

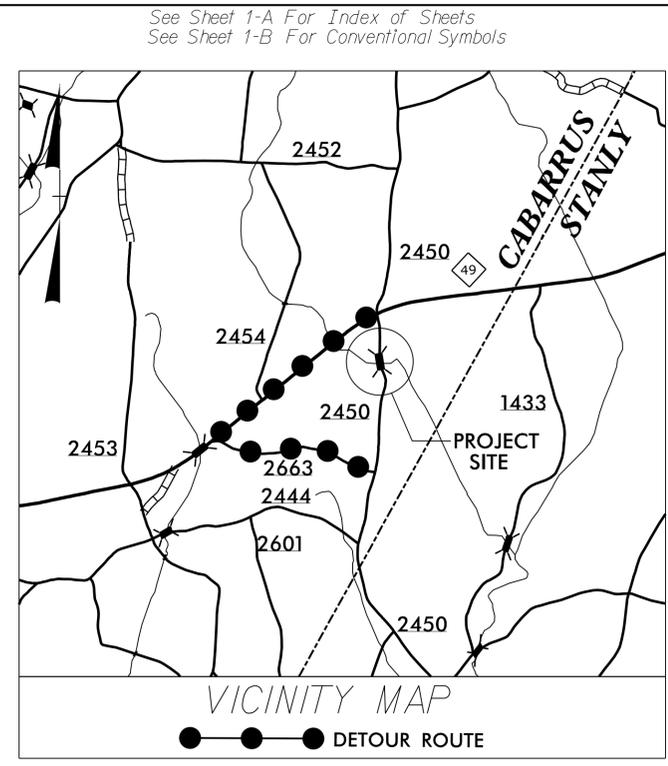
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.10.R.110	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.10.PE.110		PE	
17BP.10.ROW.110		RW	
17BP.10.R.110		CON	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

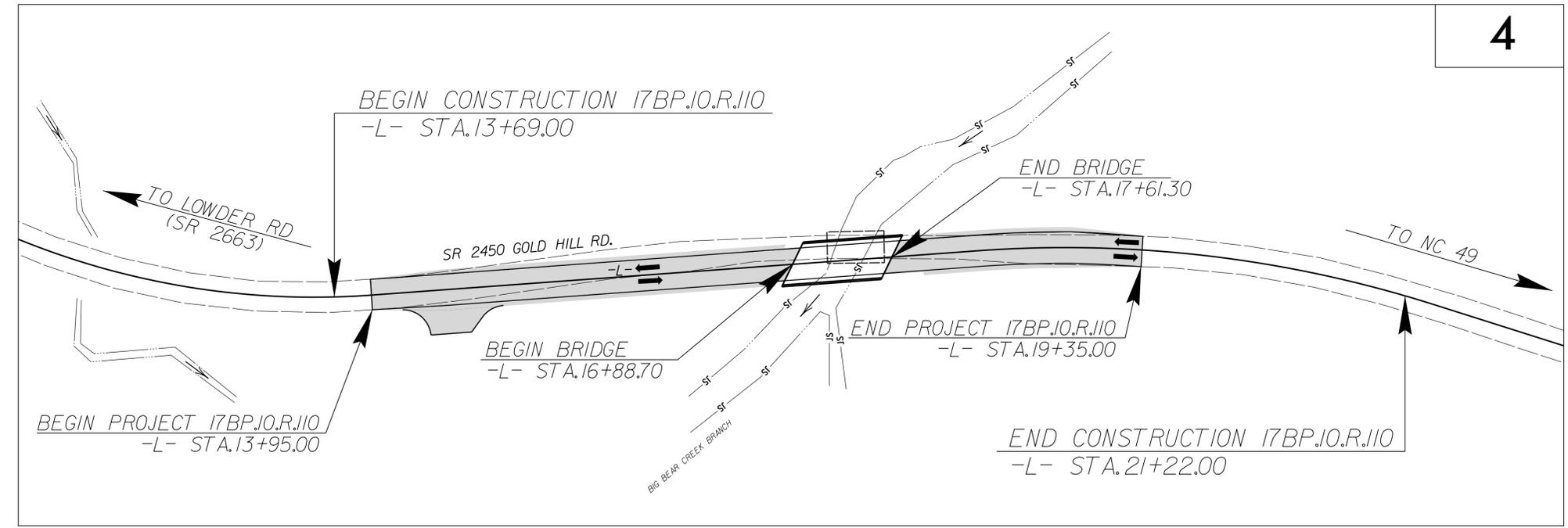
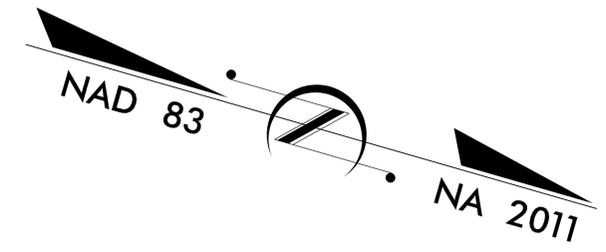
CABARRUS COUNTY

LOCATION: REPLACE BRIDGE NO. 120105 OVER BIG BEAR CREEK ON SR 2450 (GOLD HILL RD.)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE



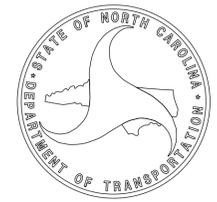
FINAL PLANS



4

STRUCTURES

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

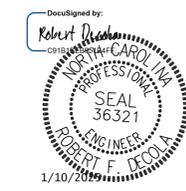


DESIGN DATA

ADT 2022 = 400
ADT 2045 = 450
V = 45 MPH
FUNC CLASS = LOCAL
SUB - REGIONAL TIER

PROJECT LENGTH

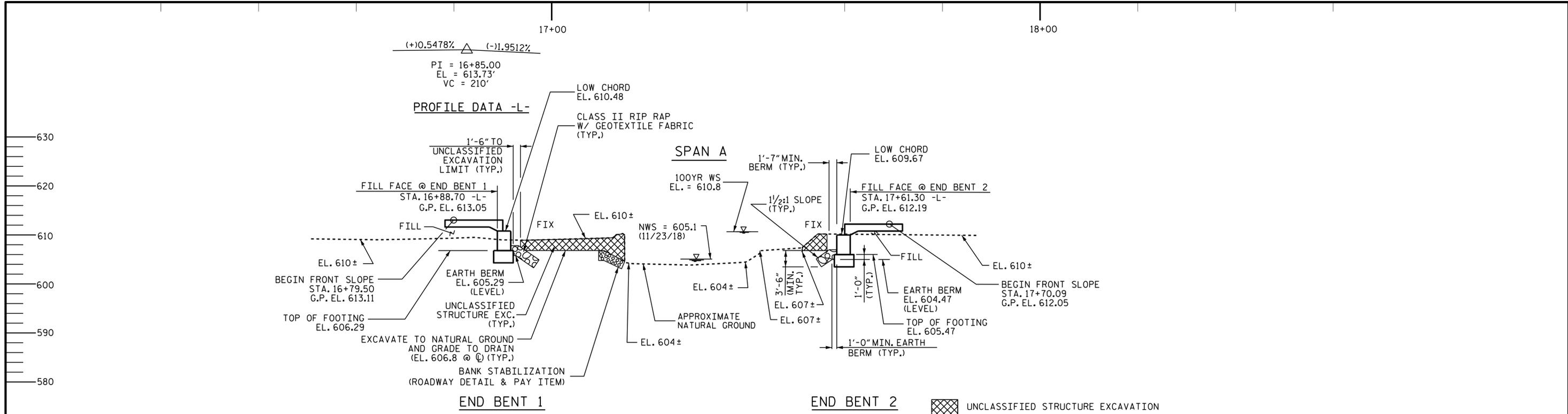
LENGTH OF ROADWAY STATE PROJECT 17BP.10.R.110 = .088 MILES
LENGTH OF STRUCTURE STATE PROJECT 17BP.10.R.110 = .014 MILES
TOTAL LENGTH OF STATE PROJECT 17BP.10.R.110 = .102 MILES



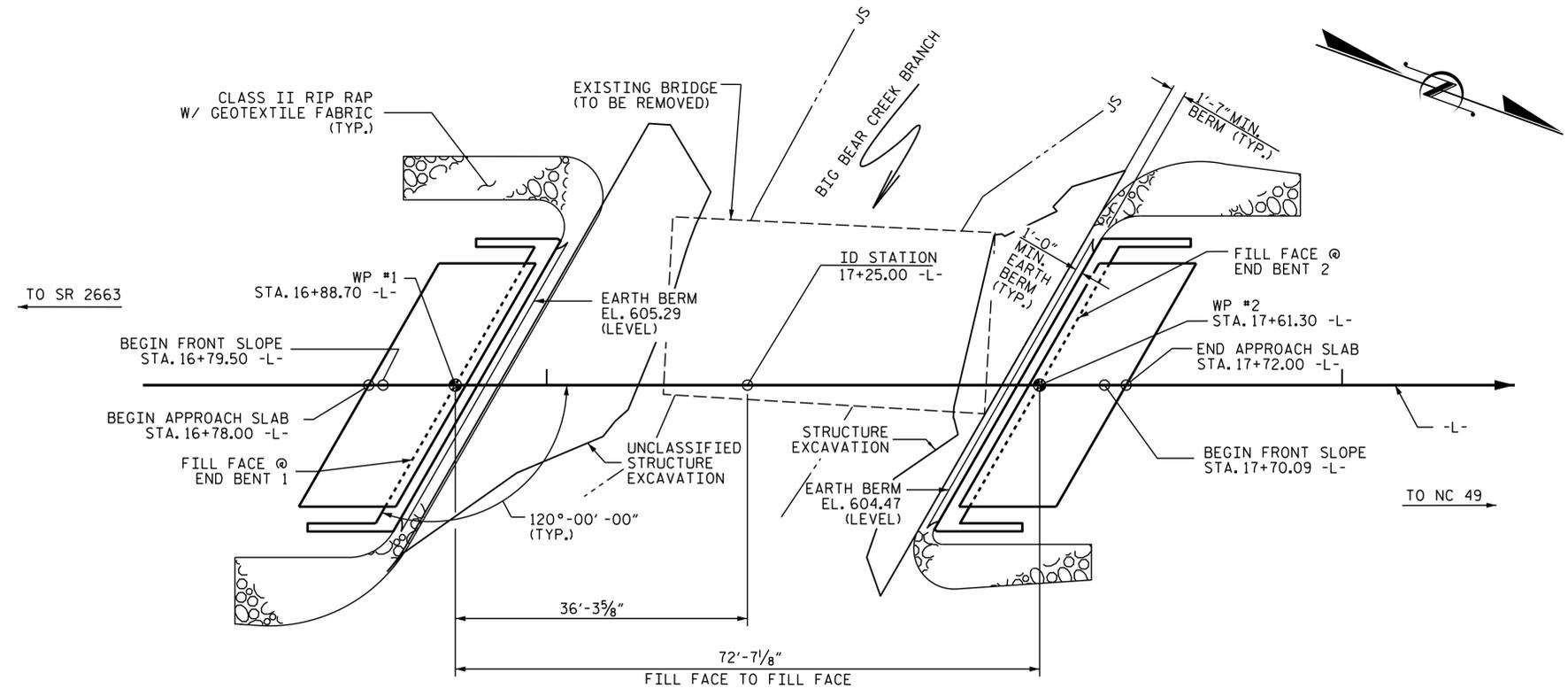
Prepared in the Office of: KCI Associates of N.C., P.A. 4800 Falls of Neuse Road, Suite 200 Raleigh, NC 27609 Phone (919) 783-9214 NC Firm License No: C-0764	Plans Prepared For: NCDOT DIVISION 10 716 W. Main St. Albemarle, NC 28001
2024 STANDARD SPECIFICATIONS	ROBERT F. DECOLA, P.E. PROJECT ENGINEER
LETTING DATE: FEBRUARY 19, 2025	MATTHEW G. ARMSTRONG, PE PROJECT DESIGN ENGINEER
NCDOT CONTACT:	YANWEI MA, P.E. DIVISION 10 BRIDGE PROGRAM MANAGER

18-DEC-2024 16:52 M:\2016\221601946\08 NCDOT Div 10 LIBR\221601946-08B-17BP.10.R.110.Bridge 105\Structures\Drawings\FINAL\401_00_17BP.10.R.110_SMU_TSH_0_000.dgn \$\$\$\$SERVNAME\$\$\$\$

CONTRACT: DJ00545 STATE PROJECT: 17BP.10.R.110



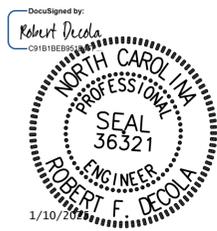
SECTION ALONG -L-
(SECTIONS AT END BENTS ARE AT RIGHT ANGLES)



