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09/08/99

TIP PROJECT: BR-0032

CONTRACT: C204484

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MADISON COUNTY

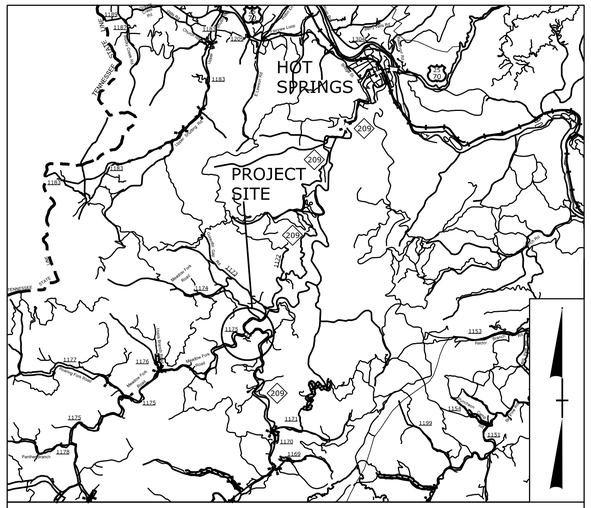
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0032		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
67032.1.1		PE
67032.2.1		ROW & UTILITIES
67032.3.1		CONST.

90% PLANS

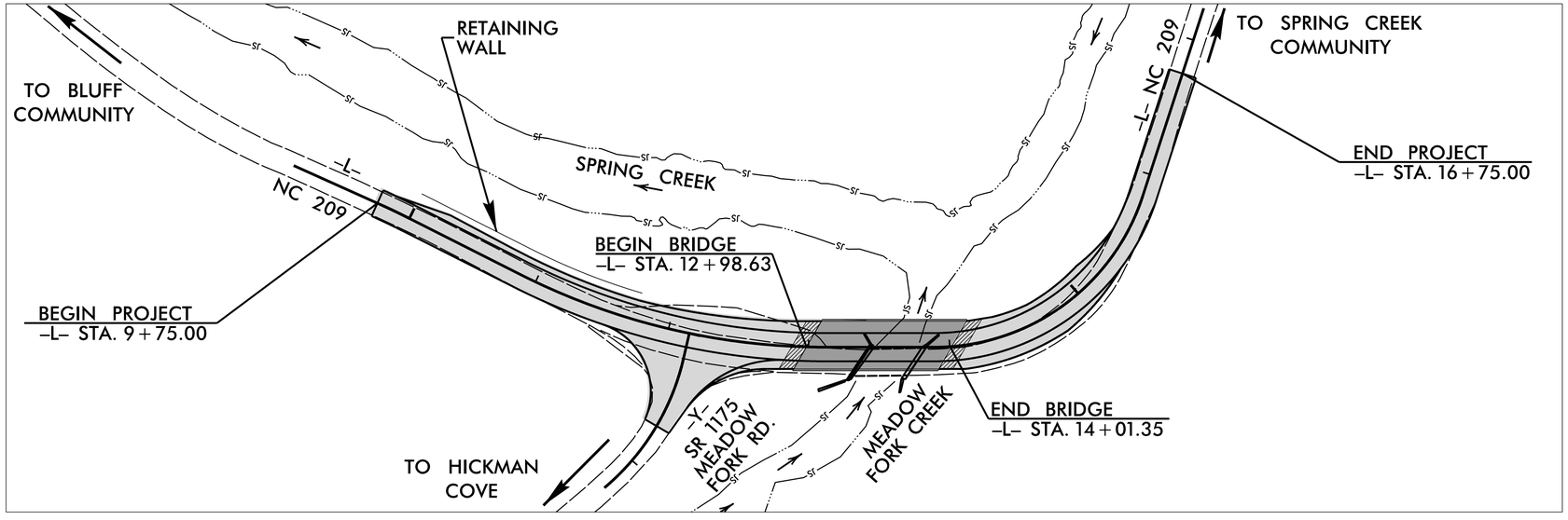
LOCATION: BRIDGE NO. 84 ON NC 209 OVER MEADOW FORK CREEK

TYPE OF WORK: GRADING, DRAINAGE, PAVING, RETAINING WALL AND STRUCTURE.



VICINITY MAP

NC GRID
NAD 83 NA 2011



STRUCTURE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

ADT 2020 = 460 vpd
ADT 2040 = 600 vpd
D = 60 %
K = 10 %
T = 13 % *
* V = 25 MPH
* TTST =1% DUAL 12%

FUNC CLASS =
RURAL COLLECTOR
SUB REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT = 0.114 MILES

LENGTH STRUCTURES PROJECT = 0.019 MILES

TOTAL LENGTH PROJECT = 0.133 MILES

NCDOT CONTACT: DAVID STUTTS, PE
PROJECT MANAGER

Prepared for:
STRUCTURE MANAGEMENT UNIT
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

LETTING DATE:
APRIL 19, 2022

EMILY E. MURRAY, PE
PROJECT ENGINEER

PATRICK HOLDER, PE
PROJECT DESIGN ENGINEER

Prepared in the Office of:

VOLKERT
5430 Wade Park Blvd., Suite 410
Raleigh, NC 27607
Tel. 919-854-0344 Fax. 919-854-0355
NC License No. F-0765

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

11-JAN-2022 12:44
Z:\PROJECTS\Engineering Projects\I02850I.I6 BR-0032 Madison 84\FinalPlans\400_000_BR-0032_SMU_TSH_560084.dgn
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12+50.00 13+00.00 13+50.00 14+00.00 14+50.00

GRADE DATA

-3.5890% +0.3000%

PI STA. = 12+50.00 -L-
EL. = 1867.12'
V.C. = 100'

SPAN A SPAN B

FILL FACE @ END BENT 1
STA. 12+98.63 -L-
G.P. EL. 1867.27

1'- 7'' MIN. BERM

1'- 0'' MIN. EARTH BERM

BEGIN FRONT SLOPE
STA. 12+90.46 -L-
G.P. EL. 1867.26

UNCLASSIFIED STRUCTURE EXCAVATION (TYP.)

BASE DISCHARGE (0100)
EL. 1859.9

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

FILL FACE @ END BENT 2
STA. 14+01.35 -L-
G.P. EL. 1867.57

BEGIN FRONT SLOPE
STA. 14+18.57 -L-
G.P. EL. 1867.63

FIX FIX FIX FIX

EL. 1865.0± EL. 1863.0± EL. 1865.0± EL. 1863.0±

1870 1860 1850 1840

APPROX. EXISTING GROUND LINE

LOW CHORD EL. 1864.5

1'- 6''

CLASS II RIP RAP

HP 12X53 STEEL PILES

STREAMBANK STABILIZATION (ROADWAY DETAIL & PAY ITEM)

EXCAVATE TO EL. 1860.5± (GRADE TO DRAIN)

EXISTING STRUCTURE (TYP.)

WATER SURFACE & NORMAL WATER SURFACE EL. 1845.5 (10/10/2018)

TOP OF PIER EL. 1851.17

3'-0" DIA. DRILLED PIER

1½:1 SLOPE NORMAL TO SKEW (TYP.)

EL. 1847.0± EL. 1845.0± EL. 1843.0± EL. 1846.0± EL. 1845.0± EL. 1847.0±

LOW CHORD EL. 1864.6

TOP OF FTG. EL. 1857.90

BOTT. OF FTG. EL. 1855.90

CLASS II RIP RAP

APPROX. EXISTING GROUND LINE

END BENT 1 BENT 1 END BENT 2

GRADE DATA

+0.3000% +4.7769%

PI STA. = 14+70.00 -L-
EL. = 1867.78'
V.C. = 120'

NC GRID NAD 83/NA 2011

HORIZONTAL CURVE DATA

PI STA. = 12+02.09 -L-	PI STA. = 15+01.80 -L-
△ = 26°-50'-14.8'' (LT.)	△ = 72°-02'-02.8'' (LT.)
D = 11° -56'-11.8''	D = 36°-57'-54.1''
L = 224.83'	L = 194.87'
T = 114.52'	T = 112.68'
R = 480.00	R = 155.00

SECTION ALONG -L-

(SECTION AT END BENTS AND BENT ARE AT RIGHT ANGLES)

1'- 0'' MIN. EARTH BERM
EL. 1861.35

STREAMBANK STABILIZATION (ROADWAY DETAIL & PAY ITEM)

1'- 0'' MIN. EARTH BERM
EL. 1854.90

W.P. #1
FILL FACE @ END BENT 1
STA. 12+98.63 -L-
OFFSET 2⅜'' (RT.)

W.P. #2
BENT 1 CONTROL LINE
STA. 13+30.00 -L-

W.P. #3
FILL FACE @ END BENT 2
STA. 14+01.35 -L-
OFFSET 5 13/16'' (RT.)

END APPROACH SLAB
STA. 14+11.91 -L-
OFFSET 1'-8 5/16" (RT.)

TO SR 1171

BEGIN APPROACH SLAB
STA. 12+87.95 -L-
OFFSET 7½'' (RT.)

TO SR 1175

BRIDGE I.D.
STA. 13+50.00 -L-

-L-

EXTENDED TANGENT

PC STA. 13+89.12 -L-

EXTENDED TANGENT

BEGIN FRONT SLOPE
STA. 12+90.46 -L-
OFFSET 6'' (RT.)

PT STA. 13+12.40 -L-

120°00'00'' (TYP.)

BEGIN FRONT SLOPE
STA. 14+18.57 -L-
OFFSET 2'-10 1/16" (RT.)

TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC

EXISTING STRUCTURE (TYP.)

MEADOW FORK CREEK

TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC

CLASS II RIP RAP

CLASS II RIP RAP

1'- 0'' MIN. EARTH BERM
EL. 1862.94

1'- 0'' MIN. EARTH BERM
EL. 1854.90

20'- 0''

31'- 4 7/16'' ALONG EXTENDED TANGENT

71'- 4 7/16'' ALONG EXTENDED TANGENT

102'- 8⅞'' ALONG EXTENDED TANGENT (FILL FACE @ END BENT 1 TO FILL FACE @ END BENT 2)

PLAN

DRILLED PIERS ARE NOT SHOWN FOR CLARITY

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. BR-0032
MADISON COUNTY
STATION: 13+50.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE #84

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON NC 209 OVER MEADOW FORK CREEK BETWEEN SR 1175 & SR 1171

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
Emily E. Murray
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : D. A. GLADDEN DATE : 09/21
CHECKED BY : E. E. MURRAY DATE : 12/21
DESIGN ENGINEER OF RECORD: E.E.MURRAY DATE : 1/22

22-FEB-2022 16:45
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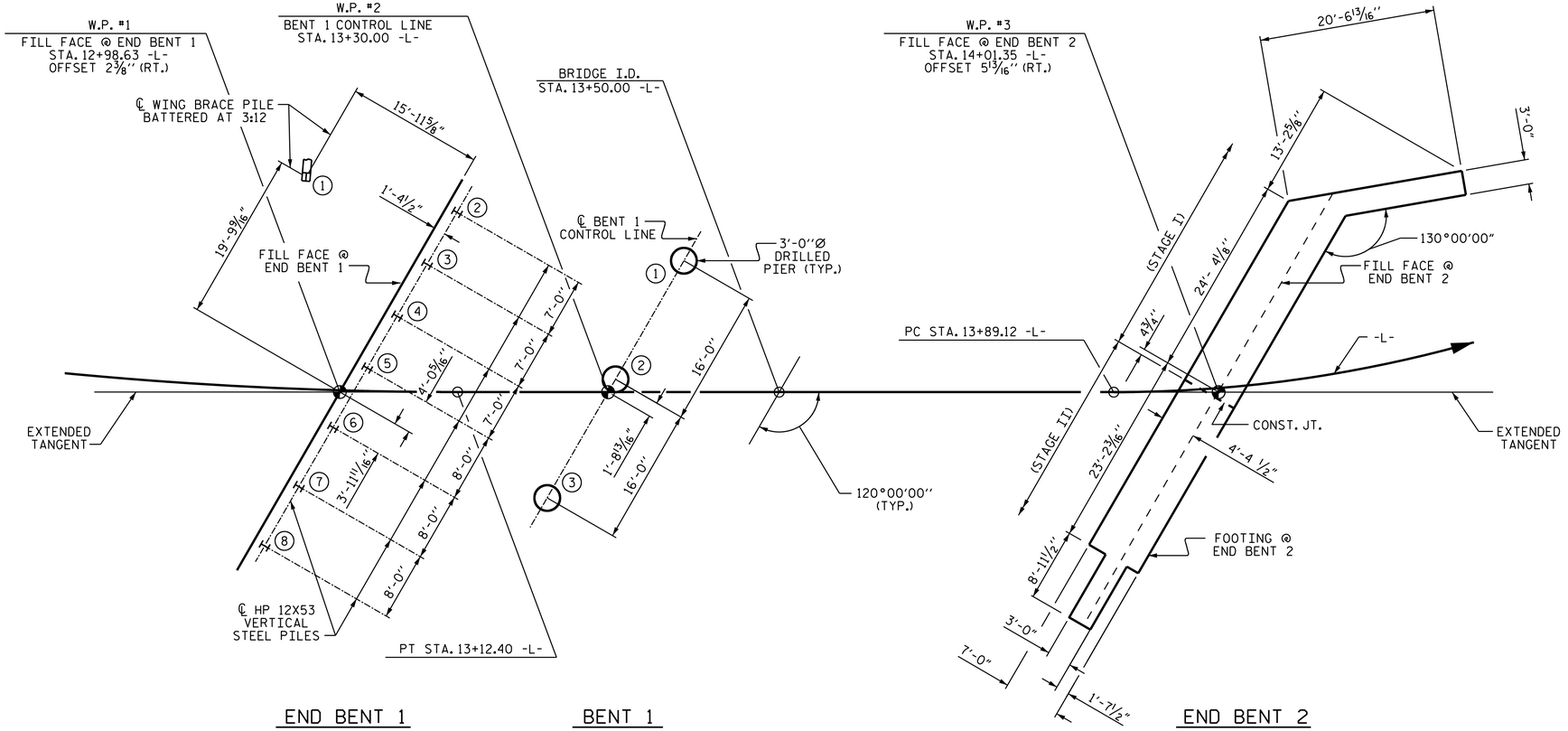
emily.murray AT C-1000324



END BENT 1

STAGE I - PILES 1-5
STAGE II - PILES 6-8

BENT 1

STAGE I - DRILLED PIER 1 & 2
STAGE II - DRILED PIER 3

END BENT 2

FOUNDATION LAYOUT

DIMENSIONS LOCATING STEEL PILES ARE SHOWN TO STEEL PILE CENTERLINES.
FOR FOUNDATION NOTES, SEE SHEET S-3.

PROJECT NO. BR-0032
MADISON COUNTY
STATION: 13+50.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON NC 209 OVER MEADOW FORK CREEK BETWEEN SR 1175 & SR 1171

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER E. E. MURRAY
Emily E. Murray
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3/3/2022

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : D. A. GLADDEN DATE : 09/21
CHECKED BY : E. E. MURRAY DATE : 12/21
DESIGN ENGINEER OF RECORD: E. E. MURRAY DATE : 1/22

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 Lenth 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 1-5	54	**See Structure**	20	N/A		90					1838.0	5.0	14.2
End Bent No.1 Piles 6-8	54	**Plans**	20	N/A		90					1840.0	5.7	11.1

*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.

SUMMARY OF SPREAD FOOTING INFORMATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #-# (e.g., "Bent 1, Piers 1-3")	Factored Bearing Resistance TSF	Footing Dimensions (Length x Width) FT x FT	Required Bearing Resistance TSF	Scour Critical Elevation FT	Minimum Bottom of Footing (Footing No Higher Than) Elevation FT
End Bent No. 2	15	47.6X 7.0	25	1855.9	1855.9

SUMMARY OF DRILLED PIER INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #-# (e.g., "Bent 1, Piers 1-3")	Factored Resistance per Pier TONS	Minimum Pier Tip (Tip No Higher Than) Elevation FT	Required Tip Resistance per Pier TSF	Scour Critical Elevation FT	Minimum Drilled Pier Penetration Into Rock per Pier Lin FT	Drilled Pier Length per Pier Lin FT	Drilled Pier Length Not In Soil per Pier Lin FT	Drilled Pier Length In Soil per Pier Lin FT	Permanent Steel Casing Required? YES or MAYBE	Permanent Steel Casing Tip Elevation (Elev Not To Extend Casing Below) FT	Permanent Steel Casing Length* per Pier Lin FT
Bent No. 1 Piers 1-2	395	1823.5	15	1838	17.0	27.7	17.0	10.7	MAYBE	1840.5	11.0
Bent No. 1 Piers 3	395	1831.0	15	1838	10.0	20.2	10.0	10.2	MAYBE	1842.2	9.0

*Permanent Steel Casing Length equals the difference between the ground line or top of drilled pier elevation, whichever is higher, and the permanent casing tip elevation.

SUMMARY OF DRILLED PIER TESTING

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #-# (e.g., "Bent 1, Piers 1-3")	Standard Penetration Test (SPT) Required? YES or MAYBE	Crosshole Sonic Logging (CSL) Required?* YES or MAYBE	Total CSL Tube Length (For All Tubes) per Pier Lin FT	Shaft Inspection Device (SID) Required? YES or MAYBE	Pile Integrity Test (PIT) Required? MAYBE
Bent No. 1 Piers 1-2	No	Maybe	233	Maybe	No
Bent No. 1 Piers 3	No	Maybe	87	Maybe	No
TOTAL QTY:		1	320	2	

*CSL Tubes are required if CSL Testing is or may be required. The number of CSL Tubes per drilled pier is equal to one tube per foot of design pier diameter with at least 4 tubes per pier. The length of each CSL Tube is equal to the drilled pier length plus 1.5 ft.

FOUNDATION NOTES

1 FOR PILES, SEE PILES PROVISION AND SECTION 450 OF THE STANDARD SPECIFICATIONS.

2 FILL HOLES FOR PILE EXCAVATION AT END BENT NO. 1 WITH CONCRETE.

3 FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

4 CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR THE DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

5 KEY IN SPREAD FOOTINGS AT END BENT NO. 2 AT LEAST 6" INTO ROCK/12" INTO WEATHERED ROCK WITH MINIMUM THICKNESS AS SHOWN ON THE PLANS.

6 FOR BLASTING, SEE SECTION 220 OF THE STANDARD SPECIFICATIONS.

7 BLAST ALL PHASES OF THE PROJECT AT THE SAME TIME. PATCH/REPAIR ROADWAY AS DIRECTED BY THE ENGINEER.

8 CONTRACTOR IS TO PROVIDE A BLASTING CONSULTANT TO REVIEW SITE CONDITIONS, SCOPE OF WORK AND PROVIDE A BLASTING DESIGN/PLAN

9 DEPENDING ON THE APPROVED BLASTING PLAN, ADDITIONAL TRAFFIC CONTROL MEASURES INCLUDING TEMPORARY CLOSURES, DETOURS , OR OTHER MEASURES MAY BE REQUIRED AND WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE COST FO R THIS WORK WILL BE CONSIDERED INCIDENTAL TO THE BLASTING WITH NO ADDITIONAL COST TO THE DEPARTMENT FOR DESIGN OR IMPLEMENTATION

PROJECT NO. BR-0032

MADISON COUNTY

STATION: 13+50.00 -L-

NOTES:

1. The Pile and Drilled Pier Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Shiping Yang, PE #031661) on 11-05-2021.
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, Pipe Pile Plates, Permanent Steel Casing, SPTs, CSL Testing, SID Inspections and PITs when these items may be required.

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY

Emily E. Murray

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2/22/2022

SIGNATURE DATE

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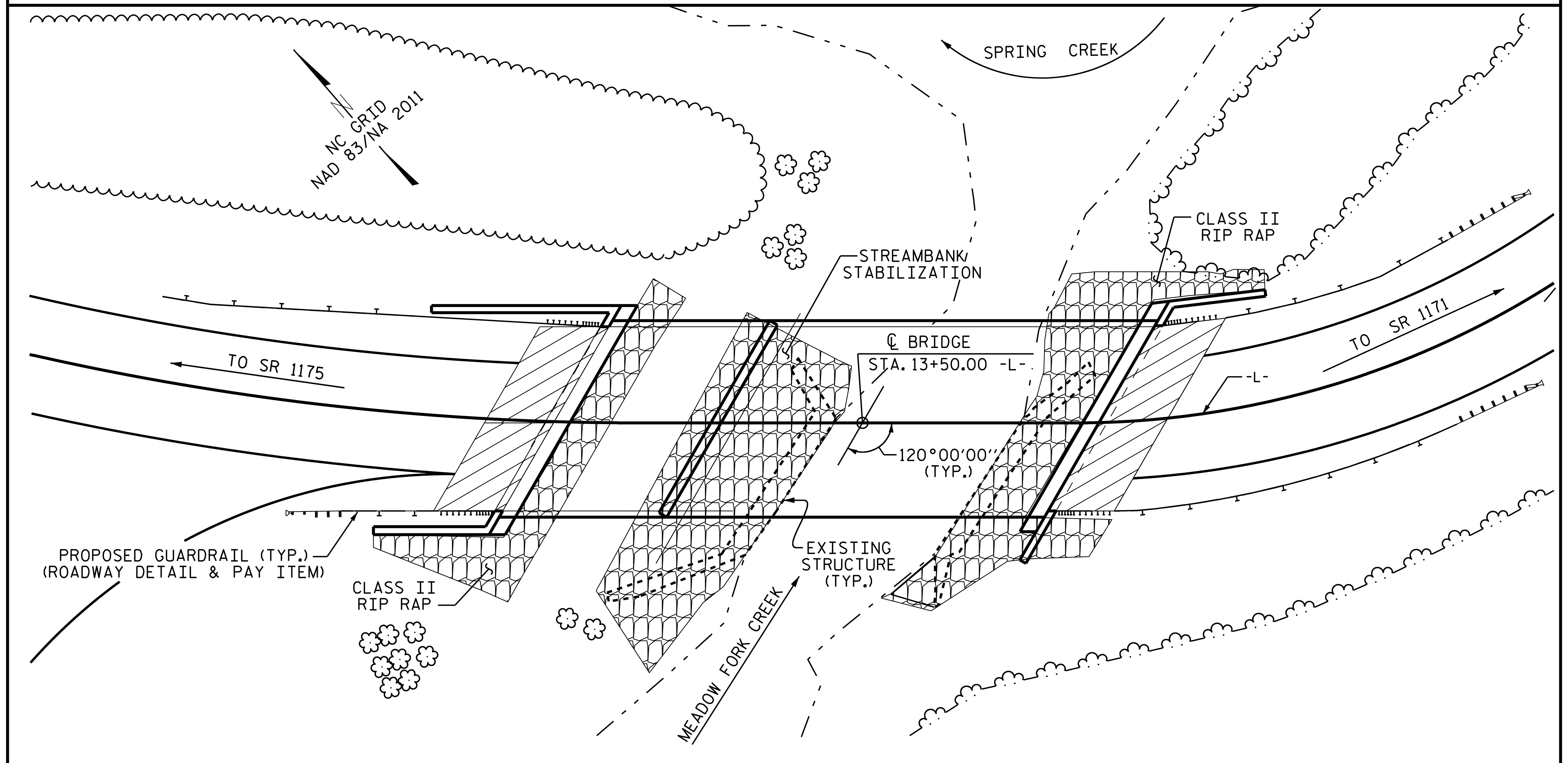
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE, DRILLED PIER AND SPREAD FOOTING FOUNDATION TABLES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			34

BM #1: RAILROAD SPIKE IN BASE OF 30" SYCAMORE, 30.61' RT. OF STA. 13+05.61 -L-, ELEV. = 1863.10



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL 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.

FOR TEMPORARY ANCHORED PORTABLE CONCRETE MEDIAN BARRIER, SEE TRAFFIC MANAGEMENT PLANS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AT END BENT 1 SHALL BE EXCAVATED FOR A DISTANCE OF 25 FT. LEFT SIDE AND 50 FT. RIGHT SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA AT END BENT 2 SHALL BE EXCAVATED FOR A DISTANCE OF 23 FT. LEFT SIDE AND 30 FT. 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 A SINGLE 41'-0" SPAN STEEL PLANK DECK ON I-BEAMS SUPPORTED ON MASONRY ABUTMENTS, AND A CLEAR ROADWAY WIDTH 19'-5" LOCATED AT THE PROPOSED STRUCTURE SITE 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 BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

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 13+50.00 -L-."

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

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

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	FOUNDATION EXCAVATION FOR END BENT 2	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	3'-0" DIA DRILLED PIERS IN SOIL	3'-0" DIA DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-0" DIA DRILLED PIERS	CSL TESTING	SID INSPECTIONS	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	PILE DRIVING EQUIPMENT SET UP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	
	LUMP SUM	LUMP SUM	LUMP SUM	LN. FT.	LN. FT.	LN. FT.	LN. FT.	LN. FT.	EA.	EA.	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	LBS.	EA.	NO.	LN. FT.
SUPERSTRUCTURE																		
END BENT NO. 1				104.3	42.1							20.9		3027		8	8	160
BENT NO. 1						31.6	44.0	31.0				23.1		11899	1876			
END BENT NO. 2			LUMP SUM									76.3		11985				
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	104.3	42.1	31.6	44.0	31.0	1	2	LUMP SUM	120.3	LUMP SUM	26911	1876	8	8	160

TOTAL BILL OF MATERIAL

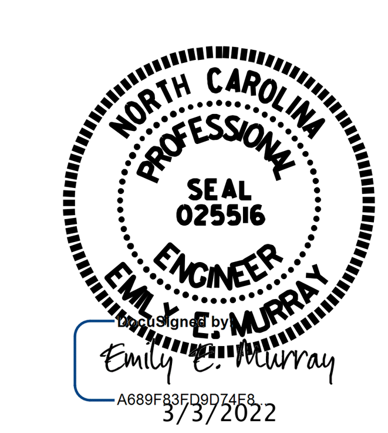
	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARING	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS		3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLABS	
	LN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LN. FT.	NO.	LN. FT.
SUPERSTRUCTURE	200.58				12	360	12	840
END BENT NO. 1		23	26					
BENT NO. 1								
END BENT NO. 2		157	175					
TOTAL	200.58	180	201	LUMP SUM	12	360	12	840

HYDRAULIC DATA

DESIGN DISCHARGE = 4500 C.F.S.
FREQUENCY OF DESIGN FLOOD = 50 YEARS
DESIGN HIGH WATER ELEVATION = 1858.5 FT.
DRAINAGE AREA = 22.8 SQ. MI.
BASE DISCHARGE (Q100) = 5400 C.F.S.
BASE HIGH WATER ELEVATION = 1859.9 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 12100 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD = 500+ YEARS
OVERTOPPING FLOOD ELEVATION = 1867.7 FT.
OVERTOPPING FLOOD STATION = 12+92.30 -L-



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DRAWN BY : D. A. GLADDEN DATE : 09/21
CHECKED BY : E. E. MURRAY DATE : 12/21
DESIGN ENGINEER OF RECORD: E. E. MURRAY DATE : 1/22

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PROJECT NO. BR-0032
MADISON COUNTY
STATION: 13+50.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON NC 209 OVER MEADOW FORK CREEK BETWEEN SR 1175 & SR 1171

