STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROWAN COUNTY

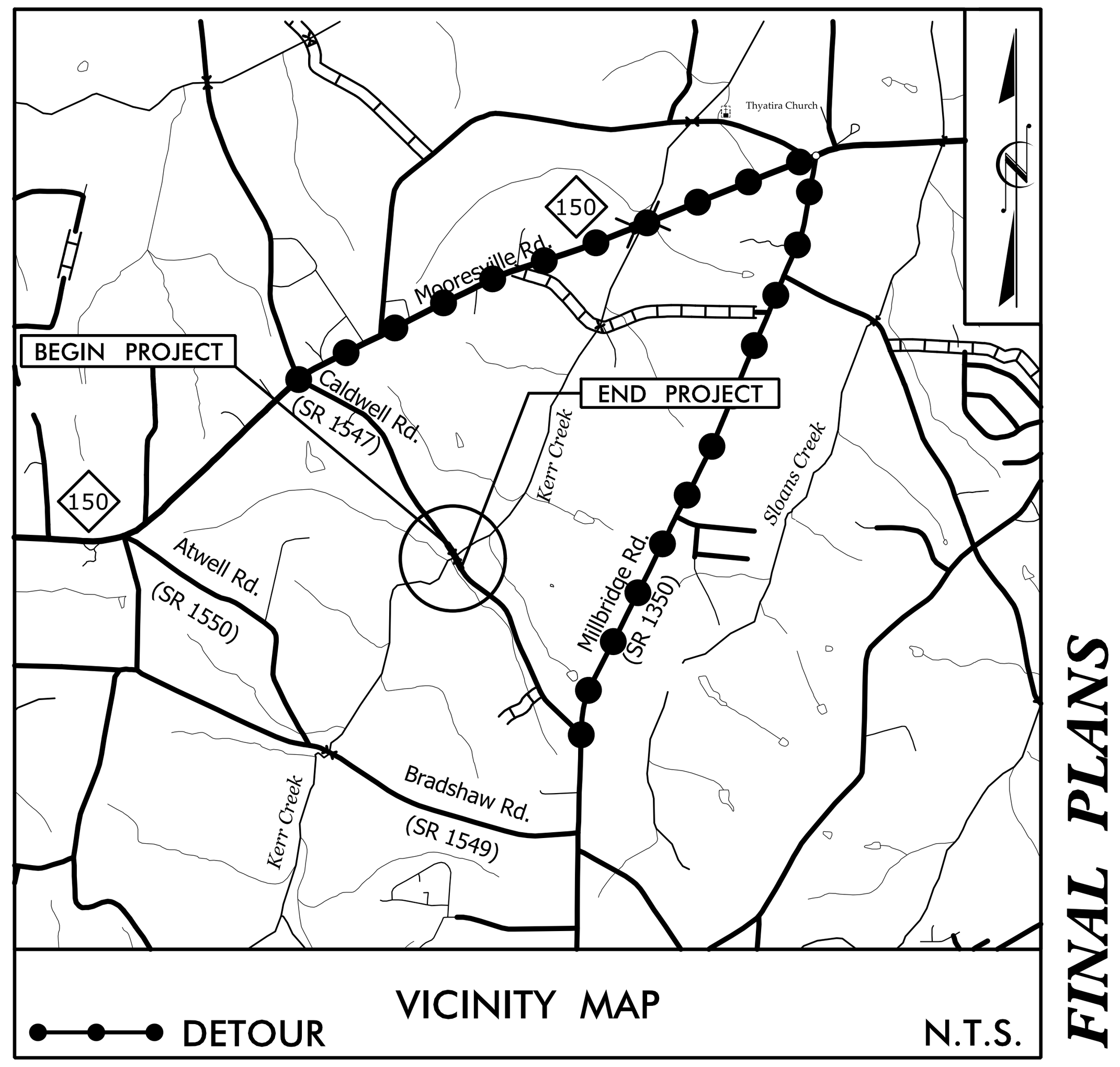
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.9.R.96	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.9.R.96		P.E.
17BP.9.R.96		R.O.W.
17BP.9.R.96		CONSTRUCTION

PROJECT WBS: 17BP.9.R.96

CONTRACT: DI00378

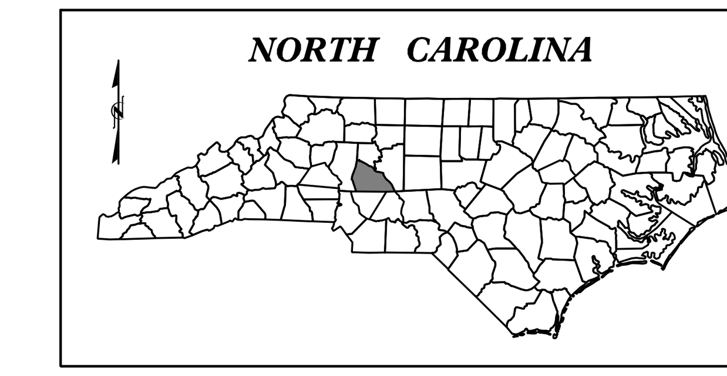
See Sheet 1A For Index of Sheets
See Sheet 1B For Standard Symbology Sheet

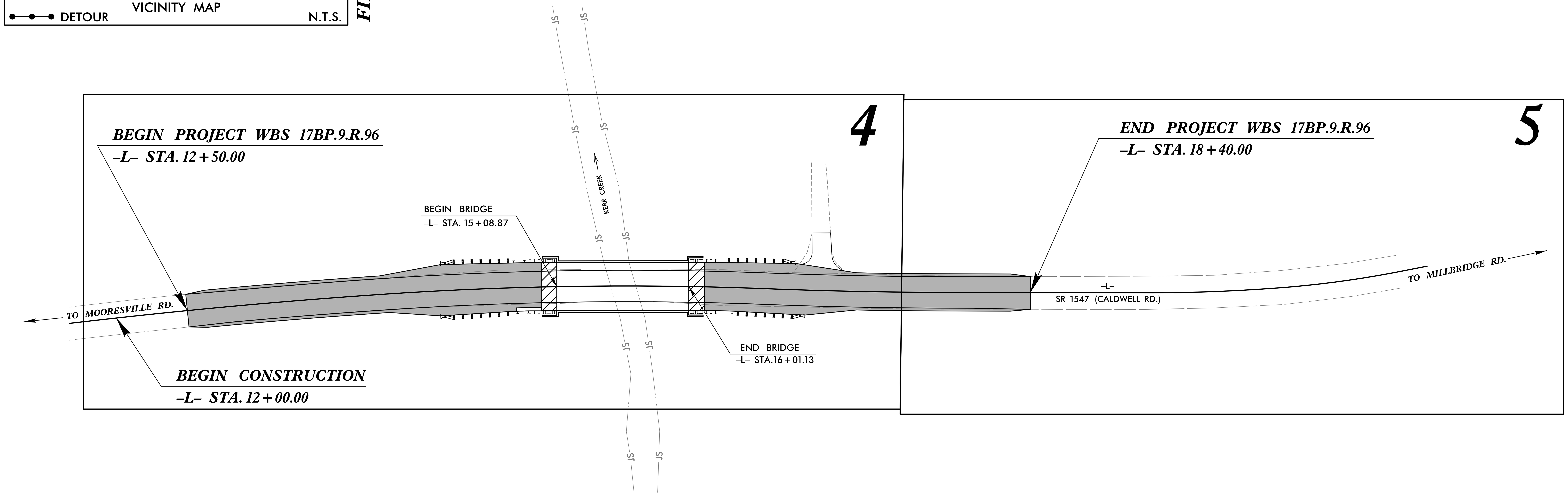


FINAL PLANS

LOCATION: BRIDGE #254 OVER KERR CREEK ON SR 1547 (CALDWELL RD)

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





DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 20 10 0 20 40

PROFILE (HORIZONTAL): 20 10 0 20 40

PROFILE (VERTICAL): 4 2 0 4 8

DESIGN DATA

ADT 2026	=	1670
ADT 2046	=	2428
DHV	=	N/A
D	=	N/A
T	=	6 %
V	=	55 MPH

FUNC. CLASSIFICATION: LOCAL SUB REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT WBS 17BP.9.R.96 = 0.095 MILES

LENGTH OF STRUCTURE PROJECT WBS 17BP.9.R.96 = 0.017 MILES

TOTAL LENGTH OF PROJECT WBS 17BP.9.R.96 = 0.112 MILES

NCDOT CONTACT: JEREMY KEATON, P.E.
Division Bridge Manager

PLANS PREPARED FOR THE NCDOT BY:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JANUARY 25, 2023

LETTING DATE: FEBRUARY 25, 2026

GERALD H. McCAULEY, PE — PROJECT ENGINEER

CARLOS G. OWENS JR. — PROJECT DESIGNER

HYDRAULICS ENGINEER
1/23/2026
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
1/23/2026
SIGNATURE: P.E.

DEPARTMENT OF TRANSPORTATION — STATE OF NORTH CAROLINA

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
I7BP.9.R.96	1A
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

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INDEX OF SHEETS

GENERAL NOTES

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

GRADE LINE:
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE 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.

GUARDRAIL:

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

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 - DUKE ENERGY
TELECOM - CONTERRA NETWORKS

RIGHT-OF-WAY MARKERS:

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

STANDARD DRAWINGS

2024 ROADWAY ENGLISH STANDARD DRAWINGS EFF. January, 2024

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
423.01	Bridge Approach Fills - Type I Approach Fill
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
815.02	Subsurface Drain
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame Grates
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
866.01	Chain Link Fence - 4' High Fence
876.01	Rip Rap in Channels and Ditches
876.02	Guide for Rip Rap at Pipe Outlets
DIVISION 11 - WORK ZONE TRAFFIC CONTROL	
1101.01	Work Zone Warning Signs
1101.03	Temporary Road Closures
1101.11	Traffic Control Design Tables
1110.01	Stationary Work Zone Signs - Mounting Height & Lateral Clearance
1110.02	Portable Work Zone Signs - Mounting Height & Lateral Clearance
1145.01	Barricades - Type III

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9/10/2021

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.96	1-B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

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

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

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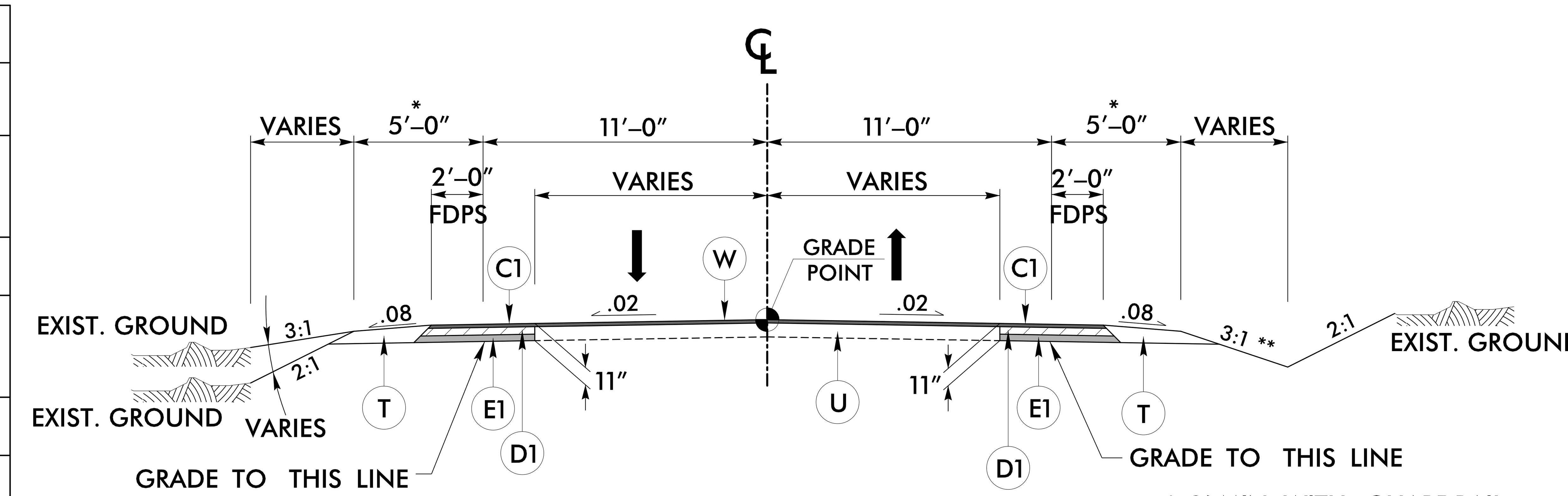
STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.96	2A-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
SEAL 013008 NORTH CAROLINA PROFESSIONAL ENGINEER GERALD H. McCAULEY 1/23/2026	PAVEMENT DESIGN PROVIDED BY NCDOT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

	PAVEMENT SCHEDULE
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN TWO LAYERS
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1.0" IN DEPTH OR GREATER THAN 1.5" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2.5" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3.0" IN DEPTH OR GREATER THAN 5.5" IN DEPTH.
R	CONCRETE SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	PAVEMENT WEDGING

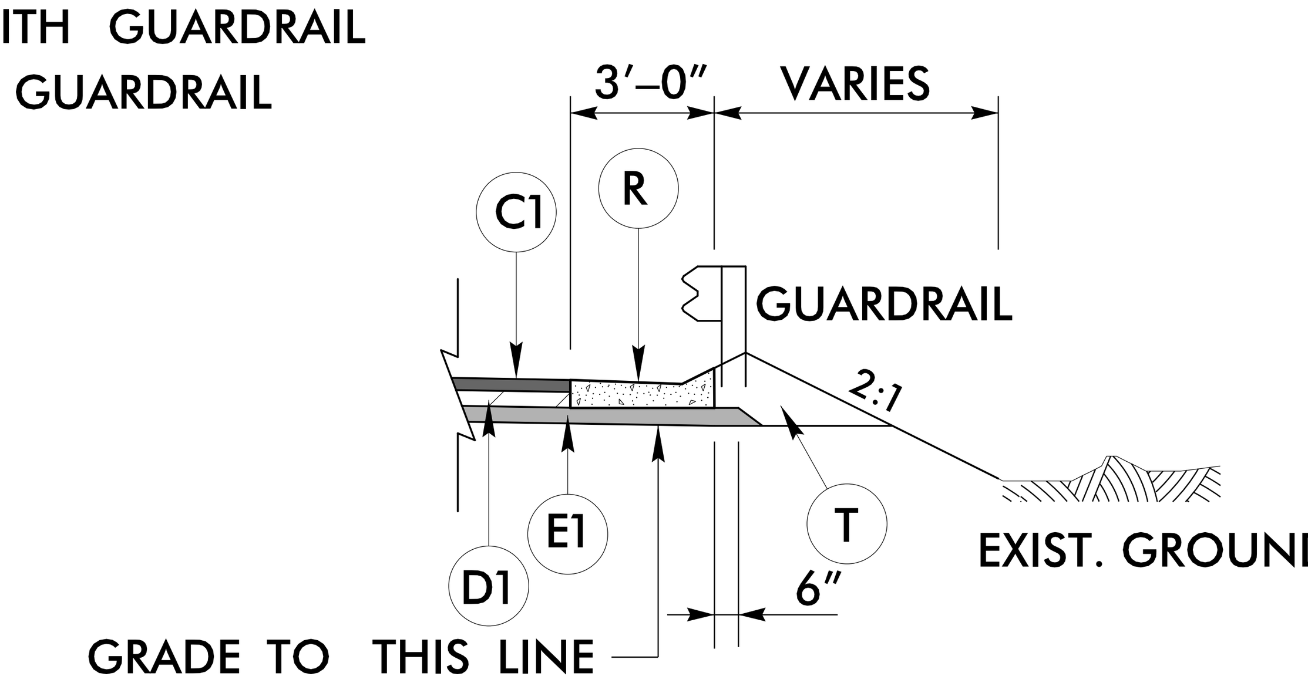
ALL PAVEMENT SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION 1

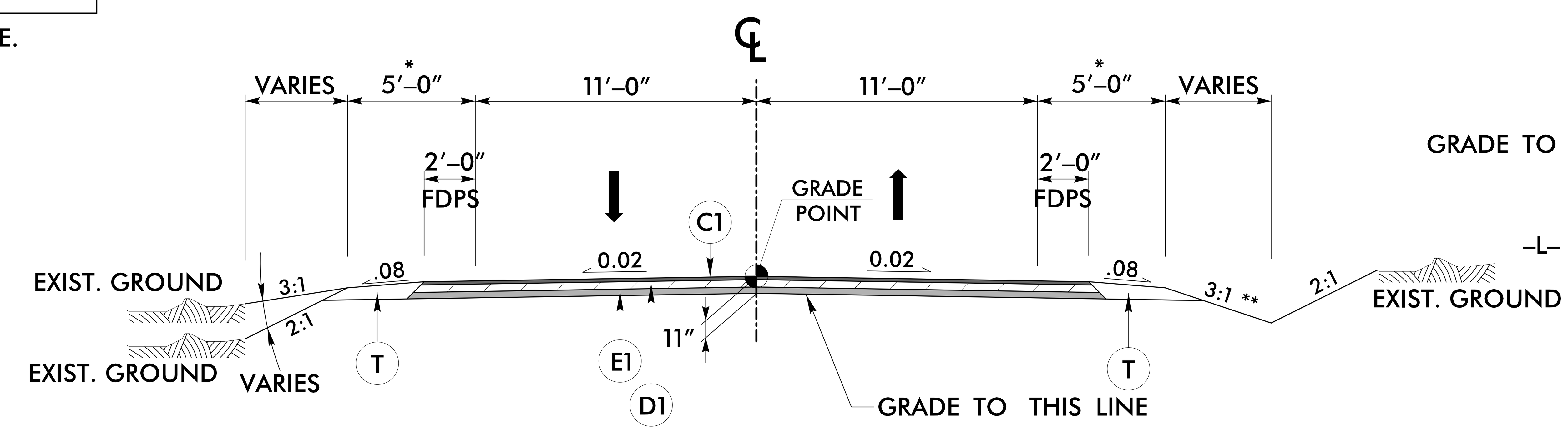
-L- STA. 12+50.00 TO 15+08.87 (BEGIN BRIDGE)
-L- STA. 17+25.00 TO 18+40.00

* 9' MIN. WITH GUARDRAIL
** 2:1 WITH GUARDRAIL



SBG DETAIL A

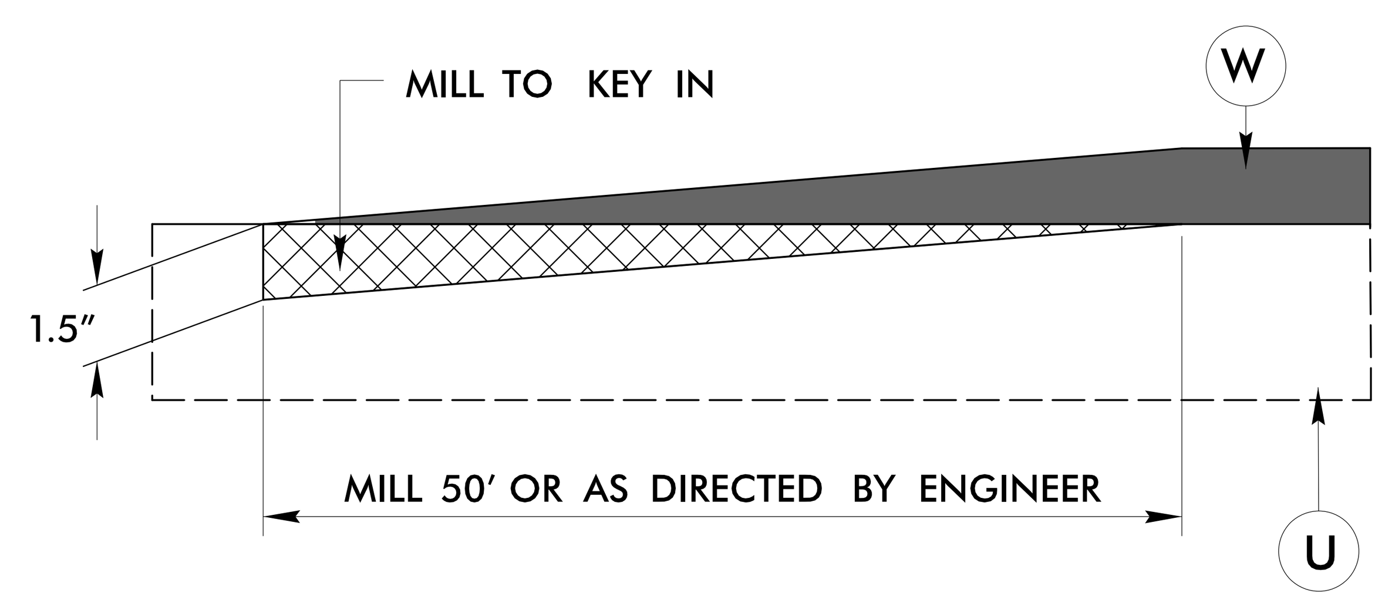
-L- STA. 14+80.24 TO 14+97.67 (RT.)



TYPICAL SECTION 2

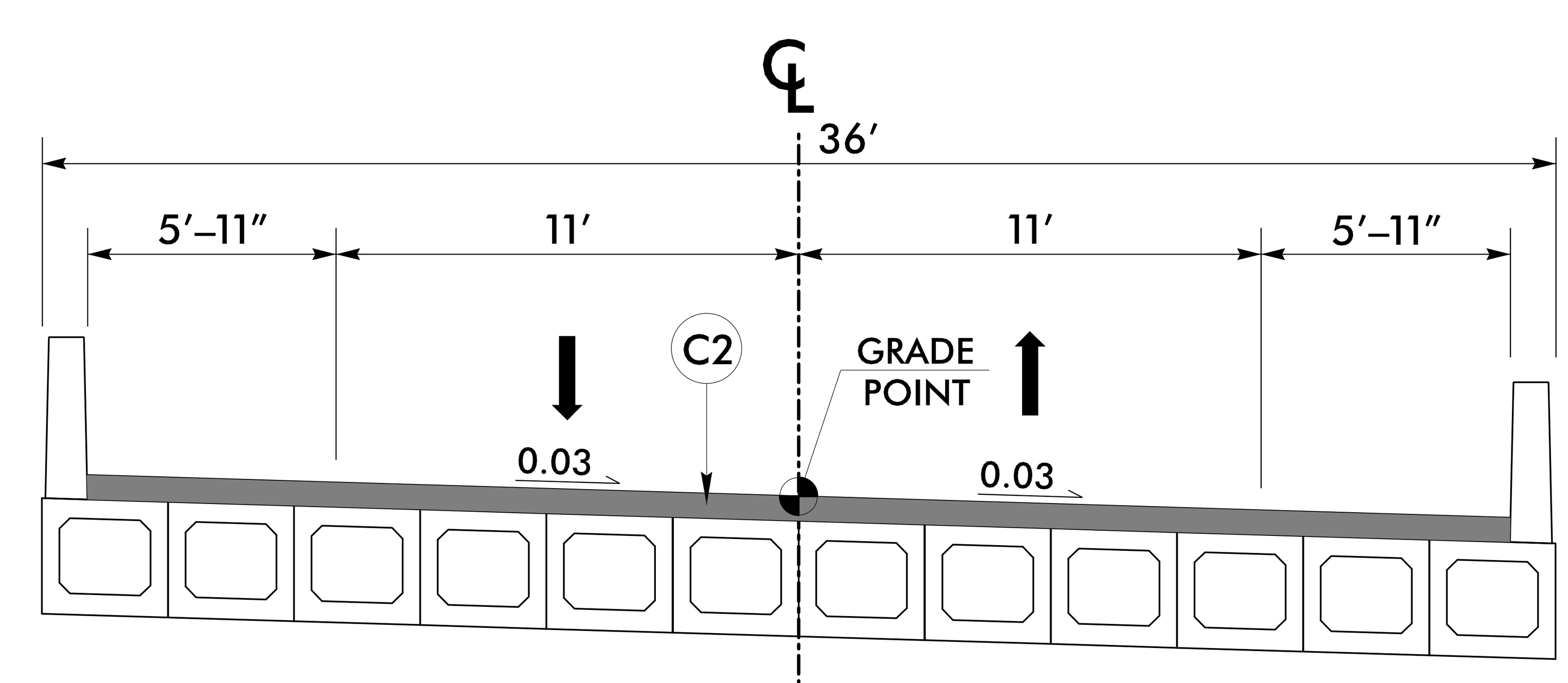
-L- STA. 16+01.13 (END BRIDGE) TO 17+25.00

* 9' MIN. WITH GUARDRAIL
** 2:1 WITH GUARDRAIL



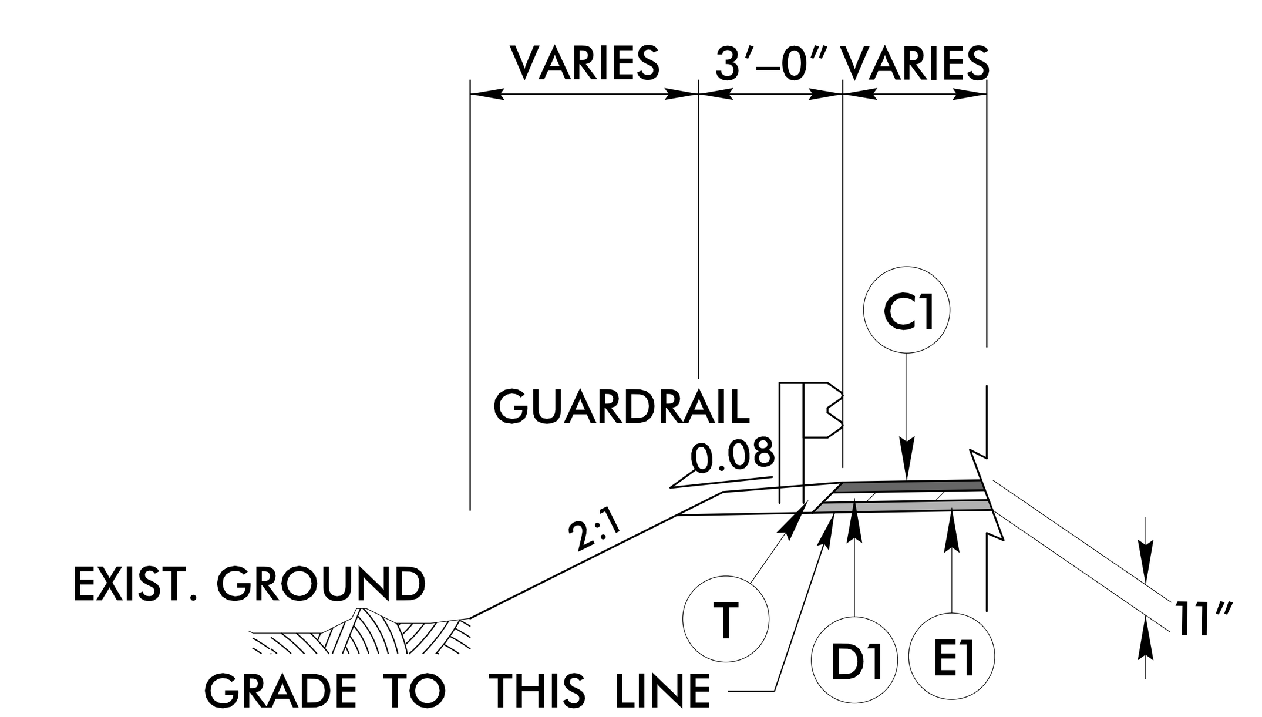
KEY-IN DETAIL C

TO BE USED AT ALL TIE-IN LOCATIONS



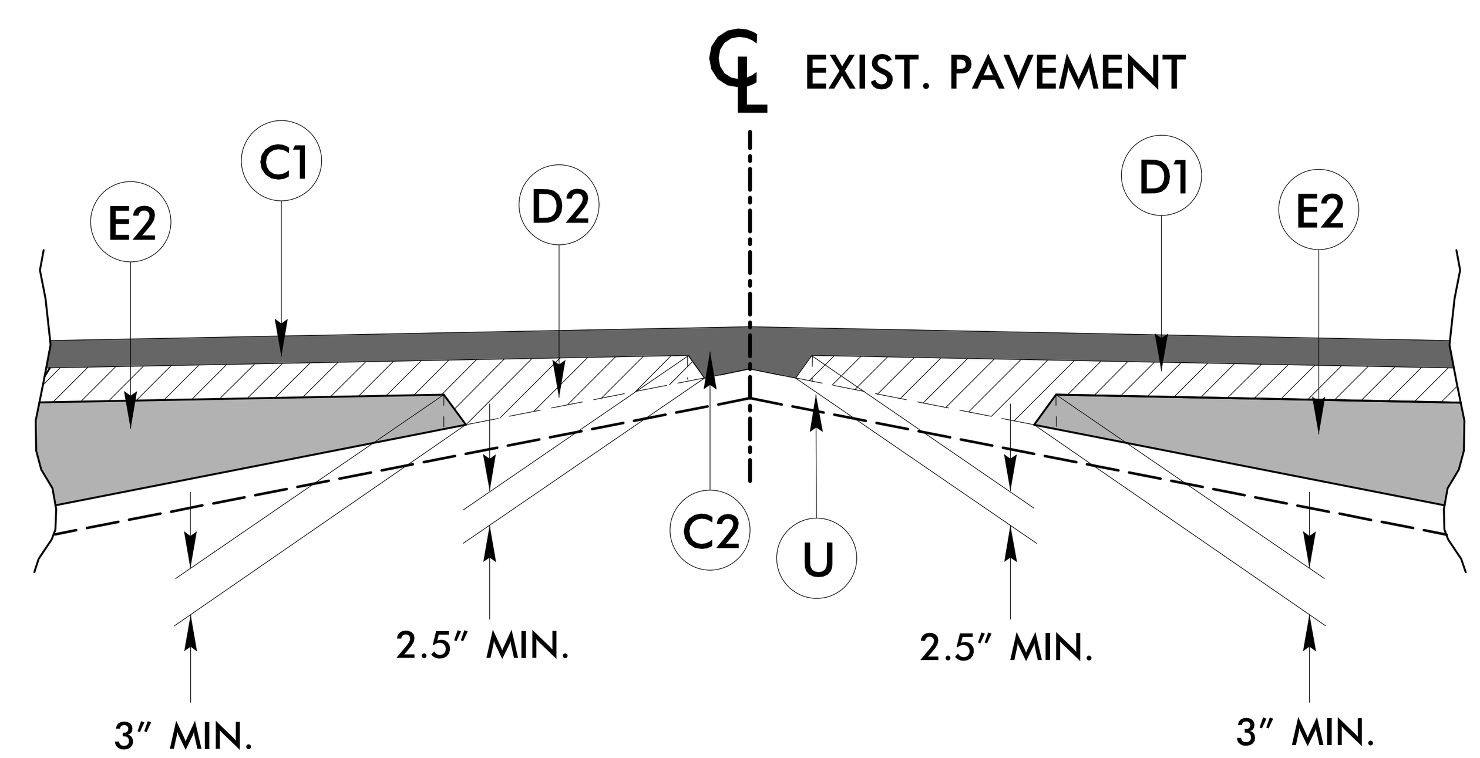
TYPICAL SECTION 3

-L- STA. 15+08.87 (BEGIN BRIDGE) TO 16+01.13 (END BRIDGE)
SEE STRUCTURE PLANS FOR STRUCTURE CONSTRUCTION DETAILS



GUARDRAIL DETAIL B

-L- STA. 14+28.51 TO 15+09.18 (BEGIN BRIDGE) (LT.)
-L- STA. 14+26.77 TO 15+08.56 (BEGIN BRIDGE) (RT.)
-L- STA. 16+00.82 (END BRIDGE) TO 16+75.54 (LT.)
-L- STA. 16+01.44 (END BRIDGE) TO 16+82.90 (RT.)