PLAN
FOOTINGS NOT SHOWN IN PLAN VIEW

PROJECT NO. 17BP.10.R.110
CABARRUS COUNTY
 STATION: 17+25.00 -L-

SHEET 1 OF 5 REPLACES BRIDGE NO. 120105



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON SR 2450 OVER
 BIG BEAR CREEK BRANCH
 BETWEEN SR 2663 & NC 49

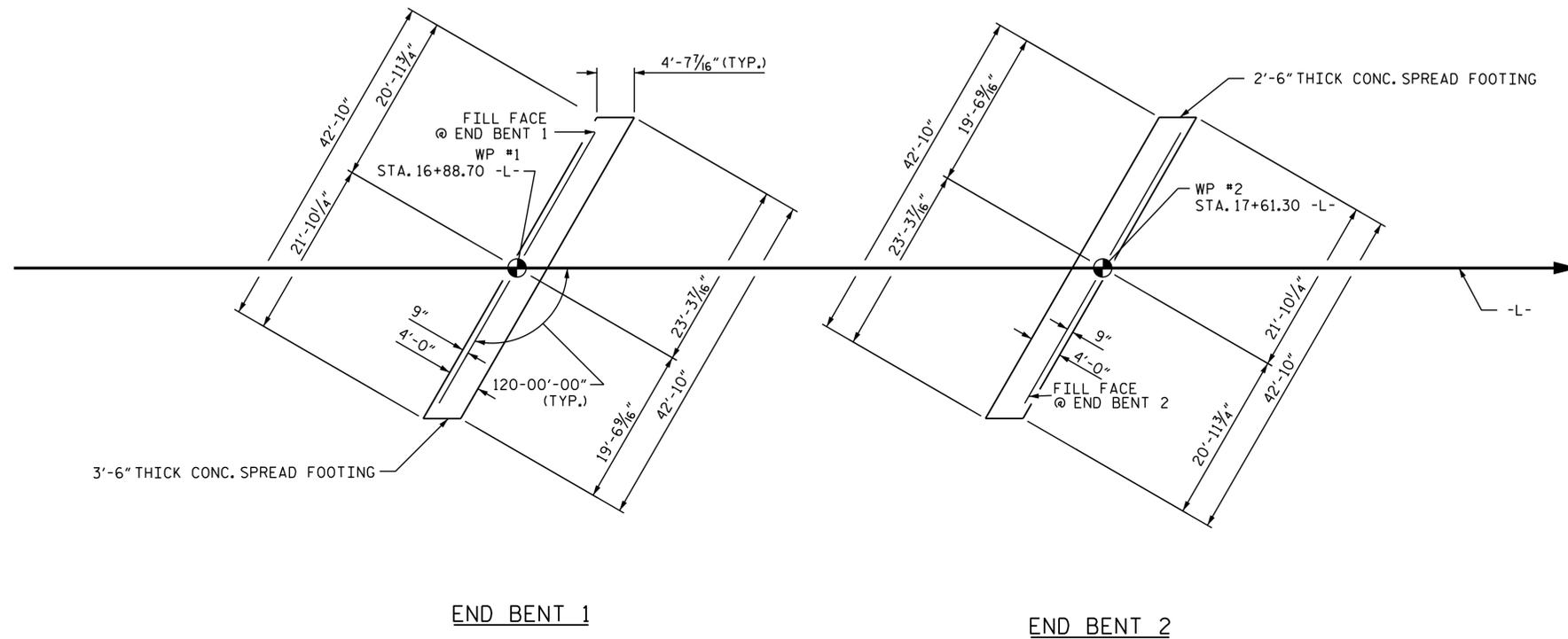
DESIGN ENGINEER OF RECORD: R.F. DECOLA DATE: 1/10/2025
 DRAWN BY: C.M. MURPHY DATE: 10/22/24
 CHECKED BY: R.F. DECOLA DATE: 10/24/24

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

KCI Associates of N.C., P.A.
 4800 Falls of Neuse Road, Suite 200
 Raleigh, NC 27609
 Phone (919) 783-9214
 NC Firm License No: C-0764

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

TOTAL SHEETS: 17



FOUNDATION LAYOUT

FOUNDATION NOTES

THE SPREAD FOOTING AT END BENTS NOS. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 20.0 KSF. CHECK FIELD CONDITIONS FOR THE REQUIRED RESISTANCE OF 45 KSF JUST BEFORE PLACING CONCRETE.

FOR BLASTING ADJACENT TO HIGHWAY STRUCTURES, SEE ARTICLE 410-9 OF THE STANDARD SPECIFICATIONS.

KEY IN SPREAD FOOTINGS AT END BENTS NOS. 1 AND 2 AT LEAST 12" INTO WEATHERED ROCK WITH MINIMUM THICKNESS AS SHOWN ON THE PLANS.

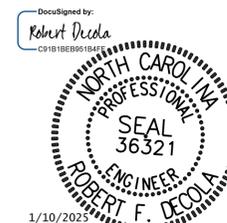
ESTIMATE 5 CUBIC YARDS OF ROCK EXCAVATION FOR END BENT NO. 1 FOUNDATION AND 14 CUBIC YARDS OF ROCK EXCAVATION FOR END BENT NO. 2 FOUNDATION.

PROJECT NO. 17BP.10.R.110
CABARRUS COUNTY
 STATION: 17+25.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

FOUNDATION LAYOUT



1/10/2025

DESIGN ENGINEER OF RECORD:	DATE :	1/10/2025
R.F. DeCola		
DRAWN BY :	DATE :	10/22/24
C.M. MURPHY		
CHECKED BY :	DATE :	10/24/24
R.F. DeCola		

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S- 2
1			3			TOTAL SHEETS
2			4			17

SUMMARY OF SPREAD FOOTING INFORMATION

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

END BENT / BENT NO FOOTING(S) *(-*) (E.G., BENT 1, FOOTING 1-2)	FACTORED BEARING RESISTANCE KSF	FOOTING DIMENSIONS (LENGTH x WIDTH) FT x FT	REQUIRED BEARING RESISTANCE KSF	SCOUR CRITICAL ELEVATION FT	MINIMUM BOTTOM OF FOOTING (FOOTING NO HIGHER THAN) ELEVATION FT
END BENT 1, FOOTING	20		45		603
END BENT 2, FOOTING	20		45		603

NOTES:

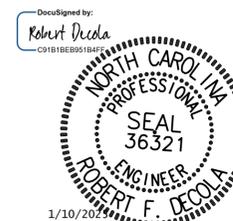
1. THE SPREAD FOOTING FOUNDATION TABLES ARE BASED ON THE BRIDGE SUPERSTRUCTURE DESIGN AND FOUNDATION RECCOMENDATIONS SEALED BY A NORTH CAROLINA PROFESSIONAL ENGINEER (SHIPING YANG, #031361) ON 09-25-2024

PROJECT NO. 17BP.10.R.110
CABARRUS COUNTY
 STATION: 17+25.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

MICROPILE AND
 SPREAD FOOTING
 FOUNDATION TABLES



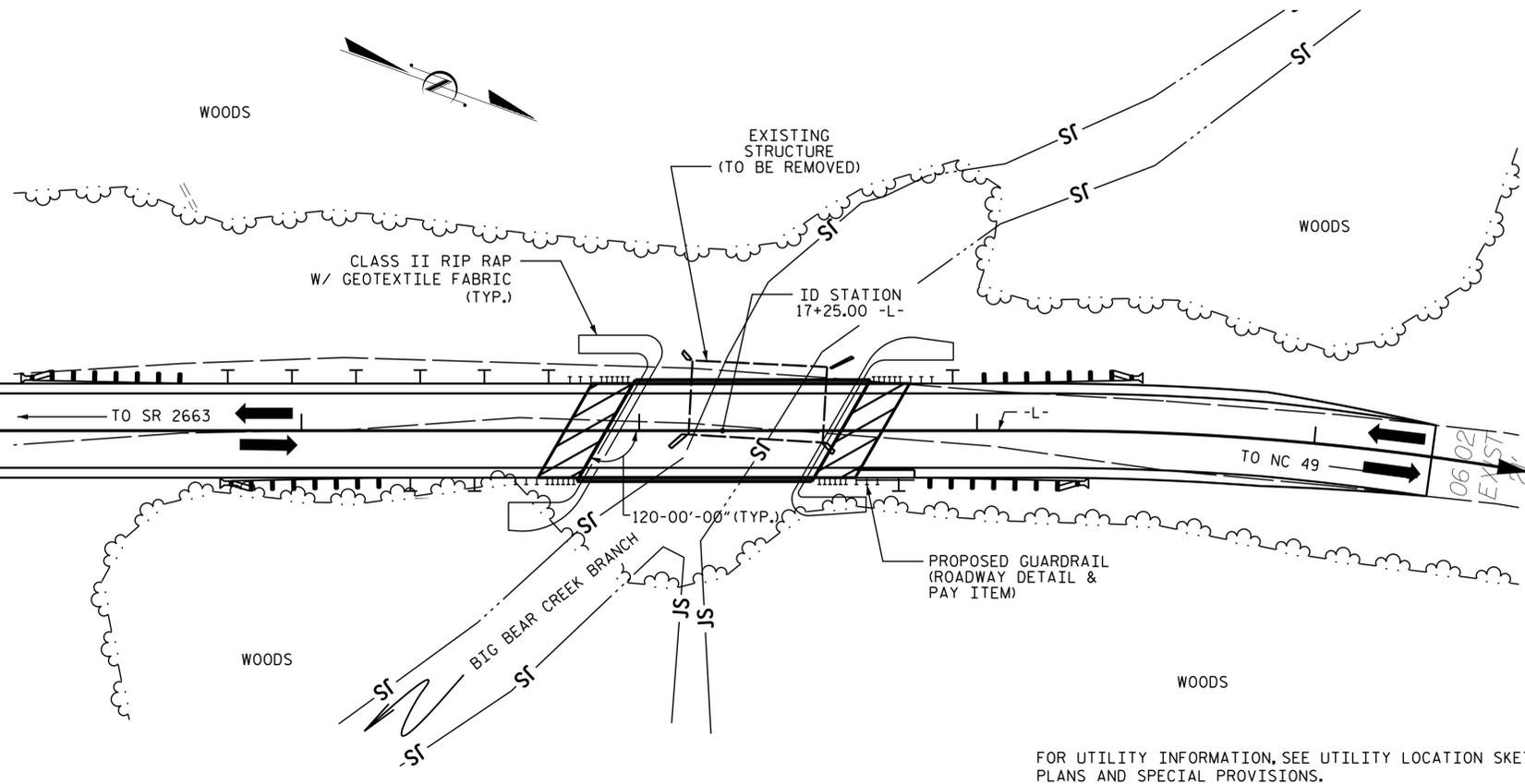
DESIGN ENGINEER OF RECORD: R.F. DeCola DATE : 1/10/2025
 DRAWN BY : C.M. MURPHY DATE : 10/22/24
 CHECKED BY : R.F. DeCola DATE : 10/24/24

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1			3			17
2			4			17

BM #1 - YELLOW BENCHTIE IN 22" HICKORY, -L- STA. 12+51.59, 26.12' LT, N 621333.85 E 1601062.68 EL. 613.36 NAVD 88



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY LOCATION SKETCH PLANS AND SPECIAL PROVISIONS.

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 SHEET SN.
- 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.
- 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 17+25.00 -L-.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 20 FT TO THE LEFT AND 20 FT TO THE RIGHT SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE EXISTING STRUCTURE CONSISTING OF ONE 41'-7" STEEL BEAM WITH 20'-9" CLEAR ROADWAY TIMBER DECK ON 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.

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

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

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

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1300	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 609.9	FT
DRAINAGE AREA	= 4.08	SO. MI.
BASE DISCHARGE	= 1800	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 610.8	FT

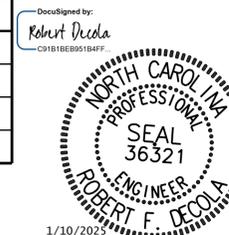
OVERTOPPING DATA

OVERTOPPING DISCHARGE	= 1800	CFS
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING ELEVATION	= 610.5	* FT

* OVERTOPS S.P. @ STA. 19+35 -L- LT

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE @ STA. 17+25.00 -L-	ASBESTOS ASSESSMENT	FOUNDATION EXCAVATION FOR END BENT NO.1 AND NO.2 AT STA. 17+25.00	UNCLASSIFIED STRUCTURE EXCAVATION @ STA 17+25.00 -L-	CLASS A CONCRETE	BRIDGE APPROACH SLABS STA. 17+25.00 -L-	REINFORCING STEEL	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLABS
	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	C.Y.	LUMP SUM	LBS.	LIN.FT.	TON	SO.YDS.	LUMP SUM	LIN.FT.
SUPERSTRUCTURE						LUMP SUM		140.29			LUMP SUM	700.00
END BENT 1					46.7		2254		115	130		
END BENT 2					40.1		2187		85	95		
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	86.8	LUMP SUM	4441	140.29	200	225	LUMP SUM	700.00



PROJECT NO. 17BP.10.R.110
CABARRUS COUNTY
 STATION: 17+25.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON SR 2450 OVER
 BIG BEAR CREEK BRANCH
 BETWEEN SR 2663 & NC 49

DESIGN ENGINEER OF RECORD: R.F. DeCola DATE: 1/10/2025
 DRAWN BY: C.M. MURPHY DATE: 10/22/24
 CHECKED BY: R.F. DeCola DATE: 10/24/24

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

TOTAL SHEETS: 17

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

LOAD TYPE	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD	HL-93 (INVENTORY)	N/A	①	1.060	--	1.75	0.248	1.14	70'	EL	34.423	0.655	1.06	70'	EL	6.885	0.80	0.248	1.11	70'	EL	34.423		
	HL-93 (OPERATING)	N/A	•	1.374	--	1.35	0.248	1.48	70'	EL	34.423	0.655	1.37	70'	EL	6.885	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.320	47.508	1.75	0.248	1.48	70'	EL	34.423	0.655	1.32	70'	EL	6.885	0.80	0.248	1.44	70'	EL	34.423		
	HS-20 (OPERATING)	36.000	•	1.711	61.585	1.35	0.248	1.91	70'	EL	34.423	0.655	1.71	70'	EL	6.885	N/A	--	--	--	--	--		
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500	•	3.204	43.258	1.4	0.248	4.12	70'	EL	34.423	0.655	3.90	70'	EL	6.885	0.80	0.248	3.20	70'	EL	34.423	
		SNGARBS2	20,000	•	2.403	48.063	1.4	0.248	3.09	70'	EL	34.423	0.655	2.78	70'	EL	6.885	0.80	0.248	2.40	70'	EL	34.423	
		SNAGRIS2	22,000	•	2.282	50.210	1.4	0.248	2.94	70'	EL	34.423	0.655	2.58	70'	EL	6.885	0.80	0.248	2.28	70'	EL	34.423	
		SNCOTTS3	27,250	•	1.595	43.463	1.4	0.248	2.05	70'	EL	34.423	0.655	1.95	70'	EL	6.885	0.80	0.248	1.59	70'	EL	34.423	
		SNAGGRS4	34,925	•	1.339	46.755	1.4	0.248	1.72	70'	EL	34.423	0.655	1.62	70'	EL	6.885	0.80	0.248	1.34	70'	EL	34.423	
		SNS5A	35,550	•	1.309	46.526	1.4	0.248	1.68	70'	EL	34.423	0.655	1.65	70'	EL	6.885	0.80	0.248	1.31	70'	EL	34.423	
		SNS6A	39,950	•	1.203	48.069	1.4	0.248	1.55	70'	EL	34.423	0.655	1.50	70'	EL	6.885	0.80	0.248	1.20	70'	EL	34.423	
		SNS7B	42,000	•	1.146	48.129	1.4	0.248	1.47	70'	EL	34.423	0.655	1.48	70'	EL	6.885	0.80	0.248	1.15	70'	EL	34.423	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33,000	•	1.468	48.444	1.4	0.248	1.89	70'	EL	34.423	0.655	1.79	70'	EL	6.885	0.80	0.248	1.47	70'	EL	34.423	
		TNT4A	33,075	•	1.475	48.790	1.4	0.248	1.90	70'	EL	34.423	0.655	1.74	70'	EL	6.885	0.80	0.248	1.48	70'	EL	34.423	
		TNT6A	41,600	•	1.208	50.272	1.4	0.248	1.55	70'	EL	34.423	0.655	1.58	70'	EL	6.885	0.80	0.248	1.21	70'	EL	34.423	
		TNT7A	42,000	•	1.216	51.061	1.4	0.248	1.56	70'	EL	34.423	0.655	1.55	70'	EL	6.885	0.80	0.248	1.22	70'	EL	34.423	
		TNT7B	42,000	•	1.261	52.955	1.4	0.248	1.62	70'	EL	34.423	0.655	1.44	70'	EL	6.885	0.80	0.248	1.26	70'	EL	34.423	
		TNAGRIT4	43,000	•	1.197	51.476	1.4	0.248	1.54	70'	EL	34.423	0.655	1.40	70'	EL	6.885	0.80	0.248	1.20	70'	EL	34.423	
		TNACT5A	45,000	•	1.128	50.745	1.4	0.248	1.45	70'	EL	34.423	0.655	1.39	70'	EL	6.885	0.80	0.248	1.13	70'	EL	34.423	
		TNACT5B	45,000	③	1.113	50.088	1.4	0.248	1.43	70'	EL	34.423	0.655	1.33	70'	EL	6.885	0.80	0.248	1.11	70'	EL	34.423	
EMERGENCY VEHICLE (EV)	EV2	28,750	④	1.198	57.432	1.3	0.248	2.32	70'	EL	34.423	0.655	2.08	70'	EL	6.885	0.80	0.248	1.20	70'	EL	34.423		
	EV3	43,000		1.306	56.170	1.3	0.248	1.52	70'	EL	34.423	0.655	1.41	70'	EL	6.885	0.80	0.248	1.31	70'	EL	34.423		