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

SHEET NO. S-4
TOTAL SHEETS 34

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**	1.202	--	1.75	0.256	2.04	30'	EL	14.423	0.655	**1.2**	30'	EL	**1.442**	0.80	0.256	1.75	30'	EL	14.423	
		HL-93(Opr)	N/A	--	1.558	--	1.35	0.256	2.64	30'	EL	14.423	0.655	1.56	30'	EL	1.442	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	**2**	1.365	49.124	1.75	0.256	2.82	30'	EL	11.538	0.655	**1.36**	30'	EL	**1.442**	0.80	0.256	2.45	30'	EL	11.538	
		HS-20(Opr)	36.000	--	1.769	63.679	1.35	0.256	3.65	30'	EL	11.538	0.655	1.77	30'	EL	1.442	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.333	45.002	1.4	0.256	5.76	30'	EL	14.423	0.655	3.33	30'	EL	1.442	0.80	0.256	3.95	30'	EL	14.423	
		SNGARBS2	20.000	--	2.581	51.624	1.4	0.256	5.04	30'	EL	11.538	0.655	2.58	30'	EL	1.442	0.80	0.256	3.50	30'	EL	11.538	
		SNAGRIS2	22.000	--	2.487	54.723	1.4	0.256	5.13	30'	EL	11.538	0.655	2.49	30'	EL	1.442	0.80	0.256	3.56	30'	EL	11.538	
		SNCOTTS3	27.250	--	1.684	45.891	1.4	0.256	2.89	30'	EL	14.423	0.655	1.68	30'	EL	1.442	0.80	0.256	1.99	30'	EL	14.423	
		SNAGGRS4	34.925	--	1.551	54.185	1.4	0.256	2.79	30'	EL	14.423	0.655	1.55	30'	EL	1.442	0.80	0.256	1.91	30'	EL	14.423	
		SNS5A	35.550	--	1.645	58.469	1.4	0.256	2.7	30'	EL	14.423	0.655	1.64	30'	EL	1.442	0.80	0.256	1.85	30'	EL	14.423	
		SNS6A	39.950	--	1.547	61.791	1.4	0.256	2.55	30'	EL	14.423	0.655	1.55	30'	EL	1.442	0.80	0.256	1.75	30'	EL	14.423	
		SNS7B	42.000	--	1.578	66.285	1.4	0.256	2.48	30'	EL	14.423	0.655	1.58	30'	EL	1.442	0.80	0.256	1.70	30'	EL	14.423	
	TTST	TNAGRIT3	33.000	--	1.838	60.67	1.4	0.256	3.31	30'	EL	14.423	0.655	1.84	30'	EL	1.442	0.80	0.256	2.27	30'	EL	14.423	
		TNT4A	33.075	--	1.71	56.559	1.4	0.256	3.13	30'	EL	14.423	0.655	1.71	30'	EL	1.442	0.80	0.256	2.15	30'	EL	14.423	
		TNT6A	41.600	--	1.652	68.714	1.4	0.256	2.85	30'	EL	14.423	0.655	1.65	30'	EL	1.442	0.80	0.256	1.96	30'	EL	14.423	
		TNT7A	42.000	--	1.573	66.067	1.4	0.256	2.94	30'	EL	14.423	0.655	1.57	30'	EL	1.442	0.80	0.256	2.02	30'	EL	14.423	
		TNT7B	42.000	--	1.536	64.525	1.4	0.256	2.77	30'	EL	14.423	0.655	1.54	30'	EL	1.442	0.80	0.256	1.90	30'	EL	14.423	
		TNAGRIT4	43.000	--	1.486	63.9	1.4	0.256	2.87	30'	EL	14.423	0.655	1.49	30'	EL	1.442	0.80	0.256	1.97	30'	EL	14.423	
		TNAGT5A	45.000	--	1.594	71.736	1.4	0.256	2.79	30'	EL	14.423	0.655	1.59	30'	EL	1.442	0.80	0.256	1.92	30'	EL	14.423	
		TNAGT5B	45.000	**3**	1.399	62.946	1.4	0.256	2.68	30'	EL	11.538	0.655	**1.4**	30'	EL	**1.442**	0.80	0.256	1.85	30'	EL	11.538	

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 **
** 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. BR-0032

MADISON COUNTY

STATION: 13+50.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR 30' CORED SLAB UNIT 60° SKEW & 120° SKEW

(NON-INTERSTATE TRAFFIC)

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY

Emily E. Murray
A689F83F0907478...
2/22/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			34

ASSEMBLED BY : D. A. GLADDEN	DATE : 6/21
CHECKED BY : E. E. MURRAY	DATE : 11/21
DRAWN BY : CVC	6/10
CHECKED BY : DNS	6/10

16-FEB-2022 09:58
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
brent.barnhill AT C-1000010

STD. NO. 21LRFR1_60&120S_30L

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**	1.06	--	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(Opr)	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(Inv)	36.000	**2**	1.32	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(Opr)	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 RATING	SV	SNSH	13.500	--	3.204	43.258	1.4	0.248	4.12	70'	EL	34.423	0.655	3.9	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	50.21	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	1.5	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	
	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	48.79	1.4	0.248	1.9	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	1.4	70'	EL	6.885	0.80	0.248	1.20	70'	EL	34.423	
		TNAGT5A	45.000	--	1.128	50.745	1.4	0.248	1.45	70'	EL	34.423	0.655	1.39	70'	EL	6.885	0.80	0.248	1.13	70'	EL	34.423	
		TNAGT5B	45.000	**3**	1.113	50.088	1.4	0.248	1.43	70'	EL	34.423	0.655	1.33	70'	EL	6.885	0.80	0.248	**1.11**	70'	EL	**34.423**	

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)

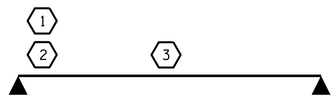
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

FOR SPAN 'B'

PROJECT NO. BR-0032

MADISON COUNTY

STATION: 13+50.00 -L-

Emily E. Murray
A689F83F0B074F8...
2/22/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

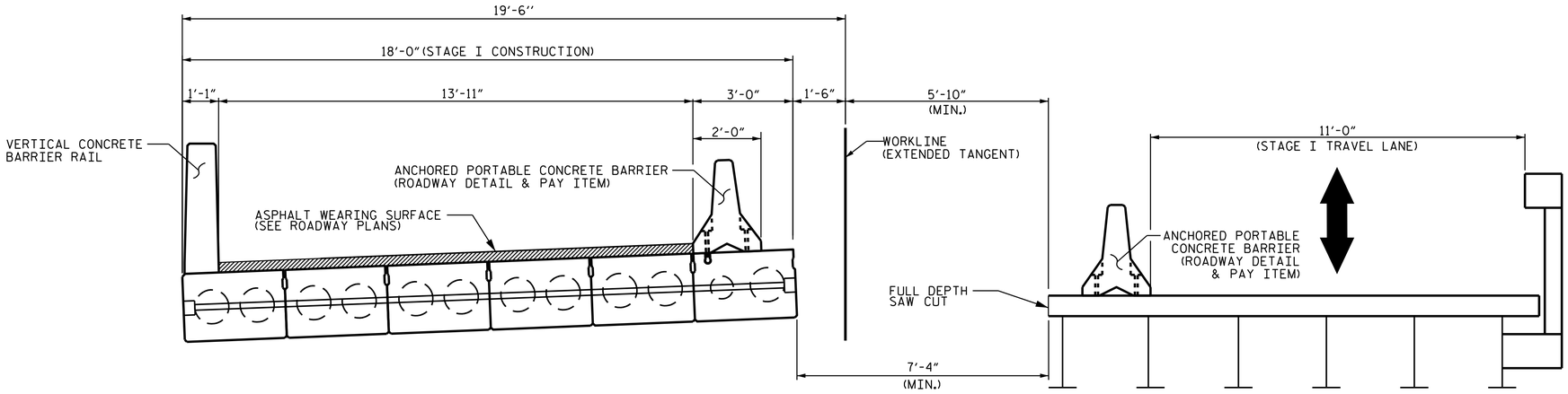
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			34

ASSEMBLED BY : D. A. GLADDEN	DATE : 6/21
CHECKED BY : E. E. MURRAY	DATE : 11/21
DRAWN BY : CVC	6/10
CHECKED BY : DNS	6/10

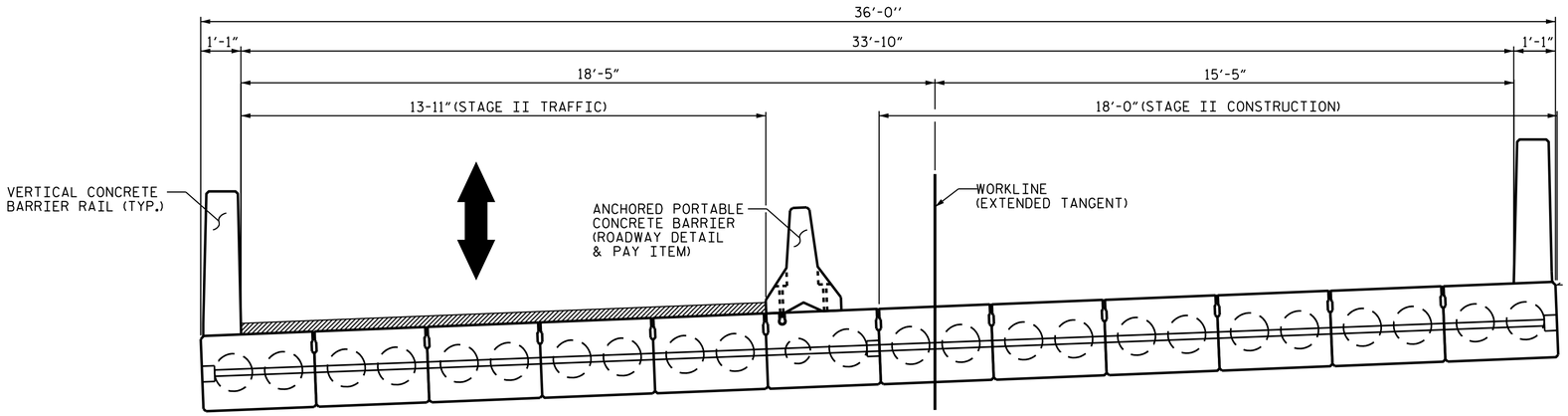
16-FEB-2022 09:59
$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$$
brent.barnhill AT C-1000010

STD. NO. 24LRFR1_60&120S_70L



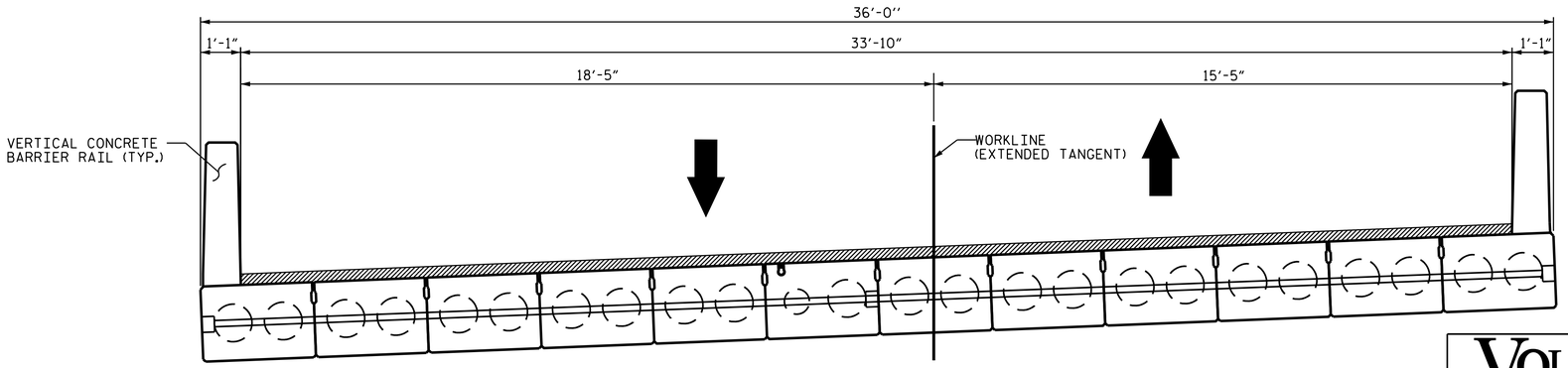
STAGE I CONSTRUCTION

EXISTING BRIDGE STAGE I TRAFFIC



STAGE II TRAFFIC

STAGE II CONSTRUCTION



FINAL TYPICAL SECTION

DRAWN BY : D. A. GLADDEN DATE : 9/21
CHECKED BY : E. E. MURRAY DATE : 12/21
DESIGN ENGINEER OF RECORD: P. N. HOLDER DATE : 10/21

16-FEB-2022 10:01
$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$$
brent.barnhill AT C-1000010

VOLKERT
5430 Wade Park Blvd., Suite 410
Raleigh, NC 27607
Tel. 919-854-0344 Fax. 919-854-0355
NC License No. F-0765

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
Emily E. Murray
A689F83FD9D74F8...
2/22/2022

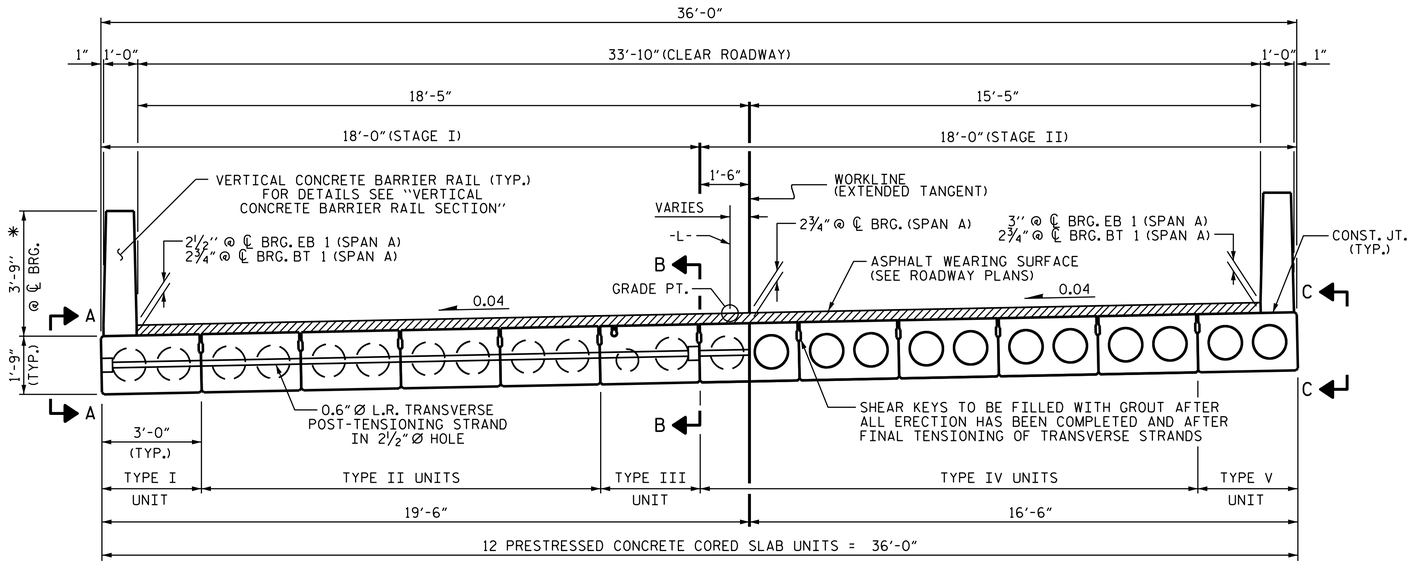
PROJECT NO. BR-0032
MADISON COUNTY
STATION: 13+50.00 -L-

SHEET 1 OF 12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONSTRUCTION SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S- 7
1			3			TOTAL SHEETS
2			4			34

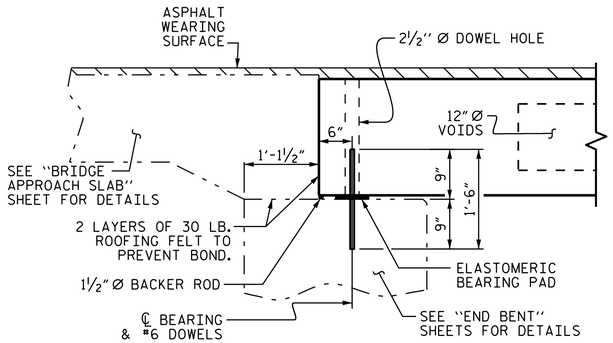


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

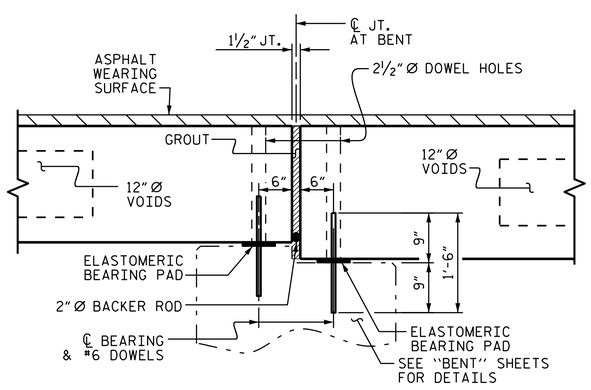
HALF SECTION
THROUGH VOIDS

TYPICAL SECTION - SPAN A

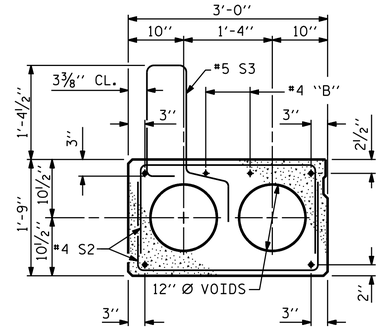
* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.



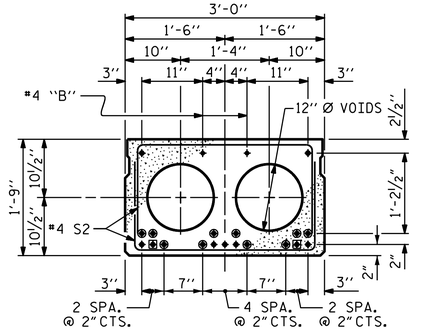
SECTION AT END BENT 1



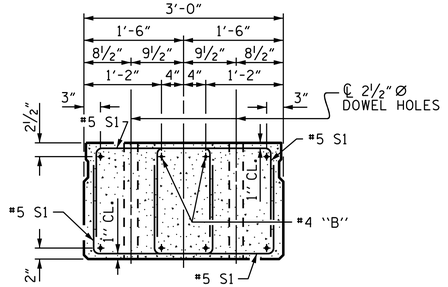
SECTION AT BENT 1



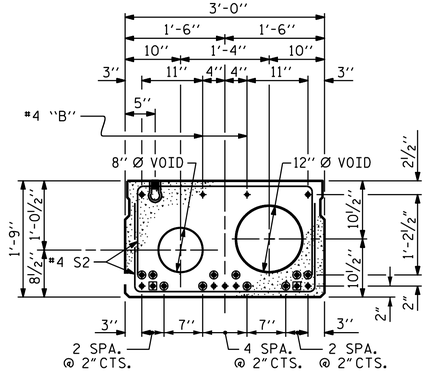
EXTERIOR SLAB SECTION
(TYPE I & TYPE V 30' UNIT)
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)



INTERIOR SLAB SECTION
(TYPE II & TYPE IV 30' UNIT)
(9 STRANDS REQUIRED)



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.

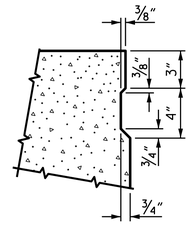


INTERIOR SLAB SECTION
(TYPE III 30' UNIT)
(9 STRANDS REQUIRED)

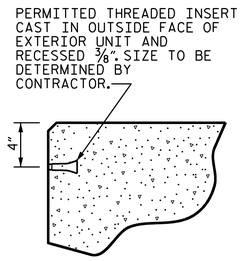
0.6" Ø LOW RELAXATION STRAND LAYOUT

- ◉ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-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.



THREADED INSERT DETAIL

PROJECT NO. BR-0032
MADISON COUNTY
STATION: 13+50.00 -L-

SHEET 1 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT (SPAN A) 120° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
Emily E. Murray
A689F83F2907474...
2/22/2022

VOLKERT
5430 Wade Park Blvd., Suite 410
Raleigh, NC 27607
Tel. 919-854-0344 Fax. 919-854-0355
NC License No. F-0765

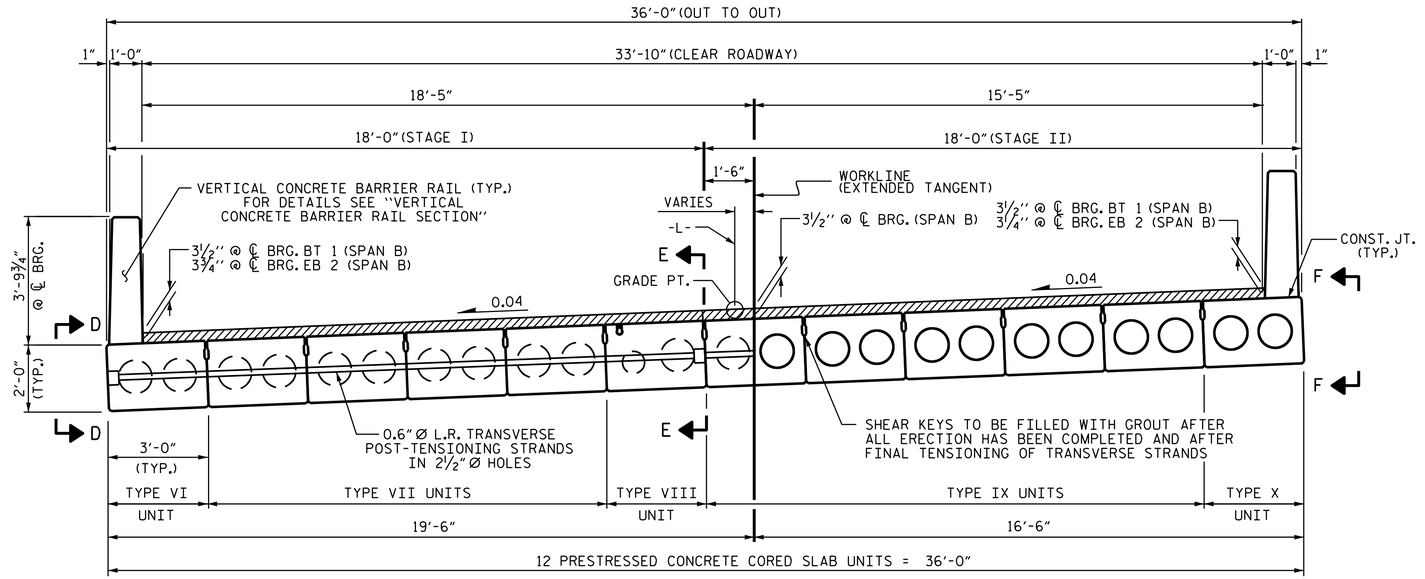
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : D. A. GLADDEN DATE : 4/21
CHECKED BY : D. R. SMITH DATE : 11/21
DESIGN ENGINEER OF RECORD: P. N. HOLDER DATE : 5/21

16-FEB-2022 15:59
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
brent.barnhill AT C-1000010

STD. NO. 21"PCS2_36_120S



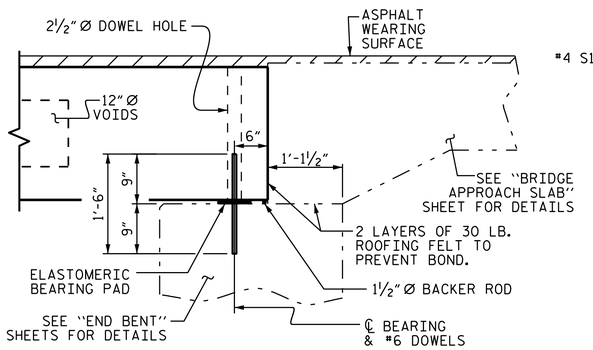
HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

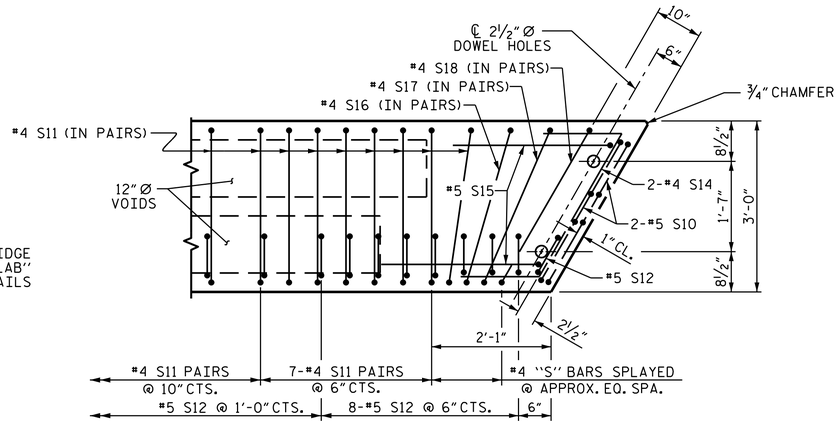
TYPICAL SECTION - SPAN B

* - 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



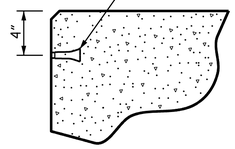
SECTION AT END BENT 2



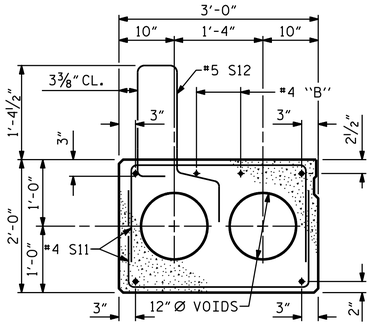
PART PLAN-EXTERIOR UNIT

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

PERMITTED THREADED INSERT CAST IN OUTSIDE FACE OF EXTERIOR UNIT AND RECESSED ⅜". SIZE TO BE DETERMINED BY CONTRACTOR.

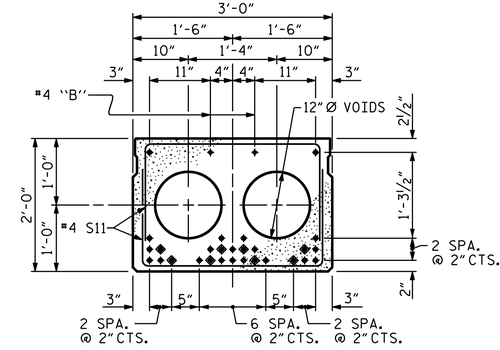


THREADED INSERT DETAIL



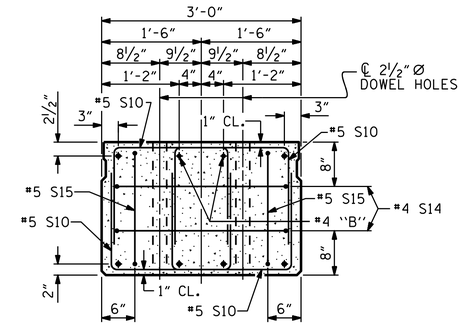
EXTERIOR SLAB SECTION (TYPE VI & TYPE X 70' UNIT)

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



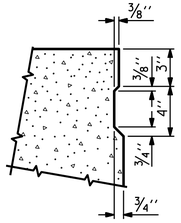
INTERIOR SLAB SECTION (TYPE VII & TYPE IX 70' UNIT)

(28 STRANDS REQUIRED)



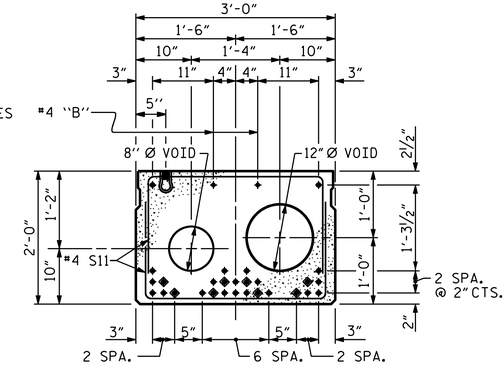
END ELEVATION

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



SHEAR KEY DETAIL

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



INTERIOR SLAB SECTION (TYPE VIII 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.