WEDGING DETAIL D

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OwensC

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.96	3B-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 013008 DocuSigned by: Gerald McCauley EE37957B1AB9460... GERALD H. McCAULEY 1/23/2026	SEAL 051699 Signed by: Tiffany Preddy A67D69D32F5847F... TIFFANY A. PREDDY 1/23/2026

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EARTHWORK SUMMARY
(IN CUBIC YARDS)

CHAIN	FROM STATION	TO STATION	SIDE	UNCL. EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L-	12+50.00	15+08.87 (BRIDGE)	LT & RT	254		200		54
-L-	16+01.13 (BRIDGE)	18+40.00	LT & RT	108		220	112	
TOTAL				362		420	112	54
LOSS DUE TO CLEARING AND GRUBBING				-200			200	
WASTE IN LIEU OF BORROW							-54	-54
PROJECT TOTAL				162		420	258	
ESTIMATE 5% FOR TOPSOIL ON BORROW PITS							13	
GRAND TOTAL				162		420	271	
SAY				165			275	

NOTE: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

Drainage Ditch Excavation = 260 cu. yd.
Per Geotech recommendation, estimated 400 Cubic Yards of Undercut to be used in the discretion of the resident Engineer.
Unclassified not to be used in top 3' of embankment.

SUMMARY OF 48" CHAIN LINK FENCE

STATION TO STATION	LT. or RT.	FABRIC LF	LINE POSTS	TERMINAL POSTS
-L- 12+50.00 to 15+00.68	RT	255.42	24.28	22
NOTE LT. OR RT. INDICATES LEFT OF RIGHT OF THE MAIN LINE	TOTAL:	255.42	24.28	22
	SAY:	256	25	22

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LENGTH
-L- RT	14+80.24	14+98.00	17.33
		TOTAL:	17.33
		SAY:	18

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

STATION SIZE THICKNESS OR GAUGE	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	ALTERNATE PIPE 12"	15"	18"	24"	30"	36"	42"	48"
14+86	RT	0401		725.9'											
		0401	0402		722.1'	720.5'			21'						
17+25	LT	0403			724.6'	724.5'									
14+71	LT														
16+94	LT														
TOTAL									21'						

STATION	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"
14+86																
17+25										52'						
14+71																
16+94																
TOTAL										52'						

STATION	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	* TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	
14+86						1							
17+25													
14+71													
16+94													
TOTAL						1							

STATION		D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	TRAFFIC BEARING G.D.I. STD. 840.35	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.29	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	J.B. STD. 840.31 OR 840.32	T.B.D.I. STD. 840.35					15" CORR. STEEL ELBOW	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
14+86											1		1									
																		2				
17+25																						
14+71																					25'	
16+94																					60'	
TOTAL											1		1					2			85'	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I. (N.S.)	GRATED DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	SHOP CURVED	DOUBLE FACED	WARRANT POINT APPROACH END	TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	TRAILING END	W* APPROACH END	TRAILING END
-L-	14+28.51	15+09.18	LT	81.25'				15+09.68	5.92'	8.92'		50'		1'
-L-	14+26.77	15+08.56	RT	81.25'			15+09.06		5.92'	8.92'	50'		1'	
-L-	16+00.82	16+75.54	LT	75.00'			16+01.32		5.92'	8.92'	50'		1'	
-L-	16+01.44	16+82.90	RT	81.25'				16+01.94	5.92'	8.92'		50'		1'
TOTAL:				318.75'										
TOTAL ANCHOR LENGTH:				275'										
TOTAL GUARDRAIL LENGTH:				43.75'										
SAY:				50'			ADDITIONAL GUARDRAIL POSTS: 5 EA							

SURVEY LINE	BEG. STA.	ANCHORS XI MOD	B-77	GREU TL-3	GREU TL-2	TYPE III	CAT-1	VI MOD	BIC	AT-1	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	14+28.51			1		1											
-L-	14+26.77			1		1											
-L-	16+00.82			1		1											
-L-	16+01.44			1		1											
TOTAL:				4 EA		4 EA											
TOTAL ANCHOR LENGTH:																	
TOTAL GUARDRAIL LENGTH:																	
SAY:																	

1/22/2026
R:\Roadway\Proj\SHT\R96_rdy_psh03B-1.dgn
OwensC

COMPUTED BY: M. CRUZ, PE DATE: MARCH, 2023
CHECKED BY: D. DEWEY, PE DATE: MARCH, 2023

(2-3-23)

PROJECT NO.	SHEET NO.
17BP.9.R.96	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

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

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

SUMMARY OF GEOTEXTILE FOR SUBGRADE STABILIZATION

LINE	Station	Station	Geotextile for Subgrade Stabilization SY
CONTINGENCY			500
		TOTAL SY:	500*

*Total square yards of "Geotextile for Subgrade Stabilization" is only the estimated quantity for subgrades and may only represent a portion of the geotextile quantity shown in the Item Sheets of the Proposal.

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Subgrade Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU (1)	12	100	100	100		
			TOTAL CY/TONS/SY:		100	100**	100**	0	0

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

6/2/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.96	3P-1

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

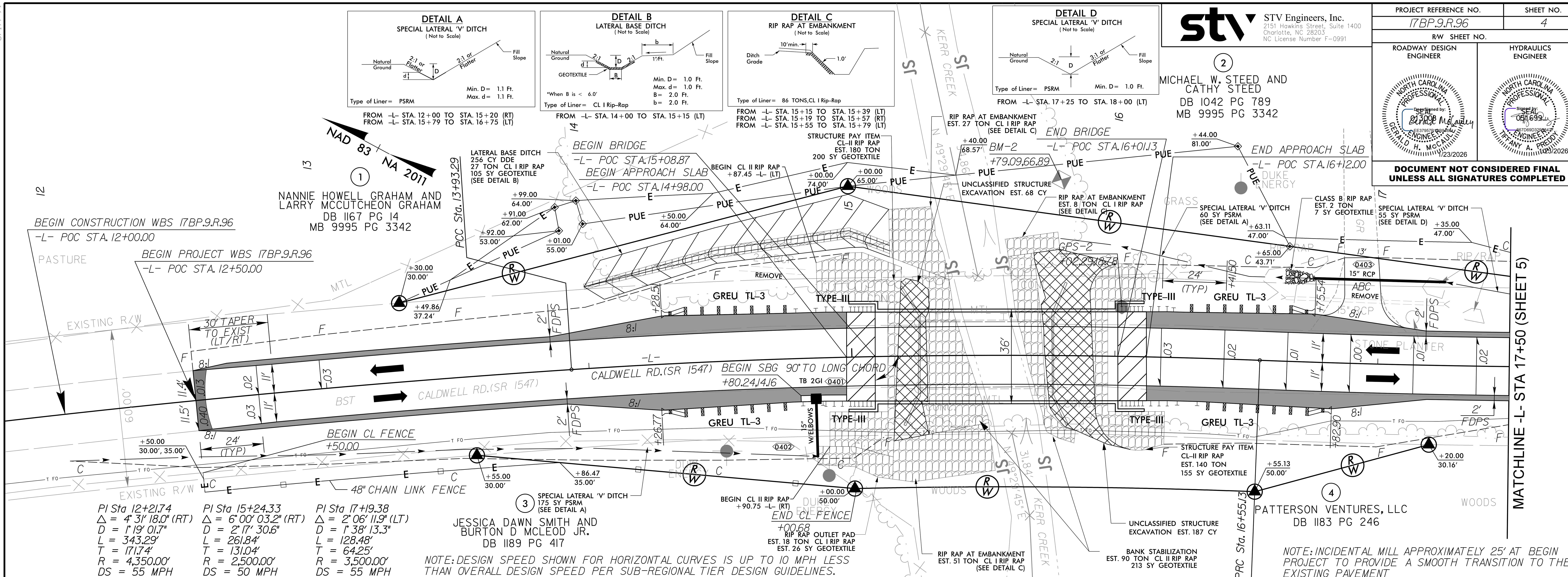
PARCEL INDEX SHEET

PARCEL NO.	SHEET NO.	PROPERTY OWNER NAME
1	4	NANNIE HOWELL GRAHAM AND LARRY MCCUTCHEON GRAHAM
2	4 & 5	MICHAEL W. STEED AND WIFE, CATHY STEED
3	4	JESSICA DAWN SMITH AND BURTON D MCLEOD JR.
4	4 & 5	PATTERSON VENTURES, LLC

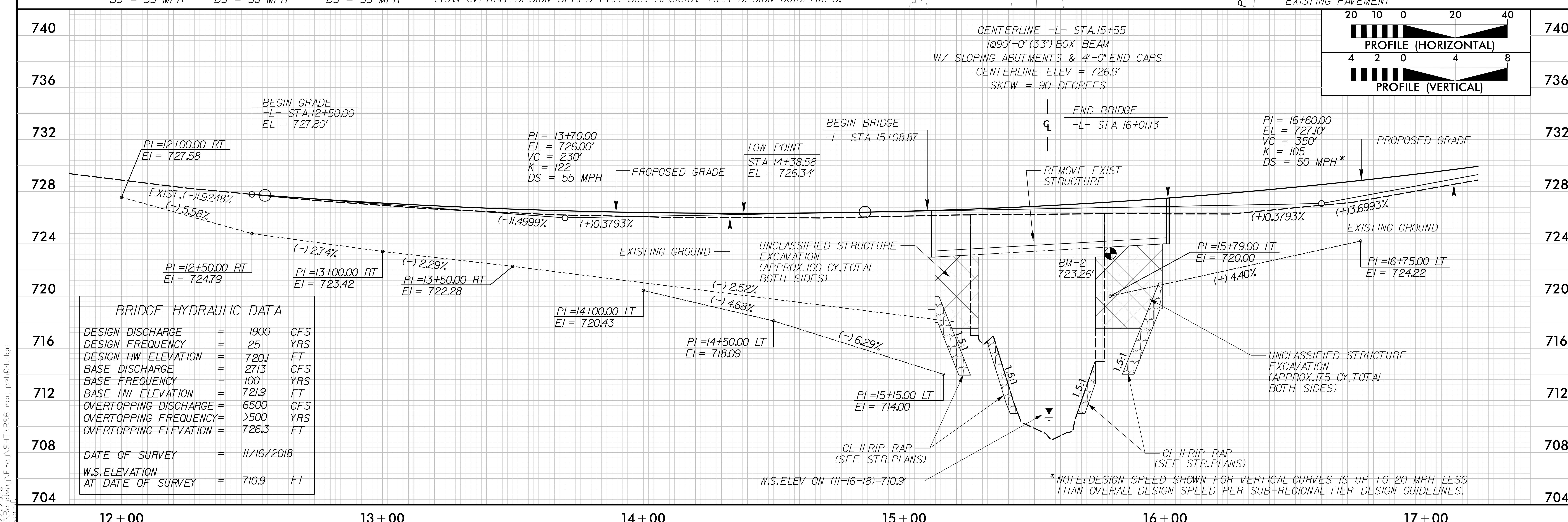
PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.96	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DETAIL A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Type of Liner= PSRM
Min. D= 1.1 Ft.
Max. d= 1.1 Ft.
FROM -L- STA. 12+00 TO STA. 15+20 (RT)
FROM -L- STA. 15+79 TO STA. 16+75 (LT)
DETAIL B
LATERAL BASE DITCH
(Not to Scale)
Type of Liner= CL I Rip-Rap
Min. D= 1.0 Ft.
Max. d= 1.0 Ft.
B= 2.0 Ft.
b= 2.0 Ft.
FROM -L- STA. 14+00 TO STA. 15+15 (LT)
DETAIL C
RIP RAP AT EMBANKMENT
(Not to Scale)
Type of Liner= 86 TONS,CL I Rip-Rap
FROM -L- STA. 15+15 TO STA. 15+39 (LT)
FROM -L- STA. 15+19 TO STA. 15+57 (RT)
FROM -L- STA. 15+55 TO STA. 15+75 (LT)
DETAIL D
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Type of Liner= PSRM
Min. D= 1.0 Ft.
FROM -L- STA. 17+25 TO STA. 18+00 (LT)
NAD 83 / NA 2011
1 NANNIE HOWELL GRAHAM AND LARRY MCCUTCHEON GRAHAM DB 1167 PG 14 MB 9995 PG 3342
2 MICHAEL W. STEED AND CATHY STEED DB 1042 PG 789 MB 9995 PG 3342
3 JESSICA DAWN SMITH AND BURTON D MCLEOD JR. DB 1189 PG 417
4 PATTERSON VENTURES, LLC DB 1183 PG 246
BEGIN CONSTRUCTION WBS 17BP.9.R.96 -L- POC STA. 12+00.00
BEGIN PROJECT WBS 17BP.9.R.96 -L- POC STA. 12+50.00
BEGIN BRIDGE -L- POC STA. 15+08.87
BEGIN APPROACH SLAB -L- POC STA. 14+98.00
END BRIDGE -L- POC STA. 16+01.13
END APPROACH SLAB -L- POC STA. 16+12.00
BM-2 +79.09,66.89
GPS-2
CALDWELL RD.(SR 1547)
BEGIN SBG 90° TO LONG CHORD +80.24,14.16
BEGIN CL FENCE +50.00
END CL FENCE +00.68
48" CHAIN LINK FENCE
30' TAPER TO EXIST (LT/RT)
GREU TL-3
TYPE-III
KERR CREEK
DUKE ENERGY
MATCHLINE -L- STA 17+50 (SHEET 5)
PI Sta 12+21.74 Δ = 4°31' 18.0" (RT) D = 1°19' 01.7" L = 343.29' T = 171.74' R = 4,350.00' DS = 55 MPH
PI Sta 15+24.33 Δ = 6°00' 03.2" (RT) D = 2°17' 30.6" L = 261.84' T = 131.04' R = 2,500.00' DS = 50 MPH
PI Sta 17+19.38 Δ = 2°06' 11.9" (LT) D = 1°38' 13.3" L = 128.48' T = 64.25' R = 3,500.00' DS = 55 MPH
NOTE: DESIGN SPEED SHOWN FOR HORIZONTAL CURVES IS UP TO 10 MPH LESS THAN OVERALL DESIGN SPEED PER SUB-REGIONAL TIER DESIGN GUIDELINES.
NOTE: INCIDENTAL MILL APPROXIMATELY 25' AT BEGIN PROJECT TO PROVIDE A SMOOTH TRANSITION TO THE EXISTING PAVEMENT



CENTERLINE -L- STA. 15+55
1@90'-0" (33") BOX BEAM
W/ SLOPING ABUTMENTS & 4'-0" END CAPS
CENTERLINE ELEV = 726.9'
SKEW = 90-DEGREES
PROFILE (HORIZONTAL)
PROFILE (VERTICAL)
BEGIN GRADE -L- STA. 12+50.00 EL = 727.80'
PI = 13+70.00 EL = 726.00' VC = 230' K = 122 DS = 55 MPH
LOW POINT STA 14+38.58 EL = 726.34'
PI = 16+60.00 EL = 727.10' VC = 350' K = 105 DS = 50 MPH*
BEGIN BRIDGE -L- STA 15+08.87
END BRIDGE -L- STA 16+01.13
PROPOSED GRADE
EXISTING GROUND
REMOVE EXIST STRUCTURE
UNCLASSIFIED STRUCTURE EXCAVATION (APPROX. 100 CY. TOTAL BOTH SIDES)
UNCLASSIFIED STRUCTURE EXCAVATION (APPROX. 175 CY. TOTAL BOTH SIDES)
CL II RIP RAP (SEE STR. PLANS)
W.S. ELEV ON (11-16-18)=710.9'
BM-2 723.26'
*NOTE: DESIGN SPEED SHOWN FOR VERTICAL CURVES IS UP TO 20 MPH LESS THAN OVERALL DESIGN SPEED PER SUB-REGIONAL TIER DESIGN GUIDELINES.
12+00
13+00
14+00
15+00
16+00
17+00

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	1900	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	720.1	FT
BASE DISCHARGE	=	2713	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	721.9	FT
OVERTOPPING DISCHARGE	=	6500	CFS
OVERTOPPING FREQUENCY	=	>500	YRS
OVERTOPPING ELEVATION	=	726.3	FT
DATE OF SURVEY	=	11/16/2018	
W.S. ELEVATION AT DATE OF SURVEY	=	710.9	FT

1/23/2026

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.96	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 013008 GERALD H. McCAULEY 1/23/2026	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051699 TIFFANY A. PREDDY 1/23/2026

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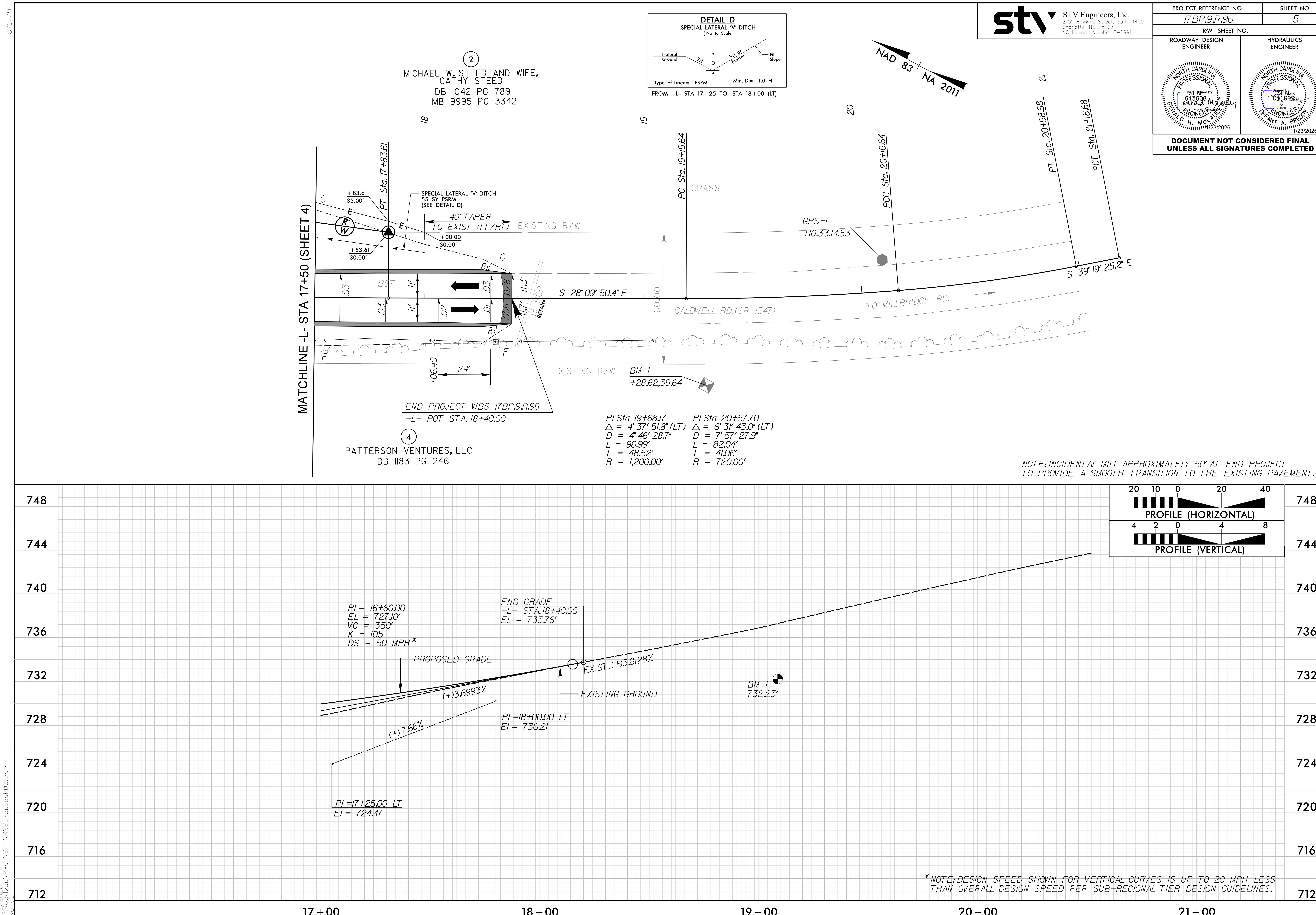


09/08/99

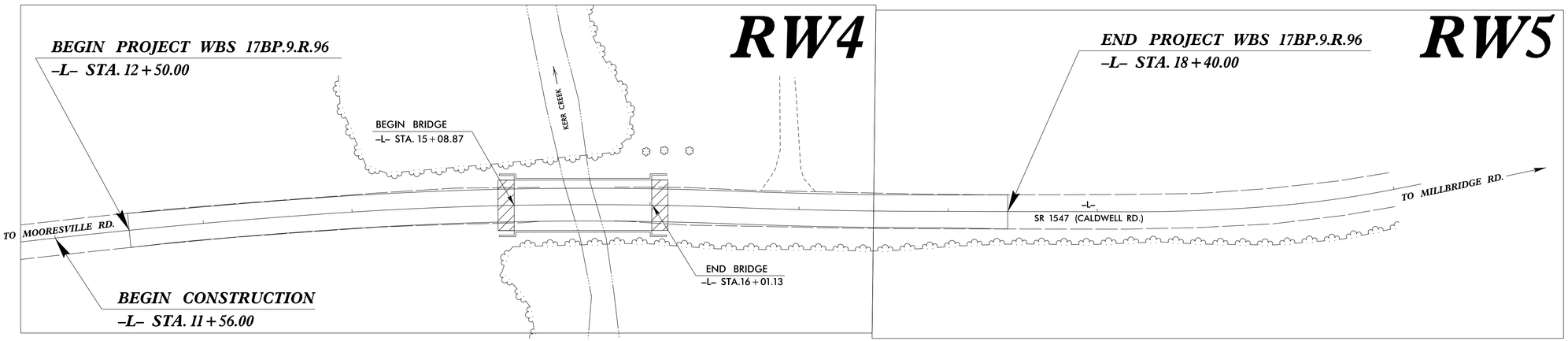
TIP PROJECT: 17BP.9.R.96

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.9.R.96	RW01	05

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

ROWAN COUNTY



GRAPHIC SCALE

50 25 0 50 100

PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
NCDOT FOR MONUMENT "GPS 2"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 685,626.160(ft) EASTING: 1,505,782.618(ft)
ELEVATION: 725.57(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.999863739
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"GPS 2" TO -L- STATION 10+00.00 IS
N 34°40'06.85" W 603.72(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:	*LETTING DATE:*
XX/XX/XXXX	*XX/XX/XXXX*

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

DocuSigned by: Michael L Motsinger
FDB8FE70E23C40E...

07/27/2023

SIGNATURE: *Date:*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

27-JUL-2023 10:12
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mmotsinger AT LS-3286TIL

6/2/99

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

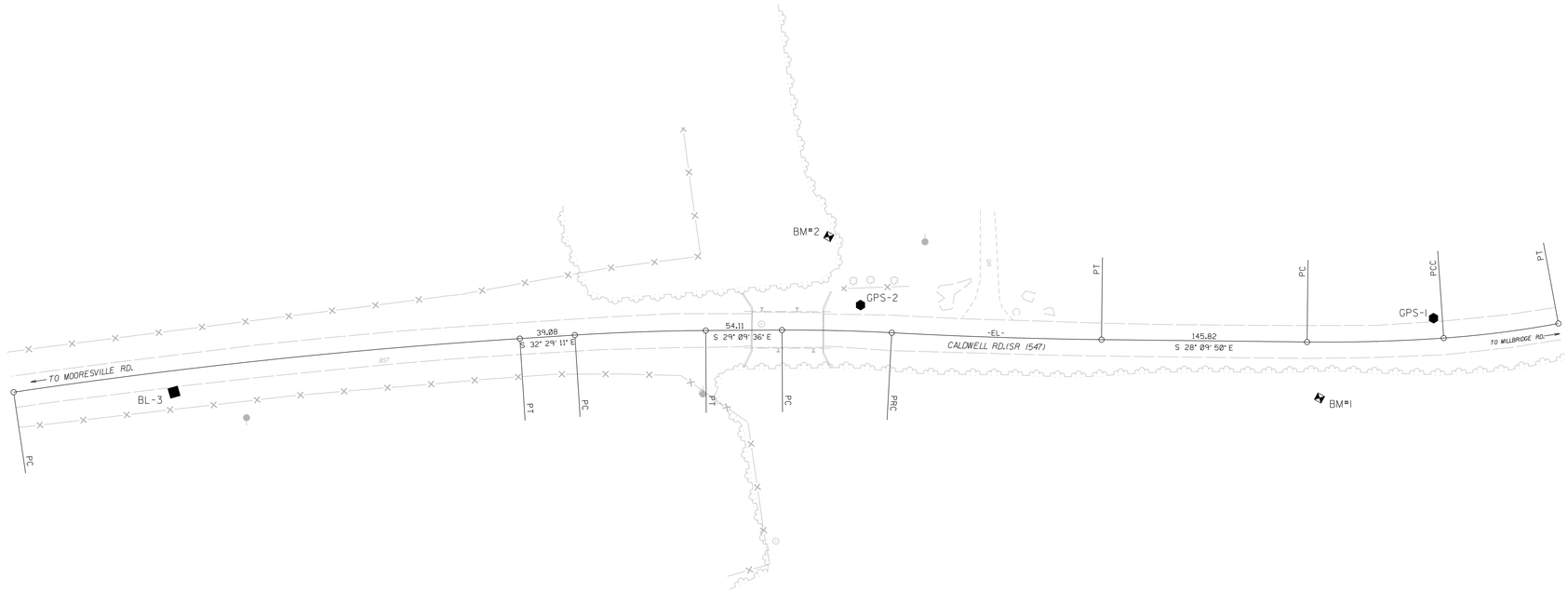
PROJECT REFERENCE NO.	SHEET NO.
79-0254	RW02C-1
Location and Surveys	

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NC GRID NAD 83 NA 2011



SEE SHEET RW02C-2 FOR FURTHER ALIGNMENT DETAILS

I, Michael L. Motsinger, PLS, certify that the 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: December 2017
Datum/Epoch:NAD 83/2011
Published/Fixed-control use: [Project Control if applicable, N/A for RTN]
Localized around: 790254-2
Northing:685626.1600
Easting:1505782.6180
Combined grid factor:0.999863739
Geoid model: Geoid 18
Units:English

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from December 2017 to February 2018 , and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 27 th day of July, 2023.

DocuSigned by:
Michael L. Motsinger
FDB6FE70E23C40E...

Professional Land Surveyor L-3877

NOTES:

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

27-JUL-2023 10:37
F:\Bridge\Division_LowImpact\79-0254_Caldwell_Rd\RW Staking\tobechecked\79-0254_LS_rw02c-1.dgn
mmotsinger AT LS-328671L

6/2/99

REVISIONS

SURVEY CONTROL SHEET

BASELINE AND BENCHMARKS

BL

POINT	DESC.	NORTH	EAST	ELEVATION
3	BL3	686022.9550	1505493.7050	730.53
2	GPS2	685626.1600	1505782.6180	725.57
1	GPS1	685265.6000	1505970.4410	739.69

****

BM#1 ELEVATION = 732.23
N 685309 E 1505882
RR SPIKE IN 21" DIA POPLAR

****
****

BM#2 ELEVATION = 723.26
N 685669 E 1505814
RR SPIKE IN 17" DIA POPLAR

****

PROJECT REFERENCE NO.	SHEET NO.
79-0254	RW02C-2

Location and Surveys

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

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I, Michael L. Motsinger, PLS, certify that the 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: December 2017
Datum/Epoch:NAD 83/2011
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Localized around: 790254-2
Northing:685626.1600
Easting:1505782.6180
Combined grid factor:0.999863739
Geoid model: Geoid 18
Units:English

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from December 2017 to February 2018 , and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 27 th day of July, 2023.

DocuSigned by:
Michael L. Motsinger
F0B6FE7DE23C40E...
Professional Land Surveyor L-3877

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	686122.647	1505438.879							
CURVE			S 34°51'54.6" E	361.09	04°45'26.7"(RT)	01°19'01.7"	361.19	180.70	4350.00
PT	685826.374	1505645.295							
LINE			S 32°29'11.2" E	39.08					
PC	685793.407	1505666.286							
CURVE			S 30°49'23.7" E	92.88	03°19'34.9"(RT)	03°34'51.6"	92.89	46.46	1600.00
PT	685713.649	1505713.875							
LINE			S 29°09'36.2" E	54.11					
PC	685666.398	1505740.239							
CURVE			S 27°26'37.3" E	77.87	03°25'57.9"(RT)	04°24'26.5"	77.89	38.95	1300.00
PCC	685597.287	1505776.130							
CURVE			S 26°56'44.4" E	148.84	02°26'12.1"(LT)	01°38'13.3"	148.85	74.44	3500.00
PT	685464.608	1505843.575							
LINE			S 28°09'50.4" E	145.82					
PC	685336.051	1505912.403							
CURVE			S 30°28'46.3" E	96.97	04°37'51.8"(LT)	04°46'28.7"	96.99	48.52	1200.00
PCC	685252.484	1505961.587							
CURVE			S 36°03'33.7" E	82.00	06°31'43.0"(LT)	07°57'27.9"	82.04	41.06	720.00
PT	685186.197	1506009.852							

PROPOSED ALIGNMENT

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	686122.6960	1505439.2030
PC	10+50.00	686082.5464	1505469.0025
PCC	13+93.29	685799.1021	1505662.5177
PRC	16+55.13	685570.3338	1505789.6455
PRC	16+55.13	685570.3338	1505789.6455
PT	17+83.61	685455.9757	1505848.1966
PC	19+19.64	685336.0505	1505912.4030
PCC	20+16.64	685252.4841	1505961.5872
PT	20+98.68	685186.1974	1506009.8523
POT	21+18.68	685170.7259	1506022.5263

NOTES:

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

27-JUL-2023 11:00
F:\Bridge\Division_LowImpact\79-0254_Caldwell_Rd\RW Staking\tobechecked\79-0254_LS_rw02c-2.dgn
mmotsinger AT LS-32867IL

PROJECT REFERENCE NO.	SHEET NO.
79-0254	RW04

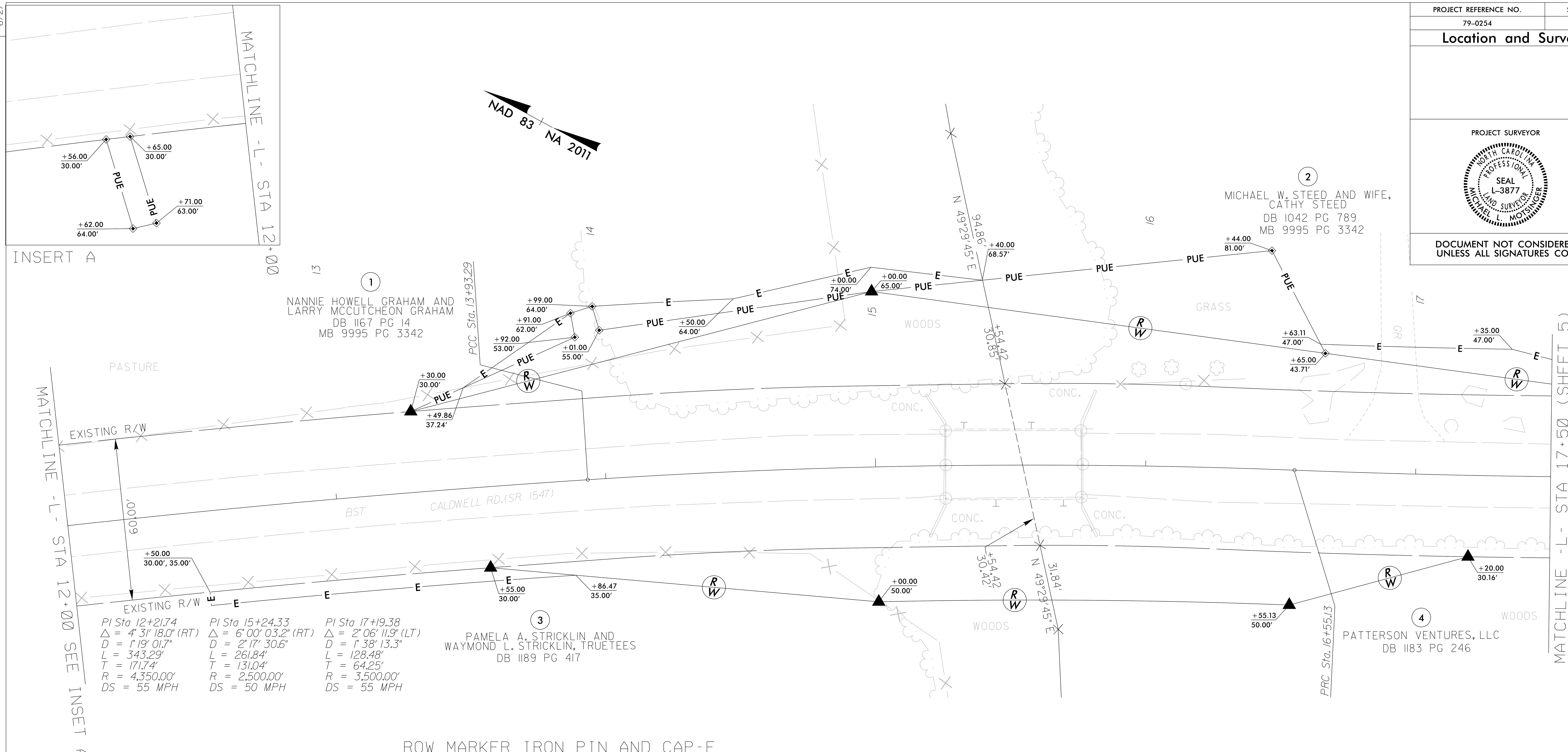
Location and Surveys

PROJECT SURVEYOR

SEAL L-3877 NORTH CAROLINA PROFESSIONAL LAND SURVEYOR MICHAEL L. MOTSINGER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS



ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	13+30.00	-30.00	685868.7882	1505653.7209
L	13+55.00	30.00	685815.3164	1505616.7650
L	15+00.00	50.00	685682.7797	1505673.7465
L	15+00.00	-65.00	685739.6110	1505773.7225
L	16+55.13	50.00	685548.3677	1505744.7290
L	17+20.00	30.16	685498.5754	1505791.8352
L	17+83.61	-30.00	685470.1356	1505874.6446

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+56.00	30.00	685979.3807	1505506.6159
L	11+62.00	64.00	685954.9545	1505482.2318
L	11+65.00	30.00	685972.0707	1505511.7588
L	11+71.00	63.00	685948.2683	1505488.1435
L	13+91.00	-62.00	685833.9842	1505713.8263
L	13+92.00	-53.00	685828.3452	1505706.7392
L	13+99.00	-64.00	685828.1114	1505719.8577
L	14+01.00	-55.00	685821.6162	1505713.2998
L	16+44.00	-81.00	685616.2308	1505857.3387
L	16+65.00	-43.71	685580.7870	1505833.2041

I , Michael L. Motsinger , certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from July 3, 2023____ to _July _12, 2023___, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 27th day of July, 2023

DocuSigned by:
Michael L. Motsinger
EDB6FE70E23C40E
Professional Land Surveyor L-3877

SEAL L-3877 NORTH CAROLINA PROFESSIONAL LAND SURVEYOR MICHAEL L. MOTSINGER

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED _____ TO _____ .