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	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:

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

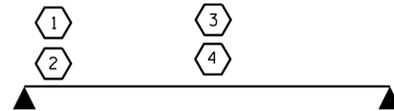
③ LEGAL LOAD RATING **

④ EMERGENCY VEHICLE LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY
FOR SPAN A

PROJECT NO. 17BP.10.R.110
CABARRUS COUNTY
 STATION: 17+25.00 -L-

SHEET 5 OF 5



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

LRFR SUMMARY FOR
 70' CORED SLAB UNIT
 120° SKEW

(NON-INTERSTATE TRAFFIC)

DESIGN ENGINEER OF RECORD: R.F. DeCola DATE: 1/10/2025

DRAWN BY: C.M. MURPHY DATE: 10/22/24

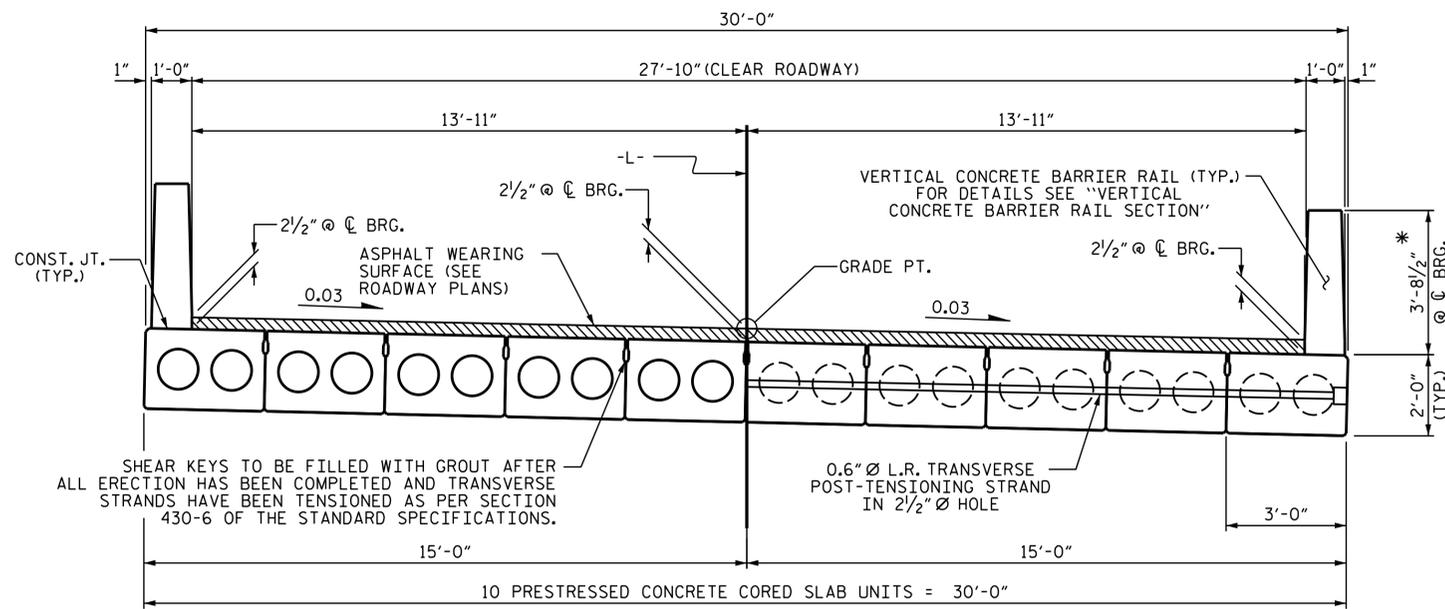
CHECKED BY: R.F. DECOLA DATE: 10/24/24

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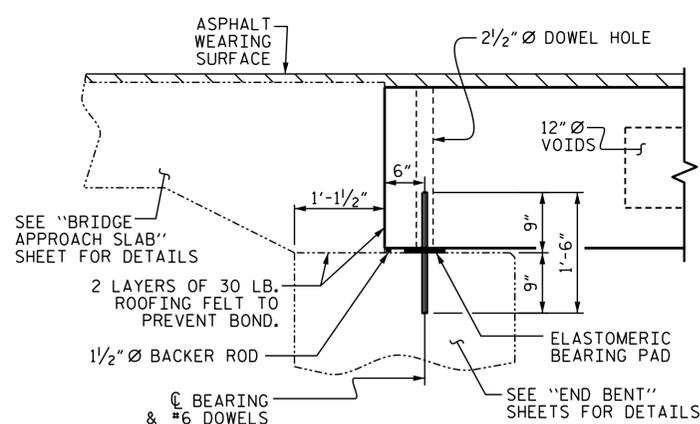
TOTAL SHEETS: 17



HALF SECTION AT INTERMEDIATE DIAPHRAGMS **TYPICAL SECTION** HALF SECTION THROUGH VOIDS

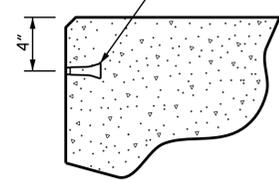
* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.

FIXED END

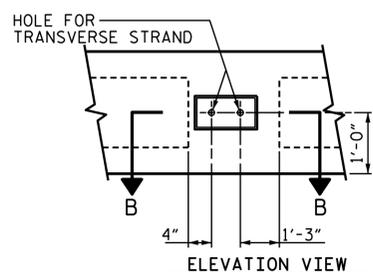


SECTION AT END BENT

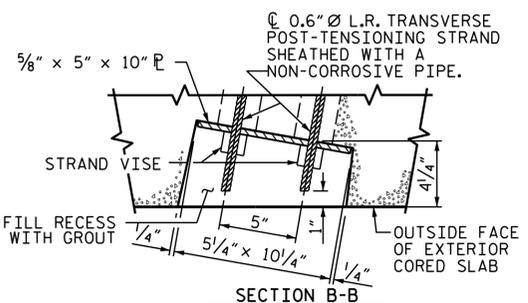
PERMITTED THREADED INSERT CAST IN OUTSIDE FACE OF EXTERIOR UNIT AND RECESSED 3/8" SIZE TO BE DETERMINED BY CONTRACTOR.



THREADED INSERT DETAIL

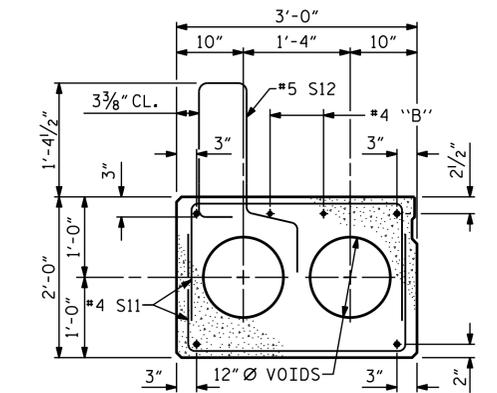


ELEVATION VIEW

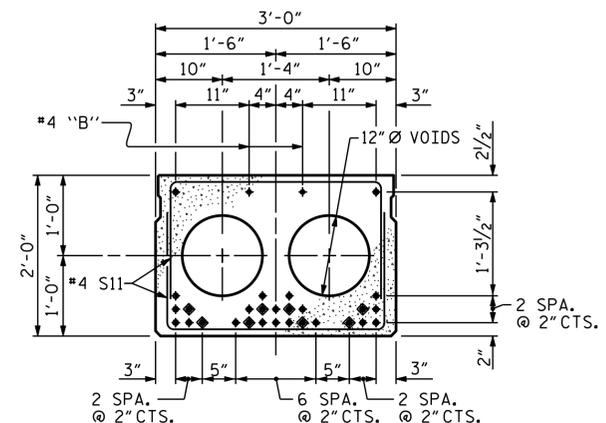


SECTION B-B

GRAUTED RECESS AT END OF POST-TENSIONED STRAND-CORED SLABS



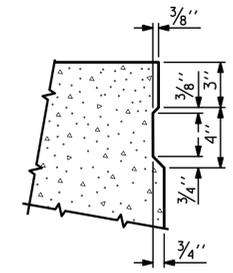
EXTERIOR SLAB SECTION (FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)



INTERIOR SLAB SECTION (70' UNIT) (28 STRANDS REQUIRED) 0.6" Ø LOW RELAXATION STRAND LAYOUT

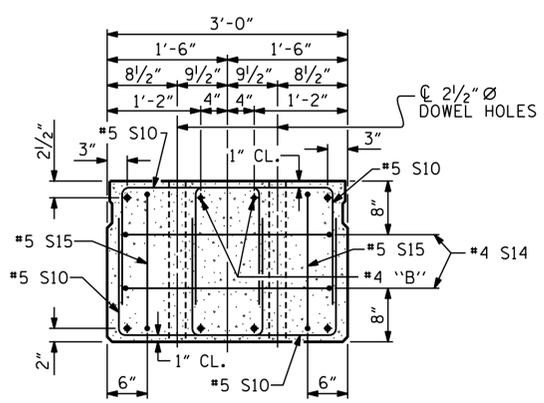
- ◆ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 12'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND



SHEAR KEY DETAIL

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



END ELEVATION

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

PROJECT NO. 17BP.10.R.110
CABARRUS COUNTY
STATION: 17+25.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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



DESIGN ENGINEER OF RECORD:	DATE:
R.F. DeColo	1/10/2025
DRAWN BY:	DATE:
C.M. MURPHY	10/22/24
CHECKED BY:	DATE:
R.F. DECOLA	10/24/24

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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

SHEET NO.		S-6
TOTAL SHEETS		17

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 1/8" 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 1/8" 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.)

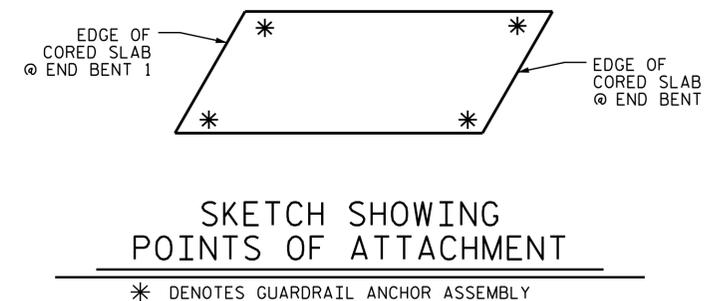
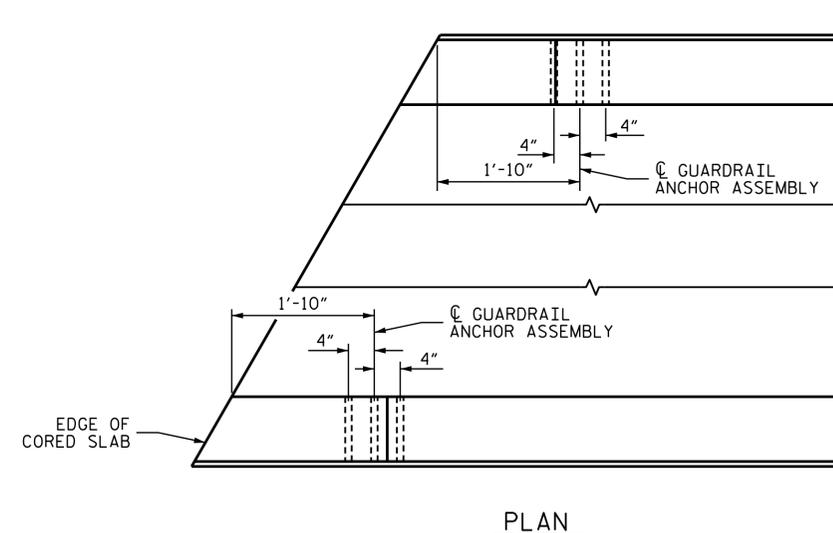
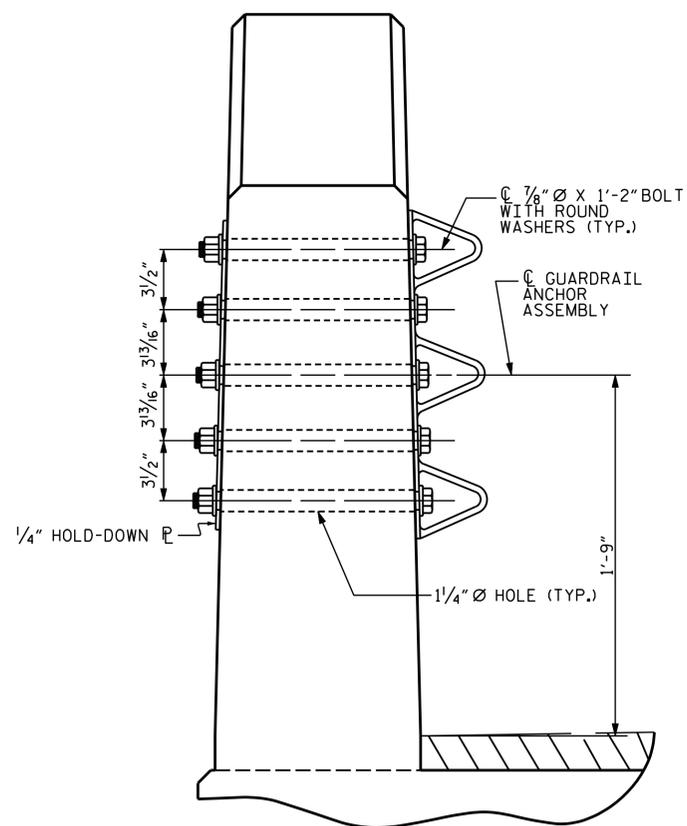
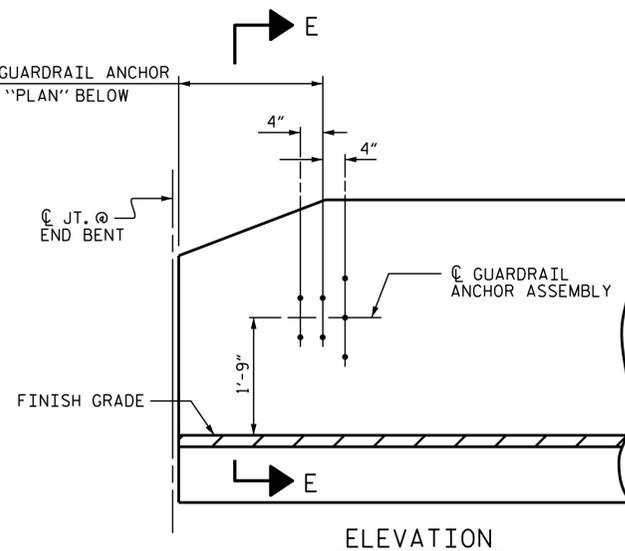
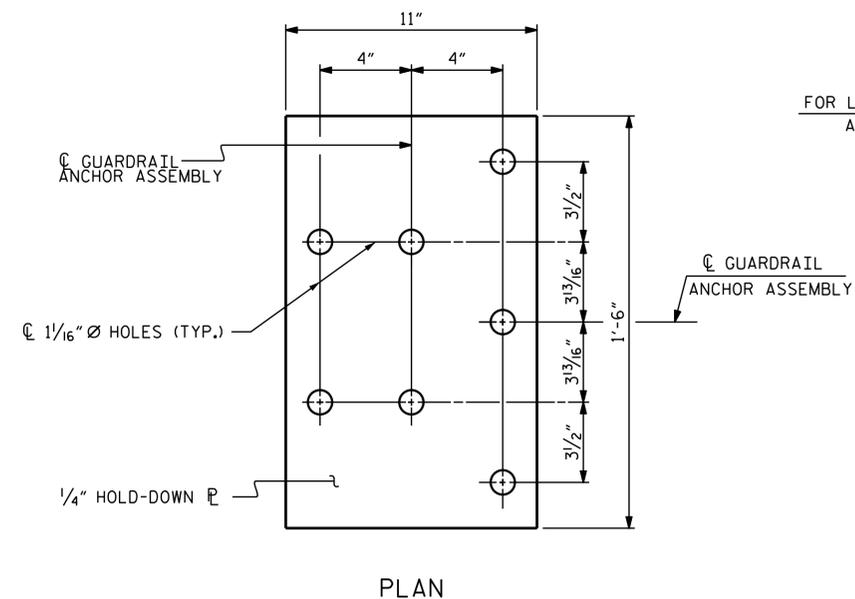
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.