DEBONDING LEGEND

PROJECT NO. BR-0032
MADISON **COUNTY**
STATION: 13+50.00 -L-

SHEET 2 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT (SPAN B) 120° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : D. A. GLADDEN DATE : 4/21
CHECKED BY : D. R. SMITH DATE : 11/21
DESIGN ENGINEER OF RECORD: P. N. HOLDER DATE : 5/21

VOLKERT
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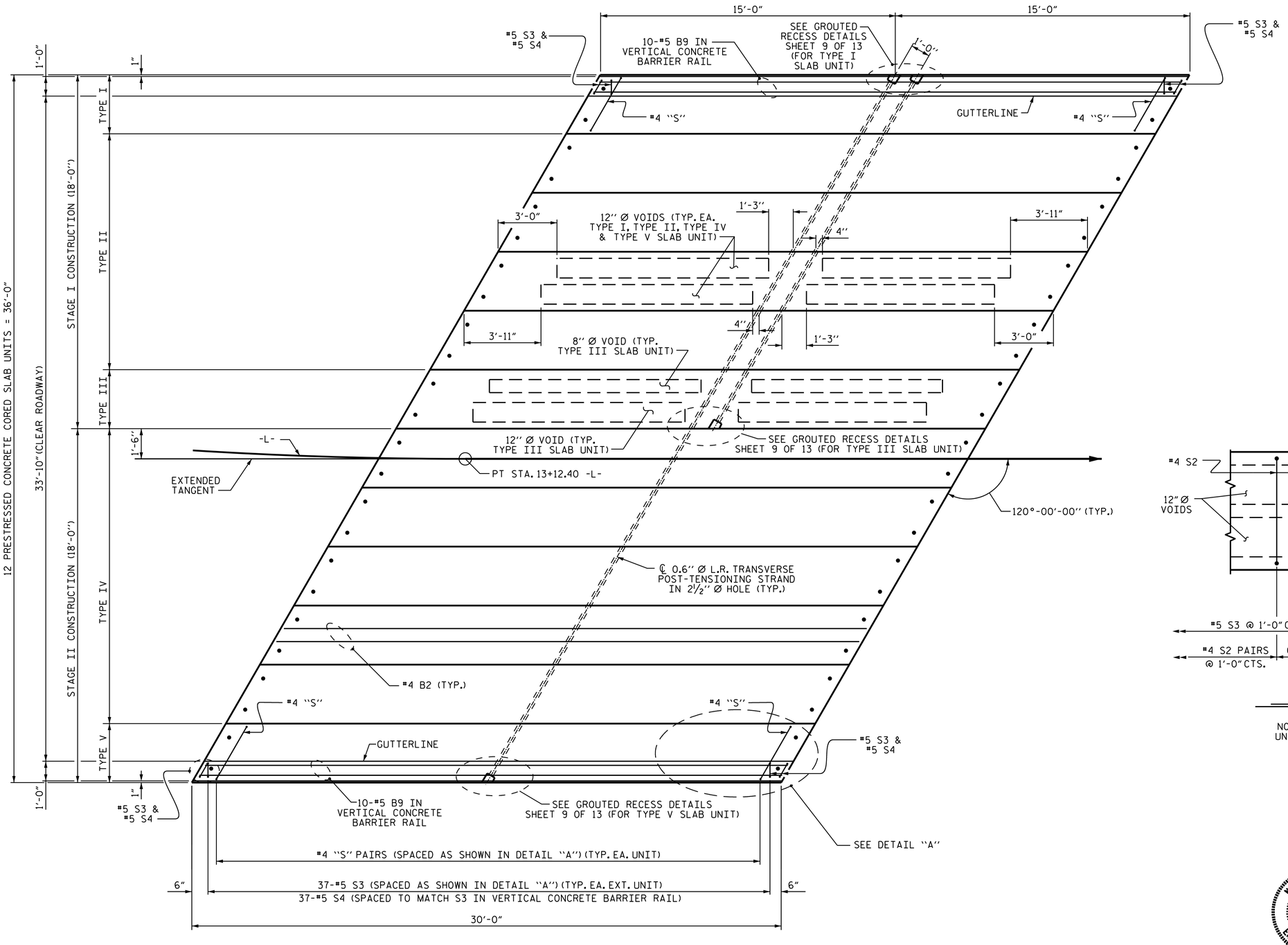
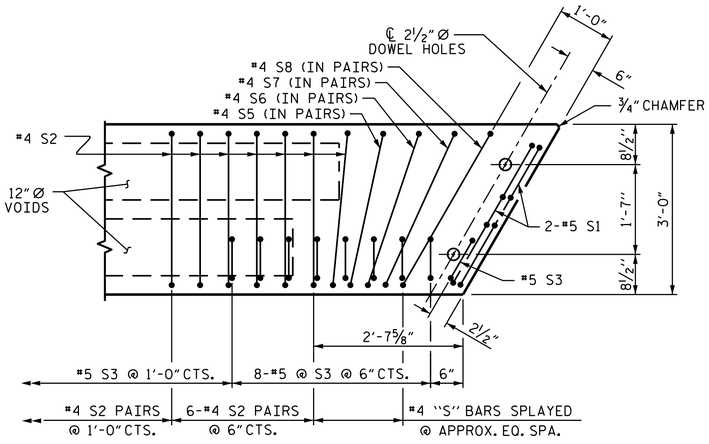
Raleigh, NC 27607
Tel. 919-854-0344 Fax. 919-854-0355
NC License No. F-0765

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
Emily E. Murray
A686F83E0D07AFB...
2/22/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PLAN OF 30' UNIT (SPAN A)



DETAIL "A"

(SIMILAR EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT *5 S3 BARS.

PROJECT NO. BR-0032
MADISON COUNTY
STATION: 13+50.00 -L-

SHEET 3 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 30' UNIT 33'-10" CLEAR ROADWAY 120° SKEW (SPAN A)

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER Emily C. Murray
A689F83F290747F8...
2/22/2022

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			34

ASSEMBLED BY : D. A. GLADDEN		DATE : 4/21		
CHECKED BY : D. R. SMITH		DATE : 11/21		
DRAWN BY : DGE	5/09	REV. 12/5/11		MAA/AAC
CHECKED BY: BCH	6/09	REV. 8/14		MAA/TMG

16-FEB-2022 16:03
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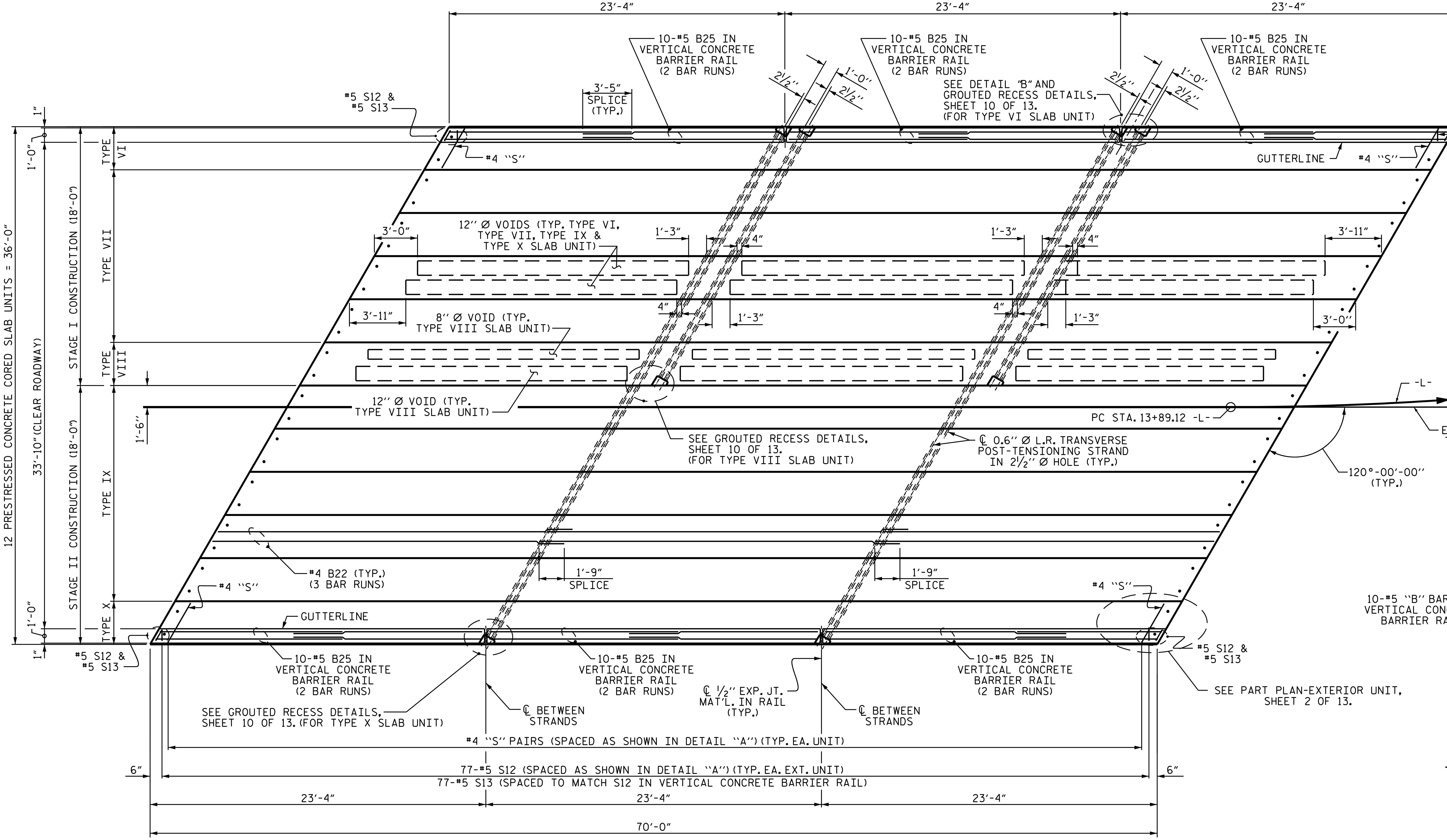
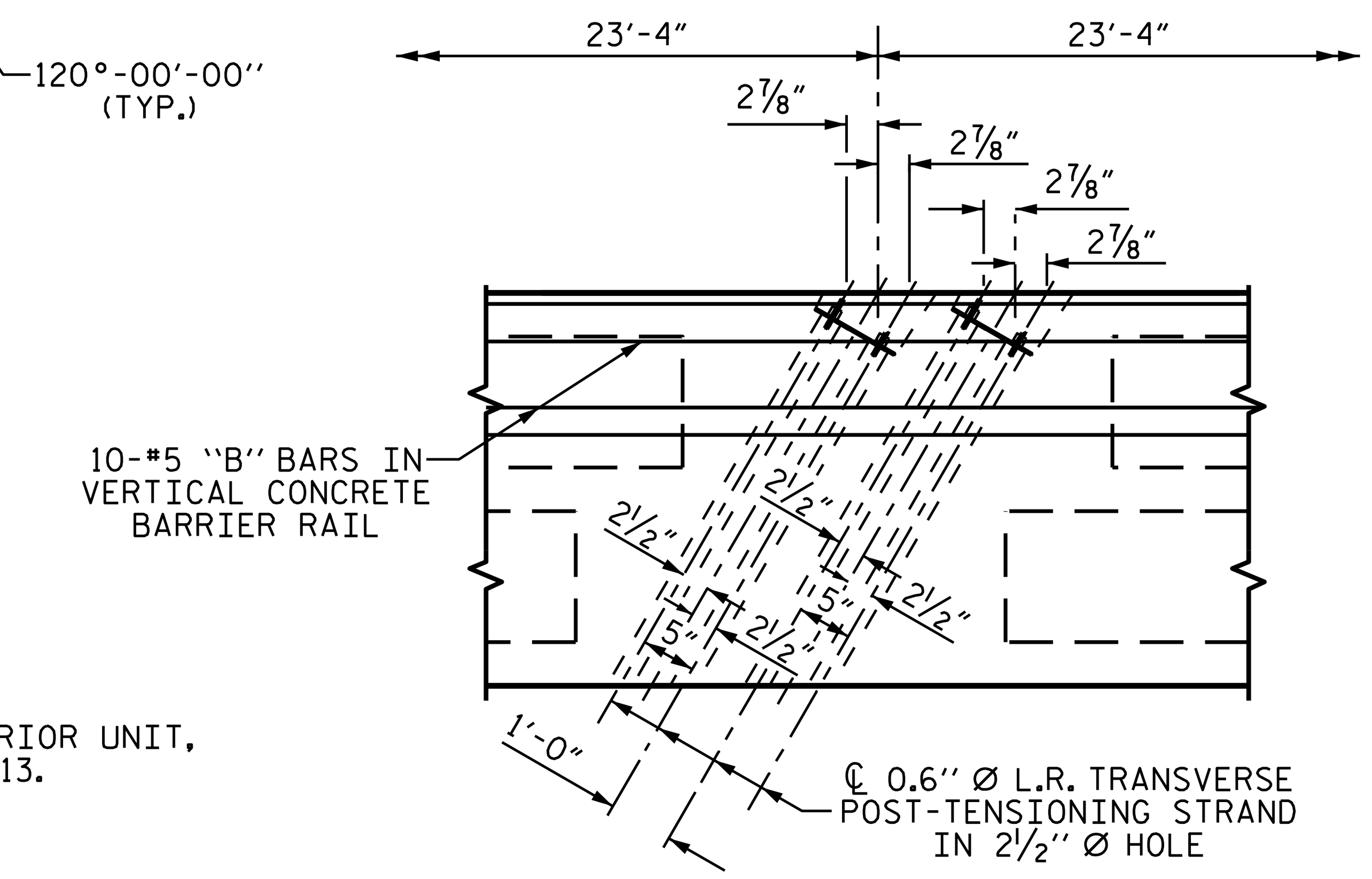
brent.barnhill AT C-1000010

STD. NO. 21"PCS_36_120S_30L





DETAIL "B"

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

PLAN OF 70' UNIT (SPAN B)

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

PROJECT NO. BR-0032
MADISON COUNTY
STATION: 13+50.00 -L-

SHEET 4 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 70' UNIT 33'-10" CLEAR ROADWAY 120° SKEW (SPAN B)

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
Emily E. Murray 2/22/2022

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			34

DRAWN BY :	D. A. GLADDEN	DATE :	4/21
CHECKED BY :	D. R. SMITH	DATE :	11/21
DESIGN ENGINEER OF RECORD:	P. N. HOLDER	DATE :	5/21

22-FEB-2022 18:42
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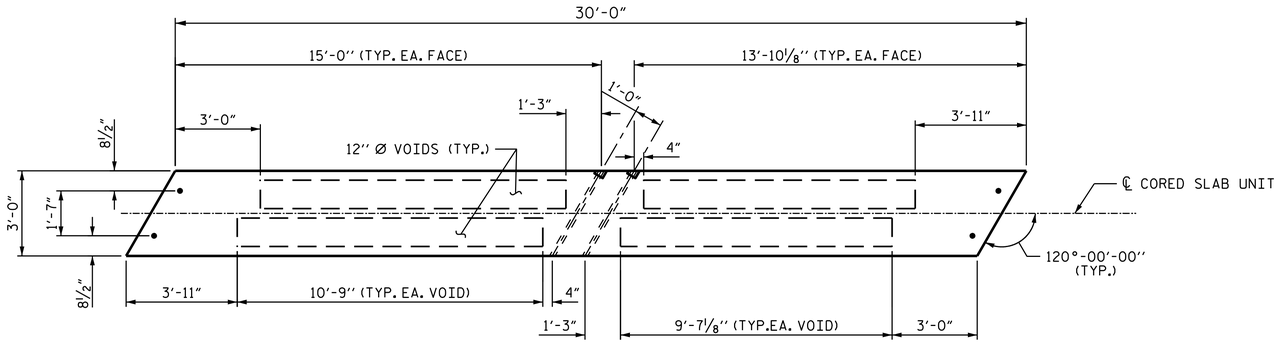
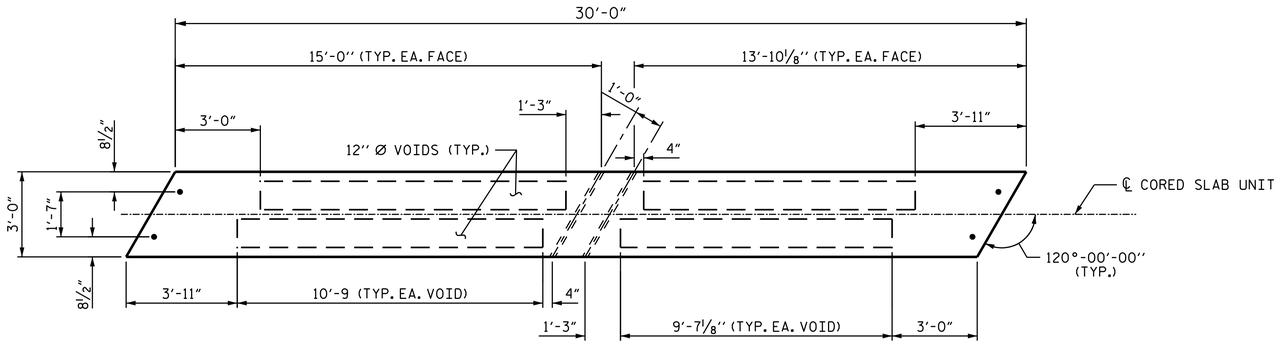
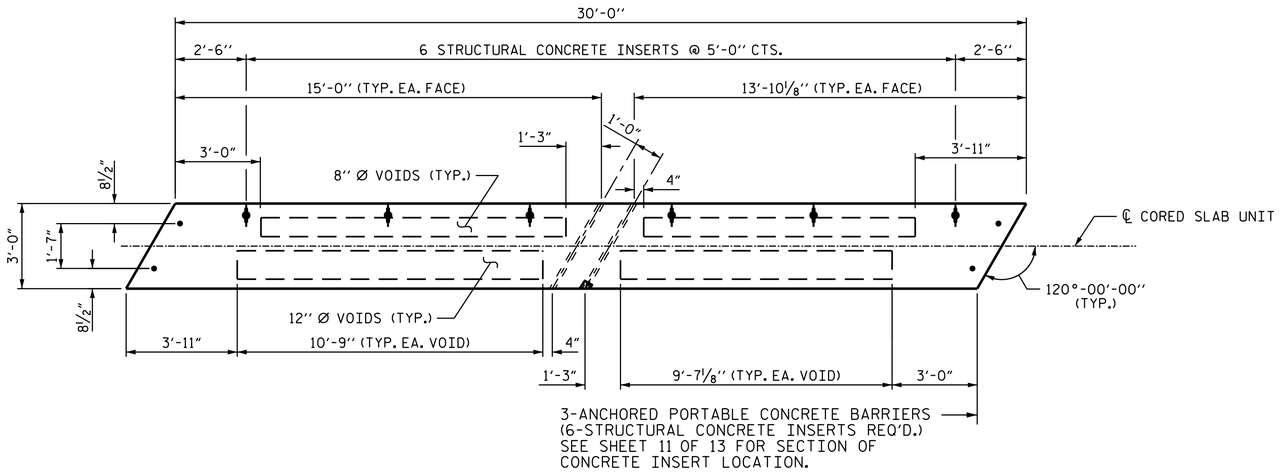
emily.murray AT C-1000324



PLAN OF TYPE I EXTERIOR CORED SLAB UNIT



PLAN OF TYPE II INTERIOR CORED SLAB UNIT



PLAN OF TYPE III INTERIOR CORED SLAB UNIT

ANCHORS FOR PORTABLE CONCRETE BARRIER HAVE BEEN SPACED ACCORDING TO ROADWAY STANDARD 1170.01. THE CONTRACTOR SHALL CONFIRM THE USE OF BARRIERS MATCHING THIS STANDARD AND THE LOCATIONS OF THE ANCHORS. IF THE PORTABLE CONCRETE BARRIER DOES NOT MEET THE STANDARD'S DETAILS AND THE SPACING OF THE ANCHORS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING ANCHORS PROPERLY SPACED FOR THE PROPOSED BARRIERS AS APPROVED BY THE ENGINEER.

DRAWN BY : D. A. GLADDEN DATE : 4/21
CHECKED BY : D. R. SMITH DATE : 11/21
DESIGN ENGINEER OF RECORD: D. R. SMITH DATE : 11/21

16-FEB-2022 16:11
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
brent.barnhill AT C-1000010

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Raleigh, NC 27607
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NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
Digitally signed by Emily E. Murray
A689F83FD9D74F8...
2/22/2022

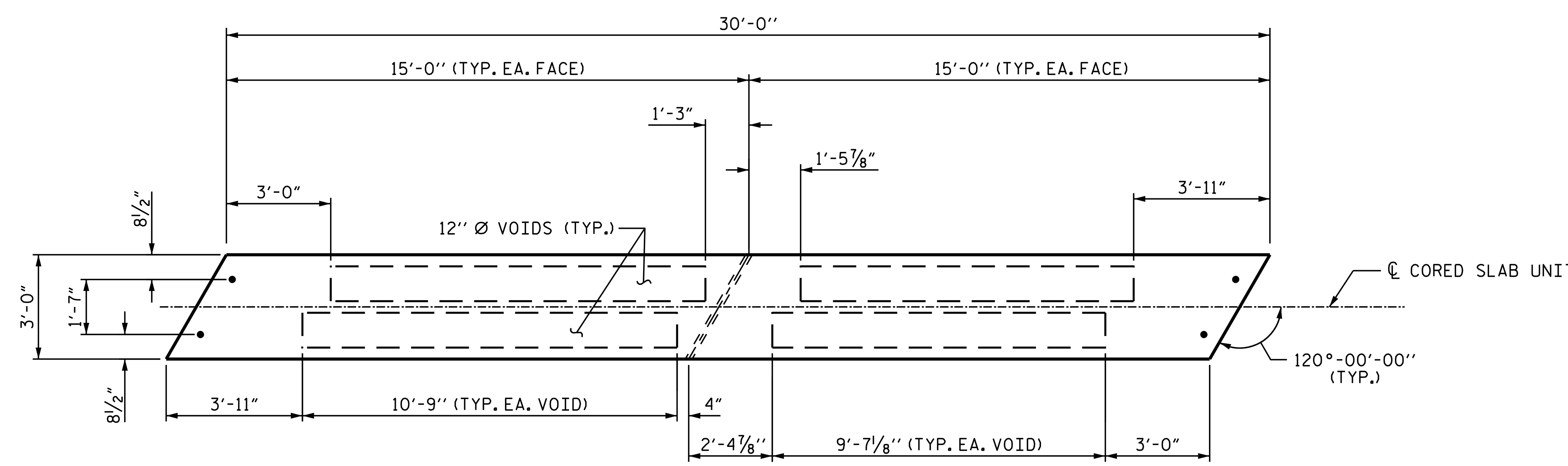
PROJECT NO. BR-0032
MADISON COUNTY
STATION: 13+50.00 -L-
SHEET 5 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

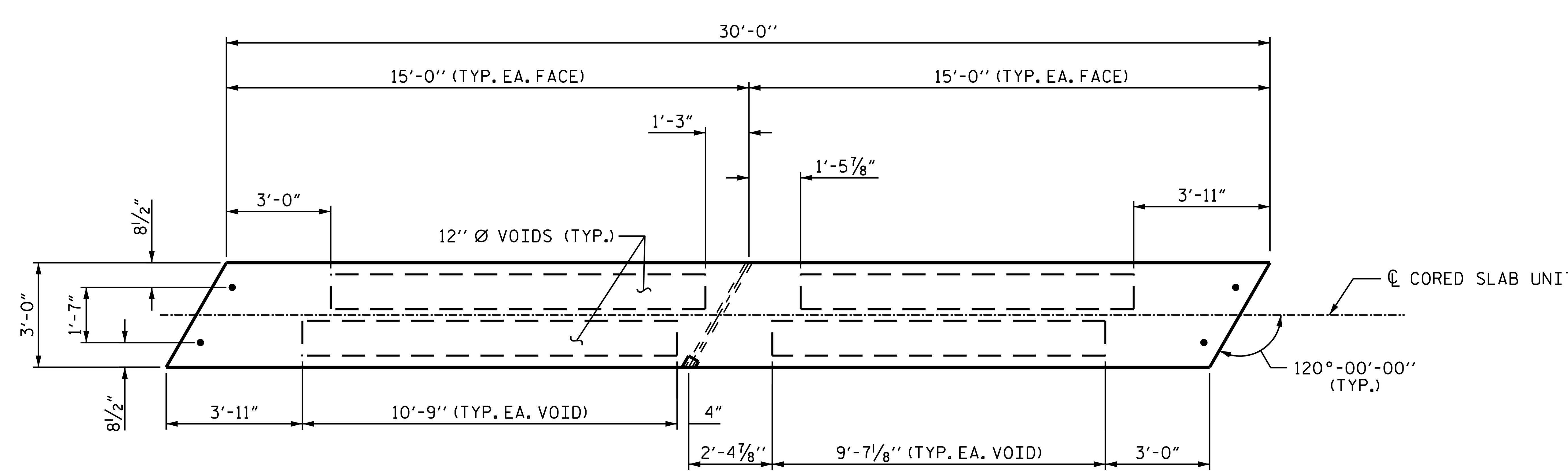
PLAN OF 30′-0″ PRESTRESSED CONCRETE CORED SLAB UNIT TYPE I, TYPE II, AND TYPE III (SPAN A)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			34

STD. NO. 21"PCS_36_120S_30L



PLAN OF TYPE IV INTERIOR CORED SLAB UNIT



PLAN OF TYPE V EXTERIOR CORED SLAB UNIT

PROJECT NO. BR-0032
MADISON COUNTY
STATION: 13+50.00 -L-

SHEET 6 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 30'-0" PRESTRESSED CONCRETE CORED SLAB UNIT TYPE IV AND TYPE V (SPAN A)

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
2/22/2022

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			34

DRAWN BY :	D. A. GLADDEN	DATE :	4/21
CHECKED BY :	D. R. SMITH	DATE :	11/21
DESIGN ENGINEER OF RECORD:	D. R. SMITH	DATE :	11/21

16-FEB-2022 10:12
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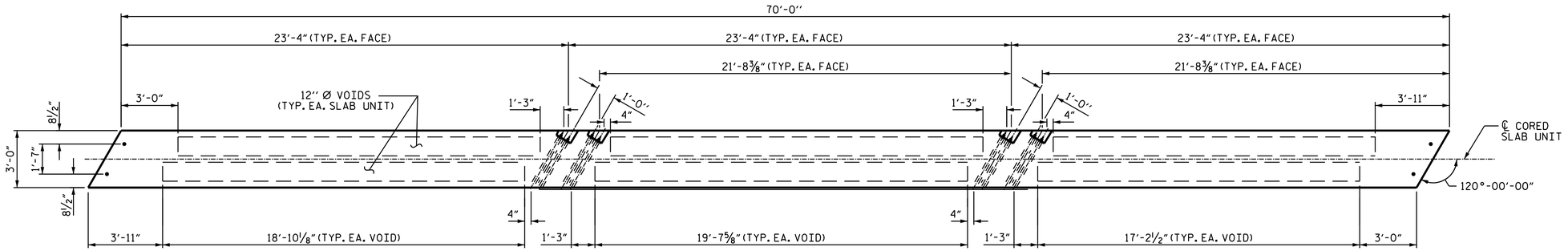
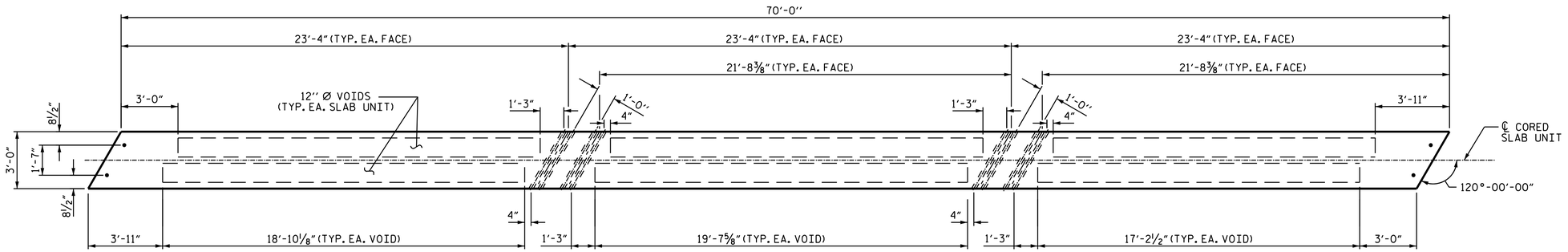
brent.barnhill AT C-1000010

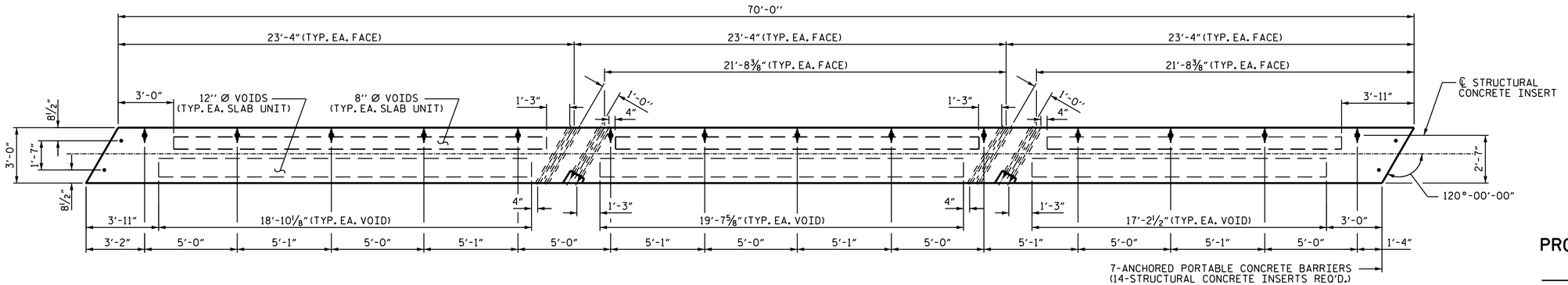
STD. NO. 21" PCS_36_120S_30L



PLAN OF TYPE VI EXTERIOR CORED SLAB UNIT



PLAN OF TYPE VII INTERIOR CORED SLAB UNIT



7-ANCHORED PORTABLE CONCRETE BARRIERS (14-STRUCTURAL CONCRETE INSERTS REQ'D.) SEE SHEET 11 OF 13 FOR SECTION OF CONCRETE INSERT LOCATION.