6/2/99

27-JUL-2023 13:47
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mmotsinger AT LS-32867JL

PROJECT REFERENCE NO.	SHEET NO.
79-0254	RW05

Location and Surveys

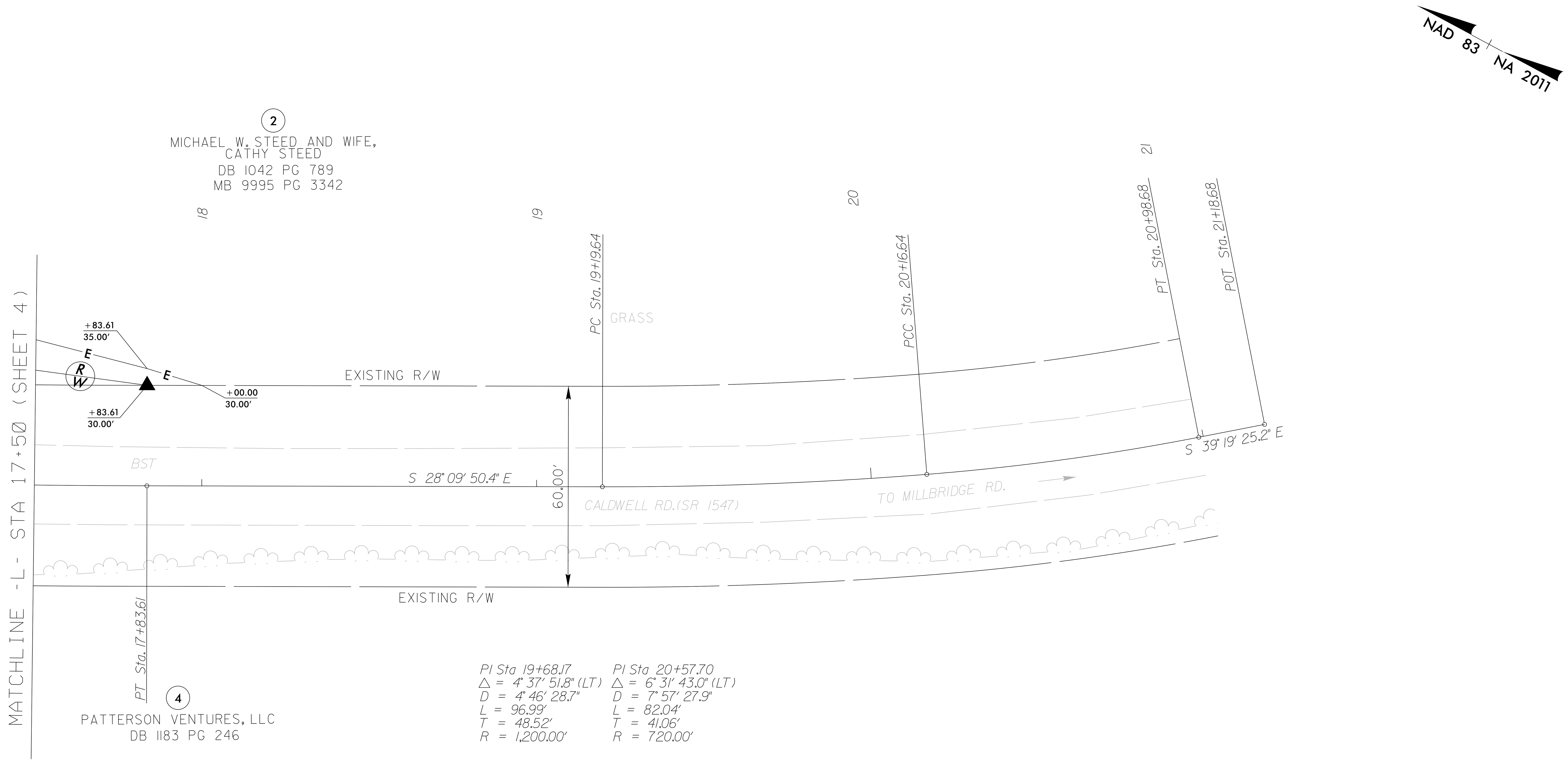
INSERT CONSULTANT'S NAME

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS



I , Michael L. Motsinger , certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from July 3, 2023____ to _July _12, 2023___, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 27th day of July, 2023.

DocuSigned by:

Professional Land Surveyor L-3877

NORTH CAROLINA PROFESSIONAL SEAL L-3877 LAND SURVEYOR MICHAEL L. MOTSINGER

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED _____ TO _____ .

6/2/99

27-JUL-2023 13:55
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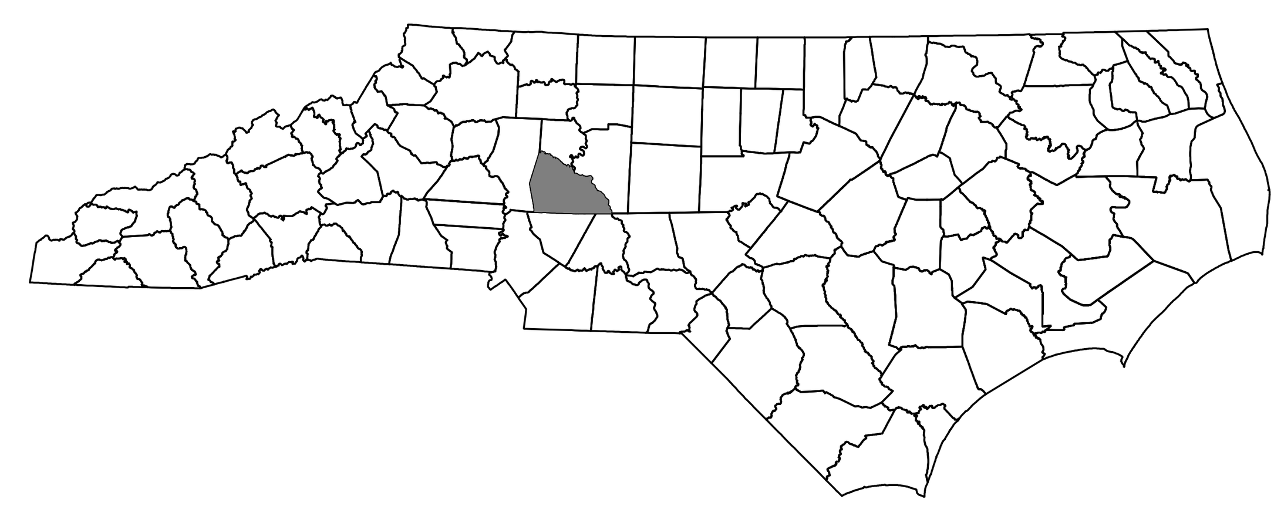
mmotsinger AT LS-32867IL

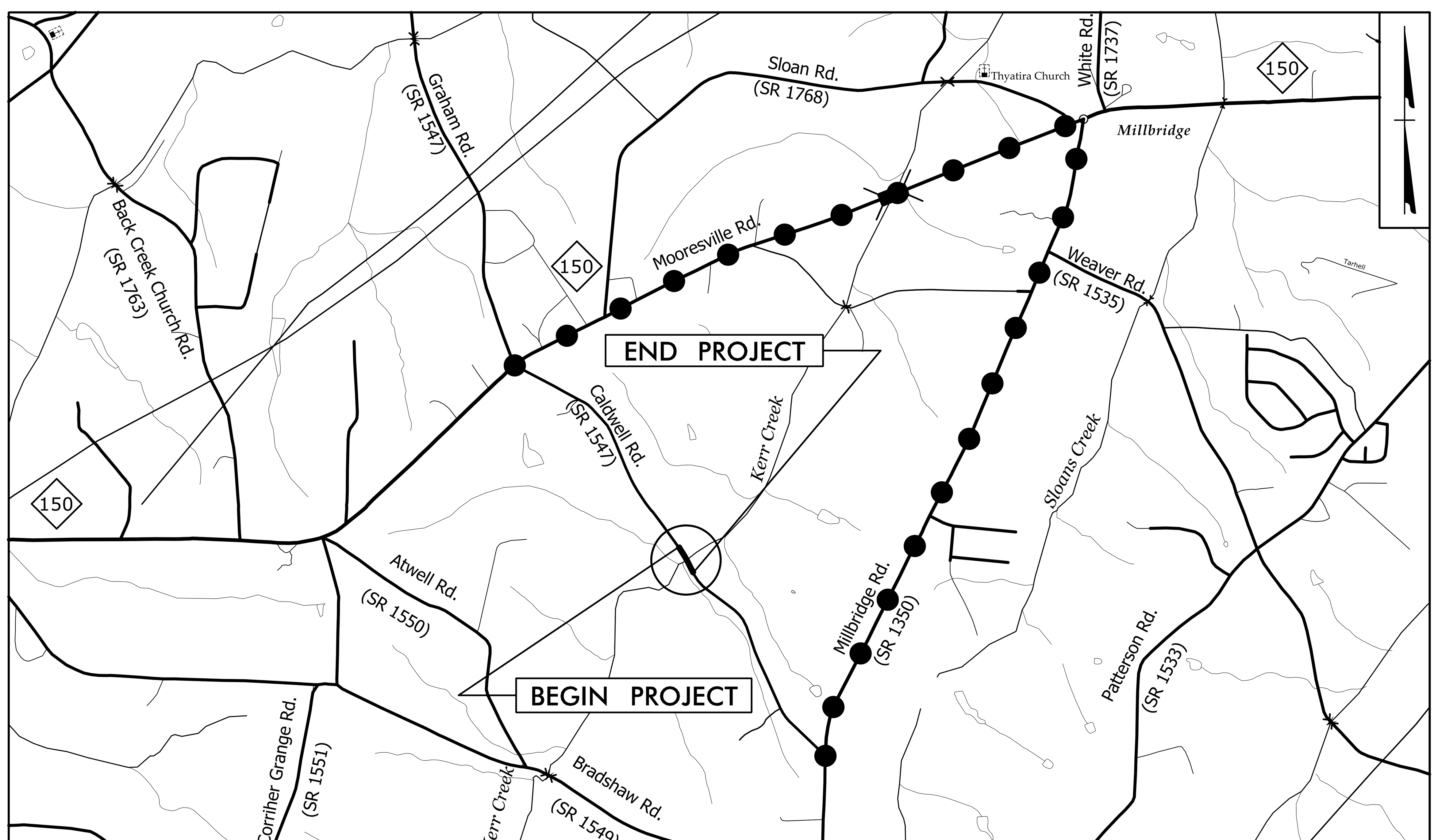
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

ROWAN COUNTY



LOCATION: BRIDGE #254 OVER KERR CREEK ON SR 1547 (CALDWELL RD)

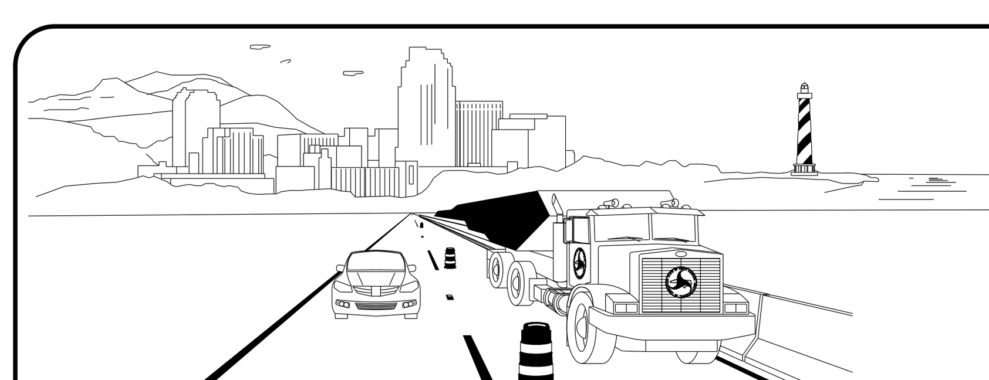


VICINITY MAP — OFFSITE DETOUR

INDEX OF SHEETS

SHEET NO. TMP-1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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

PLANS PREPARED BY:

GERALD H. McCAULEY, PE
TRAFFIC ENGINEER

CARLOS G. OWENS JR.
TRANSPORTATION DESIGNER

NCDOT CONTACTS:

JEREMY KEATON, PE
PROJECT ENGINEER

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

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

APPROVED:

DATE:

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER — GERALD H. McCAULEY — SEAL 013008

1/23/2026

1/22/2026
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OwensC

ROADWAY STANDARD DRAWINGS

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

STD. NO.	TITLE
1101.01	WORK ZONE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1145.01	BARRICADES

STV Engineers, Inc.
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Charlotte, NC 28203
NC License Number F-0991

PROJ. REFERENCE NO.	SHEET NO.
17.BP.9.R.96	TMP-2

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- WORK AREA

SIGNALS

- EXISTING
- PROPOSED
- TEMP — TEMPORARY
- MOD — MODIFIED

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

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

APPROVED: ____________

DATE: ____________

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 013008 GERALD H. McCAULEY

1/23/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ROADWAY STANDARD DRAWINGS & LEGEND

PROJECT NOTES

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.

HOLIDAYS & EVENTS

1. FOR UNEXPECTED OCCURRENCE THAT CREATES UNUSUALLY HIGH TRAFFIC VOLUMES, AS DIRECTED BY THE ENGINEER.
2. FOR NEW YEAR'S DAY, BETWEEN THE HOURS OF 6:00 AM DECEMBER 31ST AND 9:00 AM JANUARY 2ND. IF NEW YEAR'S DAY IS ON A FRIDAY, SATURDAY, SUNDAY OR MONDAY, THEN UNTIL 9:00 AM THE FOLLOWING TUESDAY.
3. FOR EASTER, BETWEEN THE HOURS OF 6:00 AM THURSDAY AND 9:00 AM MONDAY.
4. FOR MEMORIAL DAY, BETWEEN THE HOURS OF 6:00 AM FRIDAY AND 9:00 AM TUESDAY.
5. FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 6:00 AM THE DAY BEFORE INDEPENDENCE DAY AND 7:00 PM THE DAY AFTER INDEPENDENCE DAY.

   IF INDEPENDENCE DAY IN ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY, THEN BETWEEN THE HOURS OF 6:00 AM THE THURSDAY BEFORE INDEPENDENCE DAY AND 7:00 PM THE TUESDAY AFTER INDEPENDENCE DAY.
6. FOR LABOR DAY, BETWEEN THE HOURS OF 6:00 AM FRIDAY AND 9:00 AM TUESDAY.
7. FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 6:00 AM FRIDAY AND 9:00 AM TUESDAY.
8. FOR CHRISTMAS, BETWEEN THE HOURS OF 7:00 PM THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 9:00 AM THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS DAY.

TRAFFIC PATTERN ALTERATIONS

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

LANE AND SHOULDER CLOSURE REQUIREMENTS

B) 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.

C) 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. 1101.02 UNLESS THE WORK AREA IS PROTECTED BARRIER OR GUARDRAIL.

SIGNING

D) INSTALL 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.

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

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

G) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED FOR OFF-SITE DETOUR WHEN DETOUR IS NOT IN OPERATION.

TRAFFIC CONTROL DEVICES

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

TRAFFIC MANAGEMENT STRATEGIES

THE PROJECT WILL BE CONSTRUCTED AWAY FROM TRAFFIC USING OFF SITE DETOUR WHEREVER POSSIBLE, WHERE TRAFFIC IS AFFECTED, A COMBINATION OF LANE CLOSURES AND FLAGGERS WILL BE USED AS NECESSARY.

LANE SHIFTS OR CLOSURES
SHOULDER CLOSURES
ONE-LANE, TWO WAY OPERATION (FLAGGING)

DURING OFF PEAK TIMES USE TEMPORARY LANE CLOSURE AS REQUIRED, CONSTRUCT PAVEMENT TIE INS, DRAINAGE AND PAVEMENT WEDGING WHEN WORK ZONE IS LESS THAN 5' FROM AN OPEN TRAVEL LANE

LOCAL NOTES

1. CONTACT ROWAN COUNTY AND TOWN OF CHINA GROVE EMERGENCY SERVICES AND SCHOOLS AT LEAST ONE MONTH PRIOR TO CONSTRUCTION.

PHASING

NOTE: BEFORE BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL PLACE ADVANCE WORK ZONE WARNING SIGNS. (SEE RSD 1101.01, SHEET 3 OF 3)

PHASE 1

STEP 1

INSTALL OFF-SITE DETOUR SIGNING TO CLOSE CALDWELL ROAD (SR 1547) TO THROUGH TRAFFIC (SEE TMP-4).

USING RSD 1101.03 (SHEETS 1 OF 9) INSTALL TYPE III BARRICADES AND CLOSE CALDWELL ROAD TO THROUGH TRAFFIC.

STEP 2

AWAY FROM TRAFFIC, REMOVE THE EXISTING BRIDGE, CONSTRUCT PROPOSED BRIDGE, DRAINAGE, AND ROADWAY INCLUDING THE FINAL LAYER OF SURFACE COURSE.
PLACE FINAL PAVEMENT MARKINGS.

STEP 3

USING RSD 1101.02 SHEET 1 OF 19, REMOVE ALL TRAFFIC CONTROL DEVICES, SIGNING AND DETOUR ROUTE SIGNING.

OPEN CALDWELL ROAD (SR 1547)TO THE FINAL TRAFFIC PATTERN.

OFF-SITE DETOUR SIGNING AND ROAD CLOSURE SIGNING

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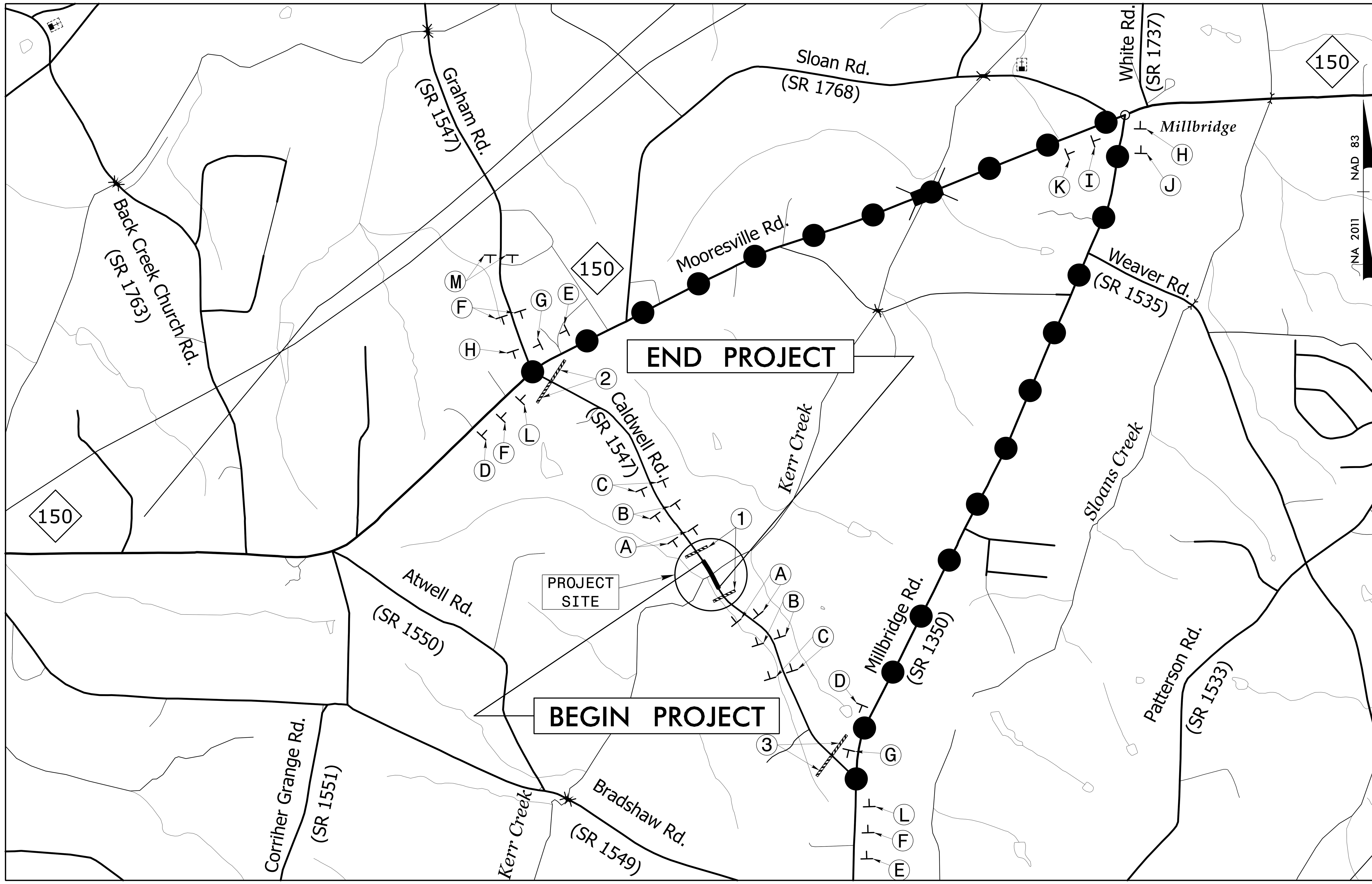
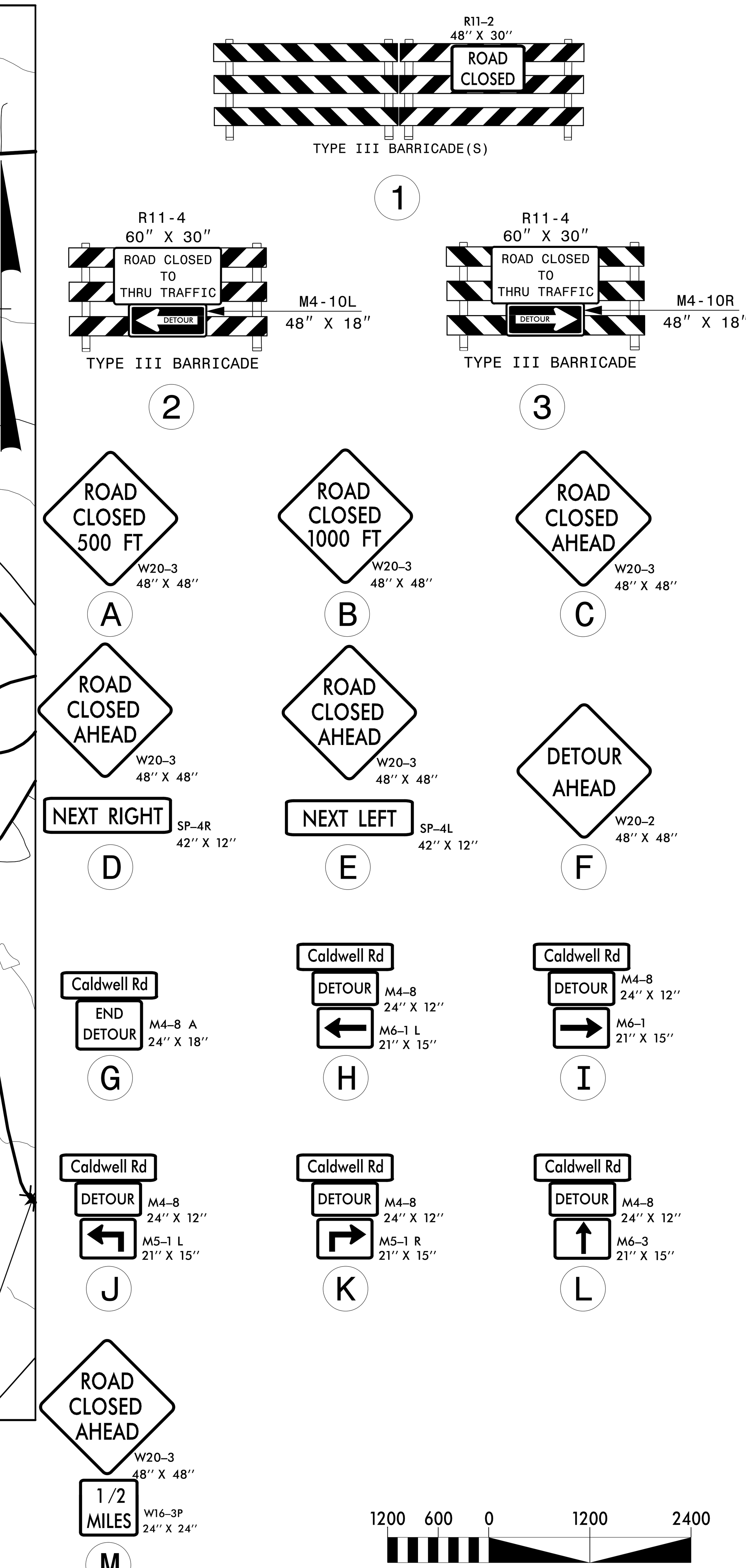
Charlotte, NC 28203
NC License Number F-0991

PROJ. REFERENCE NO.	SHEET NO.
17BP.9.R.96	TMP-4

NOTE: MAINTAIN DRIVEWAY ACCESS THROUGHT THE PROJECT LIMITS.

SEE ROADWAY STD DWG 1101.03, SHEET 1 OF 9 FOR ADVANCE WARNING AND BARRICADE PLACEMENT.





N.T.S.

ROADWAY DETOUR

1200 600 0 1200 2400

Scale: 1" = 1200'

APPROVED: ____________

DATE: ____________

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 033008 ENGINEER GERALD H. McCAULEY

1/23/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TRANSPORTATION MANAGEMENT PLAN DETOUR ROUTE

8/17/99

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

PROJ. REFERENCE NO.	SHEET NO.
BP10-R017	TMP-5

BRIDGE #254

SIGN NUMBER: I-1
TYPE: D
QUANTITY: See Plans

SIGN WIDTH: 42″
HEIGHT: 24″
TOTAL AREA: 7.0 Sq.Ft.

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

NO. Z BARS:
LENGTH:

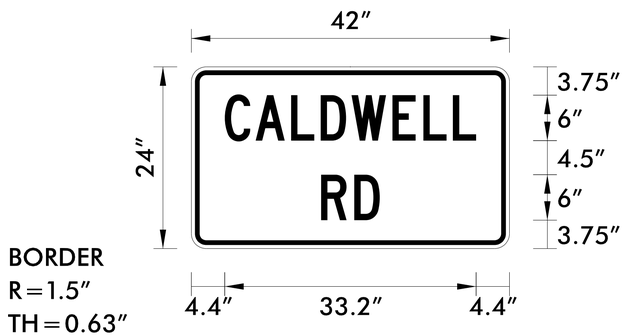
BACKG COLOR: Orange
COPY COLOR: Black

SYMBOL	X	Y	WID	HT

MAT'L: 0.080″ (2.0 mm) ALUMINUM

USE NOTES: 1,2
1. Legend and border shall be direct applied encapsulated lens reflective sheeting.
2. Background shall be NC Grade B fluorescent.

DESIGN BY: SLS
CHECKED BY: GHM
PROJECT ID: 17BP.9.R.96
DIV: 9
DATE: Oct 6, 2022



BORDER
R = 1.5″
TH = 0.63″
IN = 0.47″

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter positions are to the lower left corners

																									Series/Size Text Length
	C	A	L	D	W	E	L	L																	C 2000 / 6
	4.4	8.5	13.2	17.1	21.1	26.5	30.6	34.5																	33.2
	R	D																							C 2000 / 6
	17.1	21.5																							7.7

NORTH CAROLINA D.O.T. SIGN DETAIL

APPROVED: _____
DATE: _____
SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 023008 GERALD H. MCCAULEY
Digitally signed by GERALD H. MCCAULEY
1/23/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TRANSPORTATION
MANAGEMENT PLAN
SPECIAL SIGN DESIGN
CALDWELL ROAD

1/22/2026
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OwensC

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
I7BP.9.R.96	PMP-1
R/W SHEET NO.	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ROADWAY DESIGN ENGINEER

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING & SIGNING PLANS
ROWAN COUNTY

LOCATION: BRIDGE #254 OVER KERR CREEK ON SR 1547 (CALDWELL ROAD)

INDEX

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

ROADWAY STANDARD DRAWINGS

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

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.12	PAVEMENT MARKINGS - BRIDGES
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

GENERAL NOTES

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

A) INSTALL PAVEMENT MARKINGS ON THE FINAL SURFACE.

ROAD NAME	MARKING	MARKERS
SR 1547 (CALDWELL ROAD)	THERMO PLASTIC	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) REPLACE ANY PAVEMENT MARKINGS BEYOND THE PROJECT LIMITS DAMAGED BY THE CONTRACTORS' OPERATIONS DURING CONSTRUCTION.

