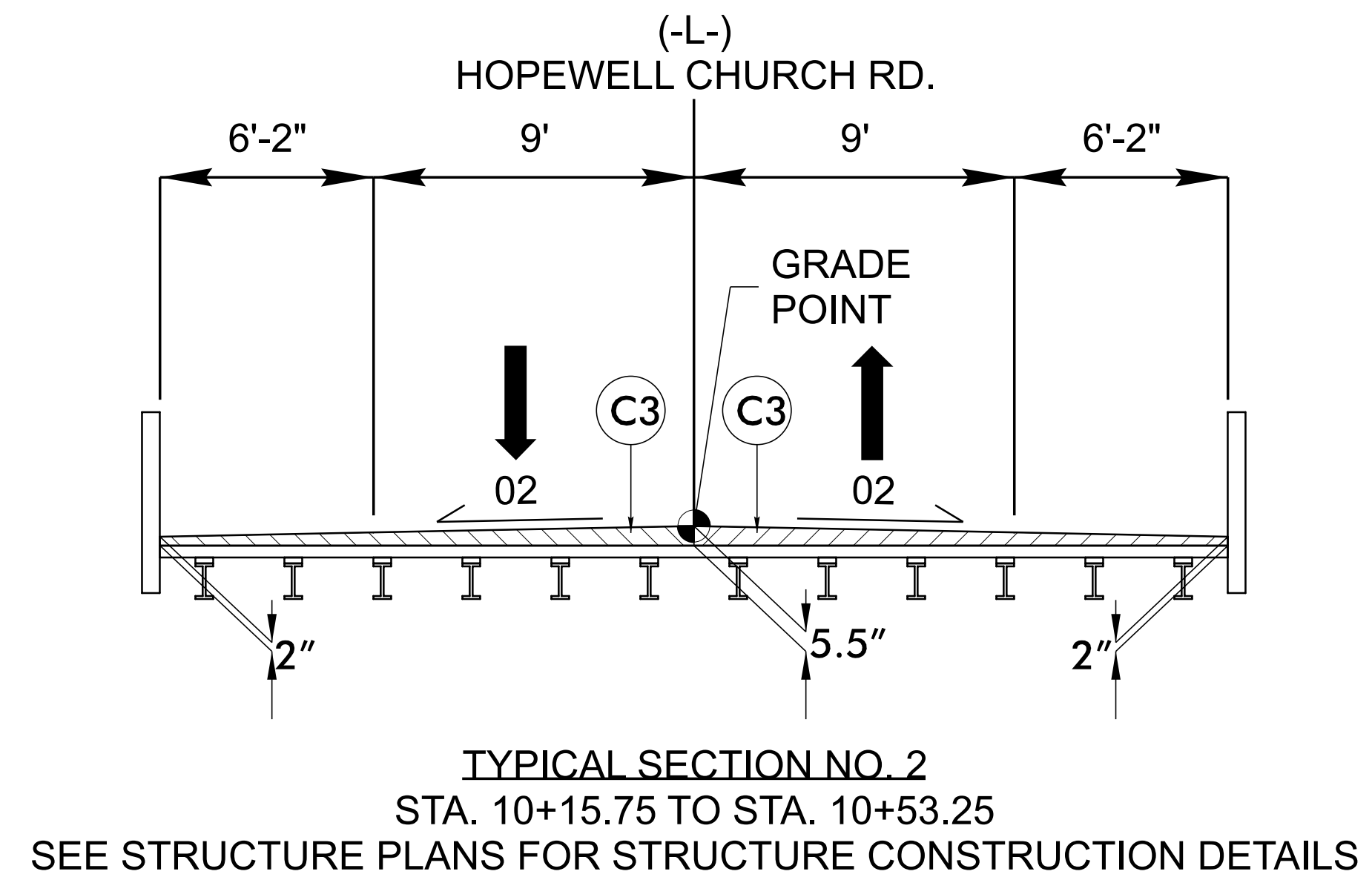
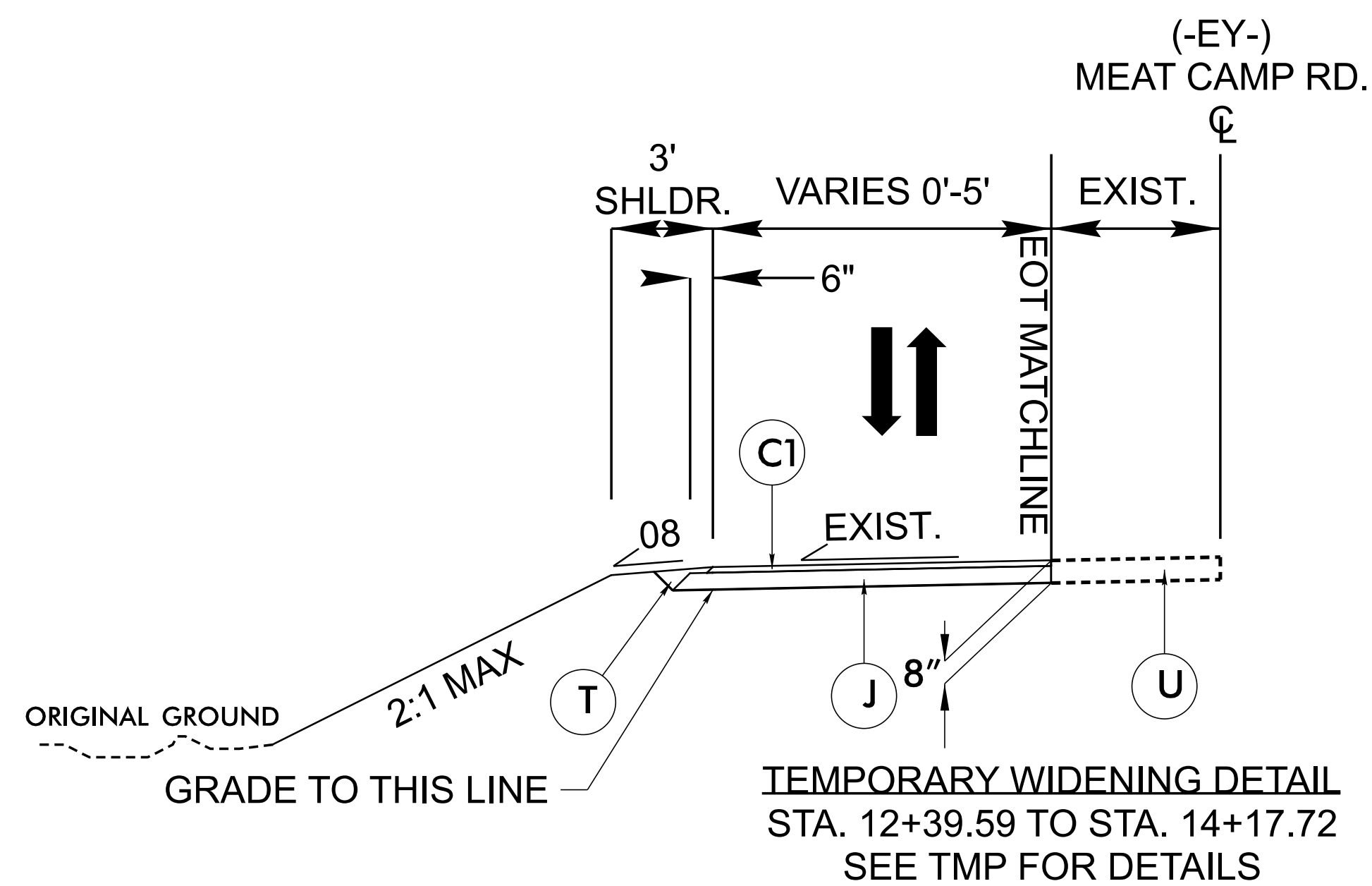
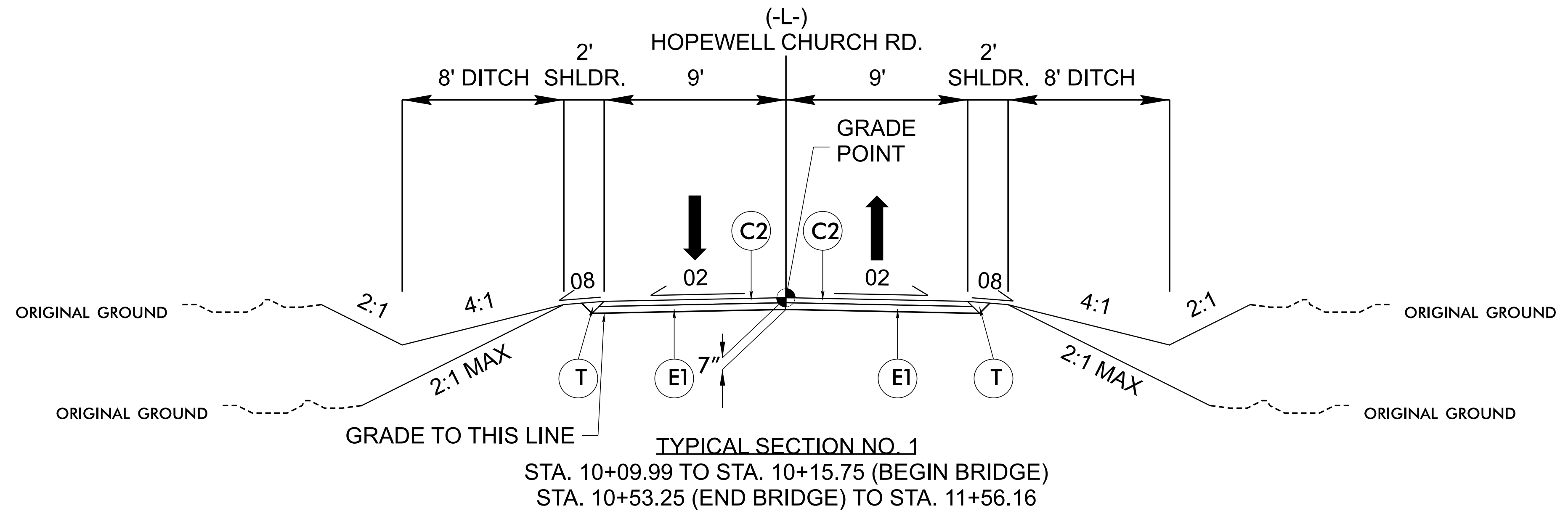
Utility Pole	●
Utility Pole with Base	⊠
Utility Located Object	○
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line (SUE - LOS B)*	-----
U/G Tank; Water, Gas, Oil	▭
Underground Storage Tank, Approx. Loc.	⊕
A/G Tank; Water, Gas, Oil	▭
Geoenvironmental Boring	⊕
Abandoned According to Utility Records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

# FINAL PAVEMENT SCHEDULE

(APRIL 2025)

C1	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
J	PROP. 6" AGGREGATE BASE COURSE.
T	EARTH MATERIAL

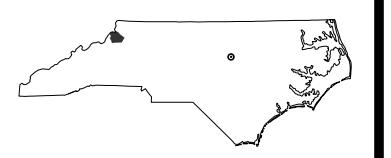
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE



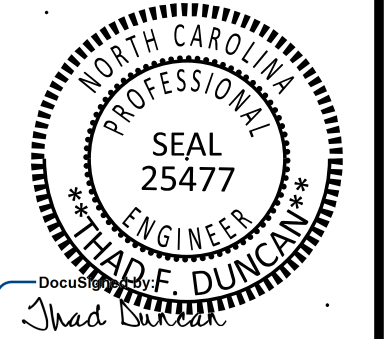
DF18311.2095784

4R01 2A-1

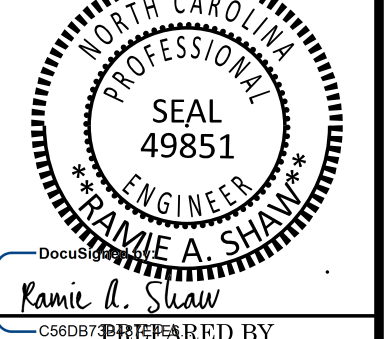
NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
WATAUGA COUNTY



ROADWAY DESIGN UNIT  
ROADWAY DESIGN ENGINEER  
11/10/2025

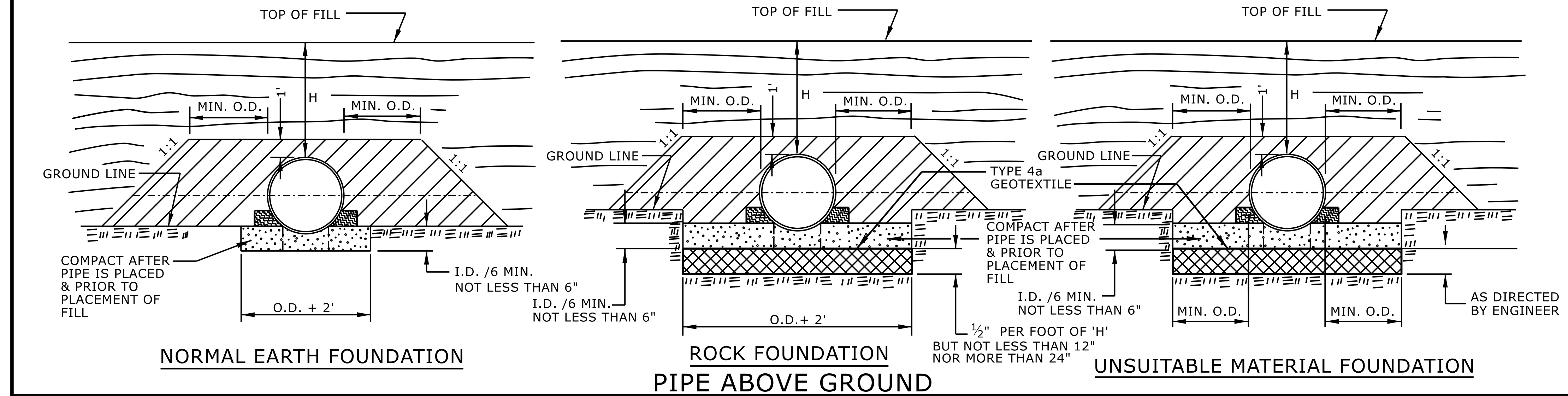
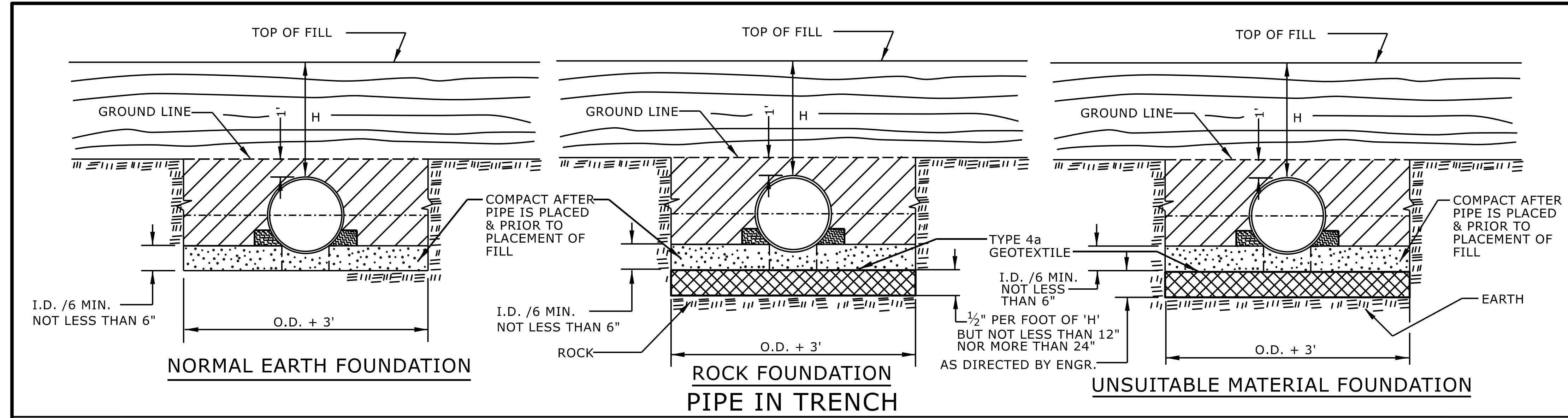


PAVEMENT DESIGN ENGINEER  
11/11/2025



PREPARED BY  
VHB Engineering, Inc. P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27605

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.

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

ROADWAY DETAIL DRAWING FOR  
**METHOD OF PIPE INSTALLATION**  
 FLEXIBLE PIPE



Signed by:  
*Nicole M. Hackler*  
 5884323D34164C5...  
 9/23/2025

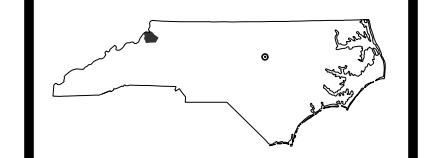
SHEET 1 OF 2  
**300.01**

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

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

**SEE TITLE BLOCK**

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



PAVEMENT REMOVAL SUMMARY							
IN SQUARE YARDS							
SURVEY	Station	Station	LOCATION	ASPHALT	ASPHALT	CONCRETE	CONCRETE
LINE			LT/RT/CL	REMOVAL	BREAKUP	REMOVAL	BREAKUP
L	10+37.89	10+96.55	RT/CL	89			
		<b>TOTAL:</b>		89			
		<b>SAY:</b>		90			

**SUMMARY OF EARTHWORK**

IN CUBIC YARDS

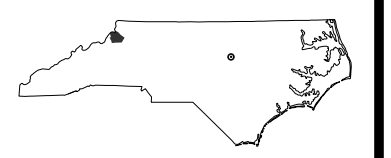
Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste	
L 10+09.99	10+15.75	2	3	1		
L 10+53.25	11+56.16	124	1		123	
<b>SUBTOTALS:</b>		126	4	1	123	Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Shoulder Borrow, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement, and Removal of Existing Pavement will be paid for at the contract lump sum price for grading.
<b>PROJECT TOTALS:</b>		126	4	1	123	
<b>PROJECT TOTALS:</b>		126	4	-1	122	Note: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.
<b>GRAND TOTALS:</b>		126	4		122	
<b>SAY:</b>		<b>140</b>				

EST. DDE = 0 CY CUBIC YARDS  
SHOULDER BORROW = 0 CY CUBIC YARDS  
50 CY EST. SHALLOW UNDERCUT

50 CY TOTAL SHALLOW UNDERCUT  
100 TONS CLASS IV SUBGRADE STABILIZATION  
PER GEOTECH RECOMMENDATION, ESTIMATED 225 CUBIC YARDS OF UNDERCUT TO BE USED IN THE DISCRETION OF THE RESIDENT ENGINEER.

REVISIONS





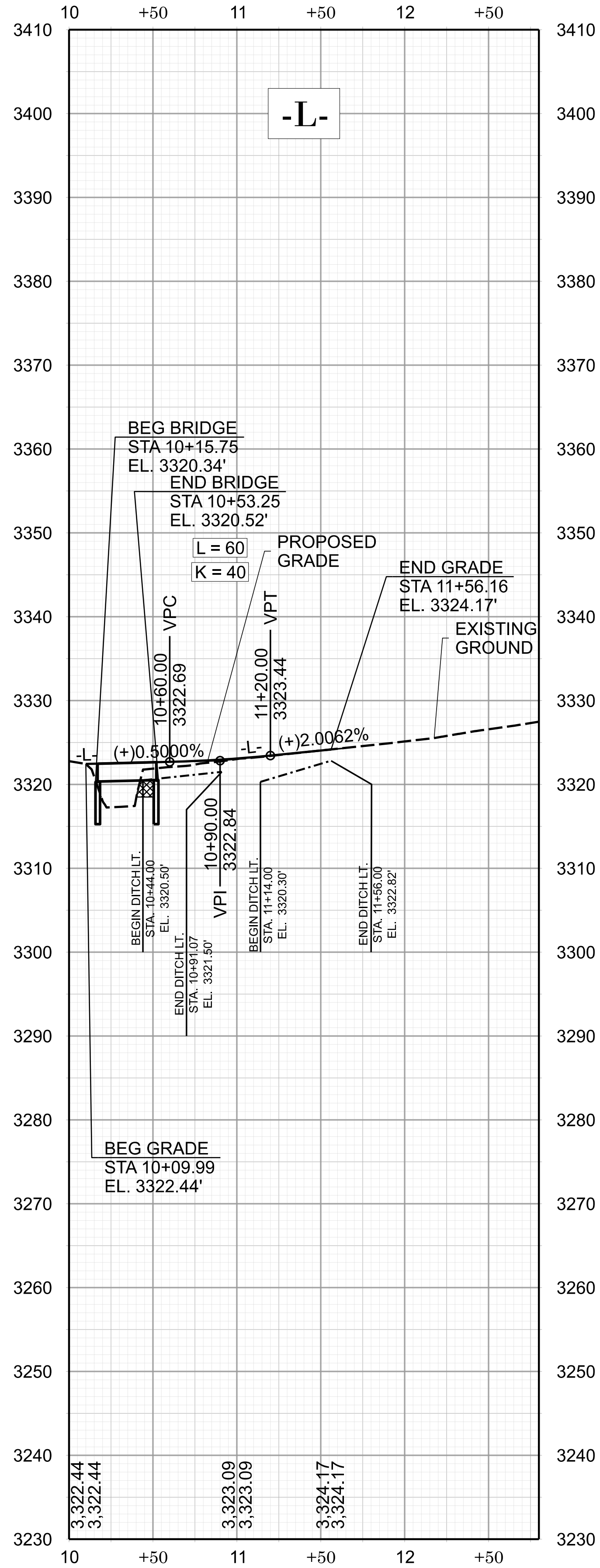
SUMMARY OF SUBSURFACE DRAINAGE					
LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
	CONTINGENCY			SD	50
				<b>TOTAL LF:</b>	50

\*UD = Underdrain

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

REVISIONS





HYDRAULIC DATA	
DESIGN DISCHARGE	= 580 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 5 YR.
DESIGN HIGH WATER ELEVATION	= 3321.6
DRAINAGE AREA	= 5.89 SQ. MI.
BASIC DISCHARGE (Q100)	= 1700 C.F.S.
BASIC HIGH WATER ELEVATION	= 3324.4

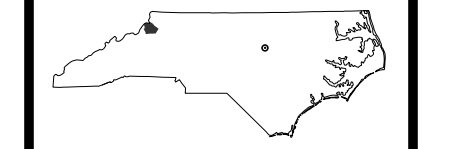
OVERTOPPING FLOOD DATA	
OVERTOPPING DISCHARGE	= 760 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	= 5+ YR.
OVERTOPPING FLOOD ELEVATION	= 3323.2
*OVERTOPPING OCCURS AT -L- STA. 10+09.99.	
WS EL. Taken @ River Station 33239	

----- LEFT DITCH

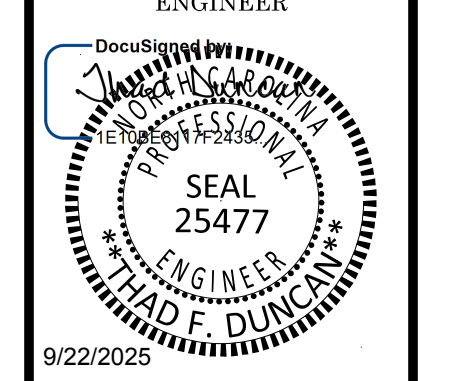
DF18311.2095784

4R01 | 5

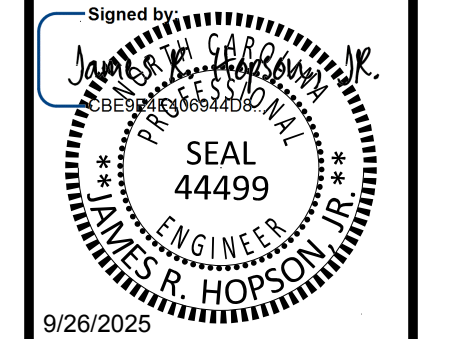
NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
WATAUGA COUNTY



ROADWAY DESIGN UNIT  
ROADWAY DESIGN  
ENGINEER



HYDRAULICS  
ENGINEER



PREPARED BY



REVISIONS

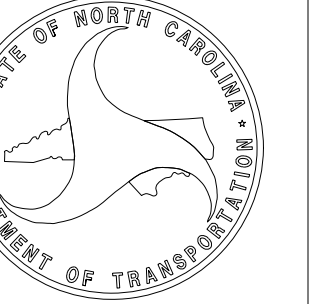
SEE PLAN SHEET 4 FOR PLAN VIEW

# PRIMARY SURVEY CONTROL SHEET

DF18311.2095784

R/W 02G-1

NORTH CAROLINA  
DEPARTMENT  
OF TRANSPORTATION



PROFESSIONAL LAND  
SURVEYOR



DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL SIGNATURES  
ARE COMPLETED

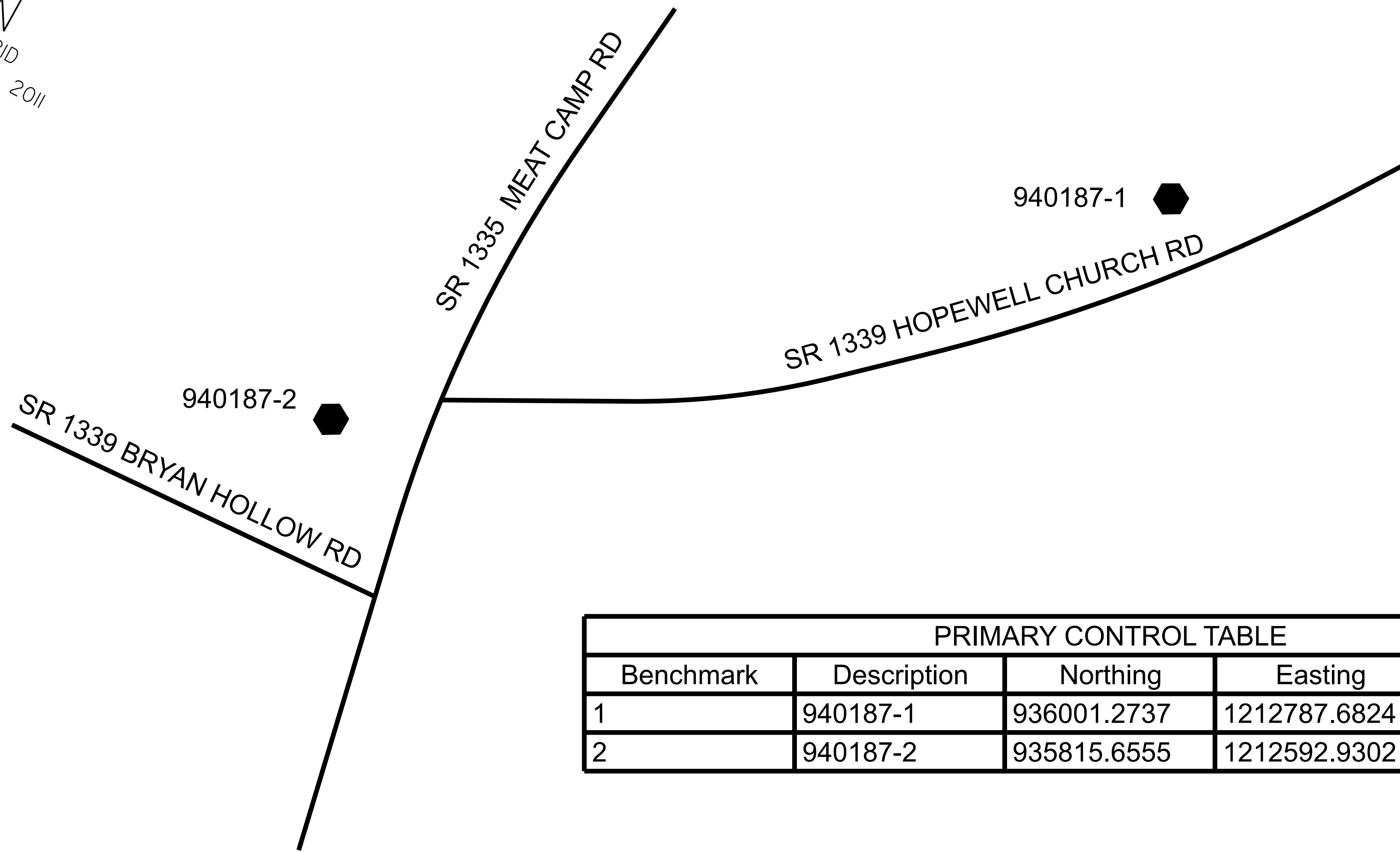
2024 STANDARD  
SPECIFICATIONS

I, M. Todd Woodruff, PLS, CERTIFY THAT THE PRIMARY PROJECT CONTROL WAS VERIFIED UNDER MY SUPERVISION FROM AN ACTUAL GPS SURVEY MADE UNDER MY SUPERVISION AND THE FOLLOWING INFORMATION WAS USED TO PERFORM THE SURVEY:

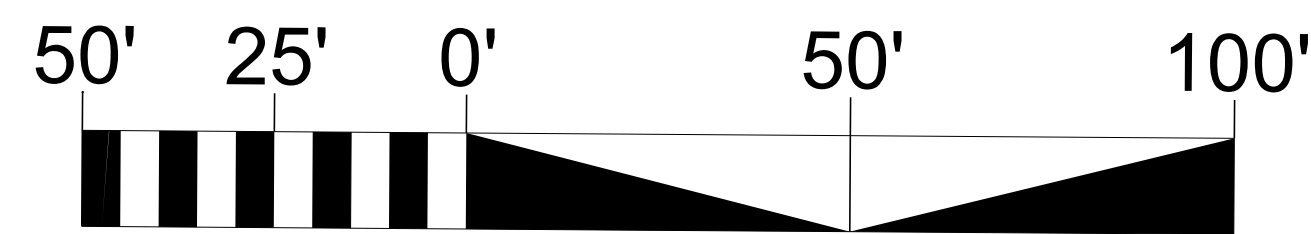
CLASS OF SURVEY: AA  
TYPE OF GPS FIELD PROCEDURE: RTN  
DATES OF SURVEY: October, 2024  
DATUM/EPOCH: NAD83/NA 2011  
PUBLISHED/FIXED-CONTROL USE: N/A  
LOCALIZED AROUND: 940187-2  
NORTHING: 935,815.6555  
EASTING: 1,212,592.9302  
COMBINED GRID FACTOR: 0.99988345788  
GEOID MODEL: GEOID18 (Conus)  
UNITS: US Survey Feet

THIS 24 DAY OF October, 2024.

Signed by:  
  
76BC08302EDF43E...  
PROFESSIONAL LAND SURVEYOR L-4206



PRIMARY CONTROL TABLE				
Benchmark	Description	Northing	Easting	Elevation
1	940187-1	936001.2737	1212787.6824	3323.916
2	940187-2	935815.6555	1212592.9302	3320.249



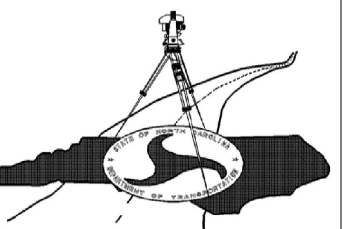
NOTES:

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.

TIP PROJECT: DF18311.2095784

County: Watauga

PREPARED FOR



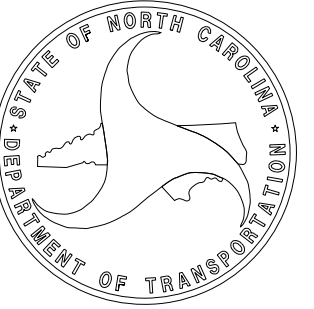
LOCATION AND SURVEYS UNIT

PREPARED BY

DIVISION 8  
LOCATION AND SURVEYS  
300 DOT DRIVE  
ASHEBORO, NC 27205

# SECONDARY SURVEY CONTROL SHEET

## W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



I, M. TODD WOODRUFF, PLS, CERTIFY THAT THE SECONDARY BASELINE CONTROL FOR THIS PROJECT WAS COMPLETED UNDER MY DIRECT AND RESPONSIBLE CHARGE FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION UTILIZING PRIMARY GPS CONTROL SET BY OTHERS; THAT ALL HORIZONTAL CLOSURES HAD A MINIMUM RATIO OF PRECISION OF 1:20,000 (CLASS AA) AND VERTICAL ACCURACY TO 1:10,000 (CLASS A). FIELD WORK WAS PERFORMED FROM 10-14-2024 TO 10-14-2024, AND ALL COORDINATES ARE BASED ON NAD 83/NA 2011 AND ALL ELEVATIONS ARE BASED ON NAVD 88; THAT THIS SURVEY WAS PERFORMED TO MEET THE REQUIREMENTS OF 21NCAC 56.1600 AS APPLICABLE.

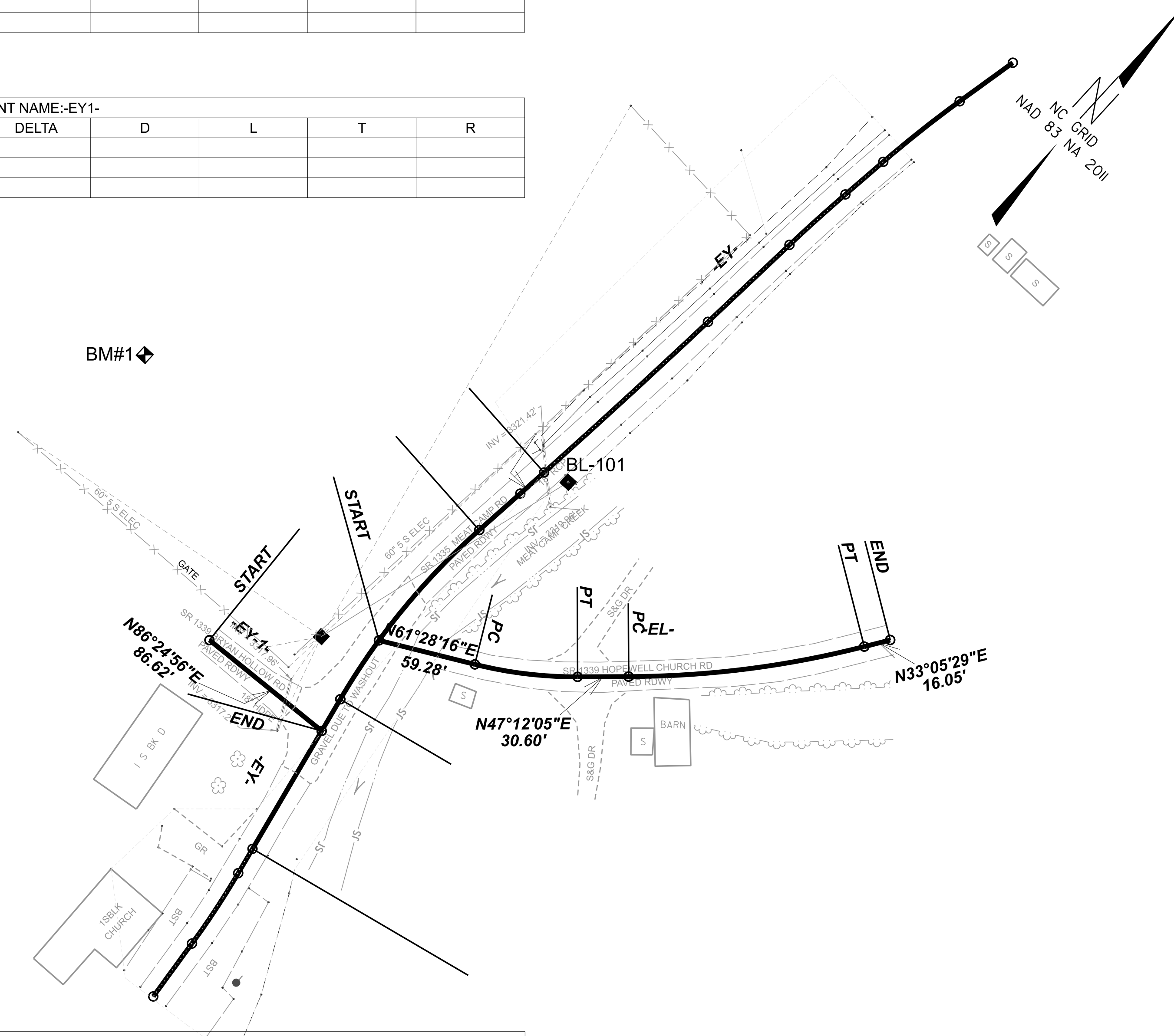
THIS 24 DAY OF October, 2024.

Signed by:  
*M. Todd Woodruff*  
768C08302EDF43E

PROFESSIONAL LAND SURVEYOR L-4206

EXISTING ALIGNMENT NAME:-EL-									
POINT	NORTHING	EASTING	BEARING	DIST	DELTA	D	L	T	R
START	935837.4063	1212619.93							
LINE			N61°28'16"E	59.28					
PC	935865.7204	1212672.016							
CURVE					14.270" Left	22.918"	62.264	31.294	250
PT	935901.9284	1212722.472							
LINE			N47°12'05"E	30.6					
PC	935922.7162	1212744.922							
CURVE					14.110" Left	9.879"	142.834	71.78	580
PT	936031.6229	1212836.78							
LINE			N33°05'29"E	16.05					
END	936045.0667	1212845.541							

EXISTING ALIGNMENT NAME:-EY1-									
POINT	NORTHING	EASTING	BEARING	DIST	DELTA	D	L	T	R
START	935768.7352	1212544.9626							
LINE			N86°24'56"E	86.62					
END	935774.1509	1212631.4154							



Benchmark	Description	Northing	Easting	Elevation
101	BL-101	935984.0760	1212639.2410	3323.60

Benchmark	Northing	Easting	Elevation	Description
BM1	935868.4430	1212400.6070	3329.44	RR SPIKE IN BASE OF 15" WHITE PINE

EXISTING ALIGNMENT NAME:-EY-									
POINT	NORTHING	EASTING	BEARING	DIST	DELTA	D	L	T	R
START	935978.5723	1212624.71							
LINE			S5°48'15"W	52.01					
PC	935926.8338	1212619.451							
CURVE					17.990" Left	13.642"	131.874	66.484	420
PT	935795.7049	1212626.761							
LINE			S21°11'09"E	104.05					
END	935693.9945	1212648.725							

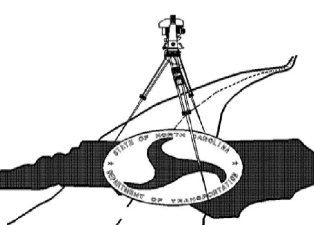


**NOTES:**

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.

**TIP PROJECT: DF18311.2095784**  
**County: Watauga**

PREPARED FOR



LOCATION AND  
SURVEYS UNIT

PREPARED BY

DIVISION 8  
LOCATION AND SURVEYS  
300 DOT DRIVE  
ASHEBORO, NC 27205



# ROADWAY STANDARD DRAWINGS

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

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.06	WARNING SIGNS FOR BLASTING ZONES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW BOARDS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGERS
1160.01	TEMPORARY CRASH CUSHION
1165.01	TRUCK MOUNTED ATTENUATOR
1170.01	PORTABLE CONCRETE BARRIER
1180.01	SKINNY DRUMS
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1205.03	PAVEMENT MARKINGS - EXITS AND ENTRANCE RAMPS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.06	PAVEMENT MARKINGS - LANE DROPS
1205.07	PAVEMENT MARKINGS - PEDESTRIAN CROSSWALKS
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.10	PAVEMENT MARKINGS - SCHOOL AREAS
1205.11	PAVEMENT MARKINGS - RAILROAD CROSSINGS
1205.12	PAVEMENT MARKINGS - BRIDGES
1205.13	PAVEMENT MARKINGS - LANE REDUCTIONS
1205.14	PAVEMENT MARKINGS - ROUNDABOUTS
1205.15	PAVEMENT MARKINGS - REDUCED CONFLICT INTERSECTIONS
1205.16	BICYCLE FACILITIES
1205.17	PAVEMENT MARKINGS - SIDE-BY-SIDE/ADJACENT ON/OFF RAMPS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION
1264.01	OBJECT MARKERS - TYPES
1264.02	OBJECT MARKERS - INSTALLATION
1266.01	RAISED PAVEMENT MARKERS TUBULAR MARKERS
1267.01	FLEXIBLE DELINEATORS - INSTALLATION
1267.02	FLEXIBLE DELINEATORS - SPACING TABLES
1267.03	FLEXIBLE DELINEATORS - INTERCHANGE PLACEMENT

# LEGEND

## GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING (LOCATION PURPOSES ONLY)
- WORK AREA

## SIGNALS

- EXISTING
- PROPOSED
- TEMPORARY

## PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

## TEMPORARY PAVEMENT MARKINGS

SYMBOL	DESCRIPTION
P1	PAINT WHITE EDGELINE (4")
P61	WHITE STOP BAR (24")

## TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM SKINNY DRUM TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW BOARD
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED ATTENUATOR (TMA)
- CHANGEABLE MESSAGE SIGN

## TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

## PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

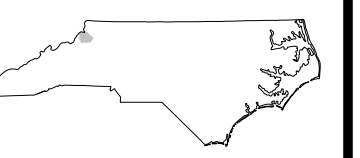
## PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

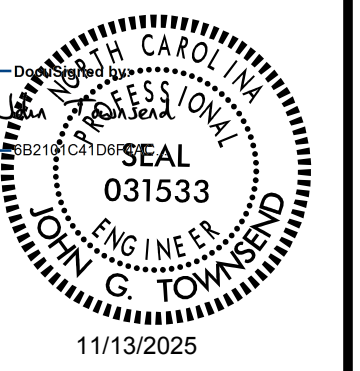
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TMP 001A

NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
WATAUGA COUNTY



WORK ZONE TRAFFIC CONTROL UNIT



ROADWAY STANDARD  
DRAWINGS & LEGEND

TIP PROJECT: DF18311.2095784

# **TRANSPORTATION MANAGEMENT STRATEGIES**

THE FOLLOWING LISTED WORK ZONE STRATEGIES ARE RECOMMENDED FOR INCLUSION WITHIN THIS TRANSPORTATION MANAGEMENT PLAN (TMP).

RECOMMENDED STRATEGIES:

TRAFFIC MANAGEMENT STRATEGIES:

- FULL ROADWAY CLOSURES
- LANE SHIFTS OR CLOSURES
- ONE-LANE, TWO WAY OPERATION (SIGNALIZED)
- OFF-SITE DETOURS / USE OF ALTERNATIVE ROUTES

## **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.

LANE AND SHOULDER CLOSURE REQUIREMENTS

- A) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.
- B) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.
- C) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 5 FT OF AN OPEN TRAVEL LANE ON AN UNDIVIDED FACILITY, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 10 FT OF AN OPEN TRAVEL LANE ON A DIVIDED FACILITY, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

- D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.
- E) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.
- F) PROVIDE TRAFFIC CONTROL FOR APPROPRIATE LANE CLOSURES FOR SURVEYING DONE BY THE DEPARTMENT.

PAVEMENT EDGE DROP OFF REQUIREMENTS

- G) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

- H) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 1,000 FT (≥ 55 MPH) / 500 FT (55 MPH) / 350 FT (40-50 MPH) / 200 FT (≤ 35 MPH) IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

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

SIGNING

- J) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
- K) 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.

- L) 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.

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

- N) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 1,000 FT (≥ 55 MPH) / 500 FT (55 MPH) / 350 FT (40-50 MPH) / 200 FT (≤ 35 MPH) IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC BARRIER

- O) INSTALL TEMPORARY BARRIER ACCORDING TO THE TRANSPORTATION MANAGEMENT PLANS A MAXIMUM OF TWO (2) WEEKS PRIOR TO BEGINNING WORK IN ANY LOCATION. ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION PROCEED IN A CONTINUOUS MANNER TO COMPLETE THE PROPOSED WORK IN THAT LOCATION UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS OR AS DIRECTED BY THE ENGINEER.

DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE.

ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION AND NO WORK IS PERFORMED BEHIND THE TEMPORARY BARRIER FOR A PERIOD LONGER THAN TWO (2) MONTHS, REMOVE / RESET TEMPORARY BARRIER AT NO COST TO THE DEPARTMENT UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS, TEMPORARY BARRIER IS PROTECTING A HAZARD, OR AS DIRECTED BY THE ENGINEER.

INSTALL TEMPORARY BARRIER WITH THE TRAFFIC FLOW BEGINNING WITH THE UPSTREAM SIDE OF TRAFFIC. REMOVE TEMPORARY BARRIER AGAINST THE TRAFFIC FLOW BEGINNING WITH THE DOWNSTREAM SIDE OF TRAFFIC.