PLAN OF TYPE VIII INTERIOR CORED SLAB UNIT

ANCHORS FOR PORTABLE CONCRETE BARRIER HAVE BEEN SPACED ACCORDING TO ROADWAY STANDARD 1170.01. THE CONTRACTOR SHALL CONFIRM THE USE OF BARRIERS MATCHING THIS STANDARD AND THE LOCATIONS OF THE ANCHORS. IF THE PORTABLE CONCRETE BARRIER DOES NOT MEET THE STANDARD'S DETAILS AND THE SPACING OF THE ANCHORS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING ANCHORS PROPERLY SPACED FOR THE PROPOSED BARRIERS AS APPROVED BY THE ENGINEER.

PROJECT NO. BR-0032

MADISON COUNTY

STATION: 13+50.00 -L-

SHEET 7 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 70'-0'' PRESTRESSED CONCRETE CORED SLAB UNIT TYPE VI, TYPE VII AND TYPE VIII (SPAN B)

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
Emily E. Murray
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2/22/2022

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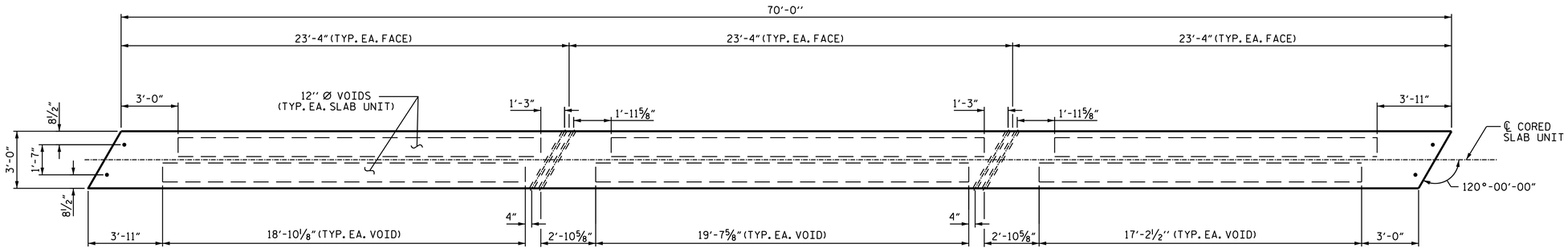
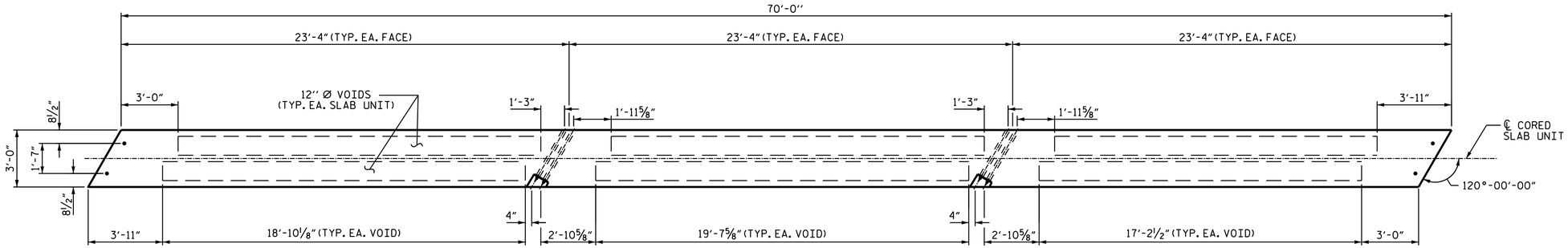
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : D. A. GLADDEN DATE : 4/21
CHECKED BY : D. R. SMITH DATE : 11/21
DESIGN ENGINEER OF RECORD: D. R. SMITH DATE : 11/21

16-FEB-2022 16:15
$$$$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$$$
brent.barnhill AT C-1000010



PLAN OF TYPE IX INTERIOR CORED SLAB UNIT



PLAN OF TYPE X EXTERIOR CORED SLAB UNIT

PROJECT NO. BR-0032

MADISON COUNTY

STATION: 13+50.00 -L-

SHEET 8 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 70'-0'' PRESTRESSED CONCRETE CORED SLAB UNIT TYPE IX AND TYPE X (SPAN B)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			34

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
Emily E. Murray
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2/22/2022

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Tel. 919-854-0344 Fax. 919-854-0355
NC License No. F-0765

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DRAWN BY : D. A. GLADDEN DATE : 4/21
CHECKED BY : D. R. SMITH DATE : 11/21
DESIGN ENGINEER OF RECORD: D. R. SMITH DATE : 11/21

16-FEB-2022 10:28
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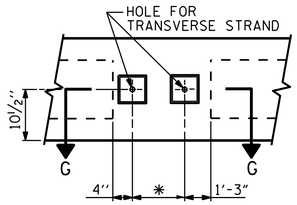
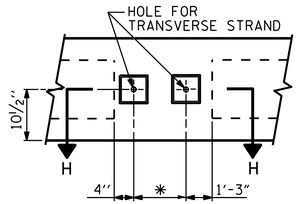
brent.barnhill AT C-1000010



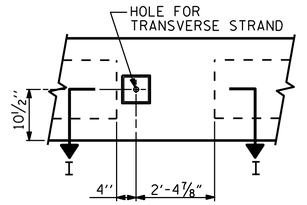
VIEW A-A (SHEET 1 OF 13)

* SEE SECTION G-G



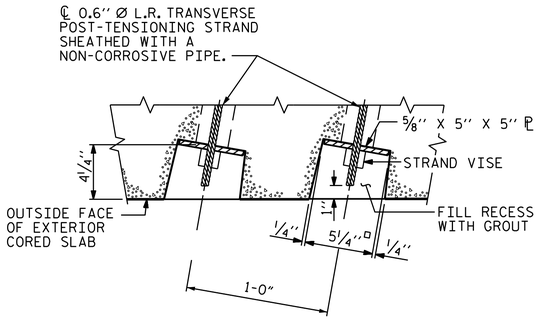
VIEW B-B (SHEET 1 OF 13)

* SEE SECTION H-H



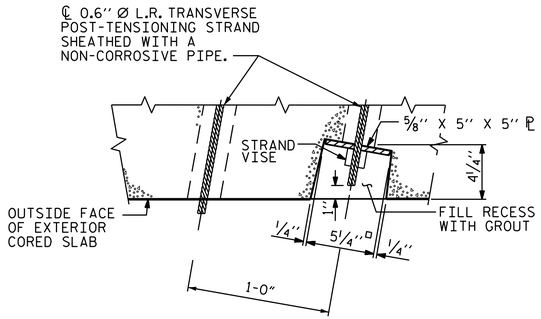
VIEW C-C (SHEET 1 OF 13)

SEE SECTION I-I



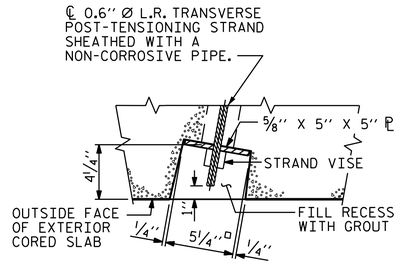
SECTION G-G

FILL RECESSES WITH GROUT



SECTION H-H

FILL RECESSES WITH GROUT



SECTION I-I

FILL RECESSES WITH GROUT

TYPE I EXTERIOR
CORED SLAB UNIT

TYPE III INTERIOR
CORED SLAB UNIT

TYPE V EXTERIOR
CORED SLAB UNIT

GROUTED RECESS AT END OF POST TENSIONED STRAND CORED SLABS (SPAN A)

PROJECT NO. BR-0032

MADISON COUNTY

STATION: 13+50.00 -L-

SHEET 9 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0'' X 1'-9''
PRESTRESSED CONCRETE
CORED SLAB UNIT
(SPAN A)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : D. A. GLADDEN DATE : 4/21
CHECKED BY : D. R. SMITH DATE : 11/21
DESIGN ENGINEER OF RECORD: D. R. SMITH DATE : 11/21

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Raleigh, NC 27607
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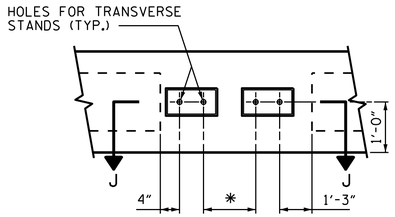
NC License No. F-0765

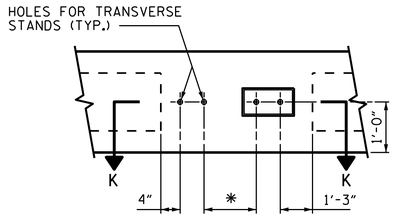
NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY C. MURRAY
Emily C. Murray
2/22/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



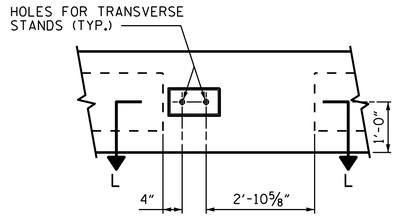
VIEW D-D (SHEET 2 OF 13)

* SEE SECTION J-J



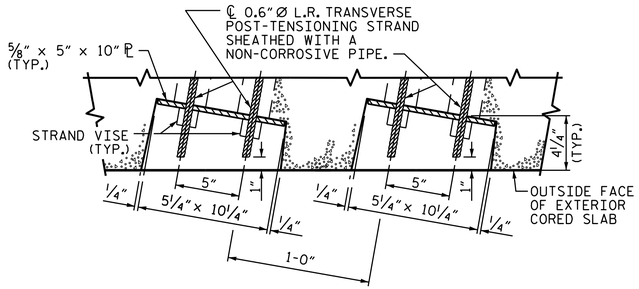
VIEW E-E (SHEET 2 OF 13)

* SEE SECTION K-K



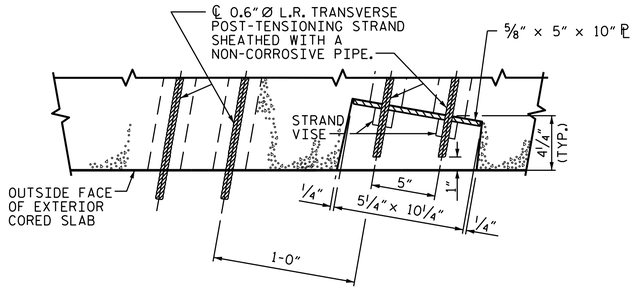
VIEW F-F (SHEET 2 OF 13)

SEE SECTION L-L



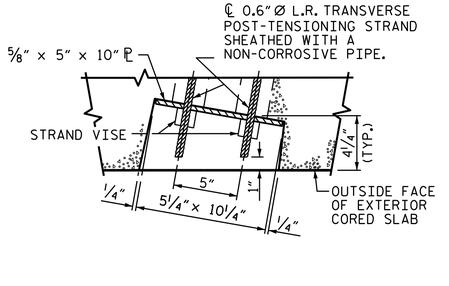
SECTION J-J

FILL RECESSES WITH GROUT



SECTION K-K

FILL RECESS WITH GROUT



SECTION L-L

FILL RECESSES WITH GROUT

TYPE VI EXTERIOR CORED SLAB UNIT

TYPE VIII INTERIOR CORED SLAB UNIT

TYPE X EXTERIOR CORED SLAB UNIT

GROUTED RECESS AT END OF POST TENSIONED STRAND CORED SLABS (SPAN B)

PROJECT NO. BR-0032

MADISON COUNTY

STATION: 13+50.00 -L-

SHEET 10 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0'' X 2'-0'' PRESTRESSED CONCRETE CORED SLAB UNIT (SPAN B)

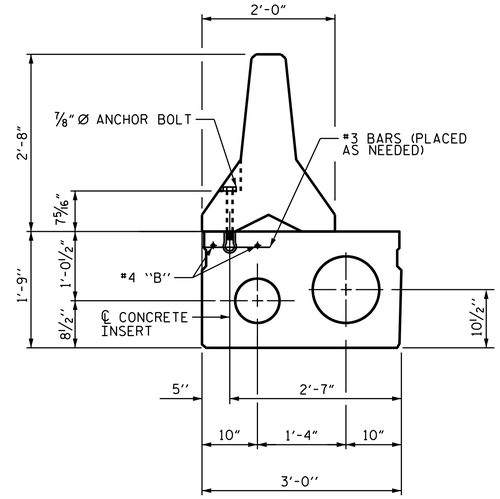
DRAWN BY : D. A. GLADDEN DATE : 4/21
CHECKED BY : D. R. SMITH DATE : 11/21
DESIGN ENGINEER OF RECORD: D. R. SMITH DATE : 11/21

VOLKERT
5430 Wade Park Blvd., Suite 410
Raleigh, NC 27607
Tel. 919-854-0344 Fax. 919-854-0355
NC License No. F-0765

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
Emily E. Murray
A689F83FD9D74F8...
2/22/2022

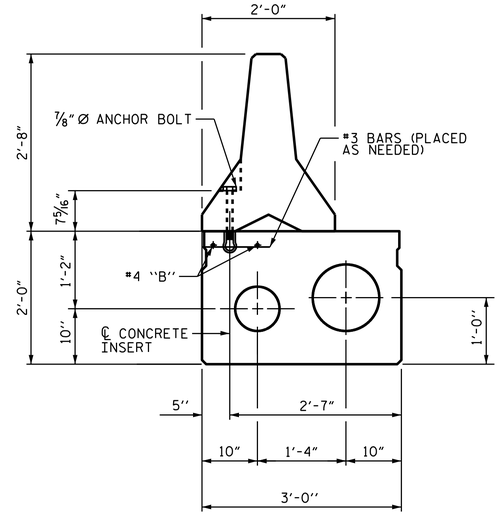
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			34



SECTION OF CONCRETE INSERT LOCATION (SPAN A)

(TYPE III CORED SLAB UNIT)



SECTION OF CONCRETE INSERT LOCATION (SPAN B)

(TYPE VIII CORED SLAB UNIT)

NOTES

THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 5/8".

B. 1 - 7/8" Ø X 8 1/2" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A325. BOLT AND WASHER SHALL BE GALVANIZED. AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø X 8 1/2" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A325. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.

D. STRUCTURAL CONCRETE INSERT ASSEMBLIES SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE COST OF THE STRUCTURAL CONCRETE INSERT ASSEMBLY, COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR 3'-0" X 1'-9" AND 3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLABS.

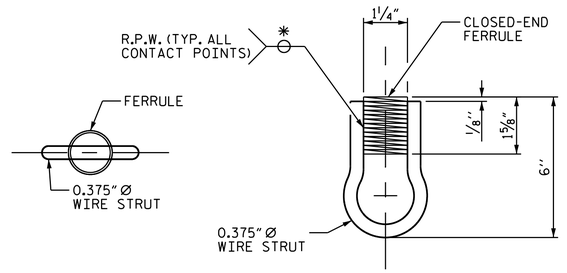
TO FACILITATE PLACEMENT OF STRUCTURAL CONCRETE INSERT ASSEMBLIES, #3 BARS MAY BE TIED TO THE #4 "B" BARS IN THE CORED SLAB UNIT. THE COST OF THE #3 BARS SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR 3'-0" X 1'-9" AND 3'-0" X 2'-0" PRESTRESSED SLABS.

STIRRUPS IN THE CORED SLAB UNITS ME BE SHIFTED SLIGHTY AS NECESSARY TO CLEAR STRUCTURAL CONCRETE INSERT ASSSEMBLIES.

FERRULES SHALL BE PLUGGED DURING CASTING OF THE CORED SLAB UNIT AS RECOMMENDED BY THE MANUFACTURER.

SEE TRAFFIC CONTROL PLANS FOR PAY LIMITS OF THE ANCHORED PORTABLE CONCRETE BARRIER.

AFTER REMOVAL OF TEMPORARY BARRIER RAIL, THE STRUCTURAL CONCRETE INSERTS SHALL BE FILLED WITH GROUT.



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

PROJECT NO. BR-0032

MADISON COUNTY

STATION: 13+50.00 -L-

SHEET 11 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CONCRETE CORED SLAB UNIT DETAILS

DRAWN BY : D. A. GLADDEN DATE : 4/21
CHECKED BY : D. R. SMITH DATE : 11/21
DESIGN ENGINEER OF RECORD: D. R. SMITH DATE : 11/21

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NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
Emily E. Murray
A689F83FD9D74F8...
2/22/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			34

BILL OF MATERIAL FOR ONE 30′ CORED SLAB UNIT

				EXTERIOR UNIT (TYPE I)		EXTERIOR UNIT (TYPE V)		INTERIOR UNIT (TYPE II)		INTERIOR UNIT (TYPE III)		INTERIOR UNIT (TYPE IV)	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT
B2	2	#4	STR	29′-7″	40	29′-7″	40	29′-7″	40	29′-7″	40	29′-7″	40
S1	8	#5	3	4′-6″	38	4′-6″	38	4′-6″	38	4′-6″	38	4′-6″	38
S2	62	#4	3	5′-4″	221	5′-4″	221	5′-4″	221	5′-4″	221	5′-4″	221
✳ S3	39	#5	1	5′-7″	227	5′-7″	227						
S5	4	#4	3	5′-5″	14	5′-5″	14	5′-5″	14	5′-5″	14	5′-5″	14
S6	4	#4	3	5′-6″	15	5′-6″	15	5′-6″	15	5′-6″	15	5′-6″	15
S7	4	#4	3	5′-7″	15	5′-7″	15	5′-7″	15	5′-7″	15	5′-7″	15
S8	4	#4	3	5′-9″	15	5′-9″	15	5′-9″	15	5′-9″	15	5′-9″	15
REINFORCING STEEL LBS.					358		358		358		358		358
✳ EPOXY COATED REINFORCING STEEL LBS.					227		227						
5000 P.S.I. CONCRETE CU. YDS.					4.7		4.7		4.7		5.0		4.7
0.6″ Ø L.R. STRANDS No.					9		9		9		9		9

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT (30′ UNITS)

	ASPHALT OVERLAY THICKNESS	RAIL HEIGHT
	@ MID-SPAN	@ MID-SPAN
LEFT SIDE	2½″	3′-8⅞″
RIGHT SIDE	2¾″	3′-8⅞″

CORED SLABS REQUIRED (30′ UNITS)

		NUMBER	LENGTH	TOTAL LENGTH
STAGE I	TYPE I	1	30′-0″	30′-0″
	TYPE II	4	30′-0″	120′-0″
	TYPE III	1	30′-0″	30′-0″
STAGE II	TYPE IV	5	30′-0″	150′-0″
	TYPE V	1	30′-0″	30′-0″
TOTAL		12		360′-0″

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

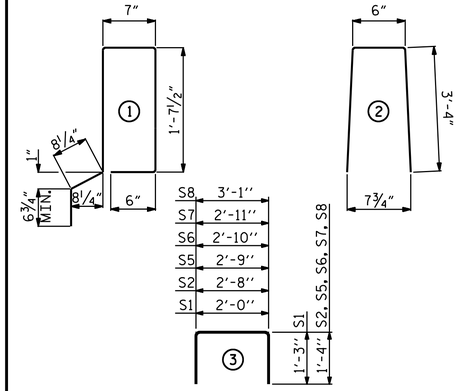
BAR	BARS PER PAIR OF EXTERIOR UNITS 30′ UNIT	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B9	20	20	#5	STR	29′-6″	615
✳ S4	78	78	#5	2	7′-2″	583
✳ EPOXY COATED REINFORCING STEEL				LBS.		1198
CLASS AA CONCRETE				CU.YDS.		7.7
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		60.29

DEAD LOAD DEFLECTION AND CAMBER

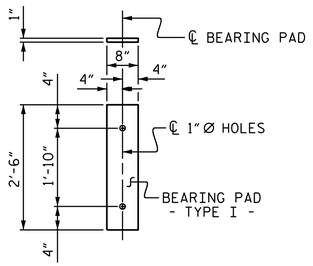
	3′-0″ x 1′-9″
30′ CORED SLAB UNIT	0.6″ Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	¼″ ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD✳✳	⅛″ ↓
FINAL CAMBER	⅛″ ↑

✳✳ INCLUDES FUTURE WEARING SURFACE

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



FIXED END
(TYPE I - 24 REQ′D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

NOTES

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

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

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

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

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

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

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

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

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

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

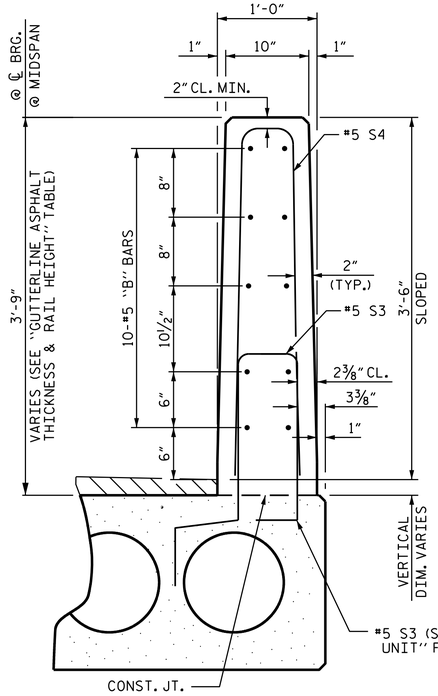
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

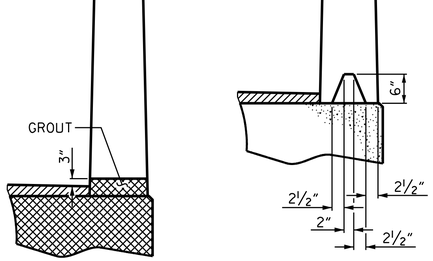
THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4′-0″ CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

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.

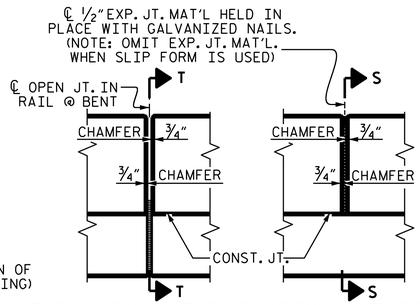


SECTION THRU RAIL



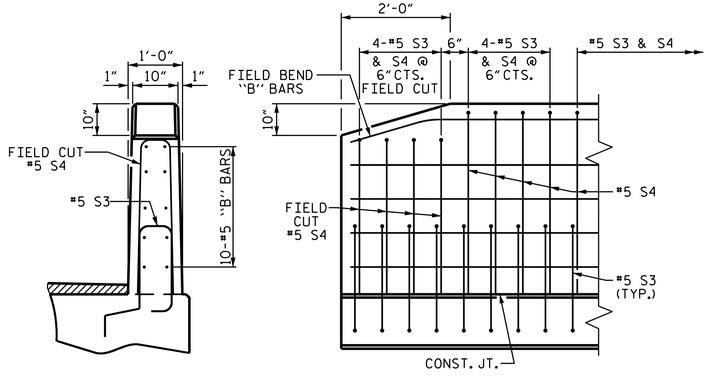
SECTION T-T
AT OPEN JOINT AT BENT
(THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)

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



END VIEW

SIDE VIEW

END OF RAIL DETAILS

CONCRETE RELEASE STRENGTH

UNIT	PSI
30′ UNITS	4000

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

PROJECT NO. BR-0032
MADISON COUNTY
STATION: 13+50.00 -L-

SHEET 12 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
3′-0″ X 1′-9″
PRESTRESSED CONCRETE
CORED SLAB UNIT
120° SKEW
(SPAN A)

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER Emily V. Murray
A689F83F09D74F8...
2/22/2022

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			34

ASSEMBLED BY : D. A. GLADDEN DATE : 9/21
CHECKED BY : D. R. SMITH DATE : 11/21
DRAWN BY : DGE 5/09
CHECKED BY : BCH 6/09
REV. 5/18 MAA/THC

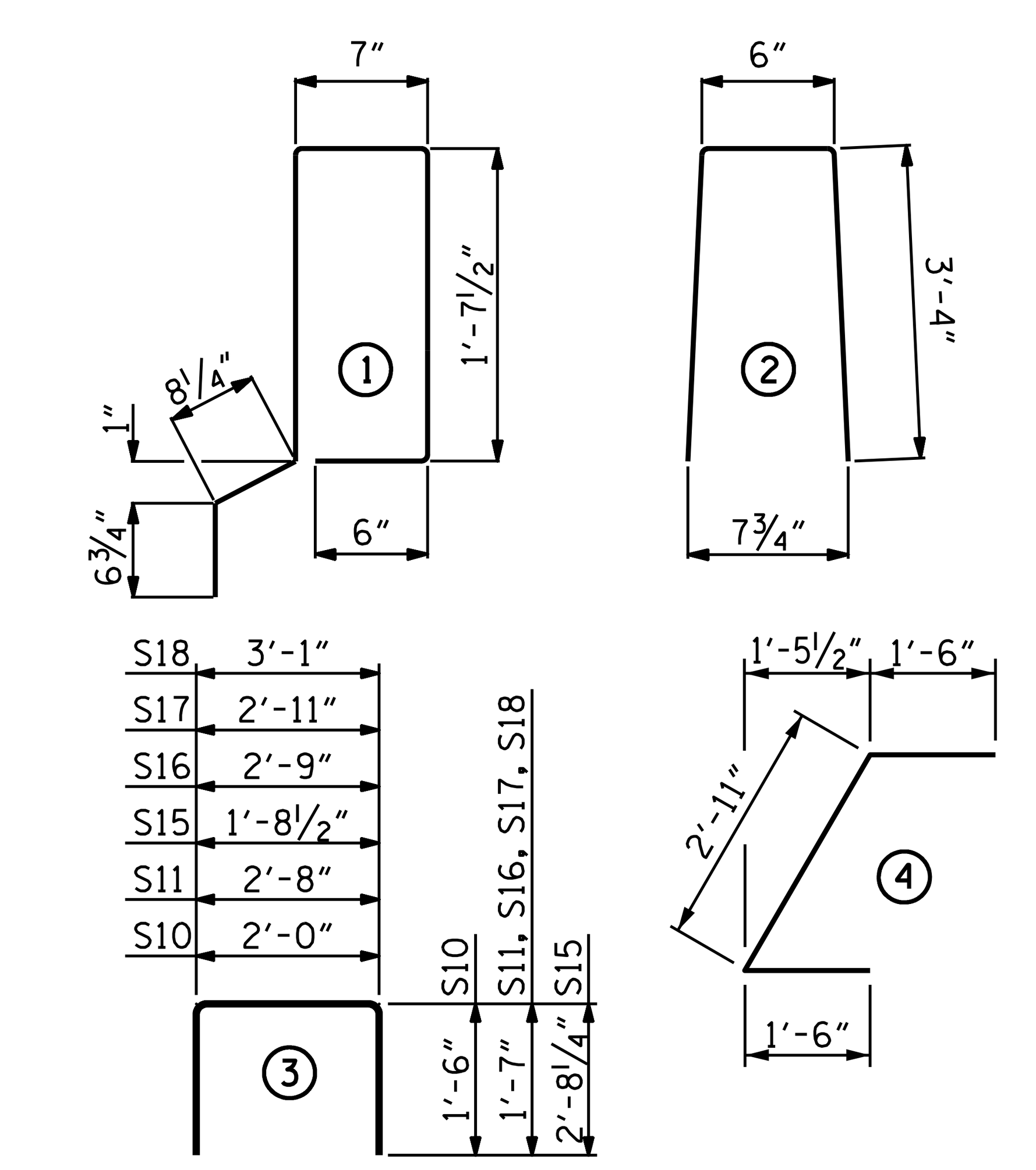
16-FEB-2022 16:19
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
brent.barnhill AT C-1000010

STD. NO. 21″PCS3_36_120S

BILL OF MATERIAL FOR ONE 70' CORED SLAB UNIT

				EXTERIOR UNIT (TYPE VI)		EXTERIOR UNIT (TYPE X)		INTERIOR UNIT (TYPE VII)		INTERIOR UNIT (TYPE VIII)		INTERIOR UNIT (TYPE IX)	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT
B22	6	#4	STR	24'-6"	98	24'-6"	98	24'-6"	98	24'-6"	98	24'-6"	98
S10	8	#5	3	5'-0"	42	5'-0"	42	5'-0"	42	5'-0"	42	5'-0"	42
S11	170	#4	3	5'-10"	662	5'-10"	662	5'-10"	662	5'-10"	662	5'-10"	662
*S12	79	#5	1	5'-7"	460	5'-7"	460						
S14	4	#4	4	5'-11"	16	5'-11"	16	5'-11"	16	5'-11"	16	5'-11"	16
S15	4	#5	3	7'-1"	30	7'-1"	30	7'-1"	30	7'-1"	30	7'-1"	30
S16	4	#4	3	5'-11"	16	5'-11"	16	5'-11"	16	5'-11"	16	5'-11"	16
S17	4	#4	3	6'-1"	16	6'-1"	16	6'-1"	16	6'-1"	16	6'-1"	16
S18	4	#4	3	6'-3"	17	6'-3"	17	6'-3"	17	6'-3"	17	6'-3"	17
REINFORCING STEEL	LBS.				897		897		897		897		897
* EPOXY COATED REINFORCING STEEL	LBS.				460		460						
7000 P.S.I. CONCRETE	CU. YDS.				12.3		12.3		12.3		13.2		12.3
0.6" Ø L.R. STRANDS	No.				28		28		28		28		28