SUMMARY OF QUANTITIES

ITEM NO. DESC. NO.	SECT. NO.	ITEM DESCRIPTION	QUANTITY	UNIT
4025000000	901	CONTRACTOR FURNISHED, TYPE E SIGN	6.5	S.F.
4072000000	903	SUPPORTS, 3 LBS STEEL U-CHANNEL	14	L.F.
4102000000	904	SIGN ERECTION, TYPE E	1	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	1	EA.

PLAN PREPARED BY:
STV Engineers, Inc.

GERALD H. McCAULEY, PE	TRAFFIC ENGINEER
CARLOS G. OWENS JR.	TRANSPORTATION DESIGNER

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 027006 GERALD H. McCAULEY
1/23/2026

8/17/99
1/22/2026
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STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
I7BP.9.R.96	PMP-2
R/W SHEET NO.	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ROADWAY DESIGN ENGINEER

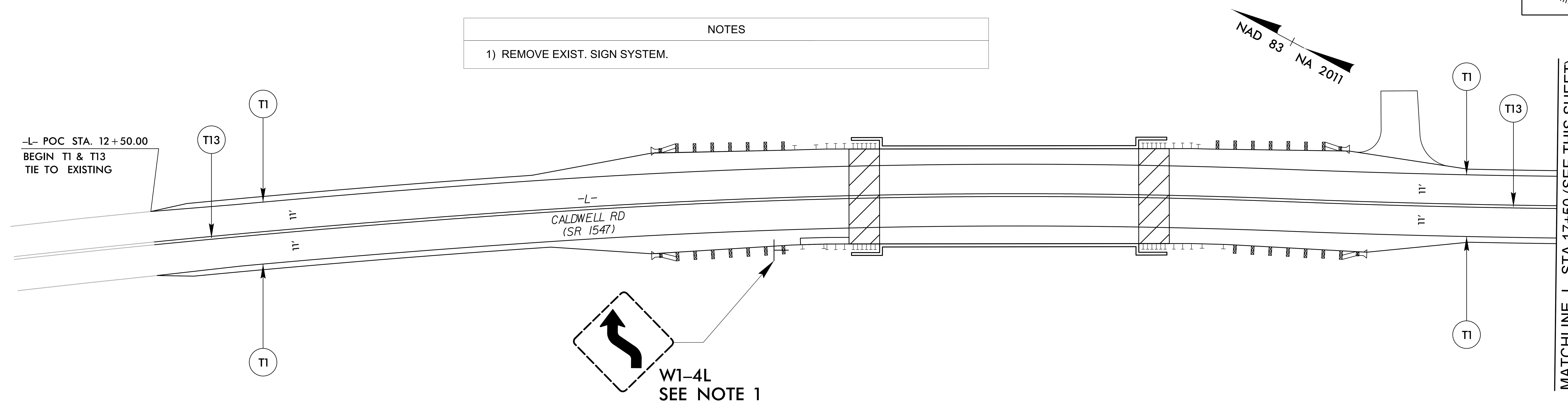
NORTH CAROLINA PROFESSIONAL SEAL 013008 ENGINEER GERALD H. McCAULEY

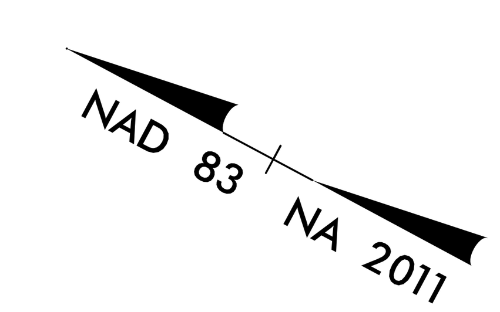
1/23/2026

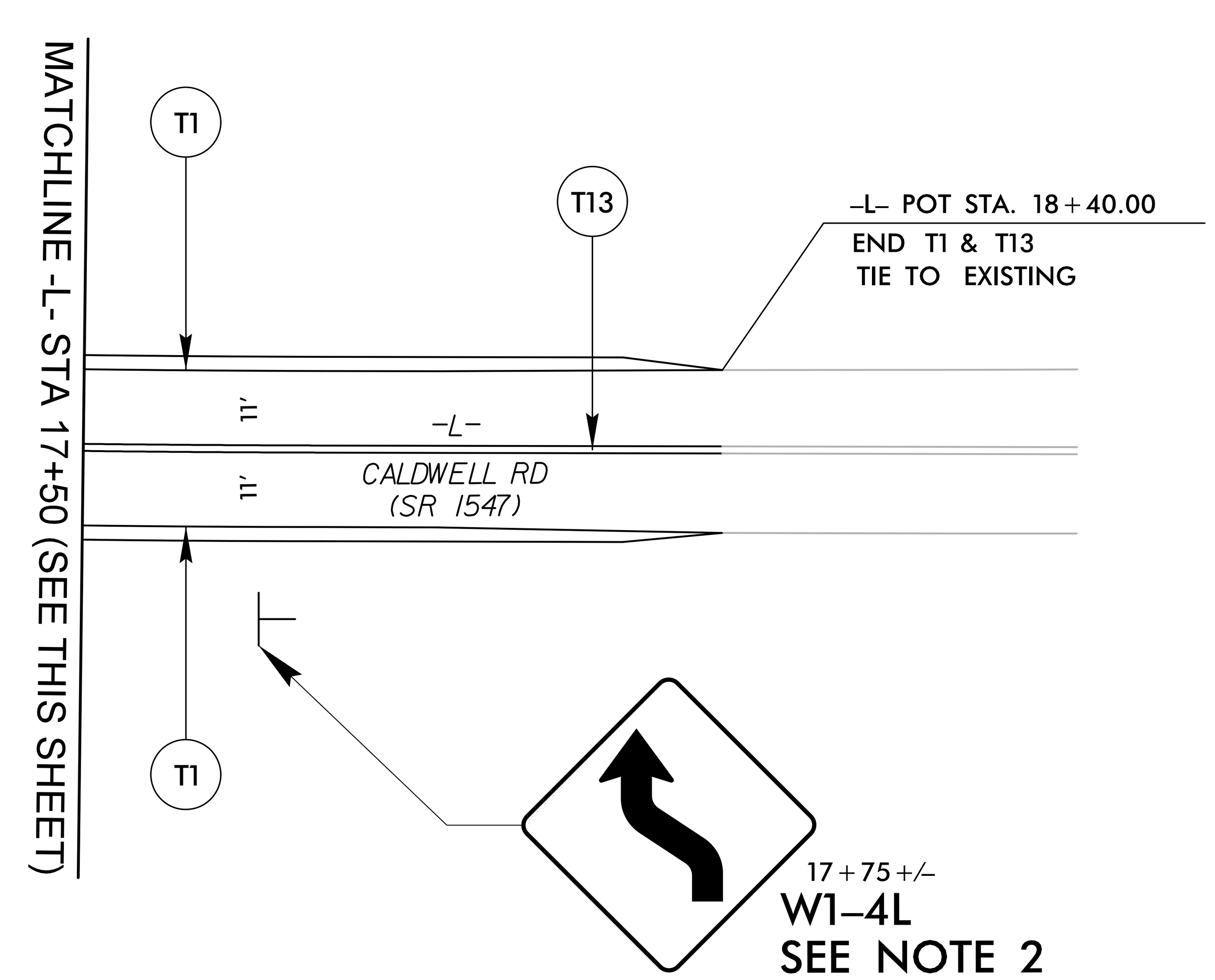
PAVEMENT MARKING PLAN

PAVEMENT MARKING SCHEDULE	
T1 - THERMOPLASTIC	WHITE EDGELINE (4", 90MIL)
T13 - THERMOPLASTIC	YELLOW DOUBLE CENTER (4", 90MIL)

NOTES
1) REMOVE EXIST. SIGN SYSTEM.







PAVEMENT MARKING SCHEDULE	
T1 - THERMOPLASTIC	WHITE EDGELINE (4", 90MIL)
T13 - THERMOPLASTIC	YELLOW DOUBLE CENTER (4", 90MIL)

NOTES
2) ERECT NEW SIGN SYSTEM AND ERECT NEW U-CHANNEL.

8/17/99

1/22/2026
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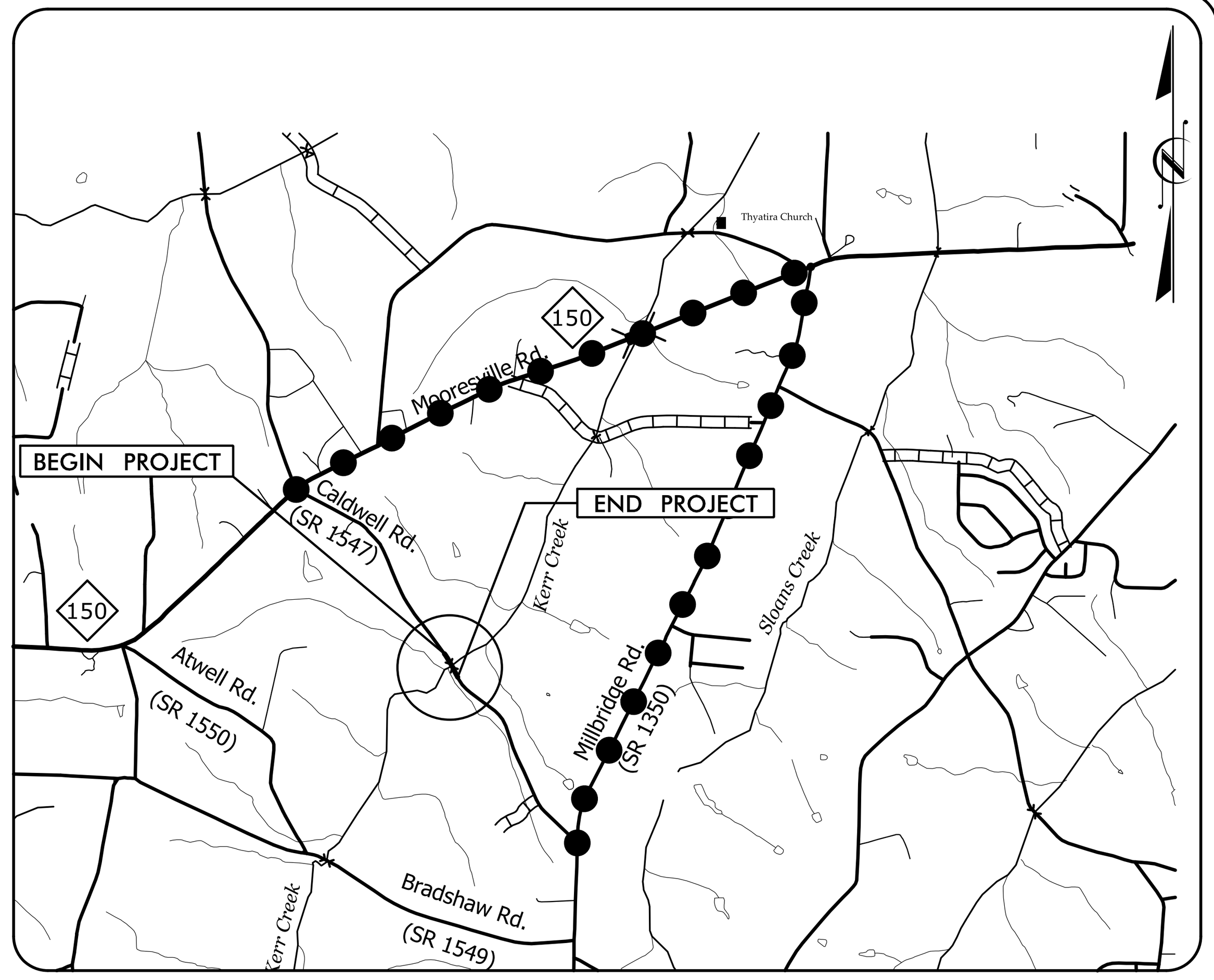
PROJECT WBS: 17BP.9.R.96

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.9.R.96	EC-1	10

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.9.R.96		P.E.
17BP.9.R.96		RW & UTILITY
17BP.9.R.96		CONSTRUCTION

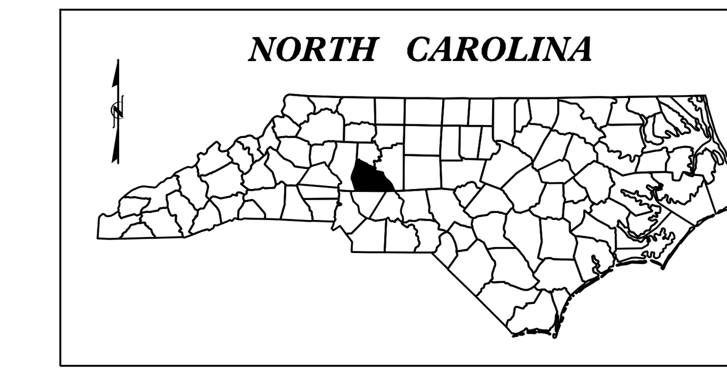


VICINITY MAP

NOT TO SCALE

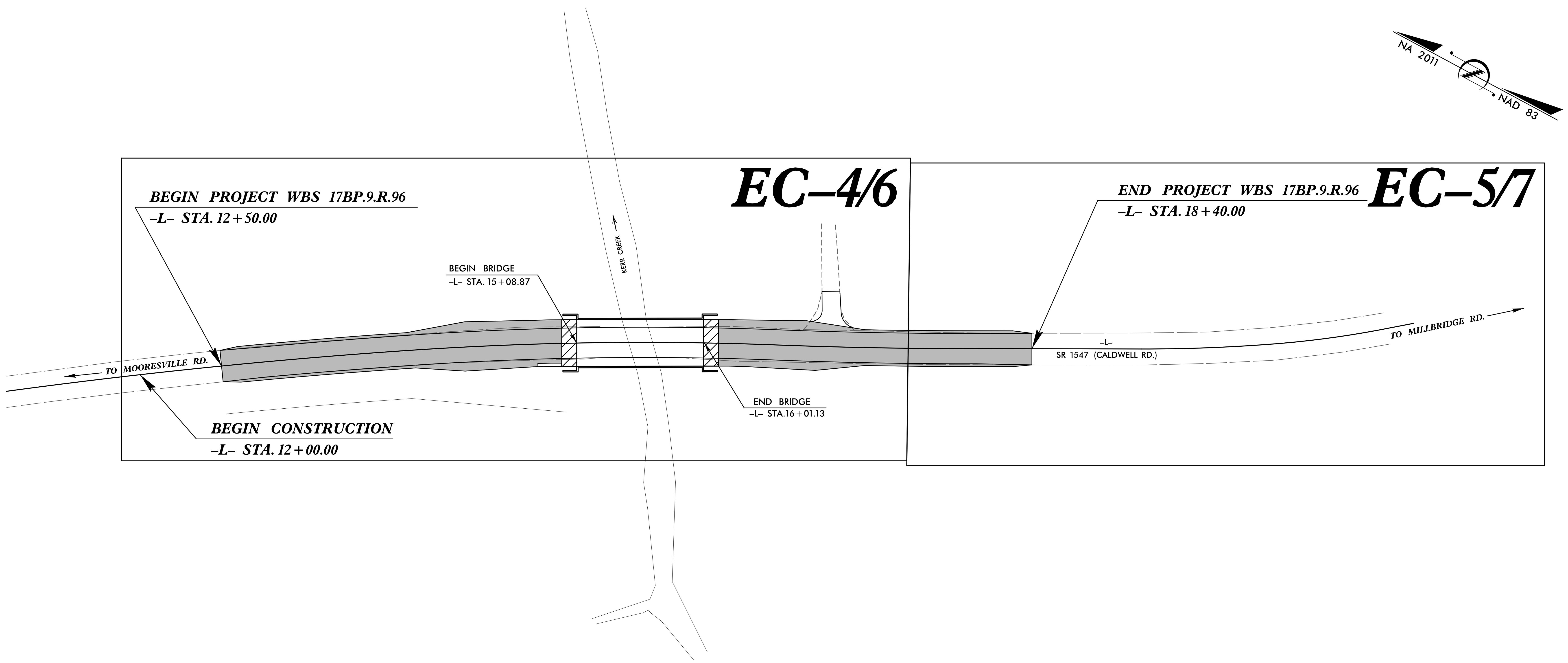
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL
ROWAN COUNTY



LOCATION: BRIDGE #254 OVER KERR CREEK ON SR 1547 (CALDWELL RD)

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



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 Sta. –L– STA. 12+50.00
to Sta. –L– STA. 18+40.00
Refer To E. C. Special Provisions for Special Considerations.

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

GRAPHIC SCALE

20 10 0 20 40

PLANS

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

stv

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

Prepared In the Office of:

STV ENGINEERS, INC.

2151 HAWKINS STREET, SUITE 1400
CHARLOTTE, NC 28203

Designed by:

JOY SADDLER, PE — ***4143***

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.

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.96	EC-1A

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
NC License Number F-0991

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

EROSION & SEDIMENT CONTROL LEGEND

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

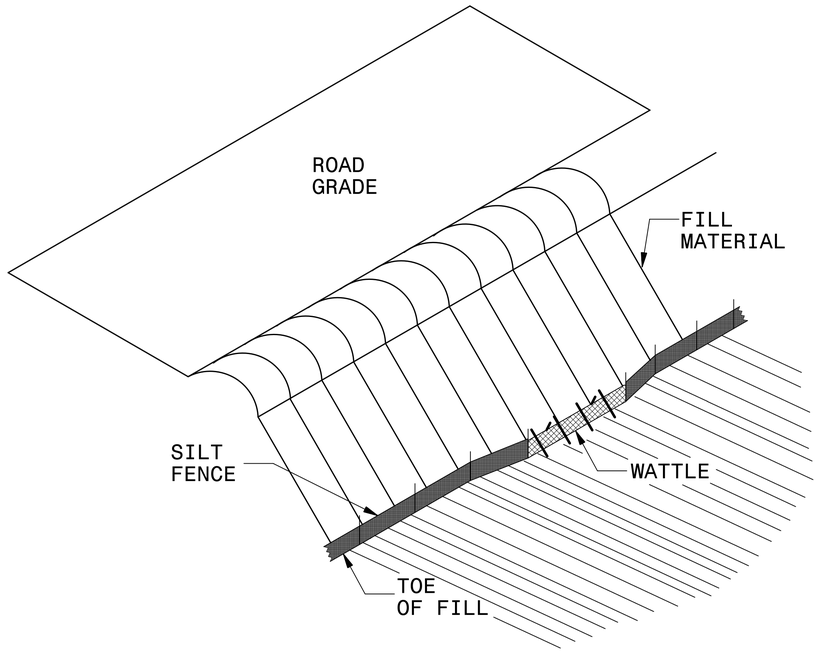
Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet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

8/17/99

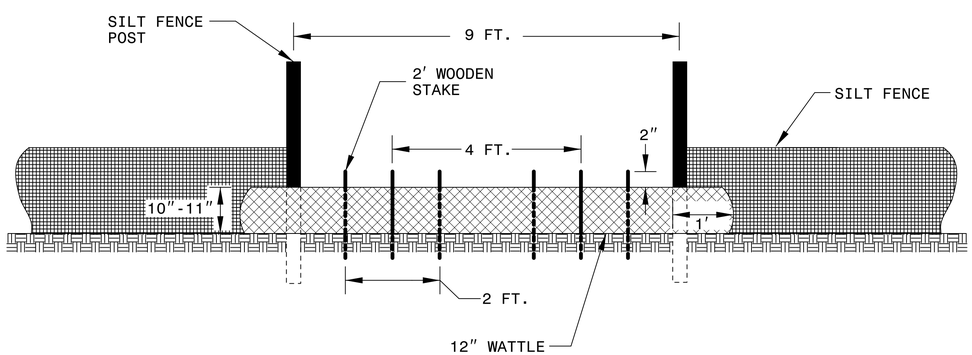
PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.96	EC-2

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
NC License Number F-0991

SILT FENCE COIR FIBER WATTLE BREAK DETAIL



ISOMETRIC VIEW



VIEW FROM SLOPE

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLE ON TOE OF SLOPE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

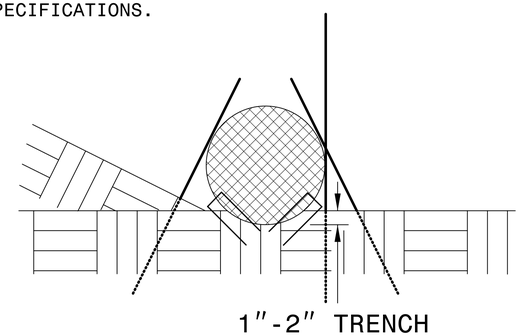
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

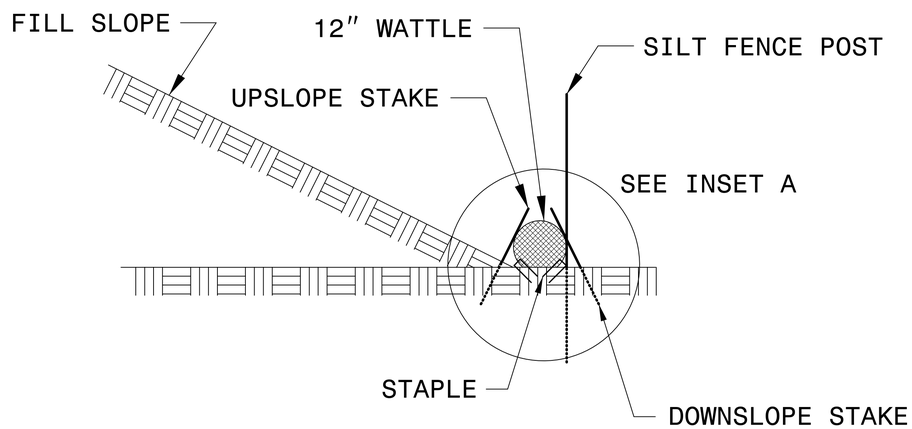
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.

INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A





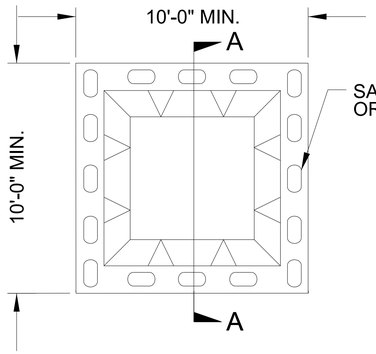
SIDE VIEW

1/21/2026
R:\Environmental\Details\R.96_EC_CFW Break_Detail_psh2.dgn
Owensc

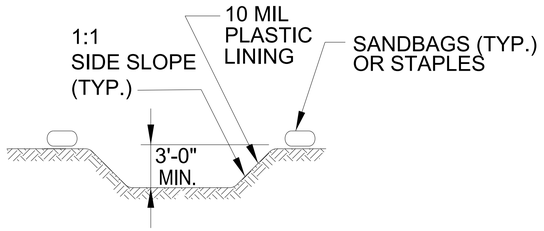
PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.96	EC-2A

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
NC License Number F-0991

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A

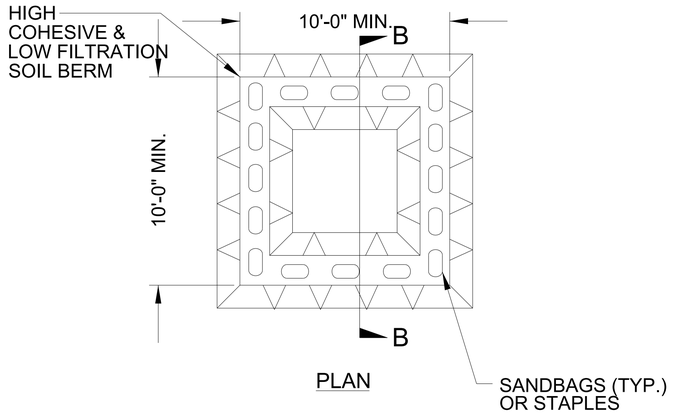
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

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

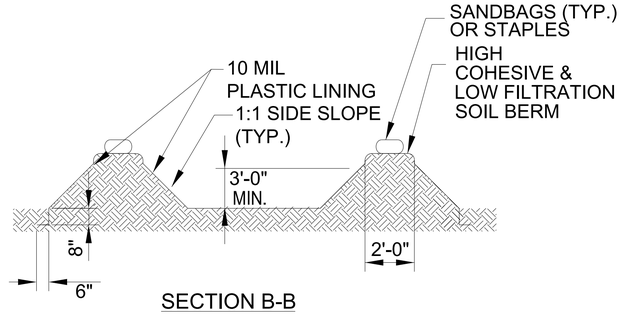
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE

NOT TO SCALE



PLAN



SECTION B-B

NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

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

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

ABOVE GRADE WASHOUT STRUCTURE

NOT TO SCALE

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.96	EC-3

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Charlotte, NC 28203
NC License Number F-0991

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					5125
				SAY	5200

PERMANENT SOIL REINFORCEMENT MATTING

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
PERMANENT SOIL REINFORCEMENT MAT – TYPE 1					
4	-L-	15+79	16+75	LT	60
PERMANENT SOIL REINFORCEMENT MAT – TYPE 3					
4	-L-	12+00	15+20	RT	175
PERMANENT SOIL REINFORCEMENT MAT – TYPE 2					
4	-L-	17+25	17+50	LT	20
5	-L-	17+50	18+00	LT	35

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.96	EC-3A

STV Engineers, Inc.
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Charlotte, NC 28203
NC License Number F-0991

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

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

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.96	EC-4/CONST 4

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
NC License Number F-0991

NAD 83 NA 2011

1
NANNIE HOWELL GRAHAM AND
LARRY MCCUTCHEON GRAHAM
DB 1167 PG 14
MB 9995 PG 3342

EARTHEN BERM TO DIRECT OFFSITE DITCH FLOW FROM FIELD INTO CLEAN WATER DIVERSION

PCC Sta. 13+93.29

PASTURE

EXISTING R/W

60.00'

CALDWELL RD.(SR 1547)

BST

EXISTING R/W

3
JESSICA DAWN SMITH
BURTON D MCLEOD
DB 1189 PG 417

PASTURE

KERR CREEK

IMPERVIOUS DIKE (TYP.)

INV=718.57

GREU TL-3

TYPE-III

TOP = 726.0
INV = 722.1
90° TO LONG CHORD

INV = 720

GREU TL-3

TYPE-III

GREU TL-3

TYPE-III

GRASS

RIP/RAP

15" RCP

STONE PLANTER

CFW

4
PATTERSON VENTURES, LLC
DB 1183 PG 246

WOODS

PRC Sta. 16+55.73

MATCHLINE -L- STA 17+50 (SHEET EC-5)

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

NOTE:
UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

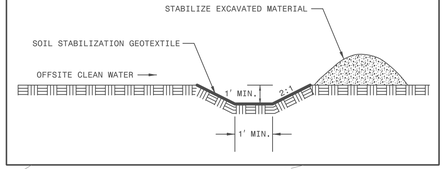
NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

NOTE:
FOLLOW NCDOT BMP MANUAL FOR CONSTRUCTION ACTIVITES FOR THE BRIDGE DEMOLITION AND CONSTRUCTION

CLEAN WATER DIVERSION

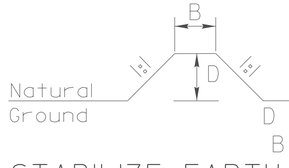
CWD → CWD → CWD → CWD →

(Not to Scale)



TEMPORARY EARTH BERM

(Not to Scale)



STABILIZE EARTH BERM

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.96	EC-5/CONST 5

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
NC License Number F-0991

NAD 83 / NA 2011

(2)
MICHAEL W. STEED AND WIFE,
CATHY STEED
DB 1042 PG 789
MB 9995 PG 3342

TYPICAL DITCH SECTION
D=1 FT.
B=0 FT.
T=12 FT.
-L- STA. 17+28 TO STA. 18+41 (LT)

PT Sta. 17+83.61
PC Sta. 19+19.64
PCC Sta. 20+16.64
PT Sta. 20+98.68
POT Sta. 21+18.68

GRASS
EXISTING R/W
INV=731.39'
BST
S 28° 09' 50.4" E
60.00'
18" RCP
CALDWELL RD.(SR 1547)
TO MILLBRIDGE RD.
S 39° 19' 25.2" E
CFW
EXISTING R/W
INV=729.51'

MATCHLINE -L- STA 17+50 (SHEET EC-4)

(4)
PATTERSON VENTURES, LLC
DB 1183 PG 246

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 5

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

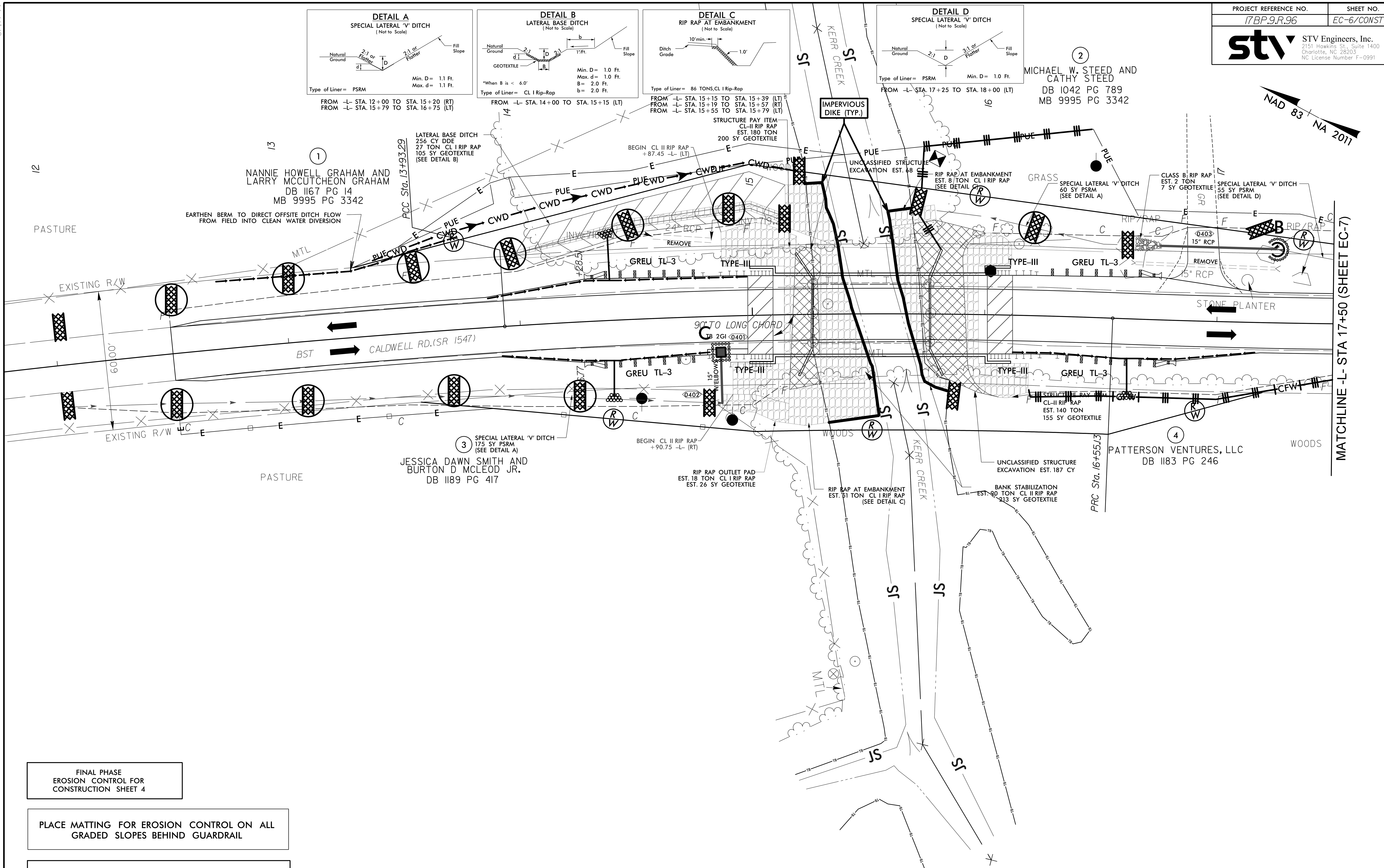
NOTE:
UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