INSTALL AND SPACE DRUMS NO GREATER THAN TWICE THE POSTED SPEED LIMIT (MPH) TO CLOSE OR KEEP THE SECTION OF THE ROADWAY CLOSED UNTIL THE TEMPORARY BARRIER CAN BE PLACED OR AFTER THE TEMPORARY BARRIER IS REMOVED.

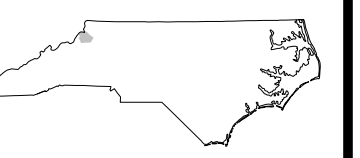
- P) PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER AT ALL TIMES DURING THE INSTALLATION AND REMOVAL OF THE BARRIER BY EITHER A TRUCK MOUNTED ATTENUATOR (MAXIMUM 72 HOURS) OR A TEMPORARY CRASH CUSHION.

PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER FROM ONCOMING TRAFFIC AT ALL TIMES BY A TEMPORARY CRASH CUSHION UNLESS THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER IS OFFSET FROM ONCOMING TRAFFIC AS FOLLOWS OR AS SHOWN IN THE PLANS: (SEE ALSO 1101.05)

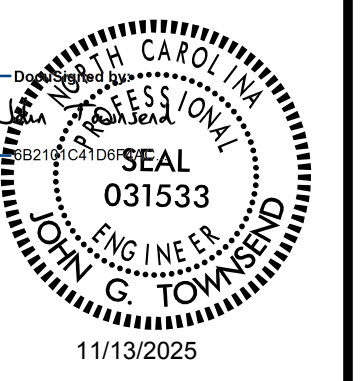
DF18311.2095784

TMP 0018

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WATAUGA COUNTY



WORK ZONE TRAFFIC CONTROL UNIT



PREPARED BY  
**vhb**  
VHB Engineering, Inc. P.C. (C-3705)  
540 Main Campus Drive, Suite 500  
Raleigh, NC 27605

TRANSPORTATION MANAGEMENT STRATEGIES AND GENERAL NOTES

TIP PROJECT: DF18311.2095784

**GENERAL NOTES (CONTINUED)**

<u>POSTED SPEED LIMIT</u>	<u>MINIMUM OFFSET</u>
40 OR LESS	15 FT
45 – 50	20 FT
55	25 FT
60 MPH or HIGHER	30 FT

**TRAFFIC CONTROL DEVICES**

- Q) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.
- R) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

**PAVEMENT MARKINGS AND MARKERS**

- S) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

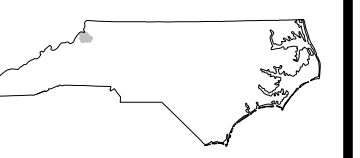
<u>ROAD NAME</u>	<u>MARKING</u>	<u>MARKER</u>
ALL ROADS	PAINT	NONE

- T) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.
- U) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- V) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

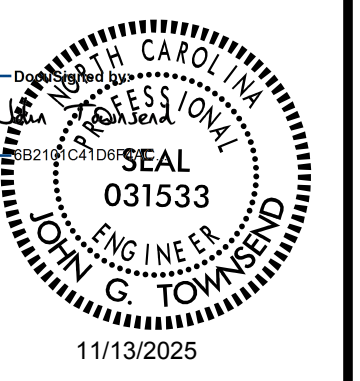
DF18311.2095784

TMP | 001C

NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
WATAUGA COUNTY



WORK ZONE TRAFFIC CONTROL UNIT



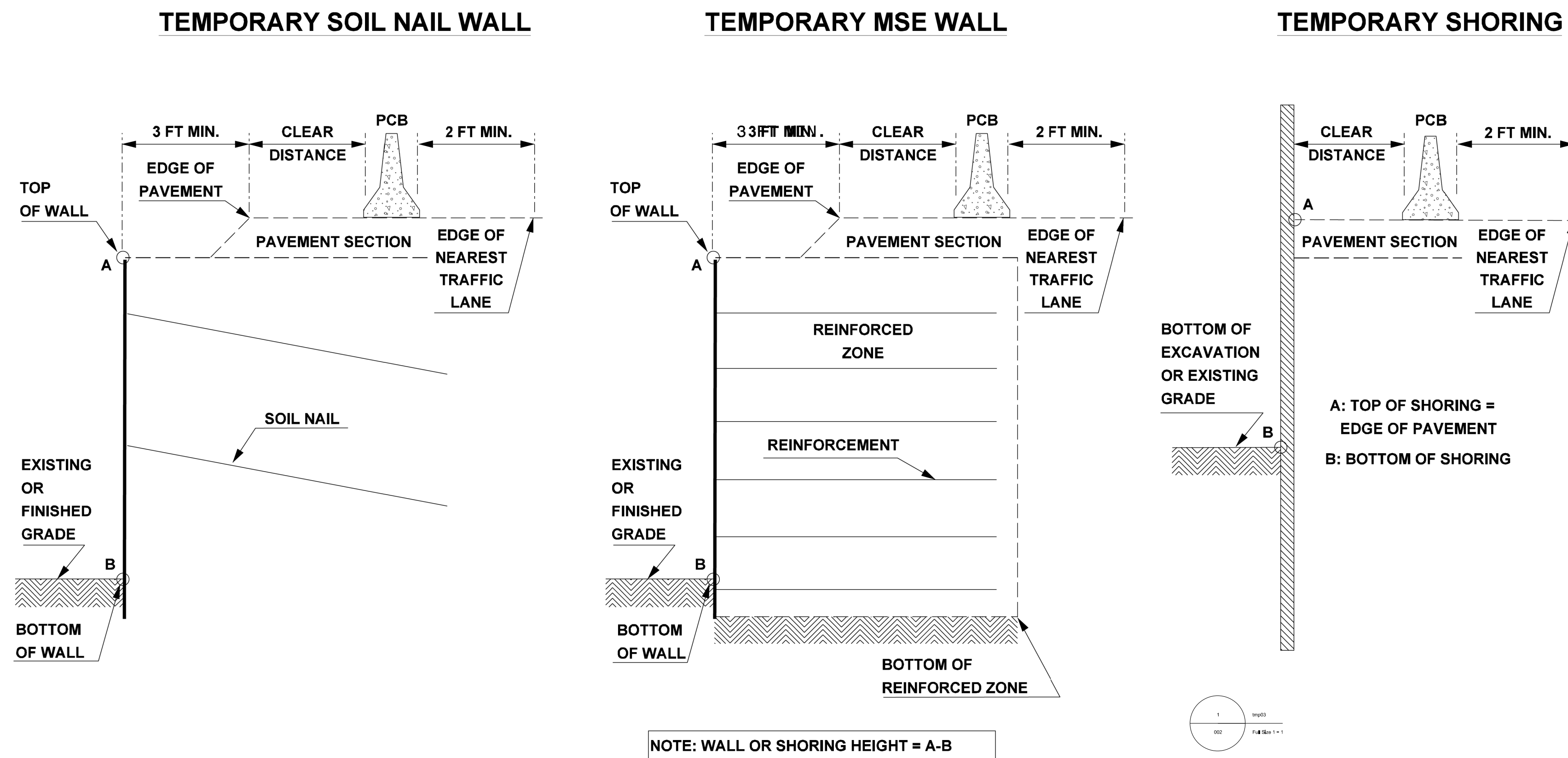
11/13/2025

PREPARED BY



TRANSPORTATION  
MANAGEMENT  
STRATEGIES AND  
GENERAL NOTES

TIP PROJECT: DF18311.2095784



**FIGURE A**

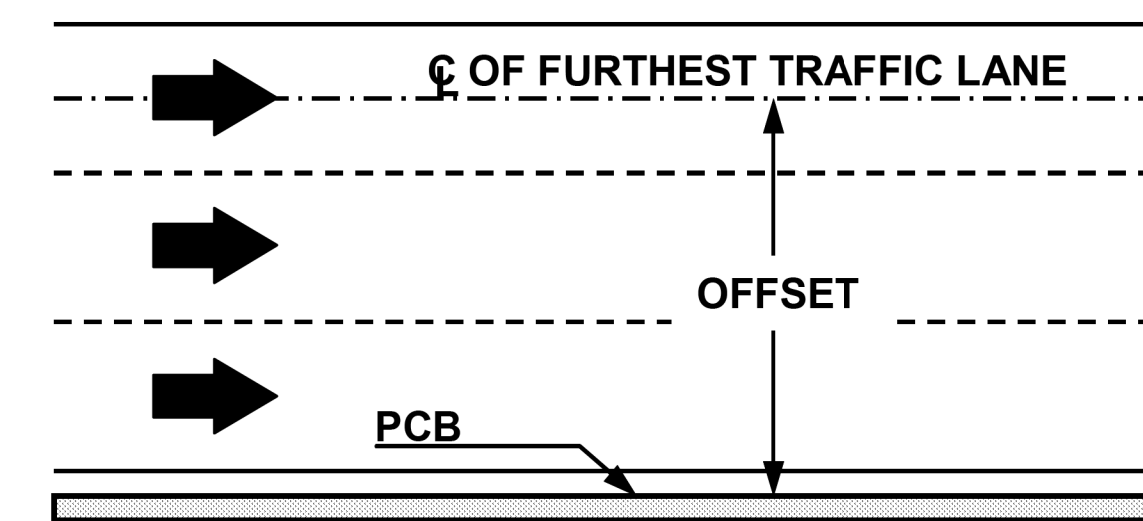
**NOTES**

- 1- REFER TO THE TRAFFIC CONTROL PLANS FOR TEMPORARY SHORING LOCATIONS AND NOTES.
- 2- REFER TO THE "TEMPORARY SHORING" STANDARD PROVISION FOR INFORMATION ABOUT TEMPORARY SHORING AND PORTABLE CONCRETE BARRIER (PCB).
- 3- PCB IS REQUIRED IF TEMPORARY SHORING/WALL IS LOCATED WITHIN THE CLEAR ZONE IN ACCORDANCE WITH THE AASHTO ROADSIDE DESIGN GUIDE. DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE. (CONTACT NCDOT PAVEMENT MANAGEMENT FOR APPLICABLE PAVEMENT DESIGN).
- 4- BASED ON THE CLEAR DISTANCE, OFFSET, DESIGN SPEED AND PAVEMENT TYPE, CHOOSE AN UNANCHORED OR ANCHORED PCB FROM THE TABLE SHOWN IN FIGURE B. CLEAR DISTANCE IS DEFINED AS SHOWN IN FIGURE A AND OFFSET IS DEFINED AS SHOWN IN FIGURE B.
- 5- AT THE CONTRACTOR'S OPTION OR IF THE MINIMUM REQUIRED CLEAR DISTANCE IS NOT AVAILABLE, SET PCB NEXT TO AND UP AGAINST THE TRAFFIC SIDE OF THE TEMPORARY SHORING/WALLS EXCEPT FOR BARRIER ABOVE TEMPORARY WALLS. PCB WITH THE MINIMUM REQUIRED CLEAR DISTANCE IS REQUIRED ABOVE TEMPORARY WALLS.
- 6- USE NCDOT PORTABLE CONCRETE BARRIER (PCB) IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1170.01 AND SECTION 1170 OF THE STANDARD SPECIFICATIONS.
- 7- SET PCB WITH A MINIMUM HORIZONTAL DISTANCE OF 2 FT BETWEEN THE FRONT FACE OF THE BARRIER AND THE EDGE OF THE NEAREST TRAFFIC LANE AS SHOWN IN FIGURE A UNLESS OTHERWISE SHOWN IN THE PLANS OR APPROVED BY THE ENGINEER.
- 8- FOR PCB ABOVE AND BEHIND TEMPORARY WALLS, PROVIDE A MINIMUM DISTANCE OF 3 FT BETWEEN THE EDGE OF PAVEMENT AND THE WALL FACE AS SHOWN IN FIGURE A. IF THIS MINIMUM REQUIRED DISTANCE IS NOT AVAILABLE, CONTACT THE ENGINEER.
- 9- TABLE SHOWN IN FIGURE B IS BASED ON NCDOT RESEARCH PROJECT NO. 2005-010 WITH VEHICLE TYPE USED FOR NCHRP 350 CRASH TESTS.

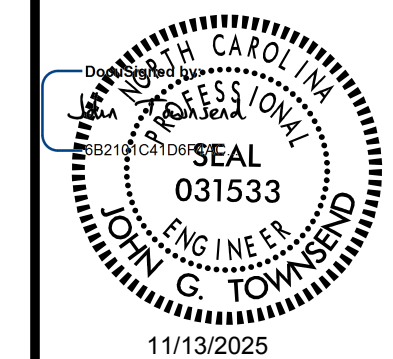
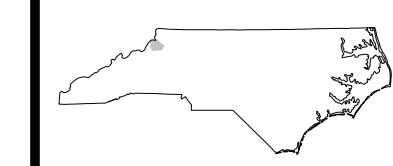
**MINIMUM REQUIRED CLEAR DISTANCE, inches**

Barrier Type	Pavement Type	Offset * ft	Design Speed, mph					
			<30	31-40	41-50	51-60	61-70	71-80
Unanchored PCB	Asphalt	<8	24	26	29	32	36	40
		8-14	26	28	31	35	38	42
		14-20	27	29	34	36	39	43
		20-26	28	31	35	38	40	44
		26-32	29	32	36	39	42	45
		32-38	30	34	38	41	43	46
		38-44	31	34	41	43	45	48
	44-50	31	35	41	43	46	49	
	50-56	32	36	42	44	47	50	
	>56	32	36	42	45	47	51	
	Concrete	<8	17	18	21	22	25	26
		8-14	19	20	23	25	26	29
		14-20	22	22	24	26	28	31
		20-26	23	24	26	27	30	34
26-32		24	25	27	28	32	35	
32-38		24	26	27	30	33	36	
38-44		25	26	28	30	34	37	
Anchored PCB	Asphalt	All Offsets	24 for All Design Speeds					
		Concrete (including bridge approach slabs)	All Offsets	12 for All Design Speeds				

\* See Figure Below



**FIGURE B**



PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS

TIP PROJECT: DF18311.2095784

**NOTES FOR TEMPORARY SHORING NO. 1**

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

TEMPORARY SHORING IS REQUIRED FOR THE BRIDGE END BENT CONSTRUCTION FROM STATION -EY- STA. 12+97±, 4' RT, TO STATION -EY- STA. 13+11±, 6' RT.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM STATION -EY- STA. 12+97±, 4' RT, TO STATION -EY- STA. 13+11±, 6' RT, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

- UNIT WEIGHT ( $\gamma$ ) = 120 PCF
- FRICTION ANGLE ( $\phi$ ) = 30 DEGREES
- COHESION ( $c$ ) = 0 PSF
- GROUNDWATER ELEVATION = 3,320 FT

DO NOT USE A TEMPORARY WALL FOR TEMPORARY SHORING FROM STATION -EY- STA. 12+97±, 4' RT, TO STATION -EY- STA. 13+11±, 6' RT.

AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING FOR TEMPORARY SHORING FROM STATION -EY- STA. 12+97±, 4' RT, TO STATION -EY- STA. 13+11±, 6' RT. SEE STANDARD DETAIL NO. 1801.01 FOR STANDARD TEMPORARY SHORING.

IT MAY BE PREFERRED TO USE A TEMPORARY SOIL NAIL WALL FOR TEMPORARY SHORING FROM STATION -EY- STA. 12+97±, 4' RT, TO STATION -EY- STA. 13+11±, 6' RT. FOR TEMPORARY SOIL NAIL WALLS, SEE TEMPORARY SOIL NAIL WALLS PROVISION.

**NOTES FOR TEMPORARY SHORING NO. 2**

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

TEMPORARY SHORING IS REQUIRED FOR THE BRIDGE END BENT CONSTRUCTION FROM STATION -EY- STA. 13+38±, 4' RT, TO STATION -EY- STA. 13+53±, 6' RT.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM STATION -EY- STA. 13+38±, 4' RT, TO STATION -EY- STA. 13+53±, 6' RT, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

- UNIT WEIGHT ( $\gamma$ ) = 120 PCF
- FRICTION ANGLE ( $\phi$ ) = 30 DEGREES
- COHESION ( $c$ ) = 0 PSF
- GROUNDWATER ELEVATION = 3,315 FT

DO NOT USE A TEMPORARY WALL FOR TEMPORARY SHORING FROM STATION -EY- STA. 13+38±, 4' RT, TO STATION -EY- STA. 13+53±, 6' RT.

AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING FOR TEMPORARY SHORING FROM STATION -EY- STA. 13+38±, 4' RT, TO STATION -EY- STA. 13+53±, 6' RT. SEE STANDARD DETAIL NO. 1801.01 FOR STANDARD TEMPORARY SHORING.

IT MAY BE PREFERRED TO USE A TEMPORARY SOIL NAIL WALL FOR TEMPORARY SHORING FROM STATION -EY- STA. 13+38±, 4' RT, TO STATION -EY- STA. 13+53±, 6' RT. FOR TEMPORARY SOIL NAIL WALLS, SEE TEMPORARY SOIL NAIL WALLS PROVISION.

THE TEMPORARY SHORING NOTES SHOWN ON THIS SHEET WERE PROVIDED THROUGH A SEALED DOCUMENT FROM THE GEOTECHNICAL ENGINEERING UNIT. THE DOCUMENT WAS SUBMITTED TO DIVISION 11 ON JULY 11, 2025, AND SEALED BY A PROFESSIONAL ENGINEER, SHIPING YANG, LICENSE #031361.

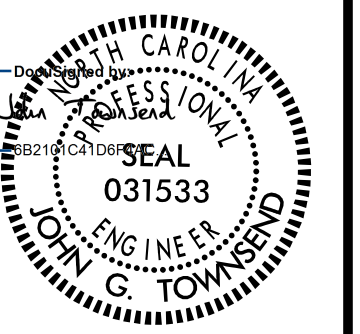
DF18311.2095784

TMP | 002A

NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
WATAUGA COUNTY



WORK ZONE TRAFFIC CONTROL UNIT



11/13/2025



TEMPORARY SHORING  
DATA

TIP PROJECT: DF18311.2095784

## PHASING

**NOTES:**

REPLACE MARKINGS AND RETURN TO THE CURRENT TRAFFIC PATTERN AT THE END OF EACH WORK PERIOD UNLESS OTHERWISE NOTED IN THE PHASING OR DIRECTED BY THE ENGINEER.

MAINTAIN VEHICULAR ACCESS TO ALL RESIDENCES AND BUSINESSES DURING THE LIFE OF THE CONTRACT UNLESS OTHERWISE NOTED IN THE PHASING OR DIRECTED BY THE ENGINEER.

COMPLETE ANY PROPOSED WIDENING IN SUCH A MANNER THAT PONDING OF WATER WILL NOT OCCUR IN THE TRAVEL LANE. THIS MAY REQUIRE A COMBINATION OF INSTALLATION OF PROPOSED PIPES, TEMPORARY PIPES, STEEL PLATES, TEMPORARY MEDIAN, AND OUTSIDE DITCHES. PROVIDE WEDGING AS REQUIRED TO PROMOTE POSITIVE DRAINAGE AND SMOOTH TRANSITIONS.

PAVE PROPOSED CONSTRUCTION UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE, IN ALL PHASES UNTIL STATED TO INSTALL FINAL LAYER IN PHASING.

THE TERM RSD REFERS TO ROADWAY STANDARD DRAWINGS.

**PHASE I (SEE TMP-4 FOR DETAIL)**

STEP 1: USING RSD 1101.01 (SHEET 3 OF 3), INSTALL ADVANCE WARNING SIGNS ON HOPEWELL CHURCH ROAD AND ALL SIDE STREETS.

STEP 2: USING RSD 1101.02 (SHEETS 1 AND 17 OF 19), CONSTRUCT TEMPORARY WIDENING ON MEAT CAMP ROAD, CLOSE THE NORTHBOUND TRAVEL LANE ON MEAT CAMP ROAD AND SHIFT TRAFFIC ONTO THE TEMPORARY WIDENING, INSTALL UNANCHORED TEMPORARY PORTABLE CONCRETE BARRIER WITH DRAINAGE SLOTS AND CRASH CUSHIONS, TEMPORARY PAVEMENT MARKINGS, AND PORTABLE TEMPORARY SIGNALS FOR 1-LANE, 2-WAY OPERATION.

STEP 3: AWAY FROM TRAFFIC, CONSTRUCT THE PROPOSED STRUCTURE, ROADWAY AND DRAINAGE. INSTALL THE FINAL LAYER OF SURFACE COURSE AND THE FINAL PAVEMENT MARKINGS IN ACCORDANCE WITH THE FINAL PAVEMENT MARKING PLANS.

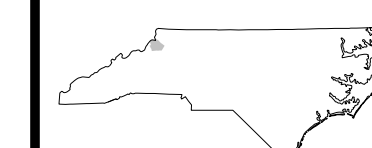
STEP 4. USING TEMPORARY LANE CLOSURES AS NEEDED, REMOVE THE TEMPORARY WIDENING AND RESTORE EXISTING CONDITIONS ON MEAT CAMP ROAD AND THEN

REMOVE ALL TEMPORARY TRAFFIC CONTROL DEVICES AND OPEN ALL LANES TO TRAFFIC.

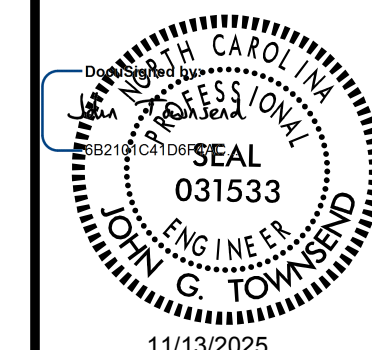
DF18311.2095784

TMP | 003

NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
WATAUGA COUNTY



WORK ZONE TRAFFIC CONTROL UNIT



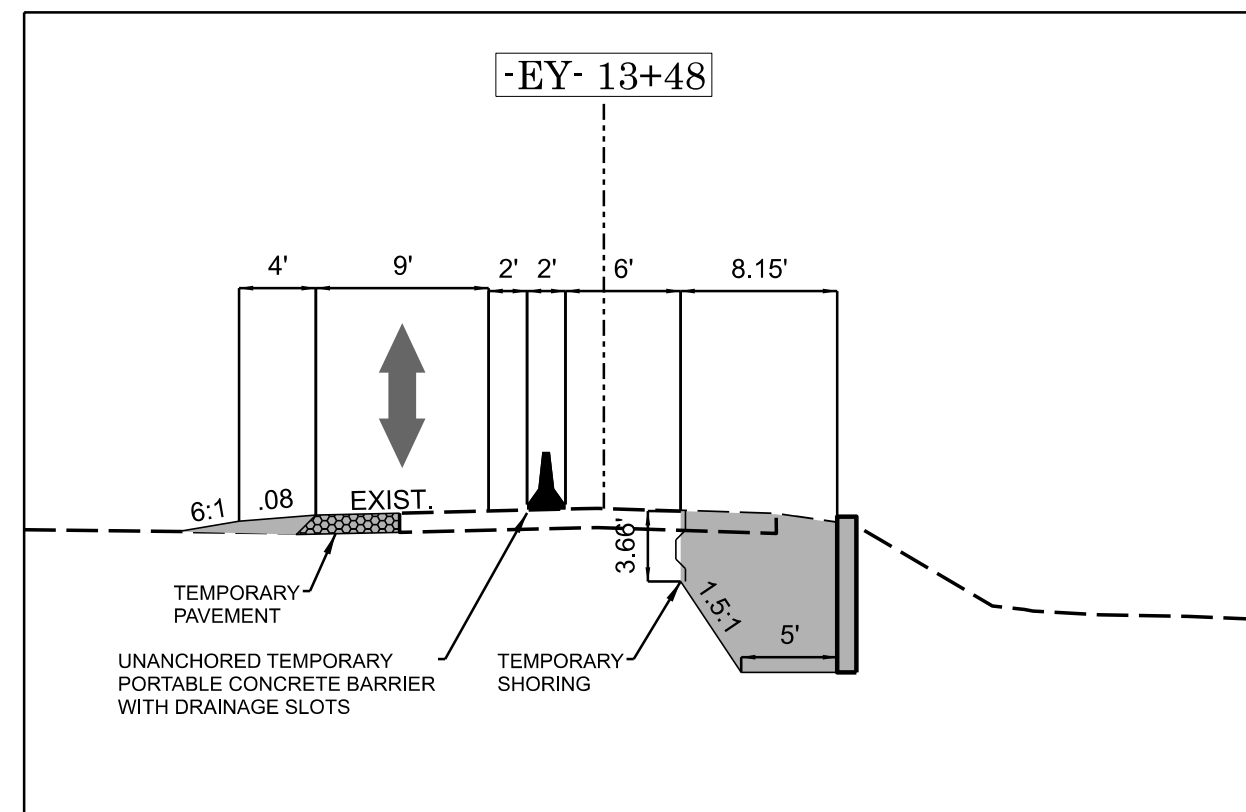
11/13/2025

PREPARED BY

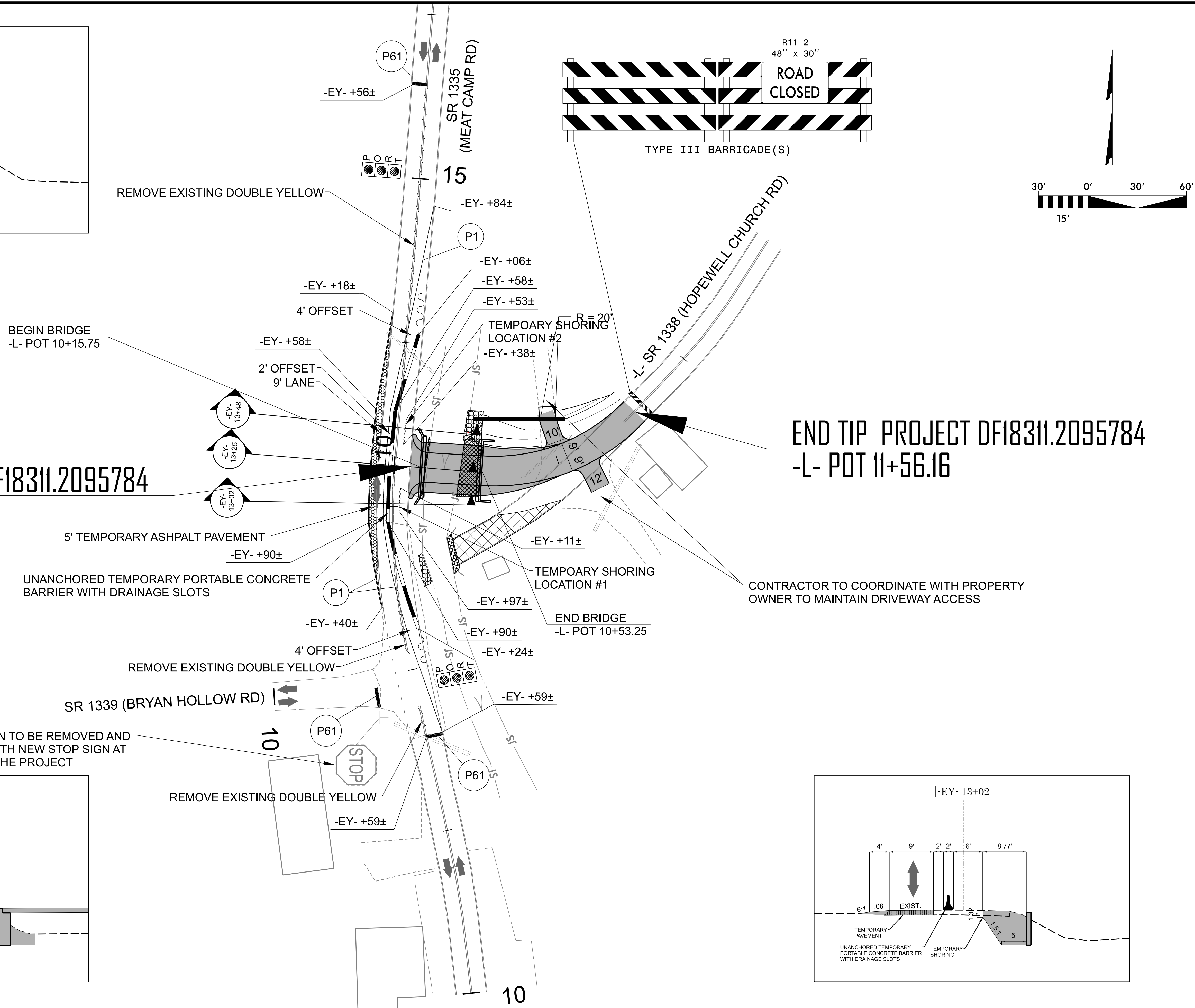
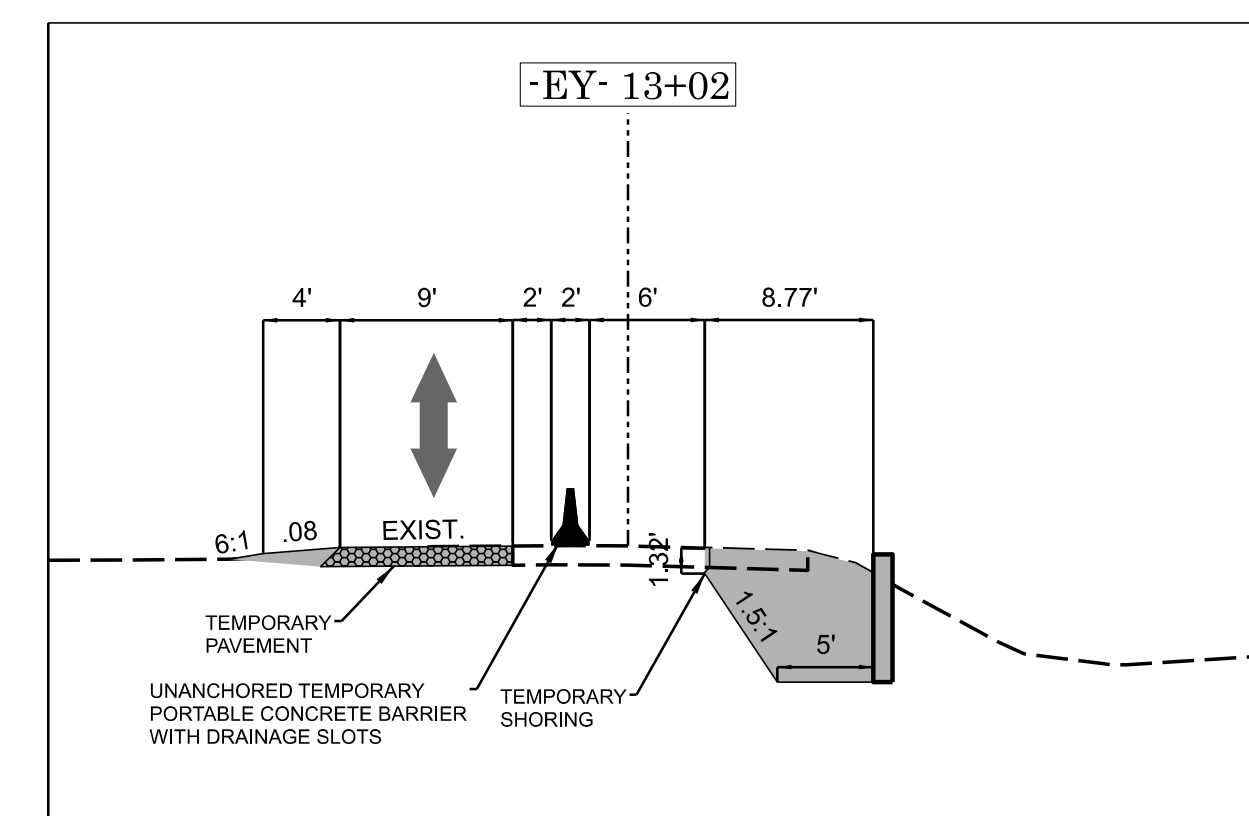
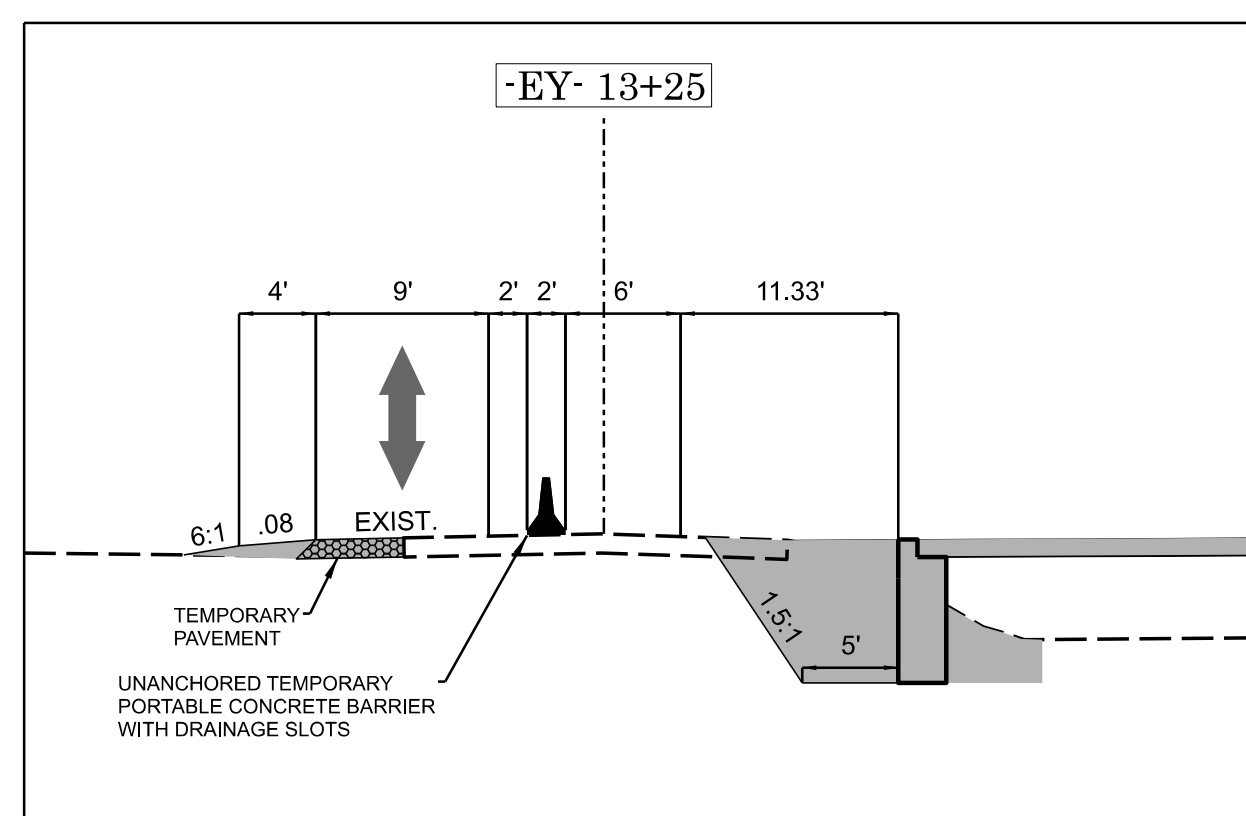


TEMPORARY TRAFFIC  
CONTROL PHASING

TIP PROJECT: DF18311.2095784



BEGIN TIP PROJECT DF18311.2095784  
-L- POT 10+09.99



END TIP PROJECT DF18311.2095784  
-L- POT 11+56.16

EXISTING SIGN TO BE REMOVED AND REPLACED WITH NEW STOP SIGN AT THE END OF THE PROJECT

CONTRACTOR TO COORDINATE WITH PROPERTY OWNER TO MAINTAIN DRIVEWAY ACCESS

DF18311.2095784  
TMP 004  
NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
WATAUGA COUNTY  
WORK ZONE TRAFFIC CONTROL UNIT  
SEAL 031533  
ENGINEER  
JOHN G. TOWNSEND  
11/13/2025

PREPARED BY  
vhb  
VHB Engineering, Inc. P.C. (C-3705)  
540 Main Campus Drive, Suite 500  
Raleigh, NC 27605

TEMPORARY TRAFFIC CONTROL DETAIL  
PHASE I

TIP PROJECT: DF18311.2095784

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN  
WATAUGA COUNTY

LOCATION: REPLACE BRIDGE 187 ON SR 1339 (HOPEWELL CHURCH RD.) OVER  
MEAT CAMP CREEK

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 MAY BE 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 MULTI-LANE ROADWAYS
1205.03	PAVEMENT MARKINGS - EXIT AND ENTRANCE RAMP
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.06	PAVEMENT MARKINGS - LANE DROPS
1205.07	PAVEMENT MARKINGS - PEDESTRIAN CROSSWALKS
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.10	PAVEMENT MARKINGS - SCHOOL AREAS
1205.11	PAVEMENT MARKINGS - RAILROAD CROSSINGS
1205.12	PAVEMENT MARKINGS - BRIDGES
1205.13	PAVEMENT MARKINGS - LANE REDUCTIONS
1205.14	PAVEMENT MARKINGS - ROUNDABOUTS
1205.15	PAVEMENT MARKINGS - REDUCED CONFLICT INTERSECTIONS
1205.16	BICYCLE FACILITIES
1205.17	PAVEMENT MARKINGS - SIDE-BY-SIDE/ADJACENT ON/OFF RAMP PVMT. MARKING LANE TREATMENT
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION
1264.01	OBJECT MARKERS - TYPES
1264.02	OBJECT MARKERS - INSTALLATION
1267.01	FLEXIBLE DELINEATORS - INSTALLATION
1267.02	FLEXIBLE DELINEATORS - SPACING TABLES
1267.03	FLEXIBLE DELINEATORS - INTERCHANGE PLACEMENT

PAVEMENT MARKING SCHEDULE

SYMBOL	PAINT PAVEMENT MARKINGS DESCRIPTION
P1	WHITE EDGELINE (4")
P5	2 FT. - 6 FT./SP WHITE MINISKIP (4")
P13	YELLOW DOUBLE CENTER (4")

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 PAINT	MARKER
ALL ROADS	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) STOP BAR LOCATION AT NON-SIGNALIZED INTERSECTIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.