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

NOTES

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

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

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

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

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

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

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

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

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

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

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

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

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

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT (70' UNITS)

	ASPHALT OVERLAY THICKNESS	RAIL HEIGHT
	@ MID-SPAN	@ MID-SPAN
LEFT SIDE	2⅛"	3'-8¼"
RIGHT SIDE	1⅞"	3'-8¼"

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

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

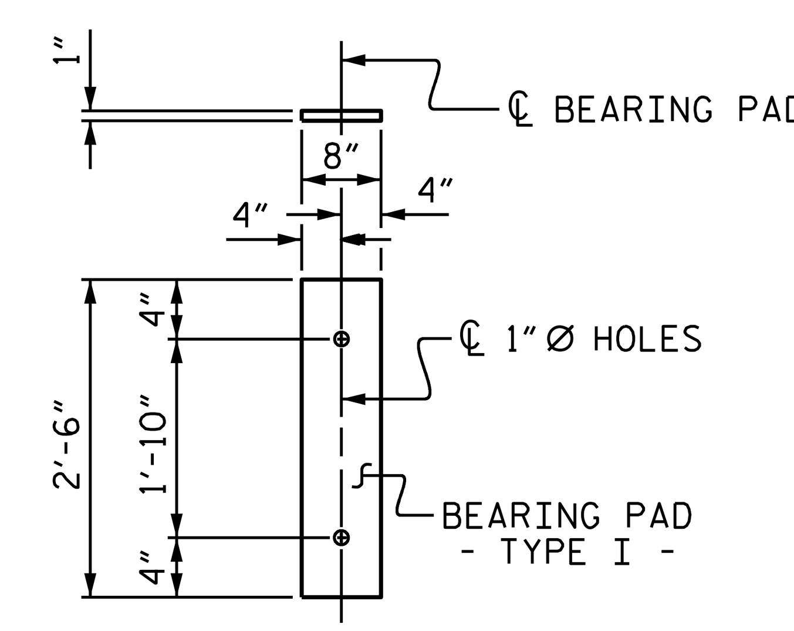
CORED SLABS REQUIRED (70' UNITS)

		NUMBER	LENGTH	TOTAL LENGTH
STAGE I	TYPE VI	1	70'-0"	70'-0"
	TYPE VII	4	70'-0"	280'-0"
	TYPE VIII	1	70'-0"	70'-0"
STAGE II	TYPE IX	5	70'-0"	350'-0"
	TYPE X	1	70'-0"	70'-0"
TOTAL		12		840'-0"

DEAD LOAD DEFLECTION AND CAMBER

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

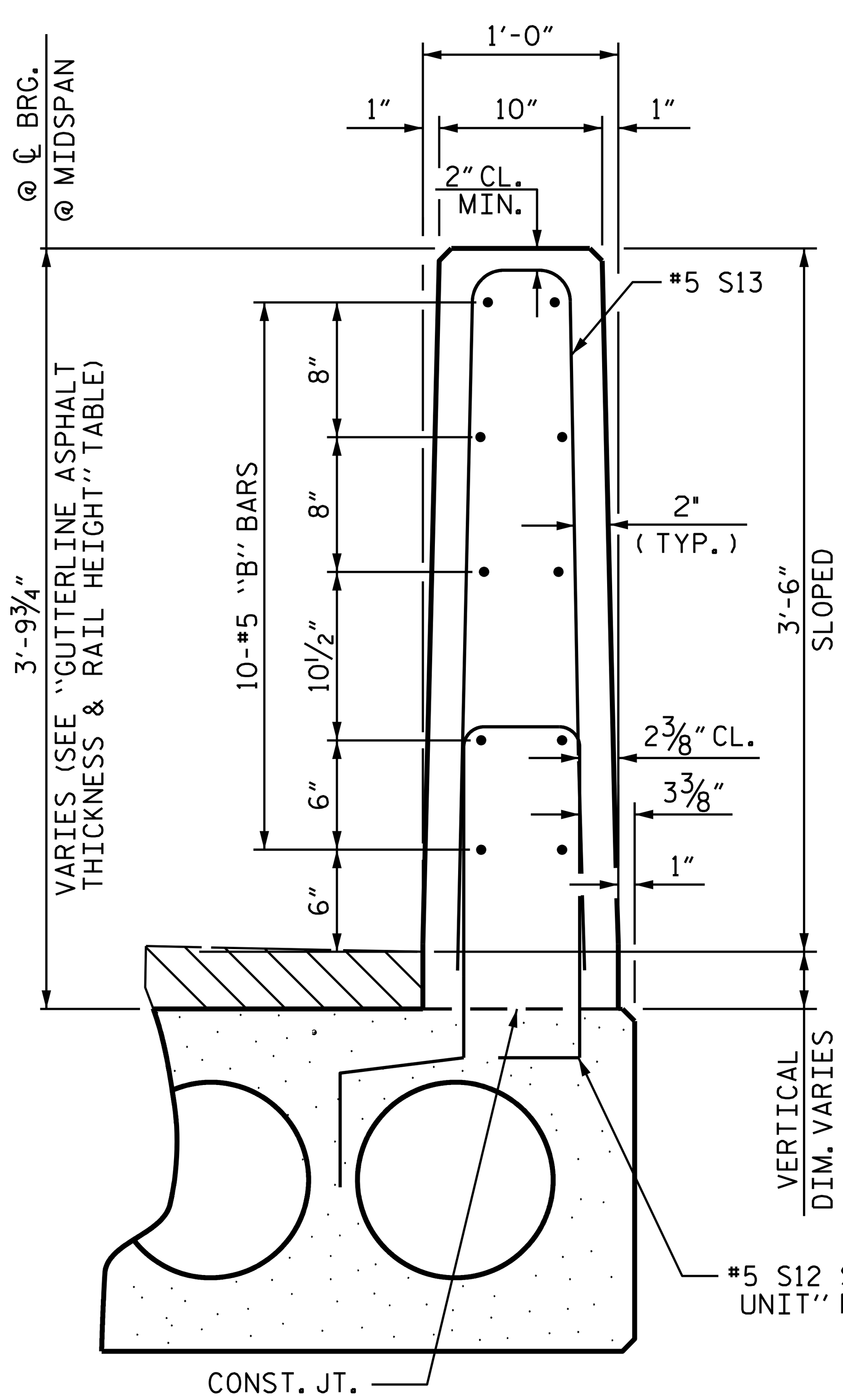
** INCLUDES FUTURE WEARING SURFACE



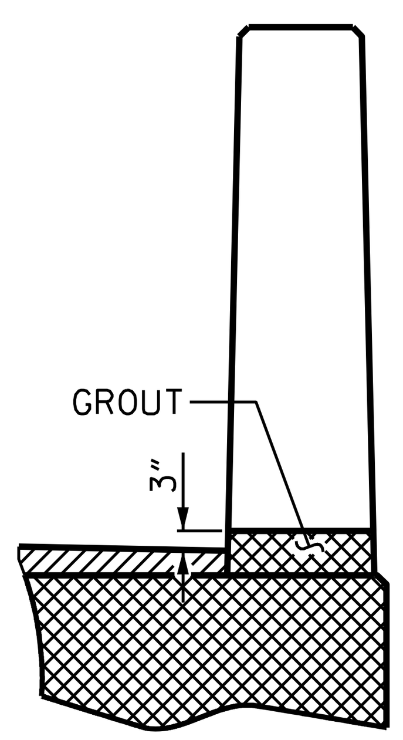
FIXED END
(TYPE I - 24 REQ'D)

ELASTOMERIC BEARING DETAILS

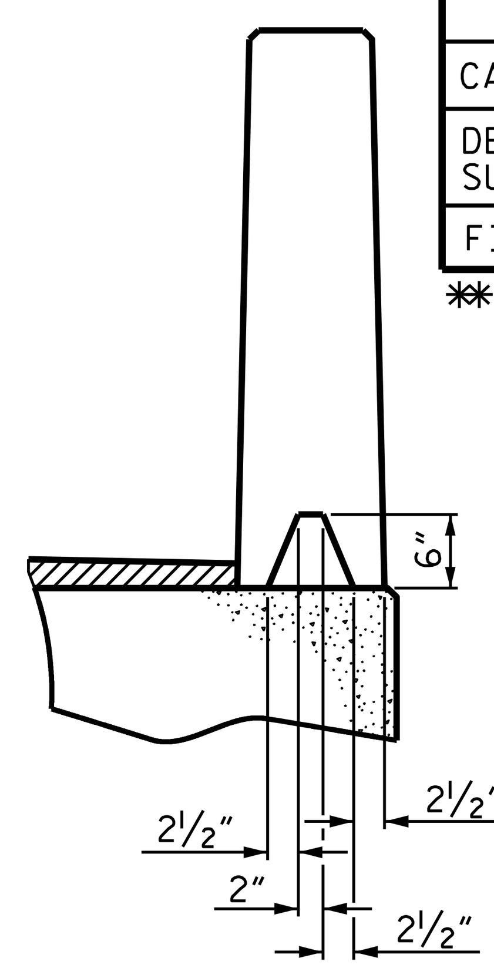
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



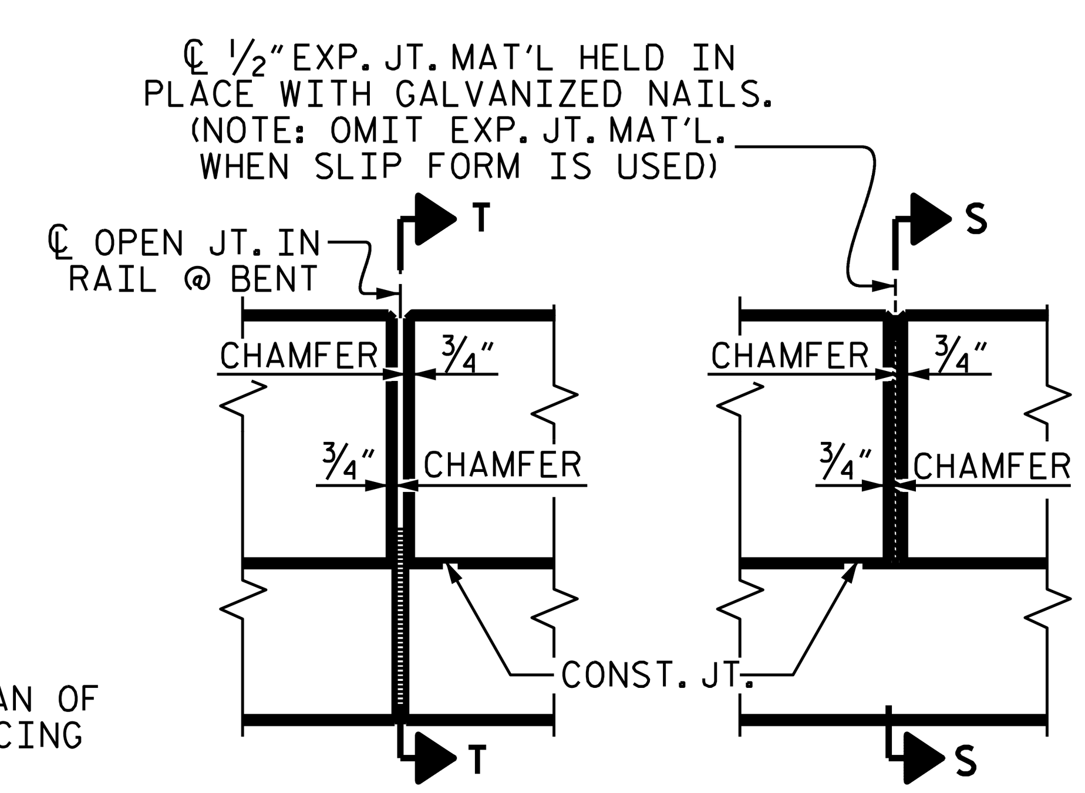
SECTION THRU RAIL



SECTION T-T
AT OPEN JOINT AT BENT (THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)

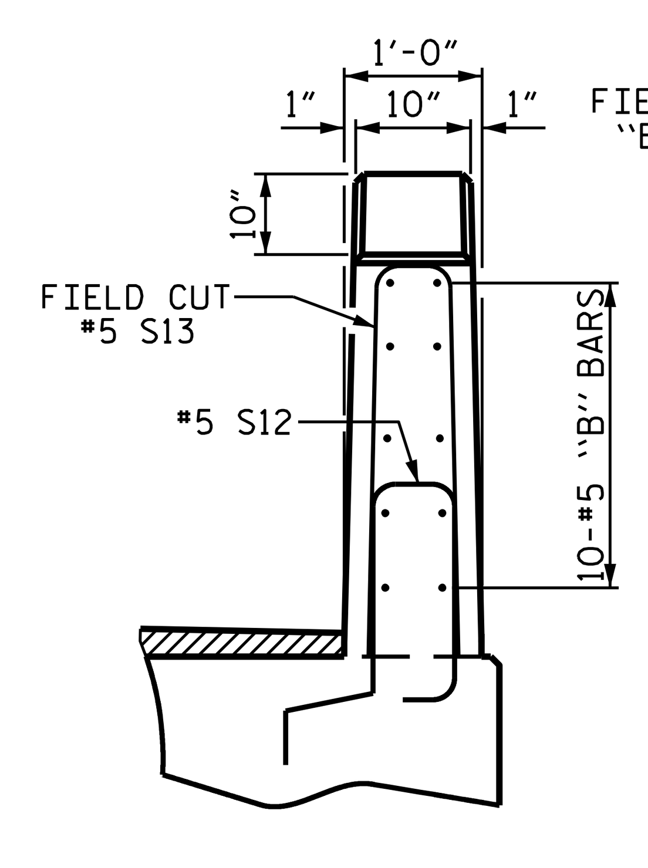


SECTION S-S
AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

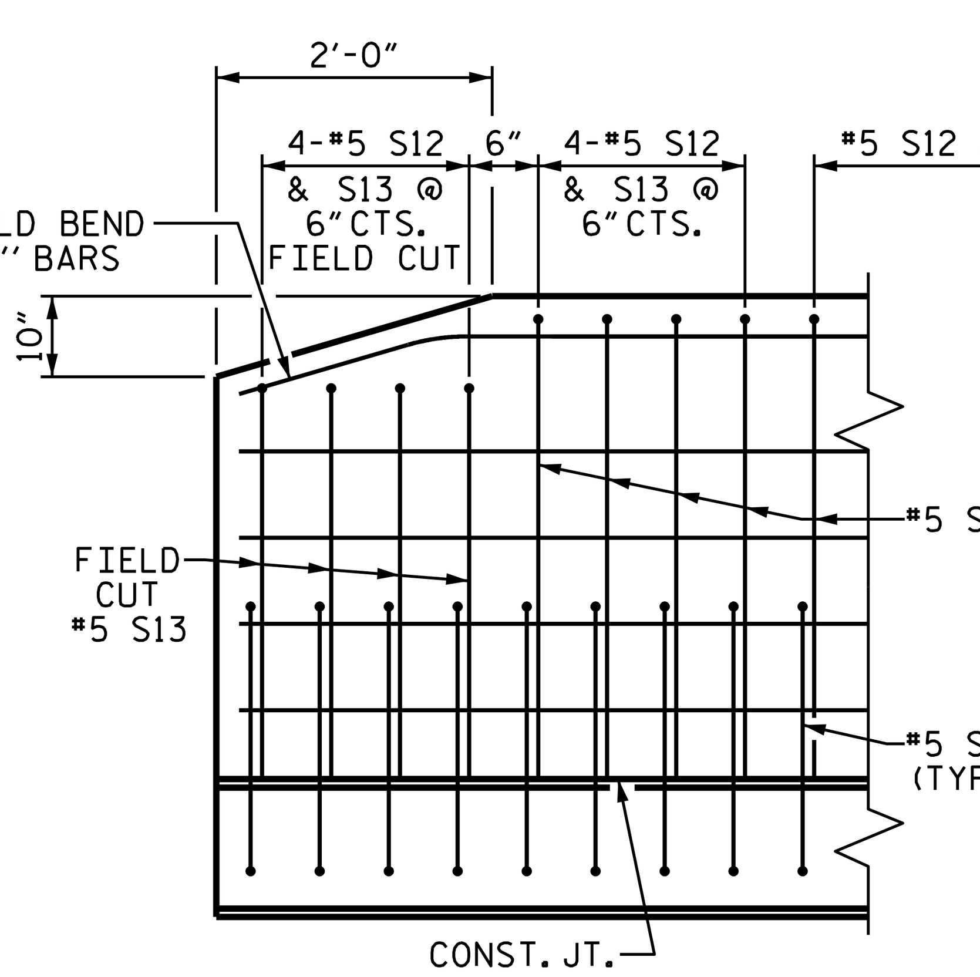


ELEVATION AT EXPANSION JOINTS

VERTICAL CONCRETE BARRIER RAIL DETAILS



END VIEW



SIDE VIEW

END OF RAIL DETAILS

CONCRETE RELEASE STRENGTH

UNIT	PSI
70' UNITS	5500

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

PROJECT NO. BR-0032
MADISON COUNTY
STATION: 13+50.00 -L-

SHEET 13 OF 13

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
Emily E. Murray
2/22/2022

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT 120° SKEW (SPAN B)

VOLKERT
5430 Wade Park Blvd., Suite 410
Raleigh, NC 27607
Tel. 919-854-0344 Fax. 919-854-0355
NC License No. F-0765

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CHECKED BY : D. R. SMITH	DATE : 11/21		
DRAWN BY : MAA 6/10		REV. 5/18	MAA/THC
CHECKED BY : MKT 7/10			

STD. NO. 24PCS3_36_60&120S

16-FEB-2022 11:15
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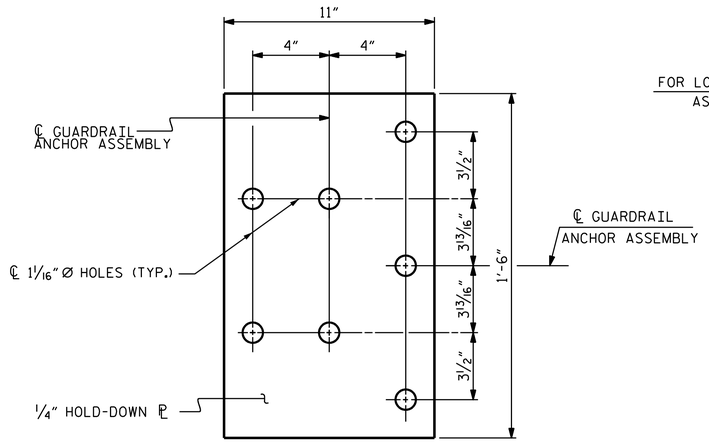
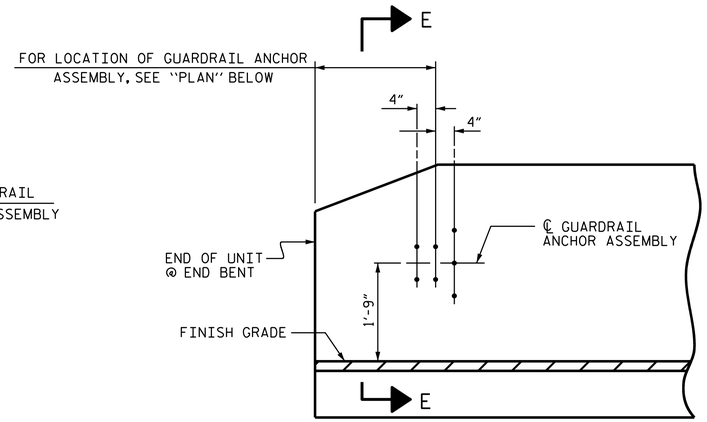
brent.barnhill AT C-1000010



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.)

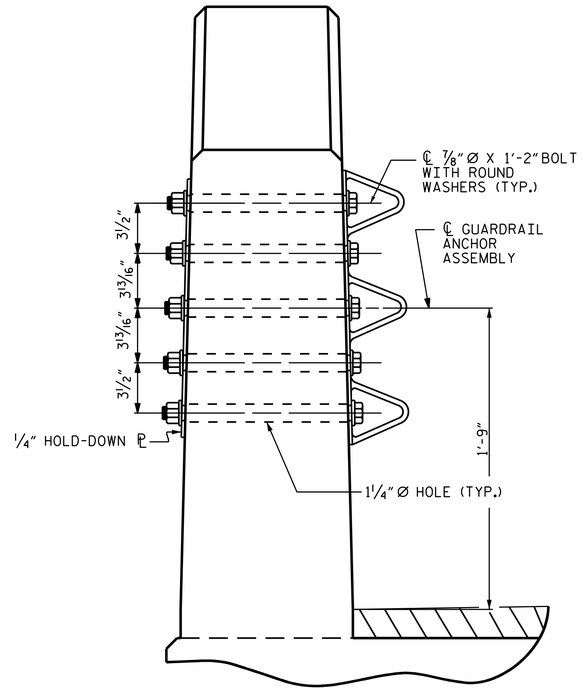
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

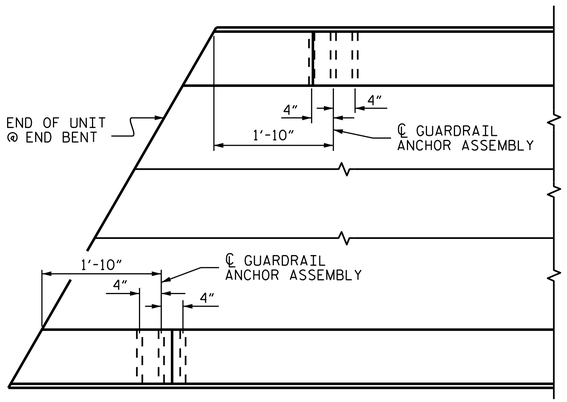
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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. BR-0032

MADISON **COUNTY**

STATION: 13+50.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE DETAILS FOR VERTICAL CONCRETE BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
Digitally signed by Emily E. Murray
2/22/2022

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CHECKED BY : D. R. SMITH	DATE : 11/21		
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CHECKED BY : GM 5/10		REV. 12/17	MAA/THC
		REV. 5/18	MAA/THC

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brent.barnhill AT C-1000010

(SHT 1b) STD. NO. GRA3

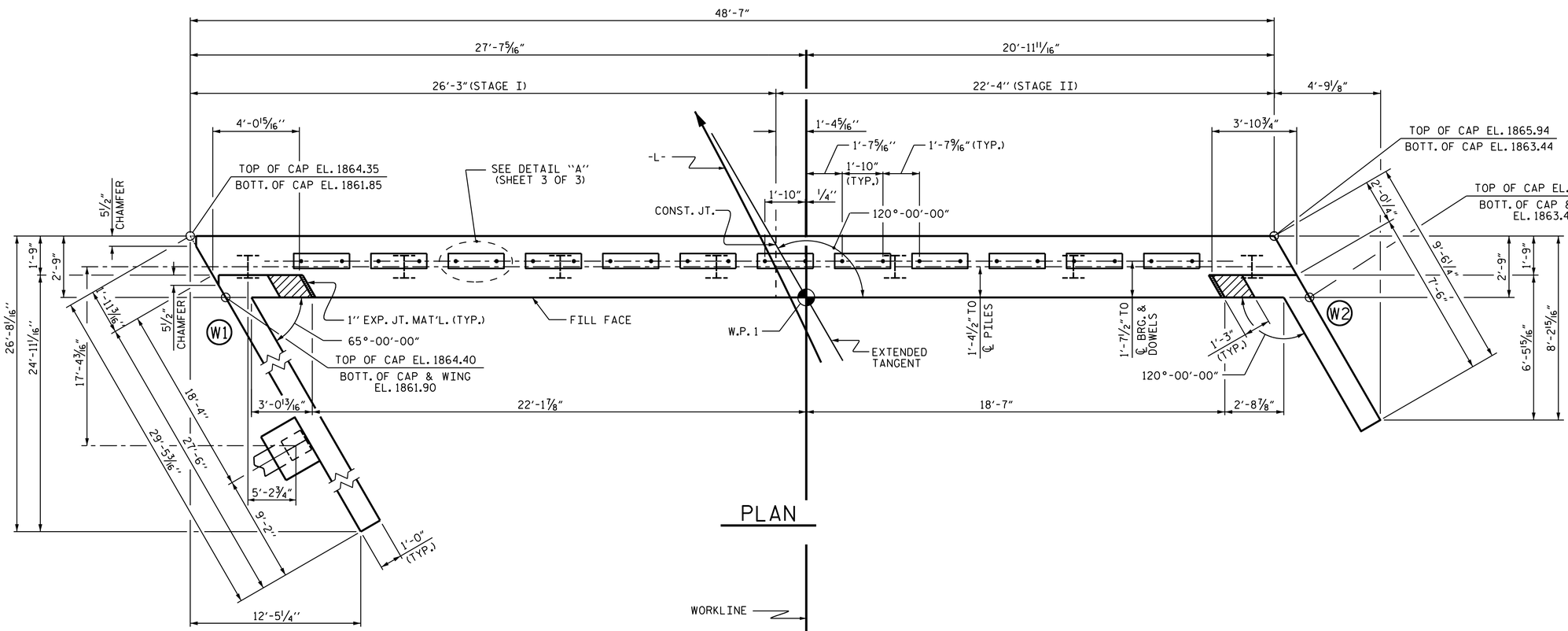
NOTES

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

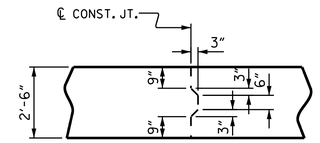
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR WING DETAILS, SEE SHEET 2 OF 3.

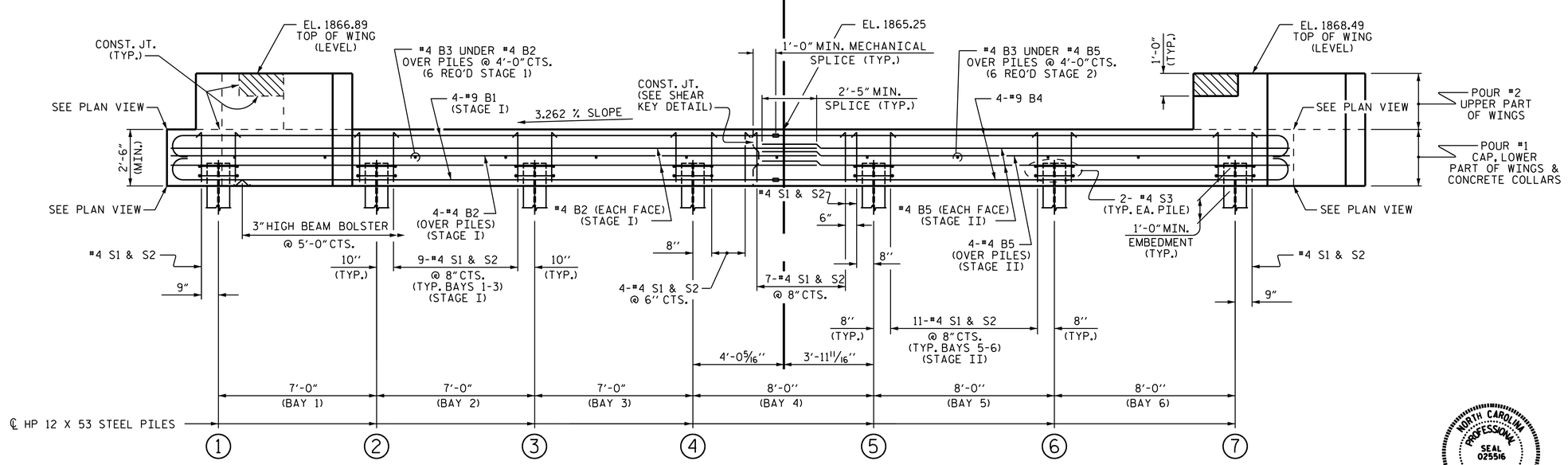


PLAN



SHEAR KEY DETAIL

TOP OF PILE ELEVATIONS	
①	1862.95
②	1863.18
③	1863.41
④	1863.64
⑤	1863.90
⑥	1864.16
⑦	1864.42



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION THRU CAP, SEE SHEET 3 OF 3.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 3 OF 3.