8/17/99

1/21/2026
K:\Projects\Environmental\Design\Sheets\R-96_EC_CG_psh05.dgn
Owner

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.96	EC-6/CONST 4

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
NC License Number F-0991


DETAIL A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
2:1 or Flatter
Fill Slope
Min. D= 1.1 Ft.
Max. d= 1.1 Ft.
Type of Liner= PSRM
FROM -L- STA. 12+00 TO STA. 15+20 (RT)
FROM -L- STA. 15+79 TO STA. 16+75 (LT)
DETAIL B
LATERAL BASE DITCH
(Not to Scale)
GEOTEXTILE
Min. D= 1.0 Ft.
Max. d= 1.0 Ft.
B= 2.0 Ft.
b= 2.0 Ft.
*When B is < 6.0'
Type of Liner= CL I Rip-Rap
FROM -L- STA. 14+00 TO STA. 15+15 (LT)
DETAIL C
RIP RAP AT EMBANKMENT
(Not to Scale)
Ditch Grade
10'min.
1.0'
Type of Liner= 86 TONS,CL I Rip-Rap
FROM -L- STA. 15+15 TO STA. 15+39 (LT)
FROM -L- STA. 15+19 TO STA. 15+57 (RT)
FROM -L- STA. 15+55 TO STA. 15+79 (LT)
DETAIL D
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
3:1 or Flatter
Fill Slope
Min. D= 1.0 Ft.
Type of Liner= PSRM
FROM -L- STA. 17+25 TO STA. 18+00 (LT)
NAD 83 / NA 2011
1
NANNIE HOWELL GRAHAM AND
LARRY MCCUTCHEON GRAHAM
DB 1167 PG 14
MB 9995 PG 3342
2
MICHAEL W. STEED AND
CATHY STEED
DB 1042 PG 789
MB 9995 PG 3342
3
JESSICA DAWN SMITH AND
BURTON D MCLEOD JR.
DB 1189 PG 417
4
PATTERSON VENTURES, LLC
DB 1183 PG 246
PASTURE
PASTURE
WOODS
WOODS
GRASS
EARTHEN BERM TO DIRECT OFFSITE DITCH FLOW FROM FIELD INTO CLEAN WATER DIVERSION
LATERAL BASE DITCH
256 CY DDE
27 TON CL I RIP RAP
105 SY GEOTEXTILE
(SEE DETAIL B)
PCC Sta. 13+93.29
BEGIN CL II RIP RAP +87.45 -L- (LT)
STRUCTURE PAY ITEM
CL-II RIP RAP
EST. 180 TON
200 SY GEOTEXTILE
IMPERVIOUS DIKE (TYP.)
UNCLASSIFIED STRUCTURE EXCAVATION EST. 68
RIP RAP AT EMBANKMENT
EST. 8 TON CL I RIP RAP
(SEE DETAIL C)
SPECIAL LATERAL 'V' DITCH
60 SY PSRM
(SEE DETAIL A)
CLASS B RIP RAP
EST. 2 TON
7 SY GEOTEXTILE
SPECIAL LATERAL 'V' DITCH
55 SY PSRM
(SEE DETAIL D)
EXISTING R/W
EXISTING R/W
60.00'
CALDWELL RD.(SR 1547)
BST
90° TO LONG CHORD
GREU TL-3
TYPE-III
STONE PLANTER
15" RCP
24" RCP
REMOVE
MATCHLINE -L- STA 17+50 (SHEET EC-7)
SPECIAL LATERAL 'V' DITCH
175 SY PSRM
(SEE DETAIL A)
BEGIN CL II RIP RAP +90.75 -L- (RT)
RIP RAP OUTLET PAD
EST. 18 TON CL I RIP RAP
EST. 26 SY GEOTEXTILE
RIP RAP AT EMBANKMENT
EST. 51 TON CL I RIP RAP
(SEE DETAIL C)
UNCLASSIFIED STRUCTURE EXCAVATION EST. 187 CY
BANK STABILIZATION
EST. 90 TON CL II RIP RAP
213 SY GEOTEXTILE
STRUCTURE PAY ITEM
CL-II RIP RAP
EST. 140 TON
155 SY GEOTEXTILE
PRC Sta. 16+55.13
KERR CREEK
JS
MTL
PUE
CWD
CFW

FINAL PHASE
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

PLACE MATTING FOR EROSION CONTROL ON ALL GRADED SLOPES BEHIND GUARDRAIL

NOTE:
UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

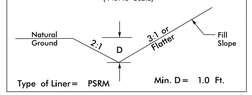
NOTE:
FOLLOW NCDOT BMP MANUAL FOR CONSTRUCTION ACTIVITES FOR THE BRIDGE DEMOLITION AND CONSTRUCTION

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.96	EC-7/CONST 5

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
NC License Number F-0991

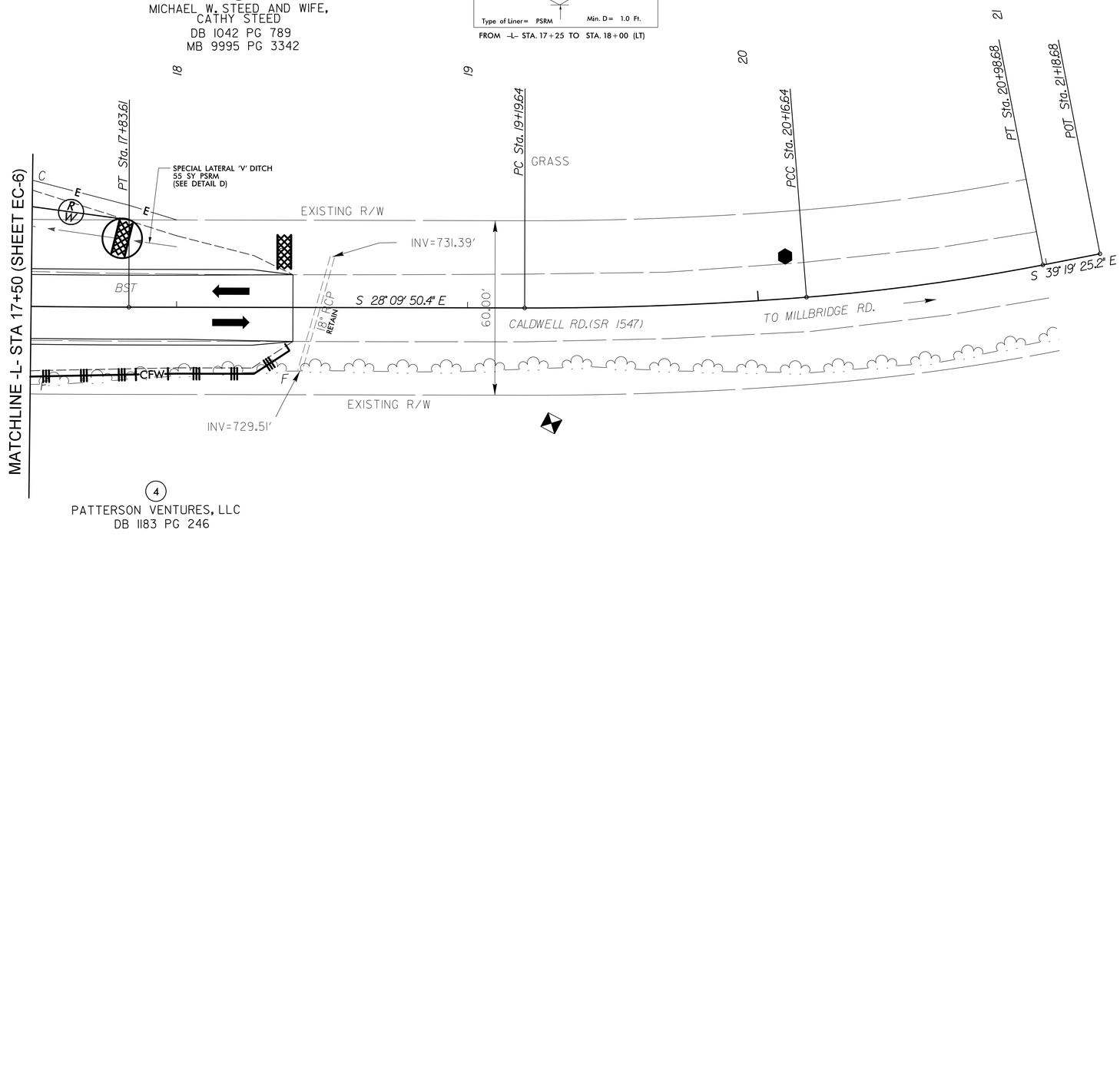
DETAIL D
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Type of Liner = PSRM Min. D = 1.0 Ft.

FROM -L- STA. 17+25 TO STA. 18+00 (LT)

(2)
MICHAEL W. STEED AND WIFE,
CATHY STEED
DB 1042 PG 789
MB 9995 PG 3342



(4)
PATTERSON VENTURES, LLC
DB 1183 PG 246

FINAL PHASE
EROSION CONTROL FOR
CONSTRUCTION SHEET 5

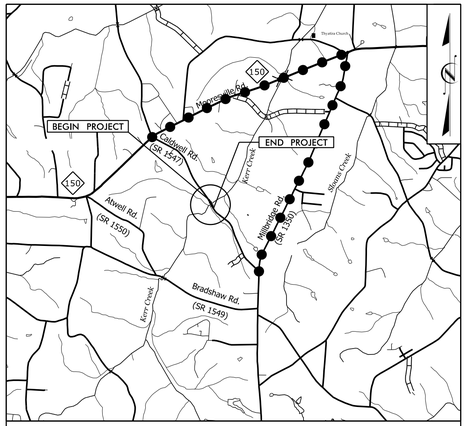
NOTE:
UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

NOTE:
FOLLOW NCDOT BMP MANUAL FOR CONSTRUCTION ACTIVITES FOR THE BRIDGE DEMOLITION AND CONSTRUCTION

1/21/2026
R:\Environmental\Design\Sheets\R.96_EC_FP_psh07.dgn
Operator

09/08/59

TIP PROJECT: 17BP.9.R.96



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

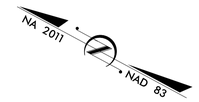
UTILITIES BY OTHERS PLANS
ROWAN COUNTY

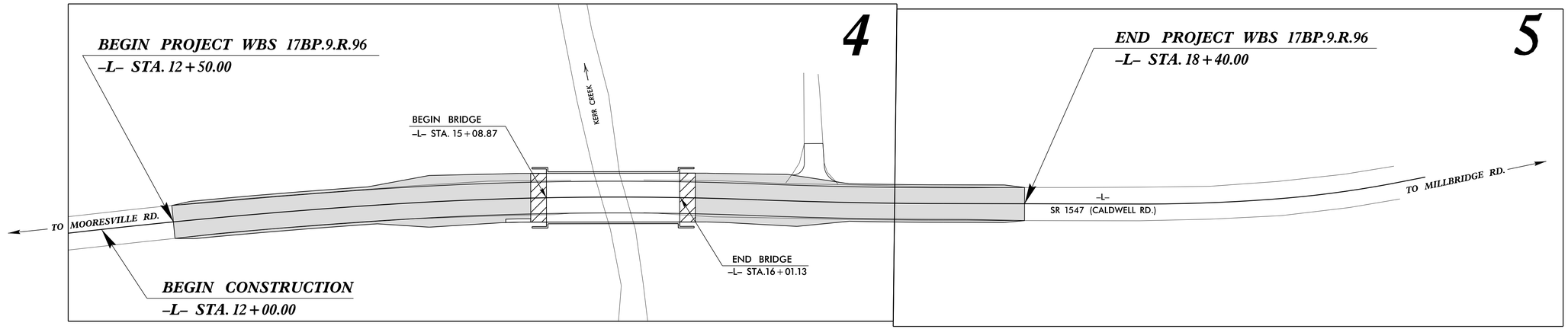
T.I.P. NO.	SHEET NO.
17BP.9.R.96	UO–1

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

LOCATION: BRIDGE #254 OVER KERR CREEK ON SR 1547 (CALDWELL RD)

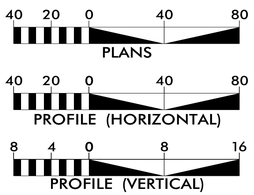
TYPE OF WORK: GRADING, PAVING, DRAINAGE, & STRUCTURE





PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES



INDEX OF SHEETS

UTILITY OWNERS WITH CONFLICTS

(A) POWER – DUKE ENERGY
(B) TELECOM – CONTERRA NETWORKS

PREPARED IN THE OFFICE OF:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F–0991

Oriana Roumillat	UTILITY PROJECT MANAGER
Phillip Vang	PROJECT UTILITY COORDINATOR
Justin Hill	PROJECT UTILITY CAD

DIVISION OF HIGHWAYS
UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH NC 27699–1555
PHONE (919) 707–6690
FAX (919) 250–4151

Ali Koucheki, PE	UTILITIES REGIONAL ENGINEER
Ian R. Armstrong	UTILITIES ENGINEER
Arlene Harper	UTILITIES AREA COORDINATOR
Roderick L. Mitchell	UTILITIES COORDINATOR

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

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.96	U0-2

UTILITIES BY OTHERS

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.

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

NAD 83 / NA 2011

INSERT U0-A

DUKE ENERGY OVERHEAD POWER

DUKE ENERGY POLE

CONTERRA UNDERGROUND FIBER

MATCHLINE -L- STA 12+00

MATCHLINE -L- STA 17+50 (SHEET U0-3)

MATCHLINE -L- STA 12+00 SEE INSET U0-A

1 NANNIE HOWELL GRAHAM AND LARRY MCCUTCHEON GRAHAM
DB 1167 PG 14
MB 9995 PG 3342

2 MICHAEL W. STEED AND CATHY STEED
DB 1042 PG 789
MB 9995 PG 3342

3 JESSICA DAWN SMITH AND BURTON D MCLEOD JR.
DB 1189 PG 417

4 PATTERSON VENTURES, LLC
DB 1183 PG 246

CALDWELL RD.(SR 1547)

EXISTING R/W

60.00'

ABANDON

PASTURE

REMOVE

REM

KERR CREEK

N 5°47'21" E 122.27'

N 49°29'45" E 94.86'

N 49°29'45" E 31.84'

S 59°08'01" W 124.63'

TOP=726.0
INV=722.1

INV=720.7

90° TO LONG CHORD

SEAT=723.17'

SEAT=723.16'

15" RCP

STONE PLANTER

RIP/RAP

WOODS

GRASS

PROP O/H POW LINES

PROP U/G TEL CABLES

PCC Sta. 13+63.29

PRC Sta. 16+55.13

5/14/99

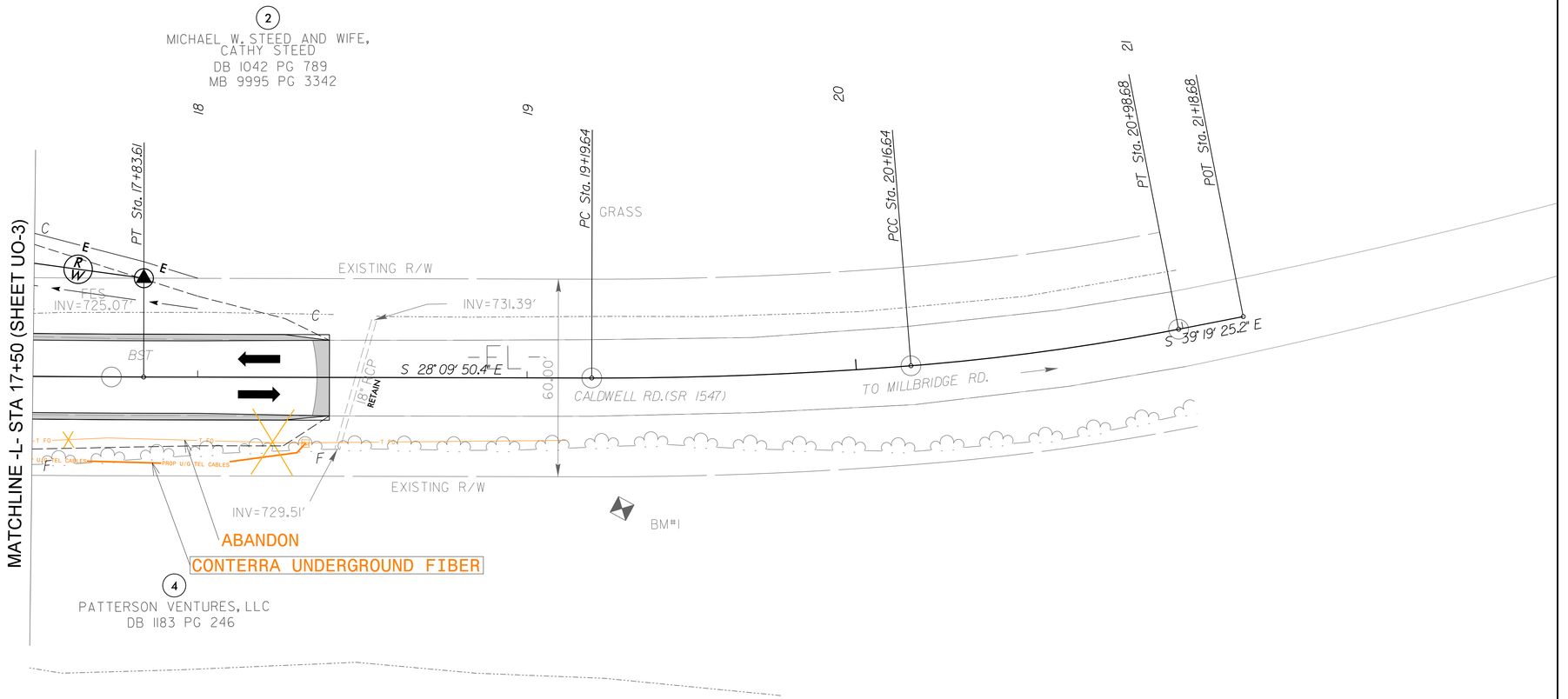
PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.96	U0-3

UTILITIES BY OTHERS

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.

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

NAD 83 NA 2011



PROJ. REFERENCE NO.	SHEET NO.
17BP.9.R.96	X-1A

Quantities are approximate only. The Resident Engineer will recross-section the work accurately when the project is staked out. These cross-section notes will be used in computing the final quantities for which the contractor will be paid.

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

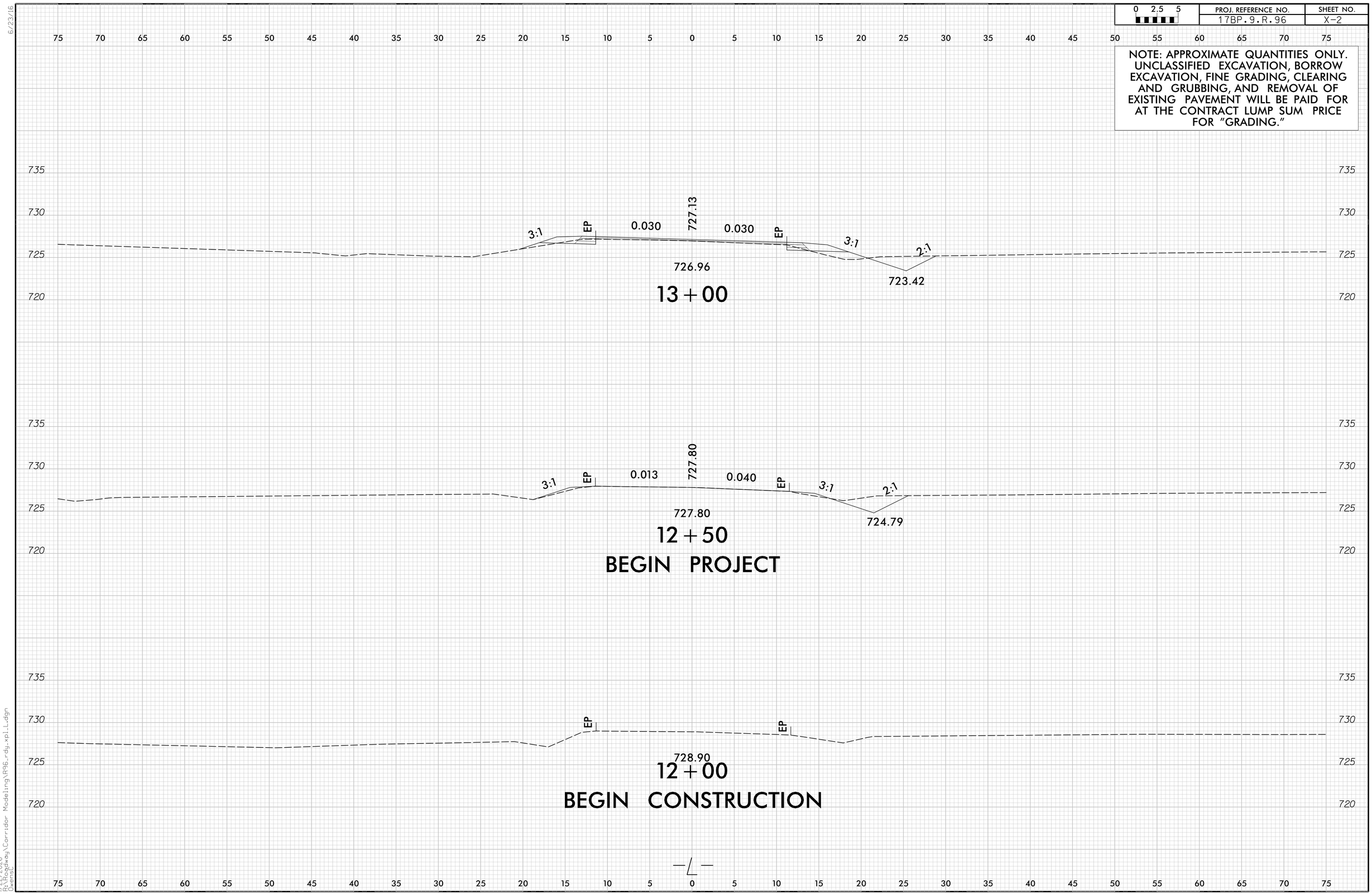
Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
12+50.00	0	0
13+00.00	17	6
13+50.00	18	10
14+00.00	23	15
14+50.00	60	40
15+00.00	136	96
15+08.87	0	0

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
16+01.13	0	0
16+50.00	0	0
17+00.00	6	118
17+50.00	42	58
18+00.00	52	6
18+40.00	8	1

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.96	X-2

NOTE: APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING."



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PROJ. REFERENCE NO.	SHEET NO.
17BP.9.R.96	X-3

6/23/16

1/22/2026
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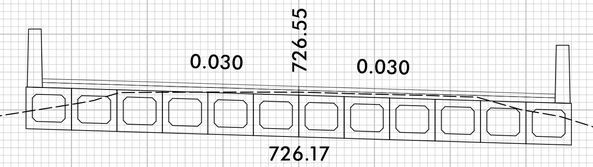
6/23/16

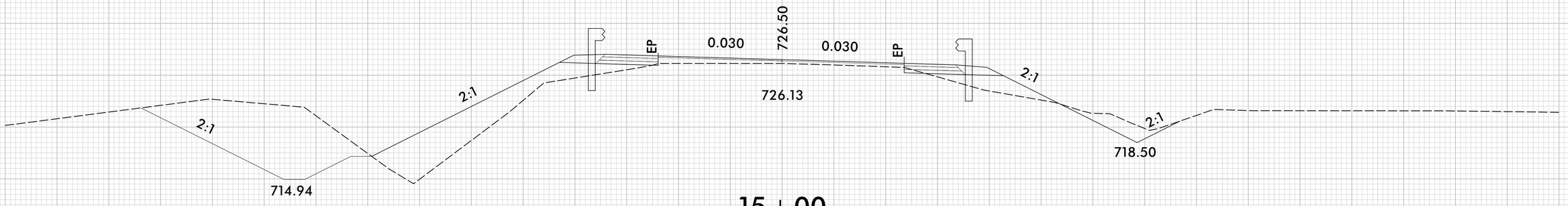
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.96	X-4

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

735
730
725
720
715
710



15+08.87
BEGIN BRIDGE



15+00

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.96	X-5

6/23/16

1/22/2026
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6/23/16

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
17BP.9.R.96	X-6

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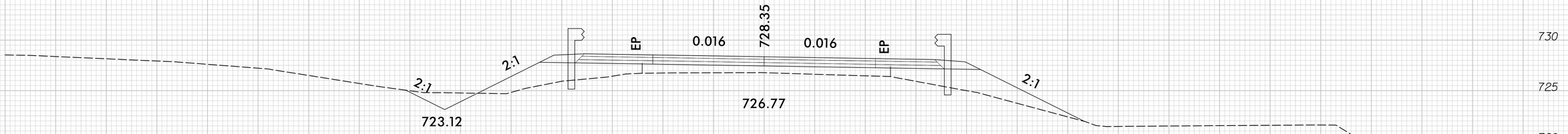
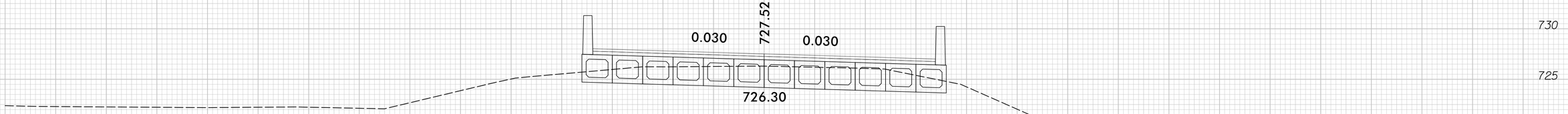
735 730 725 720 715 710



16+50



16+01.13
END BRIDGE

—⌊—

735 730 725 720 715 710

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

1/22/2026
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Owens

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.96	X-7

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

740
735
730
725
720

2:1
3:1
EP
0.025
730.77
0.025
EP
3:1
726.38
730.17

17 + 50

735
730
725
720
715

DRIVEWAY
25.16'
2%
EP
0.004
729.44
0.004
EP
3:1
728.19

17 + 00

—℄—

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

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Owens

PROJ. REFERENCE NO.	SHEET NO.
17BP.9.R.96	X-8

6/23/16

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
17BP.9.R.96	X-9

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

745
740
735
730
725
720

EP

EP

734.14

18+50

—℄—

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

745
740
735
730
725
720

PROJECT WBS: 17BP.9.R.96

CONTRACT: DI00378

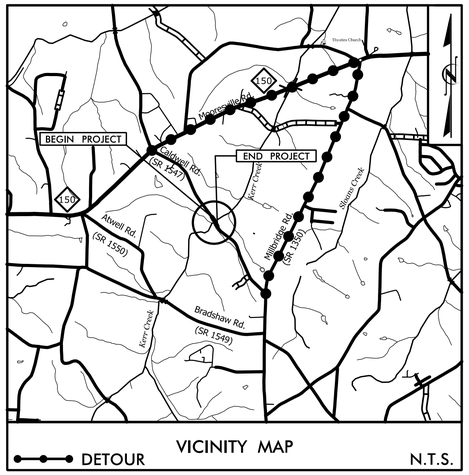
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

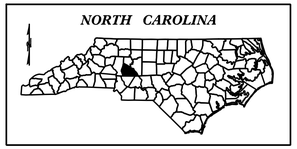
ROWAN COUNTY

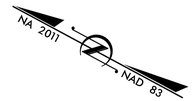
LOCATION: BRIDGE #254 OVER KERR CREEK
ON SR 1547 (CALDWELL RD)
TYPE OF WORK: GRADING, PAVING, DRAINAGE, & STRUCTURE

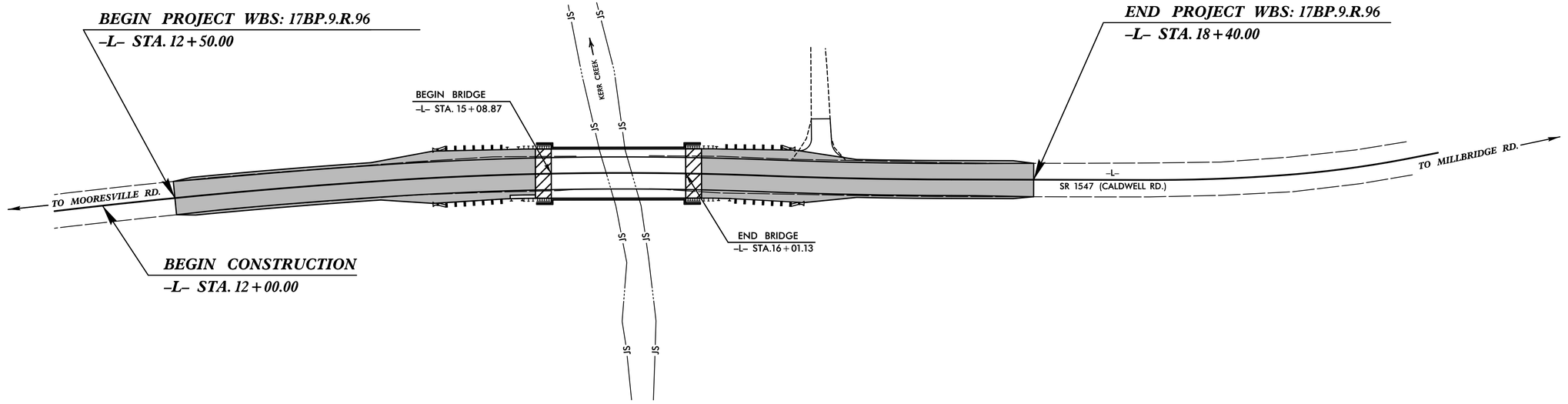
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.9.R.96	1	18

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.9.R.96		P.E.
17BP.9.R.96		R.O.W.
17BP.9.R.96		CONSTRUCTION









STRUCTURE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

ADT 2026 = 1670
ADT 2046 = 2428
DHV = N/A
D = N/A
T = 6 %
V = 55 MPH

FUNC. CLASSIFICATION: LOCAL
SUB REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT WBS 17BP.9.R.96 = 0.095 MILES

LENGTH OF STRUCTURE PROJECT WBS 17BP.9.R.96 = 0.017 MILES

TOTAL LENGTH OF PROJECT WBS 17BP.9.R.96 = 0.112 MILES

NCDOT CONTACT: JEREMY KEATON, P.E.
Division Bridge Manager

PLANS PREPARED FOR THE NCDOT BY:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
NC License Number F-0991

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JANUARY 25, 2023

LETTING DATE: FEBRUARY 25, 2026

LIU ZHUGANG, P.E.
PROJECT ENGINEER

J. WESLEY JONES, P.E.
PROJECT DESIGNER

STRUCTURES ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 WESLEY JONES 1/23/2026

P.E.

SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

1/22/2026
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JJones

14+50 15+00 15+50 16+00 16+50 17+00

740 730 720 710 700

VERTICAL CURVE DATA -L-

(-)1.4999% (+)0.3793%

PI = 13+70.00
EL = 726.00
VC = 230'

SPAN A

FILL FACE @ END BENT 1
STA. 15+08.87 -L-
GRADE POINT EL. 726.55

BEGIN FRONT SLOPE
STA. 15+00.31 -L-
GRADE POINT EL. 726.51

1'-7" MIN. BERM
1'-0" MIN. EARTH BERM
FIX
EL. 726±
EXISTING STRUCTURE (TYP.)
LOW CHORD EL. 722.85
1'-0" (TYP.)
EL. 717±
CUT OFF EXISTING ABUTMENT AT EL. 717.5± (TYP.)
CLASS II RIP RAP (SEE ROADWAY PLANS, ROADWAY DETAIL AND PAY ITEM, TYP.)
BASE DESIGN (Q100) EL. 721.9
25 YR. W.S. EL. 720.1
W.S. EL. 710.9 (11/16/18)
EL. 710±
EL. 709±
CLASS II RIP RAP (TYP. EA. END BENT)

END BENT 1

1'-6" TO UNCLASSIFIED EXCAVATION (TYP.)
FILL FACE @ END BENT 2
STA. 16+01.13 -L-
GRADE POINT EL. 727.52
BEGIN FRONT SLOPE
STA. 16+10.01 -L-
GRADE POINT EL. 727.65
EL. 726±
UNCLASSIFIED EXCAVATION (TYP.)
FIX
LOW CHORD EL. 723.78
HP 12 X 53 STEEL PILES (TYP.)
1½ (TYP.)
EL. 715±
EXCAVATE TO EL. 717.5± (GRADE TO DRAIN, TYP.)