INDEX

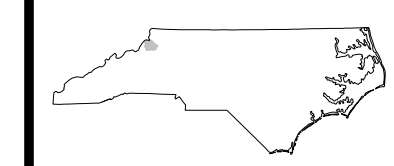
SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN TITLE AND SCHEDULE SHEET
PMP-2	PAVEMENT MARKING DETAIL

PAVEMENT MARKING QUANTITIES			
PAY ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT
4810000000-E	PAINT PAVEMENT MARKING LINES (4")	589	LF

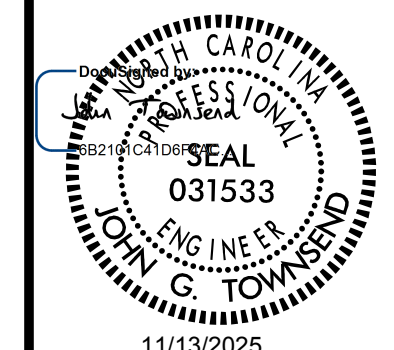
DF18311.2095784

PMP 001

NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
WATAUGA COUNTY



SIGNING AND DELINEATION UNIT



11/13/2025

PREPARED BY



PAVEMENT MARKING  
TITLE SHEET

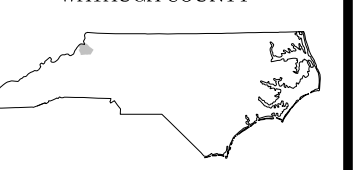
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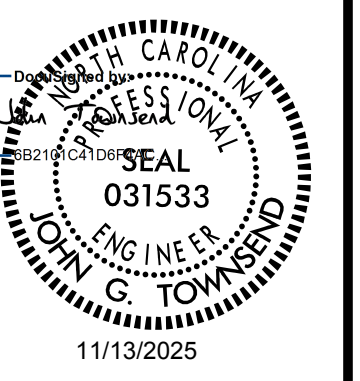
DF18311.2095784

PMP 002

NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
WATAUGA COUNTY



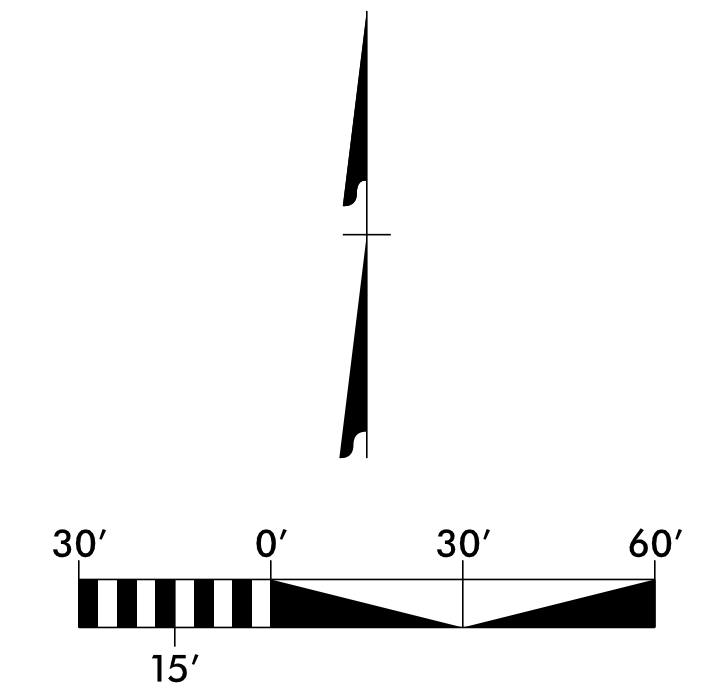
SIGNING AND DELINEATION UNIT



PREPARED BY  
**vhb**  
VHB Engineering, Inc. P.C. (C-3705)  
540 Main Campus Drive, Suite 500  
Raleigh, NC 27605

PAVEMENT MARKING  
DETAIL

TIP PROJECT: DF18311.2095784



BEGIN TIP PROJECT DF18311.2095784  
-L- POT 10+09.99

END TIP PROJECT DF18311.2095784  
-L- POT 11+56.16

BEGIN BRIDGE  
-L- POT 10+15.75

END BRIDGE  
-L- POT 10+53.25

EXISTING MARKINGS WITHIN  
WASHOUT AREA ARE  
APPROXIMATE

+09±  
TIE TO EXISTING MARKINGS

+10±  
TIE TO EXISTING MARKINGS

TIE TO EXISTING  
MARKINGS

SR 1335 (MEAT CAMP RD)

L- SR 1338 (HOPEWELL CHURCH RD)

SR 1339 (BRYAN HOLLOW RD)

P5

P1

P13

P1

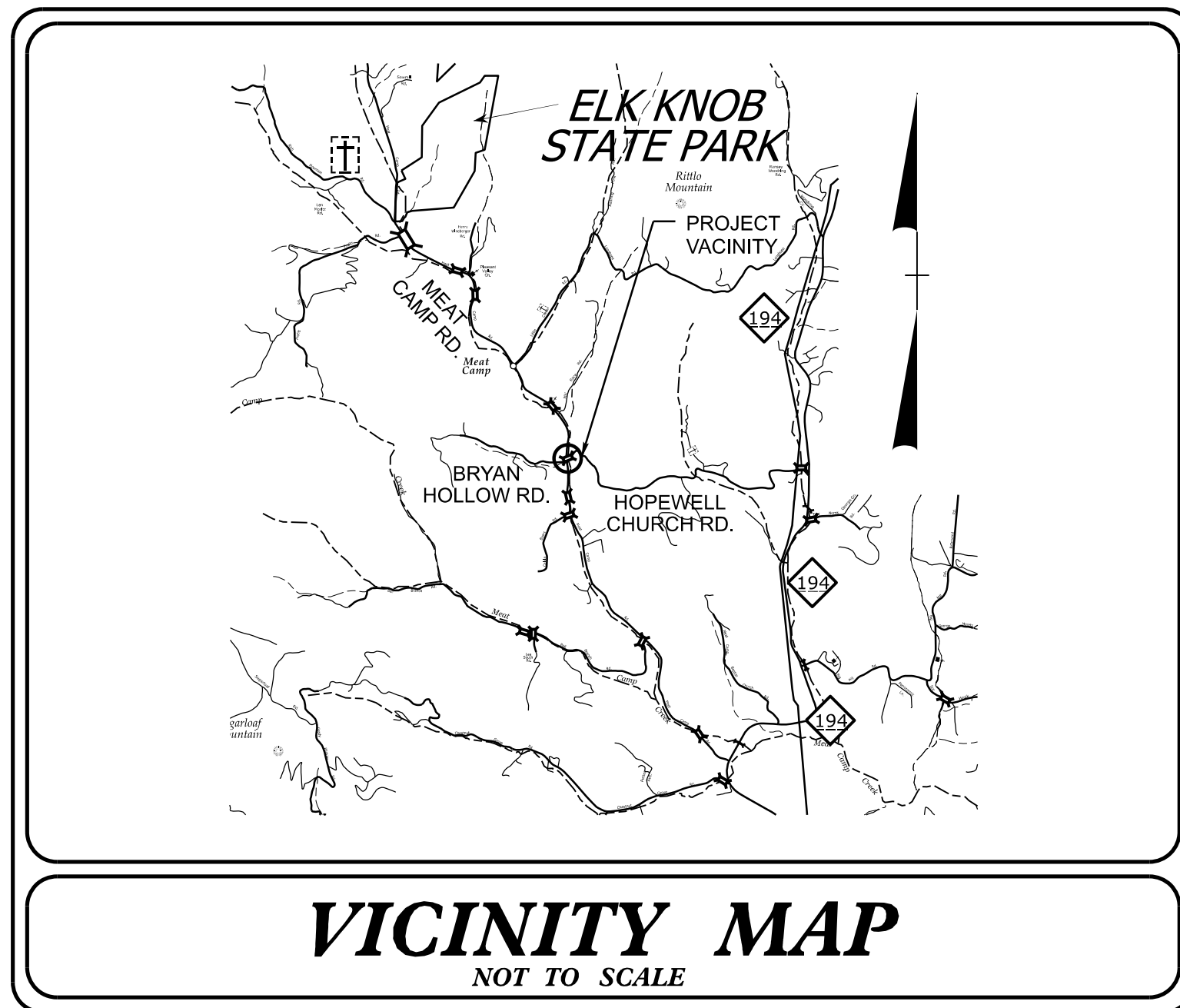
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15

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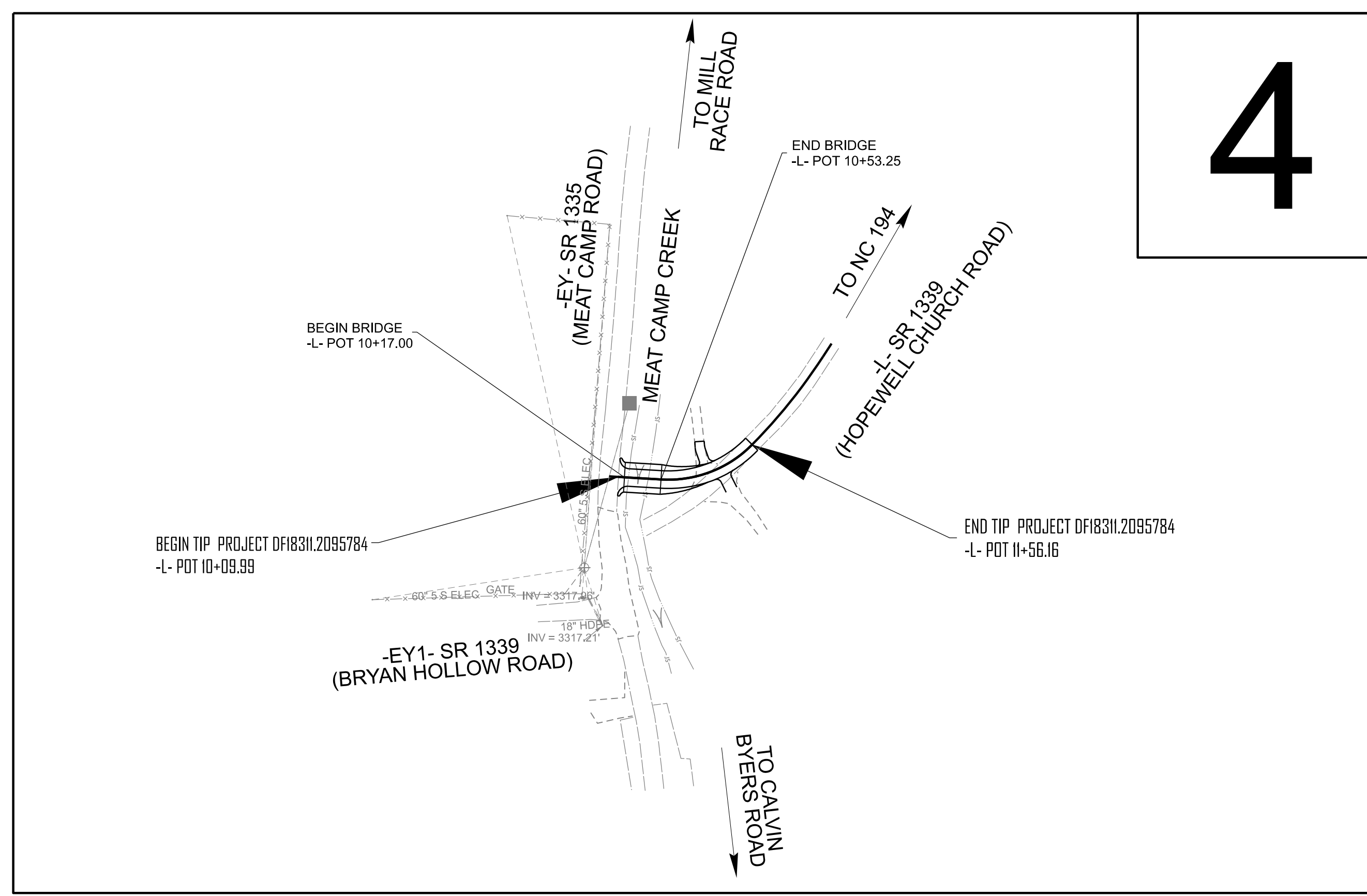
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18311.2095784	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
DF18311.2095784	N/A	PE	
DF18311.2095784	N/A	ROW & UTILITY CONSTRUCTION	
DF18311.2095784	N/A		

**TIP PROJECT: DF18311.2095784**

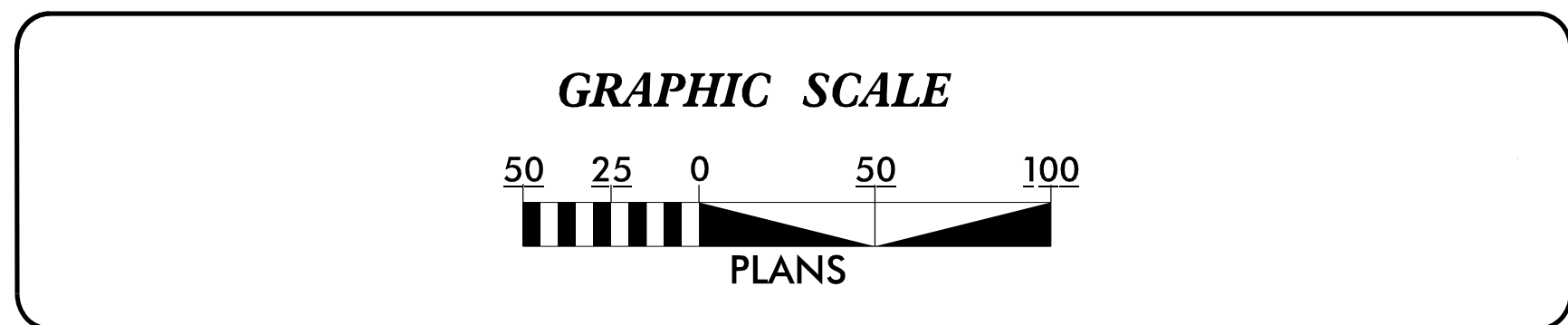


STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**PLAN FOR PROPOSED  
HIGHWAY EROSION CONTROL**  
**WATAUGA COUNTY**

LOCATION: *REPLACE BRIDGE 187 ON SR 1339  
(HOPEWELL CHURCH RD.)  
OVER MEAT CAMP CREEK*  
TYPE OF WORK: *PAVING, GRADING,  
DRAINAGE, & STRUCTURES*



- THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.
- THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.
- ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT  
*Refer To E. C. Special Provisions for Special Considerations.*
- HIGH QUALITY WATER(S) EXIST ON THIS PROJECT  
*High Quality Water Zone(s) Exist From Begin Project to End Project  
Refer To E. C. Special Provisions for Special Considerations.*



THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL AND NATURAL RESOURCES DIVISION OF WATER QUALITY

VHB Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606

Prepared in the Office of:

VHB Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606

Designed by:

Carson Crowley 4753  
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.

C:\Cher-Loette\3377\65%Revaugel187\Roadside Environmental\Erosion Control\Design\Watauga187\_EC\_TSH.dgn

# DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

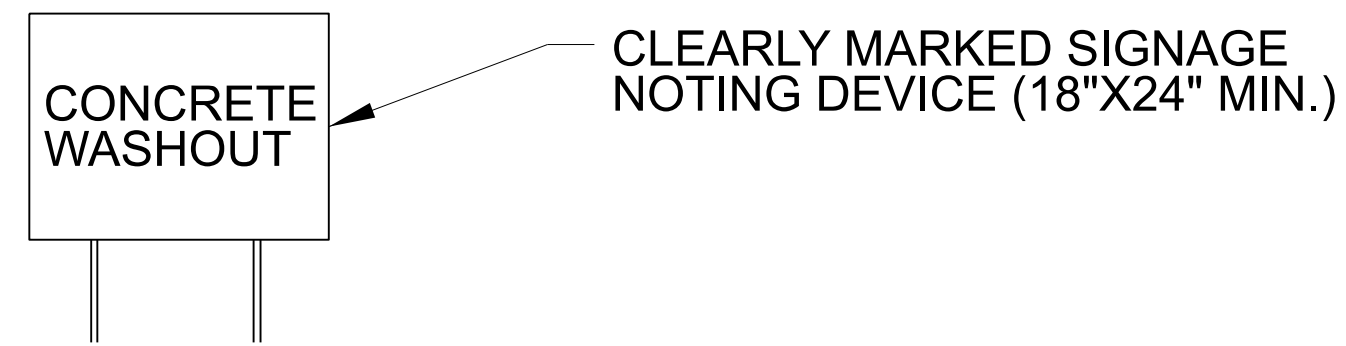
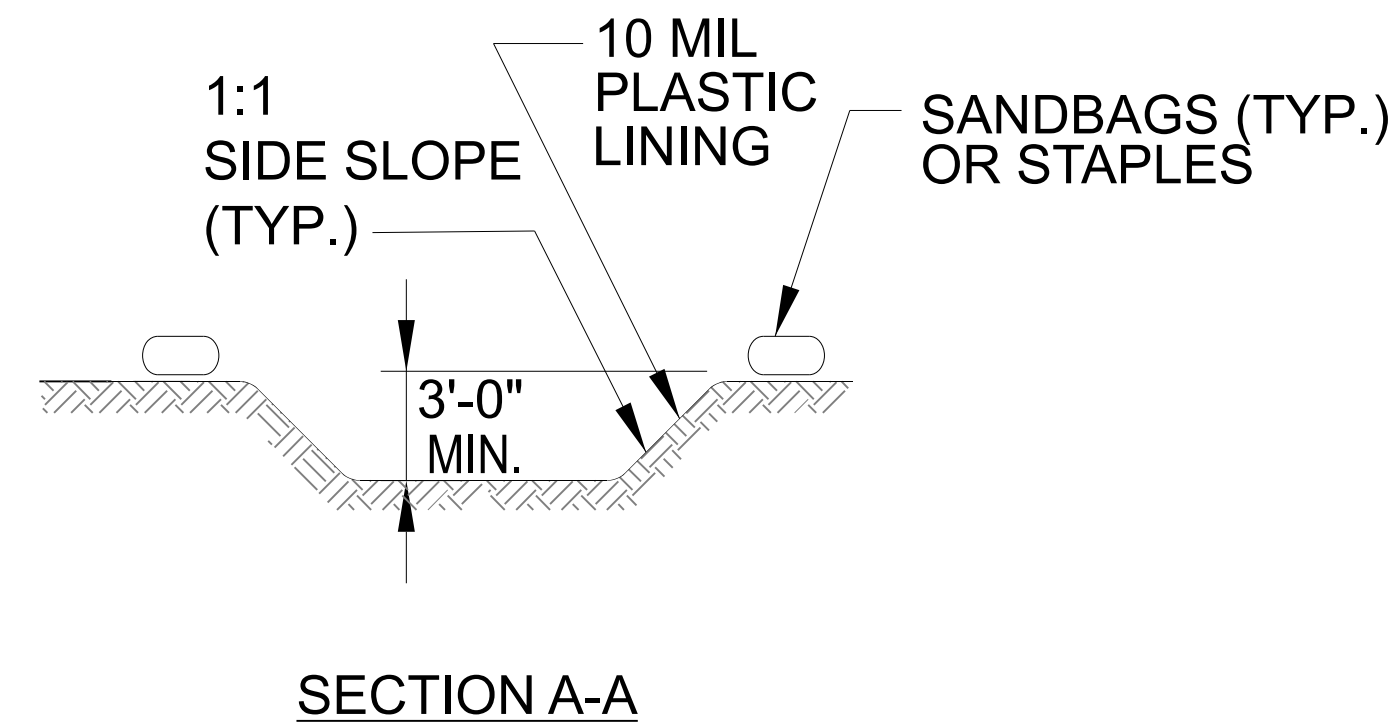
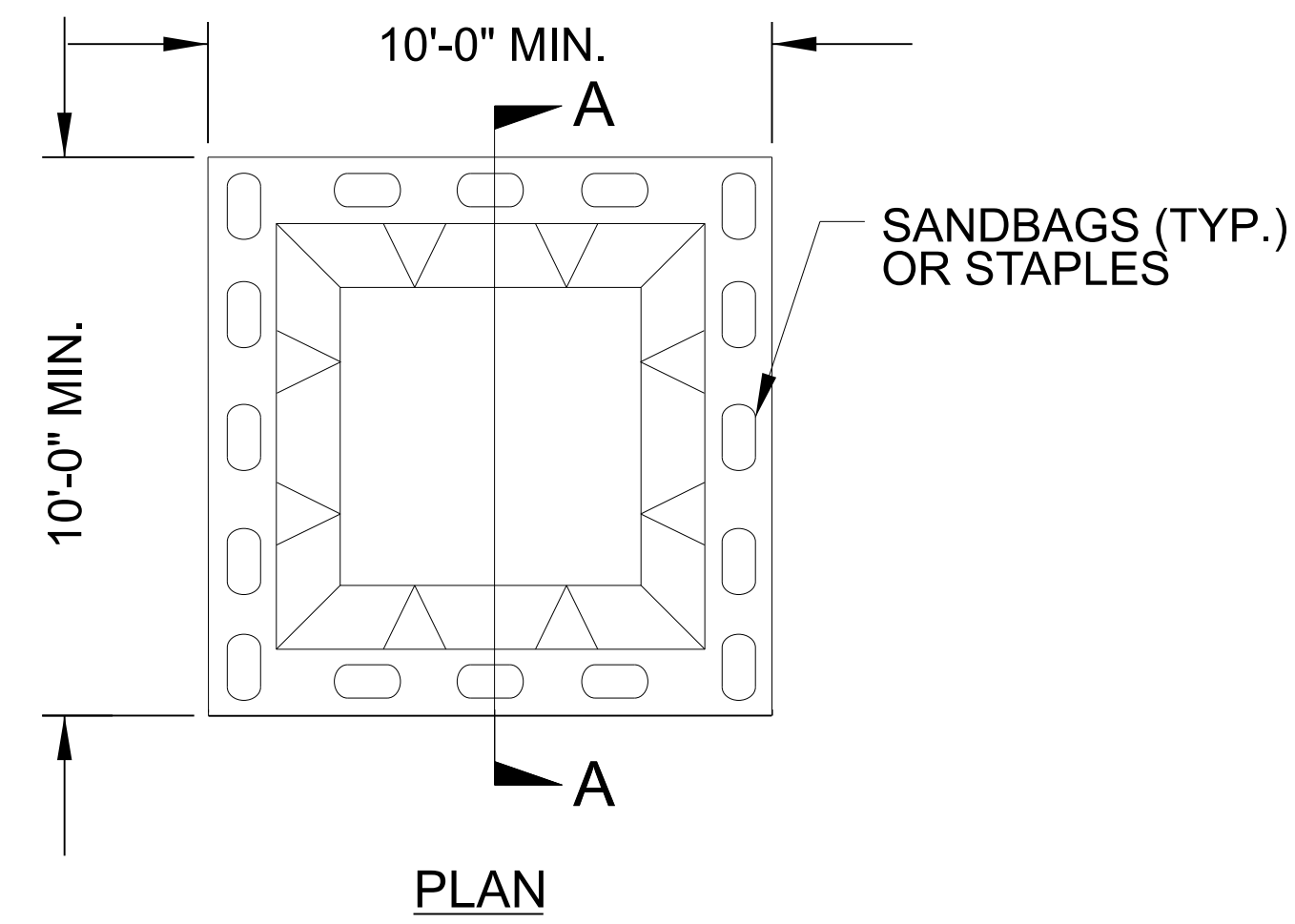
PROJECT REFERENCE NO. <b>DF18311.2095784</b>	SHEET NO. <b>EC-02</b>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

## 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	A	1636.03	Excelsior Wattle Barrier	
1632.02	Type B	B	1636.03	Coir Fiber Wattle Barrier	
1632.03	Type C	C			

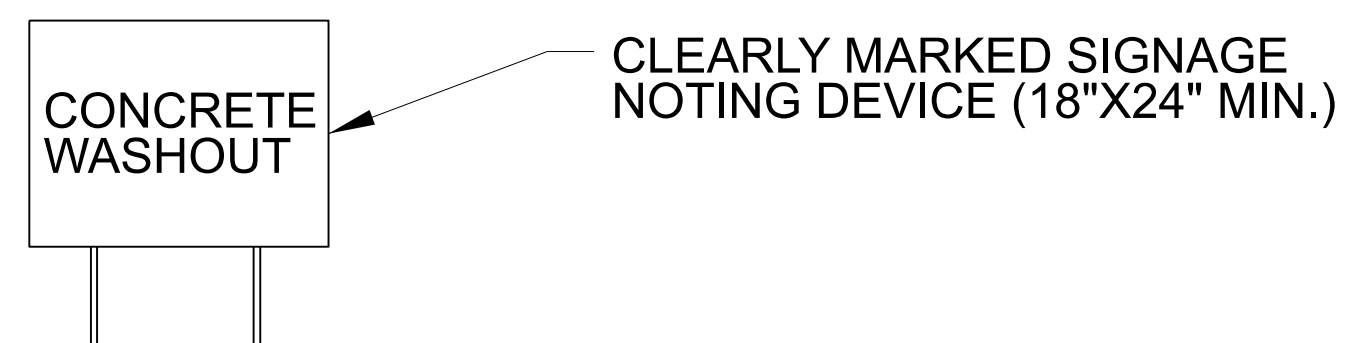
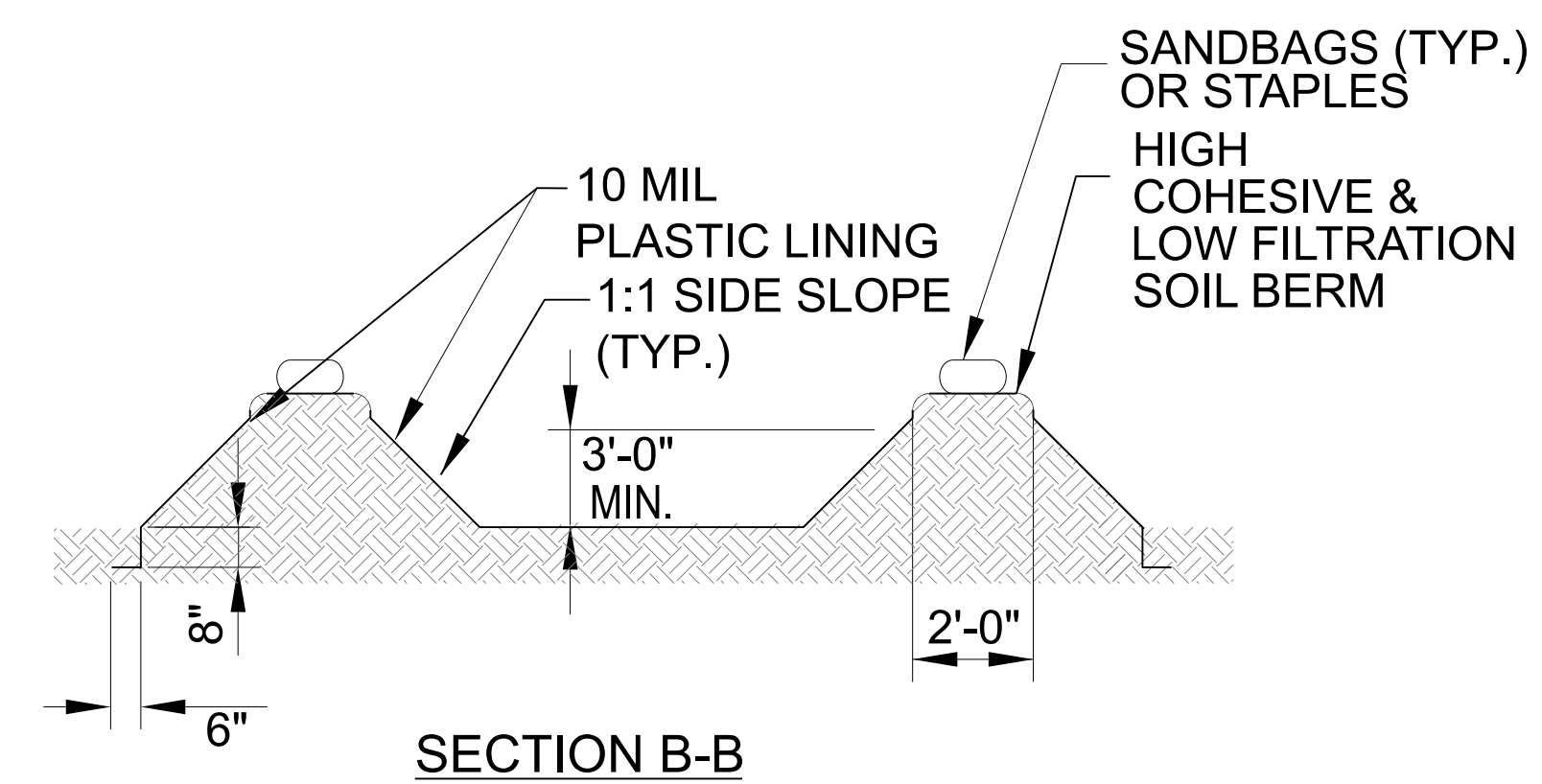
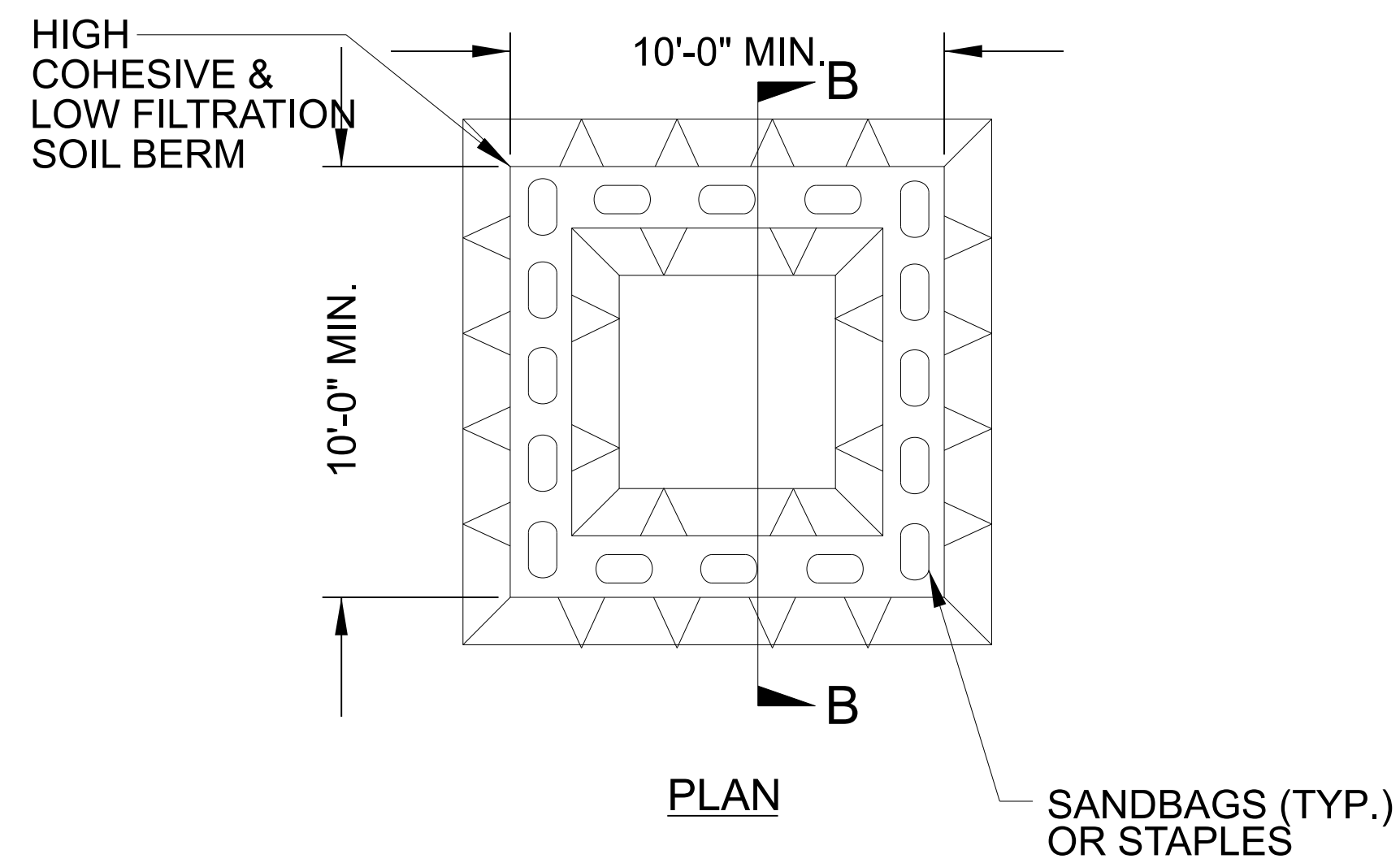
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R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



**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.



**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

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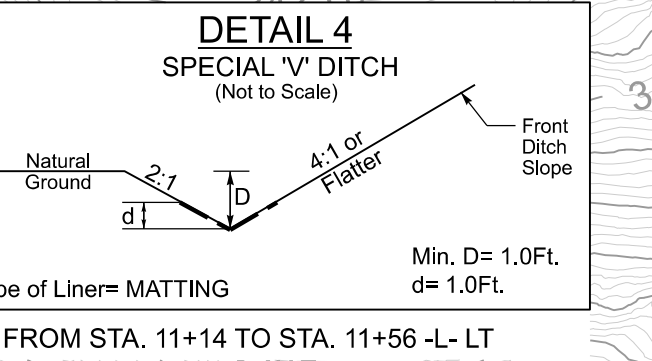
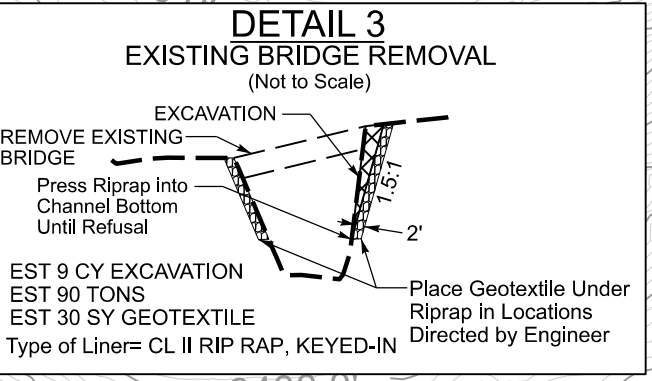
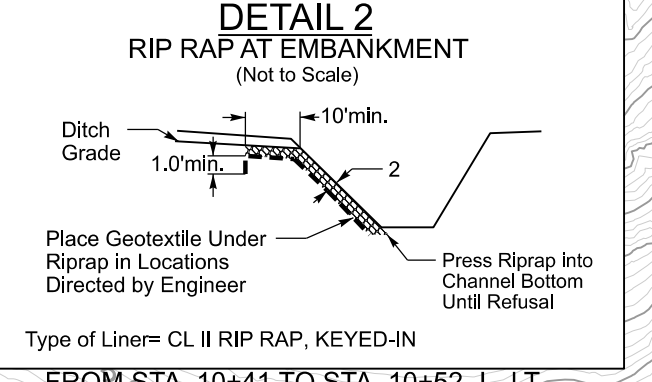
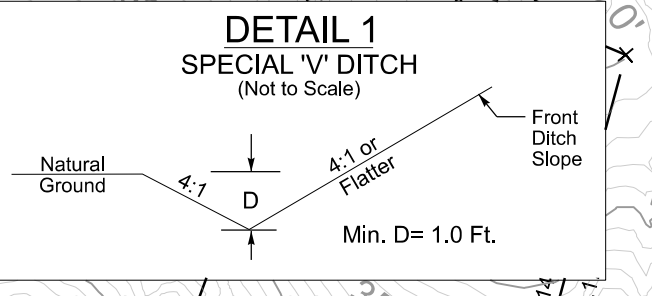
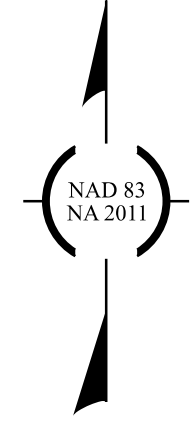
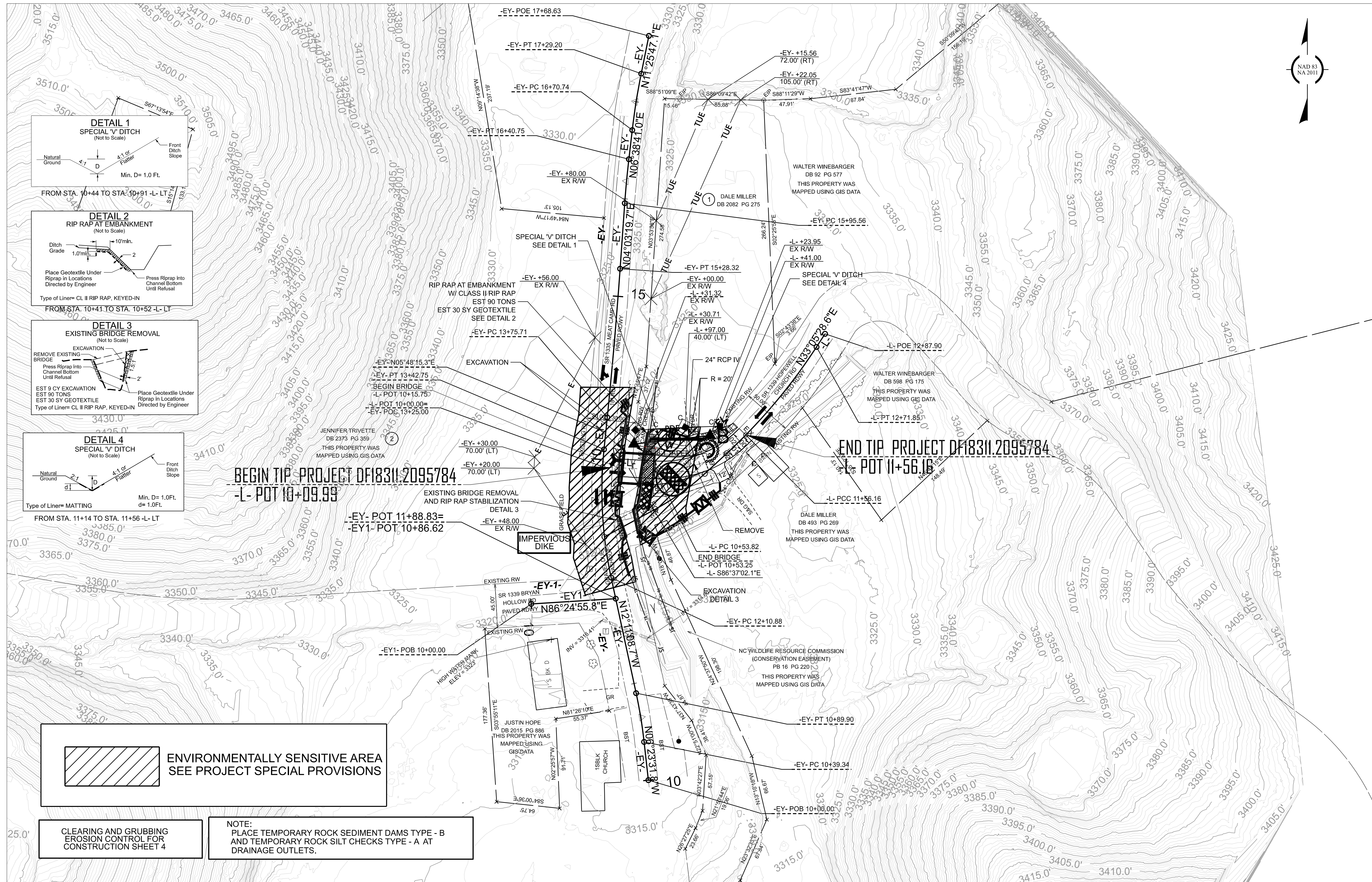


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PROJECT REFERENCE NO. <i>DF18311.2095784</i>	SHEET NO. <i>EC-03</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# ***SOIL STABILIZATION TIMEFRAMES***

<i>SITE DESCRIPTION</i>	<i>STABILIZATION TIME</i>	<i>TIMEFRAME EXCEPTIONS</i>
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



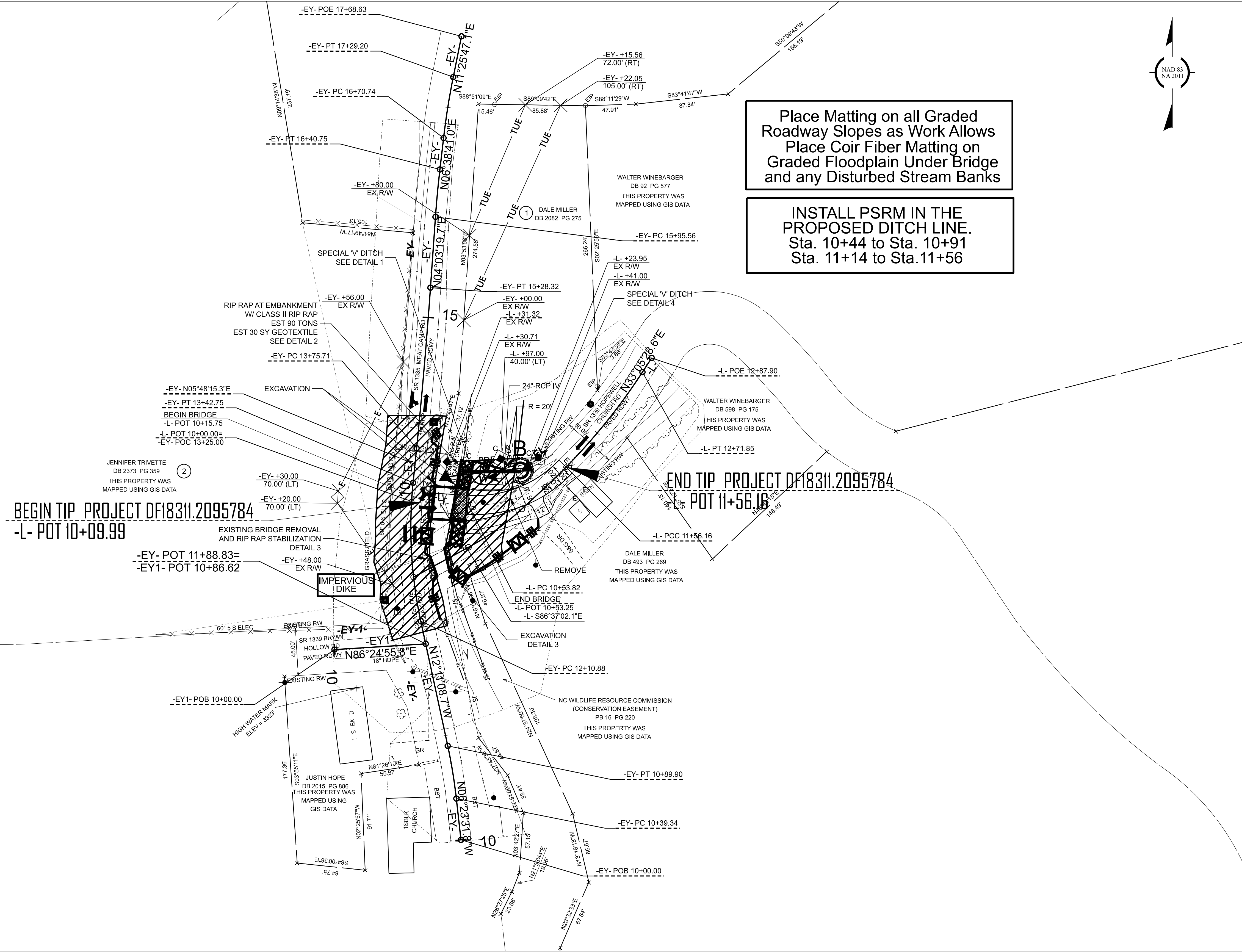
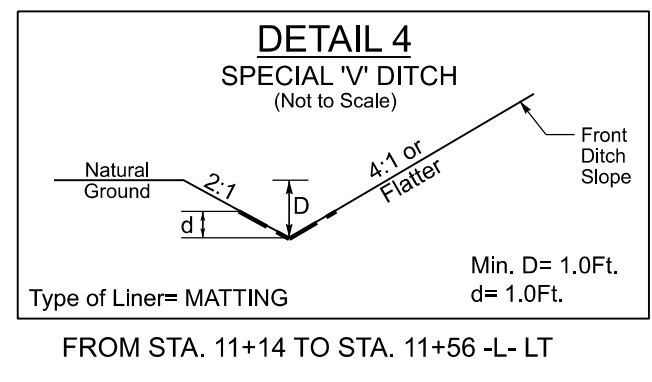
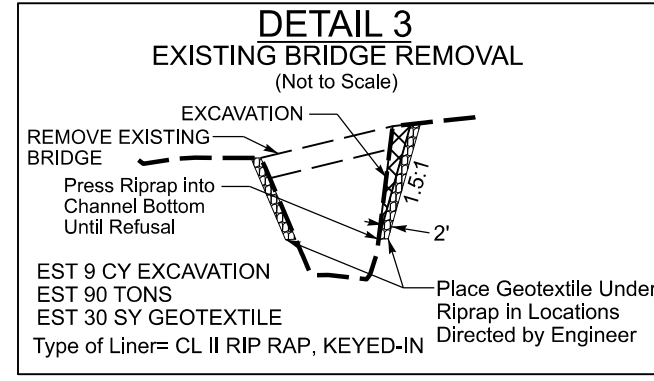
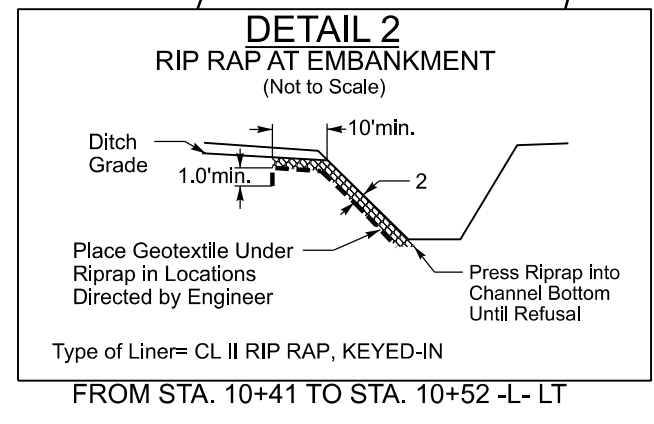
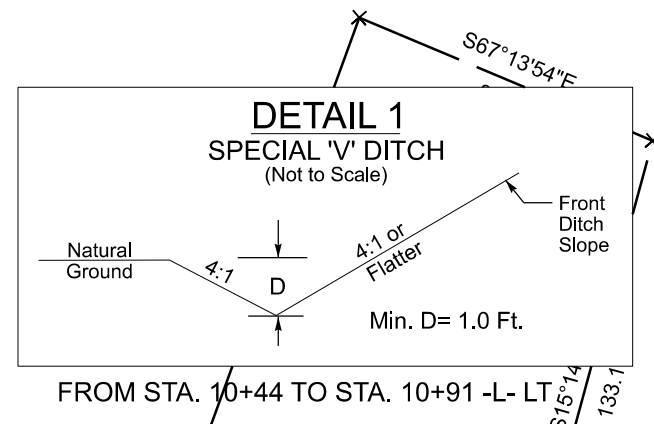
**BEGIN TIP PROJECT DF18311.2095784**  
-L- POT 10+09.99

**END TIP PROJECT DF18311.2095784**  
-L- POT 11+56.16

 ENVIRONMENTALLY SENSITIVE AREA  
SEE PROJECT SPECIAL PROVISIONS

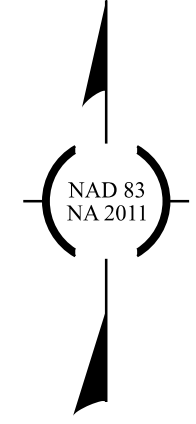
CLEARING AND GRUBBING  
EROSION CONTROL FOR  
CONSTRUCTION SHEET 4

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



Place Matting on all Graded Roadway Slopes as Work Allows  
Place Coir Fiber Matting on Graded Floodplain Under Bridge and any Disturbed Stream Banks

INSTALL PSRM IN THE PROPOSED DITCH LINE.  
Sta. 10+44 to Sta. 10+91  
Sta. 11+14 to Sta. 11+56



10/26/24

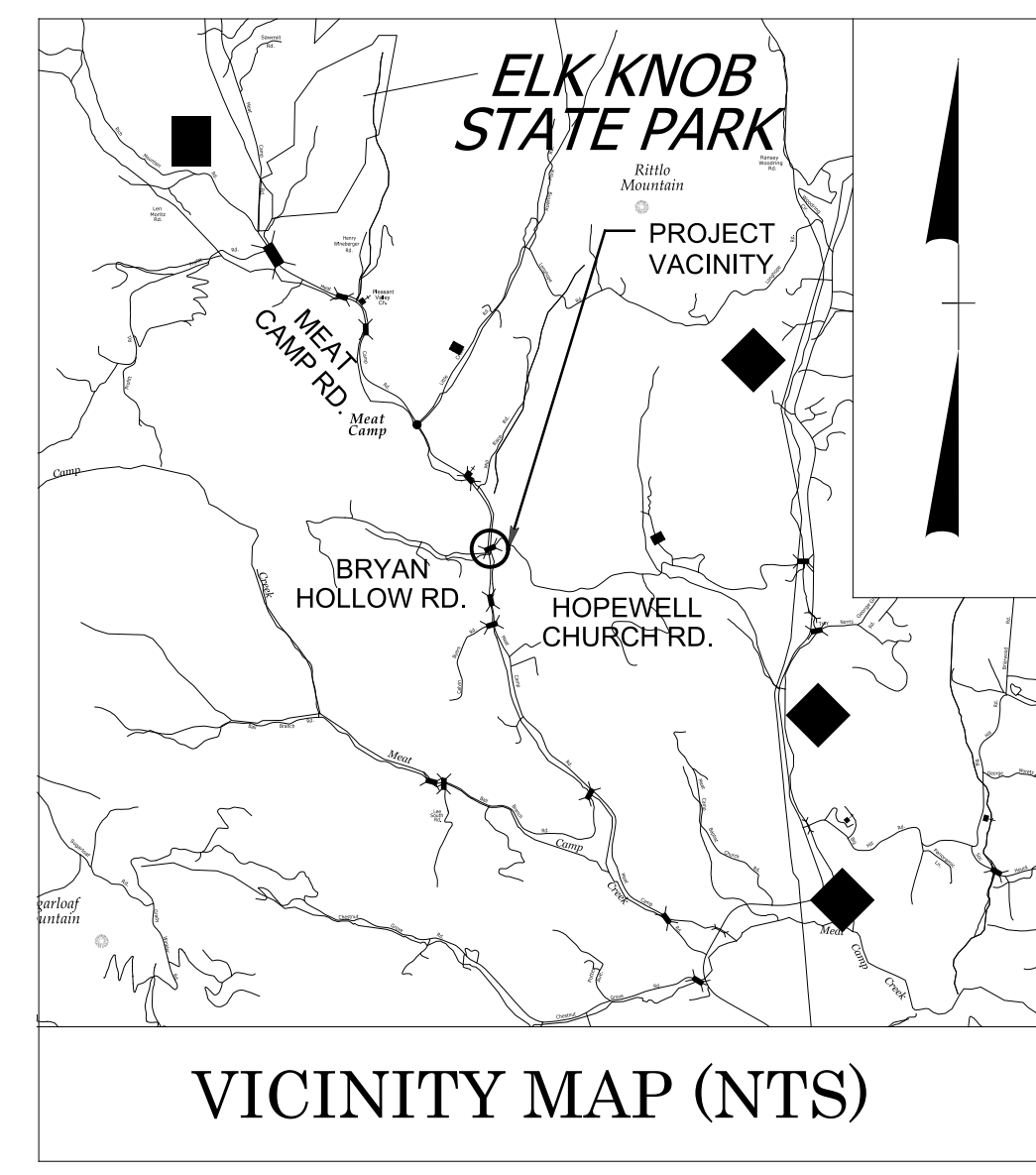
TIP PROJECT: DF18311.2095784

CONTRACT:

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
DF18311.2095784	UO-1

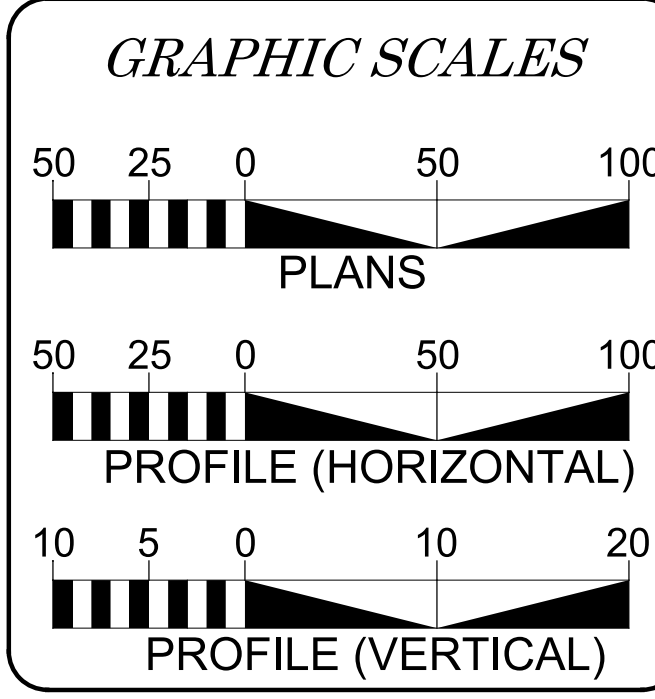
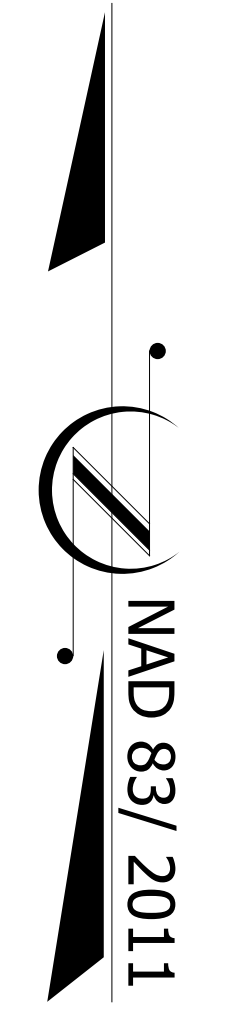
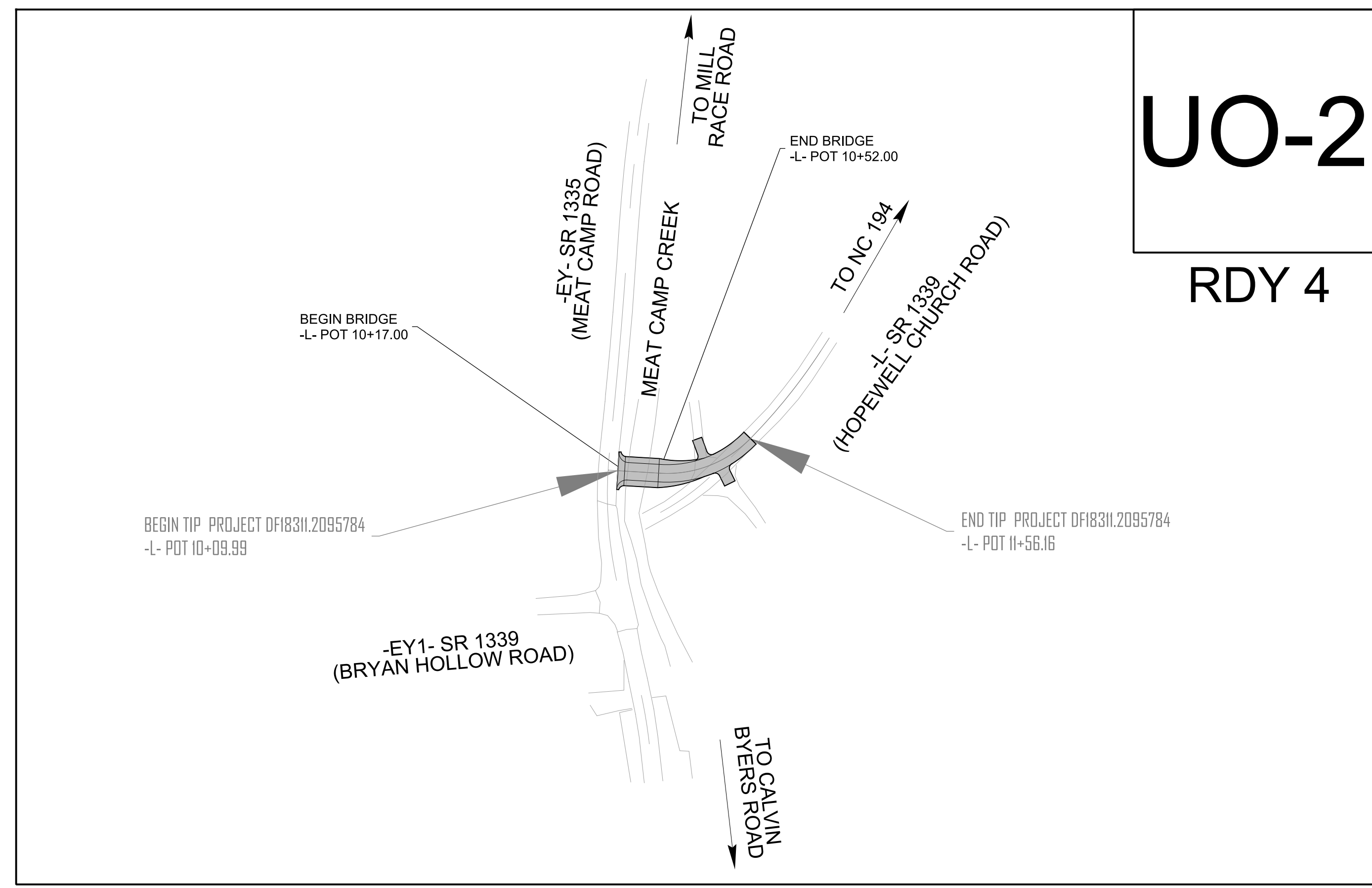
NOTE:  
ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.



# UTILITIES BY OTHERS PLANS WATAUGA COUNTY

**LOCATION: REPLACE BRIDGE 187 ON SR 1339  
(HOPEWELL CHURCH RD.)  
OVER MEAT CAMP CREEK**

**TYPE OF WORK: RELOCATION OF POWER AND CATV**



INDEX OF SHEETS

SHEET NO.:	DESCRIPTION:
UO-1	TITLE SHEET
UO-2	UBO PLAN

UTILITY OWNERS WITH CONFLICTS

(A) POWER - BLUE RIDGE EMC  
(B) CATV - SPECTRUM

PREPARED IN THE OFFICE OF

## Wooten

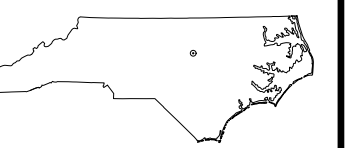
120 N. Boylan Avenue • Raleigh, NC 27603  
(919) 828-0531 • thewoolencompany.com  
License Number: F-0115

WEBB WHITE UTILITY PROJECT MANAGER  
DOUG PETRY PROJECT UTILITY COORDINATOR

DIVISION OF HIGHWAYS  
DIVISION II  
PROJECT DELIVERY UNIT

801 STATESVILLE RD.  
NORTH WILKESBORO, NC 28659  
PHONE (919) 707-6690  
FAX (919) 250-4151

ROB WEISZ, P.E. BRIDGE PROGRAM MANAGER  
BRANDON GREER DIVISION UTILITY ENGINEER



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:

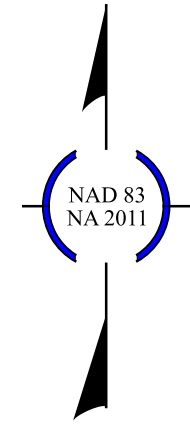
DRAWN BY:

CHECKED BY:

APPROVED BY:

REVISED:

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

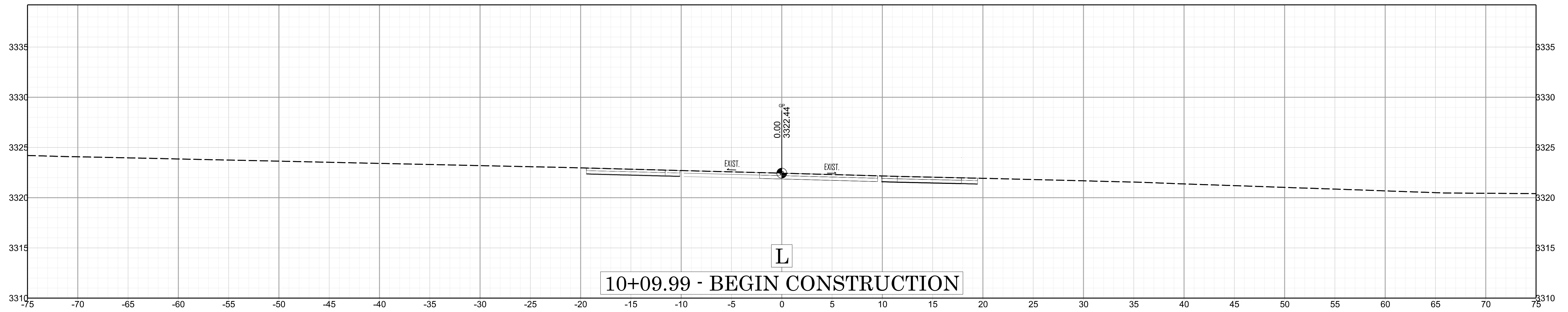
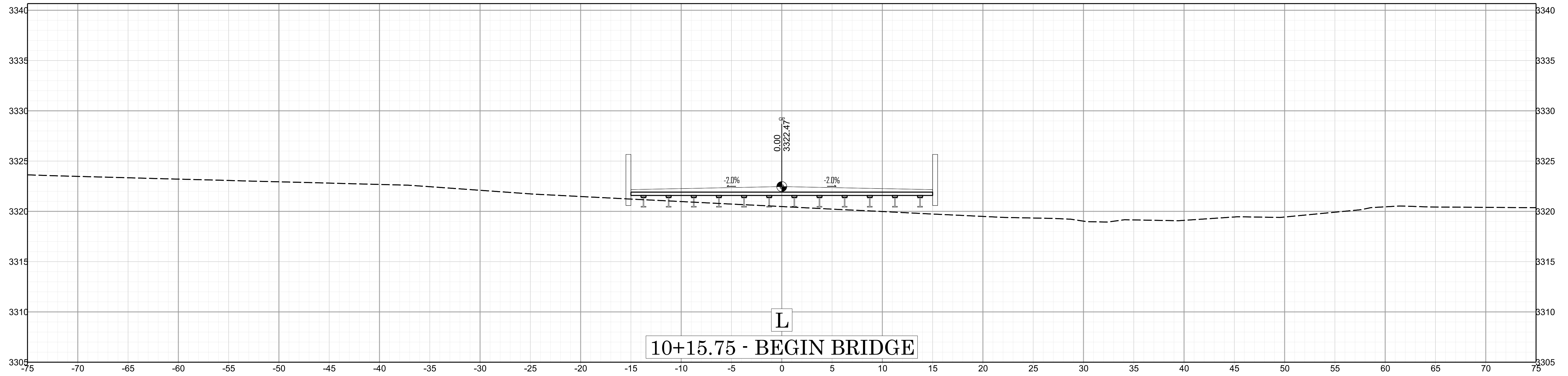


PAVEMENT REMOVAL

# CROSS SECTION SUMMARY

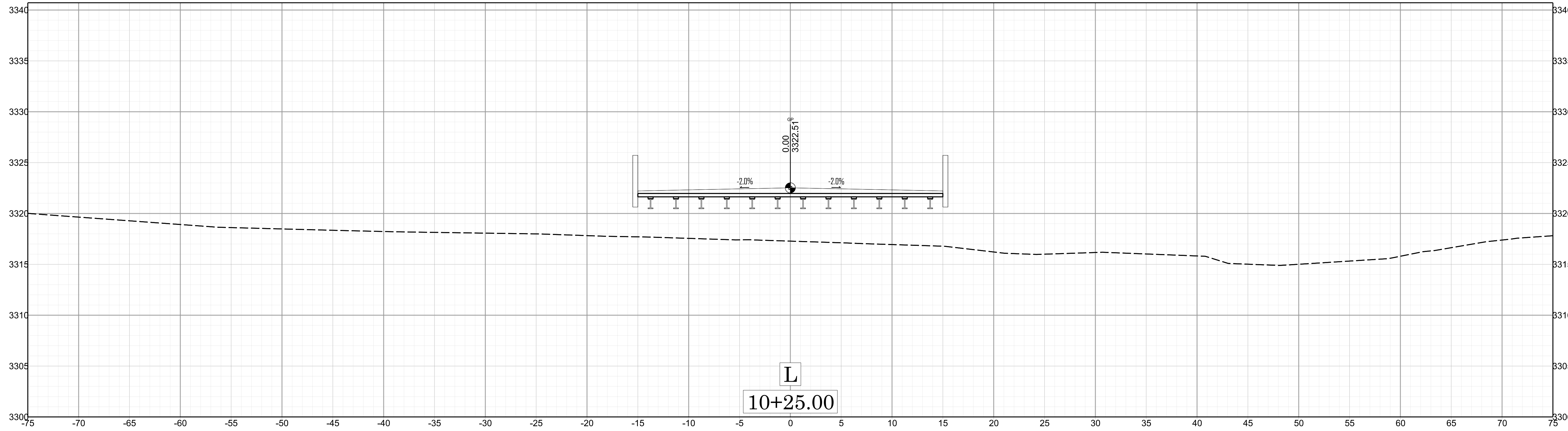
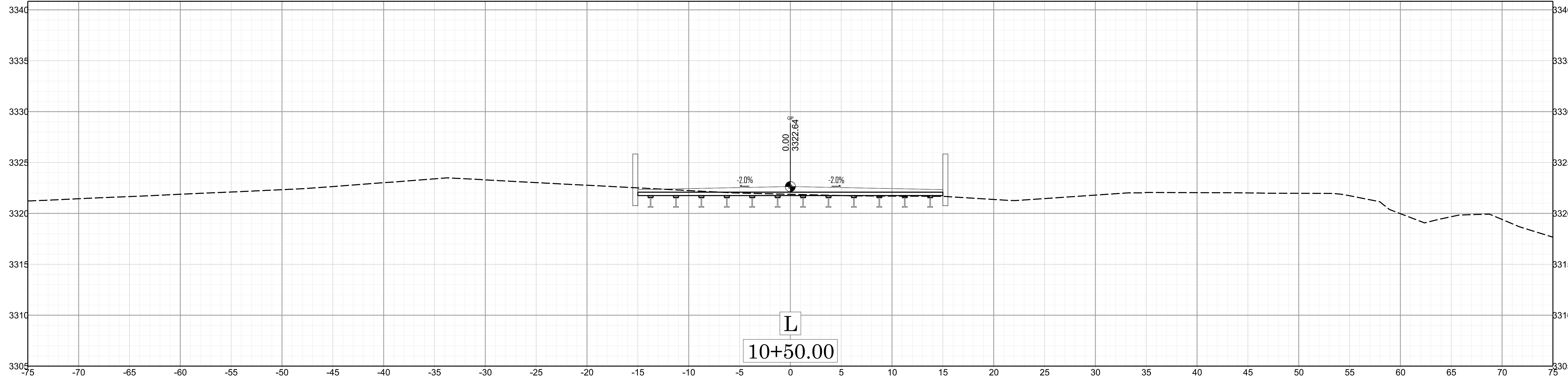
Station	Uncl. Exc.	Embt.
L	(cu. Yd.)	(cu. Yd.)
10+09.99 - 10+15.75	2	2
10+53.25 - 11+00.00	63	1
11+00.00 - 11+50.00	58	1
11+50.00 - 11+56.16	3	0

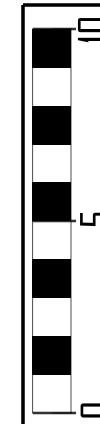
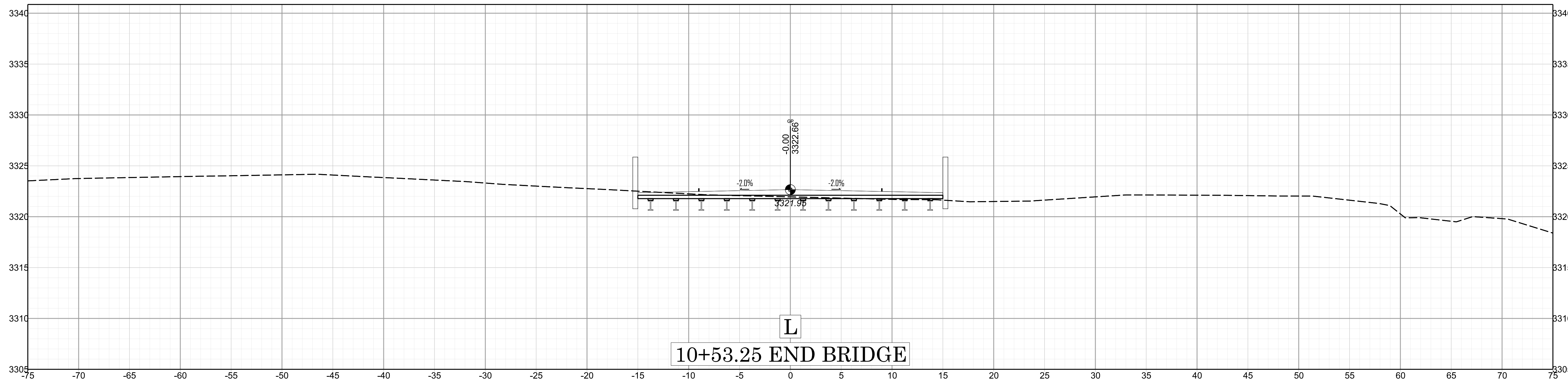
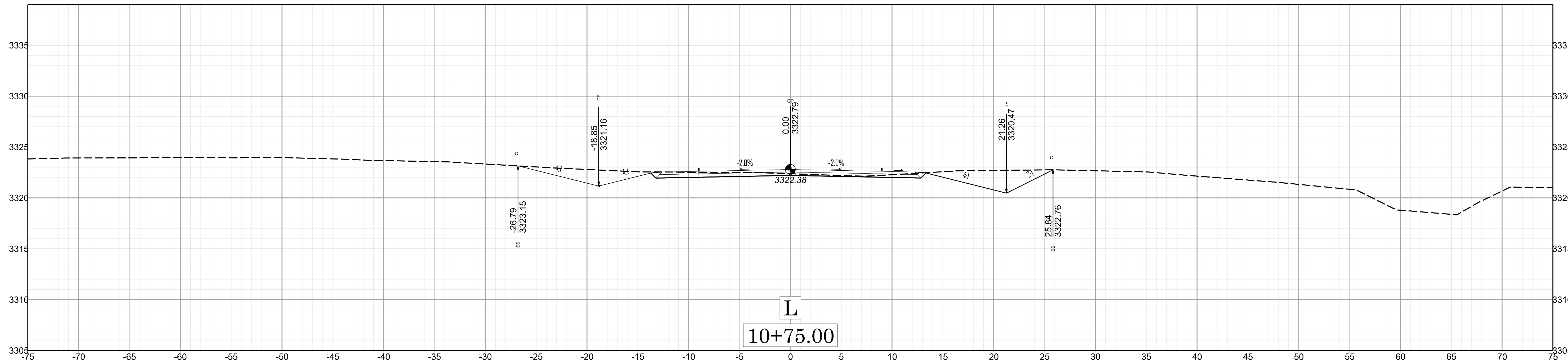
NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL OR UNDERCUT. VALUES SHOWN ARE VOLUMETRIC QUANTITIES.  
APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, FINE GRADING, CLEARING AND GRUBBING,  
AND REMOVAL OF ASPHALT PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR GRADING.



X 2

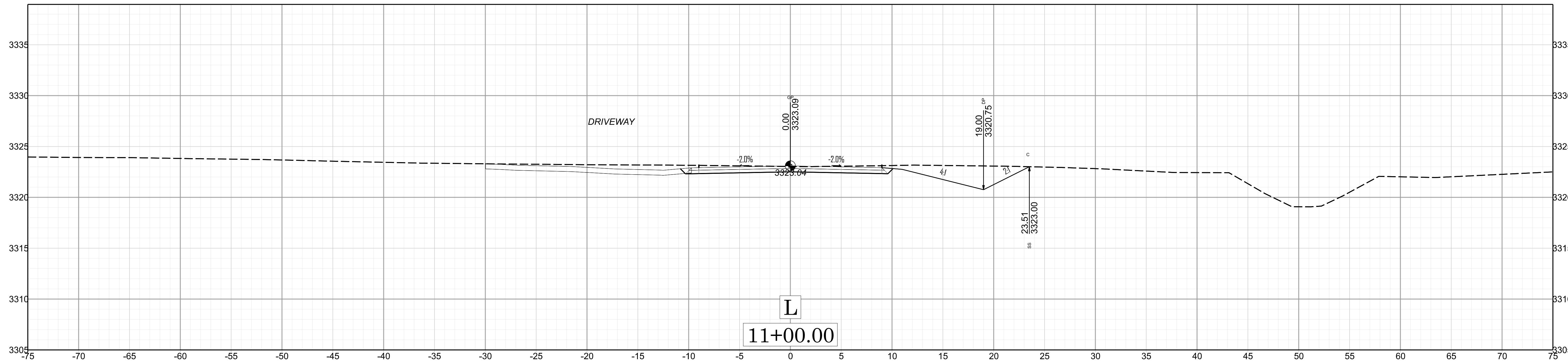
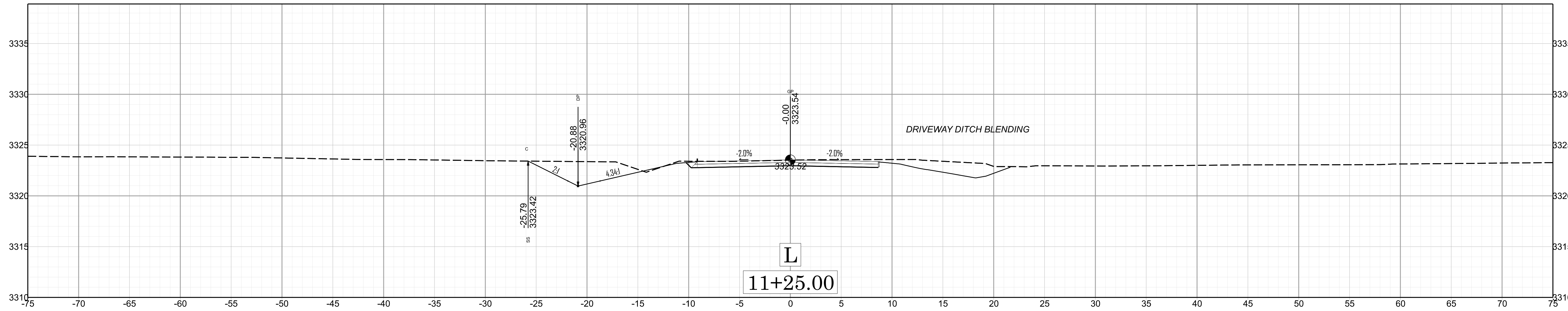
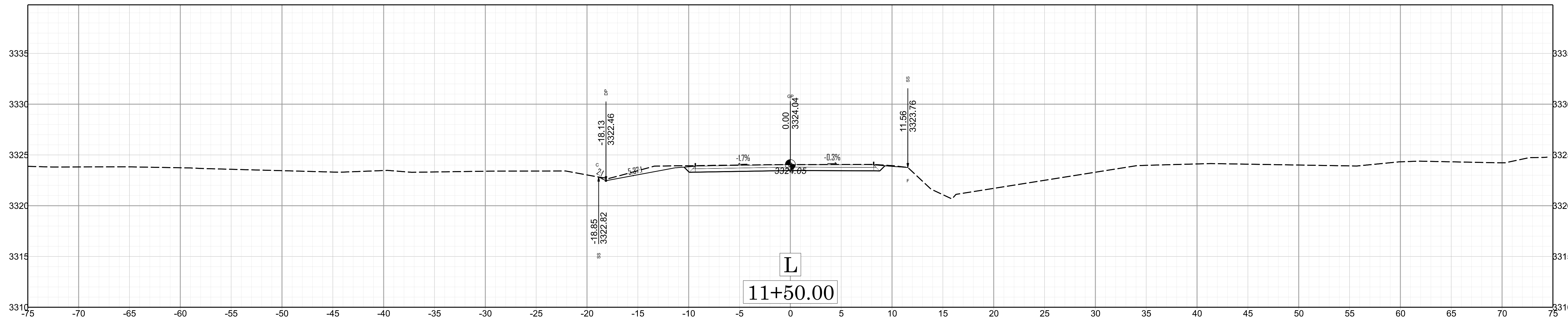
DF8311.2095784





X 4

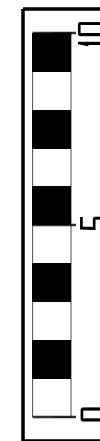
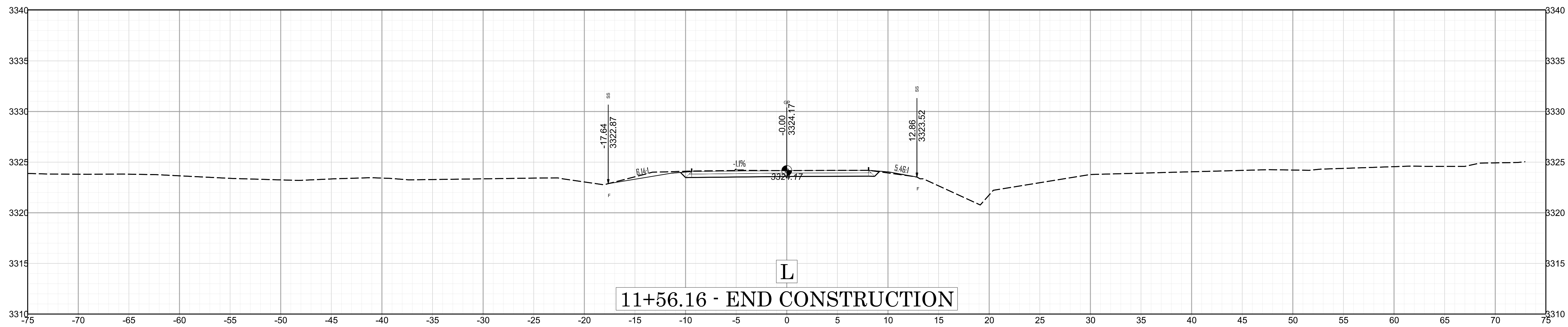
DFB311.2095784



10  
5

X  
5

DFB311.2095784

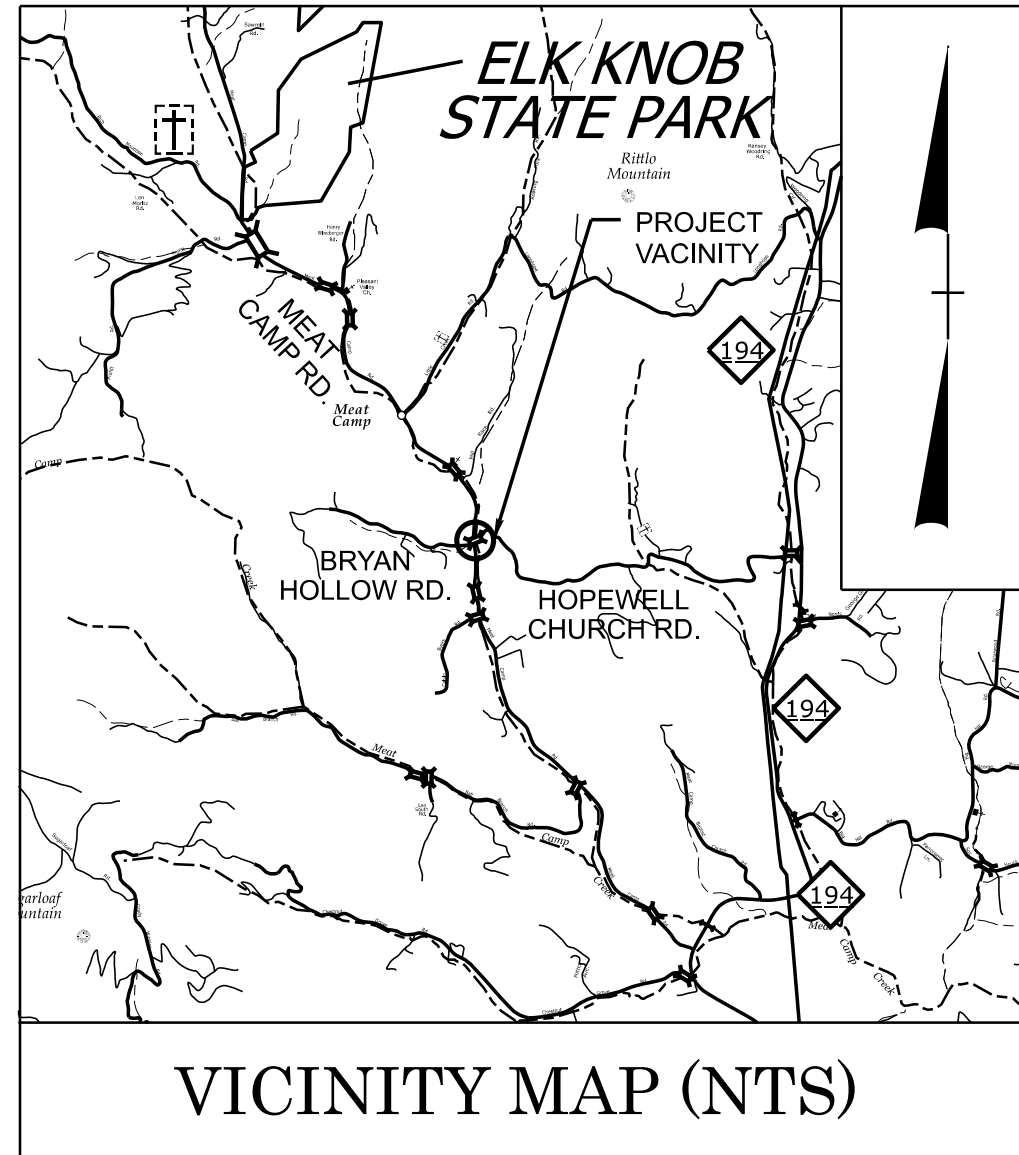


X 6

DFB311.2095784

TIP PROJECT: DF18311.2095784

CONTRACT: DK00435



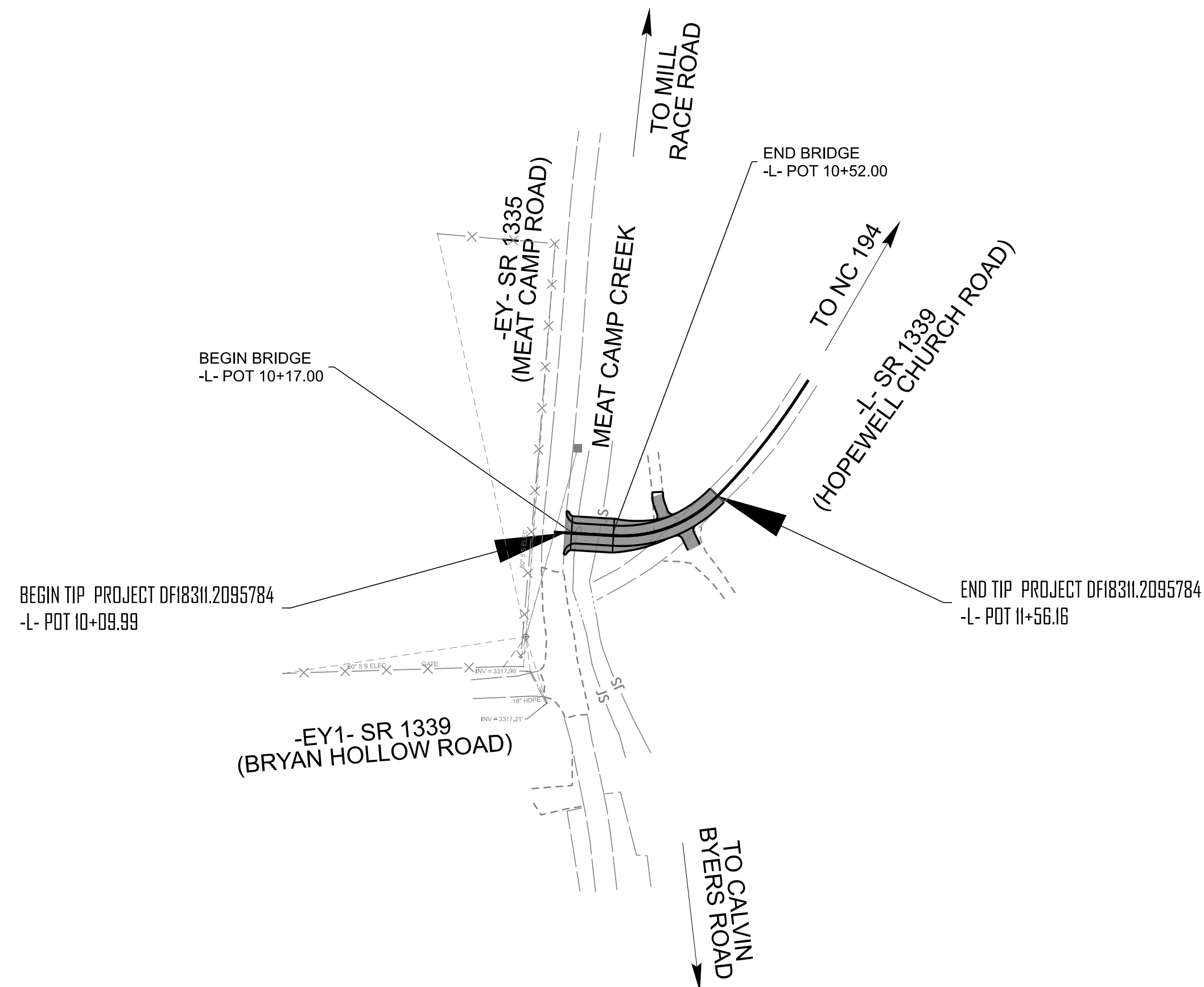
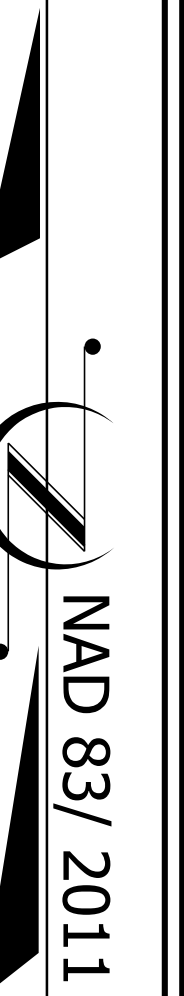
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

WATAUGA COUNTY

LOCATION: *REPLACE BRIDGE 187 ON SR 1339  
(HOPEWELL CHURCH RD.)  
OVER MEAT CAMP CREEK*

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18311.2095784		
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
DF18311.2095784	N/A	PE	
DF18311.2095784	N/A	ROW & UTILITY	
DF18311.2095784	N/A	CONSTRUCTION	



*STRUCTURE*

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

**DESIGN DATA**

ADT 2025 =	250
ADT 2026 =	250
K =	N/A %
D =	N/A %
T =	N/A % *
V =	30 MPH
* TTST = N/A DUAL N/A	
FUNC CLASS = LOCAL	
AASHTO	
LOW VOLUME ROADS	
DESIGN GUIDELINES	

**PROJECT LENGTH**

LENGTH OF ROADWAY TIP PROJECT DF18311.2095784 =	0.021 MILES
LENGTH OF STRUCTURE TIP PROJECT DF18311.2095784 =	0.007 MILES
TOTAL LENGTH OF TIP PROJECT DF18311.2095784 =	0.028 MILES

Prepared in the Office of:

VHB Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606

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2024 STANDARD SPECIFICATIONS

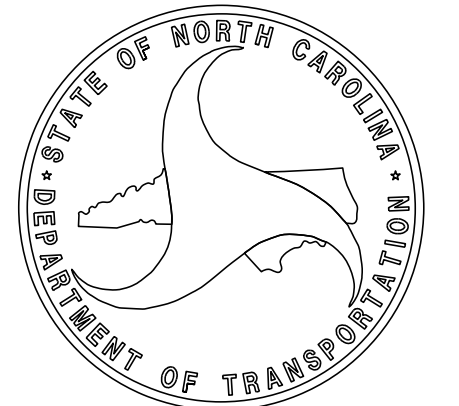
**RIGHT OF WAY DATE:**  
JUNE 10, 2025

**LETTING DATE:**  
MARCH 19, 2026

**ELIZABETH C. PHELPS, PE**  
PROJECT ENGINEER

**JEFFREY C. WILSON, PE**  
PROJECT DESIGN ENGINEER

**ROB WEISZ, PE**  
NCDOT CONTACT

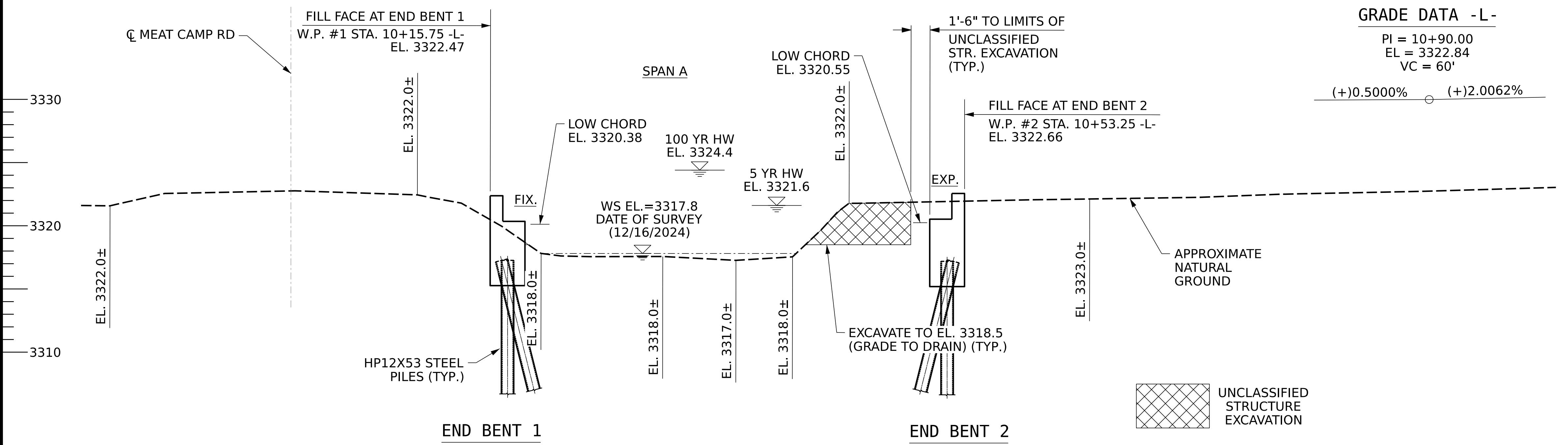


8/26/21

10+00

10+50

11+00



**GRADE DATA -L-**

PI = 10+90.00  
EL = 3322.84  
VC = 60'

(+)0.5000%    (+)2.0062%

**HYDRAULIC DATA**

DESIGN DISCHARGE	= 580 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 5 YR.
DESIGN HIGH WATER ELEVATION	= 3321.6
DRAINAGE AREA	= 5.89 SQ. MI.
BASE DISCHARGE (Q100)	= 1700 C.F.S.
BASE HIGH WATER ELEVATION	= 3324.4

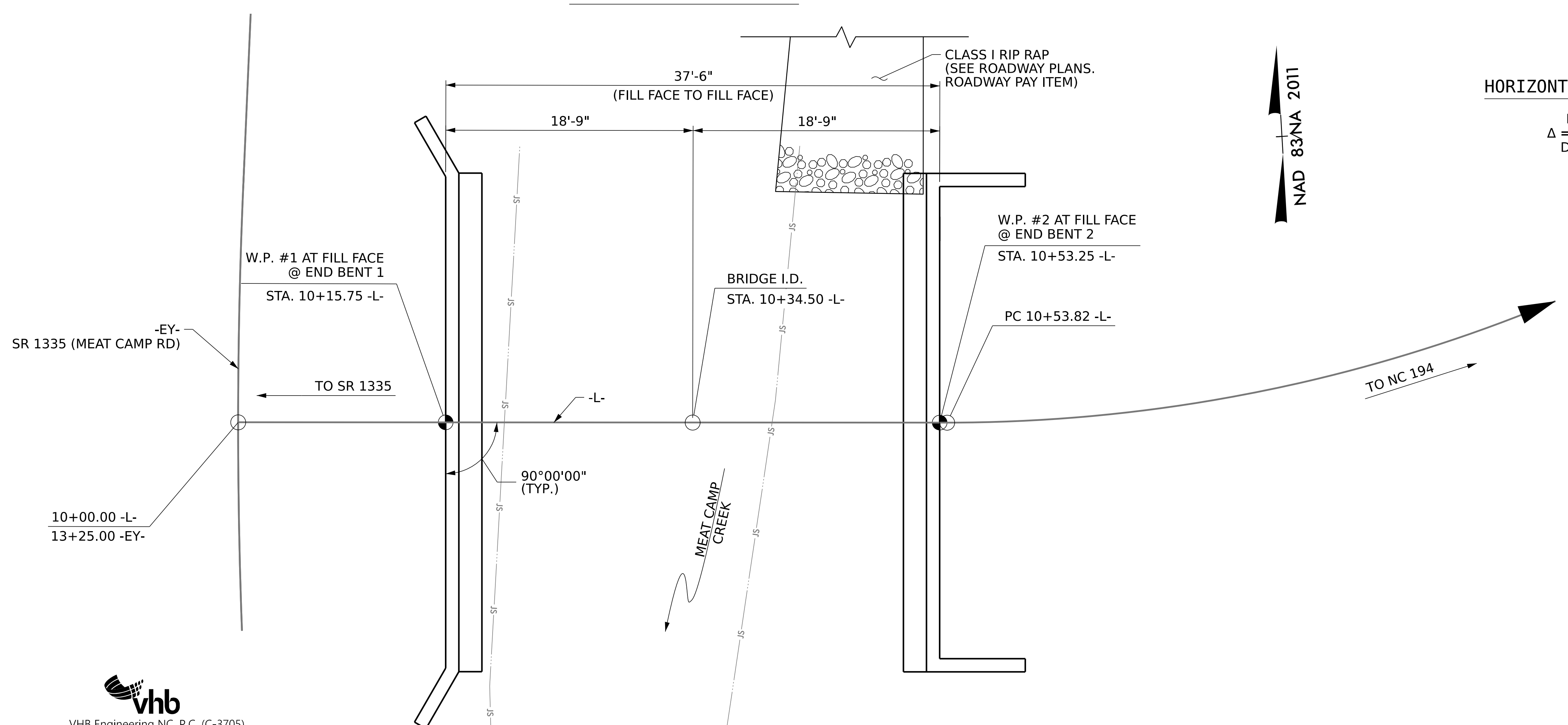
**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE	= 760 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	= 5+ YR.
OVERTOPPING FLOOD ELEVATION	= 3323.2*

\*OVERTOPPING OCCURS AT -L- STA. 10+09.99.