PROJECT NO. BR-0032
MADISON COUNTY
STATION: 13+50.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

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CHECKED BY : MKT	01/10		

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emily.murray AT C-1000324

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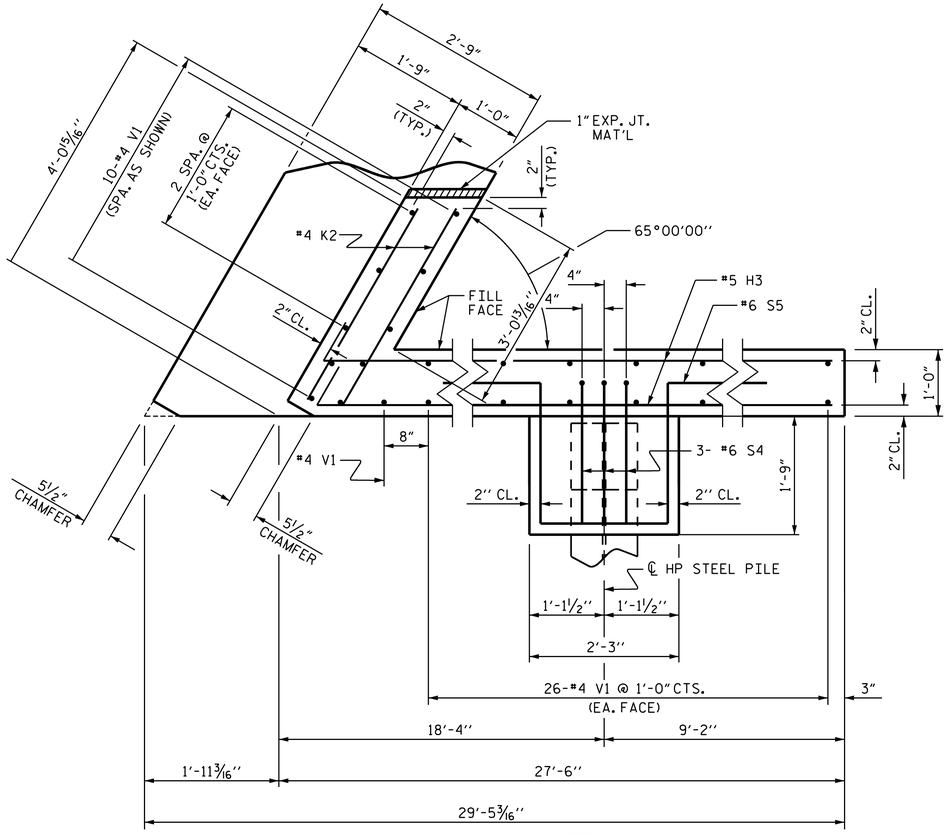
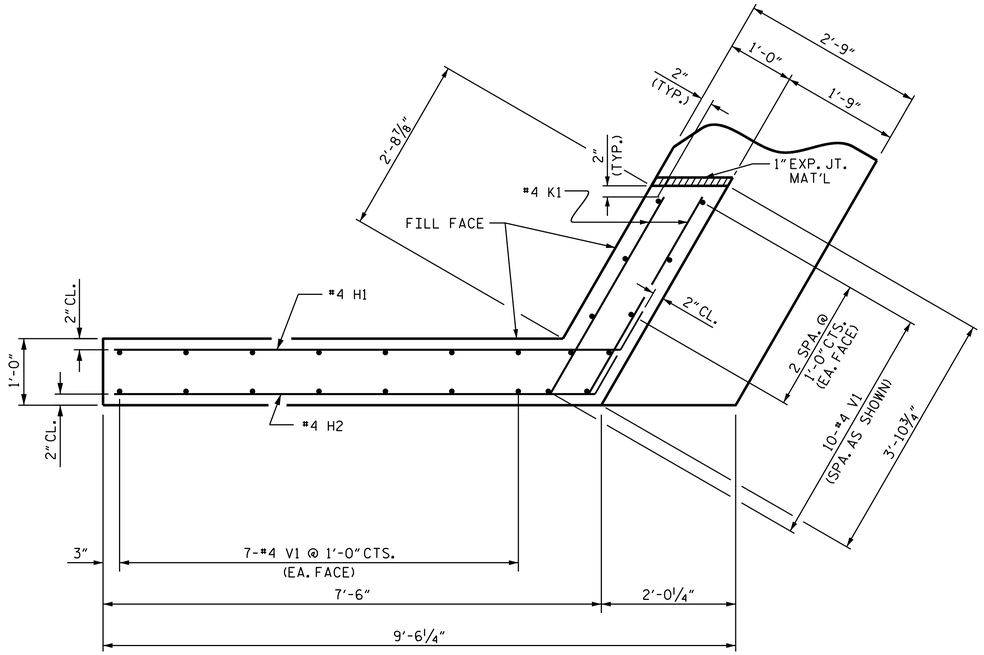
Emily E. Murray
ACKNOWLEDGED
2/22/2022

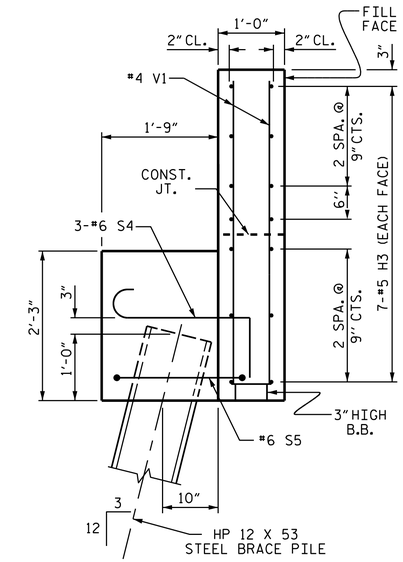
STD. NO. EB_36_120S



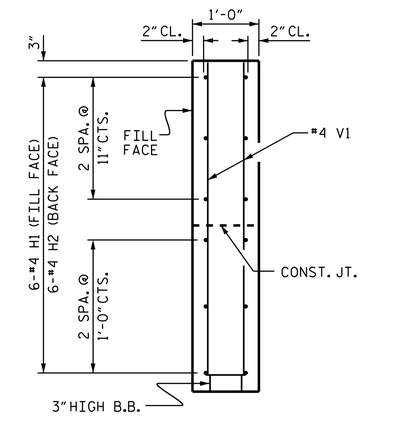
PLAN OF WING (W1)



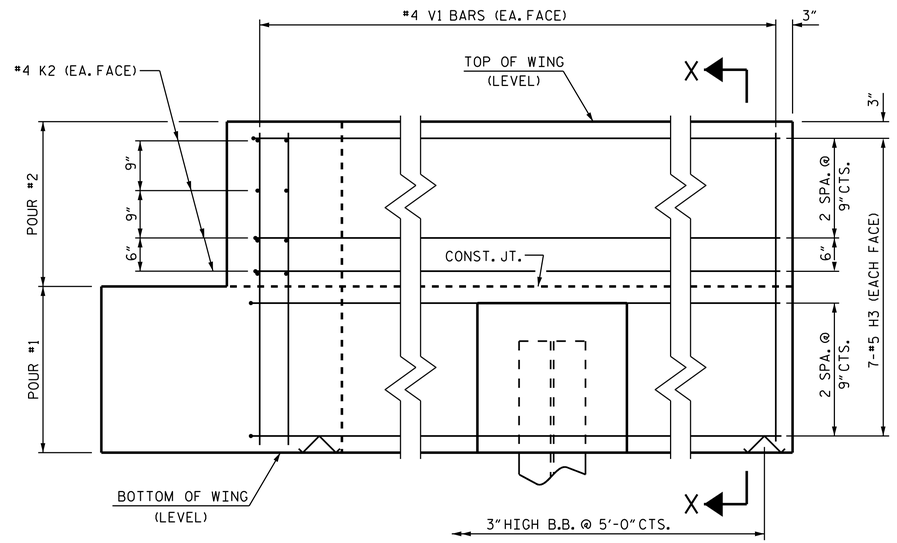
PLAN OF WING (W2)



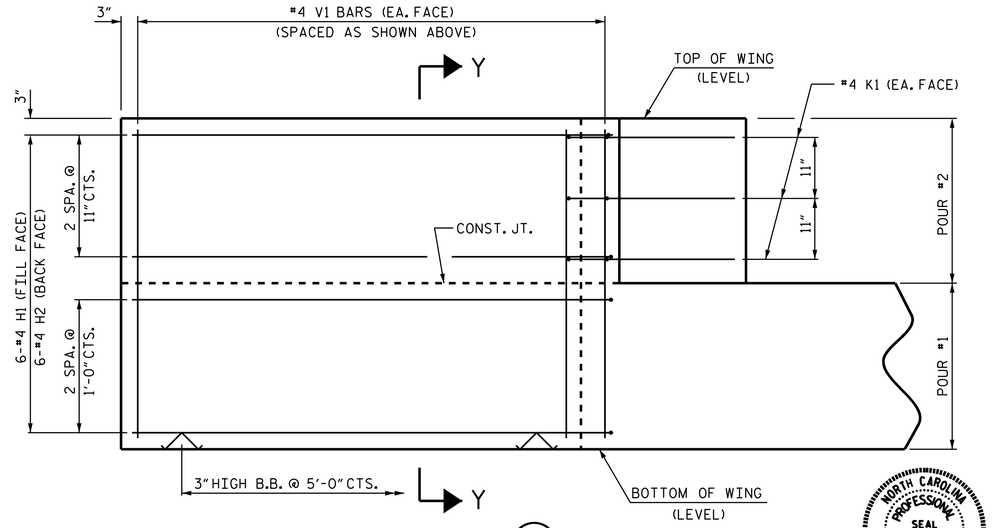
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

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CHECKED BY : MKT	01/10		

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emily.murray AT C-1000324

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Raleigh, NC 27607
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NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
Emily E. Murray
A689F83F09074F8...
2/22/2022

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MADISON COUNTY
STATION: 13+50.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #1
WING DETAILS

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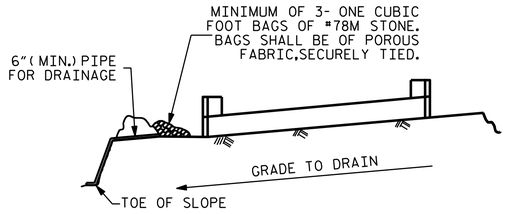
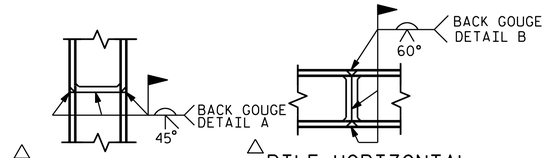


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

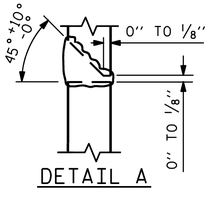
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

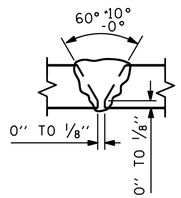


△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



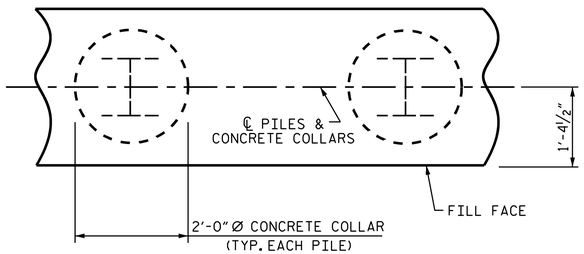
DETAIL A



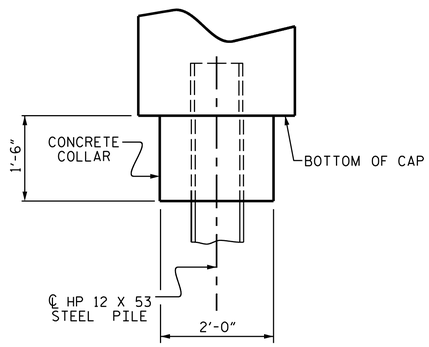
DETAIL B

△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

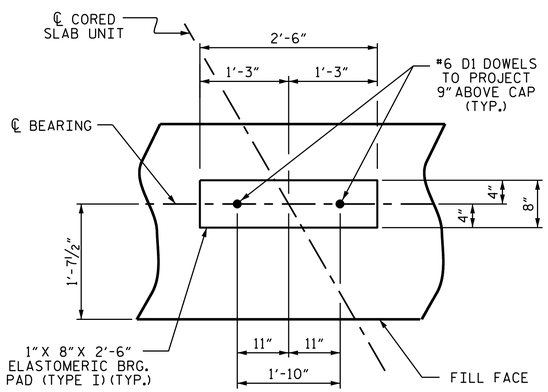


PLAN

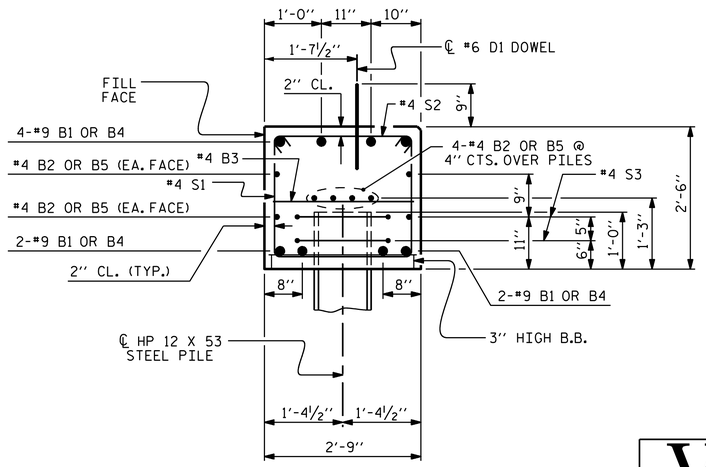


ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL



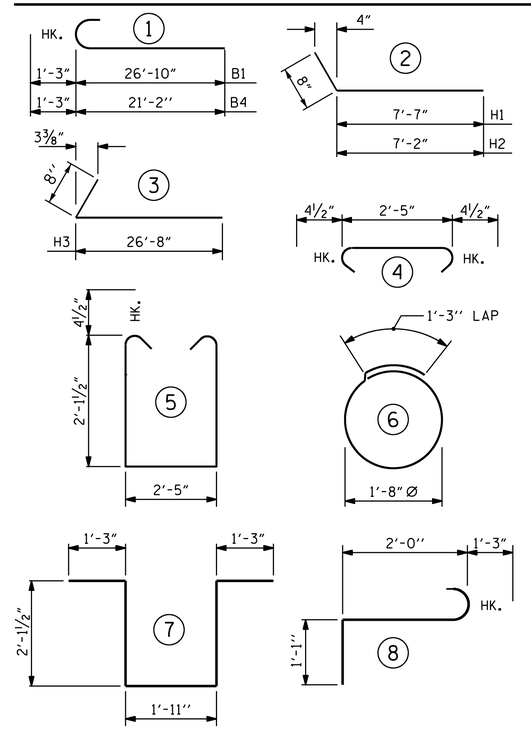
DETAIL "A"



SECTION THRU CAP

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	28'-1"	764
B2	8	#4	STR	28'-9"	154
B3	6	#4	STR	2'-5"	10
D1	13	#6	STR	1'-6"	29
H3	14	#5	3	27'-4"	399
K2	8	#4	STR	3'-5"	18
S1	32	#4	5	7'-5"	159
S2	32	#4	4	3'-2"	68
S3	8	#4	6	6'-6"	35
S4	3	#6	8	4'-4"	20
S5	1	#6	7	8'-8"	13
V1	63	#4	STR	4'-8"	196

REINFORCING STEEL (STAGE I) 1865 LBS.

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3	6	#4	STR	2'-5"	10
B4	8	#9	1	22'-5"	610
B5	8	#4	STR	22'-0"	118
D1	11	#6	STR	1'-6"	25
H1	6	#4	2	8'-3"	33
H2	6	#4	2	7'-10"	31
K1	6	#4	STR	3'-6"	14
S1	31	#4	5	7'-5"	154
S2	31	#4	4	3'-2"	66
S3	6	#4	6	6'-6"	26
V1	24	#4	STR	4'-8"	75

REINFORCING STEEL (STAGE II) 1162

CLASS A CONCRETE BREAKDOWN (STAGE I)			CLASS A CONCRETE BREAKDOWN (STAGE II)		
POUR #1	CAP, LOWER PART OF WINGS & COLLARS	10.3 C.Y.	POUR #1	CAP, LOWER PART OF WINGS & COLLARS	6.8 C.Y.
POUR #2	UPPER PART OF WINGS	2.8 C.Y.	POUR #2	UPPER PART OF WINGS	1.0 C.Y.
TOTAL CLASS A CONCRETE		13.1 C.Y.	TOTAL CLASS A CONCRETE		7.8 C.Y.

PROJECT NO. BR-0032

MADISON COUNTY

STATION: 13+50.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1 DETAILS

ASSEMBLED BY : D. A. GLADDEN	DATE : 8/21
CHECKED BY : D. R. SMITH	DATE : 11/21
DRAWN BY : DGE 12/09	REV. 4/17 MAA/THC
CHECKED BY : MKT 01/10	

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emily.murray AT C-1000324

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Emily E. Murray
A689F83FD9D74F8...
2/22/2022

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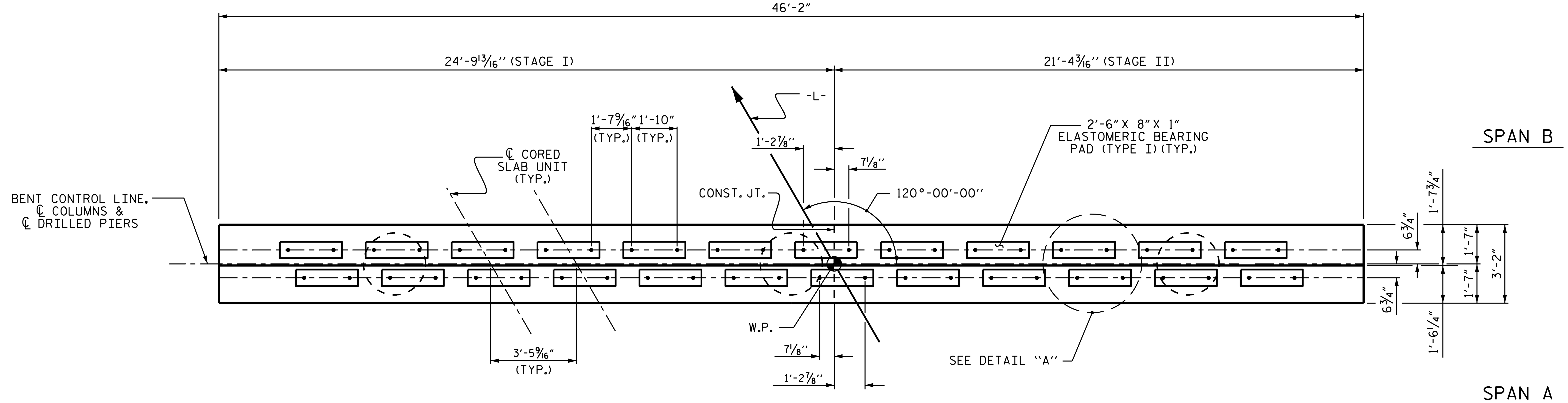
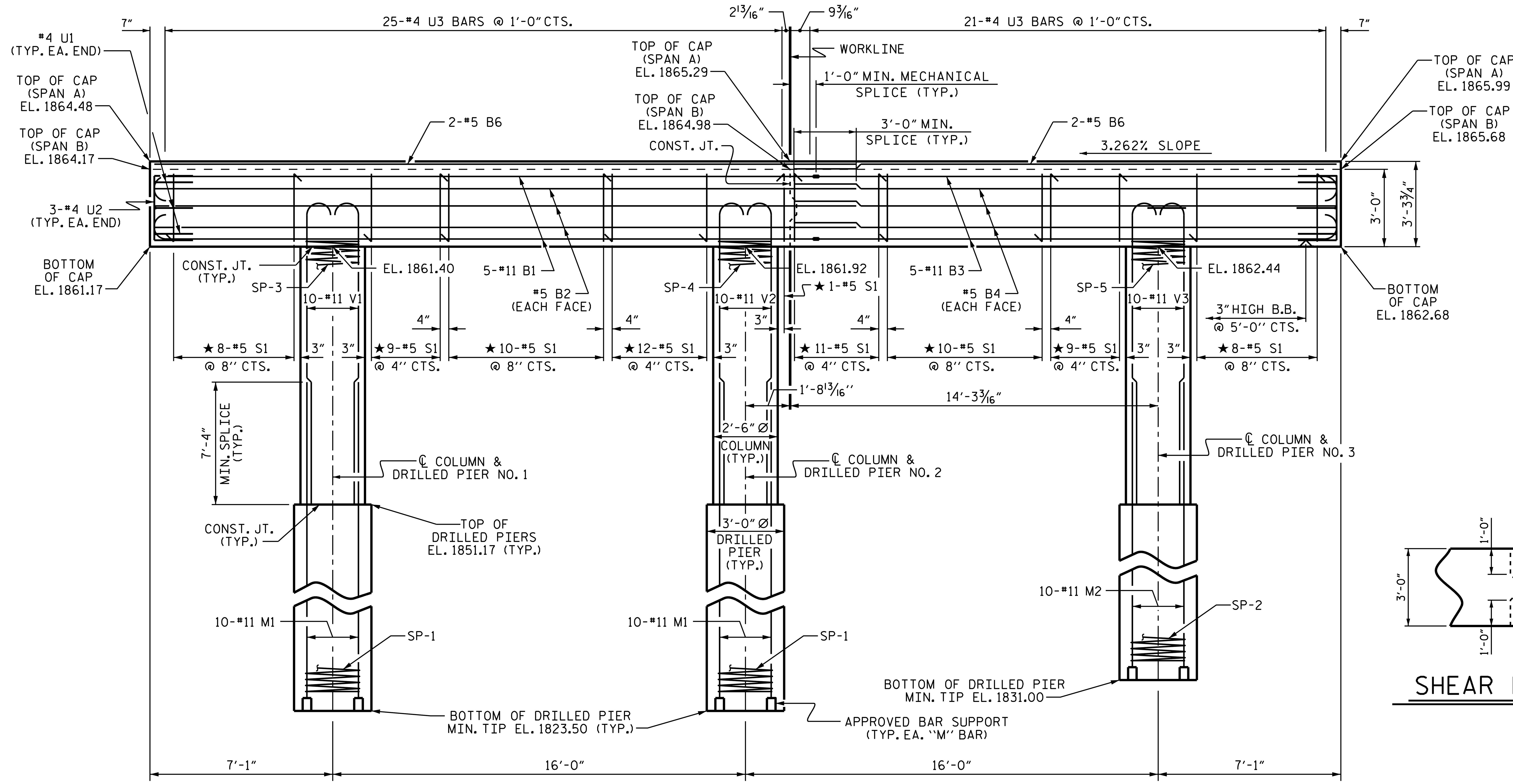
2			4			34

STD. NO. EB_36_120S



PLAN



ELEVATION

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

NOTES

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

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

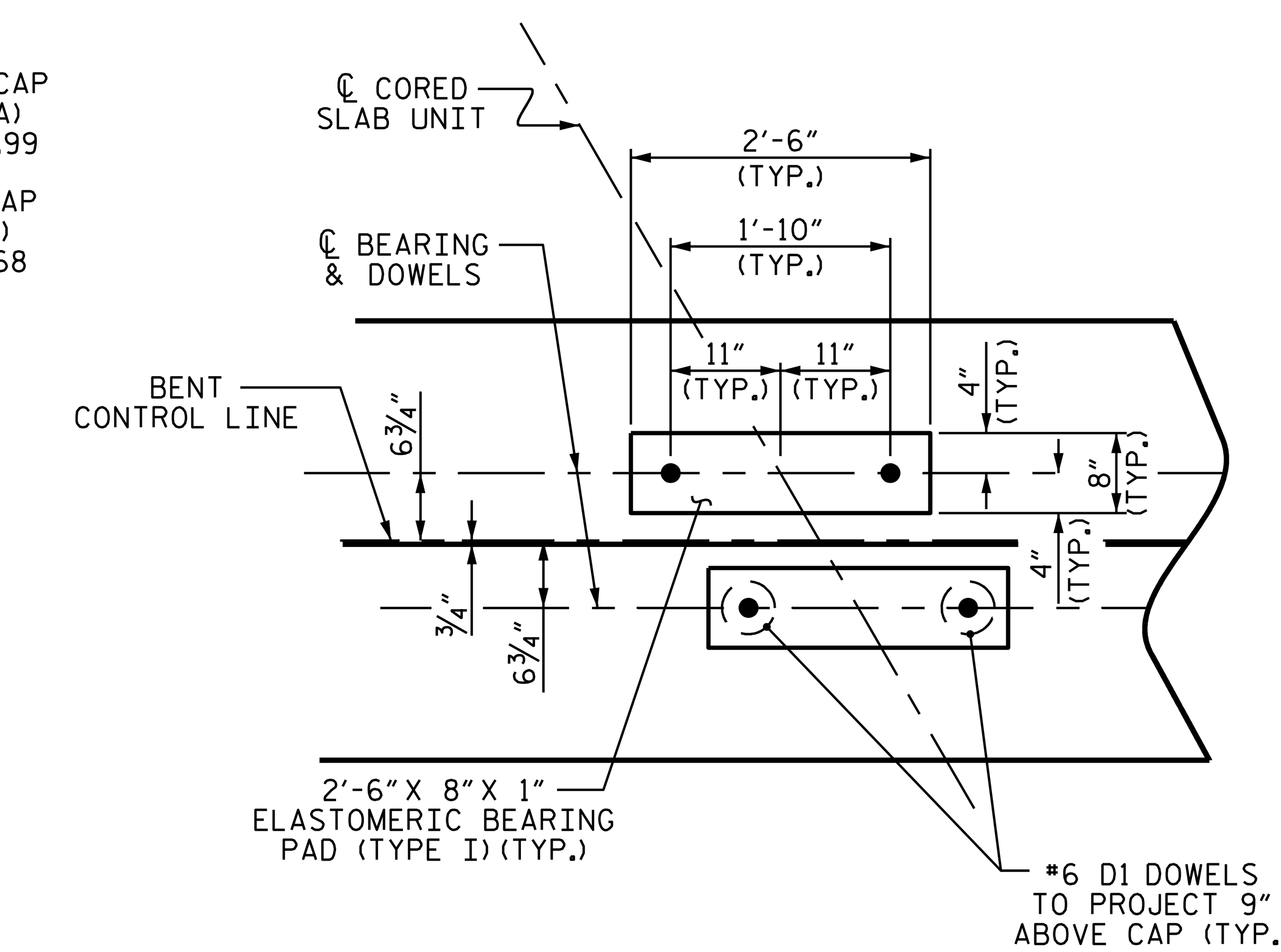
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

★ INVERT ALTERNATE STIRRUPS.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT ONE FOOT BELOW THE GROUND LINE.