END BENT 2

VERTICAL CURVE DATA -L-

(+)0.3793% (+)3.6993%

PI = 16+60.00
EL = 727.10
VC = 350'

APPROX. EXISTING GROUNDLINE
EL. 721±

SECTION ALONG -L-

HYDRAULIC DATA

DESIGN DISCHARGE:	1,900 CFS
FREQUENCY OF DESIGN FLOOD:	25 YRS.
DESIGN HIGH WATER ELEVATION:	720.1
DRAINAGE AREA:	7.82 SQ. MI.
BASE DISCHARGE (Q100):	2,713 CFS
BASE HIGH WATER ELEVATION:	721.9

OVERTOPPING DATA

OVERTOPPING DISCHARGE:	6,500 CFS
FREQUENCY OF OVERTOPPING:	500± YRS.
OVERTOPPING FLOOD ELEVATION:	726.3

OVERTOPS @ STA. 14+38.58 -L-

I HEREBY CERTIFY THESE ARE THE AS-BUILT PLANS

RESIDENT ENGINEER

BRIDGE TO BE LAID OUT ALONG LONG CHORD

92'-3" (FILL FACE END BENT 1 TO FILL FACE END BENT 2)
46'-1½" 46'-1½"
ALONG LONG CHORD

1'-0" MIN. EARTH BERM (TYP.)
EARTH BERM EL. 719.87
EARTH BERM EL. 718.94
EXISTING STRUCTURE
SF
90°-00'-00" (TO LONG CHORD)
W.P. 2 @ FILL FACE
END BENT 2
STA. 16+01.13 -L-
BEGIN FRONT SLOPE
STA. 16+10.01 -L-
END APPROACH SLAB
STA. 16+12.00 -L-
88°-56'-34" (TO TAN.)
PRC STA. 16+55.13
-L-
TO SR 1350 (MILLBRIDGE RD.)

W.P. 1 @ FILL FACE
END BENT 1
STA. 15+08.87 -L-
TO NC 150 (MOORESVILLE RD.)
BEGIN FRONT SLOPE
STA. 15+00.31 -L-
BEGIN APPROACH SLAB
STA. 14+98.00 -L-
91°-03'-26" (TO TAN.)
90°-00'-00" (TO LONG CHORD)
ID STA. 15+55.00 -L-
LONG CHORD
EARTH BERM EL. 717.68
CLASS II RIP RAP
1'-7" MIN. BERM (TYP.)
CLASS I RIP RAP (SEE ROADWAY PLANS, ROADWAY DETAIL AND PAY ITEM)
KERR CREEK FLOW
EARTH BERM EL. 718.61
CLASS II RIP RAP
CLASS I RIP RAP (SEE ROADWAY PLANS, ROADWAY DETAIL AND PAY ITEM)

PLAN

(STEEL PILES NOT SHOWN FOR CLARITY)

HORIZONTAL CURVE DATA -L-

PI = 15+24.33 -L-
Δ = 6°-00'-03.2" (RT.)
D = 2°-17'-30.6"
L = 261.84'
T = 131.04'
R = 2,500.00'

HORIZONTAL CURVE DATA -L-

PI = 17+19.38 -L-
Δ = 2°-06'-11.9" (LT.)
D = 1°-38'-13.3"
L = 128.48'
T = 64.25'
R = 3,500.00'

PROJECT NO. 17BP.9.R.96
ROWAN COUNTY
STATION: 15+55.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 790254

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1547 (CALDWELL RD.) OVER KERR CREEK BETWEEN NC 150 AND SR 1350

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 WESLEY JONES
1/23/2026

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
NC License Number F-0991

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			16

DRAWN BY : JWJ DATE : 9-22
CHECKED BY : MLO DATE : 9-22
DESIGN ENGINEER OF RECORD : JWJ DATE : 9-25

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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")	Factored Resistance per Pile TONS	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		
					Min Pile Tip (Tip No Higher Than) Elev FT	Required Driving Resistance (RDR)** per Pile TONS	Total Pile Redrives Quantity EACH	Predrilling Length per Pile Lin FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile Lin FT	Pile Exc In Soil per Pile Lin FT
End Bent No. 1, Piles 1-7	111	See Structure Drawings	15								709.0	4.0	6.0
End Bent No. 2, Piles 1-7	111		15			184							

*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.

$$**RDR = \frac{Factored\ Resistance + Factored\ Downdrag\ Load + Factored\ Dead\ Load}{Dynamic\ Resistance\ Factor} + Nominal\ Downdrag\ Resistance + \frac{Nominal\ Scour\ Resistance}{Scour\ Resistance\ Factor}$$

SUMMARY OF PDA/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Pile Driving Analyzer (PDA)				Pile Order Lengths	
End Bent/ Bent No	PDA Testing Required? YES or MAYBE	PDA Test Pile Length FT	Total PDA Testing Quantity EACH	End Bent/ Bent No(s)	Pile Order Length Basis* EST or PDA

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

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 TONS	Factored Downdrag Load per Pile TONS	Factored Dead Load* per Pile TONS	Dynamic Resistance Factor	Nominal Downdrag Resistance per Pile TONS	Nominal Scour Resistance per Pile TONS	Scour Resistance Factor (Default = 1.00)
End Bent No. 2, Piles 1-7	110			0.60			1.00

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

SUMMARY OF PILE ACCESSORIES

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Pipe Pile Plates Required? YES or MAYBE	Steel Pile Points			Steel Pile Tips Required? YES
		Pipe Pile Cutting Shoes Required? YES	Pipe Pile Conical Points Required? YES	H-Pile Points Required? YES	
End Bent No. 2, Piles 1-7				YES	
TOTAL QTY:				7	

FOUNDATION NOTES

1. For Piles, see Piles Provision and Section 450 of the Standard Specifications.
2. Fill the holes for pile excavation at End Bent No. 1 with concrete.

NOTES:

1. The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer Shiping Yang, License #031361 on 07/12/2023
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 will determine the need for PDA Testing and Pipe Pile Plates when PDAs or plates may be required.

NORTH CAROLINA PROFESSIONAL SEAL 038630 ENGINEER WESLEY JONES
1/23/2026

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
NC License Number F-0991

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PROJECT NO. 17BP.9.R.96
ROWAN COUNTY
STATION: 15+55.00 -L-

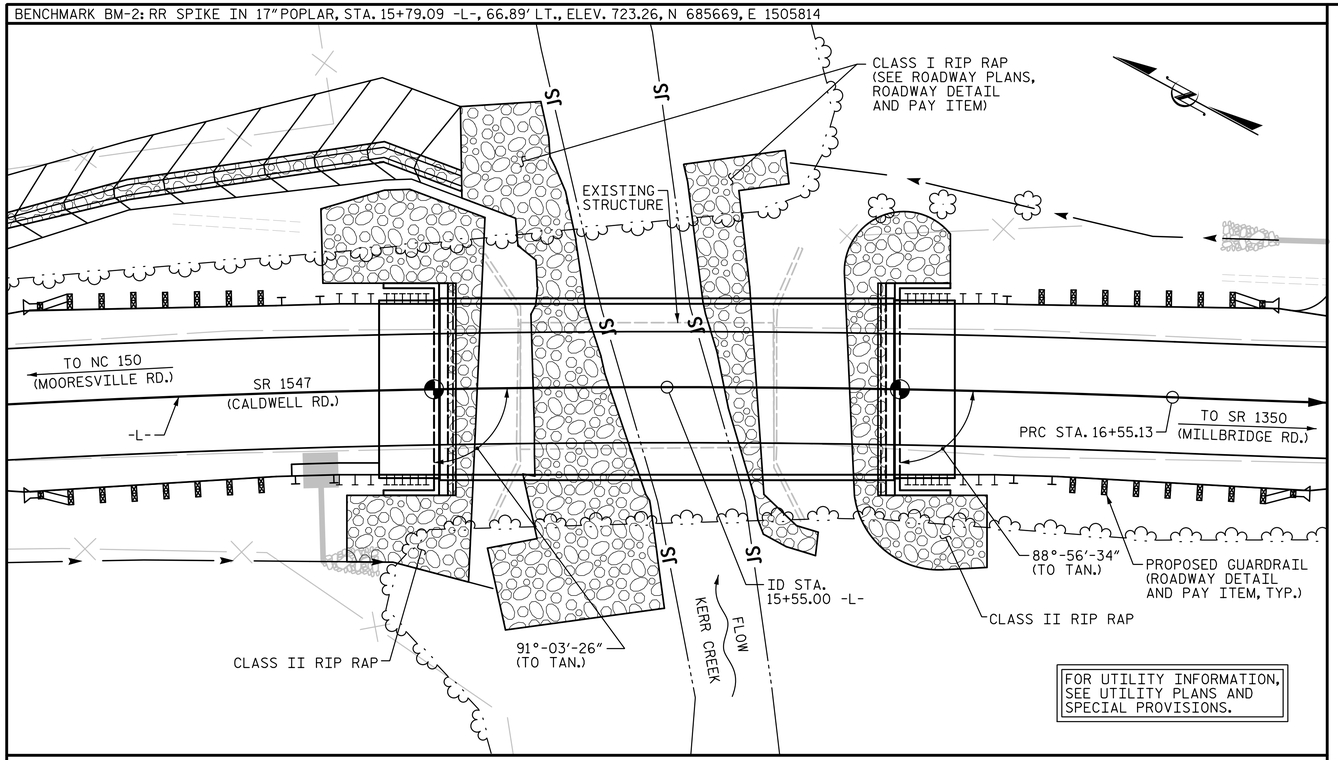
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE FOUNDATION TABLES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			16

BENCHMARK BM-2: RR SPIKE IN 17"POPLAR, STA. 15+79.09 -L-, 66.89' LT., ELEV. 723.26, N 685669, E 1505814



LOCATION SKETCH

GENERAL NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE "STANDARD NOTES" SHEET.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE EXISTING STRUCTURE CONSISTING OF (1) 51'-2" SPAN WITH STEEL PLANK DECK ON 9 LINES OF STEEL I-BEAMS WITH A CLEAR ROADWAY WIDTH OF 24'-2"± AND SUPPORTED BY MASS CONCRETE ABUTMENTS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL 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.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 15+55.00 -L-".

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA (ON SHEET 1 OF 3) SHALL BE EXCAVATED FOR A DISTANCE FROM THE CENTERLINE OF ROADWAY OF 29'± (LEFT) AND 28'± (RIGHT) AT END BENT 1 TO EL. 717.5±, AND 35'± (LEFT) AND 35'± (RIGHT) AT END BENT 2 TO EL. 717.5±, 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.

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.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

FOR ASBESTOS ASSESSMENT, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STA. 15+55.00 -L-	ASBESTOS ASSESSMENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS STA. 15+55.00 -L-	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES		STEEL PILE POINTS	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAMS	
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LUMP SUM	CU. YD.	LUMP SUM	LBS.	EA.	NO.	LIN. FT.	EA.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE													180.0				12	1080.0
END BENT 1			42	28		27.0		3,809	7	7	105			180	200			
END BENT 2						27.0		3,809	7	7	105	7		140	155			
TOTAL	LUMP SUM	LUMP SUM	42	28	LUMP SUM	54.0	LUMP SUM	7,618	14	14	210	7	180.0	320	355	LUMP SUM	12	1080.0

PROJECT NO. 17BP.9.R.96

ROWAN COUNTY

STATION: 15+55.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1547
(CALDWELL RD.) OVER
KERR CREEK BETWEEN
NC 150 AND SR 1350

NORTH CAROLINA PROFESSIONAL SEAL 038640 ENGINEER WESLEY JONES
1/23/2026

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
NC License Number F-0991

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			16

DRAWN BY : JWJ DATE : 9-22
CHECKED BY : MLO DATE : 9-22
DESIGN ENGINEER OF RECORD : JWJ DATE : 9-25

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVELOAD FACTORS	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)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	**1**	1.109	--	1.75	0.272	1.47	A	EL	44.25	0.493	1.26	A	EL	4.425	0.80	0.272	**1.11**	A	EL	**44.25**	
		HL-93(Opr)	N/A	--	1.633	--	1.35	0.272	1.9	A	EL	44.25	0.493	1.63	A	EL	4.425	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	**2**	1.507	54.255	1.75	0.272	1.99	A	EL	44.25	0.493	1.65	A	EL	4.425	0.80	0.272	**1.51**	A	EL	**44.25**	
		HS-20(Opr)	36.000	--	2.14	77.039	1.35	0.272	2.59	A	EL	44.25	0.493	2.14	A	EL	4.425	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.519	47.501	1.4	0.272	5.82	A	EL	44.25	0.493	5.05	A	EL	4.425	0.80	0.272	3.52	A	EL	44.25	
		SNGARBS2	20.000	--	2.572	51.43	1.4	0.272	4.25	A	EL	44.25	0.493	3.55	A	EL	4.425	0.80	0.272	2.57	A	EL	44.25	
		SNAGRIS2	22.000	--	2.415	53.122	1.4	0.272	4	A	EL	44.25	0.493	3.27	A	EL	4.425	0.80	0.272	2.41	A	EL	44.25	
		SNCOTTS3	27.250	--	1.749	47.674	1.4	0.272	2.89	A	EL	44.25	0.493	2.52	A	EL	4.425	0.80	0.272	1.75	A	EL	44.25	
		SNAGGRS4	34.925	--	1.443	50.381	1.4	0.272	2.39	A	EL	44.25	0.493	2.06	A	EL	4.425	0.80	0.272	1.44	A	EL	44.25	
		SNS5A	35.550	--	1.412	50.195	1.4	0.272	2.34	A	EL	44.25	0.493	2.07	A	EL	4.425	0.80	0.272	1.41	A	EL	44.25	
		SNS6A	39.950	--	1.287	51.435	1.4	0.272	2.13	A	EL	44.25	0.493	1.88	A	EL	4.425	0.80	0.272	1.29	A	EL	44.25	
		SNS7B	42.000	--	1.226	51.483	1.4	0.272	2.03	A	EL	44.25	0.493	1.83	A	EL	4.425	0.80	0.272	1.23	A	EL	44.25	
	TTST	TNAGRIT3	33.000	--	1.568	51.733	1.4	0.272	2.59	A	EL	44.25	0.493	2.24	A	EL	4.425	0.80	0.272	1.57	A	EL	44.25	
		TNT4A	33.075	--	1.572	52.007	1.4	0.272	2.6	A	EL	44.25	0.493	2.2	A	EL	4.425	0.80	0.272	1.57	A	EL	44.25	
		TNT6A	41.600	--	1.278	53.17	1.4	0.272	2.11	A	EL	44.25	0.493	1.92	A	EL	4.425	0.80	0.272	1.28	A	EL	44.25	
		TNT7A	42.000	--	1.281	53.782	1.4	0.272	2.12	A	EL	44.25	0.493	1.89	A	EL	4.425	0.80	0.272	1.28	A	EL	44.25	
		TNT7B	42.000	--	1.315	55.229	1.4	0.272	2.18	A	EL	44.25	0.493	1.79	A	EL	4.425	0.80	0.272	1.31	A	EL	44.25	
		TNAGRIT4	43.000	--	1.258	54.101	1.4	0.272	2.08	A	EL	44.25	0.493	1.74	A	EL	4.425	0.80	0.272	1.26	A	EL	44.25	
		TNAGT5A	45.000	--	1.19	53.537	1.4	0.272	1.97	A	EL	44.25	0.493	1.71	A	EL	4.425	0.80	0.272	1.19	A	EL	44.25	
		TNAGT5B	45.000	**3**	1.178	53.027	1.4	0.272	1.95	A	EL	44.25	0.493	1.66	A	EL	4.425	0.80	0.272	**1.18**	A	EL	**44.25**	
EMERGENCY VEHICLE (EV)		EV2	28.750	--	2.296	66.005	1.3	0.272	3.25	A	EL	44.25	0.493	2.49	A	EL	4.425	0.80	0.272	2.30	A	EL	44.25	
		EV3	43.000	**4**	1.510	64.924	1.3	0.272	2.14	A	EL	44.25	0.493	1.67	A	EL	4.425	0.80	0.272	**1.51**	A	EL	**44.25**	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

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

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

COMMENTS:

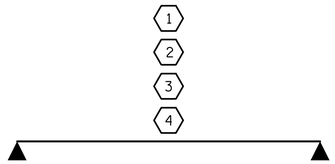
1.
2.
3.
4.

(#) 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. 17BP.9.R.96

ROWAN COUNTY

STATION: 15+55.00 -L-

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
NC License Number F-0991

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

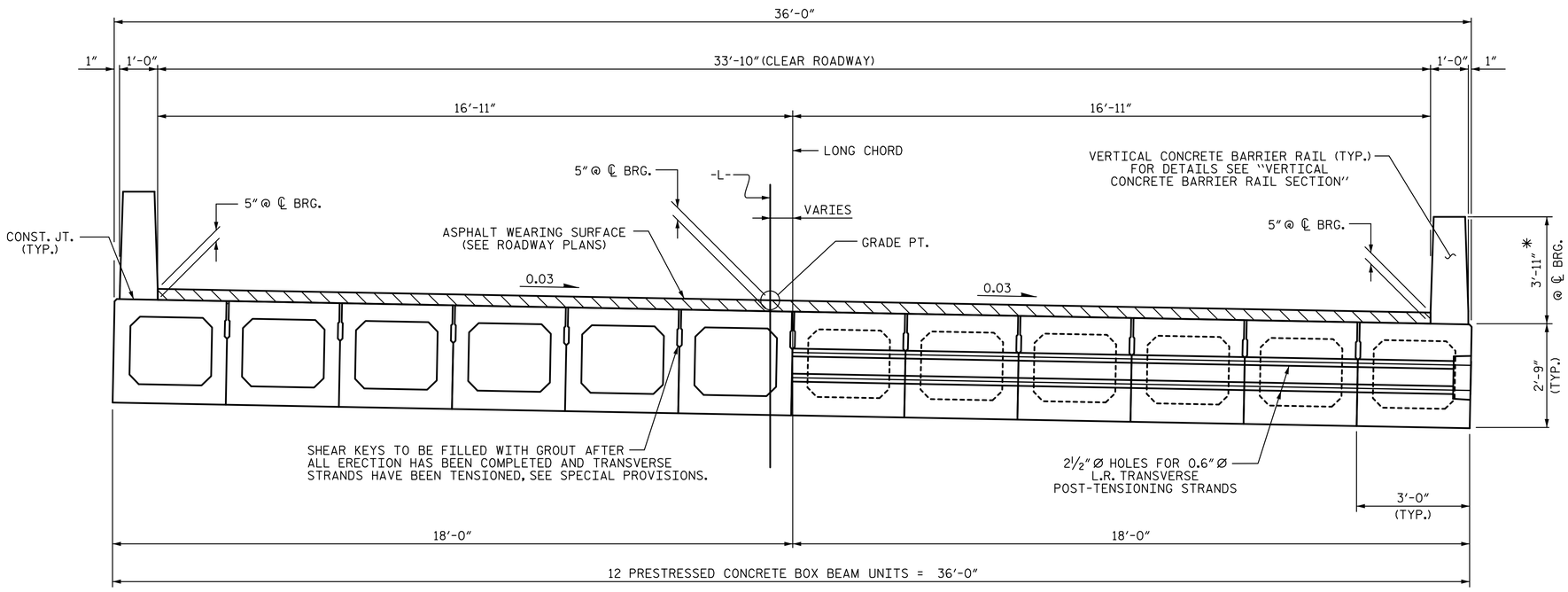
STANDARD

LRFR SUMMARY FOR 90' BOX BEAM UNIT 90° SKEW (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			16

ASSEMBLED BY : JWJ	DATE : 9-22	
CHECKED BY : MLO	DATE : 9-22	
DESIGN ENGINEER OF RECORD : JWJ	DATE : 9-25	
DRAWN BY : TMG 11/11	REV. 06/23	AKP/AAI
CHECKED BY : AAC 11/11		

STD. NO. 33LRFR1_90S_90L



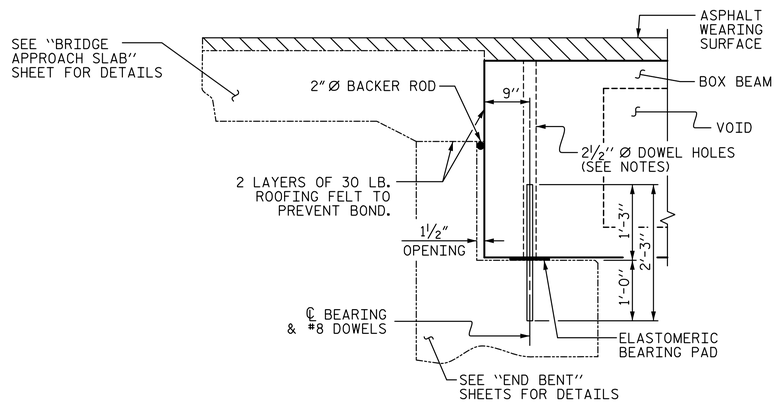
HALF SECTION
THROUGH VOIDS

HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

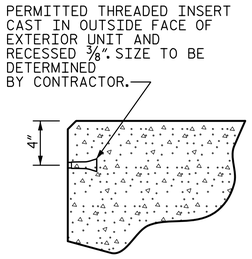
TYPICAL SECTION

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

FIXED END



SECTION AT END BENT



THREADED INSERT DETAIL

NOTES

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

ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

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

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

THE 2½″Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6000 PSI.

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

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.

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

THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

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

ASSEMBLED BY : JWJ	DATE : 9-22		
CHECKED BY : MLO	DATE : 9-22		
DESIGN ENGINEER OF RECORD : JWJ	DATE : 9-25		
DRAWN BY : DGE 8/11	REV. 9/14 MAA/TMG		
CHECKED BY : TMG 11/11			

PROJECT NO. 17BP.9.R.96
ROWAN COUNTY
STATION: 15+55.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

3′-0″ X 2′-9″ PRESTRESSED CONCRETE BOX BEAM UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			16

NORTH CAROLINA PROFESSIONAL SEAL 038640 ENGINEER WESLEY JONES 1/23/2026

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
NC License Number F-0991

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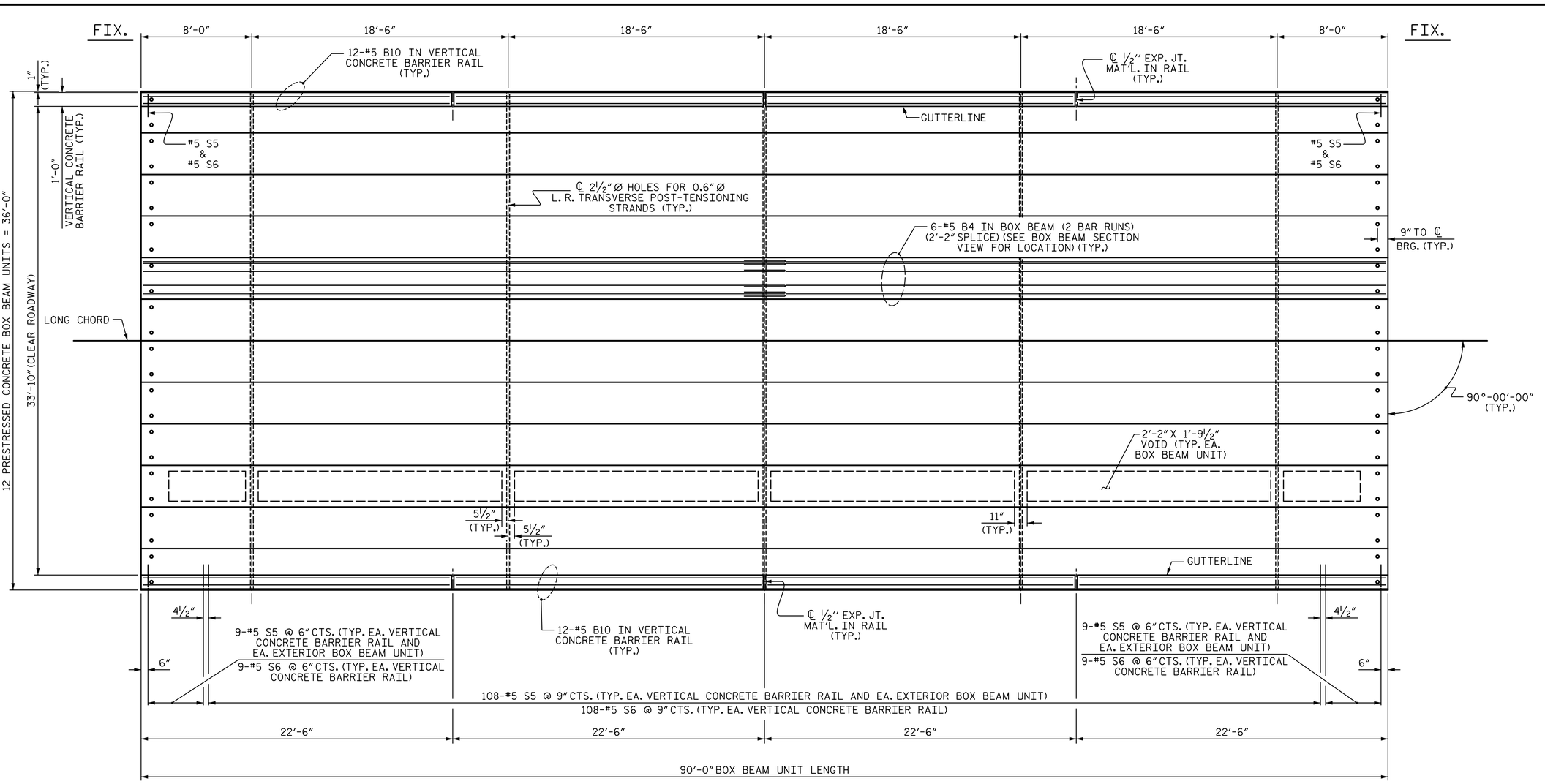
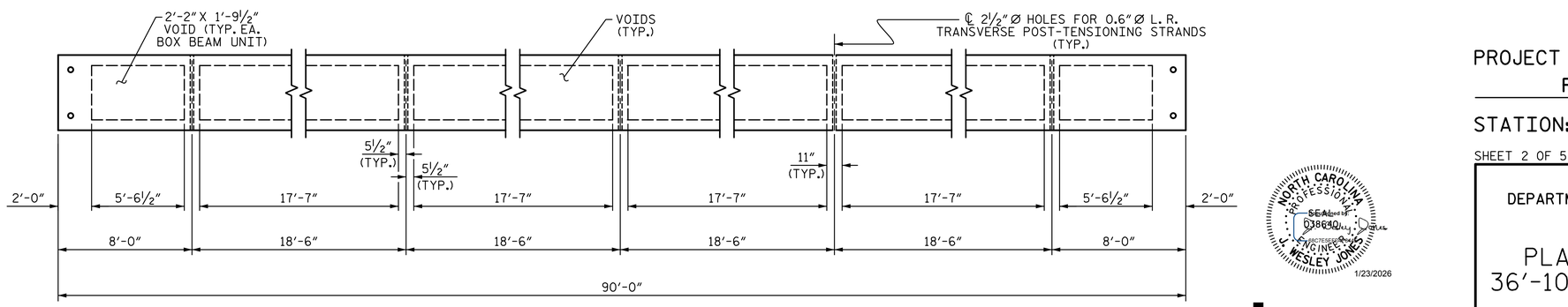
STD. NO. STD.33PCBB1_36_90S



PLAN OF UNIT



DIAPHRAGM AND VOID LAYOUT

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038600 WESLEY JONES 1/23/2026

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
NC License Number F-0991

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PROJECT NO. 17BP.9.R.96
ROWAN COUNTY
STATION: 15+55.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

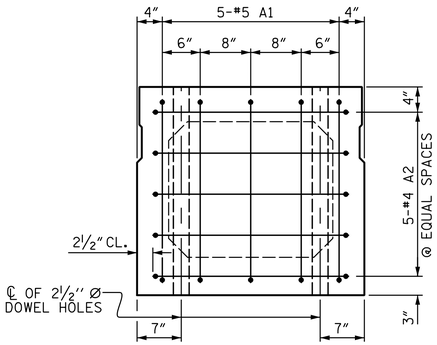
PLAN OF 90′ UNIT 36′-10″ CLEAR ROADWAY 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			16

ASSEMBLED BY :	JWJ	DATE :	9-22
CHECKED BY :	MLO	DATE :	9-22
DESIGN ENGINEER OF RECORD :	JWJ	DATE :	9-25
DRAWN BY : DGE 8/11	REV. 8/14	MAA/TMG	
CHECKED BY : TMG 11/11			

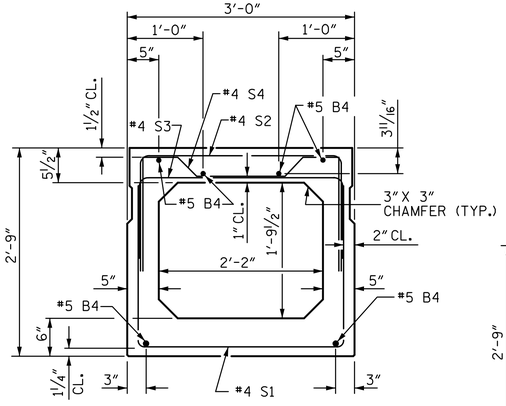
10/9/2025 9:03:14 PM R:\Structures\02 ustation\RFC\401_011_17BP.9.R.96_SMU_BB2_006_790254.dgn khinm

STD.NO.33PCBB_36_90S_90L



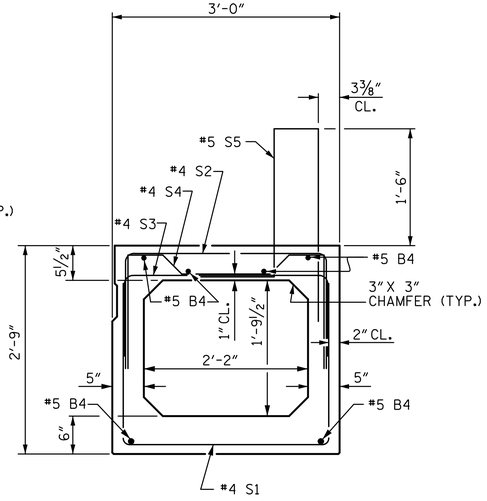
END ELEVATION

SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES. (INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. STRAND LAYOUT NOT SHOWN.)



INTERIOR BOX BEAM SECTION

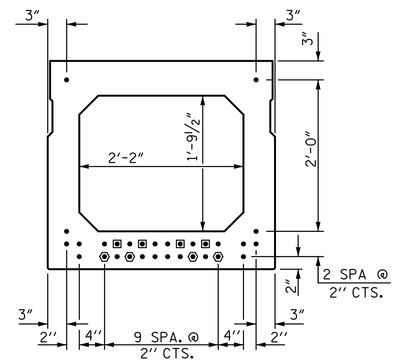
(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)

0.6″ Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION

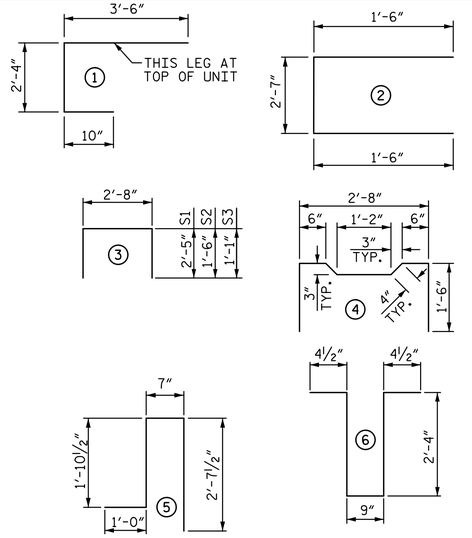
(30 STRANDS REQUIRED)

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ◉ STRANDS DEBONDED FOR 4′-0″ FROM END OF GIRDER
- ⬢ STRANDS DEBONDED FOR 12′-0″ FROM END OF GIRDER

BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.