WS EL. Taken @ River Station 33239

**SECTION ALONG -L-**



**HORIZONTAL CURVE DATA -L-**

PI = 11+08.34  
Δ = 48°51'46.8" (LT)  
D = 47°44'47.3"  
L = 102.34'  
T = 54.51'  
R = 120'

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. **DF18311.2095784**

**WATAUGA** COUNTY

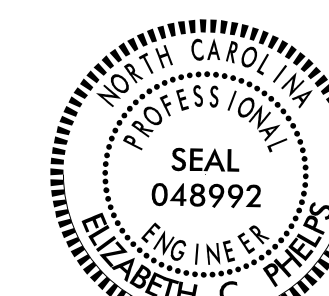
STATION: **10+34.50 -L-**

SHEET 1 OF 5 REPLACES BRIDGE NO. 940187

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**GENERAL DRAWING**

FOR BRIDGE OVER MEAT CAMP CREEK ON SR 1339 (HOPEWELL CHURCH RD) BETWEEN SR 1335 (MEAT CAMP RD) AND NC 194



DocuSigned by Elizabeth Phelps 7/23/2025

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-1

TOTAL SHEETS 18

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



VHB Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606

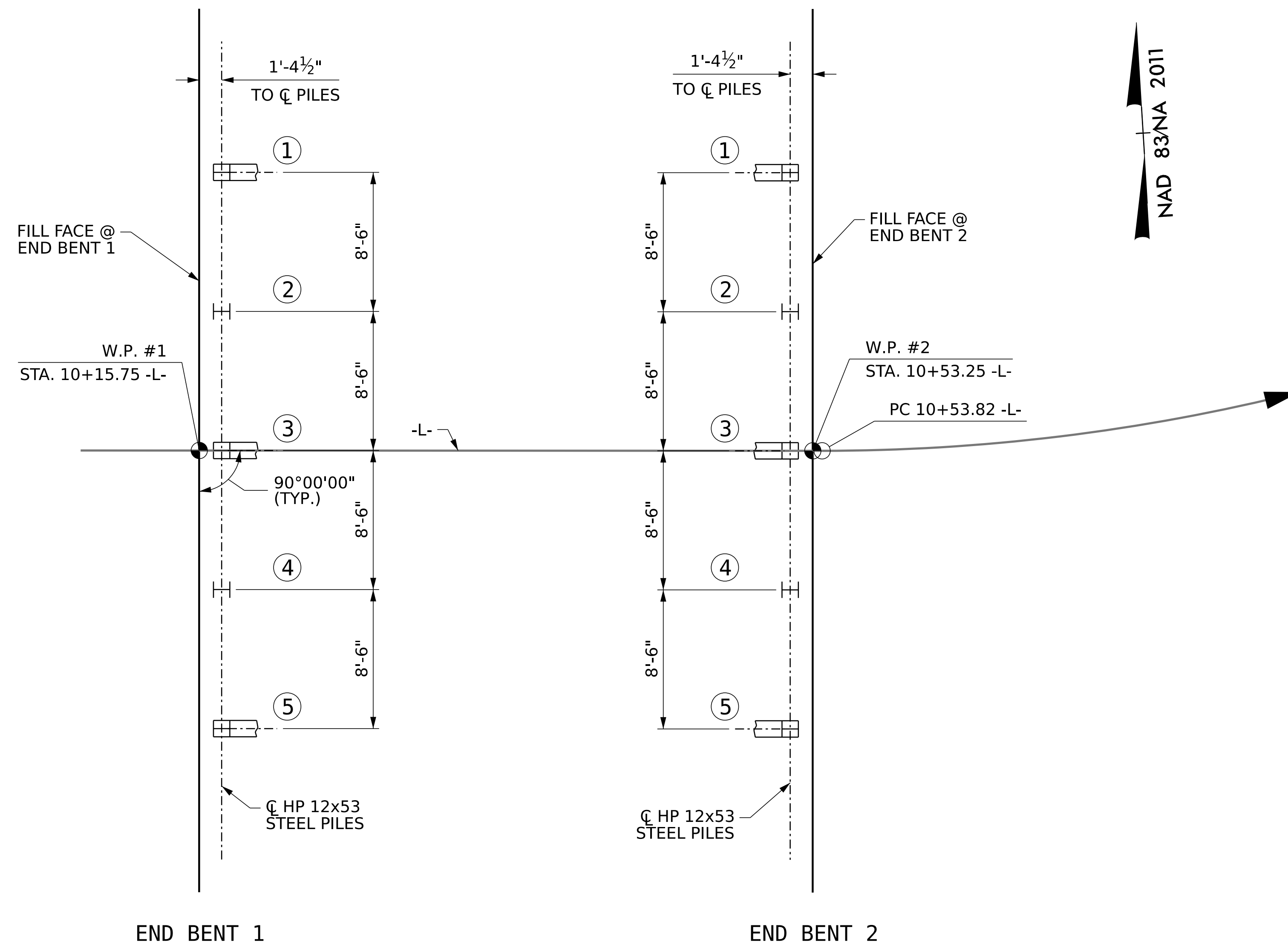
DRAWN BY : C.P. MALAGON DATE : 06/2025  
CHECKED BY : E.C. PHELPS DATE : 06/2025  
DESIGN ENGINEER OF RECORD: E.C. PHELPS DATE : 07/2025

7/23/2025  
c:\bms\vhb-pw-01\d0261752\DF18311.2095784\_SMU.GD1\_940187.dgn  
ephelps

### NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 20 TO 30 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.



### FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES

PROJECT NO. **DF18311.2095784**

**WATAUGA** COUNTY

STATION: **10+34.50 -L-**

SHEET 2 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

### GENERAL DRAWING

FOR BRIDGE OVER MEAT CAMP  
CREEK ON SR 1339 (HOPEWELL  
CHURCH RD) BETWEEN SR 1335  
(MEAT CAMP RD) AND NC 194



DocuSigned by:  
Elizabeth Phelps 7/23/2025  
A304598A0R27455...

#### REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-2
2			4			TOTAL SHEETS 18

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED



VHB Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606

DRAWN BY : <b>C.P. MALAGON</b>	DATE : <b>06/2025</b>
CHECKED BY : <b>E.C. PHELPS</b>	DATE : <b>06/2025</b>
DESIGN ENGINEER OF RECORD: <b>E.C. PHELPS</b>	DATE : <b>07/2025</b>

**SUMMARY OF PILE INFORMATION/INSTALLATION**

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #( #) (e.g., "Bent 1, Piles 1-5")	Number of Piles per Line	Factored Resistance per Pile KIPS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles **			Drilled-In Piles		
						Minimum Pile Tip (Tip No Higher Than) Elevation FT	Required Driving Resistance (RDR)* per pile KIPS	Pile Redrives Quantity EACH	Predrilling Length per Pile LIN FT	Predrilling Elevation (Elevation Not To Predrill Below) FT	Maximum Predrilling Diameter INCHES	Pile Excavation (Bottom of Hole) Elevation FT	Pile Excavation Not In Soil per Pile LIN FT	Pile Excavation In Soil per Pile LIN FT
End Bent No. 1, Piles 1-5	5	120	3317.10	40			200							
End Bent No. 2, Piles 1-2	2	120	3317.00	30			200							
End Bent No. 2, Piles 3-5	3	120	3317.00	35			200							
<b>TOTAL QUANTITY:</b>														

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

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

**PILE DESIGN INFORMATION**

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #( #) (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile KIPS	Factored Drag Load per Pile KIPS	Factored Dead Load * per Pile KIPS	Dynamic Resistance Factor	Nominal Drag Resistance per Pile KIPS	Nominal Scour Resistance per Pile KIPS
End Bent No. 1, Piles 1-5	120			0.60		
End Bent No. 2, Piles 1-5	120			0.60		

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

**NOTES:**

1. The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Michael J. Walko, #026917) on 06-09-2025.
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
3. The Engineer may adjust the quantity for DPT Testing and Pipe Pile Plates when necessary.



VHB Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606

DRAWN BY : C.P. MALAGON	DATE : 06/2025
CHECKED BY : E.C. PHELPS	DATE : 06/2025
DESIGN ENGINEER OF RECORD: E.C. PHELPS	DATE : 07/2025

PROJECT NO. **DF18311.2095784**

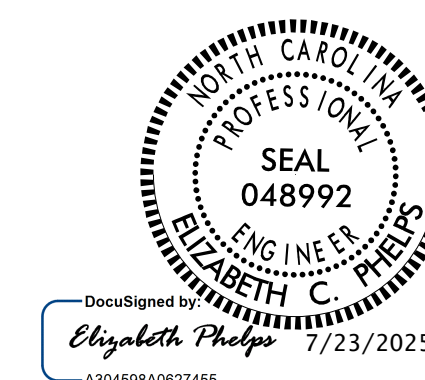
**WATAUGA** COUNTY

STATION: **10+34.50 -L-**

SHEET 3 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

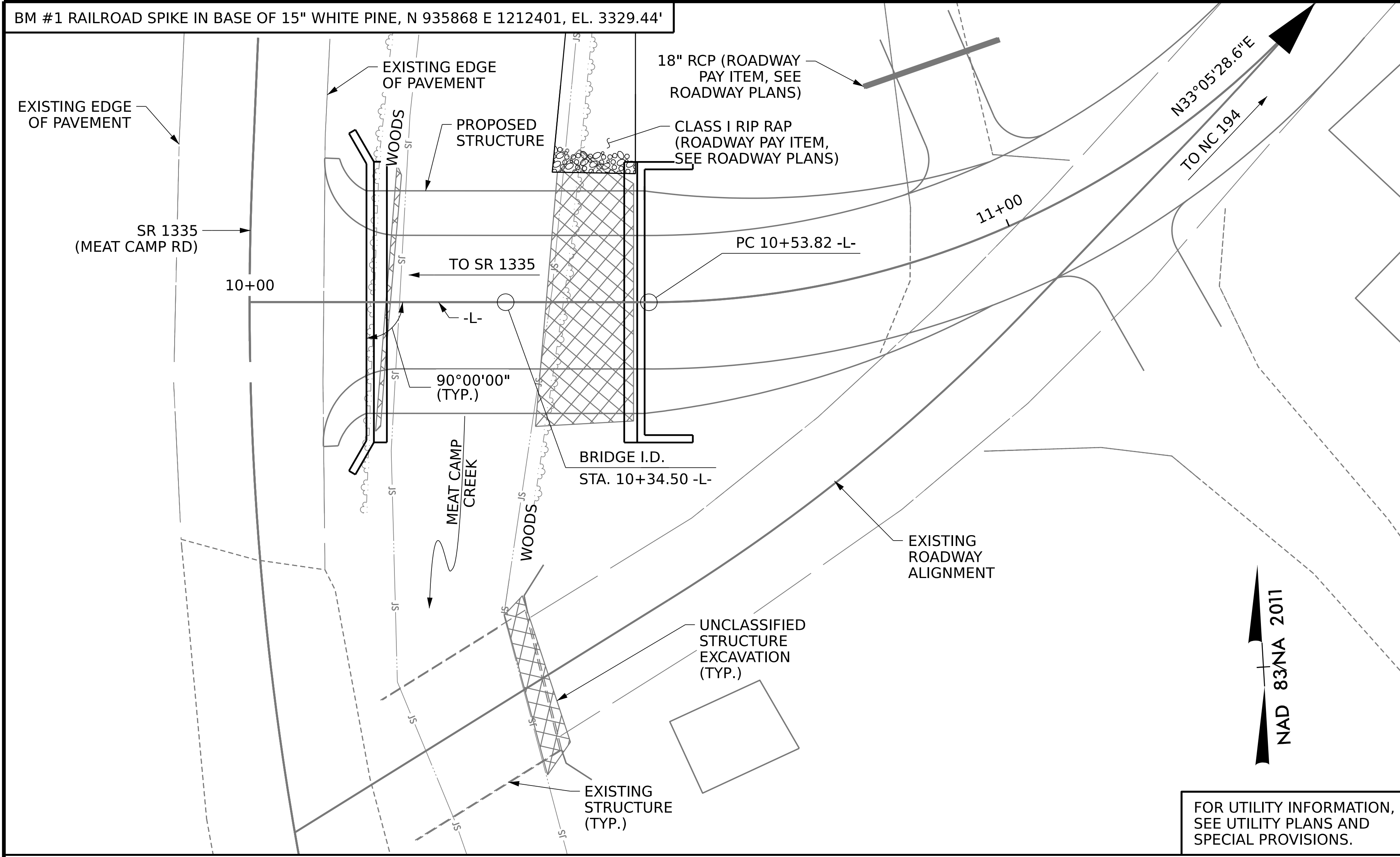
**PILE FOUNDATION  
LOAD TABLES**



DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-3
2			4			TOTAL SHEETS 18

8/26/21



**-LOCATION SKETCH-**

**NOTES**

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.  
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.  
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.  
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.  
 THE EXISTING STRUCTURE CONSISTING OF STEEL GIRDER SPANS(23'-0" TOTAL LENGTH), WITH A CLEAR WIDTH OF 18'-6" WITH A TIMBER DECK AND ASPHALT OVERLAY WEARING SURFACE, WITH SUBSTRUCTURES CONSISTING OF CAPS ON TIMBER PILES LOCATED APPROX. 40' SOUTH OF THE PROPOSED BRIDGE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR A LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.  
 THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 17 FT EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.  
 REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.  
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.  
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.  
 ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50 AND PAINTED IN ACCORDANCE WITH SYSTEM 1 OR GALVANIZED OF THE STRUCTURAL STEEL SHOP COATING PROGRAM AND ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.  
 COATING APPLICATION FOR ALL STRUCTURAL STEEL SHALL NOT BE PERFORMED UNTIL SHOP FABRICATION INCLUDING CUTTING, DRILLING AND WELDING HAS BEEN COMPLETED.  
 THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

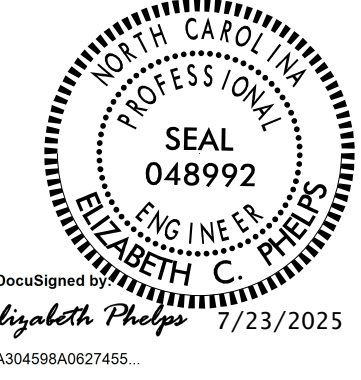
ALL TIMBER AND LUMBER MEMBERS SHALL BE TREATED SOUTHERN PINE AND CONFORM TO SECTION 1082 OF THE STANDARD SPECIFICATIONS.  
 ALL TIMBER DIMENSIONS SHOWN ON THE PLANS ARE NOMINAL DIMENSIONS.  
 WHEN FIELD CUTTING TIMBER MEMBERS, TREAT NEWLY EXPOSED SURFACES WITH EITHER A BITUMINOUS ASPHALT-BASED ROOFING CEMENT, COPPER NAPHTHENATE PASTE, OR APPROVED PRESERVATIVE SYSTEM BEFORE INSTALLING.  
 TREAT ALL DRILLED OR NEWLY EXPOSED HOLES IN TIMBER MEMBERS BY PUMPING WITH BITUMINOUS ASPHALT-BASED ROOFING CEMENT, OR APPROVED PRESERVATIVE SYSTEM BEFORE INSTALLING HARDWARE.  
 PRE-DRILL HOLES IN TIMBER AND LUMBER MEMBERS ACCEPTING BOLTS TO ELIMINATE SPLITTING.  
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.  
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.  
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.  
 ALL HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATION, UNLESS OTHERWISE NOTED ON THE PLANS.  
 DO NOT DRIVE LAG/STRUCTURAL SCREWS WITH A HAMMER, SCREW OR TORQUE LAG/STRUCTURAL SCREWS.  
 SCREWS SHALL PROVIDE SUFFICIENT LENGTH SO THAT SCREW SHANK WILL PENETRATE RECEIVING MEMBERS.  
 FOR TIMBER BRIDGE RAIL SYSTEM INCLUDING LUMBER, DELINEATORS, HARDWARE FOR BOLT CONNECTIONS, HARDWARE FOR SCREW CONNECTIONS AND ALUMINUM DRIP EDGE, SEE TIMBER BRIDGE SUPERSTRUCTURE ON STEEL BEAMS SPECIAL PROVISION.  
 FOR ASBESTOS ASSESSMENT,SEE SPECIAL PROVISIONS.  
 FOR TIMBER BRIDGE DECK SYSTEM INCLUDING HARDWARE FOR BOLT CONNECTIONS AND HARDWARE FOR SCREW CONNECTIONS,SEE TIMBER BRIDGE SUPERSTRUCTURE ON STEEL BEAMS SPECIAL PROVISION.  
 INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 10+34.50 -L"

**TOTAL BILL OF MATERIAL**

	REMOVAL OF EXISTING STRUCTURE @ STA. 10+34.50 -L-	ASBESTOS ASSESSMENTS	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	REINFORCING STEEL	APPROX. 49,141 LBS. STRUCTURAL STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	HP 12 X 53 STEEL PILES		ELASTOMERIC BEARINGS	TIMBER DECK SYSTEM	TIMBER BRIDGE RAIL SYSTEM
	LUMP SUM	LUMP SUM	LUMP SUM	CU. YDS.	LBS.	LUMP SUM	EACH	No.	LIN. FT.	LUMP SUM	LUMP SUM	LIN. FT.
SUPERSTRUCTURE						LUMP SUM				LUMP SUM	LUMP SUM	71.0
END BENT 1				25.9	3,147		5	5	200			
END BENT 2				27.5	3,319		5	5	165			
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	53.4	6,466	LUMP SUM	10	10	365	LUMP SUM	LUMP SUM	71.0

PROJECT NO. **DF18311.2095784**  
**WATAUGA** COUNTY  
 STATION: **10+34.50 -L-**

SHEET 4 OF 5



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE OVER MEAT CAMP CREEK ON SR 1339 (HOPEWELL CHURCH RD) BETWEEN SR 1335 (MEAT CAMP RD) AND NC 194

REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

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DRAWN BY : **C.P. MALAGON** DATE : **06/2025**  
 CHECKED BY : **E.C. PHELPS** DATE : **06/2025**  
 DESIGN ENGINEER OF RECORD: **E.C. PHELPS** DATE : **07/2025**

7/22/2025  
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 ephelps

LOAD AND RESISTANCE FACTOR RATING (LRFR) STEEL GIRDERS (W 12 X 96)

LOAD TYPE	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE												SERVICE II LIMIT STATE					
						MOMENT						SHEAR						MOMENT					
						LIVE-LOAD FACTORS (γ LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD	HL-93 (INVENTORY)	N/A	①	1.39	--	1.75	0.336	1.39	A	I	17.50	0.336	3.46	A	I	34.46	0.8	0.336	1.84	A	I	17.50	
	HL-93 (OPERATING)	N/A		1.80	--	1.35	0.336	1.80	A	I	17.50	0.336	4.67	A	I	34.46	N/A	0.336	2.39	A	I	17.50	
	HS-20 (INVENTORY)	36.000	②	2.36	84.78	1.75	0.336	2.36	A	EL	20.89	0.336	5.90	A	I	34.46	0.8	0.336	2.93	A	I	14.11	
	HS-20 (OPERATING)	36.000		2.88	130.79	1.35	0.336	2.88	A	I	14.11	0.336	7.64	A	I	34.46	N/A	0.336	3.80	A	I	14.11	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH		4.02	54.30	1.40	0.336	4.07	A	I	14.11	0.336	10.84	A	I	34.46	0.8	0.336	4.02	A	I	17.50	
		SNGARBS2	20.000		3.20	64.06	1.40	0.336	3.20	A	I	14.11	0.336	8.17	A	I	34.46	0.8	0.336	3.51	A	I	14.11
		SNAGRIS2	22.000		3.08	67.83	1.40	0.336	3.08	A	I	14.11	0.336	7.77	A	I	34.46	0.8	0.336	3.48	A	I	14.11
		SNCOTTS3	27.250		2.00	54.55	1.40	0.336	2.00	A	I	17.50	0.336	5.59	A	I	34.46	0.8	0.336	2.13	A	I	17.50
		SNAGGRS4	34.925		1.86	65.03	1.40	0.336	1.86	A	I	17.50	0.336	4.99	A	I	34.46	0.8	0.336	1.98	A	I	14.11
		SNS5A	35.550		1.80	64.13	1.40	0.336	1.80	A	I	17.50	0.336	5.28	A	I	34.46	0.8	0.336	1.92	A	I	17.50
		SNS6A	39.950		1.74	69.51	1.40	0.336	1.74	A	I	17.50	0.336	4.91	A	EL	34.46	0.8	0.336	1.85	A	I	17.50
		SNS7B	42.000	③	1.64	68.96	1.40	0.336	1.64	A	I	17.50	0.336	5.01	A	I	0.64	0.8	0.336	1.74	A	I	17.50
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.17	71.68	1.40	0.336	2.17	A	I	17.50	0.336	5.60	A	I	34.46	0.8	0.336	2.31	A	I	17.50
		TNT4A	33.075		2.16	71.51	1.40	0.336	2.16	A	I	17.50	0.336	5.55	A	I	0.64	0.8	0.336	2.29	A	I	17.50
		TNT6A	41.600		1.87	77.79	1.40	0.336	1.87	A	I	17.50	0.336	5.25	A	I	0.64	0.8	0.336	1.98	A	I	17.50
		TNT7A	42.000		1.94	81.44	1.40	0.336	1.94	A	I	20.98	0.336	4.83	A	I	34.46	0.8	0.336	2.05	A	EL	17.50
		TNT7B	42.000		1.92	80.72	1.40	0.336	1.92	A	I	17.50	0.336	4.67	A	I	34.46	0.8	0.336	2.04	A	I	17.50
		TNAGRIT4	43.000		1.84	79.03	1.40	0.336	1.84	A	I	14.11	0.336	4.70	A	I	0.64	0.8	0.336	2.00	A	I	14.11
		TNAGT5A	45.000		1.78	79.97	1.40	0.336	1.78	A	I	17.50	0.336	4.69	A	I	34.46	0.8	0.336	1.87	A	I	17.50
		TNAGT5B	45.000		1.72	77.49	1.40	0.336	1.72	A	I	17.50	0.336	4.22	A	I	34.46	0.8	0.336	1.82	A	I	20.89
EMERGENCY VEHICLE (EV)	EV2	28.750		2.28	65.44	1.40	0.336	2.28	A	I	14.11	0.336	5.95	A	I	34.46	0.8	0.336	2.52	A	I	20.89	
	EV3	43.000	④	1.59	68.28	1.40	0.336	1.59	A	I	17.50	0.336	4.05	A	I	34.46	0.8	0.336	1.70	A	I	17.50	

LOAD FACTORS:

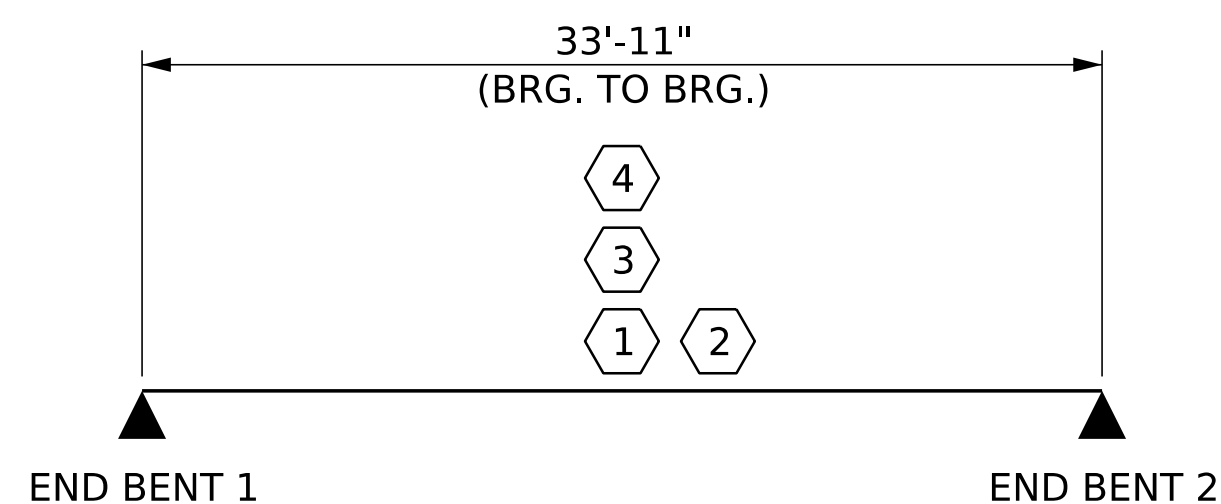
DESIGN LOAD RATING FACTORS	LIMIT STATE	γDC	γDW
	STRENGTH I	1.25	1.50
	SERVICE II	1.00	1.00

NOTES:

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

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

#	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
④	EMERGENCY VEHICLE LOAD RATING
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER	
EL - EXTERIOR LEFT GIRDER	
ER - EXTERIOR RIGHT GIRDER	



LRFR SUMMARY

PROJECT NO. **DF18311.2095784**

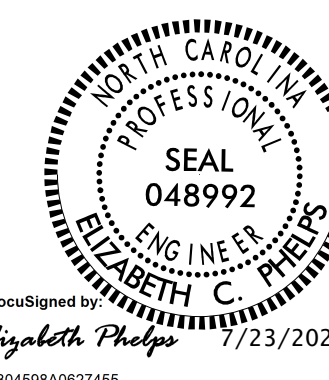
**WATAUGA** COUNTY

STATION: **10+34.50 -L-**

SHEET 5 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**LRFR SUMMARY FOR  
35FT STEEL GIRDERS**  
(NON-INTERSTATE TRAFFIC)



REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
①			③	
②			④	
TOTAL SHEETS				18

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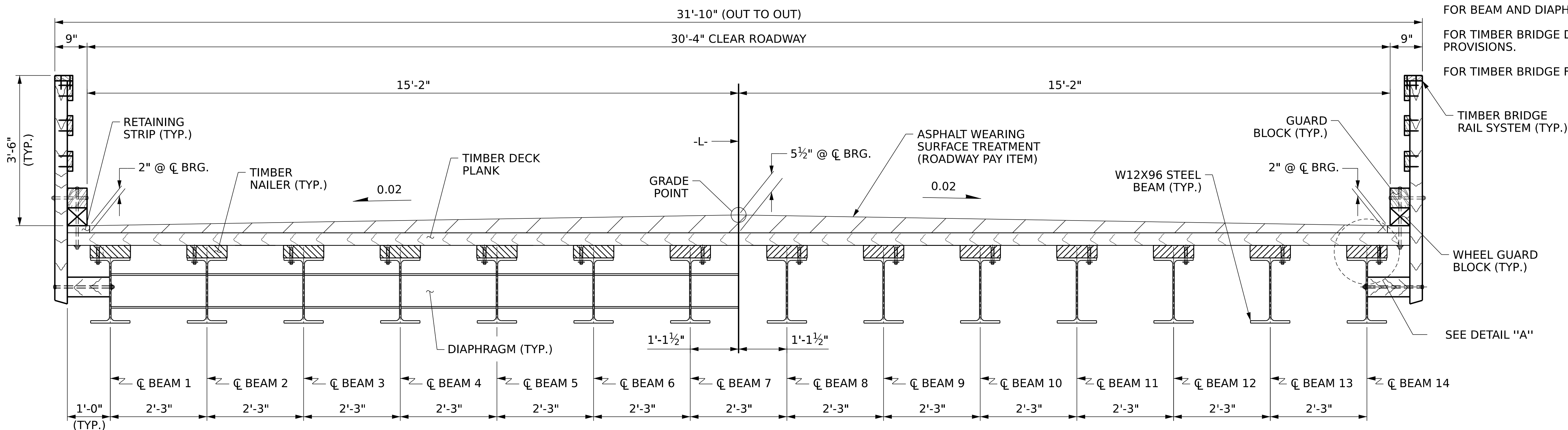


VHB Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606

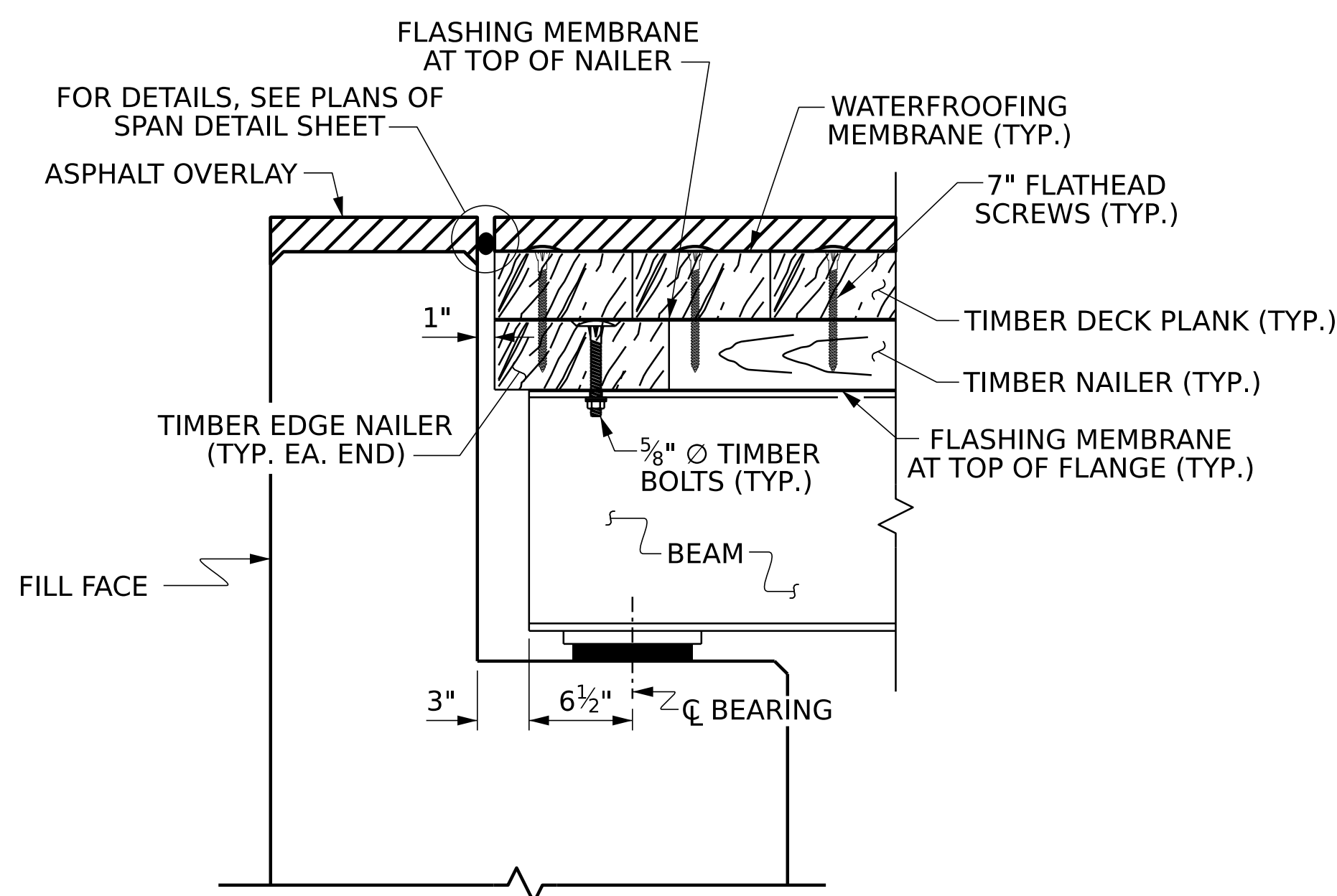
DRAWN BY : <b>C.P. MALAGON</b>	DATE : <b>06/2025</b>
CHECKED BY : <b>E.C. PHELPS</b>	DATE : <b>06/2025</b>
DESIGN ENGINEER OF RECORD: <b>E.C. PHELPS</b>	DATE : <b>07/2025</b>

**NOTES**

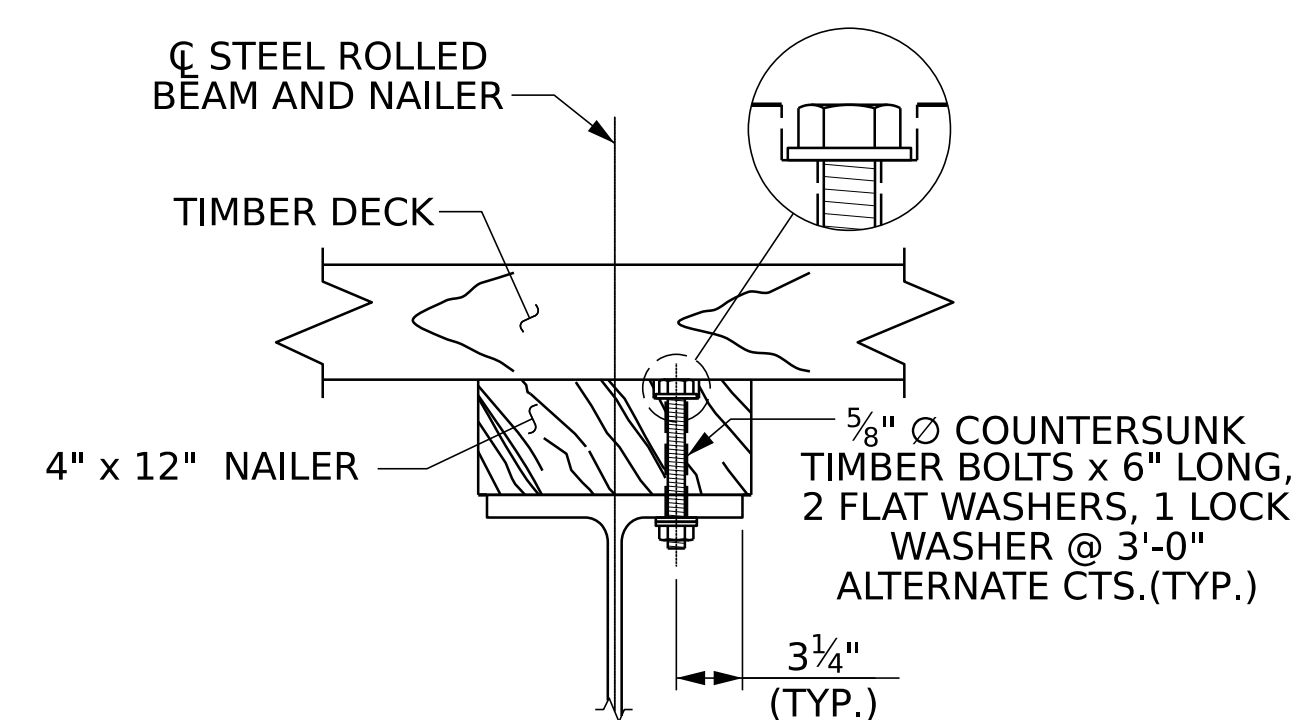
- FOR TIMBER BRIDGE DECK SYSTEM DETAILS, SEE PLAN OF SPAN.
- FOR TIMBER BRIDGE RAIL SYSTEM DETAILS, SEE TIMBER BRIDGE RAIL SYSTEM PLAN SHEET.
- PRIOR TO PLACING TIMBER BEAM NAILER AND EDGE NAILER MEMBERS, PLACE A FLASHING MEMBRANE ON THE TOP SIDE OF THE STEEL BEAMS.
- PRIOR TO PLACING TIMBER PLANK MEMBERS, PLACE A SELF-ADHERING FLASHING MEMBRANE ON THE TOP SIDE OF THE TIMBER NAILERS.
- FOR BEAM AND DIAPHRAGM DETAILS, SEE FRAMING PLAN SHEET.
- FOR TIMBER BRIDGE DECK WATERPROOFING MEMBRANE, SEE SPECIAL PROVISIONS.
- FOR TIMBER BRIDGE FLASHING MEMBRANE, SEE SPECIAL PROVISIONS.



**TYPICAL SECTION**



**SECTION AT ABUTMENT**



**DETAIL 'A'**

PROJECT NO. **DF18311.2095784**

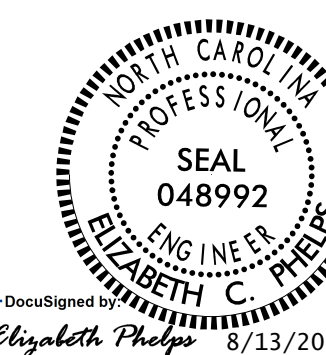
**WATAUGA** COUNTY

STATION: **10+34.50 -L-**

SHEET 1 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**STANDARD  
SUPERSTRUCTURE  
TYPICAL SECTION**



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REVISIONS		SHEET NO.	
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1			3
2			4
			S-6
			TOTAL SHEETS 18



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 CHECKED BY : **E.C. PHELPS** DATE : **06/2025**  
 DESIGN ENGINEER OF RECORD: **E.C. PHELPS** DATE : **07/2025**

### NOTES

FOR ADDITIONAL NOTES, SEE TYPICAL SECTION AND GENERAL DRAWING SHEETS.

STAGGER TIMBER DECK PLANKS BUTT JOINTS AT 4FT MINIMUMS FROM ADJACENT RUNS.

ATTACH TIMBER DECK PLANKS TO NAILERS WITH TWO STRUCTURAL SCREWS PER TIMBER DECK PLANK.

AVOID HITTING NAILER BOLT WHEN DRIVING TIMBER DECK SCREWS.

SEE BEAM DETAILS FOR SPACING OF TIMBER BOLTS IN TOP FLANGE OF ROLLED BEAM.

COUNTERSINK TIMBER BOLT AND STRUCTURAL SCREW HEADS TO BE FLUSH WITH TIMBER SURFACE.

TRIM THE EDGE NAILER FLUSH WITH THE EDGE OF DECK.

DECK PLANK WIDTH MAY BE CUT TO 6" (MIN.) TO FIT WITHIN LIMITS OF TIMBER DECK. ALL DECK PLANKS ATTACHED TO THE EDGE NAILER SHALL BE FULL WIDTH. CUT BOARDS WILL NOT BE PERMITTED TO BE PLACED ADJACENT TO ONE ANOTHER.

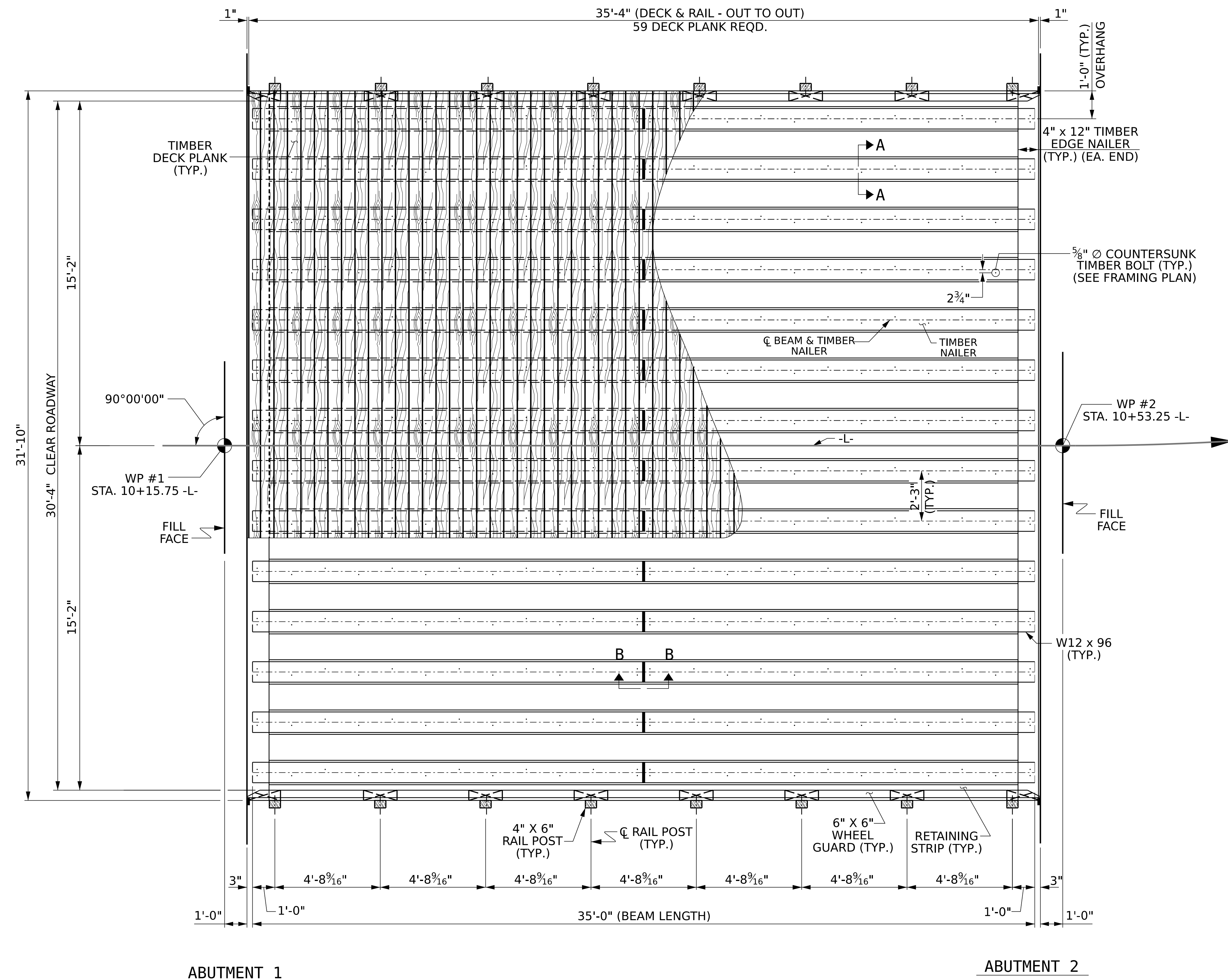
FINAL JOINT SEALS SHALL NOT BE INSTALLED UNTIL THE OVERLAY IS COMPLETE.

THE MANUFACTURER IS TO PROVIDE THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE BACKER ROD FOR THE SIZE OF THE OPENING ON THE PLANS AND ACCOMMODATE THE MINIMUM EXPANSION SHOWN ON THE PLANS.

POURABLE SILICONE JOINT SEALANT SHALL BE INSTALLED AS PER THE MANUFACTURER'S RECOMMENDATIONS.

THE CONTRACTOR WILL NOT BE PERMITTED TO FORM THE JOINTS IN LIEU OF SAWING THE JOINT.

FOR POURABLE SILICONE JOINT SEALANT, SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.