LOCATION OF ANCHORS FOR GUARDRAIL

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

SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS

PROJECT NO. 17BP.10.R.110
CABARRUS COUNTY
STATION: 17+25.00 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
GUARDRAIL ANCHORAGE
DETAILS
FOR VERTICAL CONCRETE
BARRIER RAIL

DESIGN ENGINEER OF RECORD: R.F. DeCola DATE: 1/10/2025
DRAWN BY: C.M. MURPHY DATE: 05/21/24
CHECKED BY: R.F. DECOLA DATE: 10/04/24

DOCUMENT NOT CONSIDERED FINAL
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KCI Associates of N.C., P.A.
4800 Falls of Neuse Road, Suite 200
Raleigh, NC 27609
Phone (919) 783-9214
NC Firm License No: C-0764

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS 17
2			4			

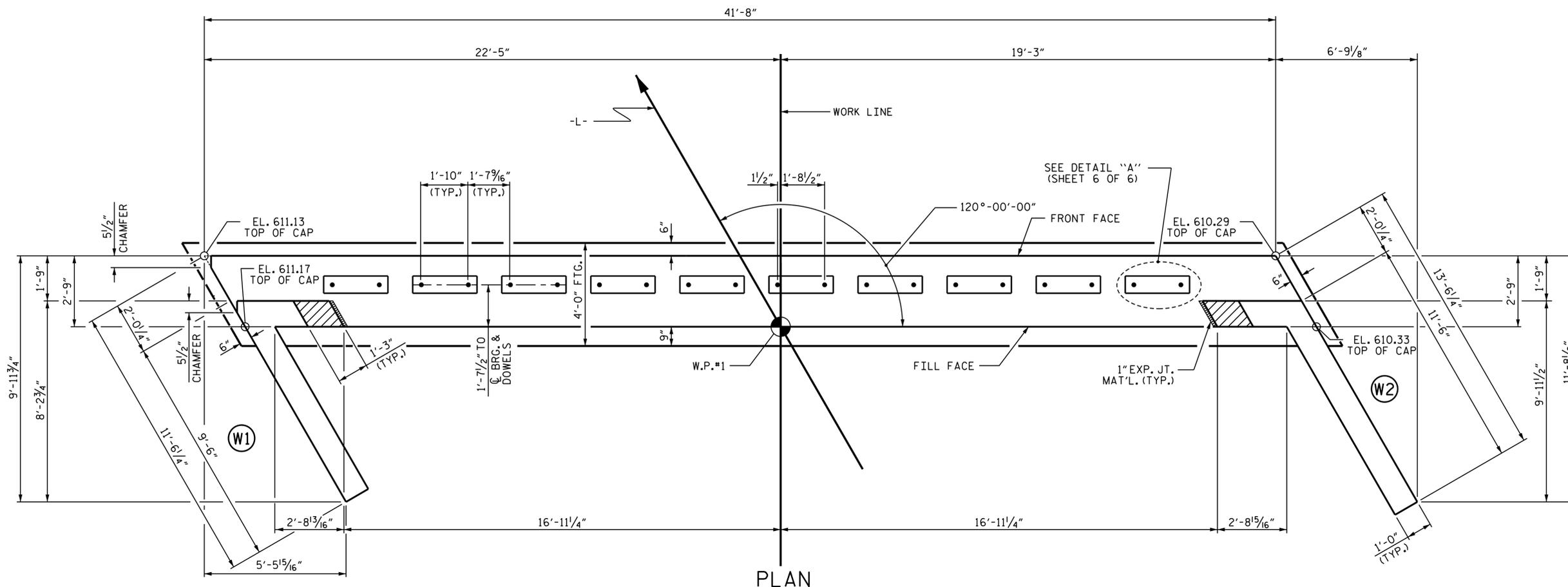
NOTES

"U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

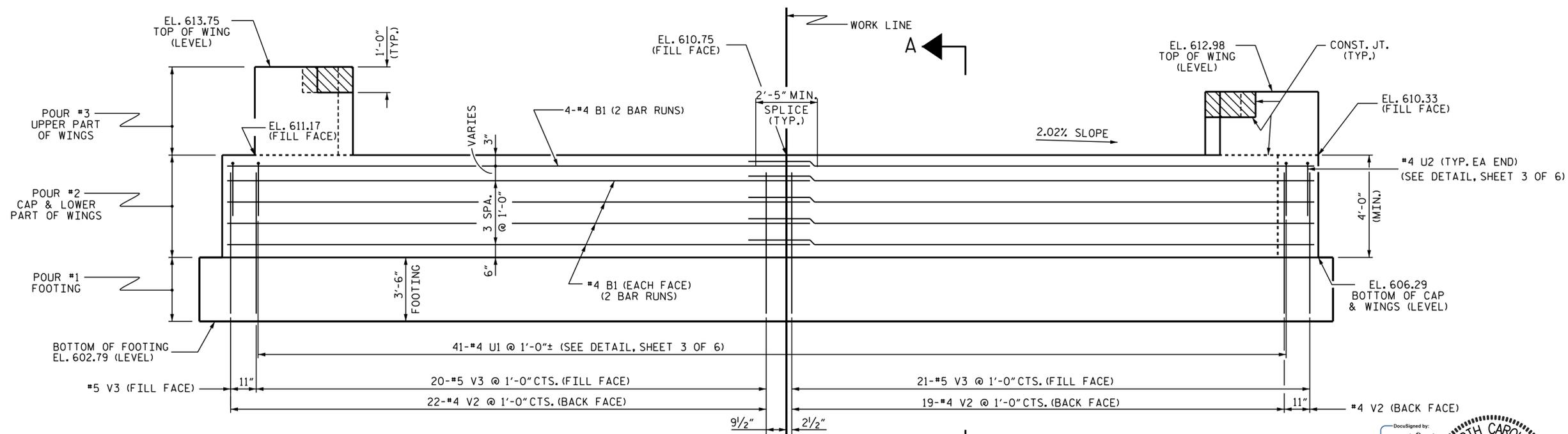
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR FOOTING DETAILS, SEE SHEET 3 OF 6.

FOR WING DETAILS, SEE SHEET 4 OF 6.



PLAN



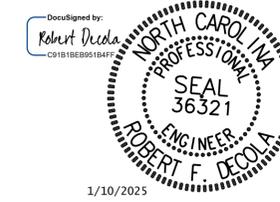
ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 6 OF 6.
FOR ADDITIONAL REINFORCING IN FOOTING, SEE SHEET 3 OF 6.

PROJECT NO. 17BP.10.R.110
CABARRUS COUNTY
STATION: 17+25.00 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 1



DESIGN ENGINEER OF RECORD: R.F. DeCola DATE: 1/10/2025
DRAWN BY: C.M. MURPHY DATE: 10/22/24
CHECKED BY: R.F. DeCola DATE: 10/24/24

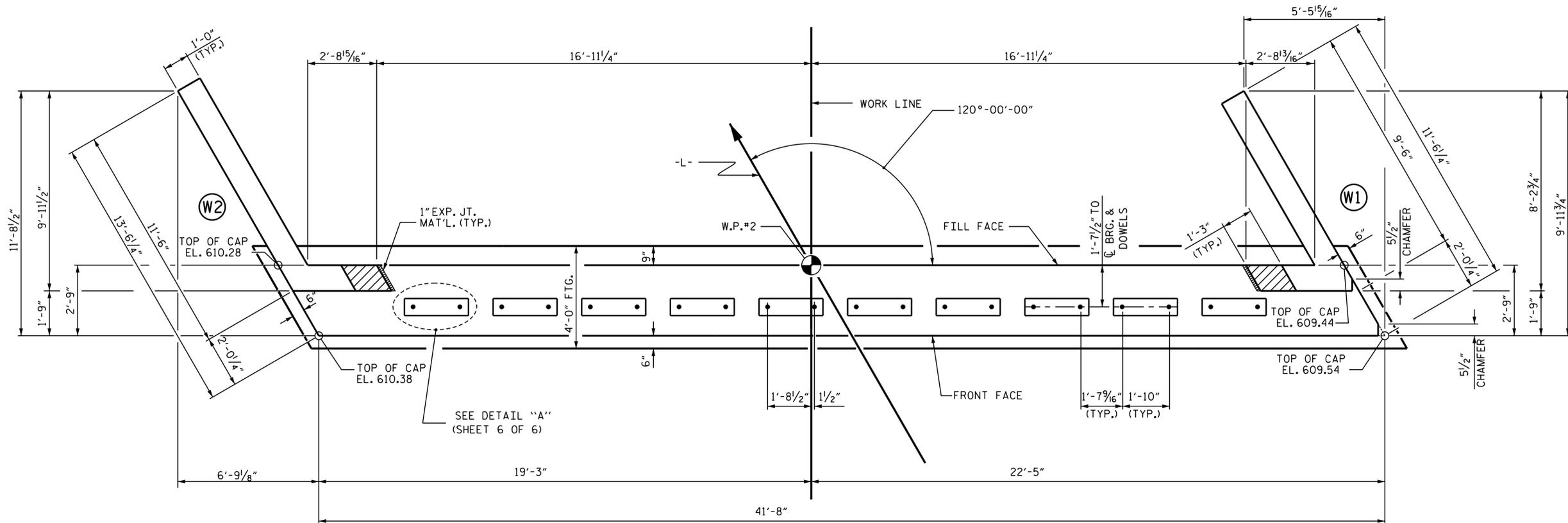
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

1/10/2025
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Raleigh, NC 27609
Phone (919) 783-9214
NC Firm License No: C-0764

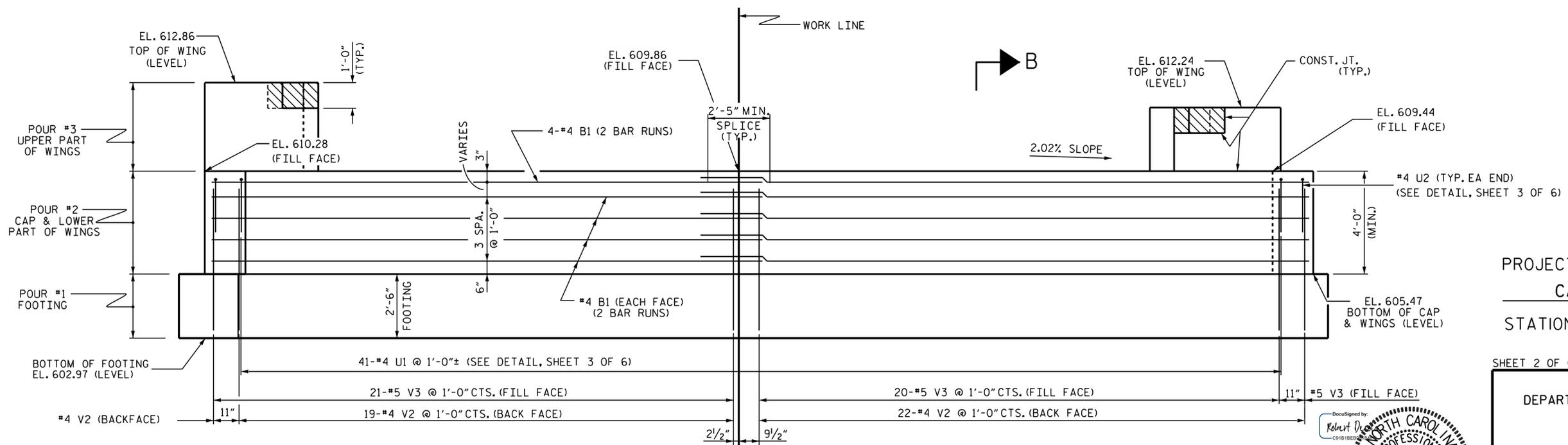
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS 17
2			4			

NOTES

"U" BARS 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 FOOTING DETAILS, SEE SHEET 3 OF 6
 FOR WING DETAILS, SEE SHEET 5 OF 6.