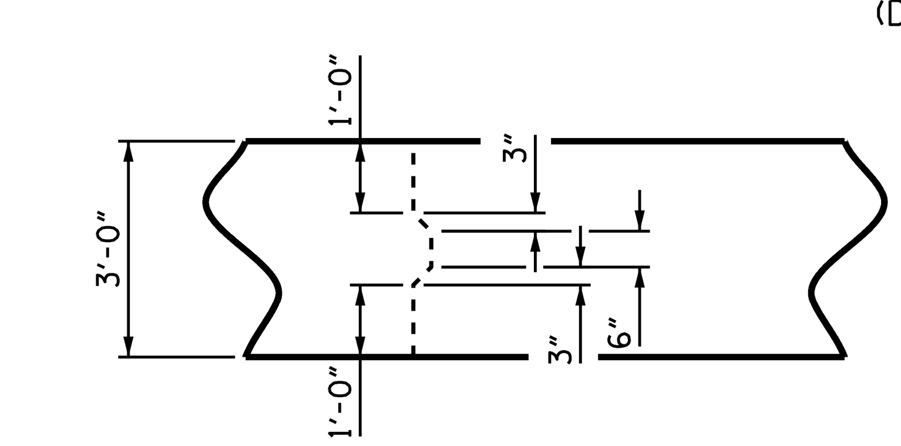
DRILLED PIERS SHALL BE TERMINATED ONE FOOT ± ABOVE NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED IN WATER.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)



SHEAR KEY DETAIL

PROJECT NO. BR-0032
MADISON COUNTY
STATION: 13+50.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
Emily E. Murray
3/3/2022

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Raleigh, NC 27607
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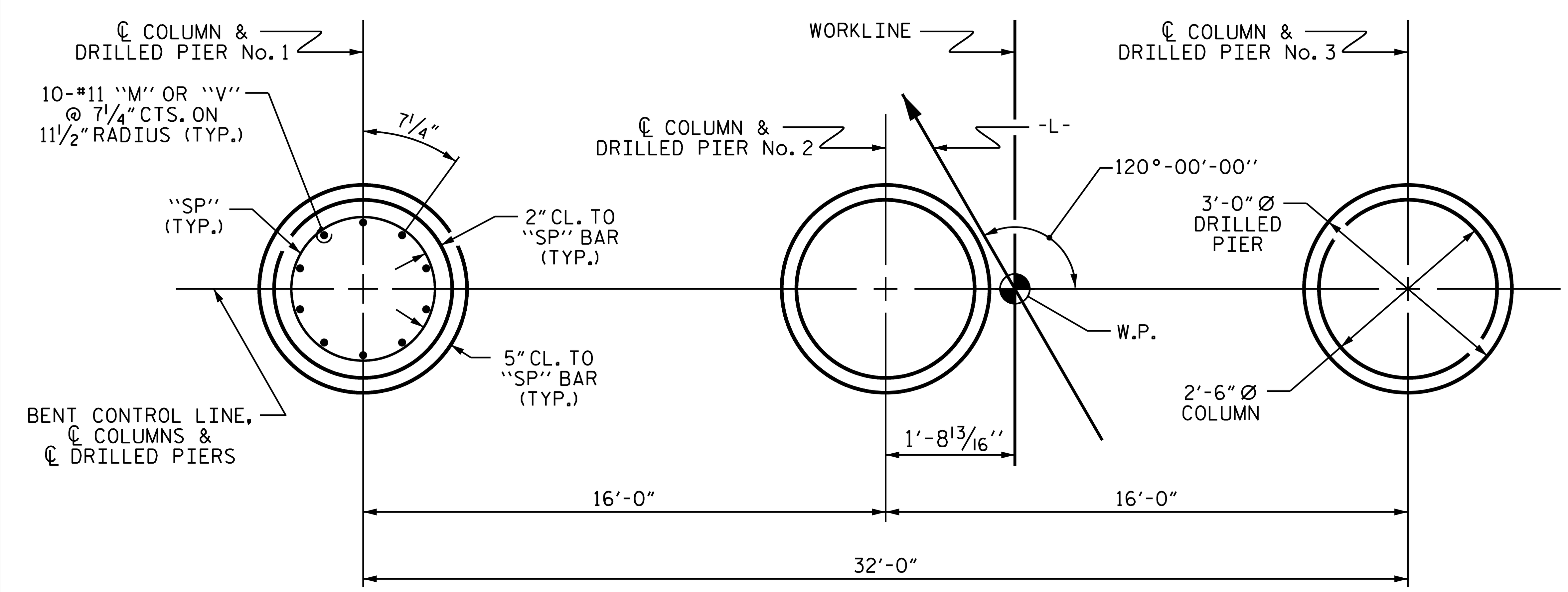
REVISIONS								SHEET NO.
NO.	BY:	DATE:		NO.	BY:	DATE:		S-25
1				3				TOTAL SHEETS
2				4				26

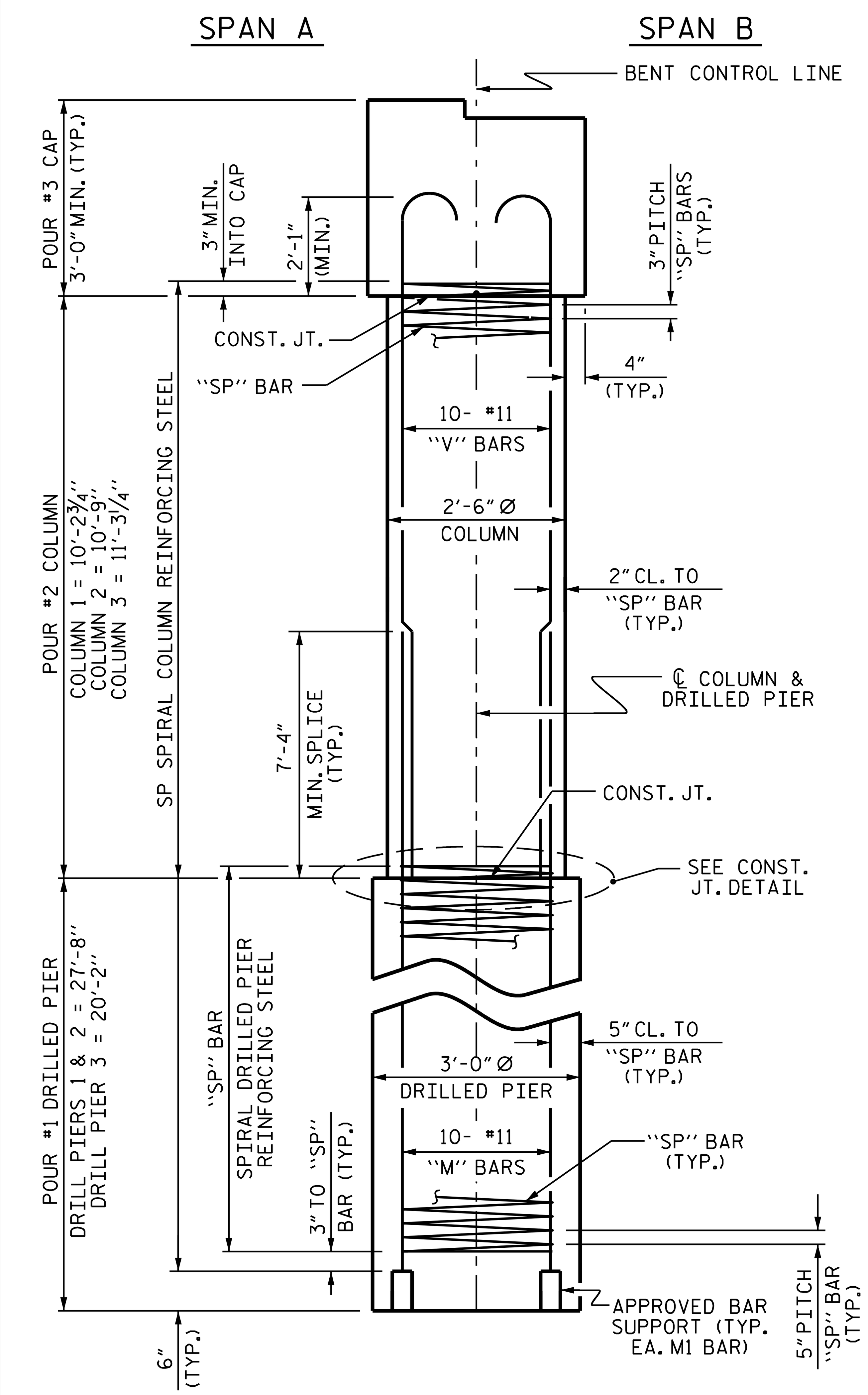
ASSEMBLED BY : D. A. GLADDEN	DATE : 8/21		
CHECKED BY : D. R. SMITH	DATE : 12/21		
DRAWN BY : DGE 4/10	REV. 11/14	MAA/TMG	
CHECKED BY : MKT 4/10			

03-MAR-2022 12:24
$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$
emily.murray AT C-1000324

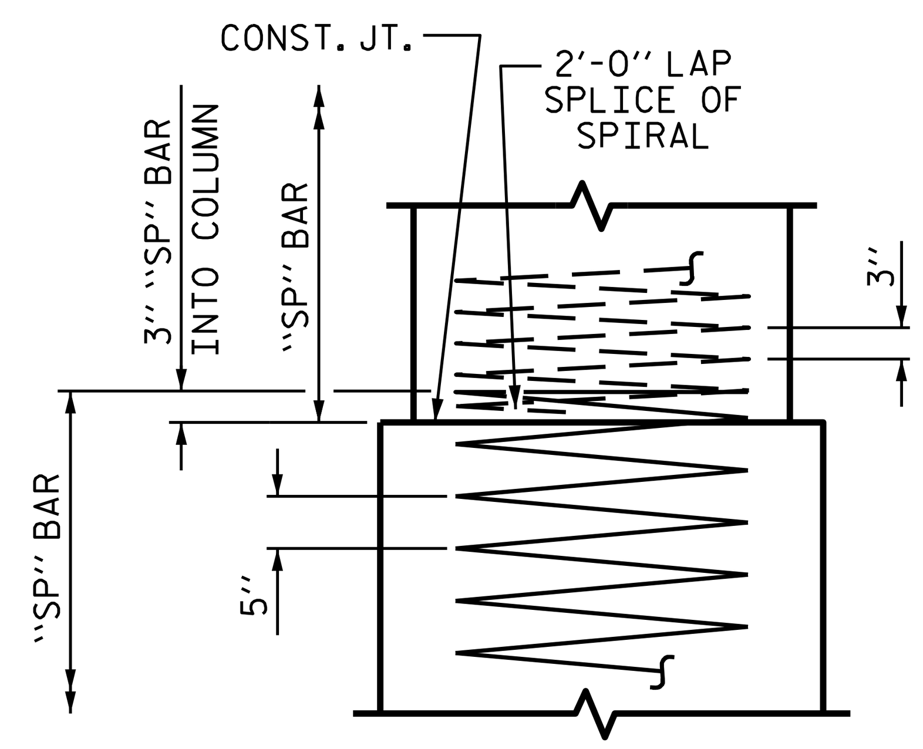
STD. NO. DP_BT_36_120S_<50'



PLAN OF DRILLED PIERS & COLUMNS

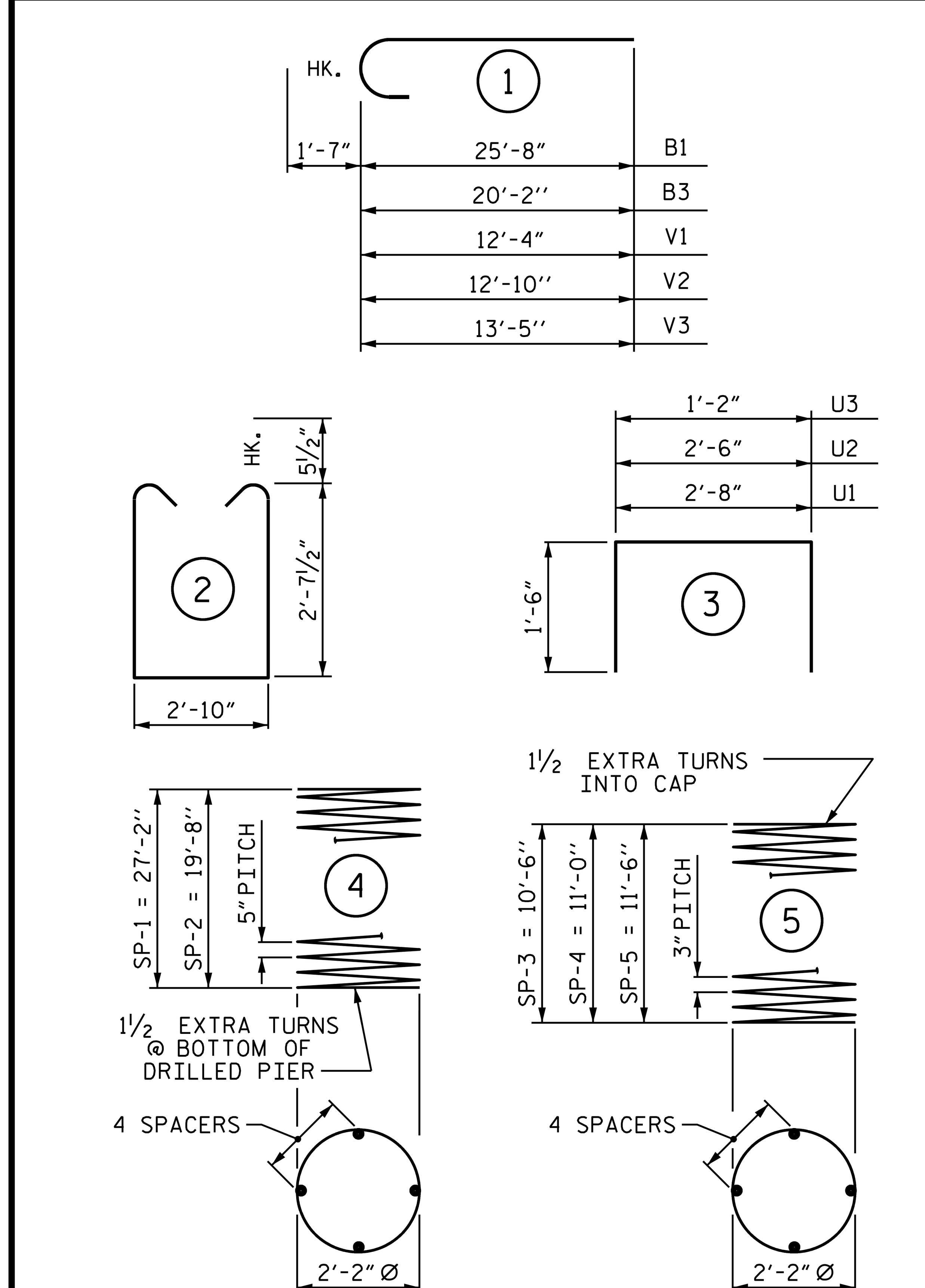


END ELEVATION



CONSTRUCTION JOINT DETAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR BENT (STAGE I)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	27'-3"	1448
B2	6	#5	STR	27'-10"	174
B5	2	#5	STR	25'-8"	54
D1	26	#6	STR	1'-6"	59
M1	20	#11	STR	37'-6"	3985
S1	40	#5	2	9'-0"	375
U1	3	#4	3	5'-8"	11
U2	3	#4	3	5'-6"	11
U3	25	#4	3	4'-2"	70
V1	10	#11	1	13'-11"	739
V2	10	#11	1	14'-5"	766
REINFORCING STEEL (STAGE I)					7692 LBS.
SP-1	2	*	4	444'-4"	927
SP-3	1	**	5	290'-8"	194
SP-4	1	**	5	305'-8"	204
SPIRAL COLUMN REINFORCING STEEL (STAGE I)					1325 LBS.

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

** THE SP-3 & SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN (STAGE I)	
POUR #2 (COLUMNS)	3.9 C.Y.
POUR #3 (CAP)	9.2 C.Y.
TOTAL CLASS A CONCRETE	13.1 C.Y.

DRILLED PIERS: (STAGE I)

DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	14.5 C.Y.

BILL OF MATERIAL FOR BENT (STAGE II)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3	10	#11	1	21'-9"	1156
B4	6	#5	STR	21'-0"	131
B6	2	#5	STR	20'-2"	42
D1	22	#6	STR	1'-6"	50
M2	10	#11	STR	30'-0"	1594
S1	38	#5	2	9'-0"	357
U1	3	#4	3	5'-8"	11
U2	3	#4	3	5'-6"	11
U3	21	#4	3	4'-2"	58
V3	10	#11	1	15'-0"	797
REINFORCING STEEL (STAGE II)					4207 LBS.
SP-2	1	*	4	324'-6"	338
SP-5	1	**	5	319'-0"	213
SPIRAL COLUMN REINFORCING STEEL (STAGE II)					551 LBS.

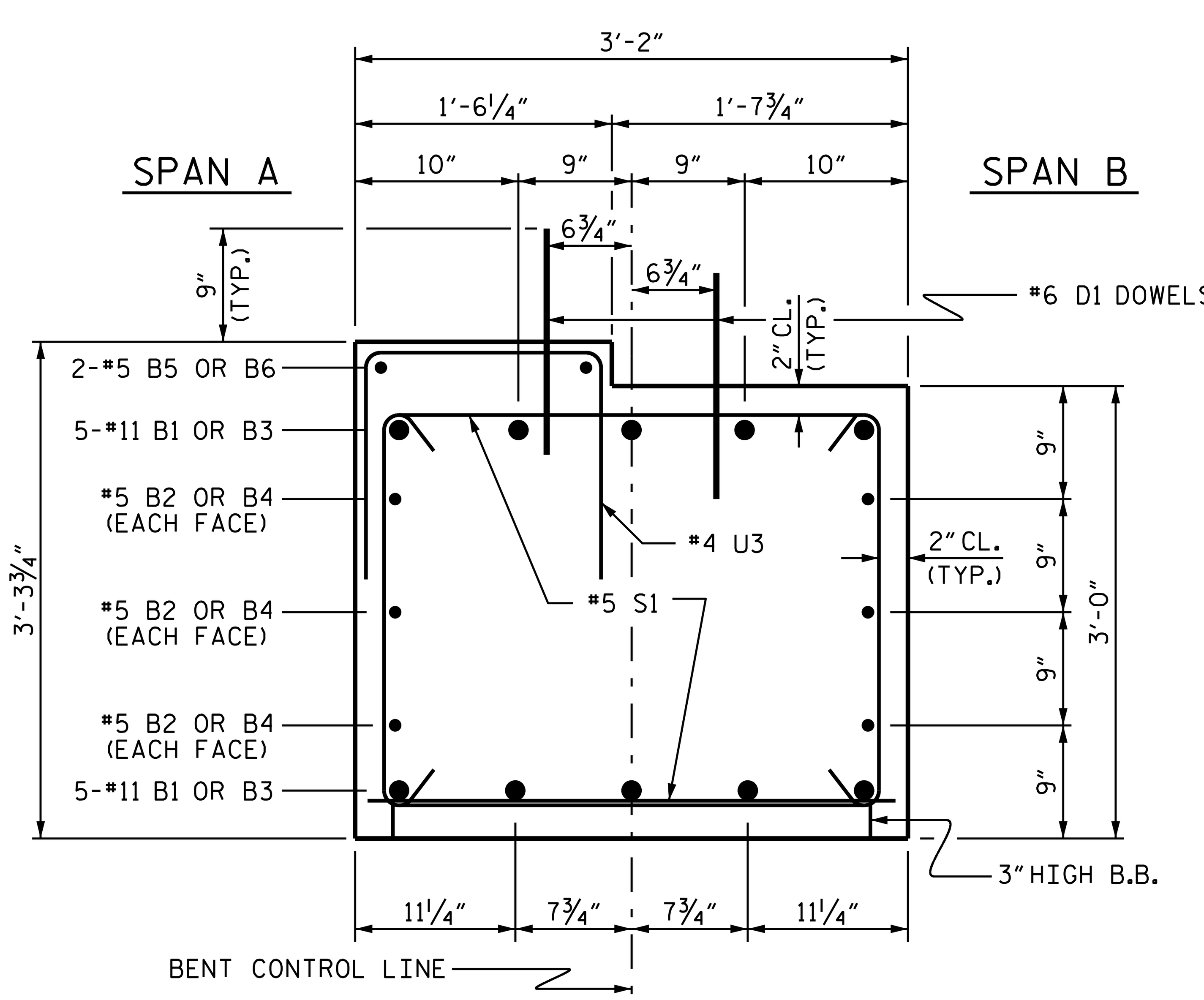
* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

** THE SP-5 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

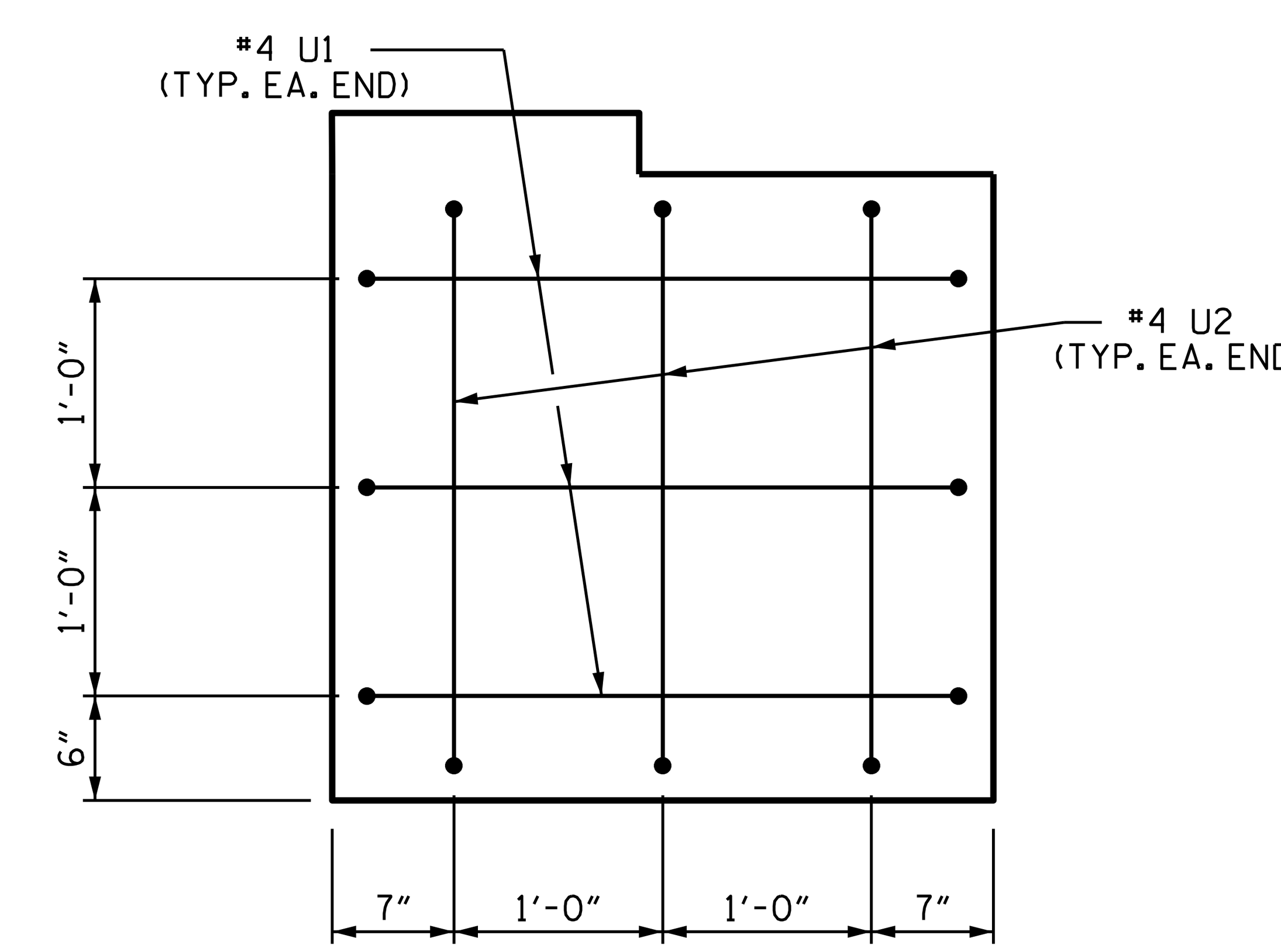
CLASS A CONCRETE BREAKDOWN (STAGE II)	
POUR #2 (COLUMNS)	2.1 C.Y.
POUR #3 (CAP)	7.9 C.Y.
TOTAL CLASS A CONCRETE	10.0 C.Y.

DRILLED PIERS: (STAGE II)

DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	5.3 C.Y.



SECTION THRU CAP



END OF CAP VIEW

(TYPICAL BOTH ENDS)

PROJECT NO. BR-0032
MADISON COUNTY
STATION: 13+50.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
3/3/2022

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			34

ASSEMBLED BY : D. A. GLADDEN	DATE : 8/21		
CHECKED BY : D. R. SMITH	DATE : 12/21		
DRAWN BY : DGE 3/10	REV. 11/14	MAA/TMG	
CHECKED BY : MKT 3/10			

03-MAR-2022 12:39
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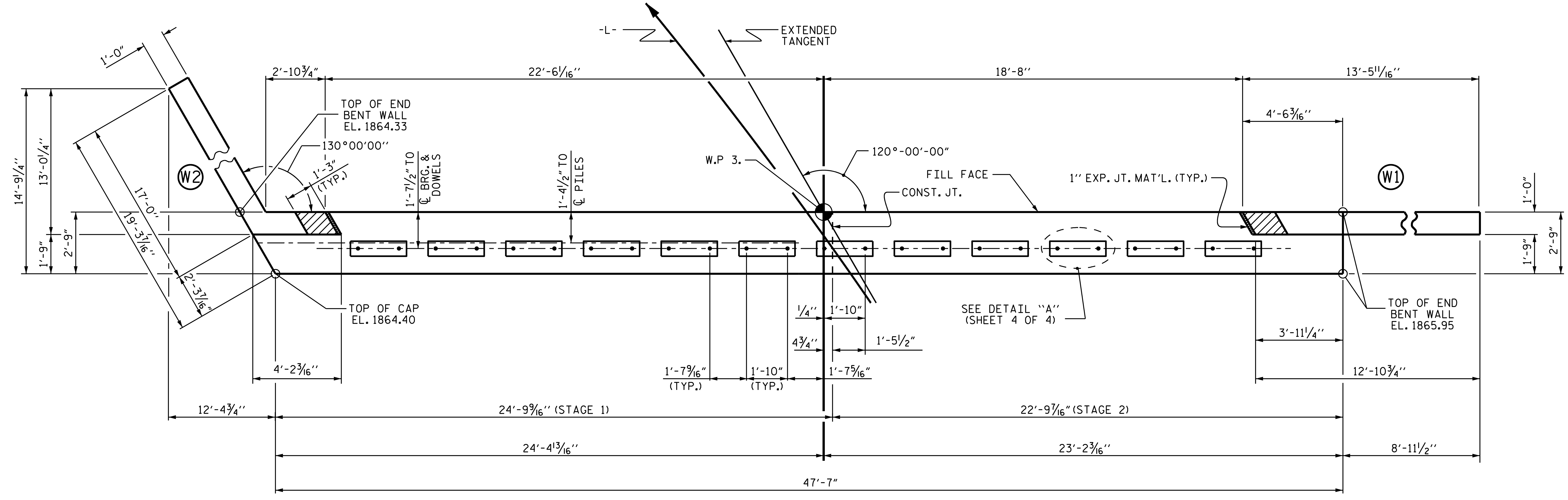
emily.murray AT C-1000324

STD. NO. DP_BT_36_120S_<50'

NOTES

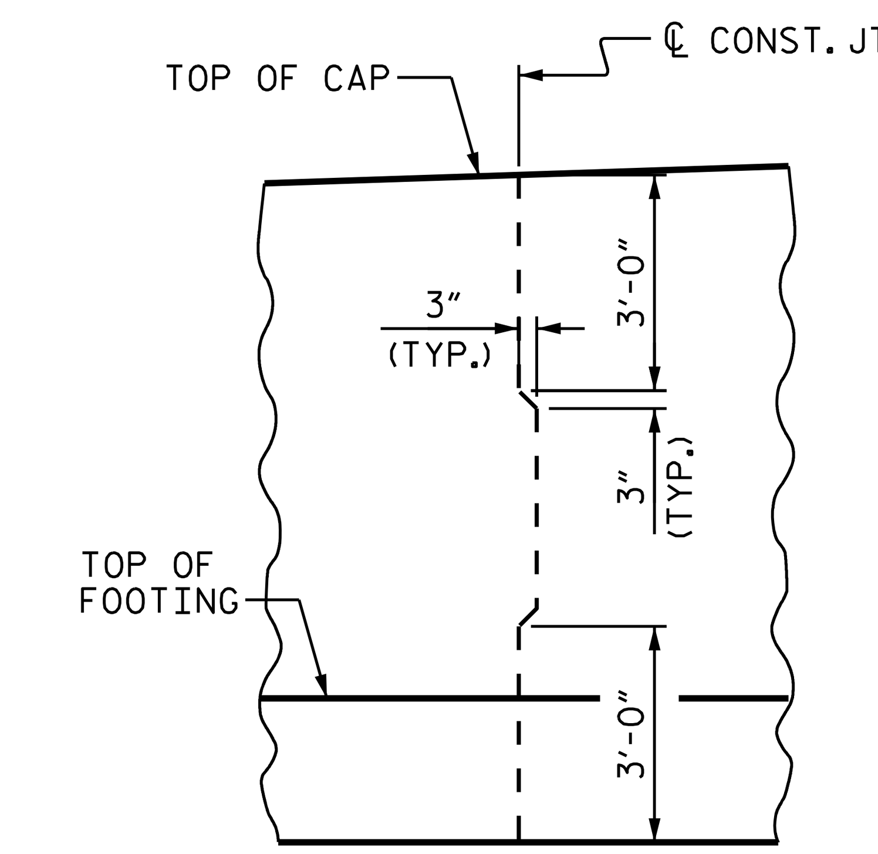
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR WING DETAILS, SEE SHEET 3 OF 4.