### DECK LAYOUT

PROJECT NO. **DF18311.2095784**

**WATAUGA** COUNTY

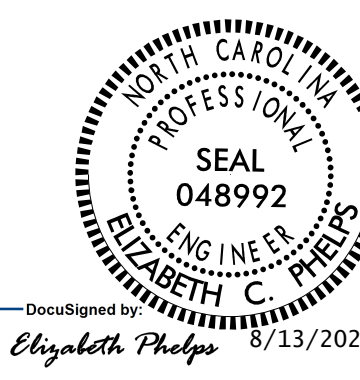
STATION: **10+34.50 -L-**

SHEET 2 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE

**PLAN OF 35' BEAM  
30' -0" CLEAR ROADWAY  
90° SKEW**



REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
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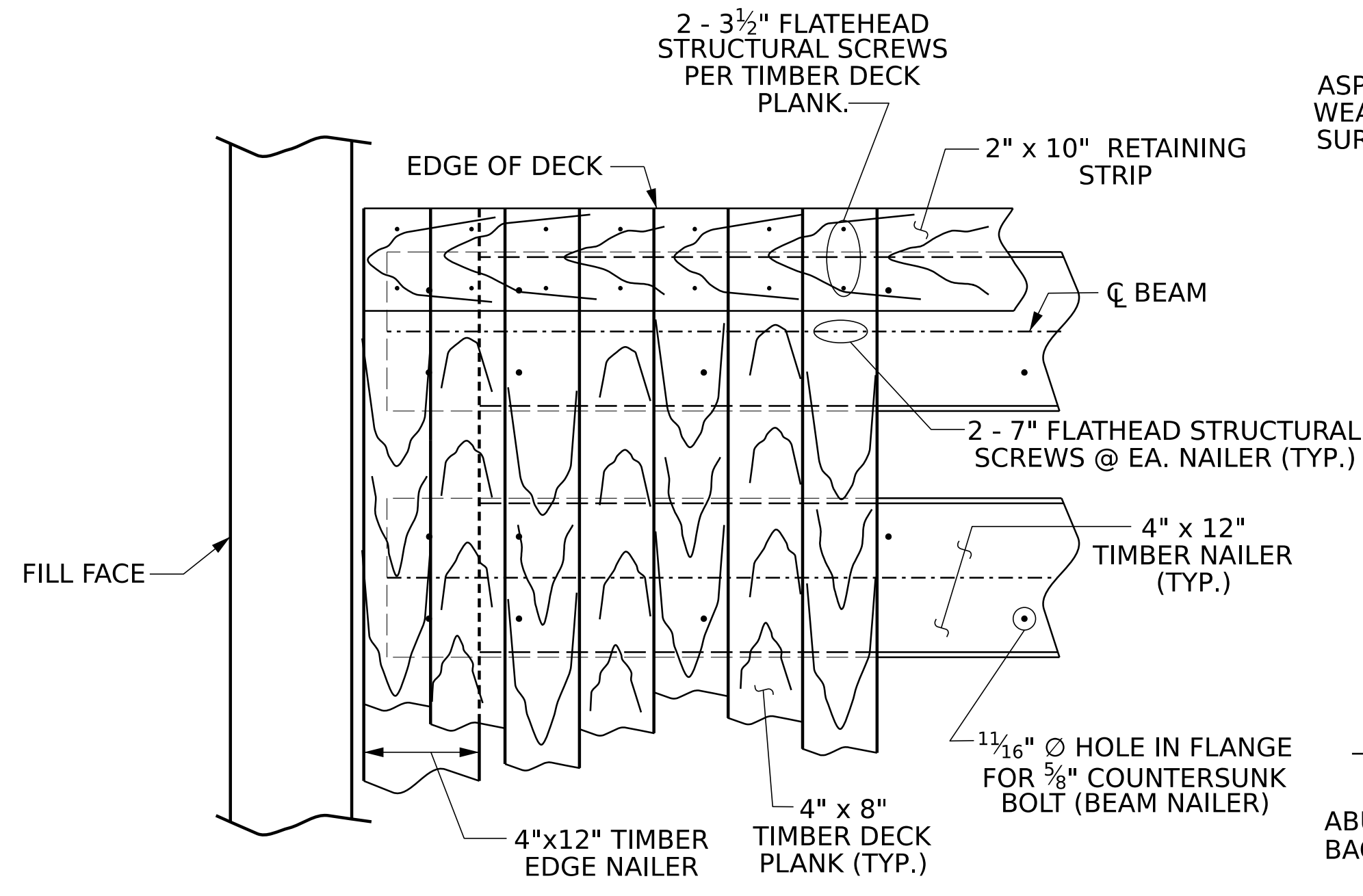
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S-7  
TOTAL SHEETS  
18

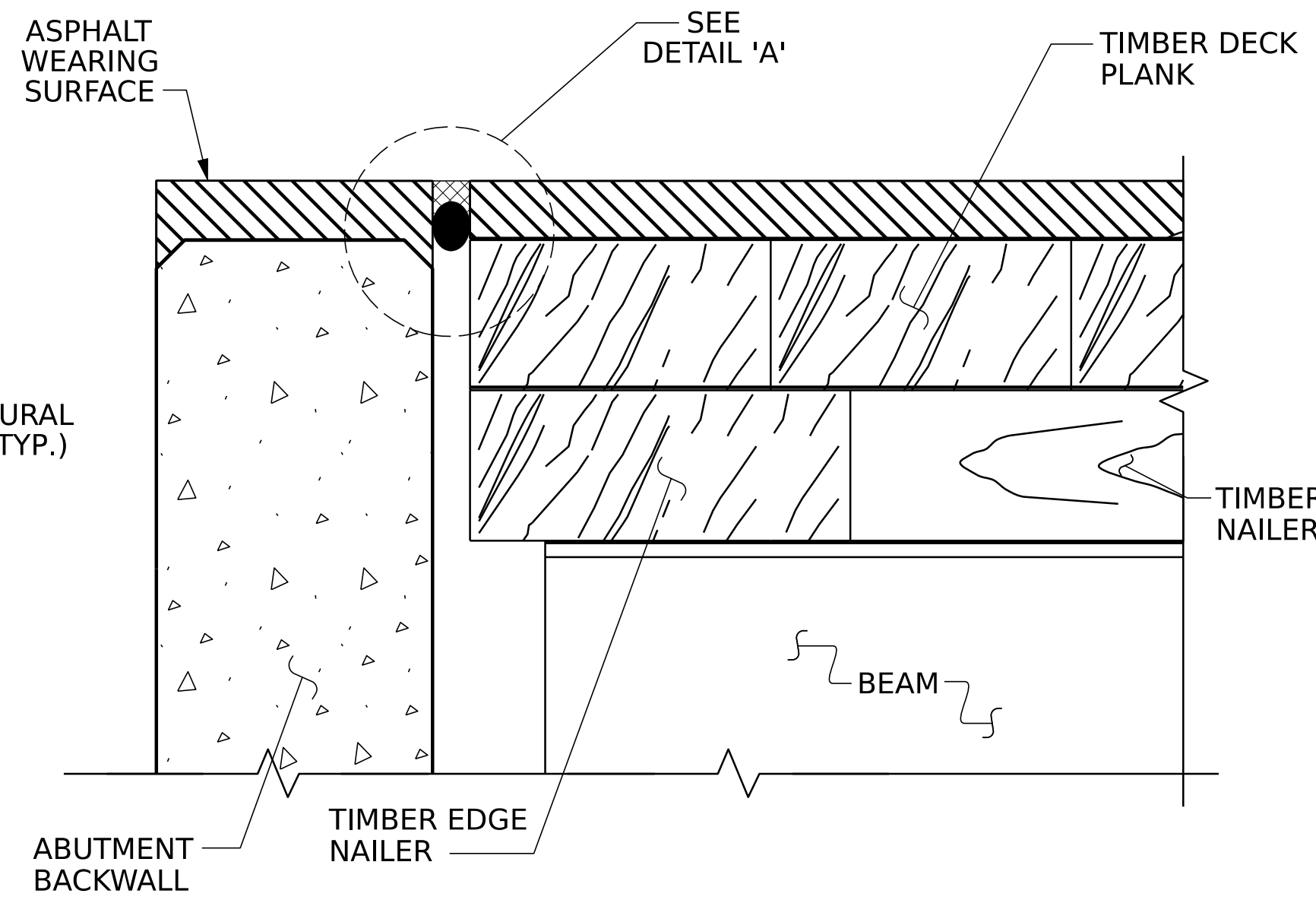


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Raleigh, NC 27606

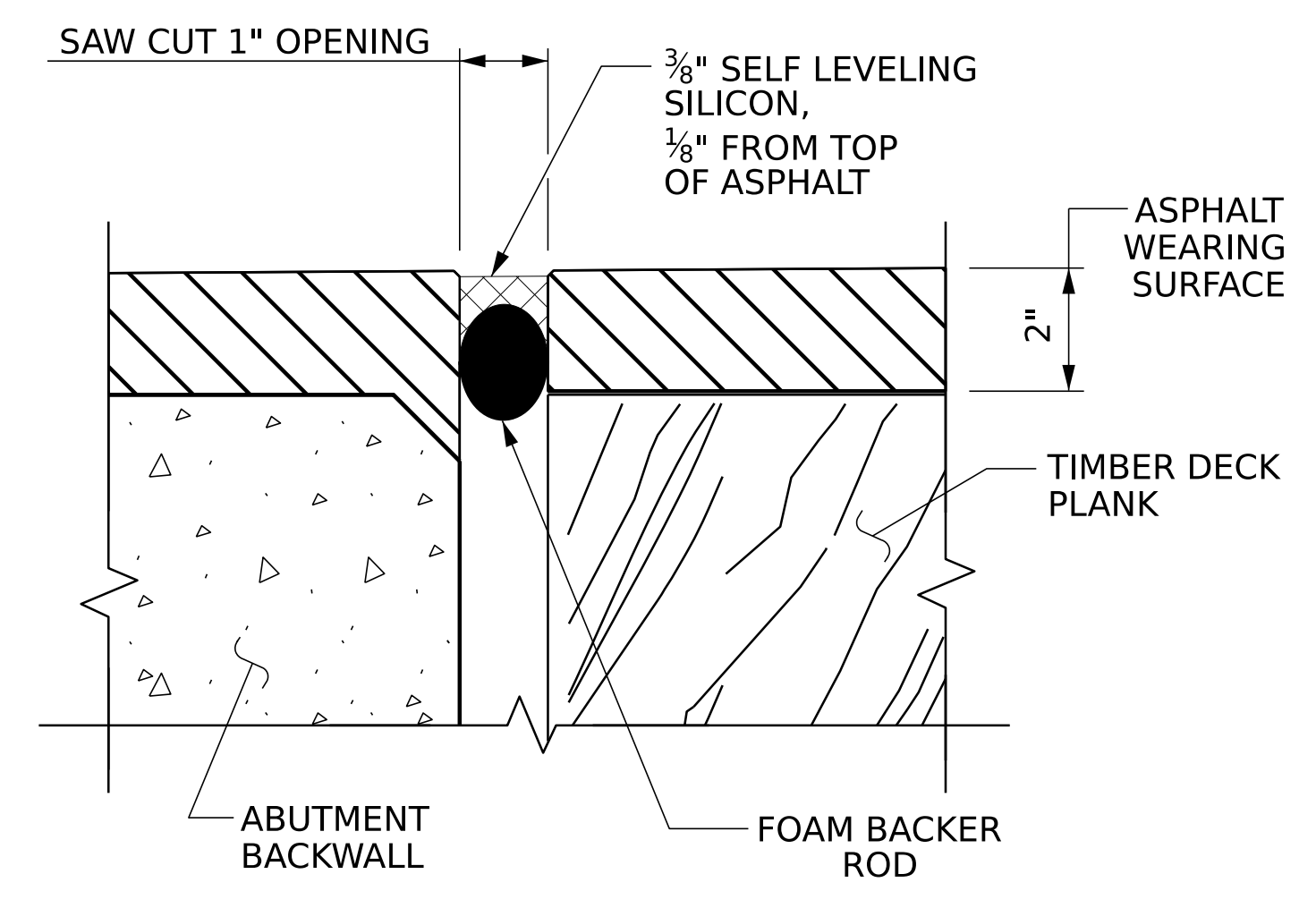
DRAWN BY : <b>C.P. MALAGON</b>	DATE : <b>06/2025</b>
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DESIGN ENGINEER OF RECORD: <b>E.C. PHELPS</b>	DATE : <b>07/2025</b>



**TYPICAL DECK DETAIL AT ABUTMENT**

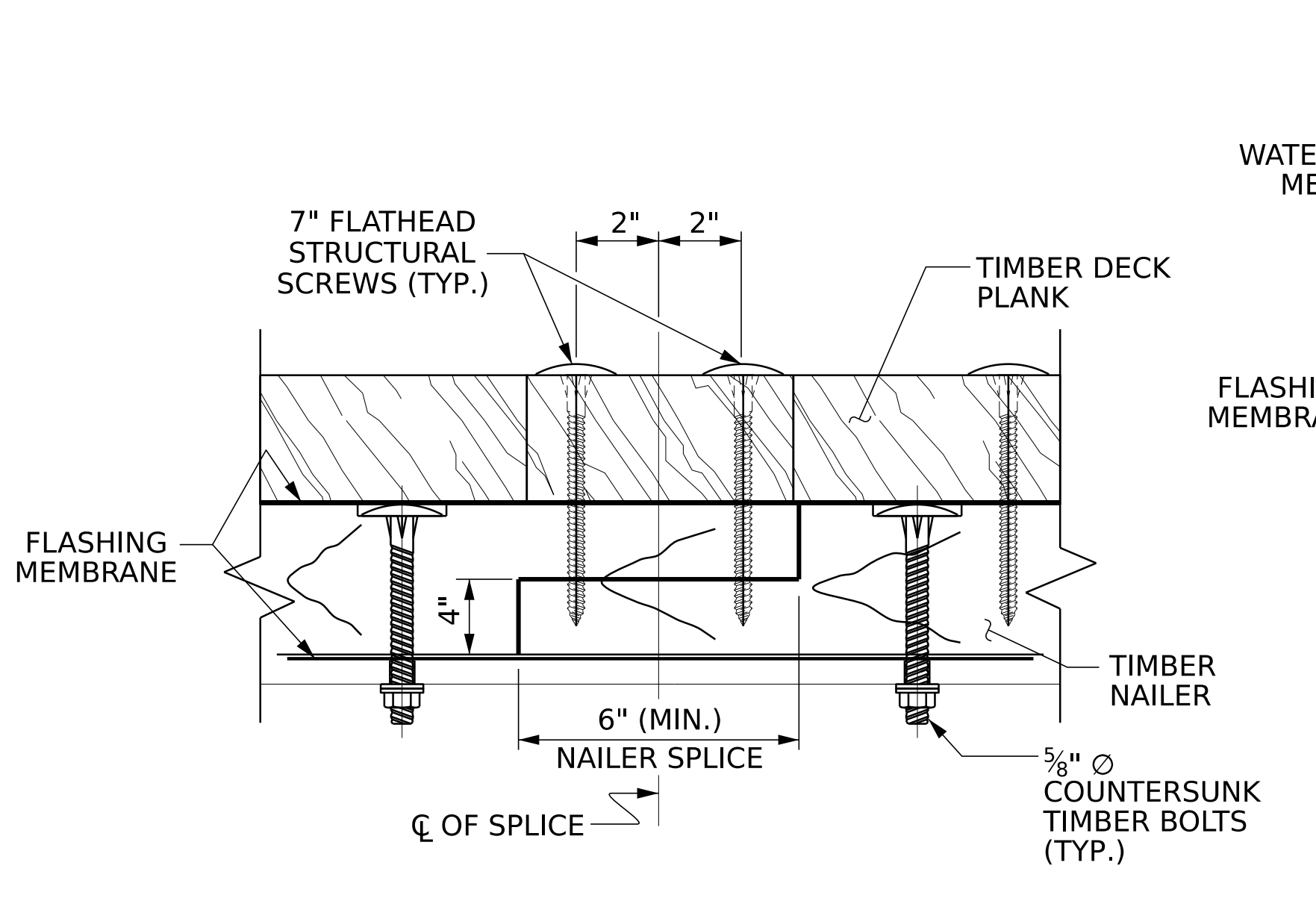


**PROPOSED POURABLE SILICONE JOINT DETAIL**

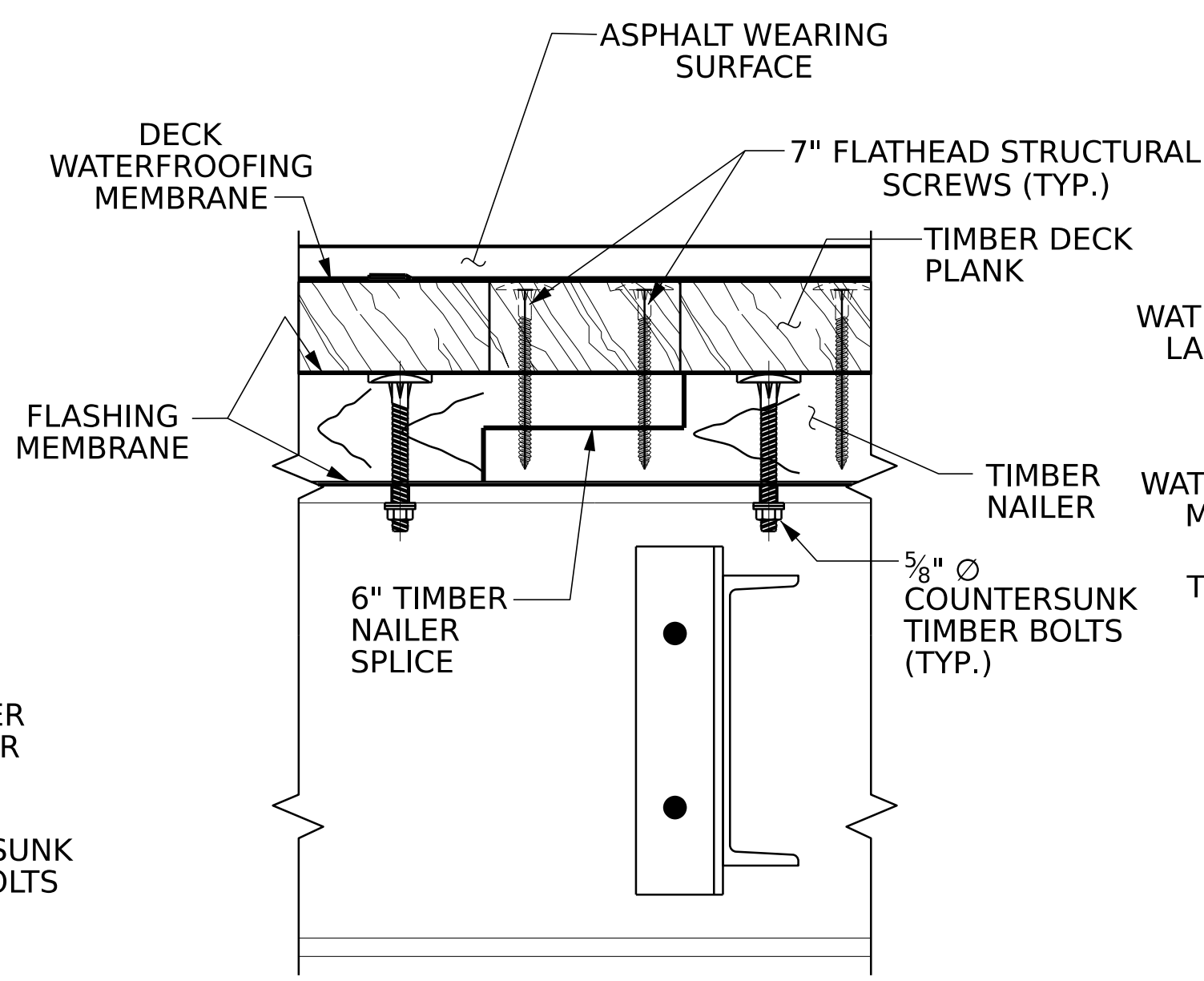


**DETAIL 'A'**

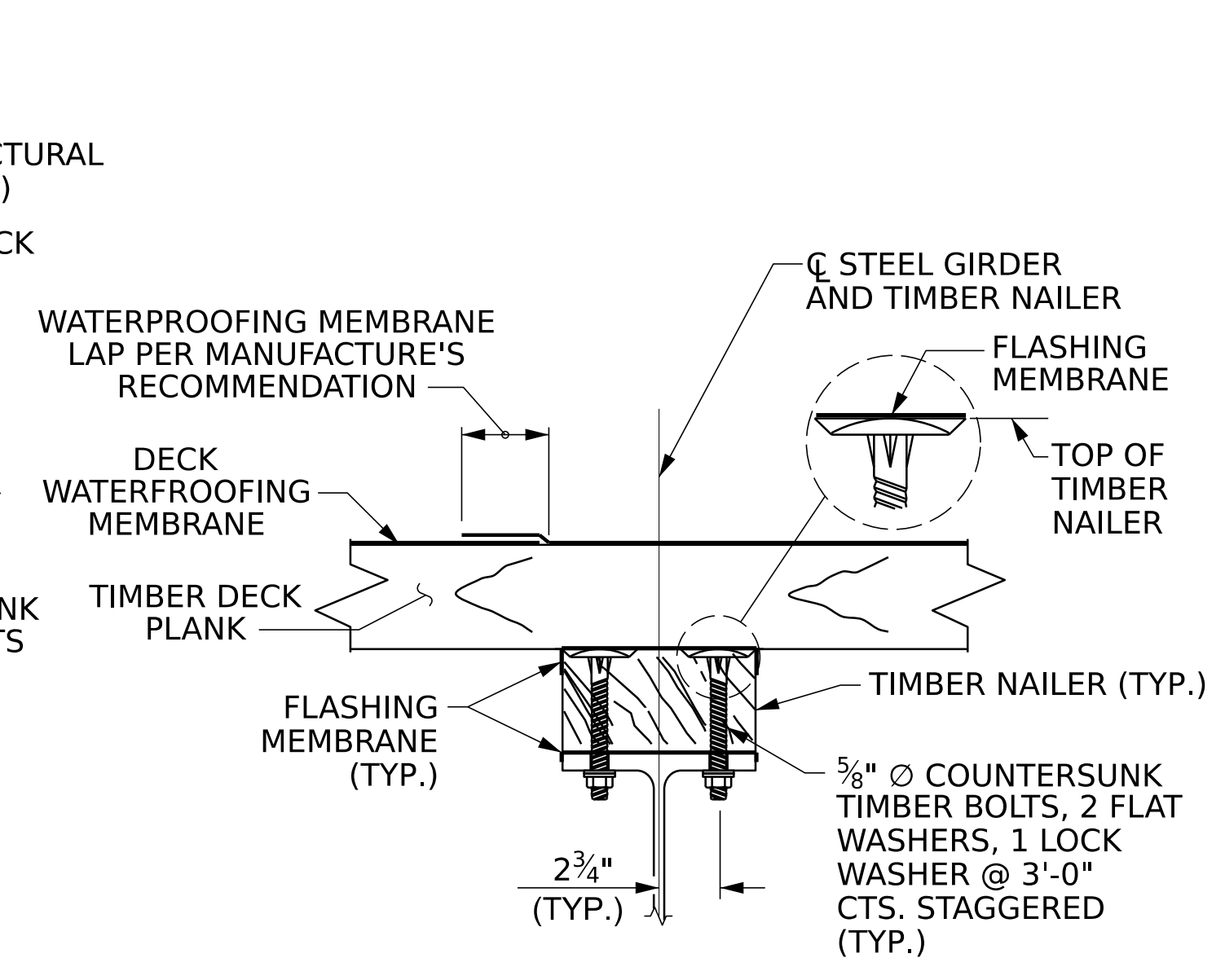
BILL OF MATERIAL FOR 35 FT. SPAN			
<b>TREATED LUMBER</b>			
ITEM	SIZE	LIN. FT.	
TIMBER DECK PLANKS	4"x8"	1878.2	
TIMBER NAILERS	4"x12"	468.4	
TIMBER EDGE NAILERS	4"x12"	63.7	
TOTAL TREATED LUMBER _____ 2410.3 LIN. FT.			
<b>FLASHING MEMBRANE</b>			
ITEM	SIZE	LIN. FT.	
TOP OF BEAM	25 MILS	490.0	
TOP OF TIMBER NAILERS	25 MILS	468.4	
TOP OF TIMBER EDGE NAILERS	25 MILS	63.7	
FLASHING MEMBRANE _____ 1022.1 LIN. FT.			
<b>HARDWARE</b>			
ITEM	Nos.	SIZE	LBS.
3/8" Ø TIMBER BOLTS	392	5/8"	548.8
HEAVY HEX NUTS	392	5/8"	47.0
STANDARD WASHER	392	5/8"	30.6
LOCK WASHER	392	5/8"	30.6
FLAT HEAD STR. SCREWS	1652	7"	16.5
HARDWARE FOR CONNECTIONS _____ 673.6 LBS.			
<b>DECK WATERPROOFING MEMBRANE</b>			
ITEM	SIZE	SQ. YDS	
DECK WATERPROOFING MEMBRANE	65 MILS.	125.0	
<b>DRIP EDGE</b>			
ITEM	SIZE	LIN. FT.	
22 GA. ALUMINUM DRIP EDGE	1'-0"	70.67	



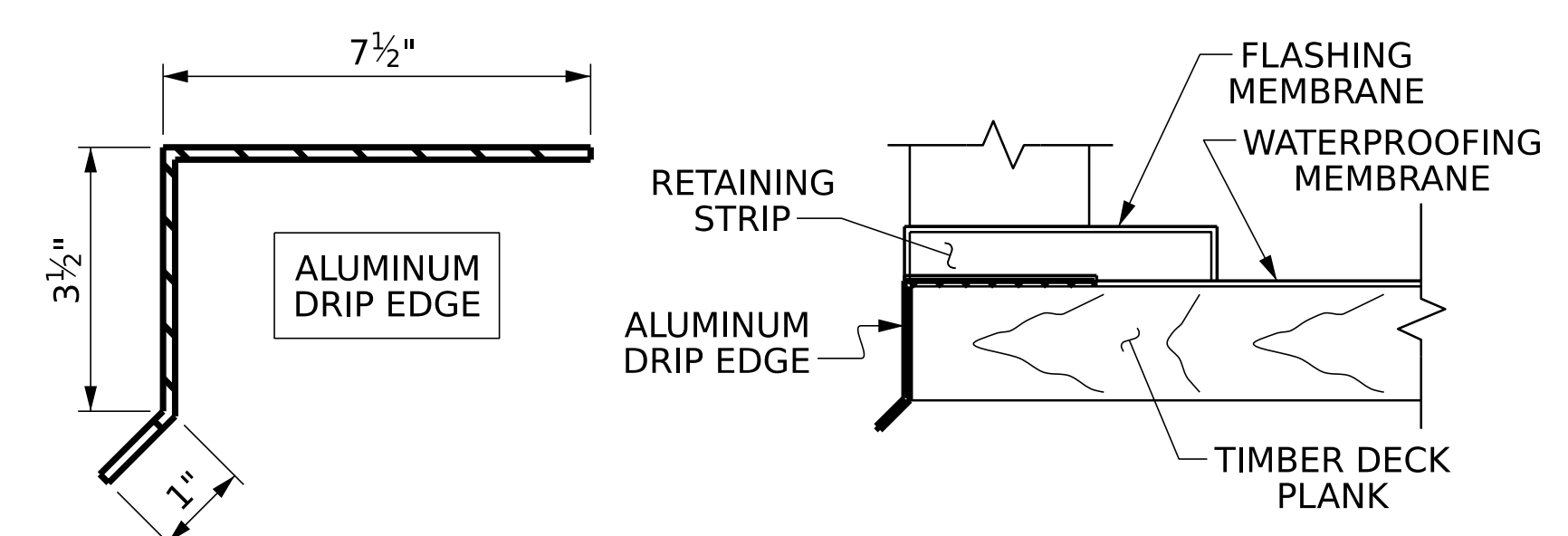
**NAILER SPLICE DETAILS**



**SECTION B-B**  
NAILER SPLICE & TIMBER PLANK ATTACHMENT DETAILS

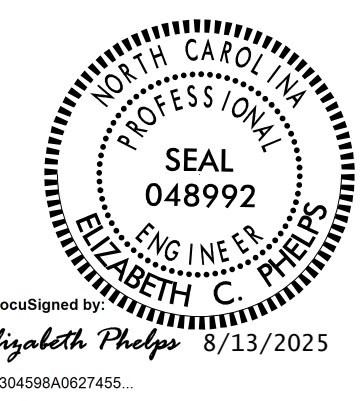


**SECTION A-A**  
TIMBER NAILER ATTACHMENT DETAILS



**DRIP EDGE DETAILS**  
POST AND BOLTS NOT SHOWN FOR CLARITY

PROJECT NO. **DF18311.2095784**  
**WATAUGA** COUNTY  
 STATION: **10+34.50 -L-**  
 SHEET 3 OF 5



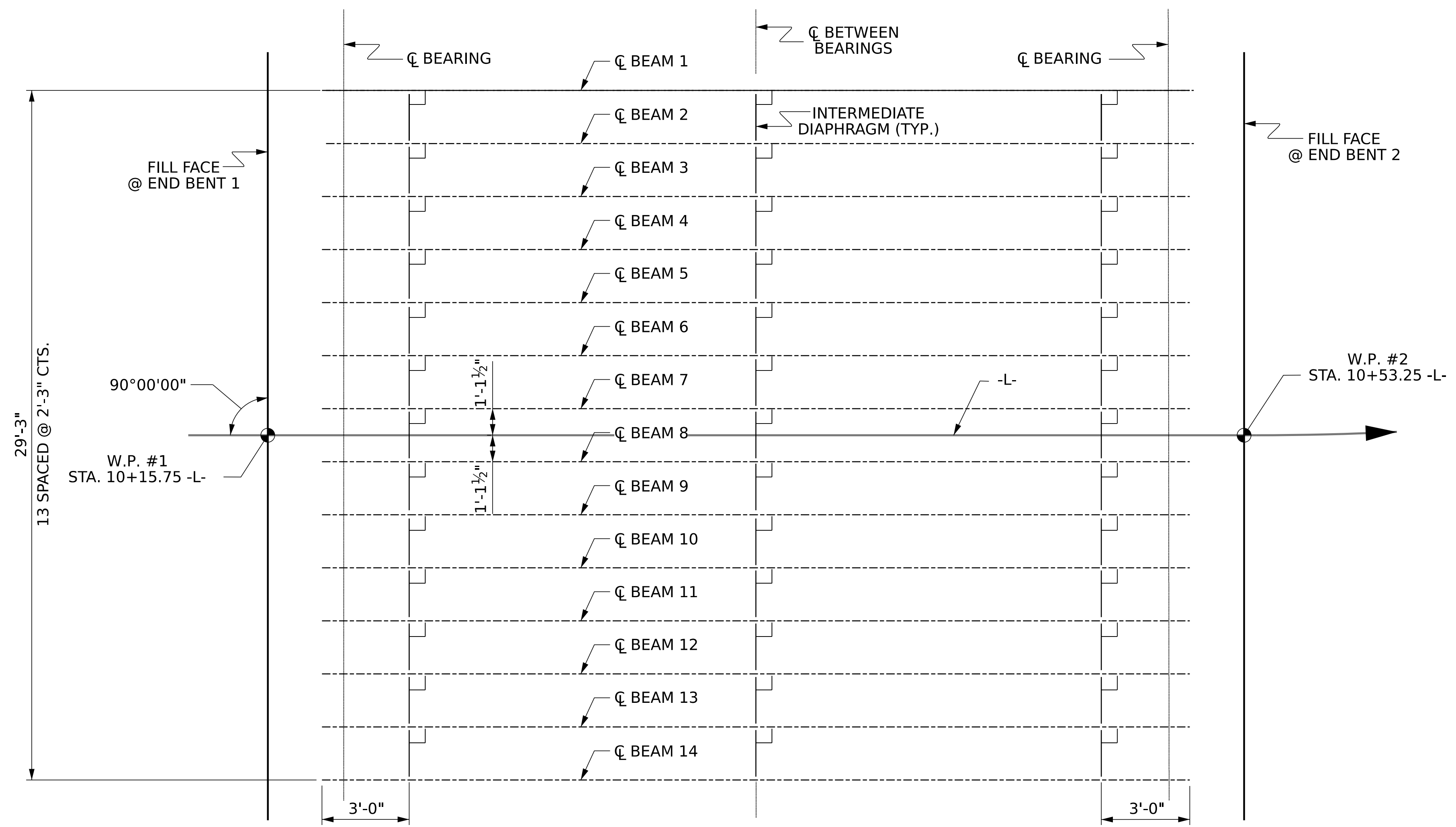
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**STANDARD SUPERSTRUCTURE PLAN OF SPAN DETAILS**

REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

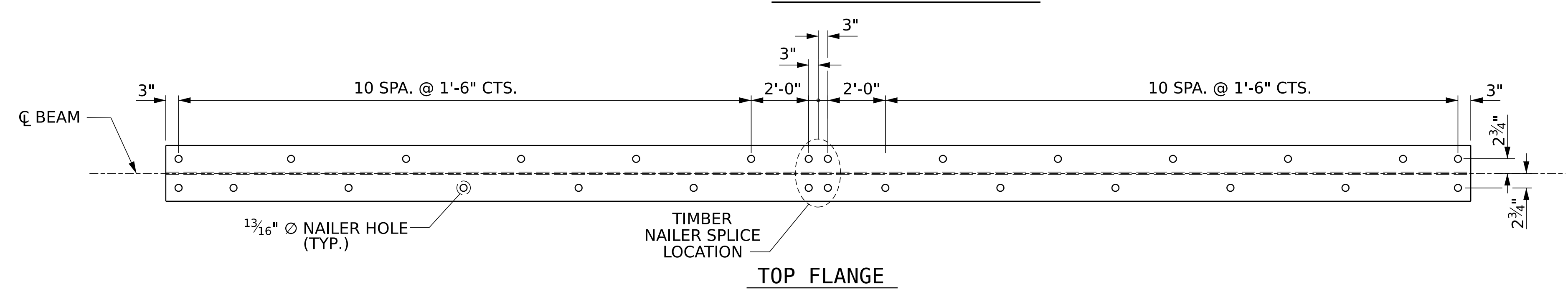
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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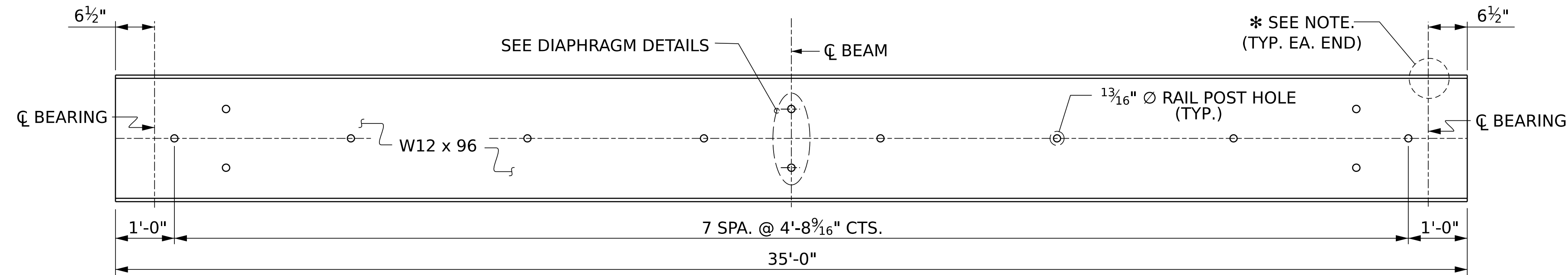
DRAWN BY : **C.P. MALAGON** DATE : **06/2025**  
 CHECKED BY : **E.C. PHELPS** DATE : **06/2025**  
 DESIGN ENGINEER OF RECORD: **E.C. PHELPS** DATE : **07/2025**



**FRAMING PLAN**



**TOP FLANGE**

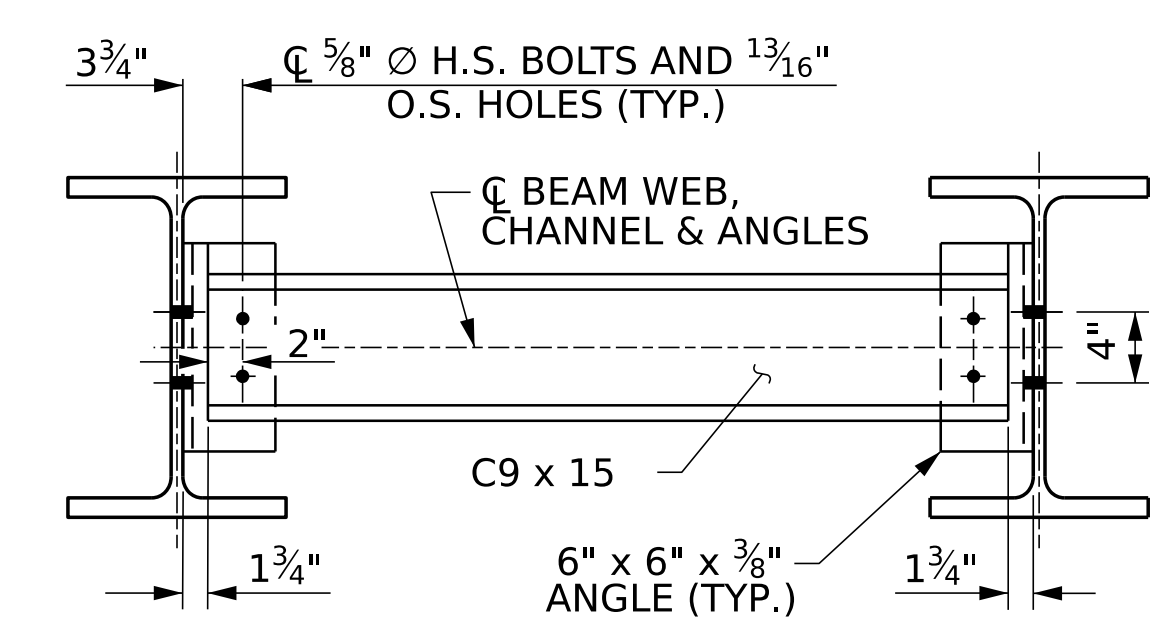


**ELEVATION**

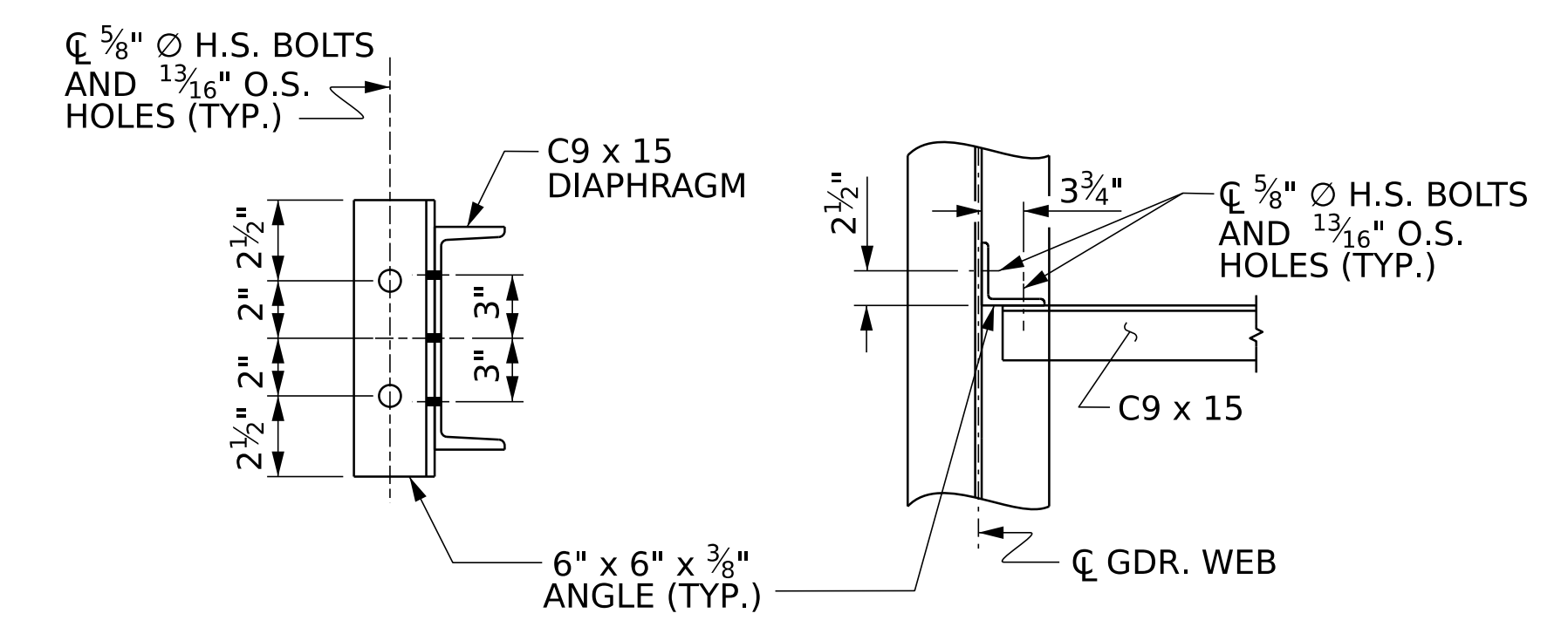
(SHOWING RAIL POST HOLES FOR EXTERIOR BEAMS  
INTERIOR BEAMS ARE SIMILAR BUT WITHOUT RAIL POST HOLES)

**BEAM DETAILS**

- NOTES**
- NO SALVAGED BEAMS SHALL BE USED, UNLESS OTHERWISE NOTED ON THE PLANS.
  - NO SHOP CAMBER REQUIRED, TURN NATURAL MILL CAMBER UP.
  - ALL STRUCTURAL STEEL FIELD CONNECTIONS SHALL BE 5/8" DIA. GALVANIZED HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.
  - BEAMS SHALL BE PLACED PARALLEL TO THE CHORD.
  - CONTRACTORS OPTION TO WELD CONNECTOR TO BEAM PRIOR TO SHOP COATING.
  - SEE GENERAL DRAWING NOTES FOR COATING.
  - \* FOR SIZE AND LOCATION OF OPTIONAL BOLTED SOLE PLATE, SEE BEARING DETAILS SHEET.



**INTERIOR DIAPHRAGM DETAIL**



**ANGLE DETAIL**

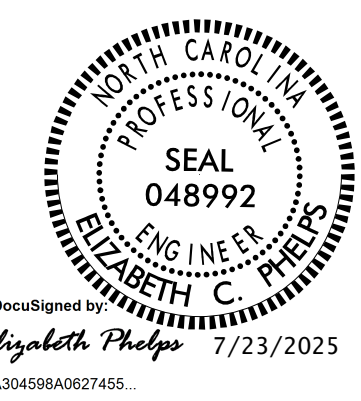


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 SHEET 4 OF 5



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 SUPERSTRUCTURE  
**FRAMING PLAN FOR  
 35' BEAM LENGTH  
 90° SKEW**

REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

TOTAL SHEETS: 18

### NOTES

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

AT ALL SUPPORTS, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 36.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS, AND WASHERS. SHOP INSPECTION IS REQUIRED.

AT THE APPROVAL OF THE ENGINEER, SOLE PLATES AT THE EXPANSION END MAY BE FIELD WELDED.