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
 FOR SECTION B-B, SEE SHEET 6 OF 6.
 FOR ADDITIONAL REINFORCING IN FOOTING, SEE SHEET 3 OF 6

PROJECT NO. 17BP.10.R.110
CABARRUS COUNTY
 STATION: 17+25.00 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
END BENT 2

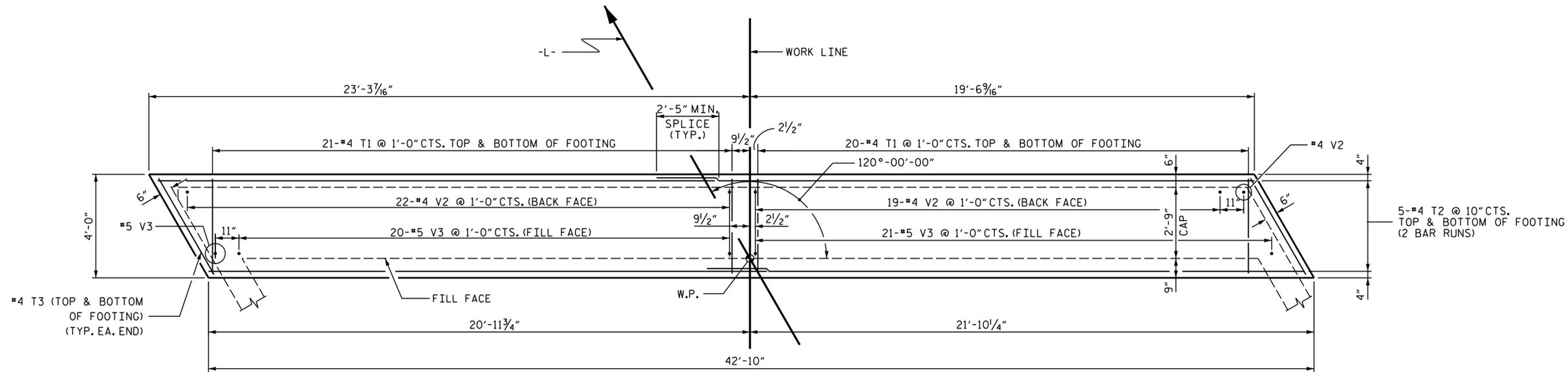


DESIGN ENGINEER OF RECORD: R.F. DeCola DATE: 1/10/2025
 DRAWN BY: C.M. MURPHY DATE: 10/22/24
 CHECKED BY: R.F. DeCola DATE: 10/24/24

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

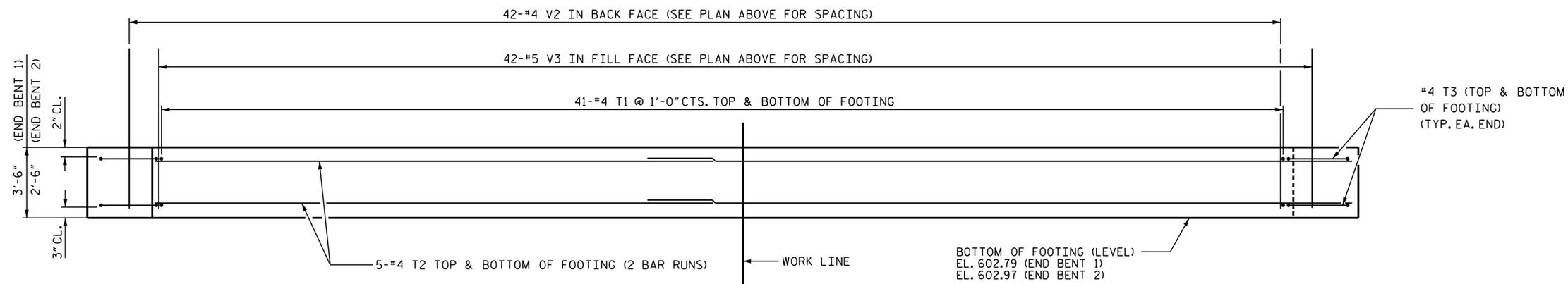
KCI Associates of N.C., P.A.
 4800 Falls of Neuse Road, Suite 200
 Raleigh, NC 27609
 Phone (919) 783-9214
 NC Firm License No: C-0764

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS 17
2			4			

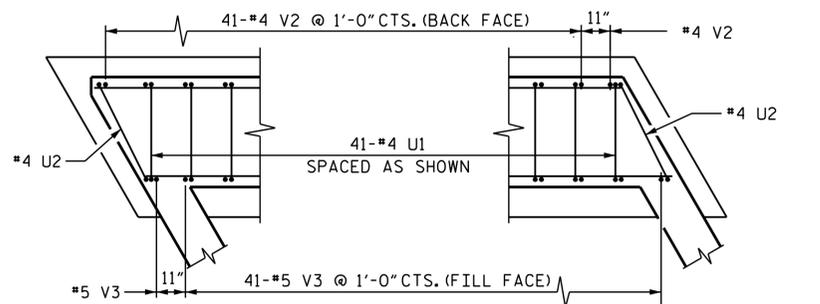


PLAN OF FOOTING

END BENT 1 SHOWN; END BENT 2 SIMILAR BY ROTATION



ELEVATION OF FOOTING

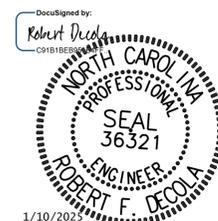


DETAIL OF "U" BARS IN ENDS OF CAP

PROJECT NO. 17BP.I0.R.I10
CABARRUS COUNTY
 STATION: 17+25.00 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT
 FOOTING DETAIL

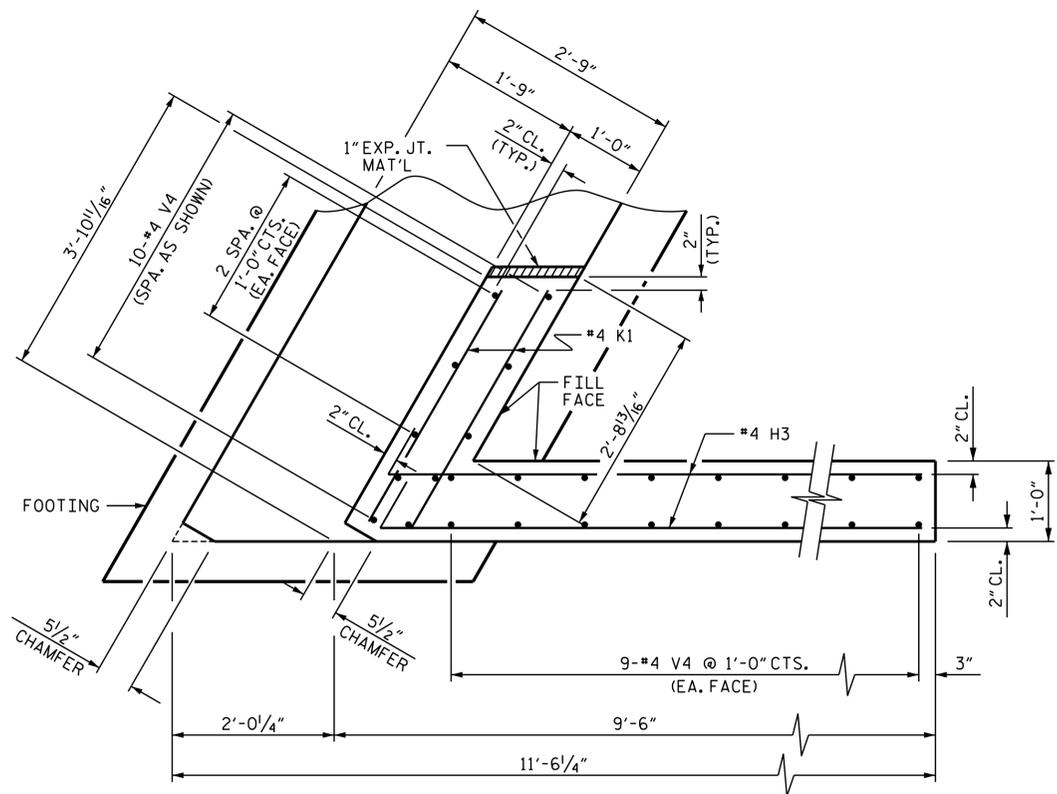


DESIGN ENGINEER OF RECORD: R.F. DeCola DATE: 1/10/2025
 DRAWN BY: C.M. MURPHY DATE: 10/22/24
 CHECKED BY: R.F. DeCola DATE: 10/24/24

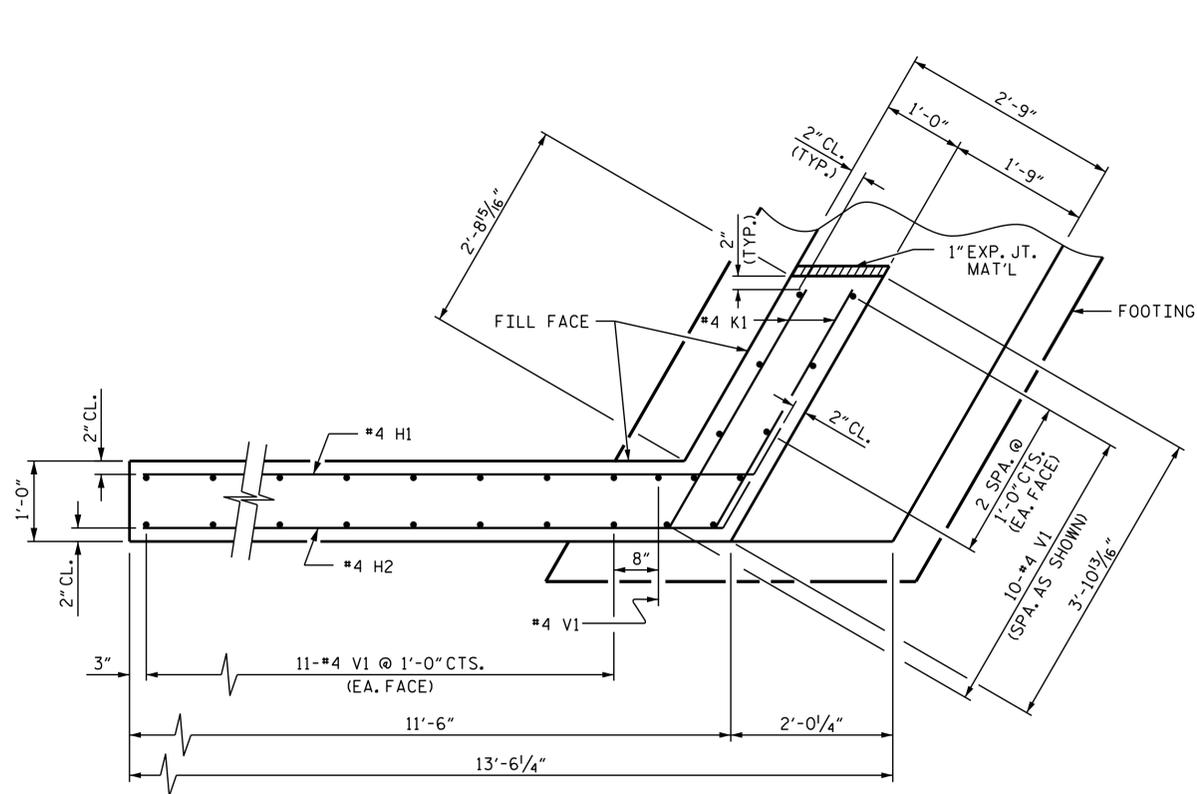
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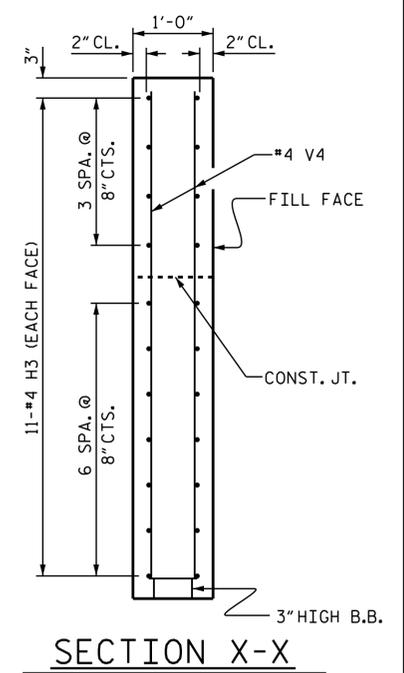
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			17



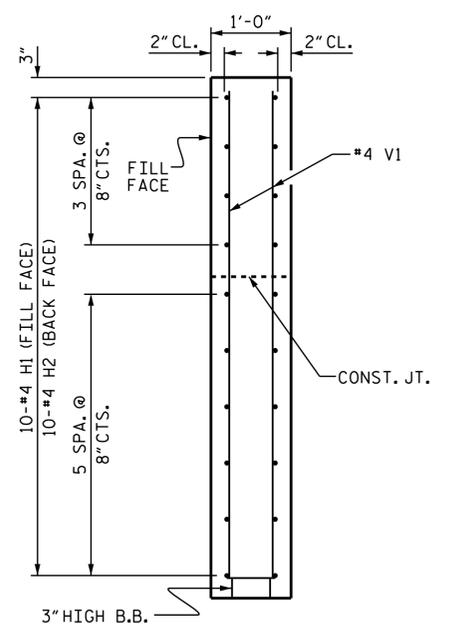
PLAN OF WING (W1)