BAR TYPES



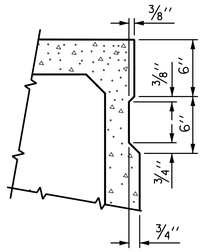
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	6′-8″	70	6′-8″	70
A2	40	#4	2	5′-7″	149	5′-7″	149
B4	12	#5	STR	45′-11″	575	45′-11″	575
K1	15	#4	6	6′-2″	62	6′-2″	62
K2	10	#4	STR	2′-7″	17	2′-7″	17
S1	73	#4	3	7′-6″	366	7′-6″	366
S2	73	#4	3	5′-8″	276	5′-8″	276
S3	127	#4	3	4′-10″	410	4′-10″	410
S4	54	#4	4	5′-10″	210	5′-10″	210
✳ S5	126	#5	5	6′-1″	799	--	--
REINFORCING STEEL					2135 LBS.		2135 LBS.
✳EPOXY COATED REINF. STEEL					799 LBS.		
8000 P.S.I. CONCRETE					16.0 CU. YDS.		15.9 CU. YDS.
0.6″Ø L.R. STRANDS					No. 30		No. 30

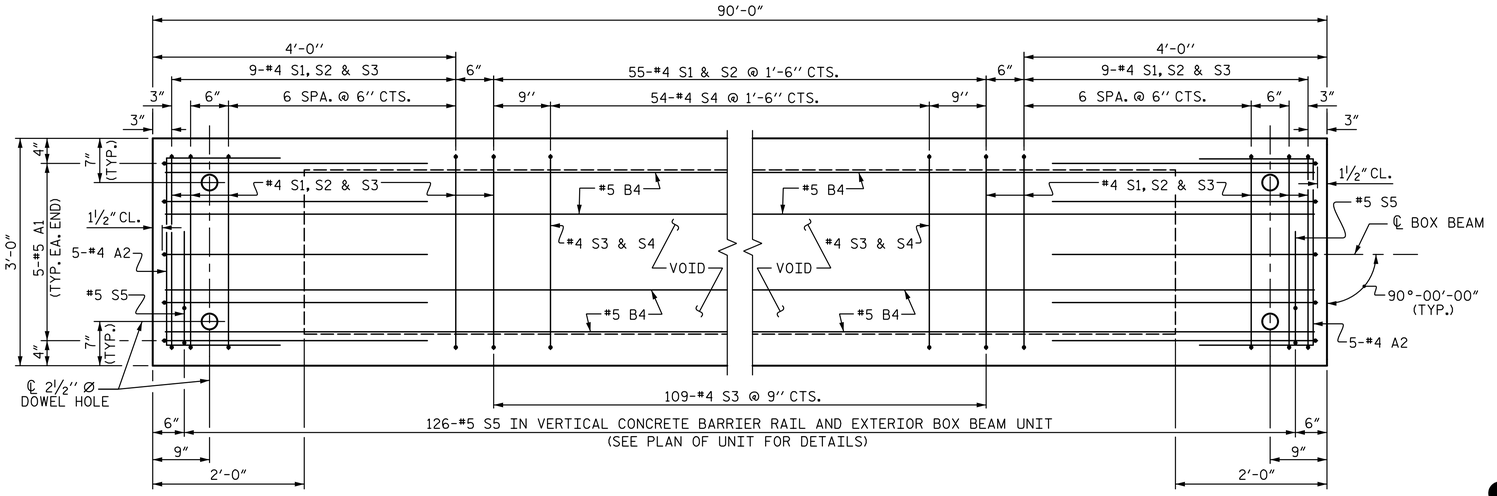
GRADE 270 STRANDS

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



SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.



PLAN OF BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS.
FOR LOCATION OF DIAPHRAGMS, SEE "PLAN OF UNIT".
FOR THREADED INSERTS, SEE "THREADED INSERT DETAIL".
FOR REINFORCING STEEL IN DIAPHRAGMS, SEE "DOUBLE DIAPHRAGM DETAILS".

ASSEMBLED BY :	JWJ	DATE :	9-22
CHECKED BY :	MLO	DATE :	9-22
DESIGN ENGINEER OF RECORD :	JWJ	DATE :	9-25
DRAWN BY : DGE 10/11	REV. 9/14 MAA/TMG		
CHECKED BY : TMG 11/11			

NORTH CAROLINA PROFESSIONAL SEAL 038640 ENGINEER JOSEPH WESLEY JONES 1/23/2026

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
NC License Number F-0991

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PROJECT NO. 17BP.9.R.96
ROWAN COUNTY
STATION: 15+55.00 -L-

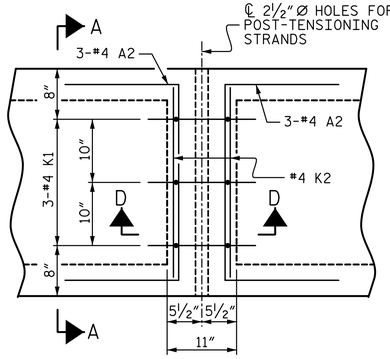
SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

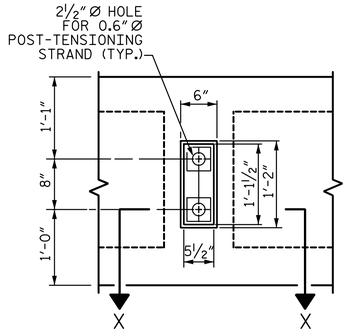
3′-0″ X 2′-9″ PRESTRESSED CONCRETE BOX BEAM UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			16

STD. NO. 33PCBB4_90S_90L

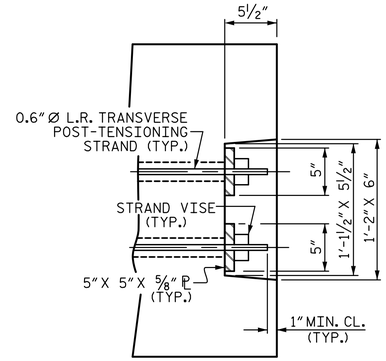


PLAN

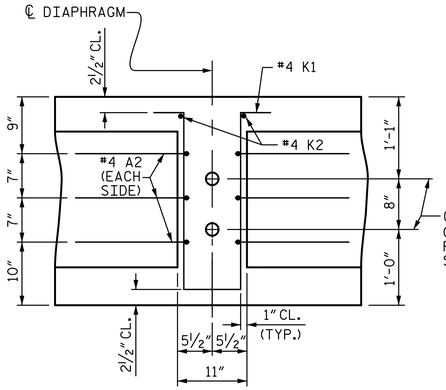


VIEW Y-Y

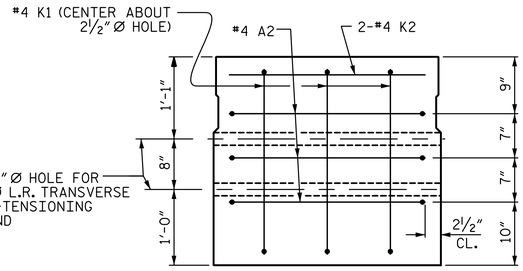
SHOWING ELEVATION VIEW OF GROUTED RECESS



DETAIL "C"

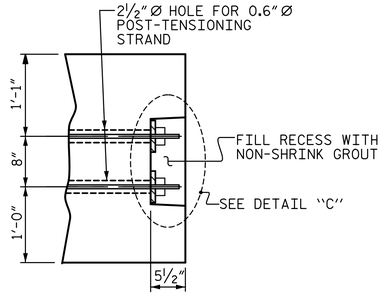


SECTION D-D

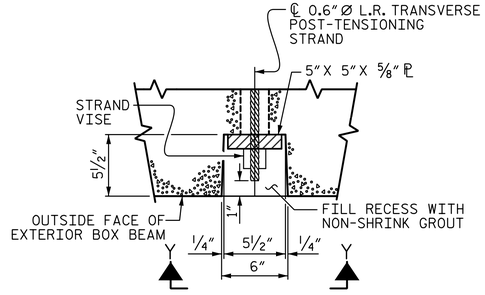


SECTION A-A

VOIDS NOT SHOWN



PART SECTION AT RECESS



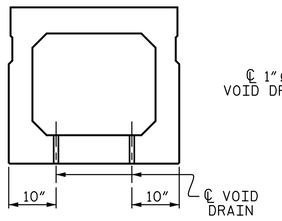
SECTION X-X

SHOWING PLAN VIEW OF GROUTED RECESS

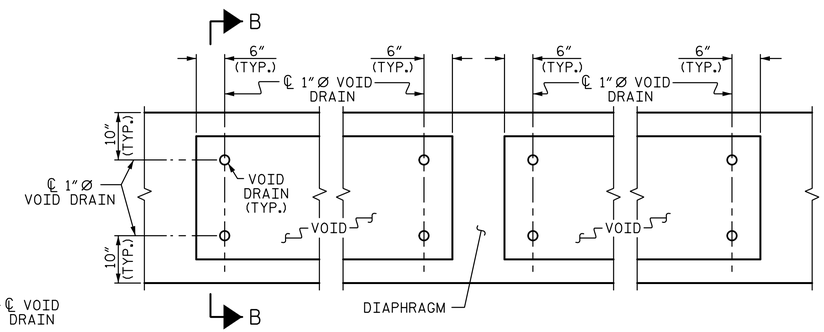
GROUTED RECESS DETAIL AT END OF POST-TENSIONED STRANDS OF EXTERIOR BOX BEAM

DOUBLE DIAPHRAGM DETAILS

#4 "S" BARS NOT SHOWN. #4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2½" Ø HOLE.



SECTION B-B



PART PLAN

VOID DRAIN DETAILS

(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0"x 2'-9"
90' BOX BEAM UNIT	0.6"Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2¾"
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	¾"
FINAL CAMBER	2"

** INCLUDES FUTURE WEARING SURFACE

ASSEMBLED BY : JWJ	DATE : 9-22	REV. 8/14	MAA/TMG
CHECKED BY : MLO	DATE : 9-22		
DESIGN ENGINEER OF RECORD : JWJ	DATE : 9-25		
DRAWN BY : DGE 10/11			
CHECKED BY : TMG 11/11			

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1/23/2026

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
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ROWAN COUNTY

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SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0"X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			16

STD.NO.33PCBB5_90S

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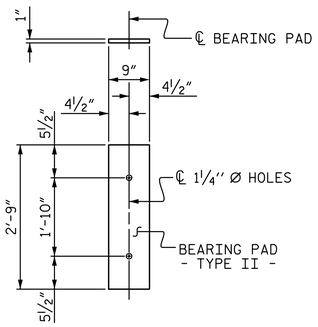
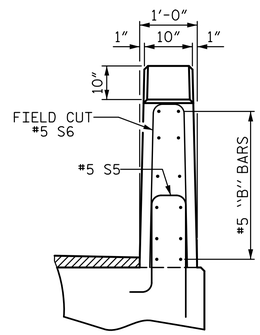
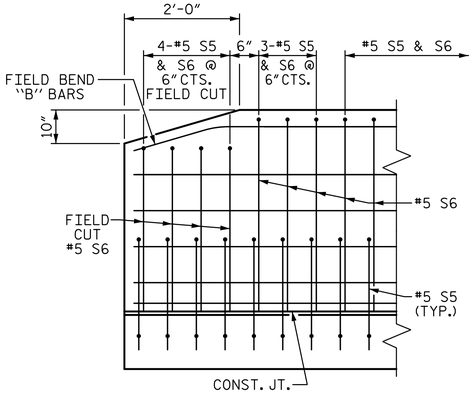


FIXED END
(TYPE II - 24 REQ'D.)



END VIEW

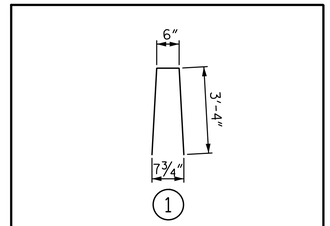


SIDE VIEW

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

END OF RAIL DETAILS



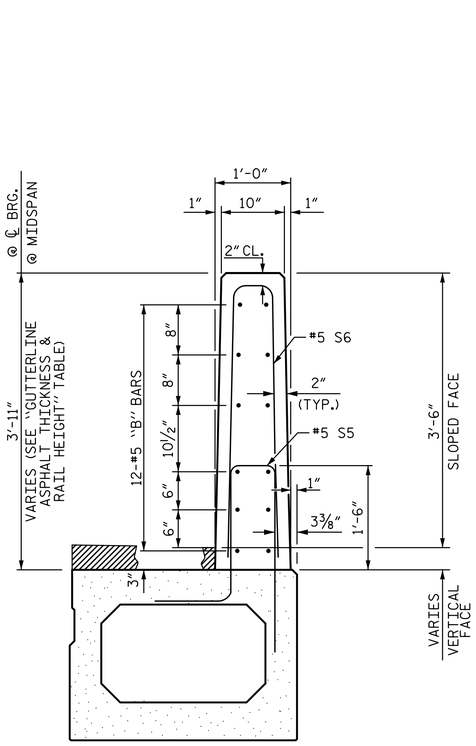
BAR TYPE
BAR DIMENSIONS ARE OUT TO OUT

BOX BEAM UNITS REQUIRED

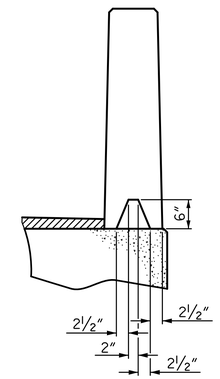
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	90'-0"	180'-0"
INTERIOR B.B.	10	90'-0"	900'-0"
TOTAL	12	———	1080'-0"

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

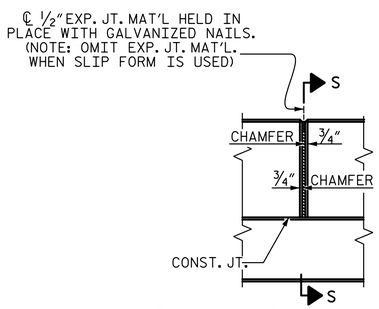
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
90' UNITS	1¾"	3'-7¾"



SECTION THRU RAIL



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



ELEVATION AT EXPANSION JOINTS

VERTICAL CONCRETE BARRIER RAIL DETAILS

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	SIZE	TYPE	LENGTH	WEIGHT
	90' UNIT				
✱B10	96	#5	STR	22'-1"	2211
✱S6	252	#5	1	7'-2"	1884
✱EPOXY COATED REINFORCING STEEL			LBS.		4095
CLASS AA CONCRETE			CU.YDS.		23.3
TOTAL VERTICAL CONCRETE BARRIER RAIL			LN. FT.		180.0

ASSEMBLED BY : JWJ	DATE : 9-22		
CHECKED BY : MLO	DATE : 9-22		
DESIGN ENGINEER OF RECORD : JWJ	DATE : 9-25		
DRAWN BY : DGE 10/11	REV. 5/18	MAA/THC	
CHECKED BY : TMG 11/11			

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ROWAN COUNTY
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SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAM UNIT

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			16

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1/23/2026

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2151 Hawkins St., Suite 1400
Charlotte, NC 28203
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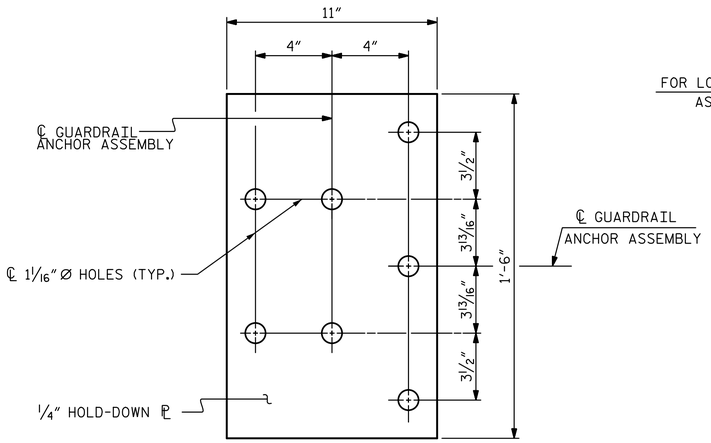
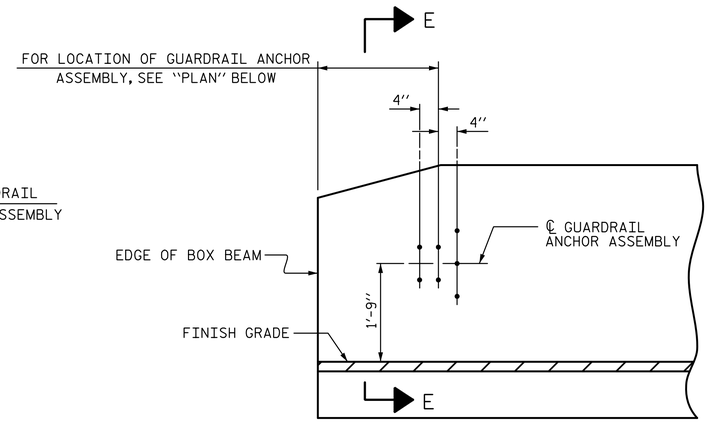


PLAN



ELEVATION

NOTES

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

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

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

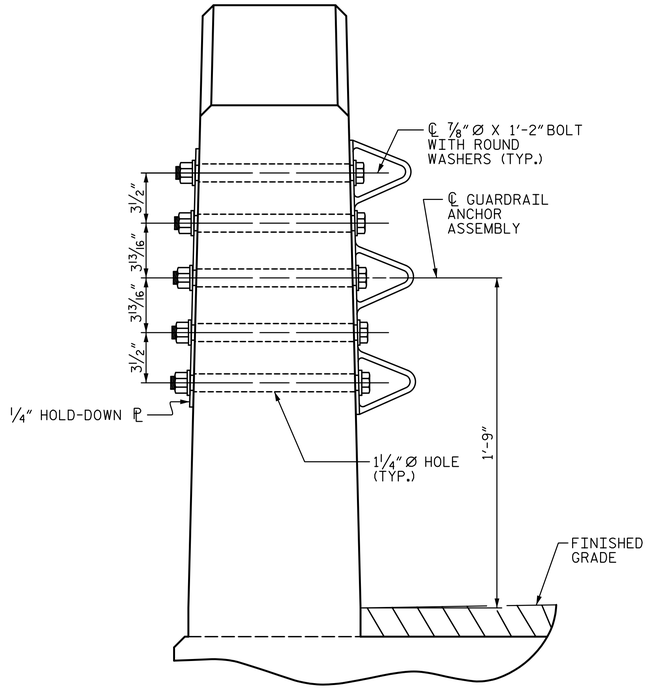
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

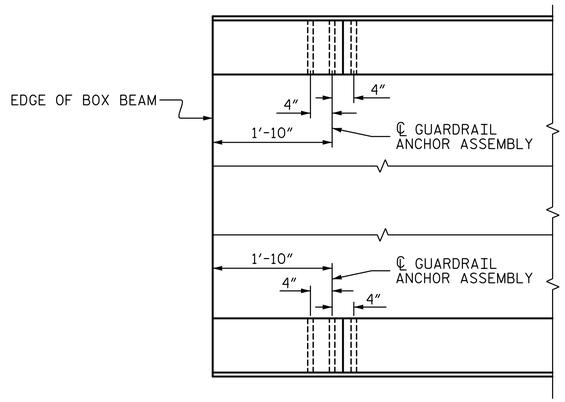
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.

SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. 17BP.9.R.96

ROWAN COUNTY

STATION: 15+55.00 -L-

ASSEMBLED BY : JWJ	DATE : 9-22		
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DESIGN ENGINEER OF RECORD : JWJ	DATE : 9-25		
DRAWN BY : MAA 5/10	REV. 1/15	MAA/TMG	
CHECKED BY : GM 5/10	REV. 12/17	MAA/THC	
	REV. 5/18	MAA/THC	

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1/23/2026

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE DETAILS FOR VERTICAL CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			16

STD. NO. GRA3

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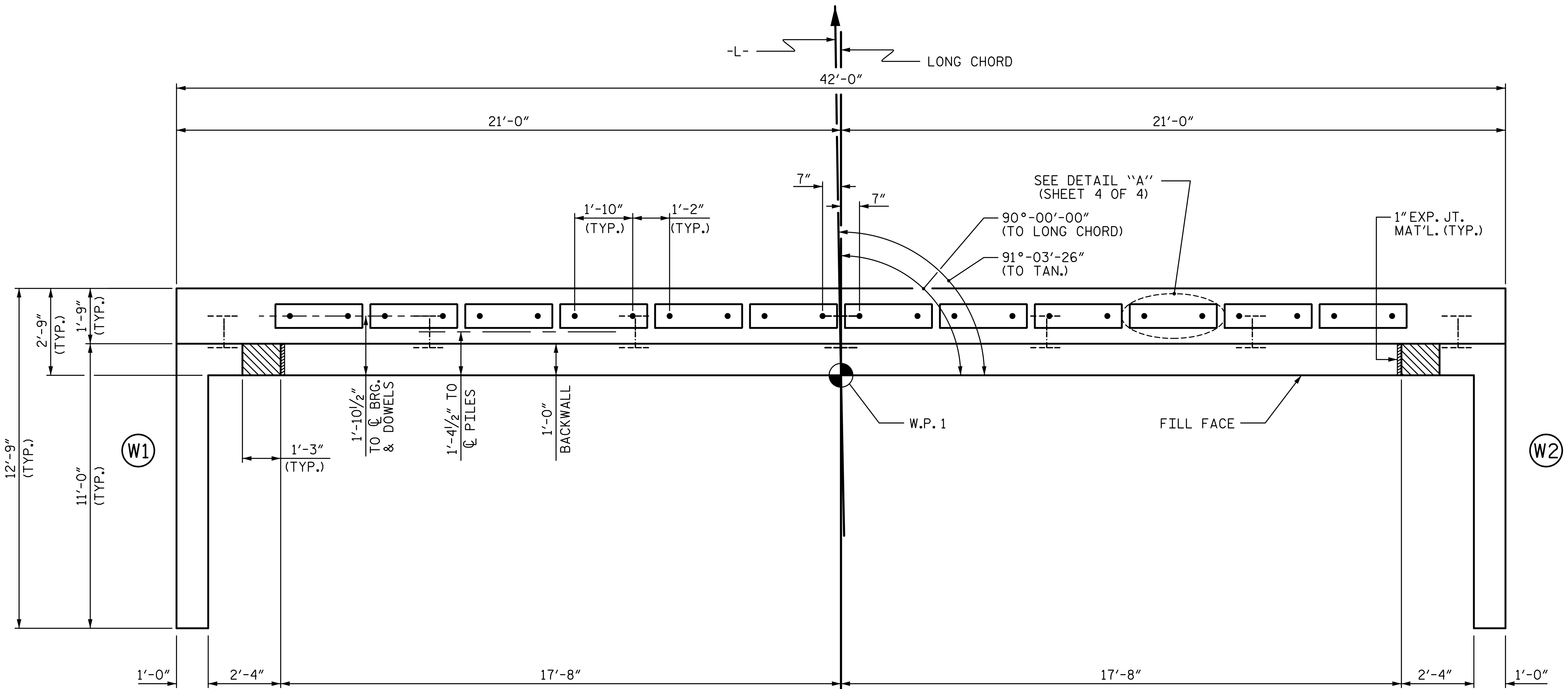
NOTES

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

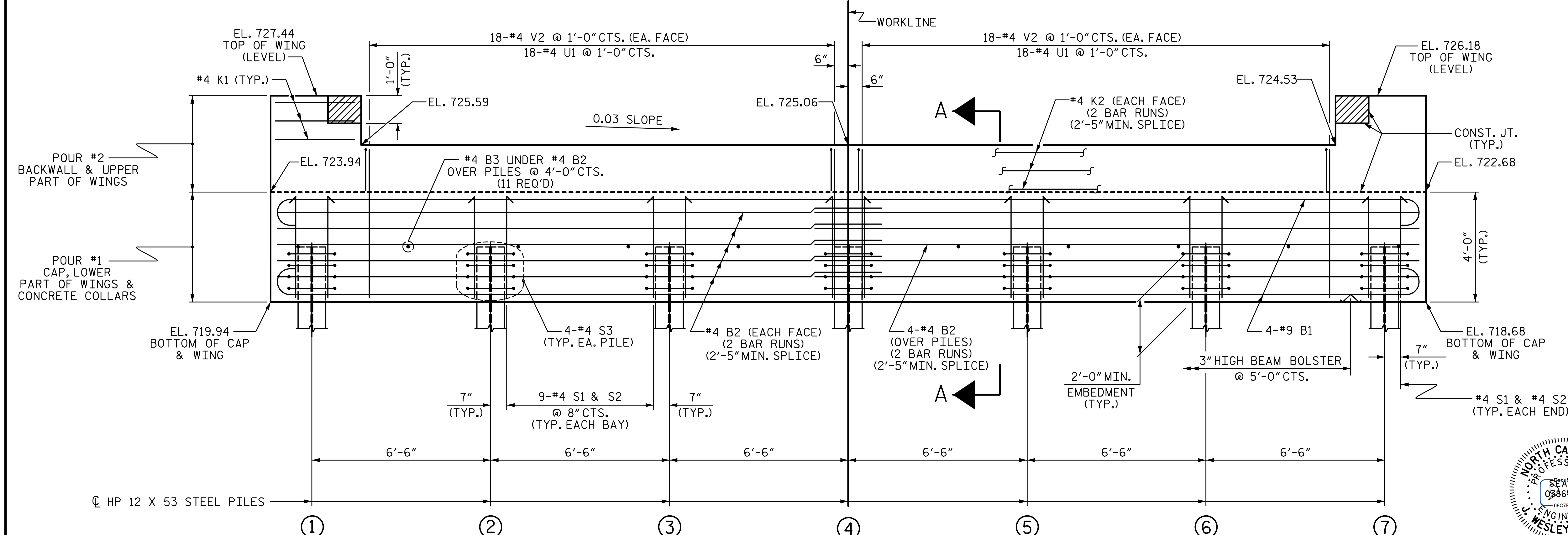
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN



ELEVATION

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

TOP OF PILE ELEVATIONS	
1	721.91
2	721.72
3	721.52
4	721.33
5	721.13
6	720.94
7	720.74

PROJECT NO. 17BP.9.R.96
ROWAN COUNTY
STATION: 15+55.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 J. WESLEY JONES 1/23/2026

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Charlotte, NC 28203
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ASSEMBLED BY :	JWJ	DATE :	9-22
CHECKED BY :	MLO	DATE :	9-22
DESIGN ENGINEER OF RECORD :	JWJ	DATE :	9-25

DRAWN BY : WJH 12/11
CHECKED BY : AAC 12/11
REV. 4/15 MAA/TMG

REVISIONS								SHEET NO.
NO.	BY:	DATE:		NO.	BY:	DATE:		S-11
1				3				TOTAL SHEETS
2				4				16

STD. NO. EB_36_90S4_33BB

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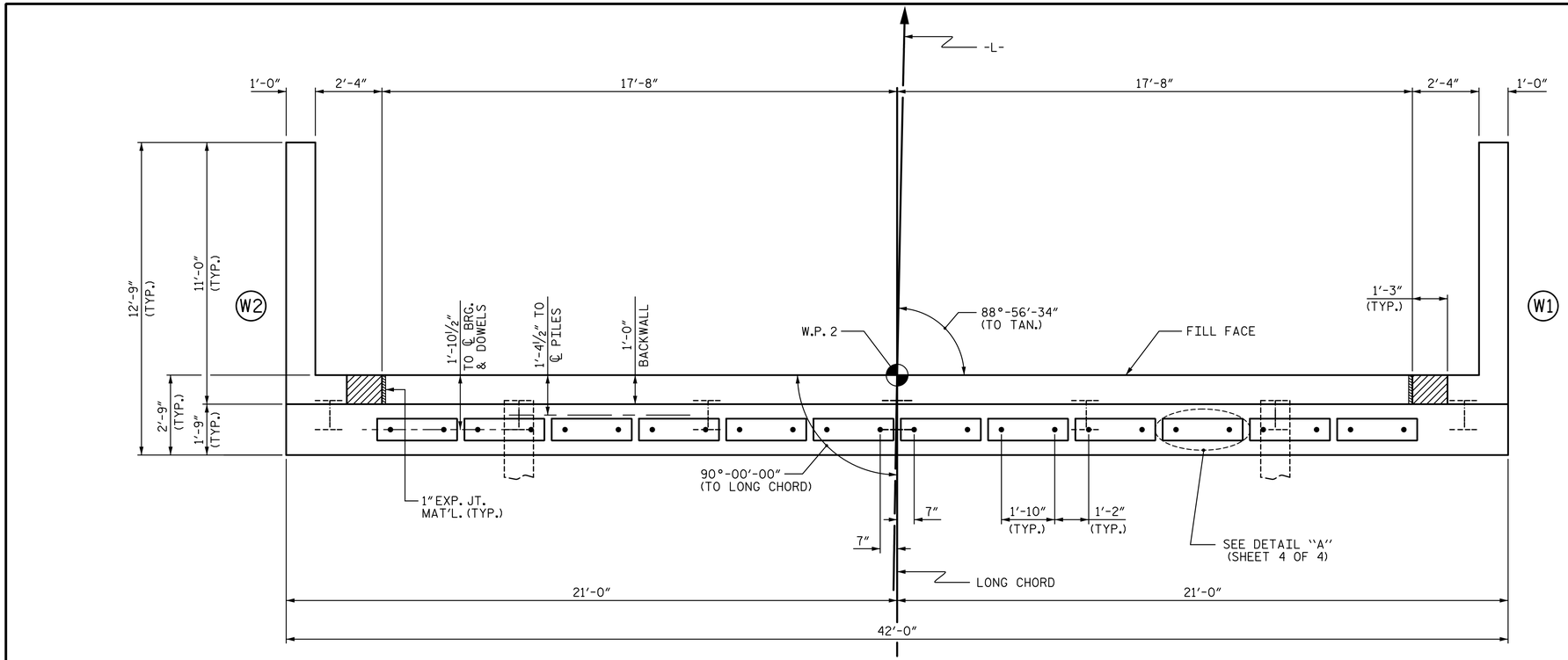
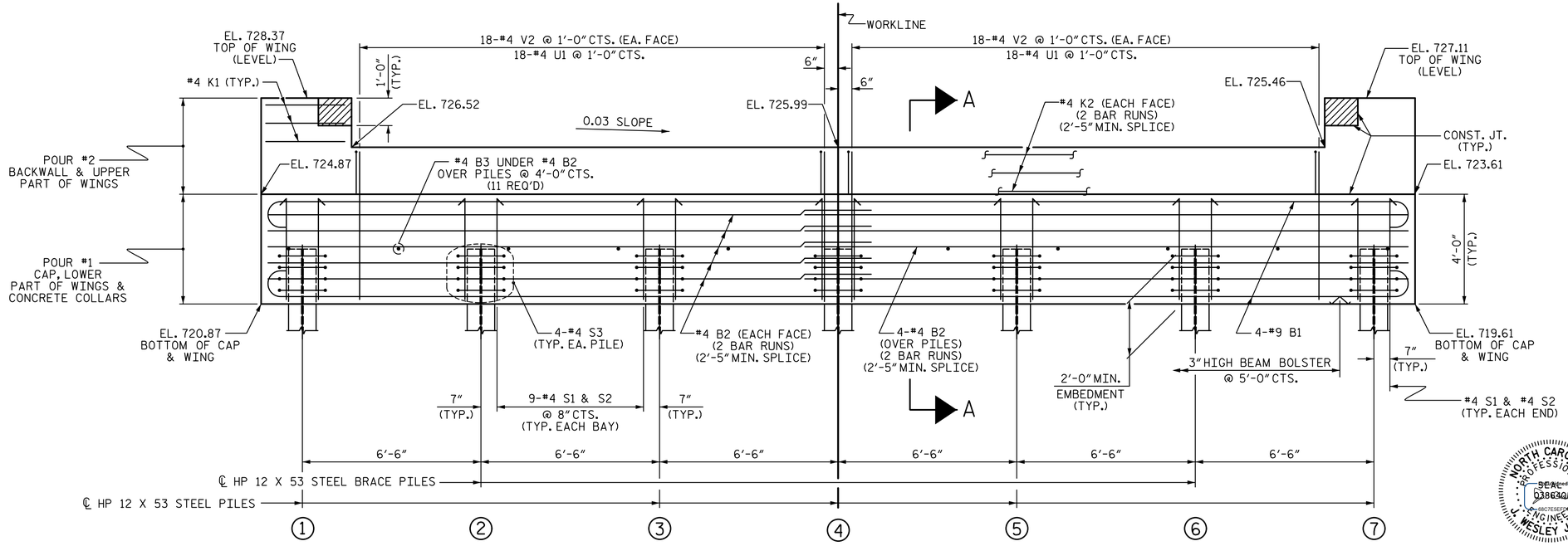