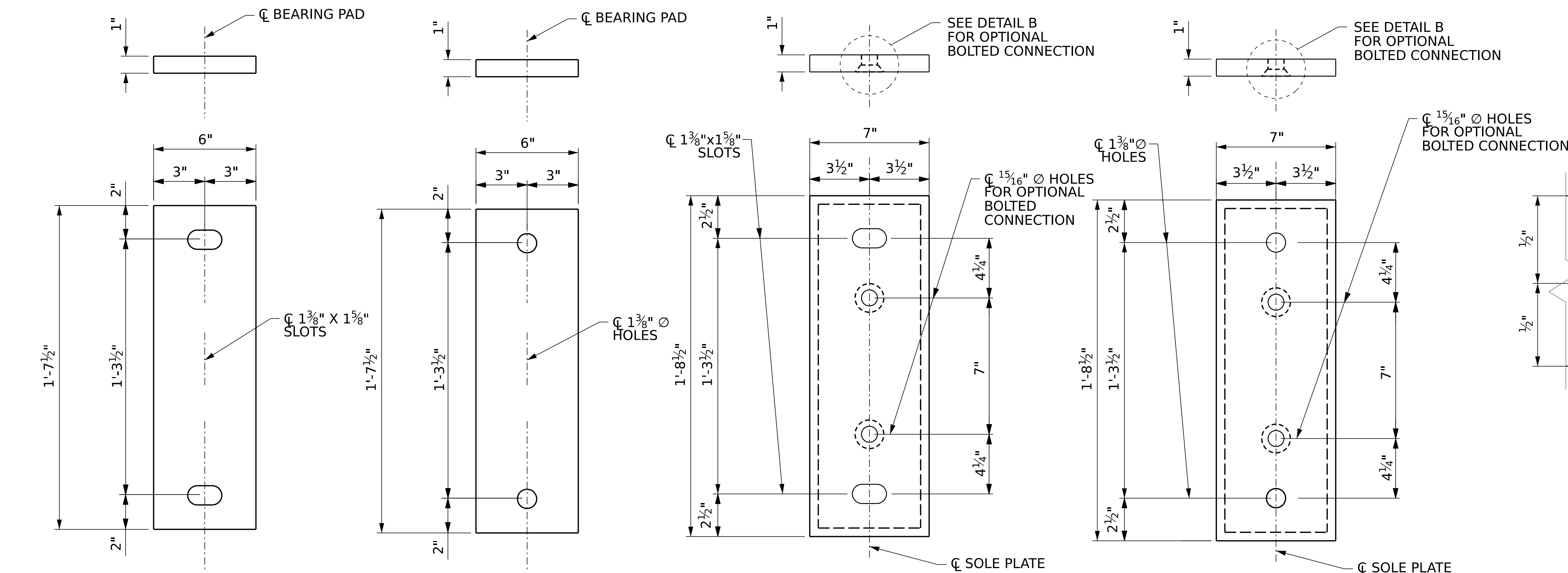
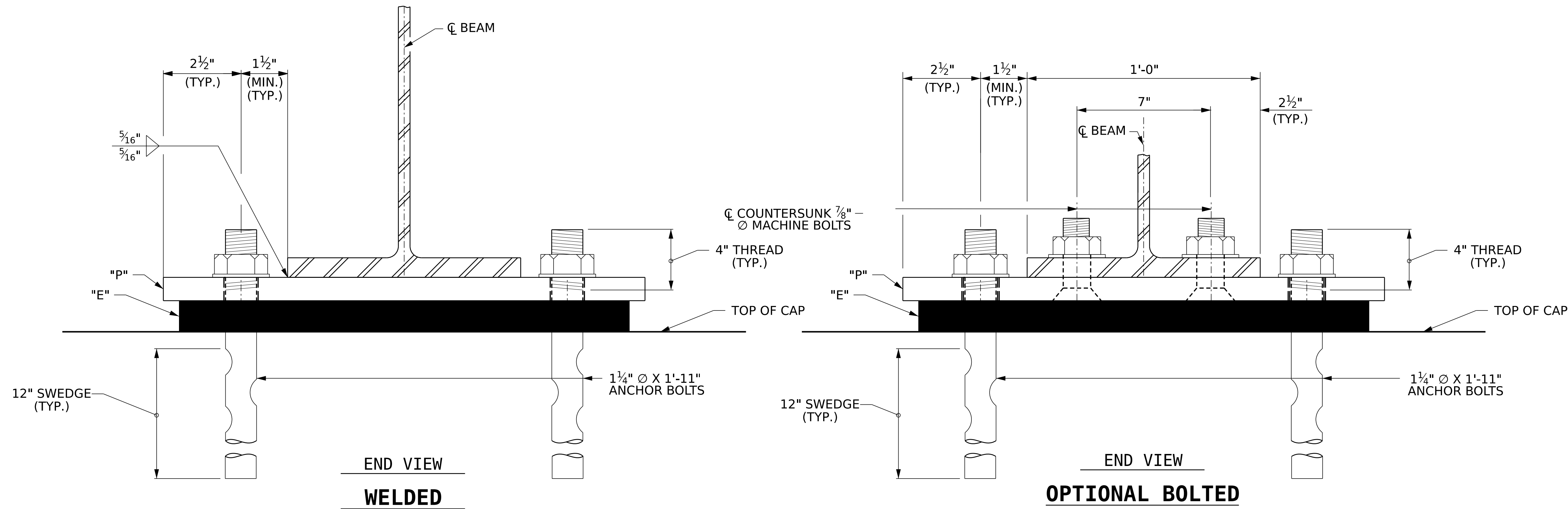
WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300° F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

AT NO ADDITIONAL COST TO THE DEPARTMENT, THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CAST-IN-PLACE ANCHORS. LEVEL 1 FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ANCHOR BOLT IS 30 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.

ADHESIVELY ANCHORED ANCHOR BOLTS SHALL BE THREADED FULL LENGTH.

AT THE APPROVAL OF THE ENGINEER, THE OPTIONAL BOLTED SOLE PLATE MAY BE USED AT NO ADDITIONAL COST TO THE DEPARTMENT.



**E1 ELASTOMERIC BEARING DETAILS**  
14 REQ'D EXPANSION

**E2 ELASTOMERIC BEARING DETAILS**  
14 REQ'D FIXED

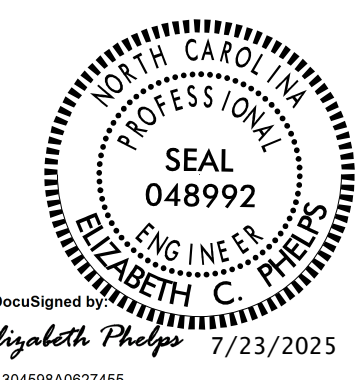
**P1 SOLE PLATE DETAILS**  
14 REQ'D EXPANSION

**P2 SOLE PLATE DETAILS**  
14 REQ'D FIXED

**DETAIL B**

PROJECT NO. **DF18311.2095784**  
**WATAUGA** COUNTY  
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SHEET 5 OF 5



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
**BEARING DETAILS  
TYPE III**

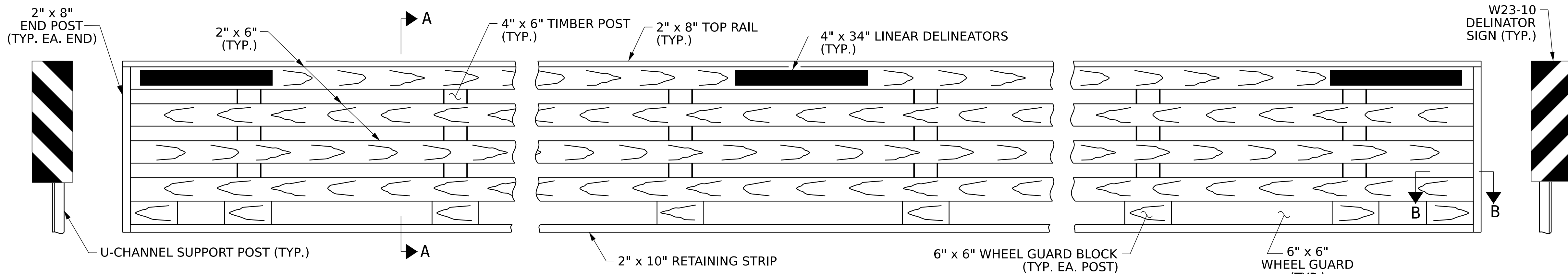
DRAWN BY : **C.P. MALAGON** DATE : **06/2025**  
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DESIGN ENGINEER OF RECORD: **E.C. PHELPS** DATE : **07/2025**

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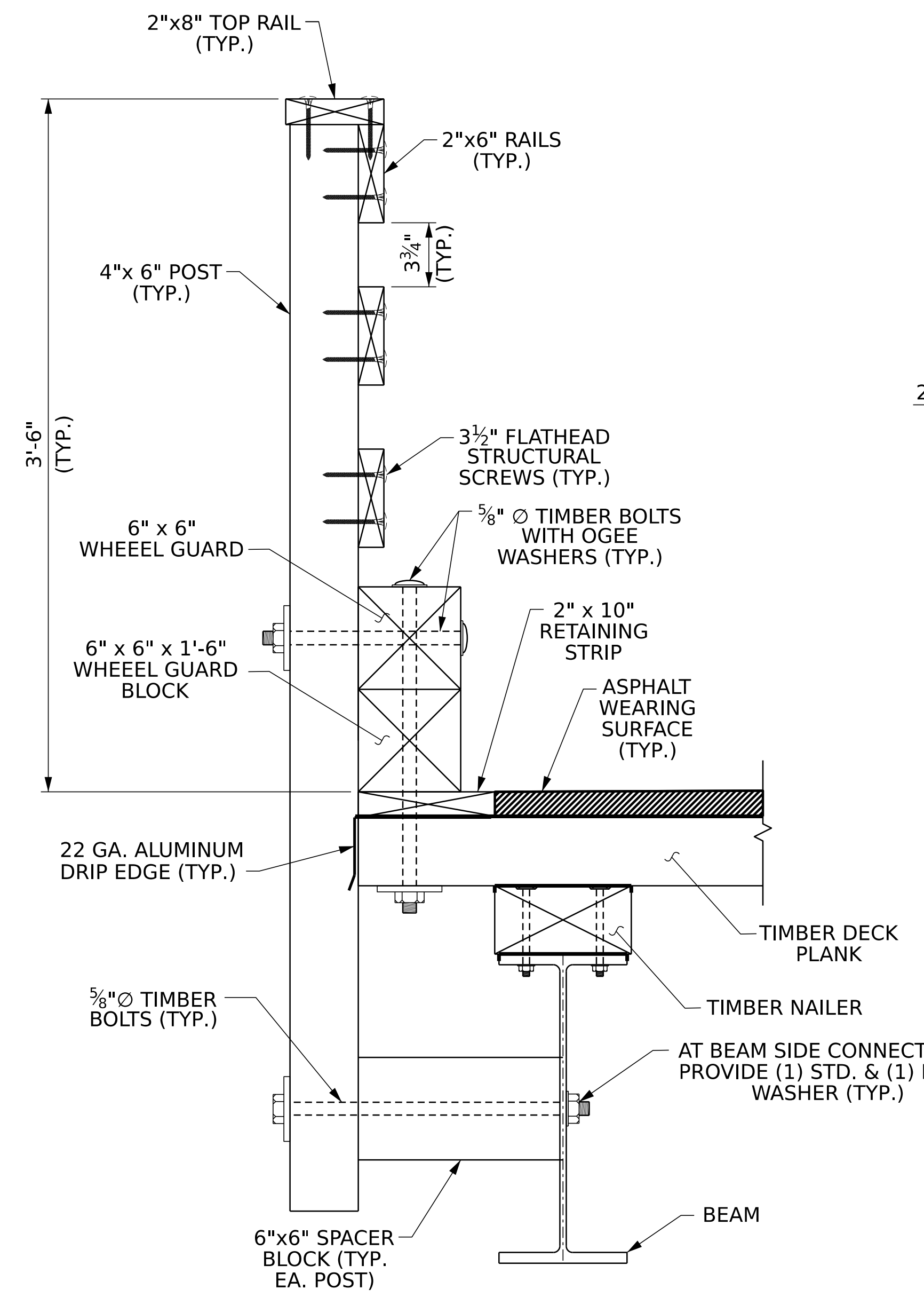
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NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		

TOTAL SHEETS: 18

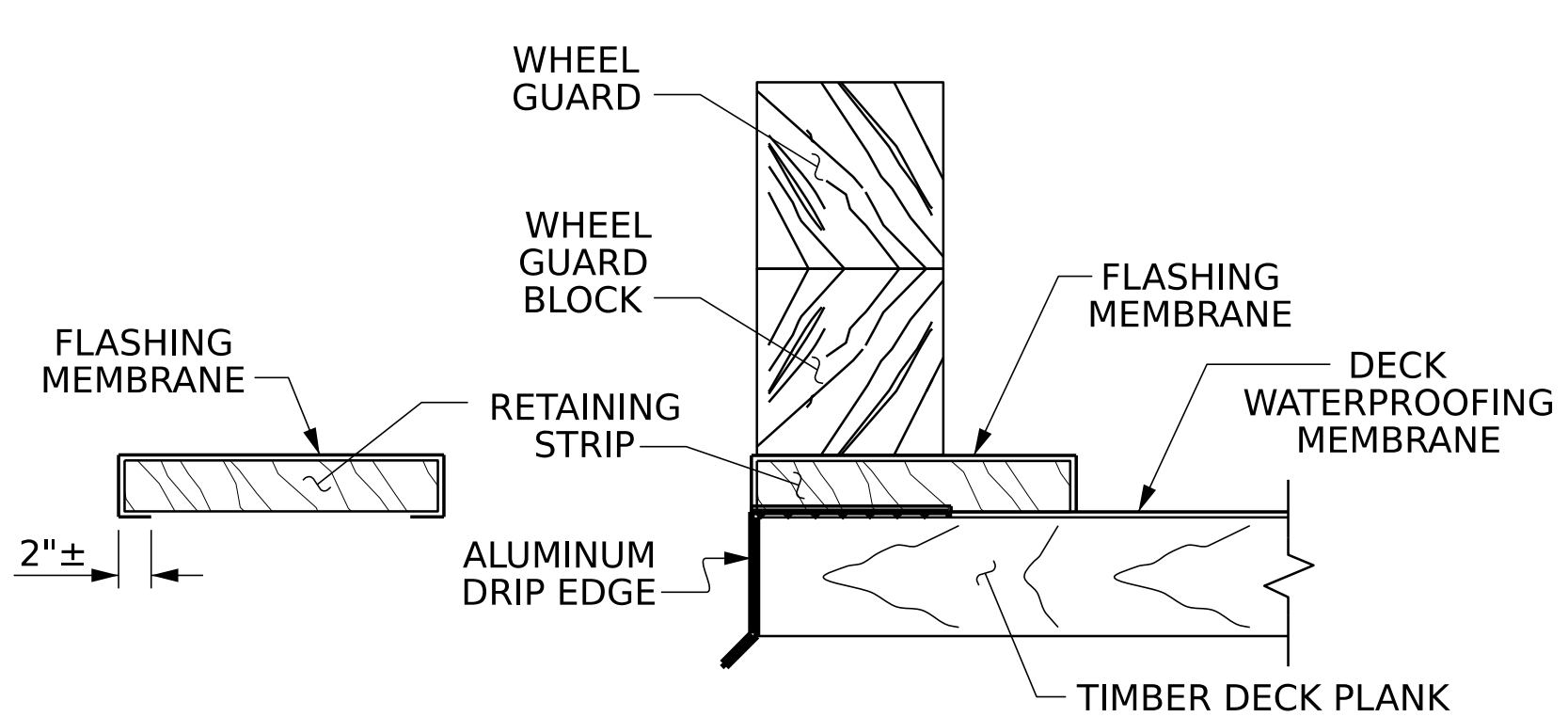




**ELEVATION**

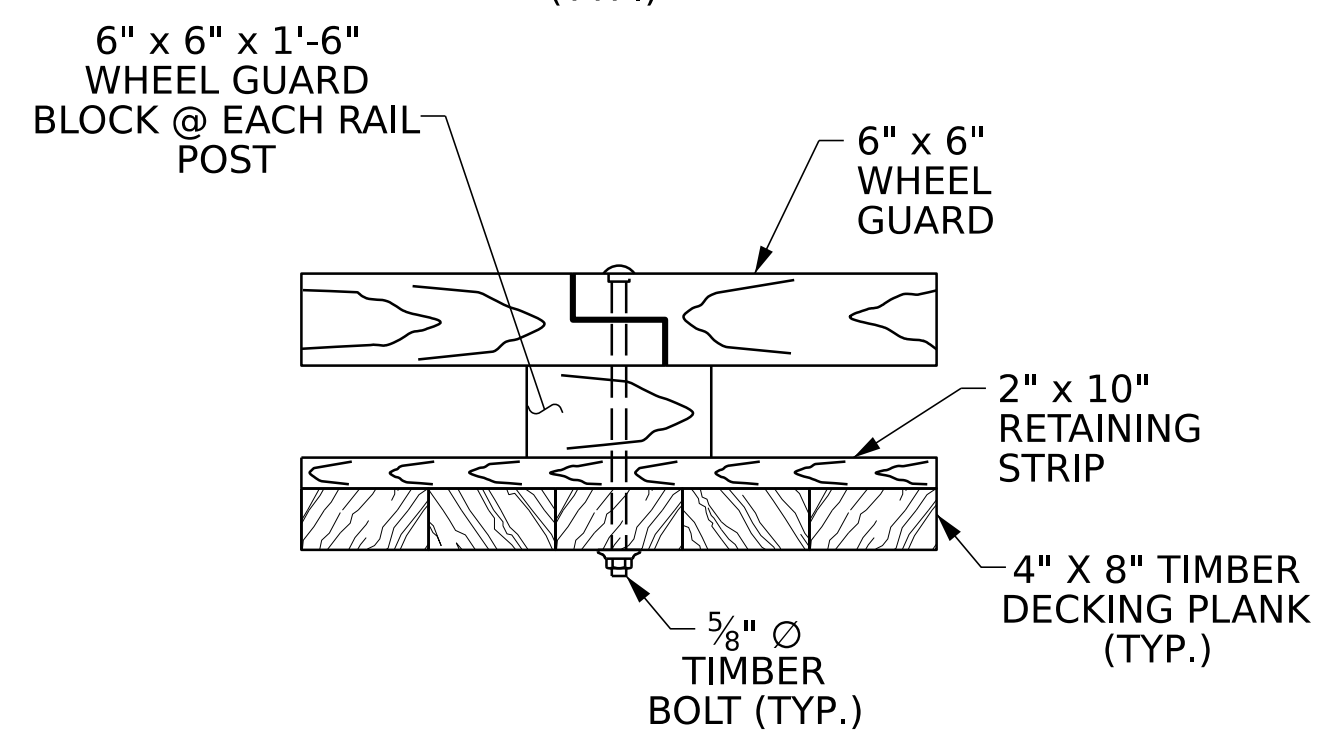


**SECTION A-A**

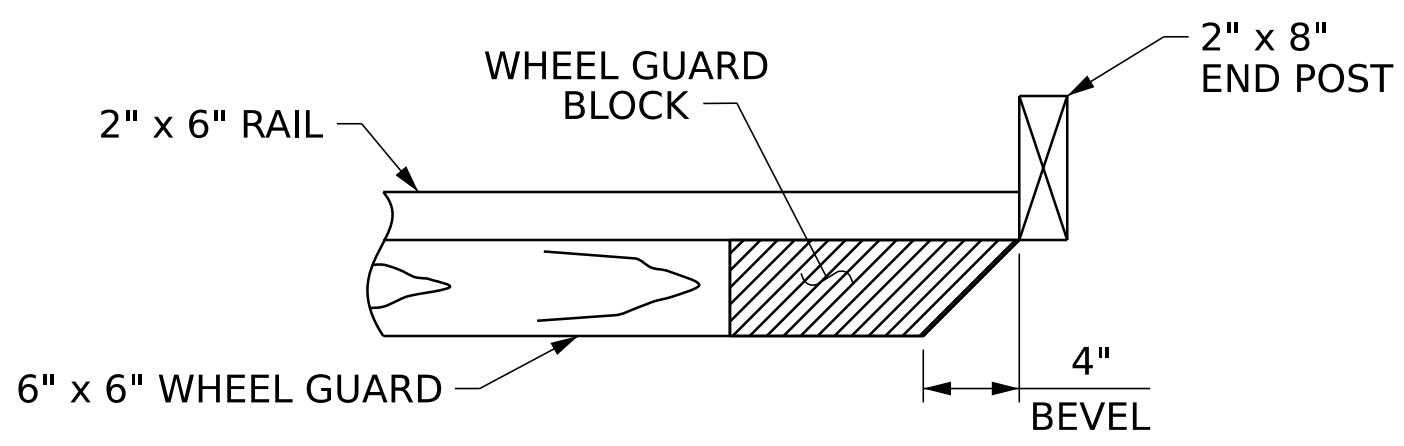


**RETAINING STRIP DETAILS**

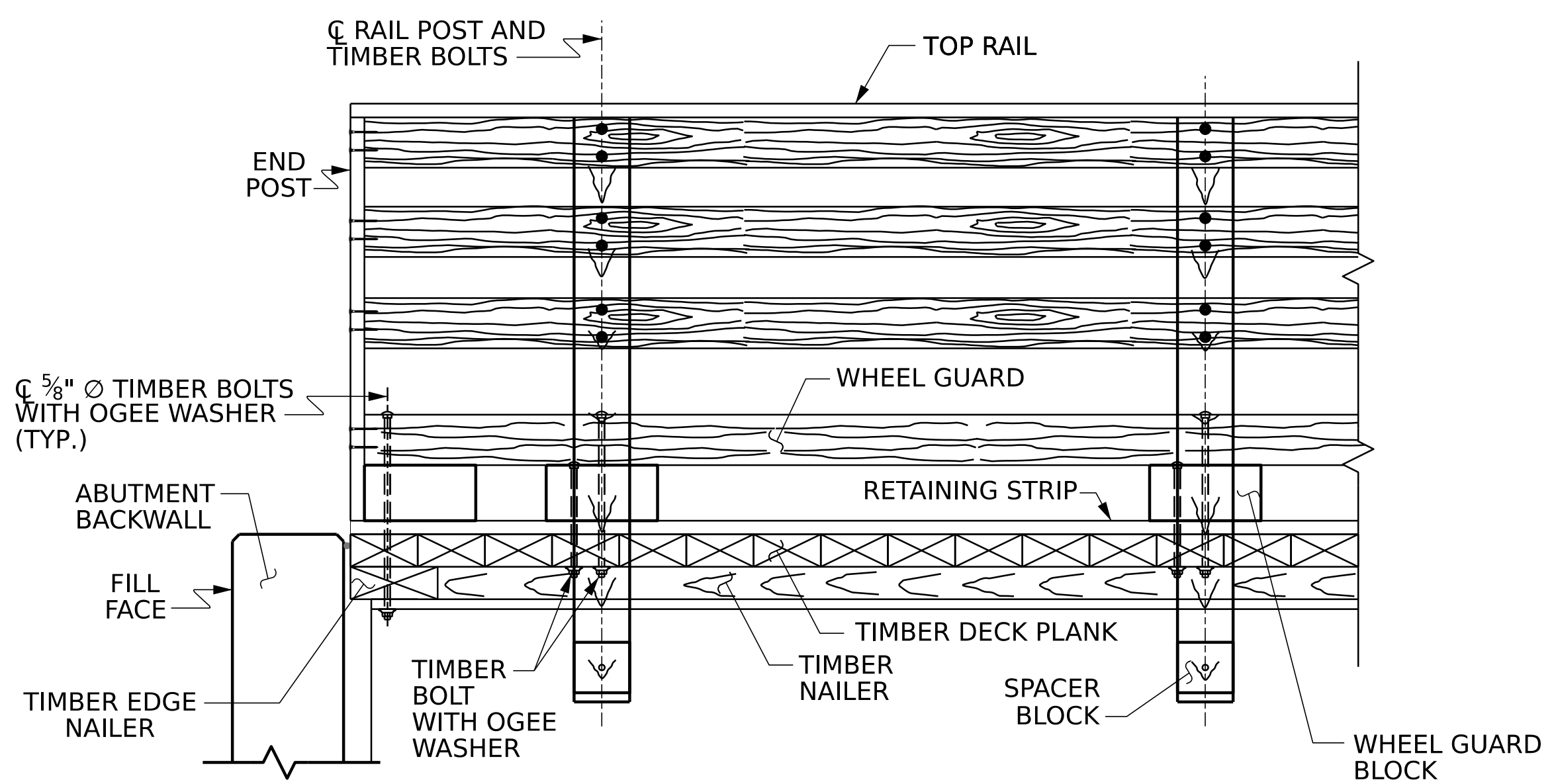
POST AND BOLTS NOT SHOWN FOR CLARITY



**WHEEL GUARD SPLICE DETAIL**



**VIEW B-B**



**RAIL DETAIL AT ABUTMENTS**

**BILL OF MATERIAL FOR ONE RAIL 35 FT (2 REQ.D)**

TREATED LUMBER		
ITEM	SIZE	LIN. FT.
RAILS	2"x 6"	105.00
RAIL POSTS	4"x 6"	48.00
TOP RAIL	2"x 8"	35.50
WHEEL GUARD	6"x 6"	35.50
WHEEL GUARD BLOCK	6"x 6"	12.00
RETAINER STRIP	2"x 10"	35.50
END POSTS	2"x 8"	12.00
SPACER BLOCK	6"x 6"	6.56

FLASHING MEMBRANE		
ITEM	SIZE	LIN. FT.
MEMBRANE FOR RETAINER STRIP	1'-6"	35.50

HARDWARE			
ITEM	Nos.	SIZE	LBS.
TIMBER BOLTS (WHEEL GUARD)	8	5/8" Ø	11.20
TIMBER BOLTS (SPACE BLOCK)	8	5/8" Ø	11.20
TIMBER BOLTS (RAIL)	8	5/8" Ø	18.40
HEAVY HEX NUTS	24	3/8" Ø	2.88
FLATHEAD STR. SCREWS	198	3 1/2"	2.19
STANDARD WASHER	8	5/8" Ø	0.73
LOCK WASHER	8	5/8" Ø	0.73
OGEE WASHERS	16	5/8" Ø	9.92

HARDWARE FOR CONNECTIONS APPROX. 57.24 LBS.

ACCESSORIES	
ITEM	Nos.
4 X 34 LINEAR DELINEATOR	5
W23-10 12x36 DELINEATOR	2
U-CHANNEL SUPPORT POST	2

PAY LENGTH = 35.5 LIN. FT.

**NOTES**

THE TIMBER BRIDGE RAIL SYSTEM SHALL NOT BE ATTACHED TO THE TIMBER BRIDGE DECK SYSTEM PRIOR TO THE TIMBER DECK WATERPROOFING MEMBRANE BEING INSTALLED.

BRIDGE RAILS SHALL BE CONTINUOUS FROM END POST TO END POST WITH NO GAPS. RAIL LUMBER LENGTHS SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

TREAT ALL DRILLED OR NEWLY EXPOSED HOLES IN TIMBER MEMBERS BY PUMPING WITH BITUMINOUS ASPHALT-BASED ROOFING CEMENT, OR APPROVED PRESERVATIVE SYSTEM BEFORE INSTALLING HARDWARE.

SEE PLAN OF SPAN SHEET FOR NUMBER OF POSTS AND POST SPACING.

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**STANDARD  
 TIMBER BRIDGE RAIL  
 SYSTEM**

REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

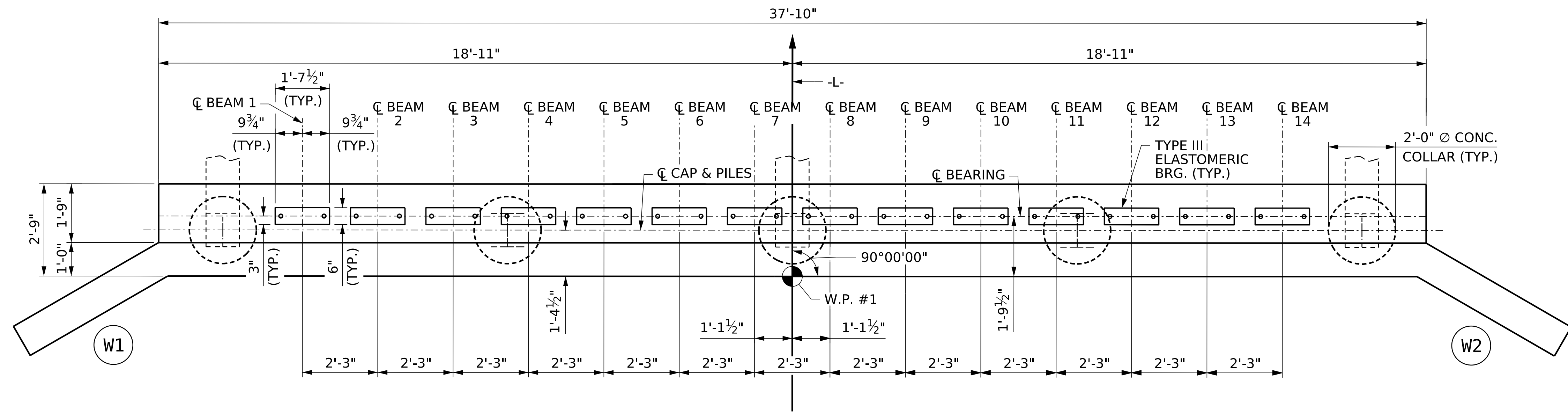
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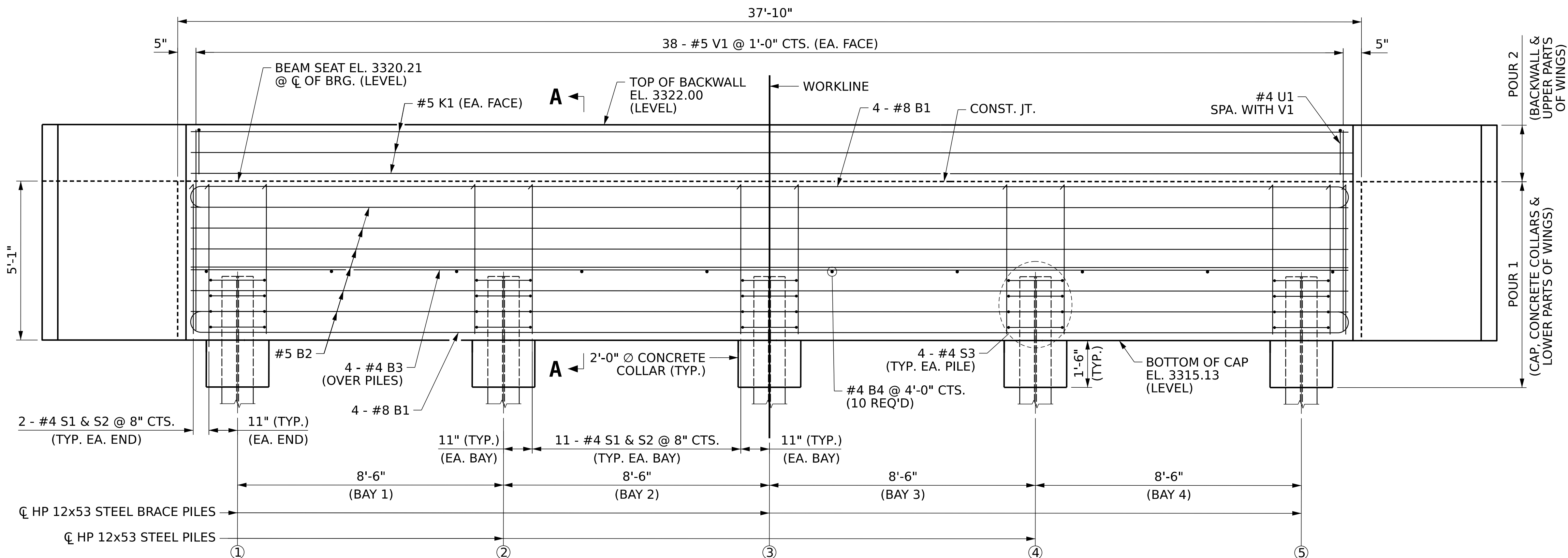


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DESIGN ENGINEER OF RECORD: E.C. PHELPS	DATE : 07/2025



PLAN



ELEVATION

NOTES

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR SECTION A-A, SEE SHEET 3 OF 3.

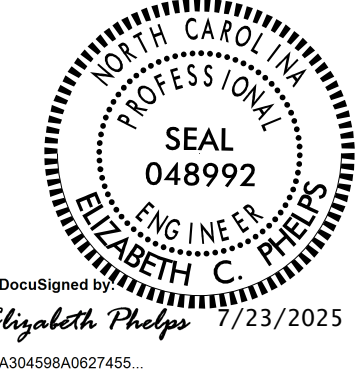
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

PROJECT NO. **DF18311.2095784**

**WATAUGA** COUNTY

STATION: **10+34.50 -L-**

SHEET 1 OF 3



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

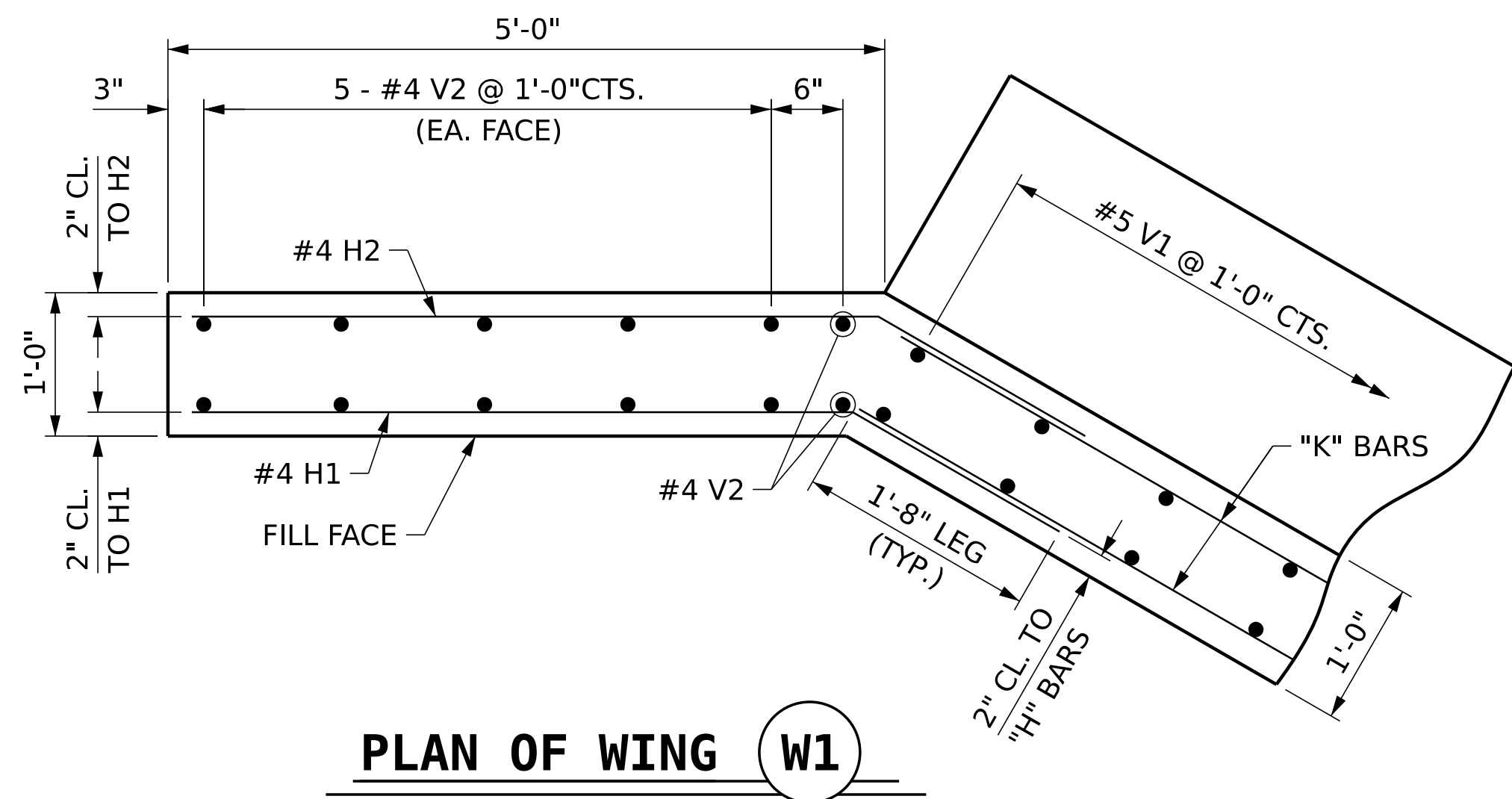
**SUBSTRUCTURE  
END BENT 1  
PLAN AND ELEVATION**

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			18

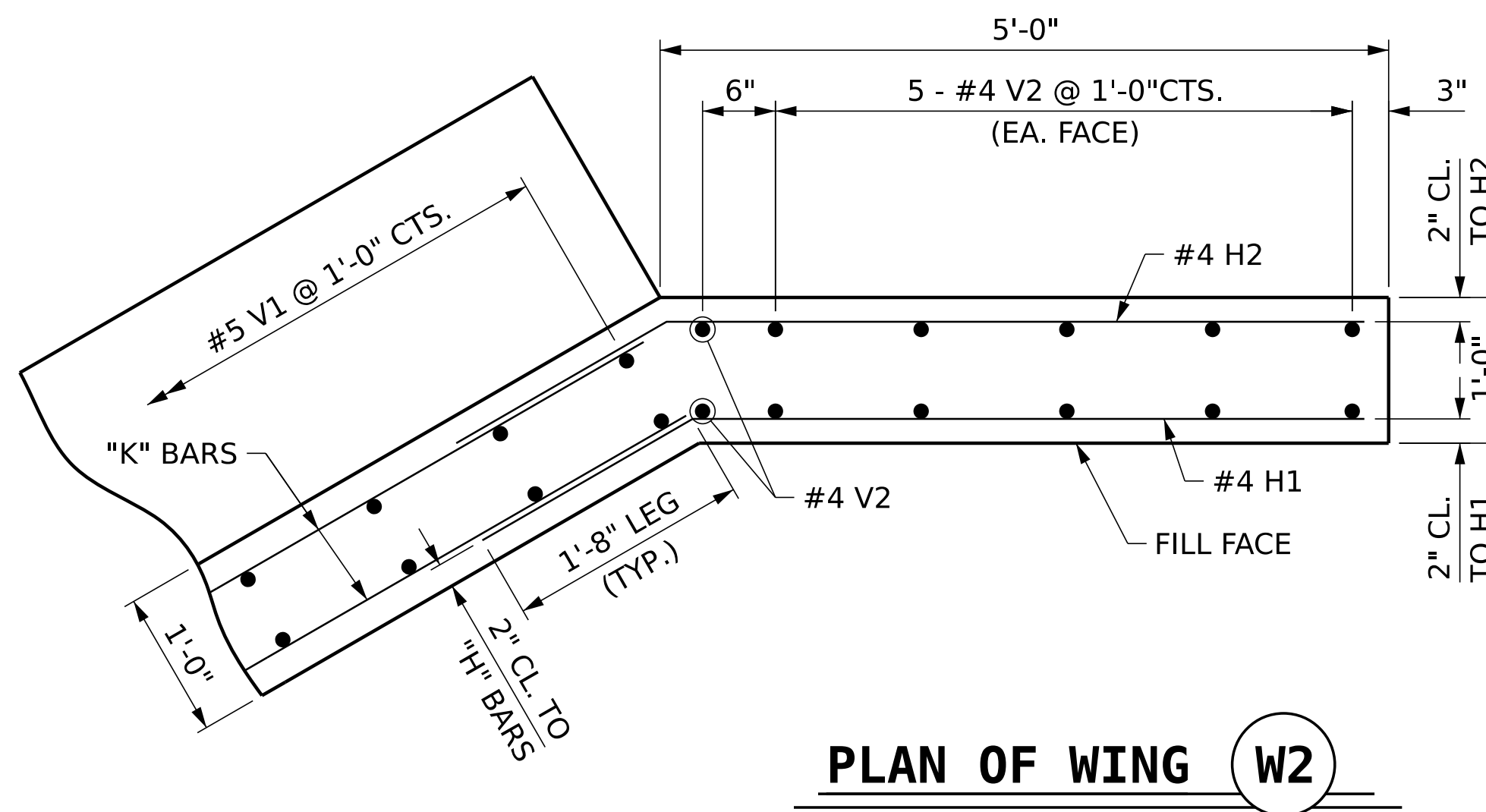
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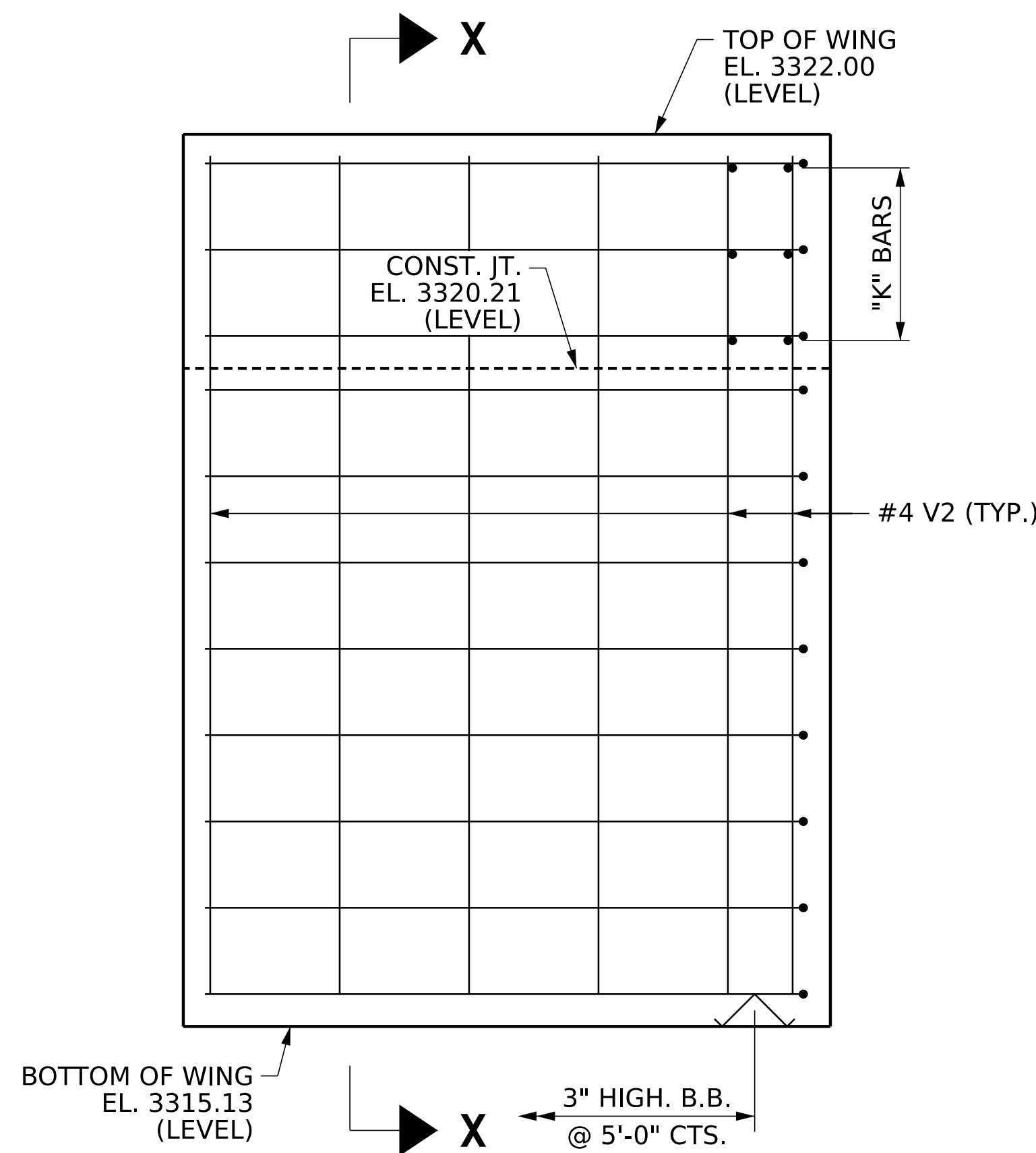
DRAWN BY : <b>C.P. MALAGON</b>	DATE : <b>06/2025</b>
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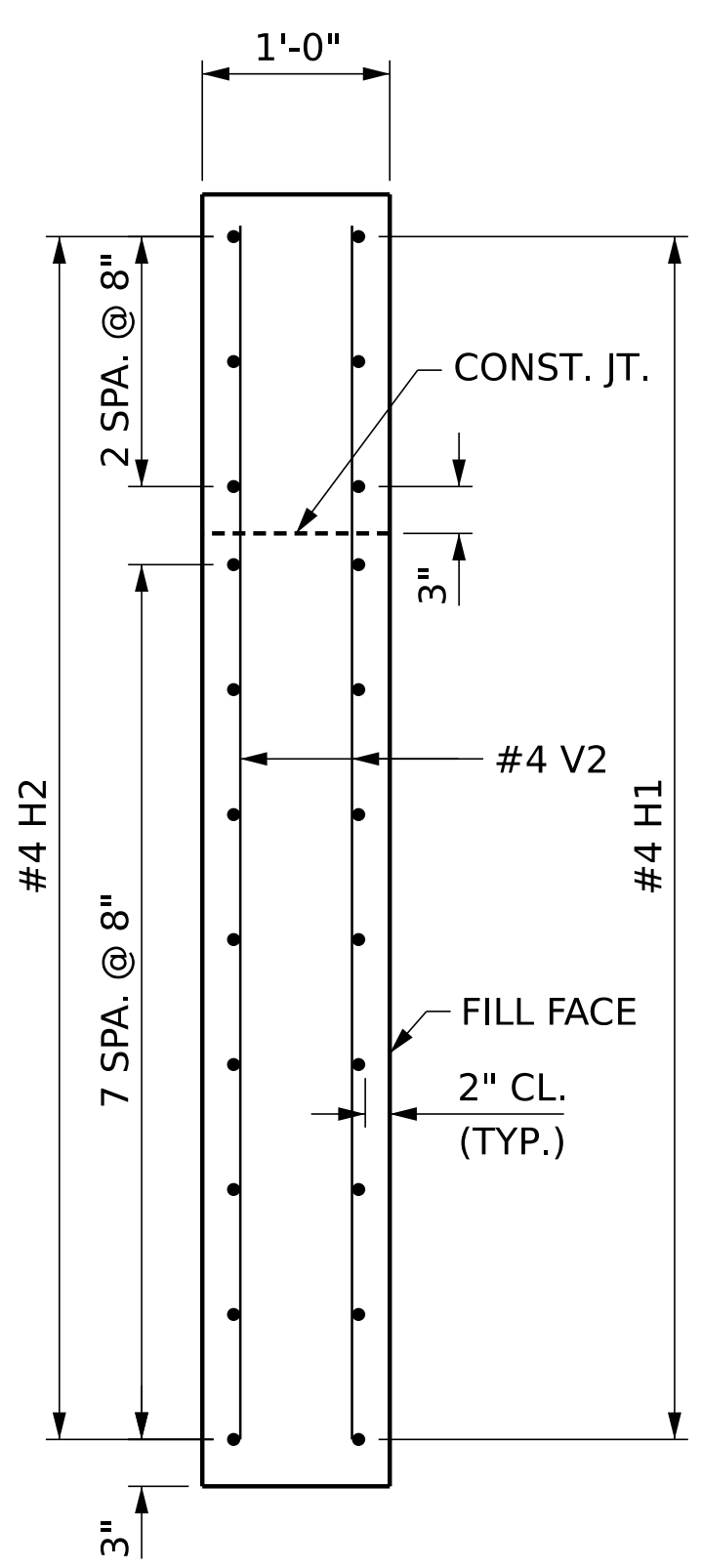
**PLAN OF WING W1**