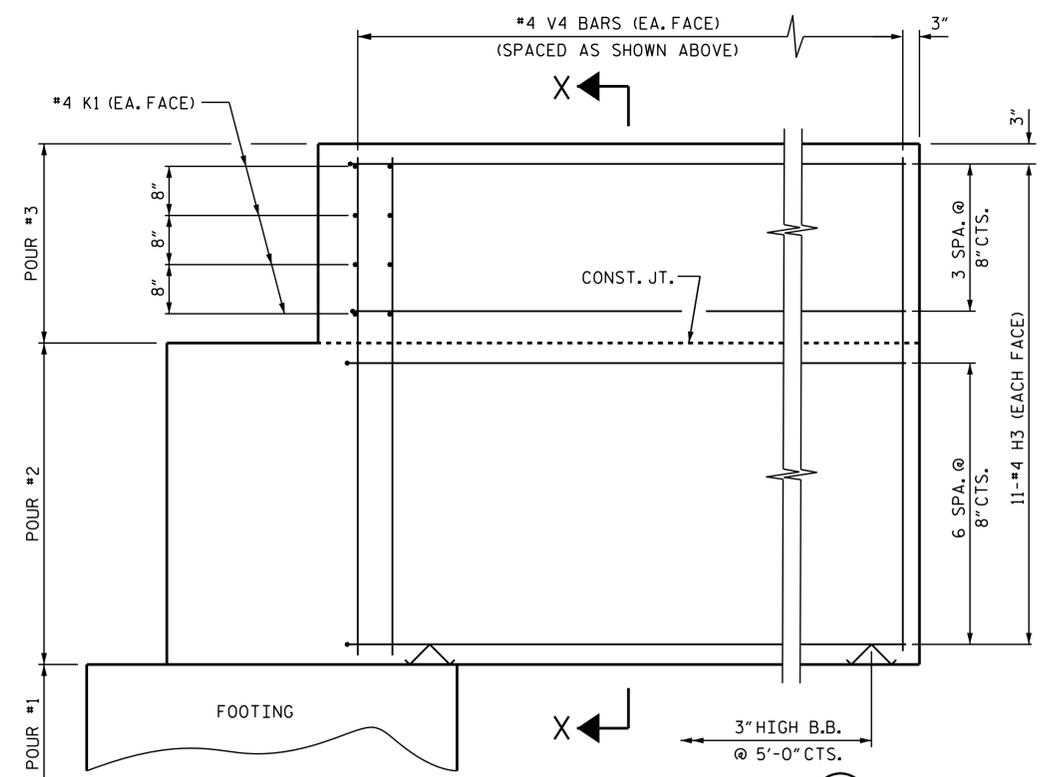
PLAN OF WING (W2)



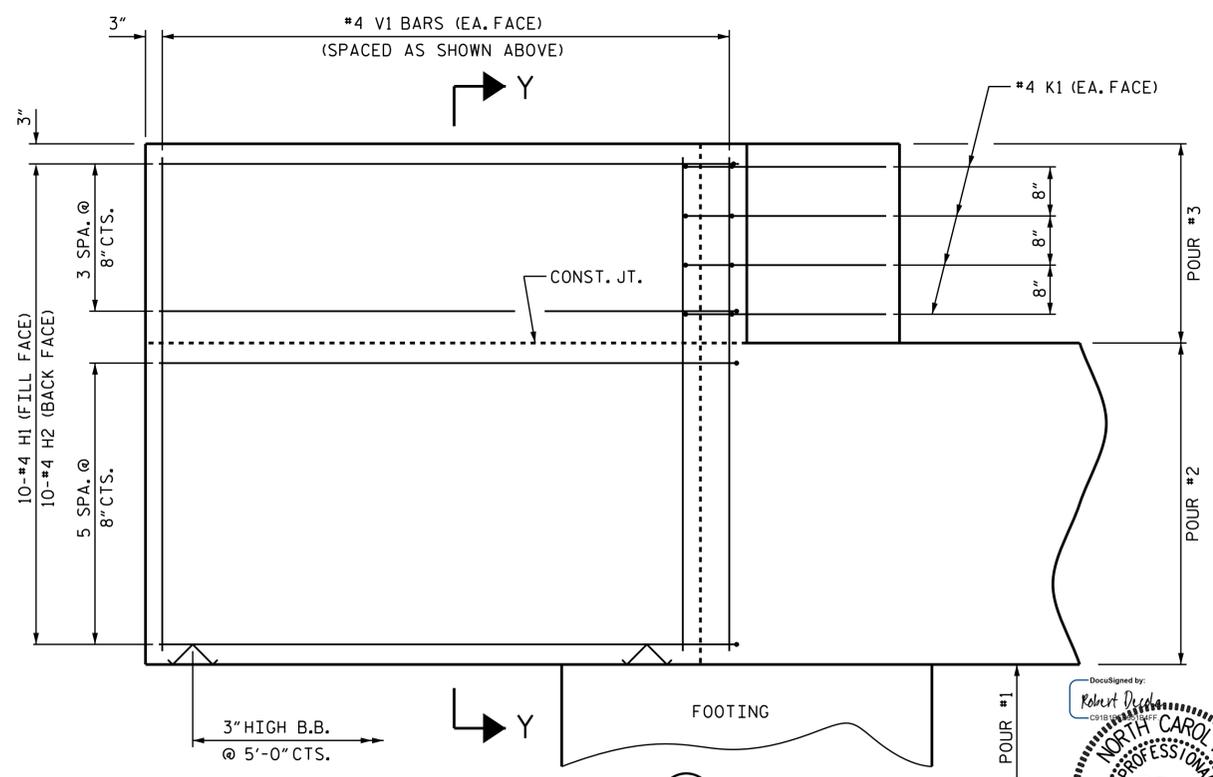
SECTION X-X



SECTION Y-Y



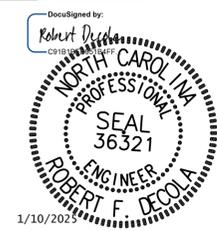
ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

PROJECT NO. 17BP.10.R.110
 CABARRUS COUNTY
 STATION: 17+25.00 -L-

SHEET 4 OF 6



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

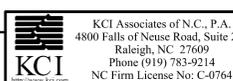
SUBSTRUCTURE
 END BENT 1
 WING DETAILS

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

DESIGN ENGINEER OF RECORD: R.F. DeCola DATE: 1/10/2025
 DRAWN BY: C.M. MURPHY DATE: 10/22/24
 CHECKED BY: R.F. DeCola DATE: 10/24/24

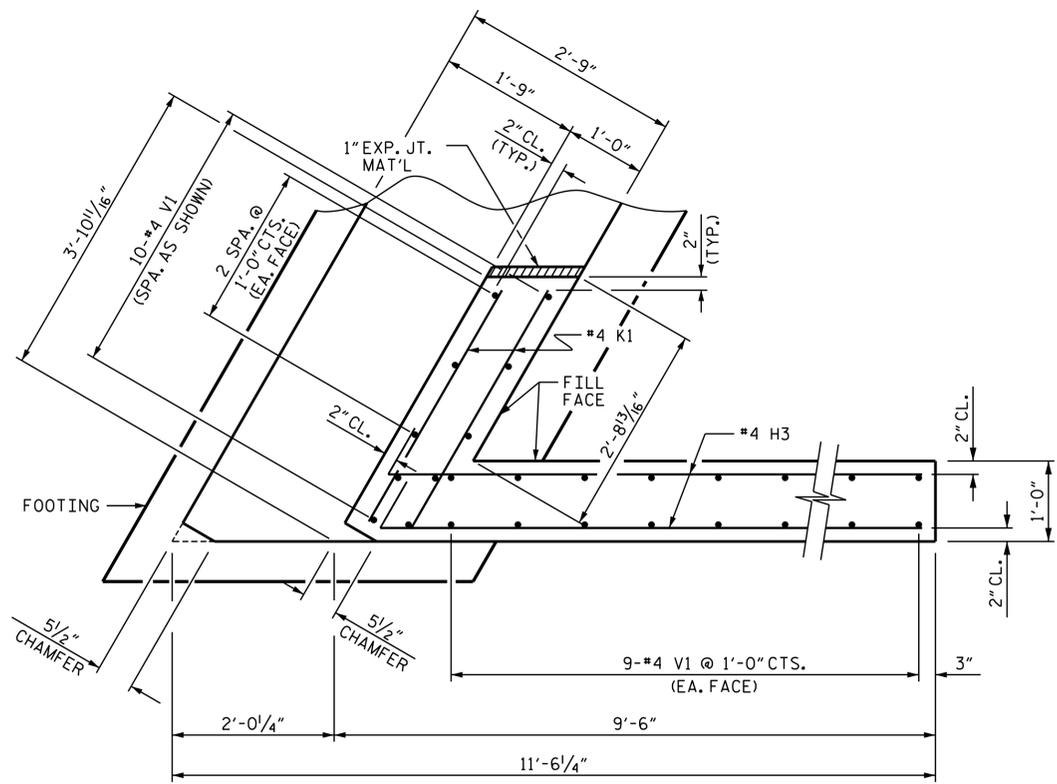
WING DETAILS

DOCUMENT NOT CONSIDERED FINAL
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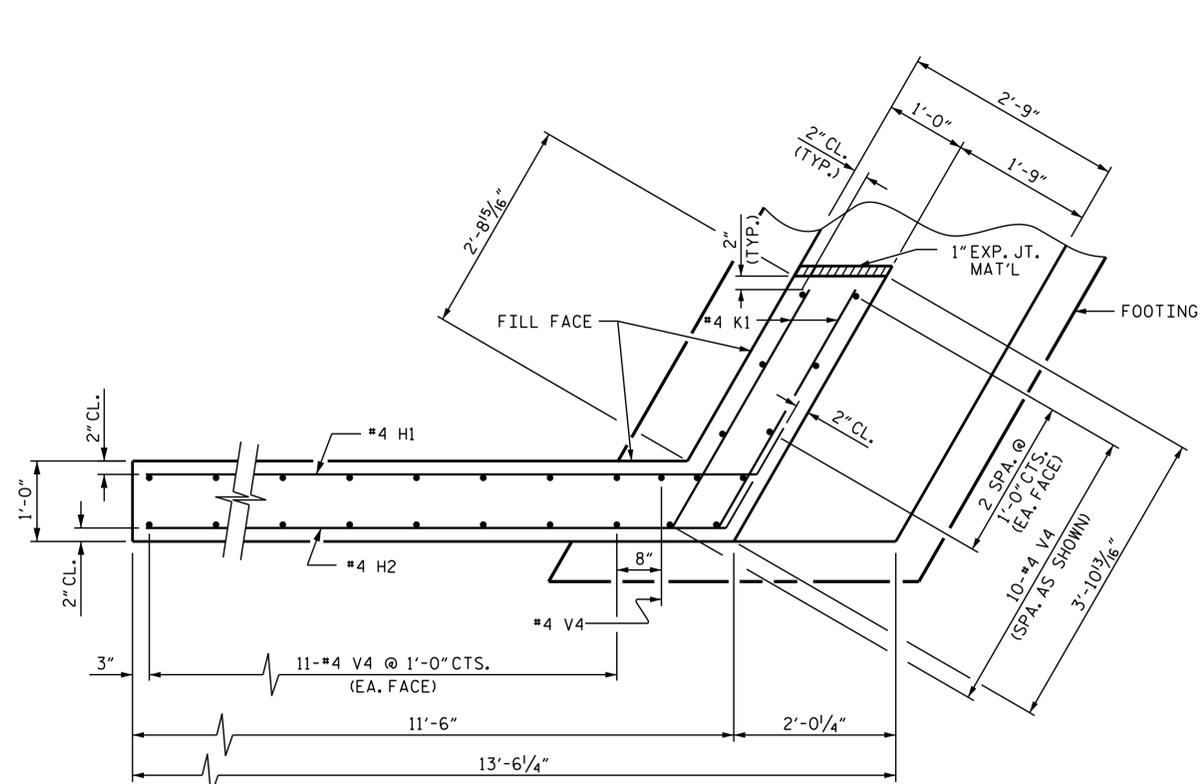


NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

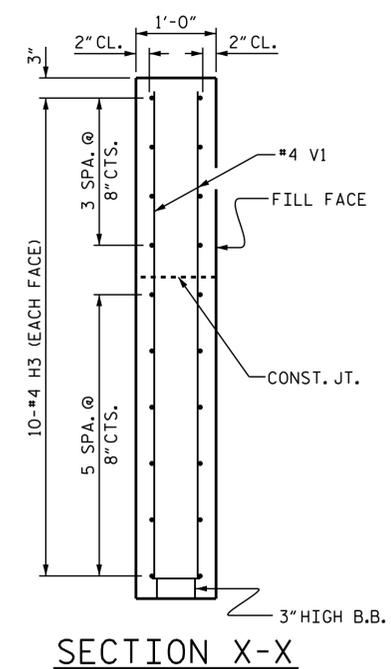
SHEET NO. S-13
 TOTAL SHEETS 17



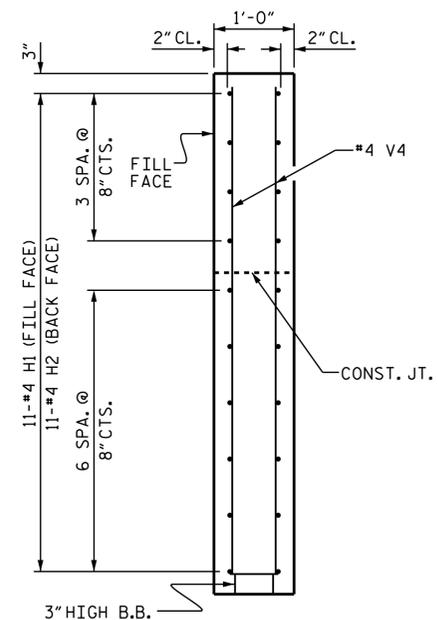
PLAN OF WING (W1)



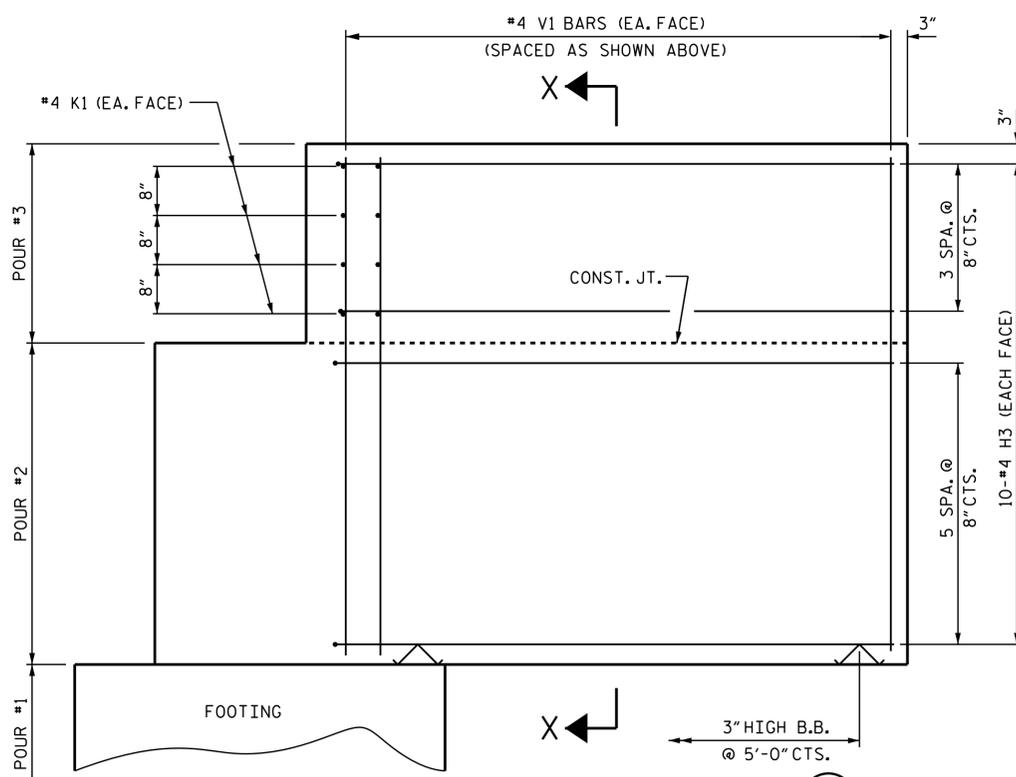
PLAN OF WING (W2)