PLAN



ELEVATION

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

NOTES

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

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

TOP OF PILE ELEVATIONS	
①	722.84
②	722.65
③	722.45
④	722.26
⑤	722.06
⑥	721.87
⑦	721.67

ASSEMBLED BY :	JWJ	DATE :	9-22
CHECKED BY :	MLO	DATE :	9-22
DESIGN ENGINEER OF RECORD :	JWJ	DATE :	9-25
DRAWN BY : WJH 12/11	REV. 4/15		MAA/TMG
CHECKED BY : AAC 12/11			

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Charlotte, NC 28203
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ROWAN COUNTY
STATION: 15+55.00 -L-

SHEET 2 OF 4

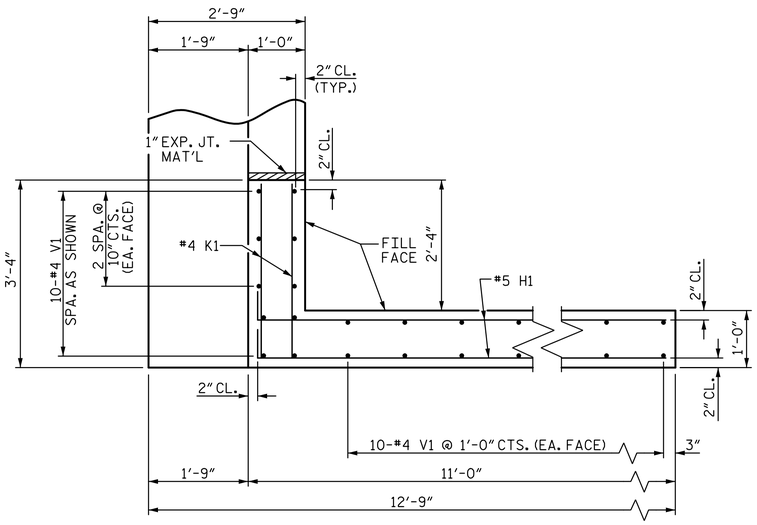
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

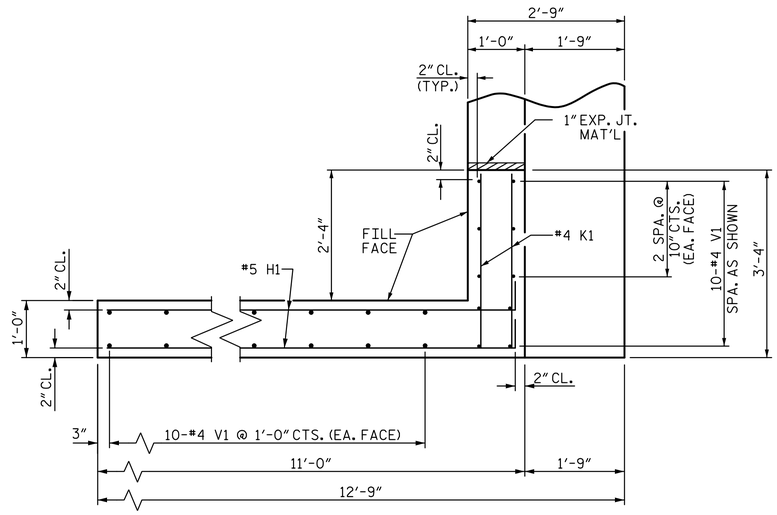
END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			16

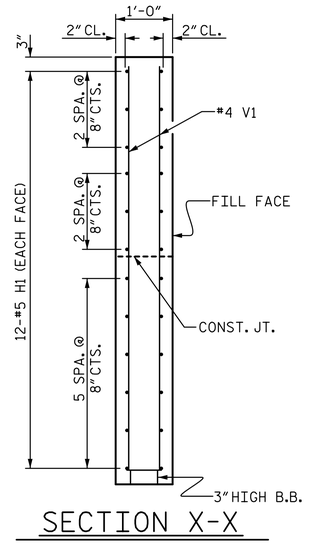
STD. NO. EB_36_90S4_33BB



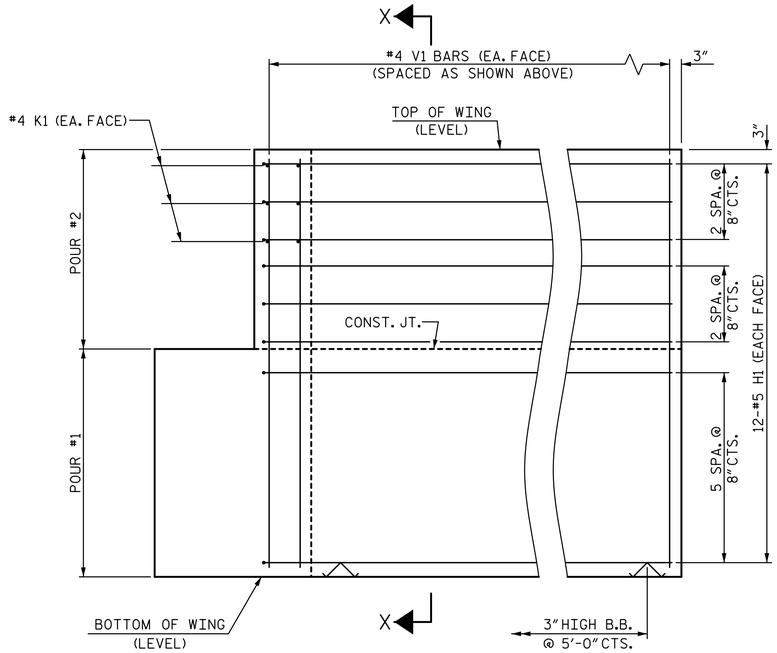
PLAN OF WING (W1)



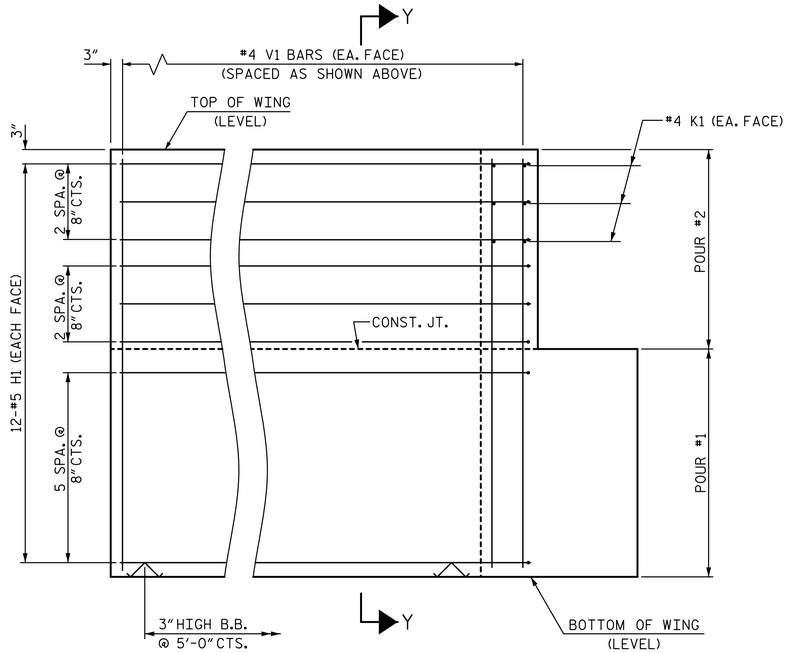
PLAN OF WING (W2)



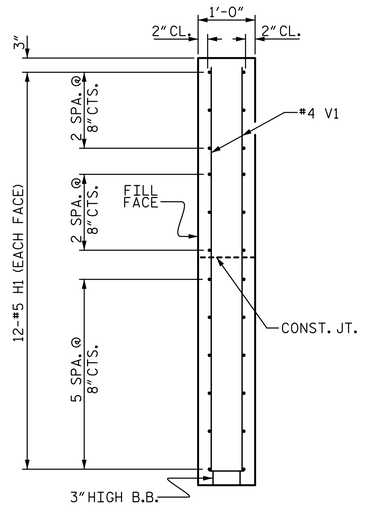
SECTION X-X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION Y-Y

WING DETAILS

PROJECT NO. 17BP.9.R.96

ROWAN COUNTY

STATION: 15+55.00 -L-

SHEET 3 OF 4

ASSEMBLED BY : JWJ	DATE : 9-22		
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DESIGN ENGINEER OF RECORD : JWJ	DATE : 9-25		
DRAWN BY : WJH 12/11	REV. 4/15	MAA/TMG	
CHECKED BY : AAC 12/11			

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SUBSTRUCTURE
END BENT
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			16

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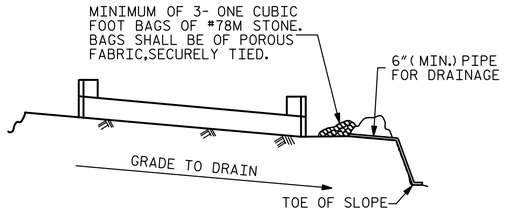
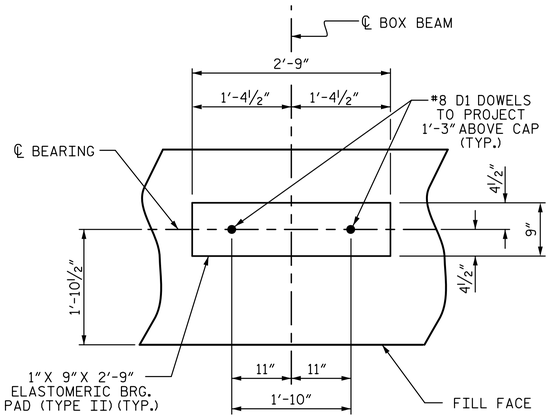


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

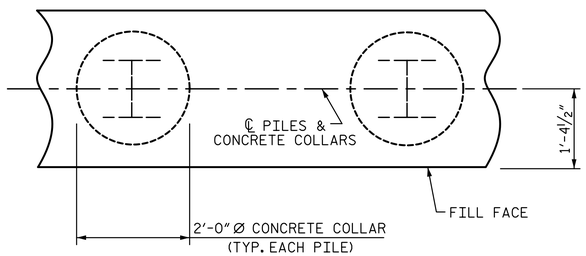
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

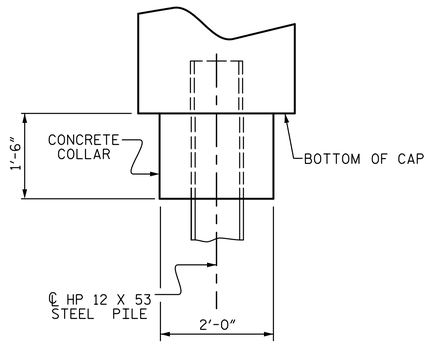


DETAIL "A"

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



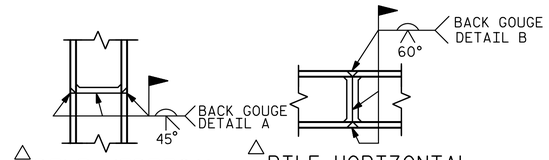
PLAN



ELEVATION

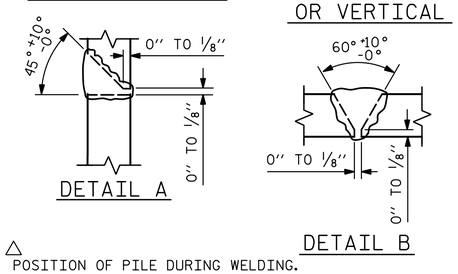
CORROSION PROTECTION FOR STEEL PILES DETAIL

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



△PILE VERTICAL

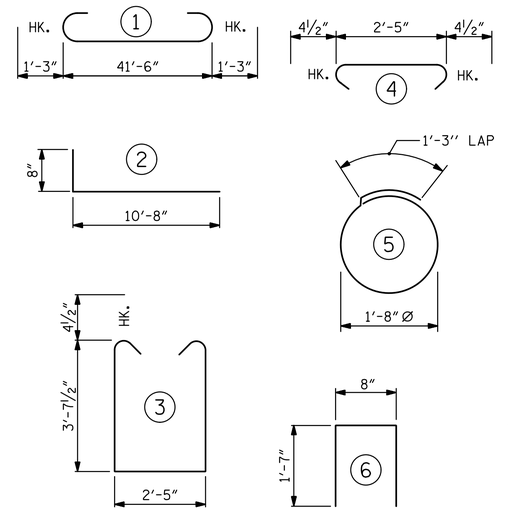
△PILE HORIZONTAL OR VERTICAL



△POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT No. 1	END BENT No. 2
HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES
NO: 7 LIN. FT.= 105	NO: 7 LIN. FT.= 105
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 7	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 7
PILE REDRIVES NO: 0	PILE REDRIVES NO: 0

BILL OF MATERIAL

FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	44'-0"	1197
B2	28	#4	STR	22'-1"	413
B3	11	#4	STR	2'-5"	18
D1	24	#8	STR	2'-3"	144
H1	48	#5	2	11'-4"	567
K1	12	#4	STR	2'-11"	23
K2	12	#4	STR	22'-1"	177
S1	56	#4	3	10'-5"	390
S2	56	#4	4	3'-2"	118
S3	28	#4	5	6'-6"	122
U1	36	#4	6	3'-10"	92
V1	60	#4	STR	7'-2"	287
V2	72	#4	STR	5'-5"	261

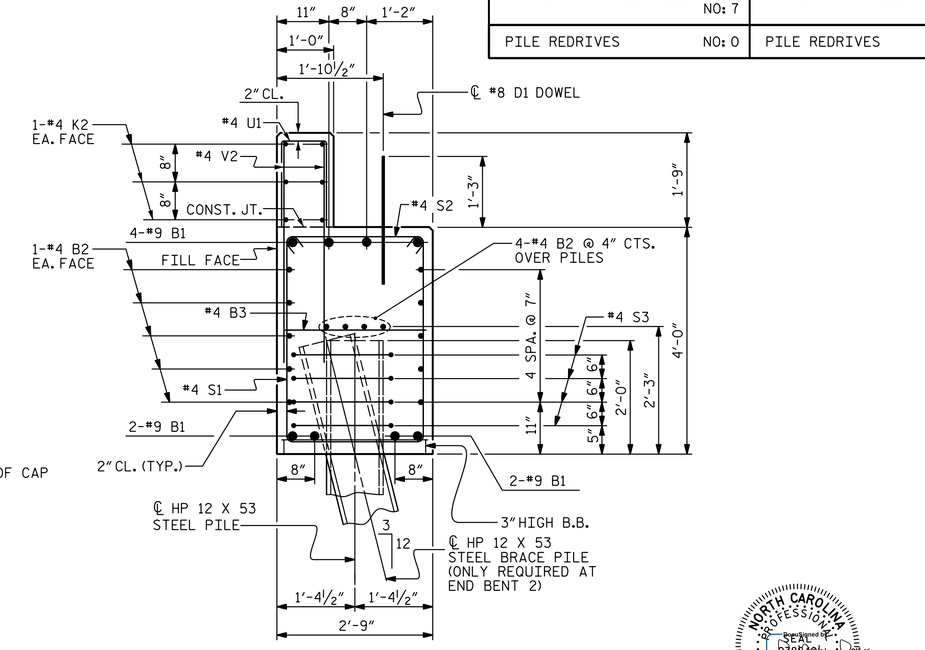
REINFORCING STEEL (FOR ONE END BENT) 3809 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 21.3 C.Y.

POUR #2 BACKWALL & UPPER PART OF WINGS 5.7 C.Y.

TOTAL CLASS A CONCRETE 27.0 C.Y.



SECTION A-A

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

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
NC License Number F-0991

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PROJECT NO. 17BP.9.R.96

ROWAN COUNTY

STATION: 15+55.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1 & 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			16

ASSEMBLED BY :	JWJ	DATE :	9-22
CHECKED BY :	MLO	DATE :	9-22
DESIGN ENGINEER OF RECORD :	JWJ	DATE :	9-25
DRAWN BY : WJH 12/11	REV. 4/17	MAA/THC	
CHECKED BY : AAC 12/11			

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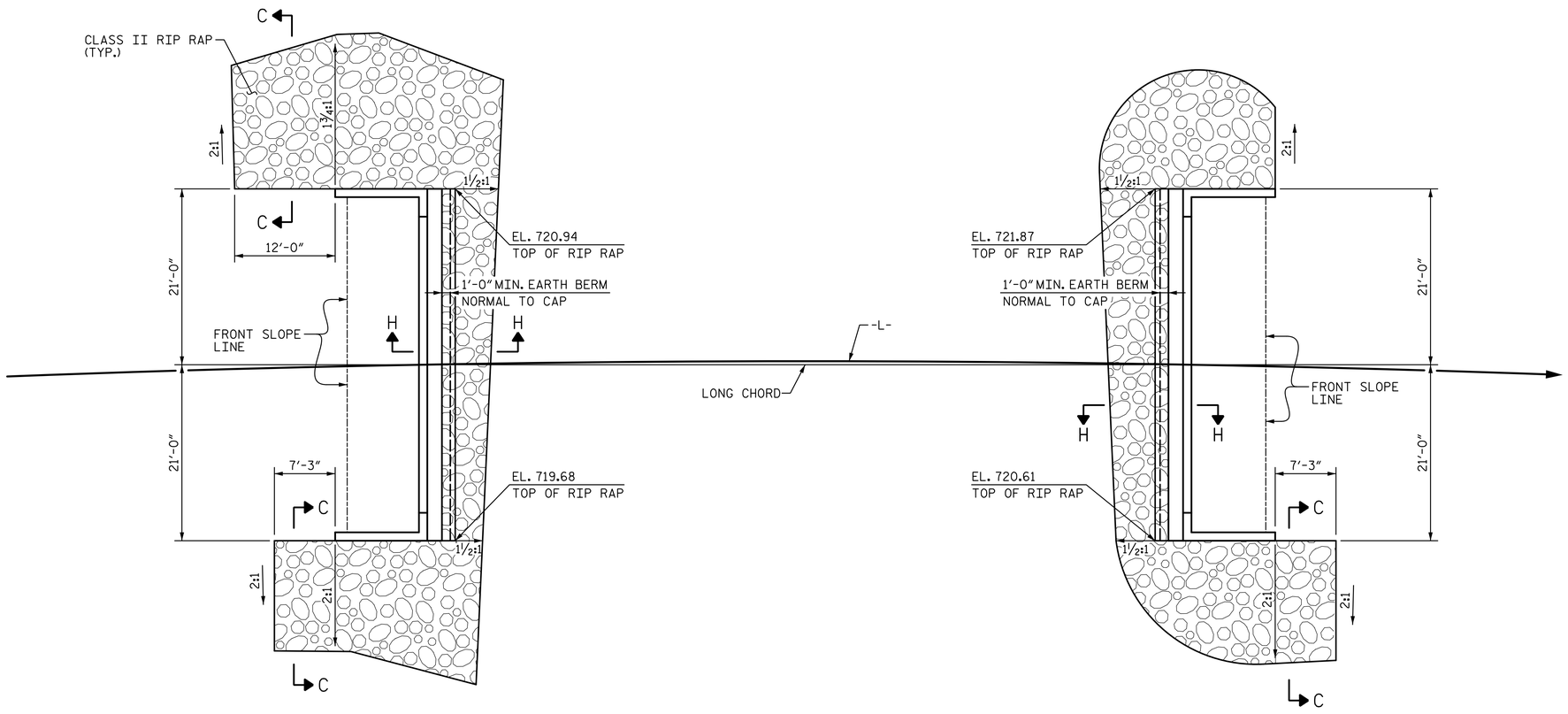
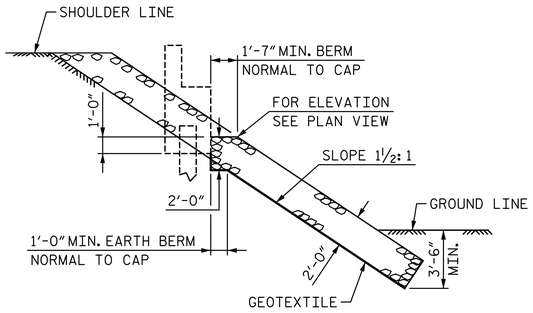
STD. NO. EB_36_90S4_33BB



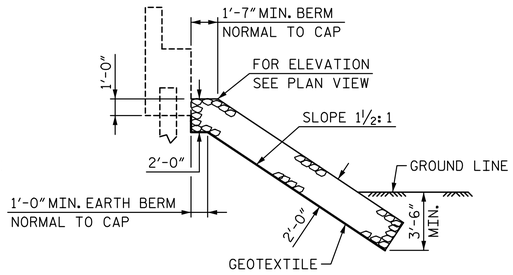
ESTIMATED QUANTITIES

BRIDGE @ STA. 15+55.00 -L-	RIP RAP CLASS II (2′-0″ THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	180	200
END BENT 2	140	155

PLAN - END BENT 1



SECTION H-H

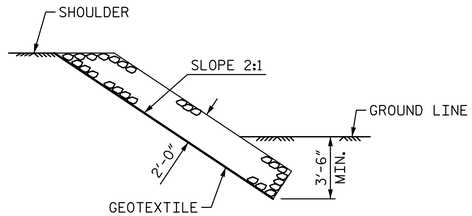


℄ SECTION

BERM RIP RAPPED

END BENT 1 SHOWN, END BENT 2 SIMILAR

PLAN - END BENT 2



SECTION C-C

PROJECT NO. 17BP.9.R.96

ROWAN COUNTY

STATION: 15+55.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			16

NORTH CAROLINA PROFESSIONAL SEAL 038640 ENGINEER WESLEY JONES 1/23/2026

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
NC License Number F-0991

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DRAWN BY :	JWJ	DATE : 9-22
CHECKED BY :	MLO	DATE : 9-22
DESIGN ENGINEER OF RECORD :	JWJ	DATE : 9-25

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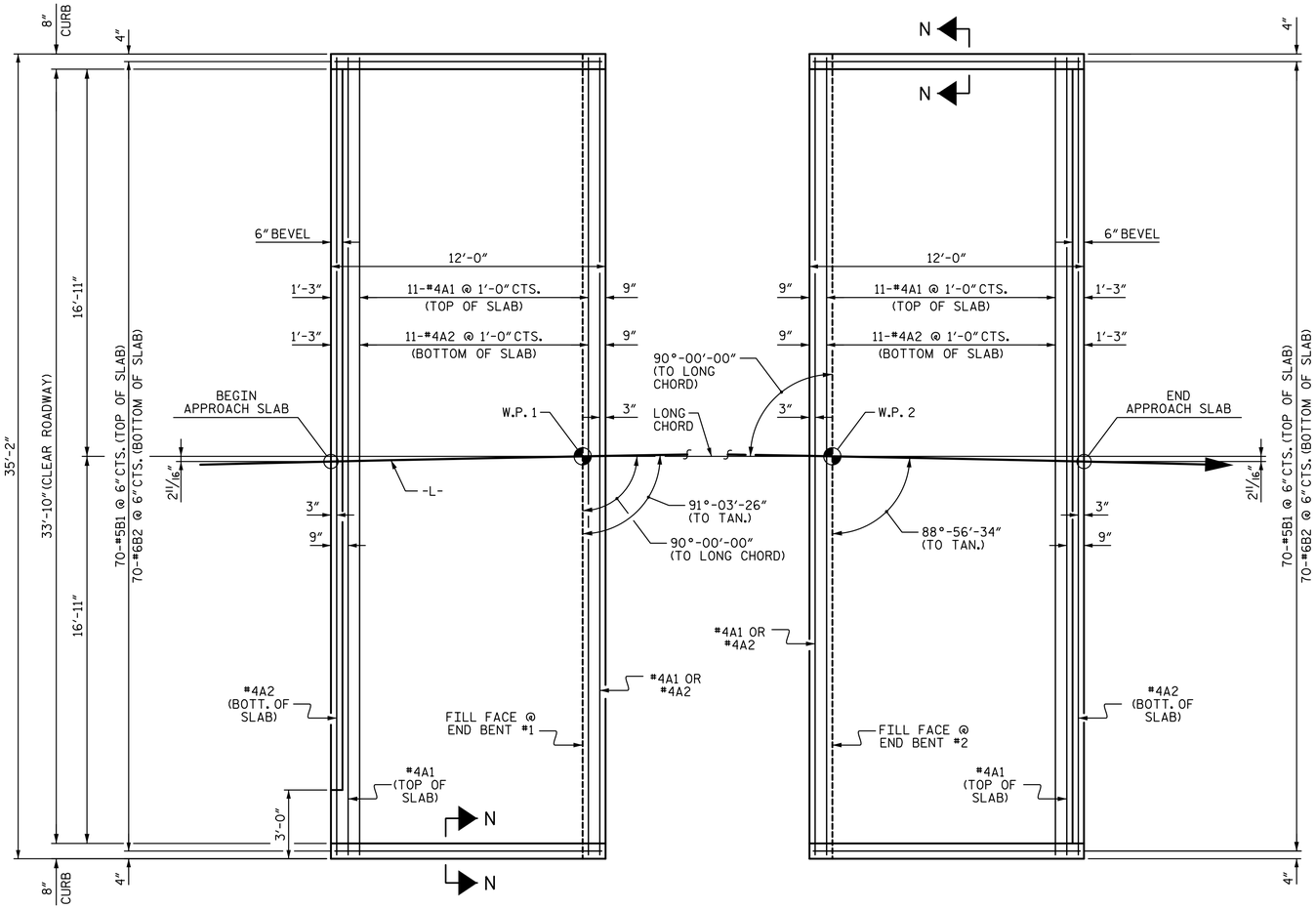
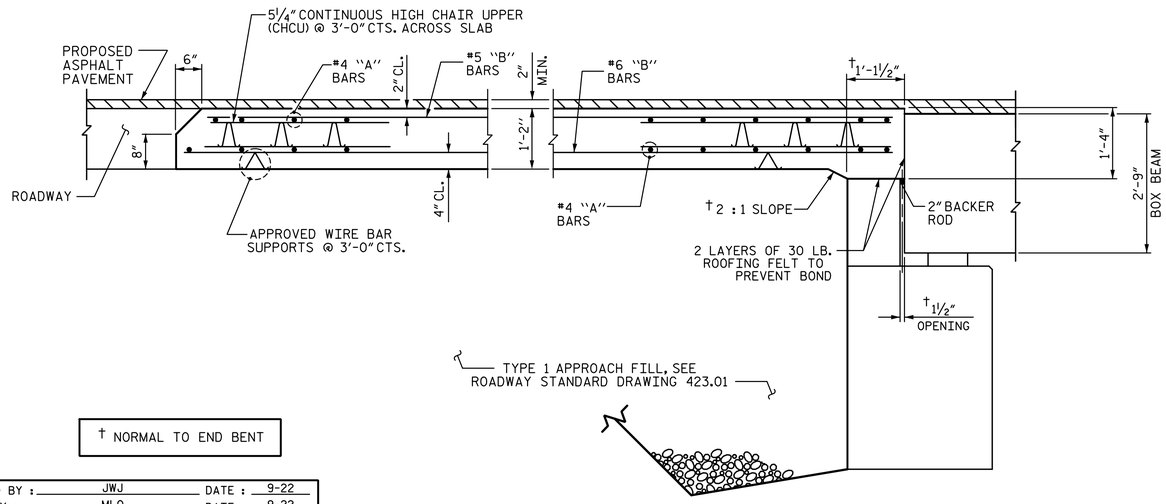


PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB

† NORMAL TO END BENT

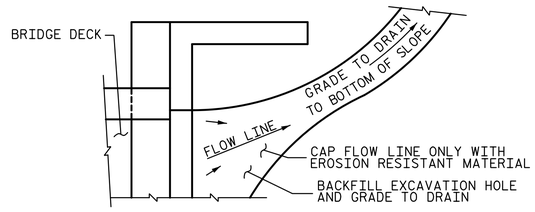
ASSEMBLED BY : JWJ		DATE : 9-22	
CHECKED BY : MLO		DATE : 9-22	
DESIGN ENGINEER OF RECORD : JWJ		DATE : 9-25	
DRAWN BY : MAA 11/11	REV. 12-17	BNB/THC	
CHECKED BY : AAC 11/11	REV. 01-25	HRS	

NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

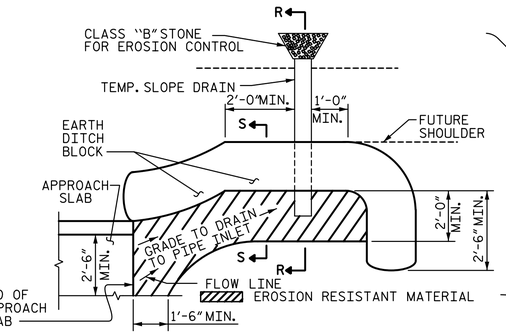
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

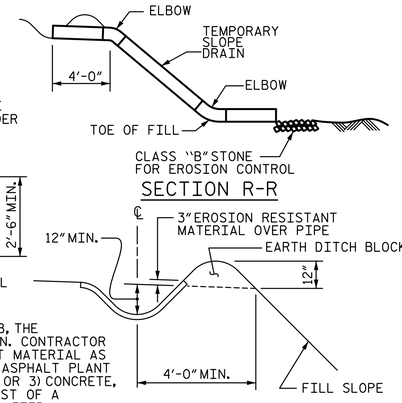


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



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

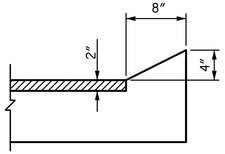


PLAN VIEW

SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION N-N

CURB DETAILS

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

BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	13	#4	STR	34'-10"	302
A2	13	#4	STR	34'-10"	302
✳ B1	70	#5	STR	11'-2"	815
B2	70	#6	STR	11'-8"	1227
REINFORCING STEEL				LBS.	1529
✳ EPOXY COATED REINFORCING STEEL				LBS.	1117
CLASS AA CONCRETE				C.Y.	18.6
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	13	#4	STR	34'-10"	302
A2	13	#4	STR	34'-10"	302
✳ B1	70	#5	STR	11'-2"	815
B2	70	#6	STR	11'-8"	1227
REINFORCING STEEL				LBS.	1529
✳ EPOXY COATED REINFORCING STEEL				LBS.	1117
CLASS AA CONCRETE				C.Y.	18.6

PROJECT NO. 17BP.9.R.96

ROWAN COUNTY

STATION: 15+55.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 038040 ENGINEER WESLEY JONES 1/23/2026

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
NC License Number F-0991

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE BOX BEAM UNIT (SUB-REGIONAL TIER) 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			16

STD. NO. BAS_BB_36_90S

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST $\frac{5}{16}$" 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. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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