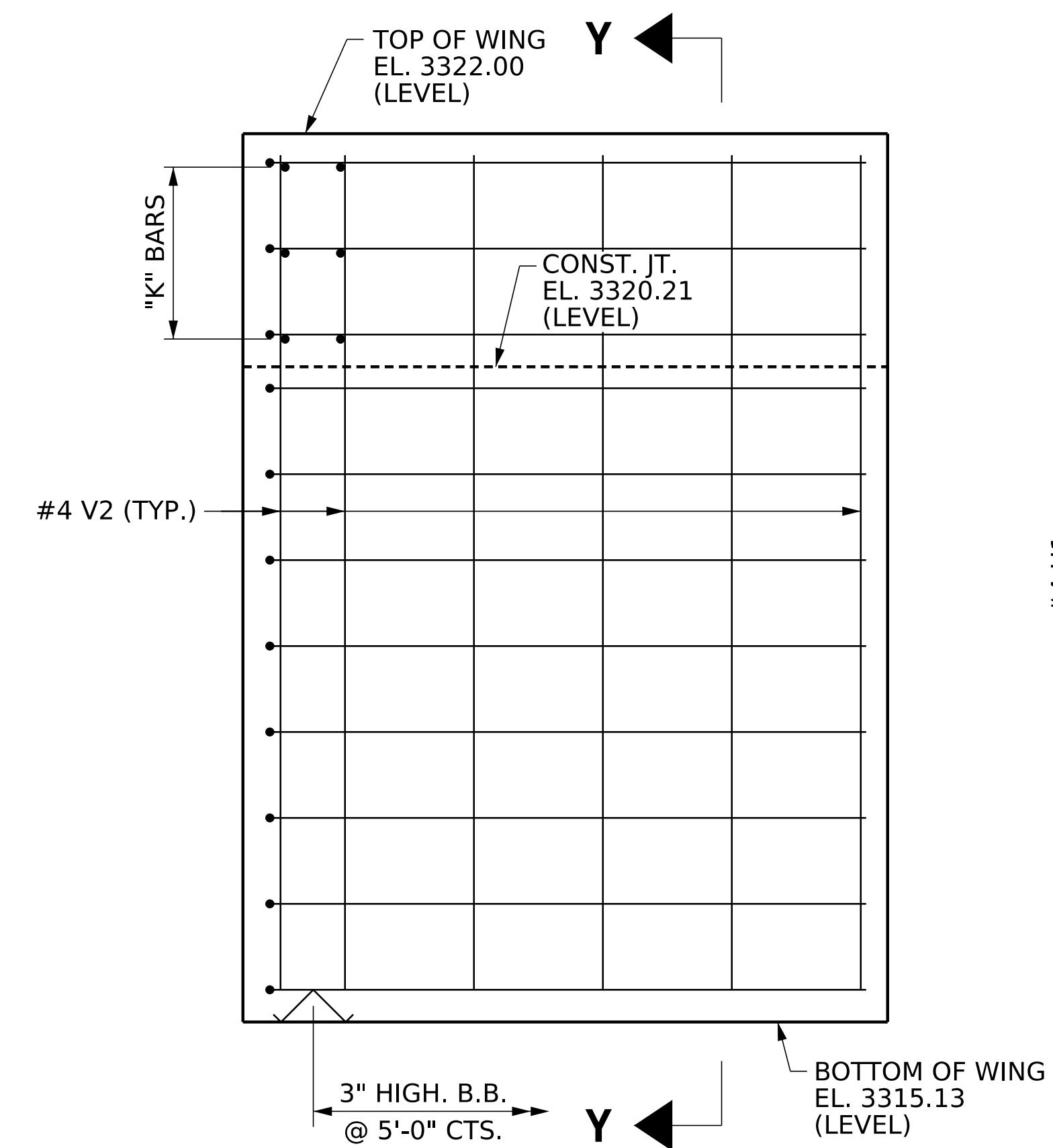
**PLAN OF WING W2**



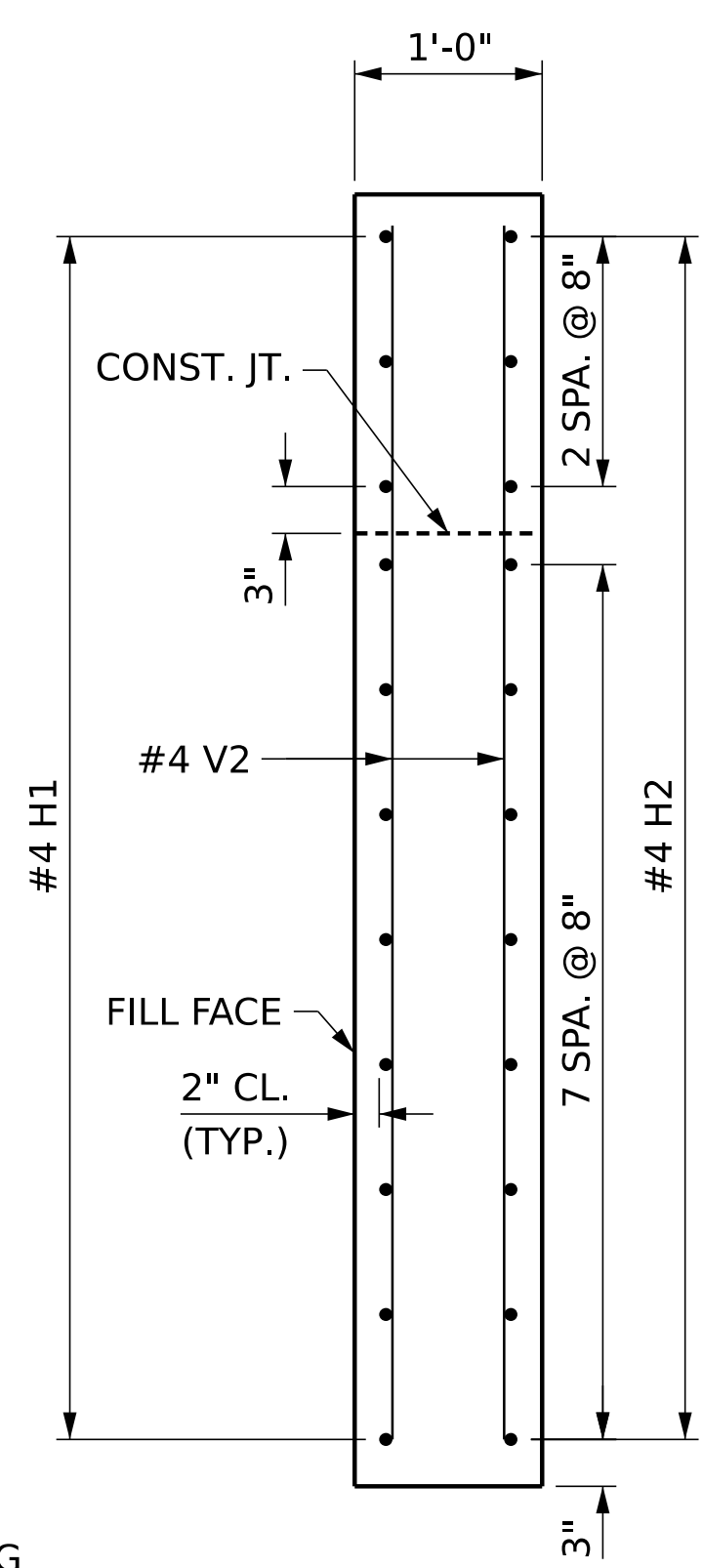
**ELEVATION OF WING W1**



**SECTION X-X**



**ELEVATION OF WING W2**



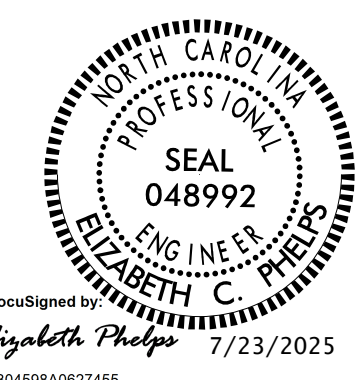
**SECTION Y-Y**

PROJECT NO. **DF18311.2095784**  
**WATAUGA** COUNTY  
 STATION: **10+34.50 -L-**

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT 1  
 WING WALL DETAILS**



REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

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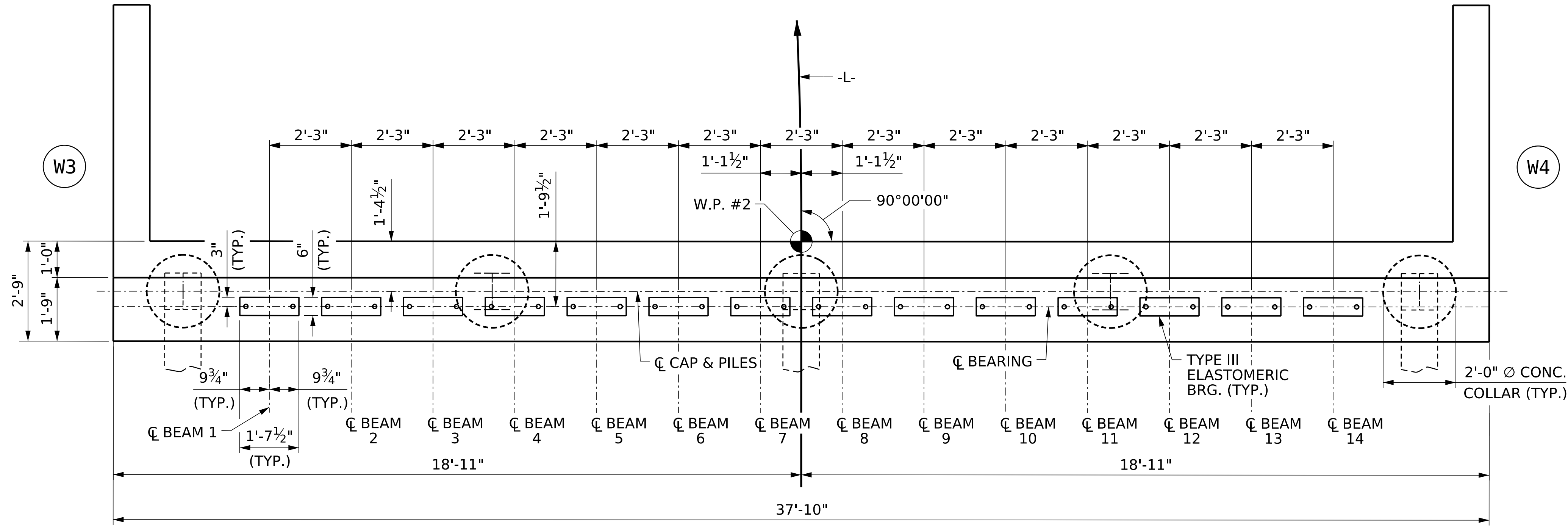
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### NOTES

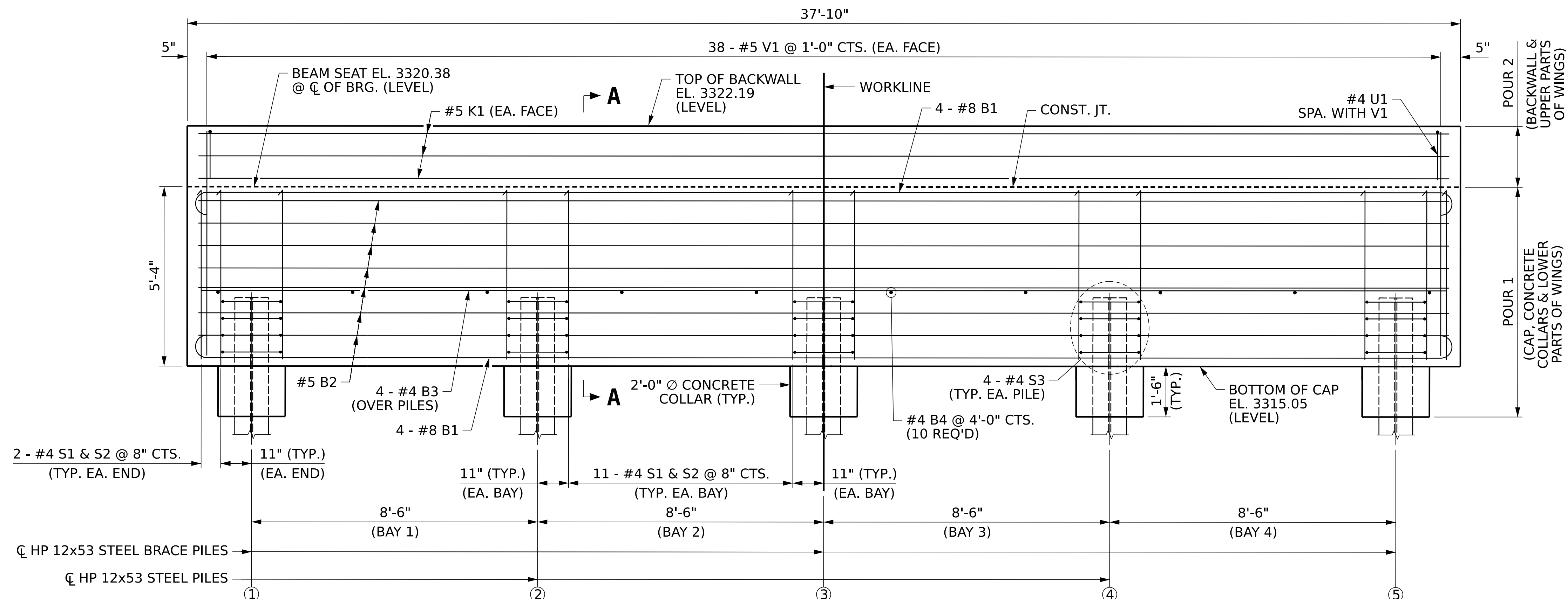
FOR PILE SPlice DETAILS, SEE SHEET 3 OF 3.

FOR SECTION A-A, SEE SHEET 3 OF 3.

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.



### PLAN



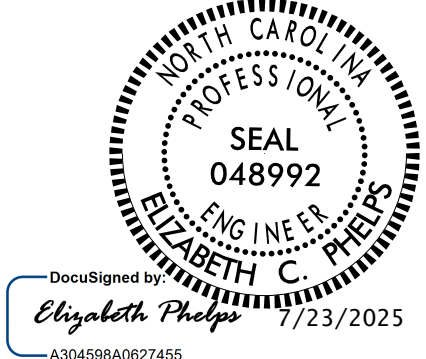
### ELEVATION

PROJECT NO. **DF18311.2095784**  
**WATAUGA** COUNTY  
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SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

## SUBSTRUCTURE END BENT 2 PLAN AND ELEVATION



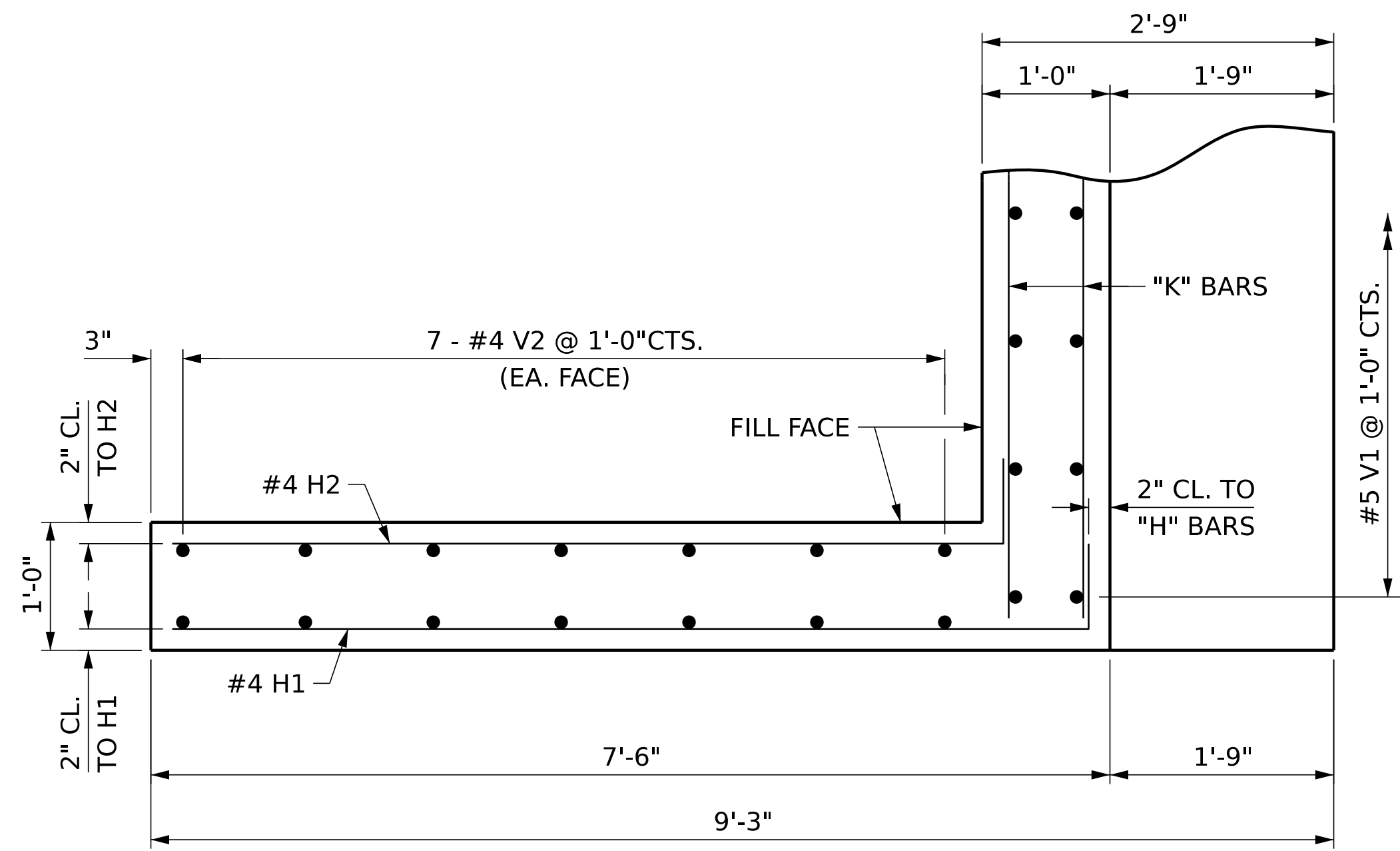
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			18

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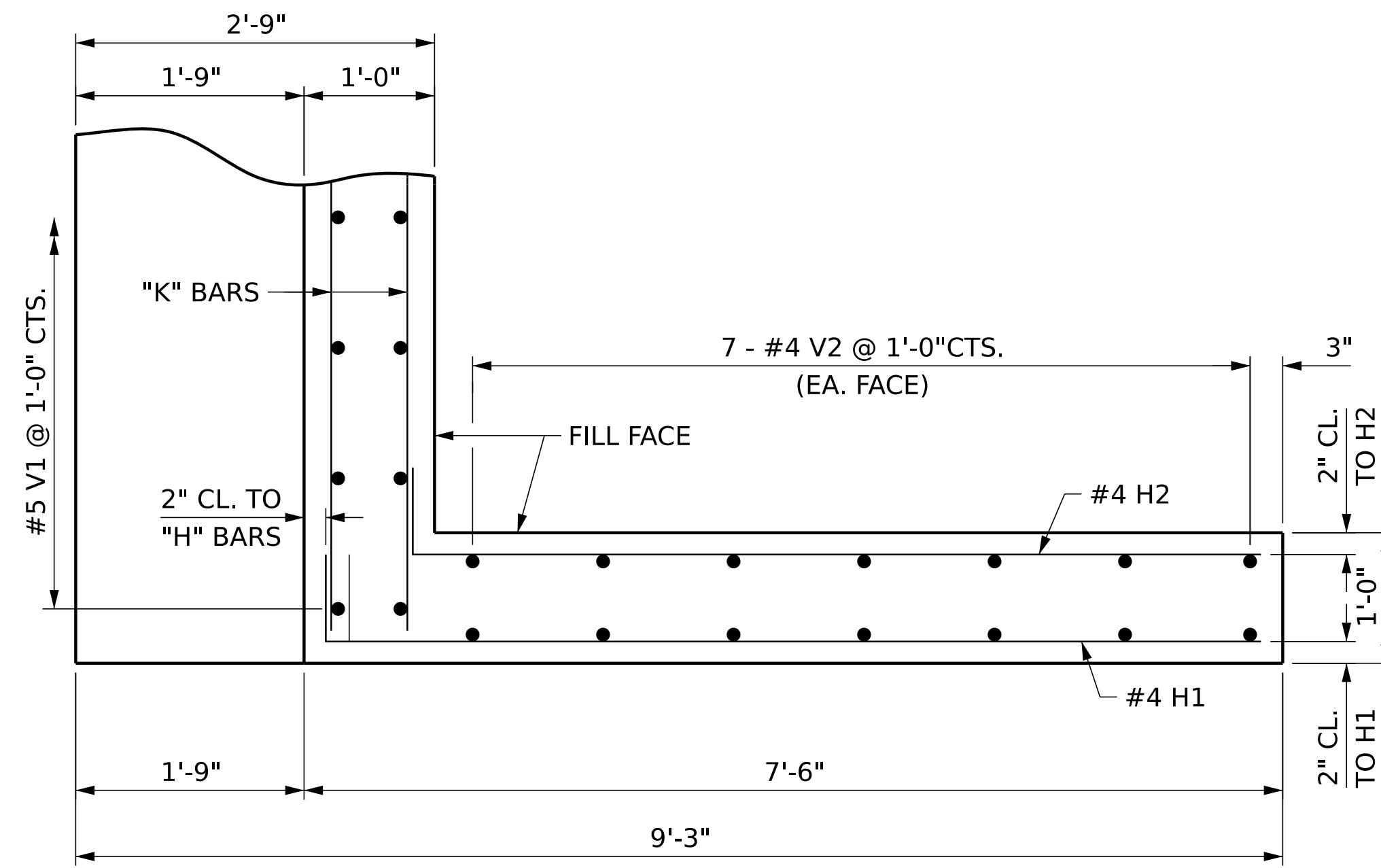


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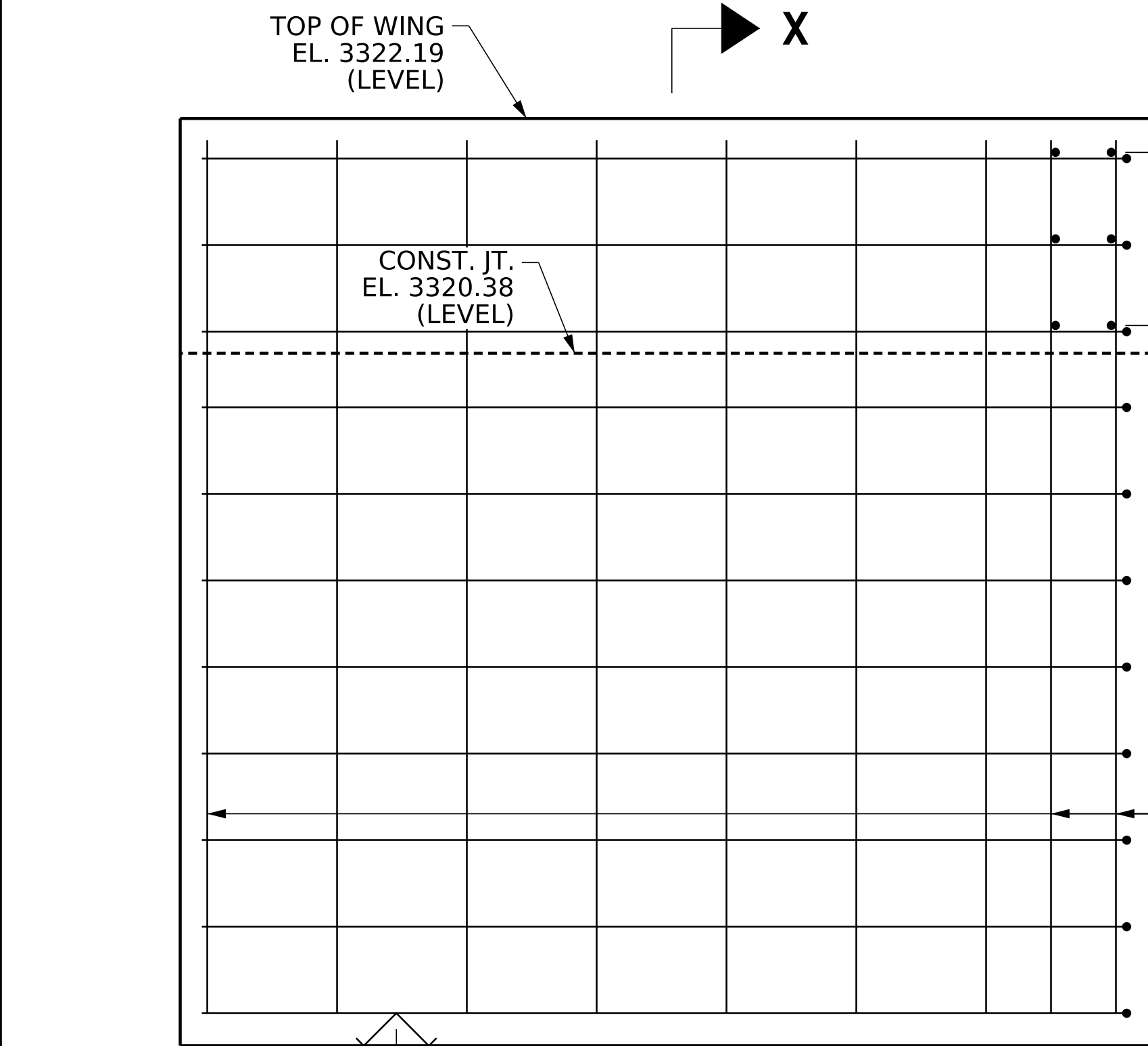
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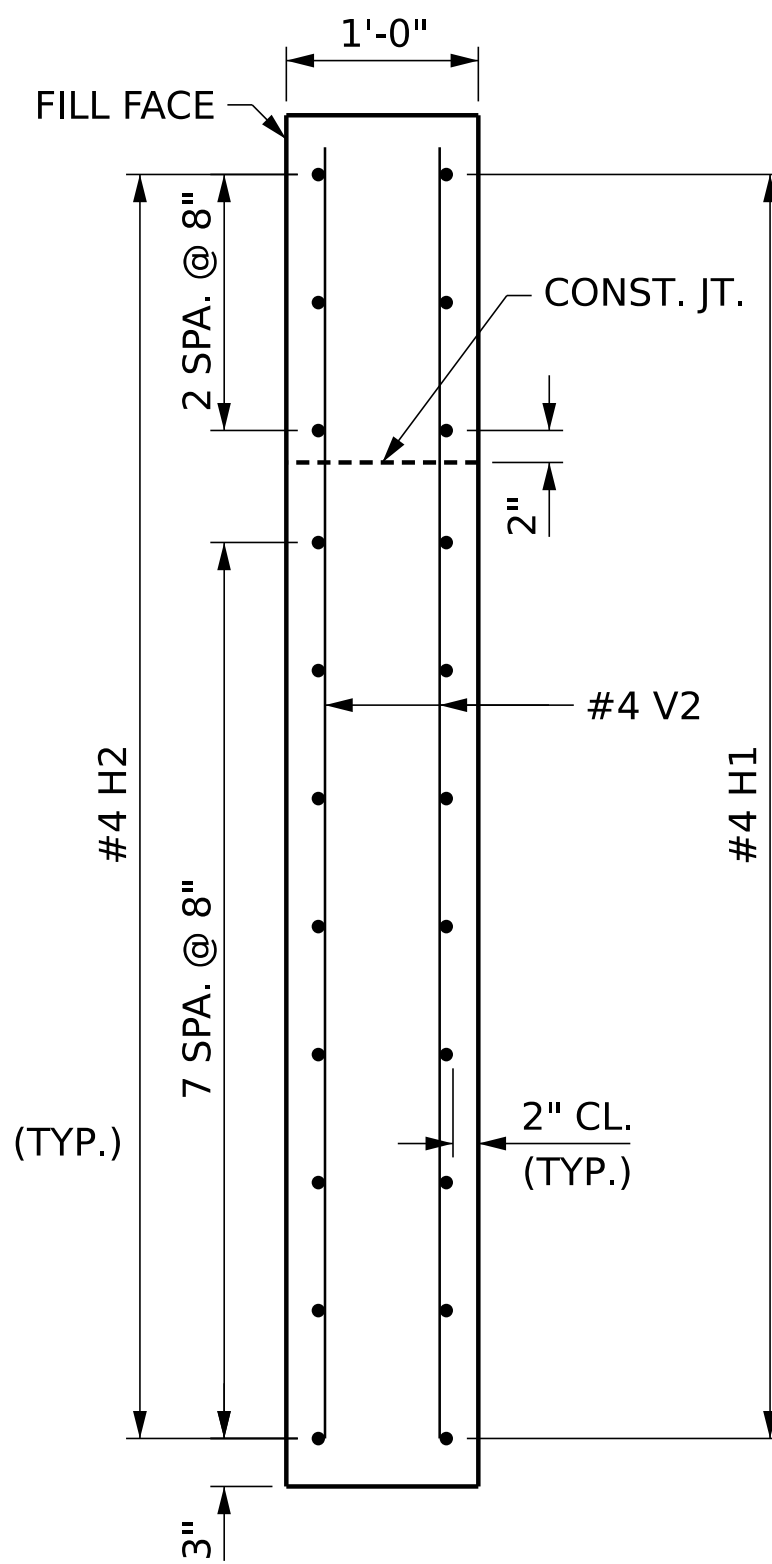
PLAN OF WING W3



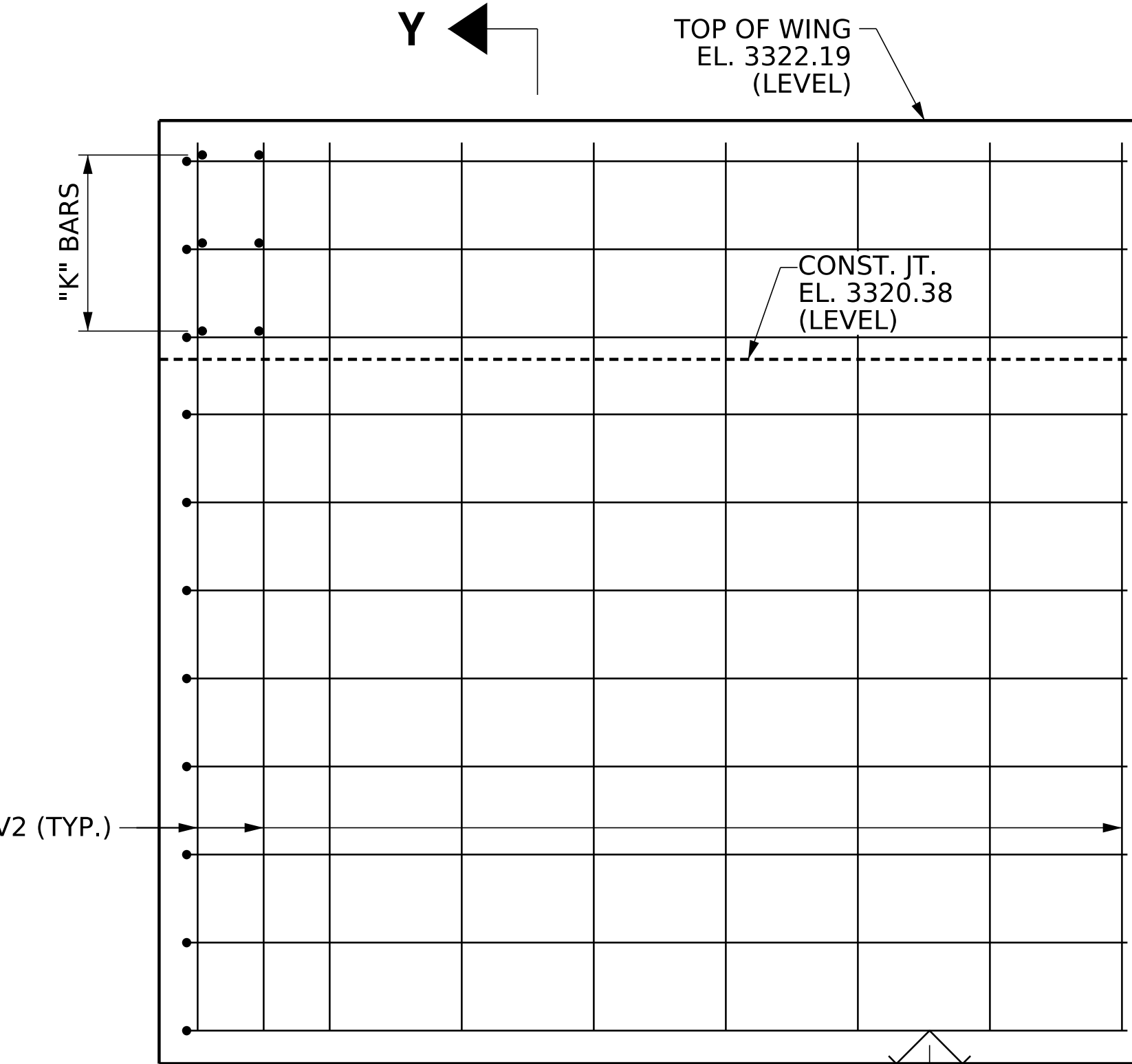
PLAN OF WING W4



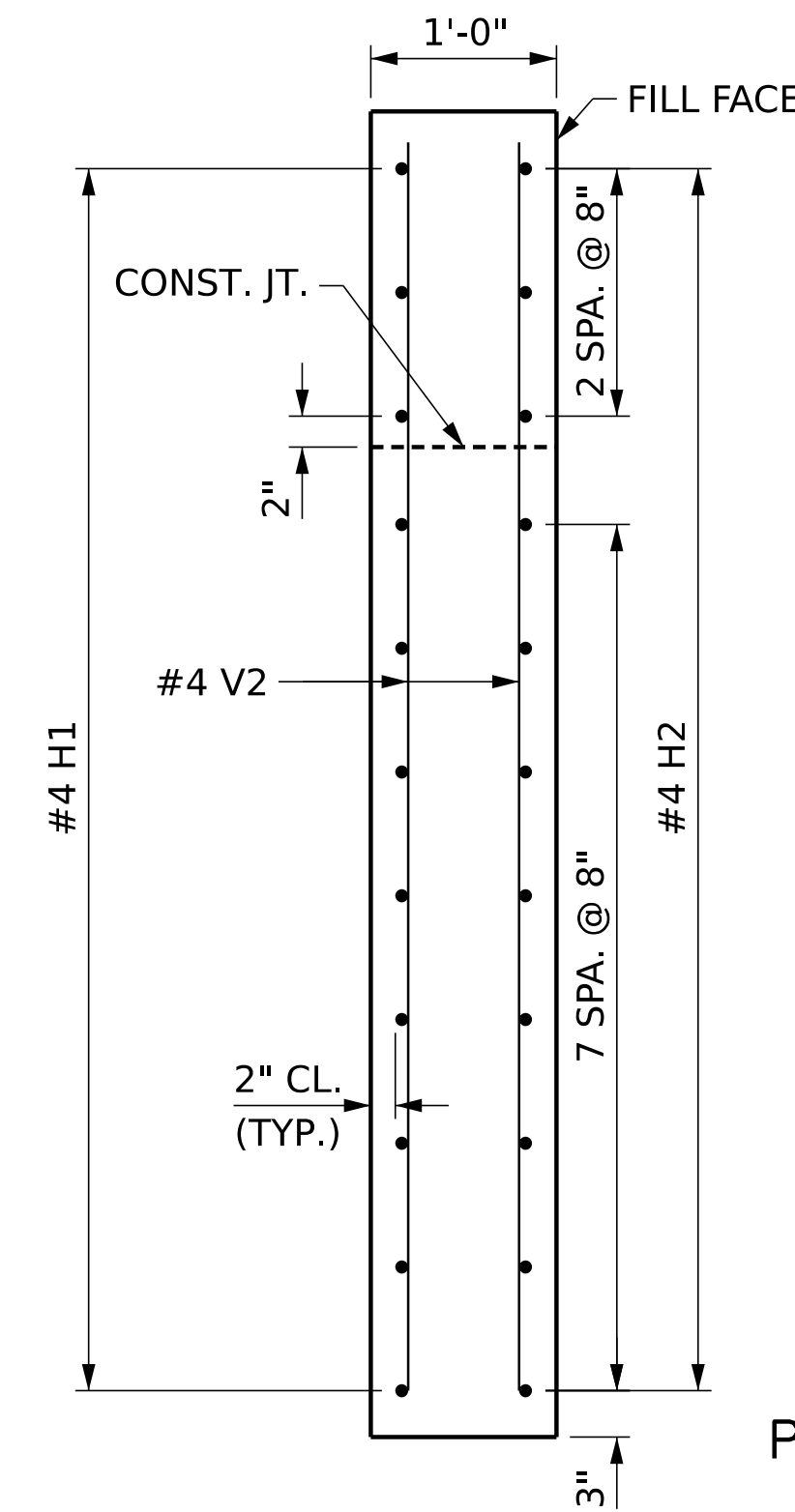
ELEVATION OF WING W3



SECTION X-X



ELEVATION OF WING W4



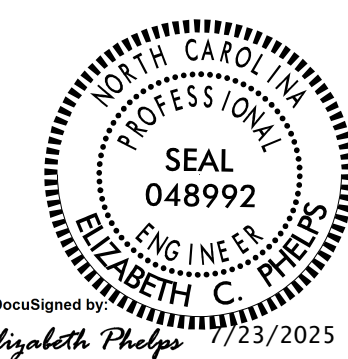
SECTION Y-Y

PROJECT NO. **DF18311.2095784**  
**WATAUGA** COUNTY  
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SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
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**SUBSTRUCTURE**  
**END BENT 2**  
**WING WALL DETAILS**



REVISIONS				SHEET NO.
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1			3	
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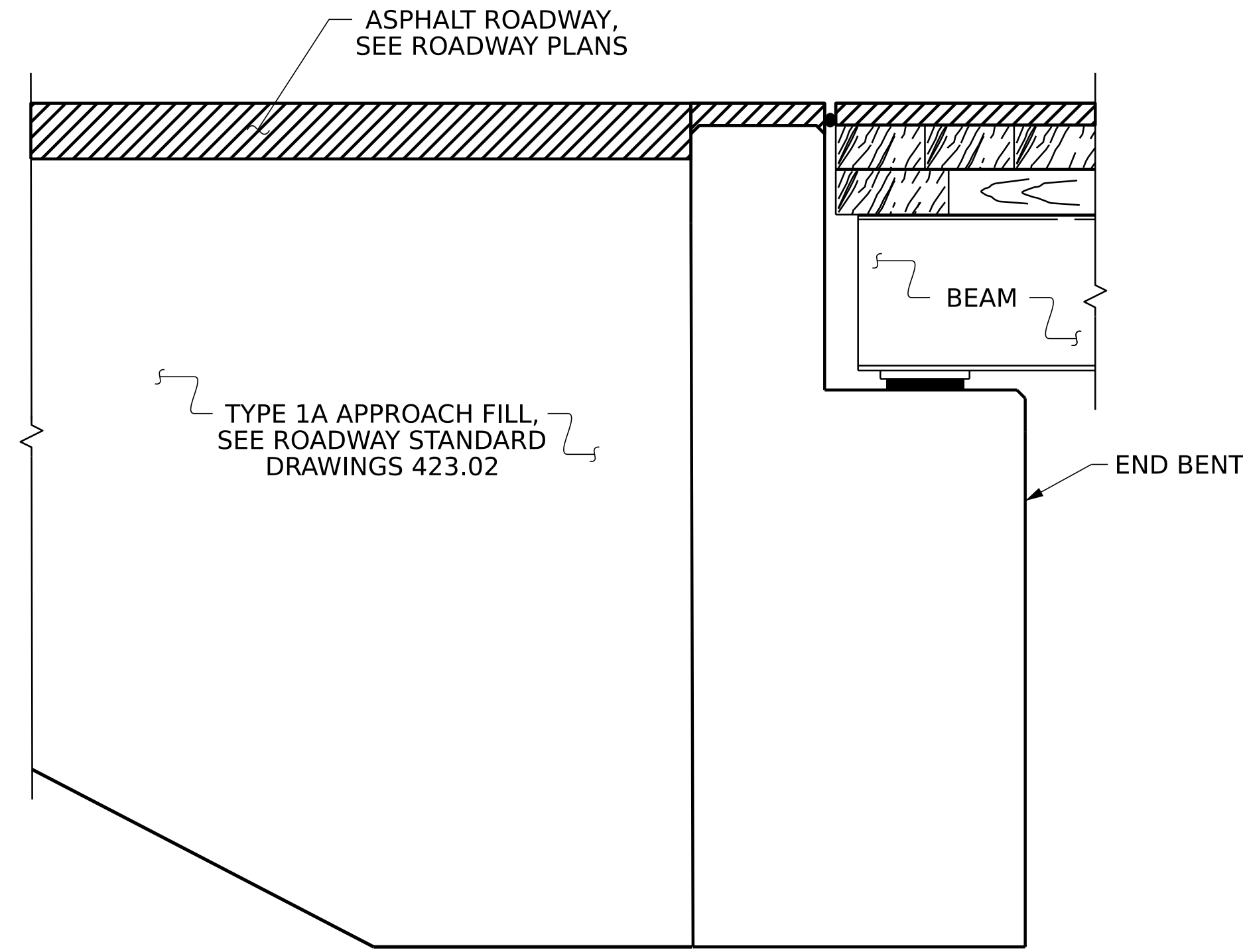
S-16  
 TOTAL SHEETS  
 18



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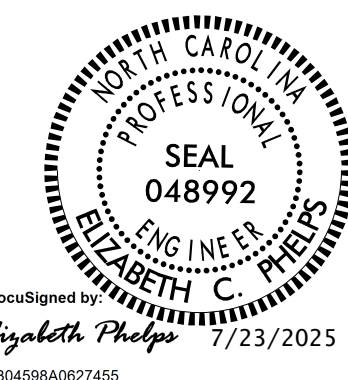
**SECTION THRU SLAB**  
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

**NOTES**

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

TYPE 1A REINFORCED BRIDGE APPROACH FILL IS REQUIRED BEHIND EACH END BENT DUE TO OVERTOPPING. THE WIRE BASKETS SHOULD EXTEND A MINIMUM OF 5 FEET BEYOND THE WIND WALLS. THE TOP OF THE BACKFILL SHOULD BE WRAPPED WITH TYPE 2 GEOTEXTILE.

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STATE OF NORTH CAROLINA  
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**APPROACH FILL  
 DETAILS**

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
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## 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  $\frac{3}{4}$ " WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO  $1\frac{1}{2}$ " RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A  $\frac{1}{4}$ " 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  $\frac{1}{4}$ " 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  $\frac{7}{8}$ "  $\emptyset$  SHEAR STUDS FOR THE  $\frac{3}{4}$ "  $\emptyset$  STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 -  $\frac{7}{8}$ "  $\emptyset$  STUDS FOR 4 -  $\frac{3}{4}$ "  $\emptyset$  STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF  $\frac{7}{8}$ "  $\emptyset$  STUDS ALONG THE BEAM AS SHOWN FOR  $\frac{3}{4}$ "  $\emptyset$  STUDS BASED ON THE RATIO OF 3 -  $\frac{7}{8}$ "  $\emptyset$  STUDS FOR 4 -  $\frac{3}{4}$ "  $\emptyset$  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  $\frac{5}{16}$ " IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

### HANDRAILS AND POSTS:

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

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. 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.