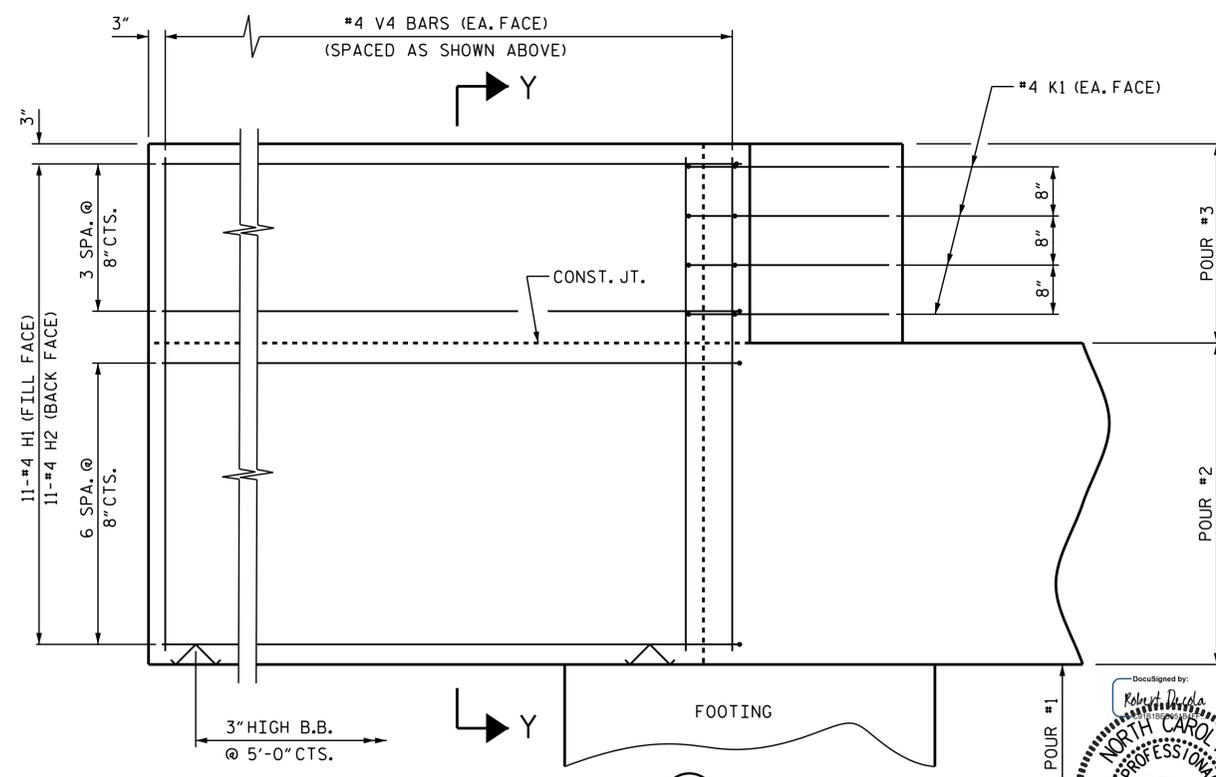
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



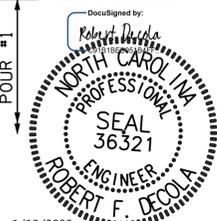
ELEVATION OF WING (W2)

PROJECT NO. 17BP.10.R.110
 CABARRUS COUNTY
 STATION: 17+25.00 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 2
 WING DETAILS



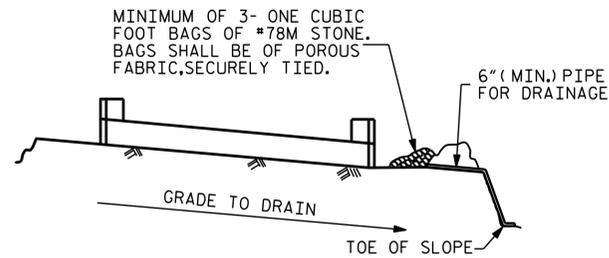
DESIGN ENGINEER OF RECORD: R.F. DeCola DATE: 1/10/2025
 DRAWN BY: C.M. MURPHY DATE: 10/22/24
 CHECKED BY: R.F. DeCola DATE: 10/24/24

WING DETAILS

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REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS 17
2			4			



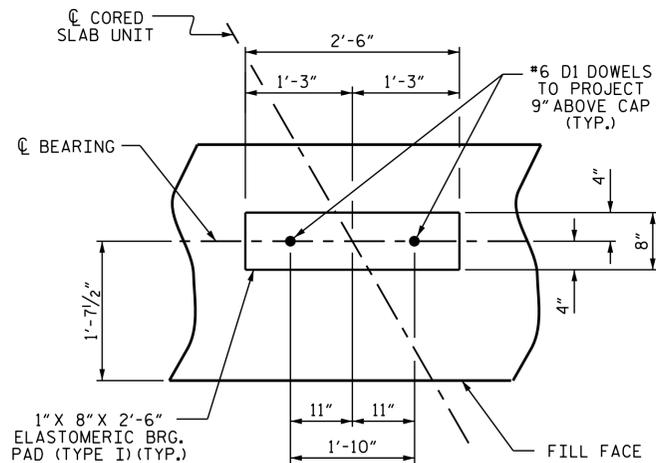
MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

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.

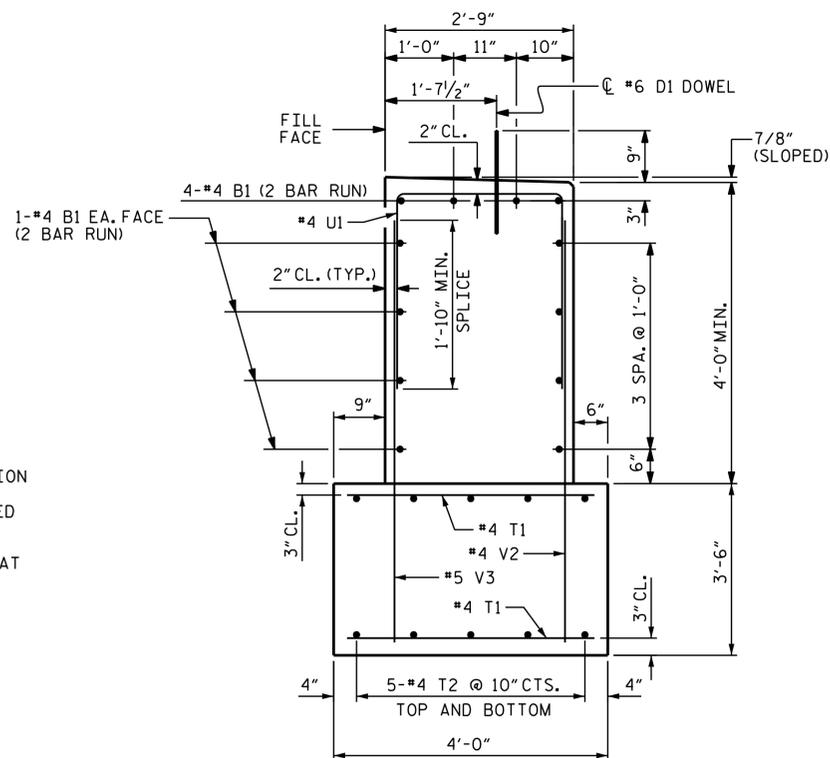
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



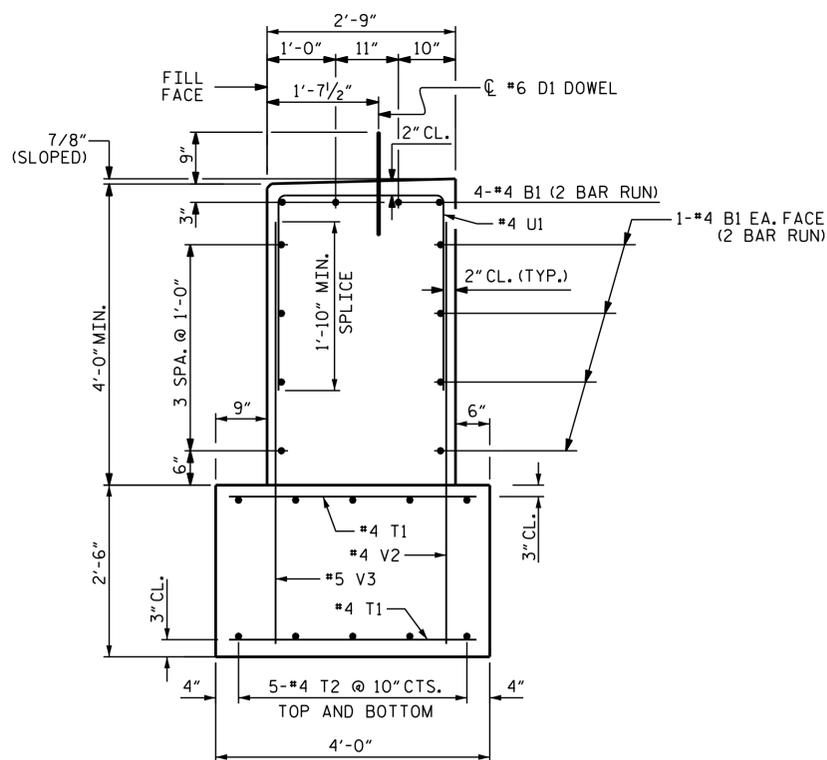
DETAIL "A"

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



SECTION A-A

(END BENT 1)



SECTION B-B

(END BENT 2)

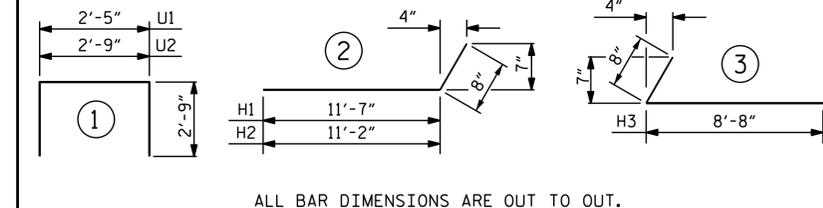
BILL OF MATERIAL

END BENT 1					END BENT 2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	24	#4	STR	21'-11"	351	B1	24	#4	STR	21'-11"	351
D1	20	#6	STR	1'-6"	45	D1	20	#6	STR	1'-6"	45
H1	10	#4	2	12'-3"	82	H1	11	#4	2	12'-3"	90
H2	10	#4	2	11'-10"	79	H2	11	#4	2	11'-10"	87
H3	22	#4	3	9'-4"	137	H3	20	#4	3	9'-4"	125
K1	16	#4	STR	3'-3"	35	K1	16	#4	STR	3'-3"	35
T1	82	#4	STR	3'-8"	201	T1	82	#4	STR	3'-8"	201
T2	20	#4	STR	22'-5"	299	T2	20	#4	STR	22'-5"	299
T3	4	#4	STR	4'-2"	11	T3	4	#4	STR	4'-2"	11
U1	41	#4	1	7'-11"	217	U1	41	#4	1	7'-11"	217
U2	2	#4	1	8'-3"	11	U2	2	#4	1	8'-3"	11
V1	33	#4	STR	6'-4"	140	V1	28	#4	STR	6'-4"	118
V2	42	#4	STR	7'-2"	201	V2	42	#4	STR	6'-2"	173
V3	42	#5	STR	7'-2"	314	V3	42	#5	STR	6'-2"	270
V4	28	#4	STR	7'-0"	131	V4	33	#4	STR	7'-0"	154

REINFORCING STEEL (FOR END BENT 1) 2254 LBS. REINFORCING STEEL (FOR END BENT 2) 2187 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)	END BENT 1	END BENT 2
POUR #1 FOOTING	22.2 C.Y.	15.9 C.Y.
POUR #2 CAP & LOWER PART OF WINGS	21.8 C.Y.	21.5 C.Y.
POUR #3 UPPER PART OF WINGS	2.7 C.Y.	2.7 C.Y.
TOTAL CLASS A CONCRETE	46.7 C.Y.	40.1 C.Y.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. 17BP.10.R.110

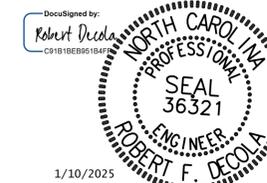
CABARRUS COUNTY

STATION: 17+25.00 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT NO. 1-2
DETAILS



1/10/2025

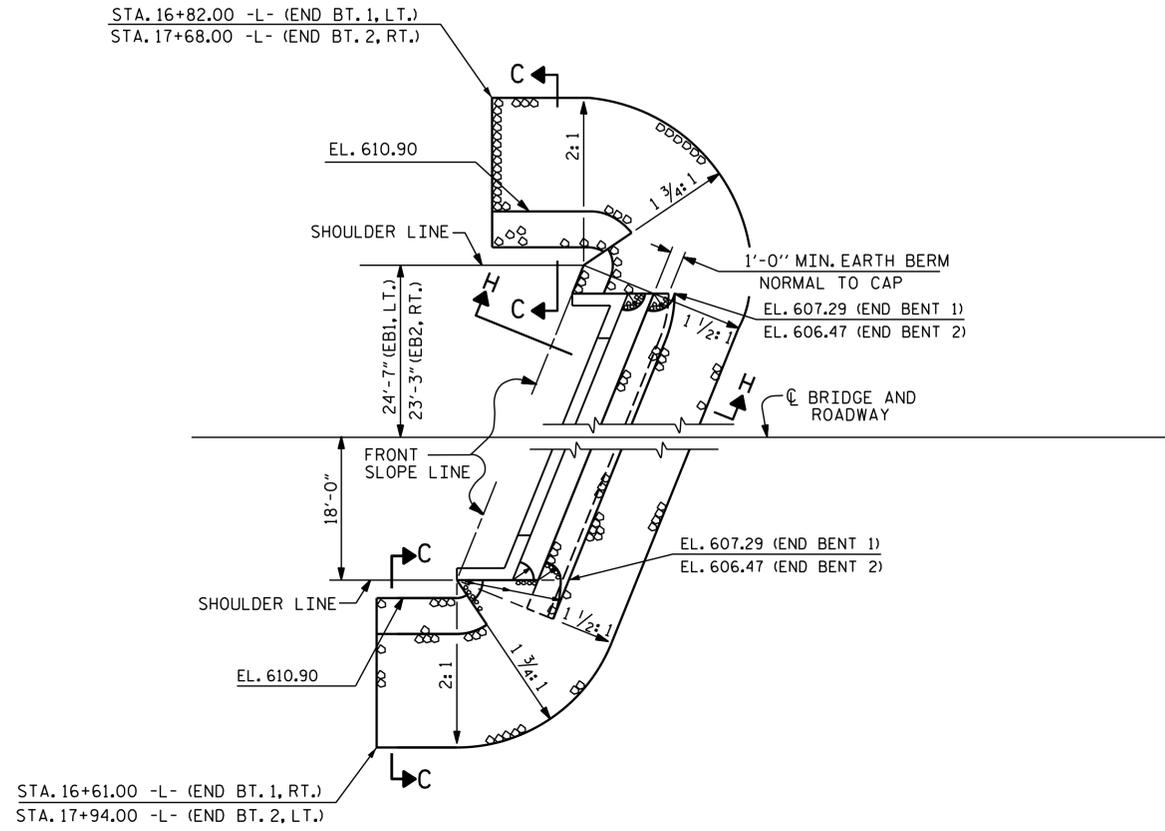
DESIGN ENGINEER OF RECORD: R.F. DeCola DATE: 1/10/2025
DRAWN BY: C.M. MURPHY DATE: 10/22/24
CHECKED BY: R.F. DeCola DATE: 10/24/24

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KCI Associates of N.C., P.A.
4800 Falls of Neuse Road, Suite 200
Raleigh, NC 27609
Phone (919) 783-9214
NC Firm License No: C-0764

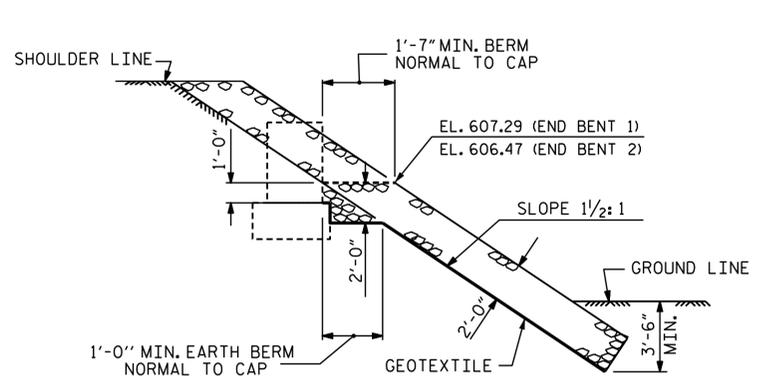
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SHEET NO. S-15
TOTAL SHEETS 17

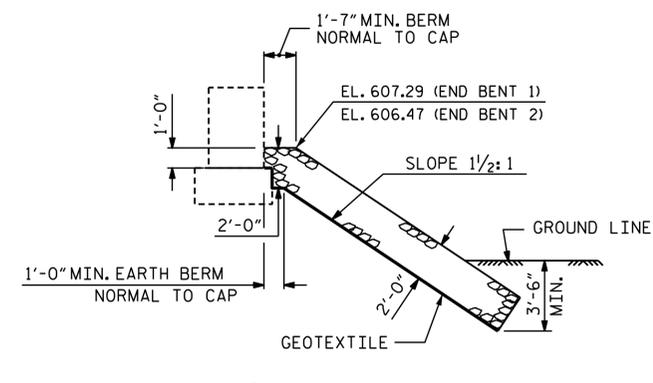


SHOULDER RIP RAP IS HIGHER THAN BERM RIP RAP

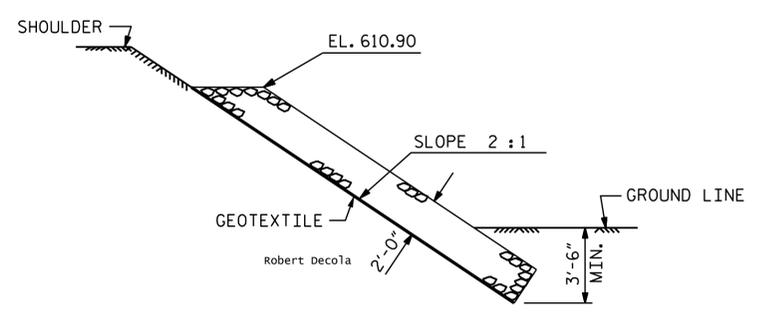
ESTIMATED QUANTITIES		
BRIDGE AT STA. 17+25.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	115	130
END BENT 2	85	95



SECTION H-H



**SECTION C-C
BERM RIP RAPPED**



SECTION C-C

PROJECT NO. 17BP.10.R.110
CABARRUS COUNTY
 STATION: 17+25.00 -L-



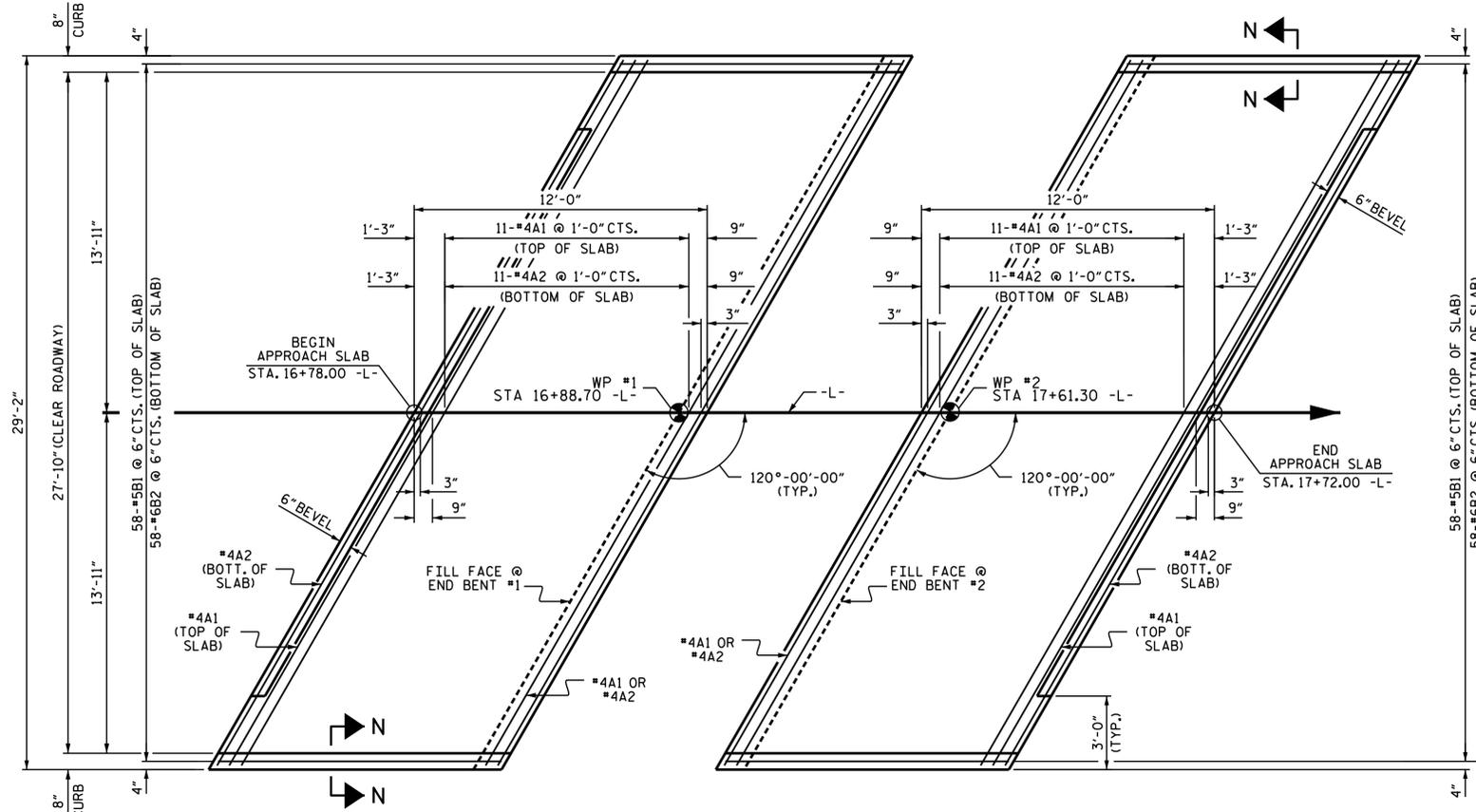
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RIP RAP DETAILS

DESIGN ENGINEER OF RECORD: R.F. DeCola DATE: 1/10/2025
 DRAWN BY: C.M. MURPHY DATE: 10/22/24
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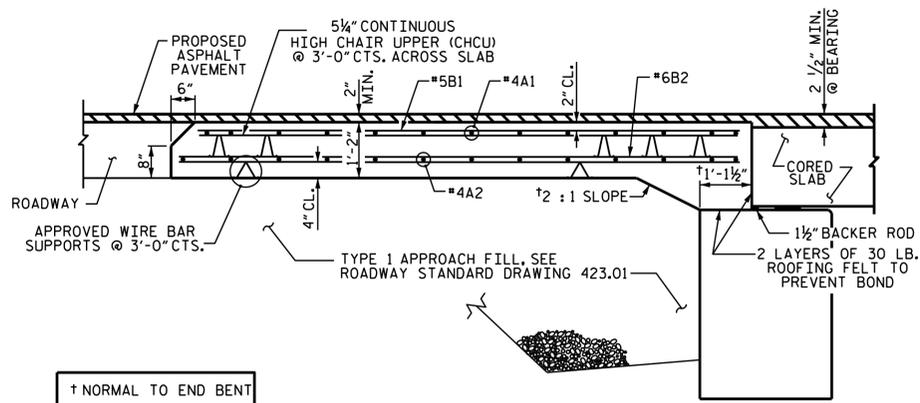
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			17



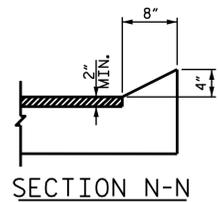
PLAN @ END BENT #1

PLAN @ END BENT #2

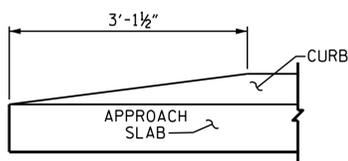
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB



SECTION N-N

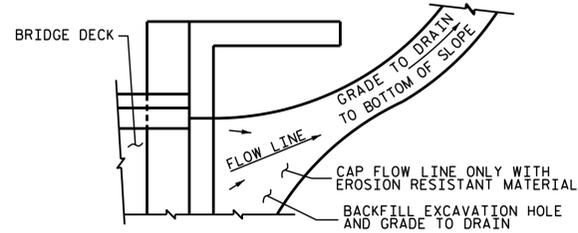


END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

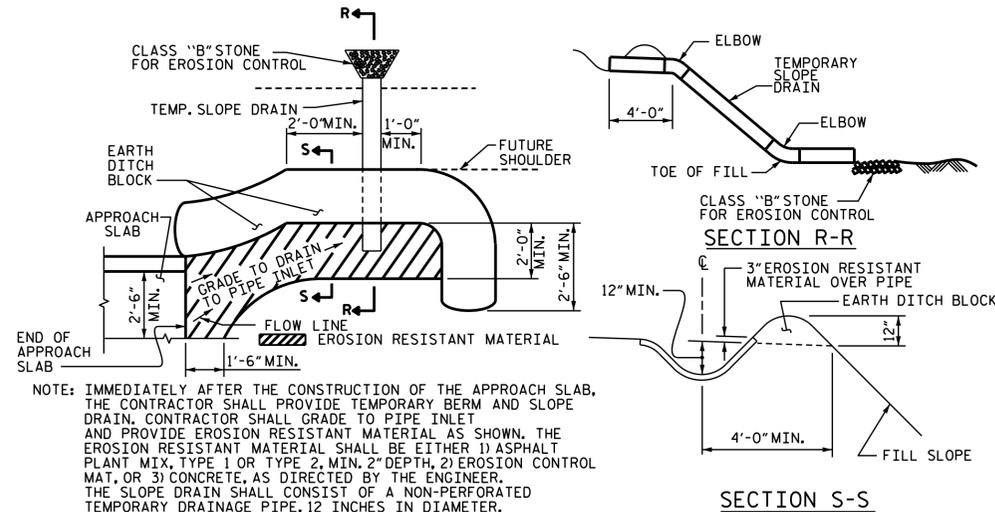
NOTES

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



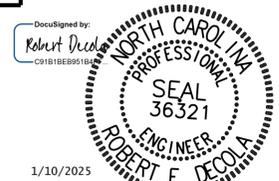
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 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.

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

SPLICE LENGTHS

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

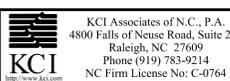


1/10/2025

BILL OF MATERIAL						
APPROACH SLAB AT EB #1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	13	#4	STR	33'-3"	289	
A2	13	#4	STR	33'-3"	289	
*B1	58	#5	STR	11'-1"	670	
B2	58	#6	STR	11'-7"	1009	
REINFORCING STEEL					LBS.	1298
*EPOXY COATED REINFORCING STEEL					LBS.	959
CLASS AA CONCRETE					C. Y.	18.0
APPROACH SLAB AT EB #2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	13	#4	STR	33'-3"	289	
A2	13	#4	STR	33'-3"	289	
*B1	58	#5	STR	11'-1"	670	
B2	58	#6	STR	11'-7"	1009	
REINFORCING STEEL					LBS.	1298
*EPOXY COATED REINFORCING STEEL					LBS.	959
CLASS AA CONCRETE					C. Y.	18.0

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

PROJECT NO. 17BP.10.R.110
 CABARRUS COUNTY
 STATION: 17+25.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 STANDARD
 BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB UNIT (SUB-REGIONAL TIER)
 120° SKEW

SHEET NO. S-17
 TOTAL SHEETS 17