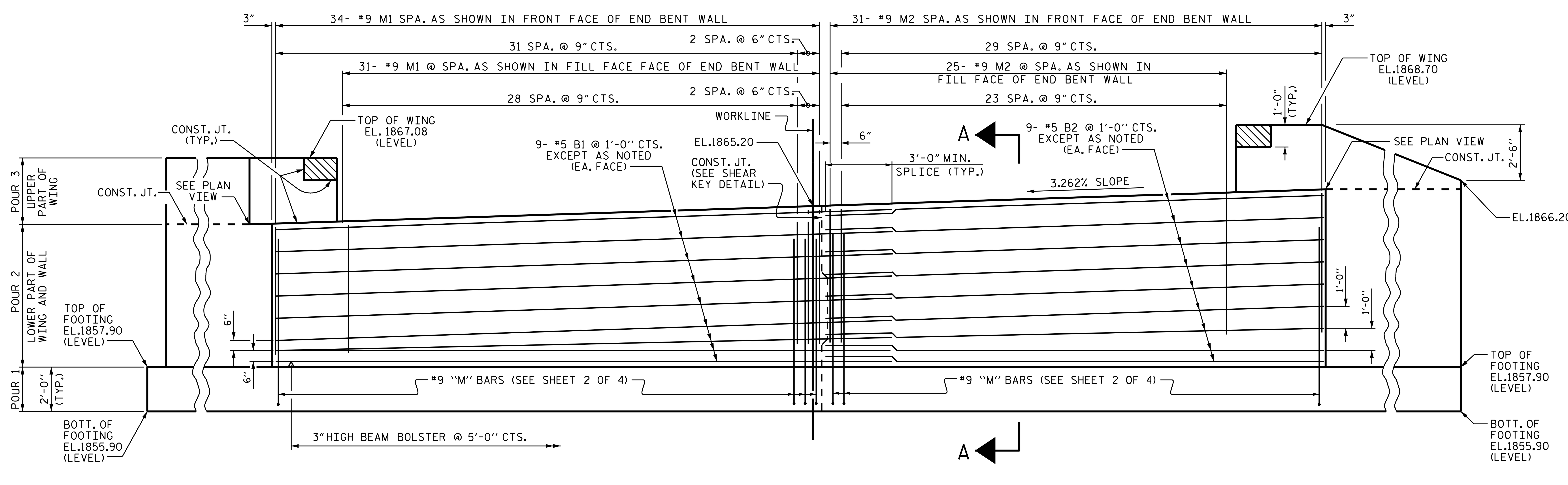


PLAN

FOOTING NOT SHOWN IN PLAN VIEW FOR CLARITY



SHEAR KEY DETAIL



ELEVATION

FOR SECTION A-A, SEE SHEET 4 OF 4.

PROJECT NO. BR-0032
MADISON COUNTY
STATION: 13+50.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
3/3/2022

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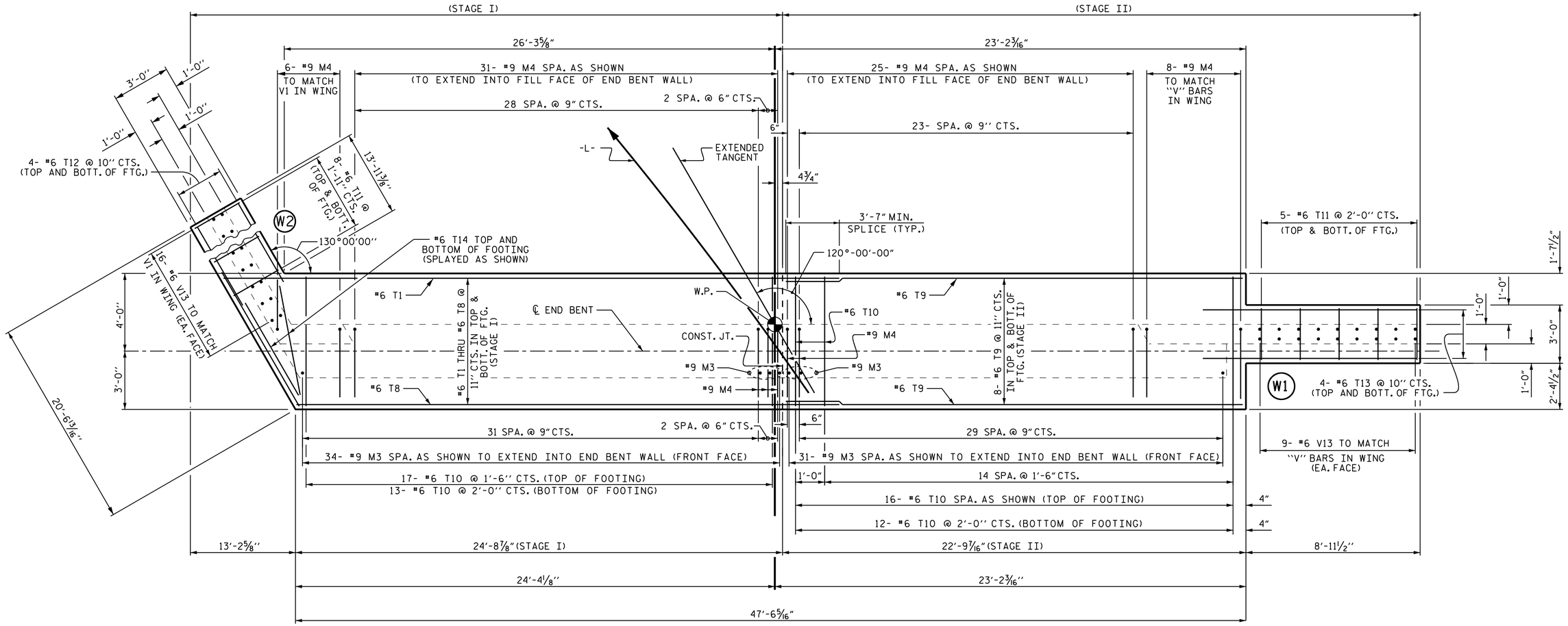
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			34

DRAWN BY :	D. A. GLADDEN	DATE :	8/21
CHECKED BY :	D. R. SMITH	DATE :	12/21
DESIGN ENGINEER OF RECORD:	E. E. MURRAY	DATE :	1/22

03-MAR-2022 12:20
$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$
emily.murray AT C-1000324

STD. NO. EB_36_120S



PLAN OF FOOTING

PROJECT NO. BR-0032

MADISON **COUNTY**

STATION: 13+50.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : D. A. GLADDEN DATE : 8/21
CHECKED BY : D. R. SMITH DATE : 12/21
DESIGN ENGINEER OF RECORD: E. E. MURRAY DATE : 1/22

18-FEB-2022 12:37
$$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$$$
emily.murray AT C-1000324

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NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
Emily E. Murray
A689F83FD9D74F8...
2/22/2022

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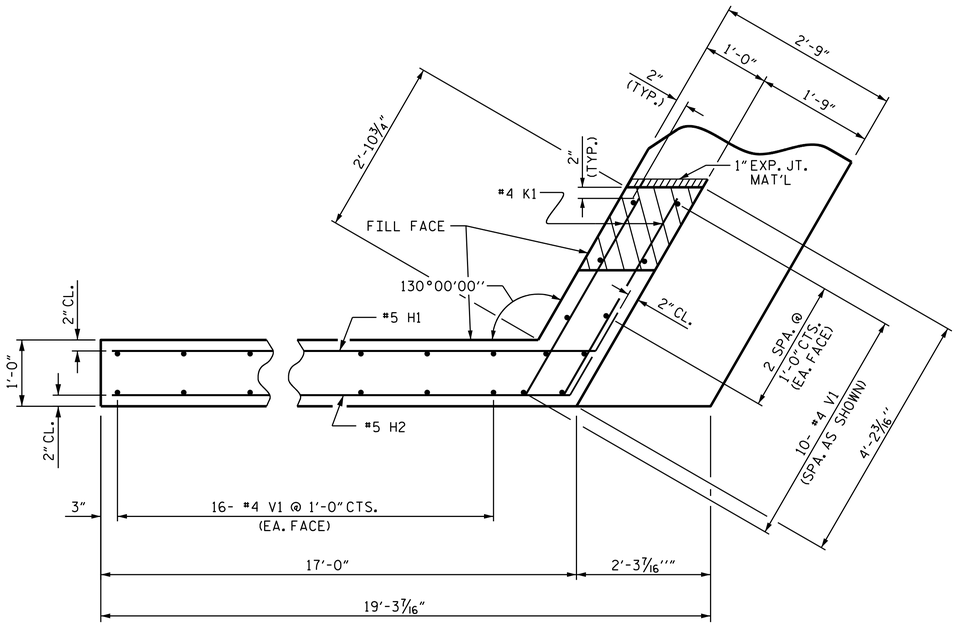
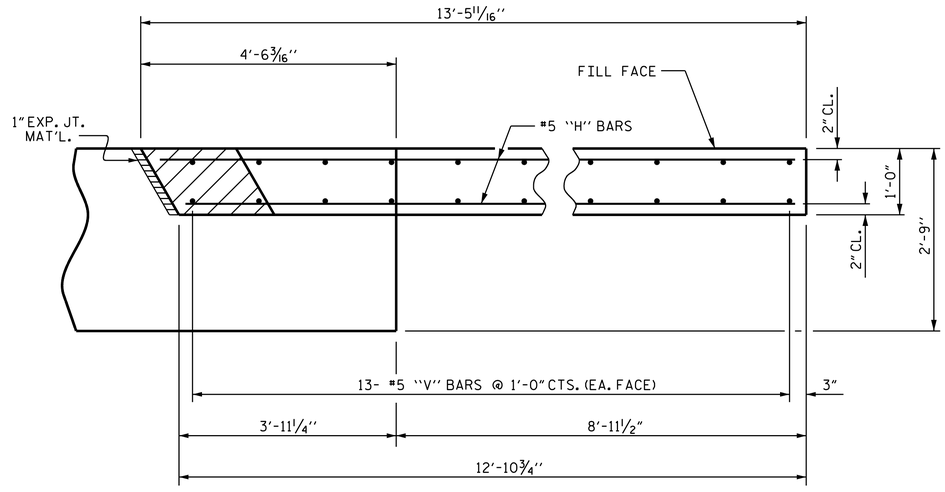
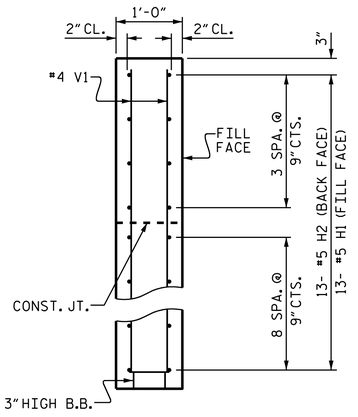
STD. NO. EB_36_120S



PLAN OF WING (W2)

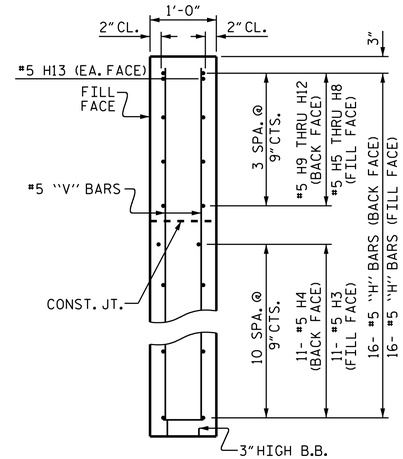


PLAN OF WING (W1)



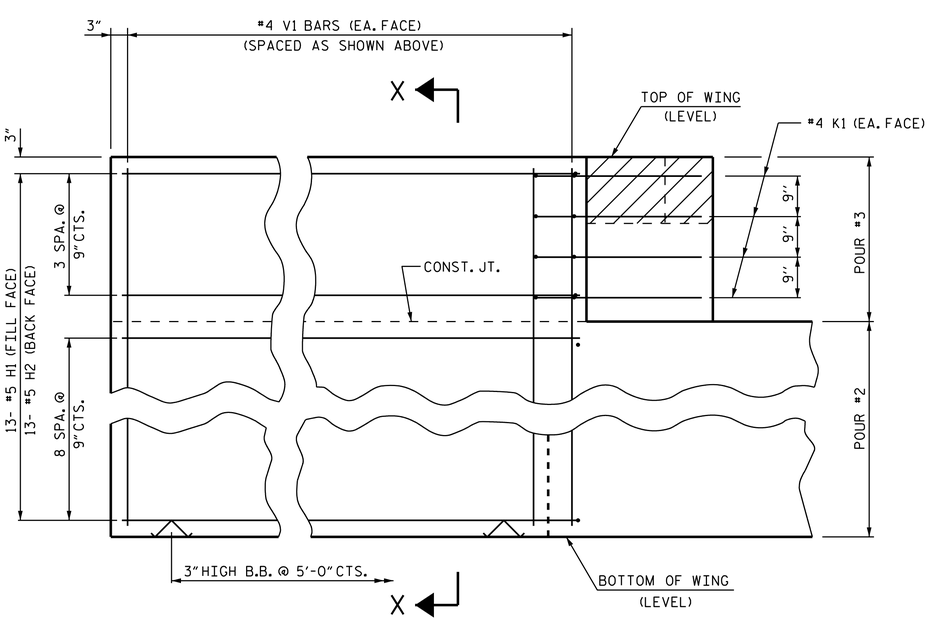
SECTION X-X

WING FOOTINGS NOT SHOWN. SEE "SECTION THROUGH WING AND FOOTING" (SHEET 4 OF 4) FOR ADDITIONAL REINFORCEMENT AND DETAILS.

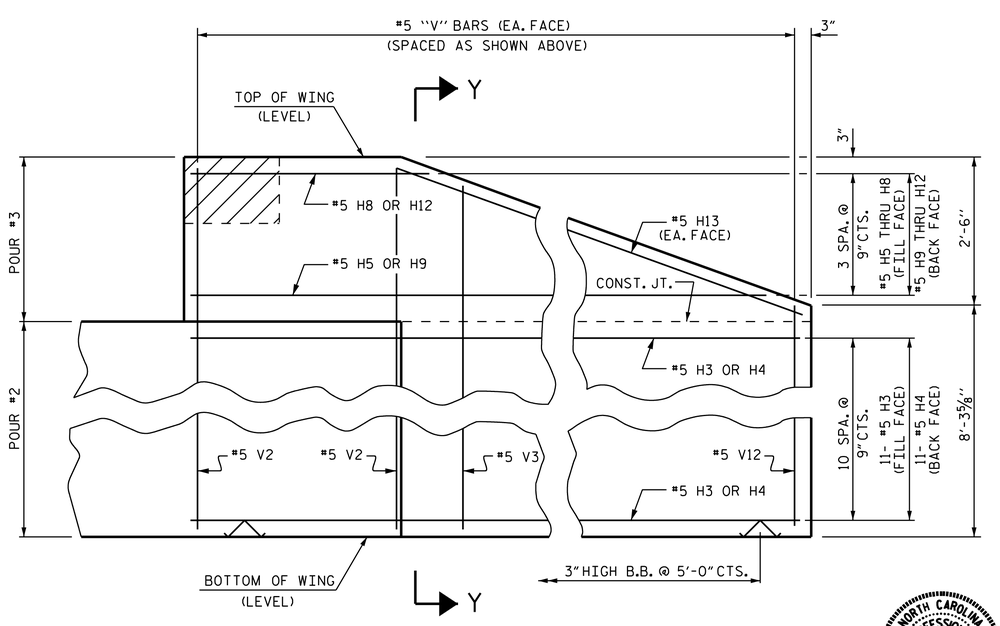


SECTION Y-Y

WING FOOTINGS NOT SHOWN. SEE "SECTION THROUGH WING AND FOOTING" (SHEET 4 OF 4) FOR ADDITIONAL REINFORCEMENT AND DETAILS.



ELEVATION OF WING (W2)



ELEVATION OF WING (W1)

WING DETAILS

WING FOOTINGS NOT SHOWN FOR CLARITY. FOR WING FOOTING DETAILS AND ADDITIONAL REINFORCING STEEL, SEE SHEET 2 OF 4 AND SHEET 4 OF 4.

PROJECT NO. BR-0032

MADISON COUNTY

STATION: 13+50.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : D. A. GLADDEN DATE : 8/21
CHECKED BY : D. R. SMITH DATE : 12/21
DESIGN ENGINEER OF RECORD: E. E. MURRAY DATE : 1/22

22-FEB-2022 14:38
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
emily.murray AT C-1000324

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
Emily E. Murray
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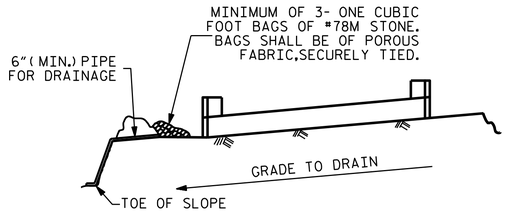
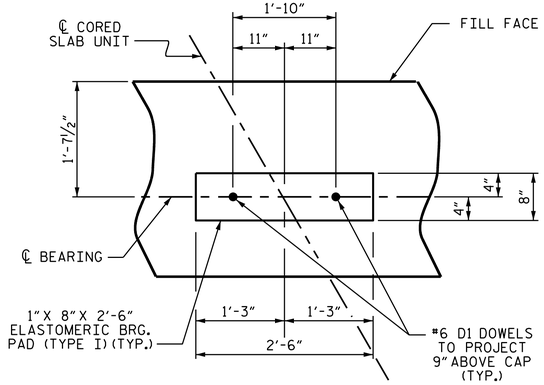


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

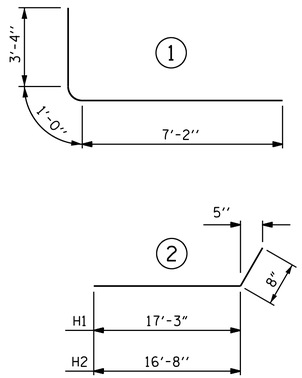
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



DETAIL "A"

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

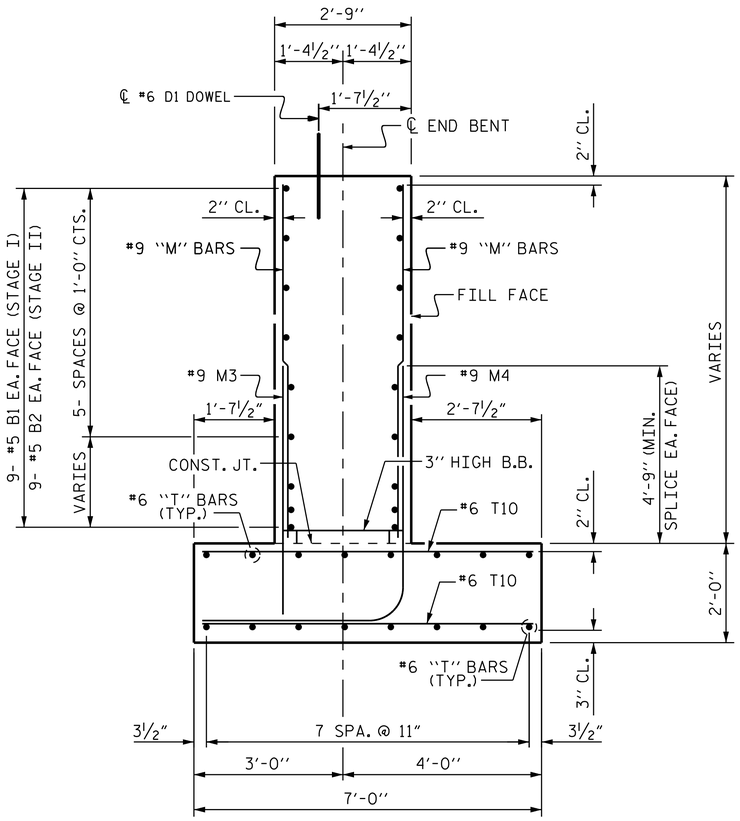
STAGE I						STAGE II					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	18	#5	STR	30'-0"	564	B2	18	#5	STR	22'-5"	421
D1	13	#6	STR	1'-6"	29	D1	11	#6	STR	1'-6"	25
H1	13	#5	2	17'-11"	243	H3	11	#5	STR	13'-0"	149
H2	13	#5	2	17'-4"	235	H4	11	#5	STR	12'-8"	145
						H5	1	#5	STR	12'-6"	13
K1	8	#4	STR	3'-9"	21	H6	1	#5	STR	9'-8"	10
						H7	1	#5	STR	6'-10"	7
M1	65	#9	STR	6'-2"	1362	H8	1	#5	STR	4'-1"	4
M3	34	#9	STR	7'-3"	838	H9	1	#5	STR	12'-4"	13
M4	37	#9	1	11'-6"	1447	H10	1	#5	STR	9'-6"	10
						H11	1	#5	STR	6'-8"	7
T1	2	#6	STR	34'-2"	103	H12	1	#5	STR	3'-11"	4
T2	2	#6	STR	33'-5"	101	H13	2	#5	STR	9'-1"	19
T3	2	#6	STR	32'-7"	98						
T4	2	#6	STR	31'-9"	96	M2	56	#9	STR	7'-0"	1333
T5	2	#6	STR	31'-0"	94	M3	31	#9	STR	7'-3"	764
T6	2	#6	STR	30'-2"	91	M4	33	#9	1	11'-6"	1290
T7	2	#6	STR	29'-5"	89						
T8	2	#6	STR	28'-7"	86	T9	16	#6	STR	22'-7"	543
T10	30	#6	STR	6'-8"	300	T10	28	#6	STR	6'-8"	280
T11	16	#6	STR	2'-8"	64	T11	10	#6	STR	2'-8"	40
T12	8	#6	STR	14'-0"	168	T13	8	#6	STR	11'-0"	132
T14	4	#6	STR	7'-6"	45						
						V2	6	#5	STR	10'-5"	65
V1	42	#4	STR	9'-0"	253	V3	2	#5	STR	10'-4"	22
V13	32	#6	STR	4'-0"	192	V4	2	#5	STR	10'-1"	21
						V5	2	#5	STR	9'-10"	21
						V6	2	#5	STR	9'-7"	20
						V7	2	#5	STR	9'-4"	19
						V8	2	#5	STR	9'-1"	19
						V9	2	#5	STR	8'-9"	18
						V10	2	#5	STR	8'-6"	18
						V11	2	#5	STR	8'-3"	17
						V12	2	#5	STR	8'-0"	17

REINFORCING STEEL (FOR STAGE I)	6519 LBS.

REINFORCING STEEL (FOR STAGE II)	5466 LBS.

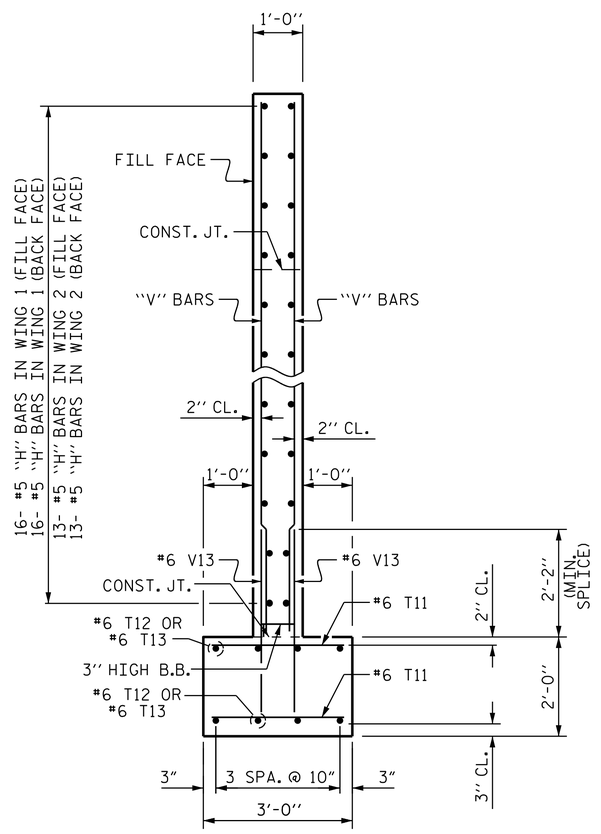
CLASS A CONCRETE BREAKDOWN (STAGE I)	
POUR #1 FOOTING	17.0 C.Y.
POUR #2 LOWER PART OF WINGS & WALL	21.8 C.Y.
POUR #3 UPPER PART OF WINGS	2.2 C.Y.
TOTAL CLASS A CONCRETE (FOR STAGE I)	41.0 C.Y.
FOUNDATION EXCAVATION AT END BENT	L.S.

CLASS A CONCRETE BREAKDOWN (STAGE II)	
POUR #1 FOOTING	13.8 C.Y.
POUR #2 LOWER PART OF WINGS & WALL	20.6 C.Y.
POUR #3 UPPER PART OF WINGS	0.9 C.Y.
TOTAL CLASS A CONCRETE	35.3 C.Y.
FOUNDATION EXCAVATION AT END BENT	L.S.



SECTION "A-A"

(SHOWING END BENT WALL AND FOOTING)



SECTION THRU WING AND FOOTING

PROJECT NO. BR-0032

MADISON COUNTY

STATION: 13+50.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			34

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
Emily E. Murray
A889F83FD9D74F8...
2/22/2022

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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

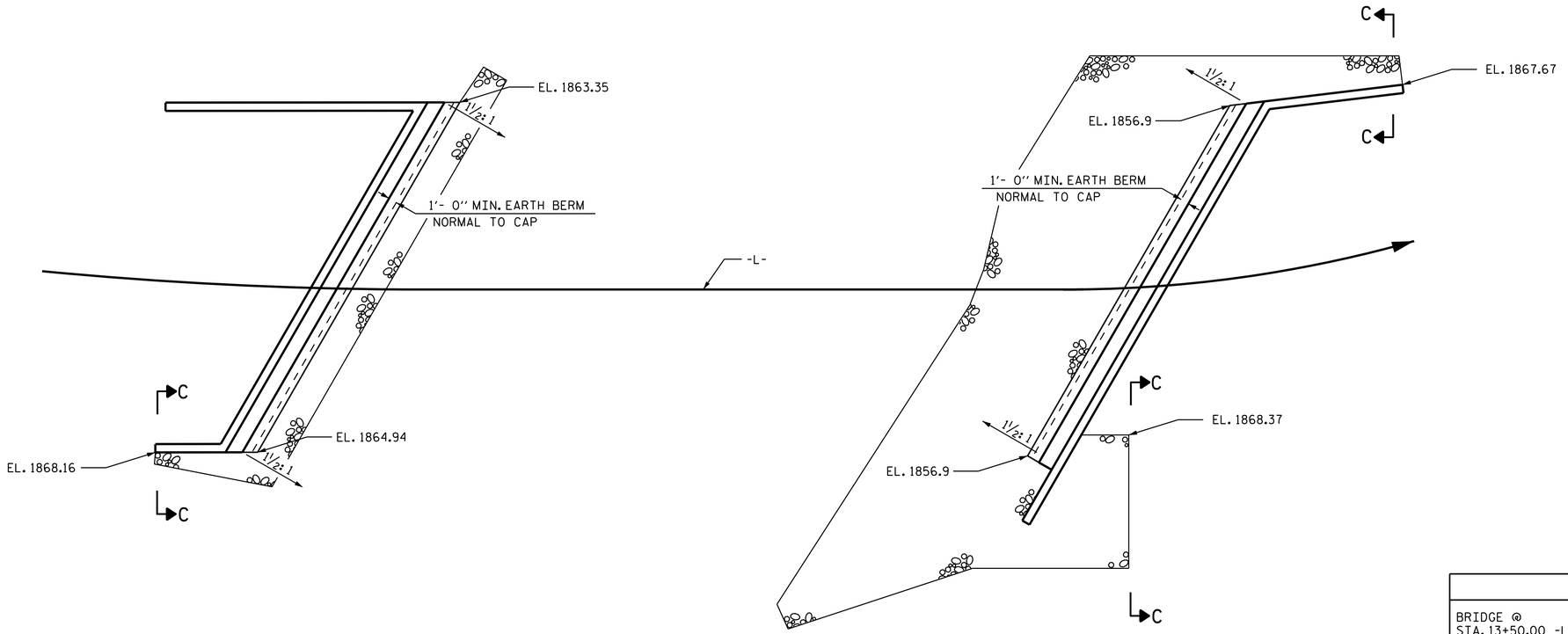
DRAWN BY : D. A. GLADDEN DATE : 8/21
CHECKED BY : D. R. SMITH DATE : 12/21
DESIGN ENGINEER OF RECORD: E. E. MURRAY DATE : 1/22

22-FEB-2022 15:54
$$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$$$
emily.murray AT C-1000324

STD. NO. EB_36_120S

NOTES :

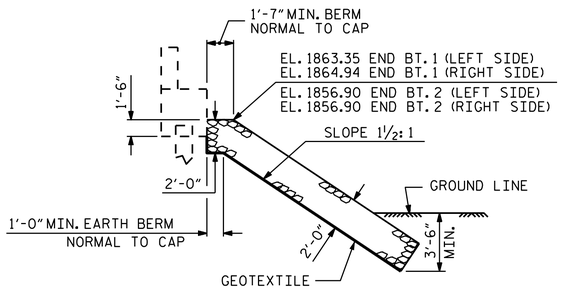
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



END BENT 1

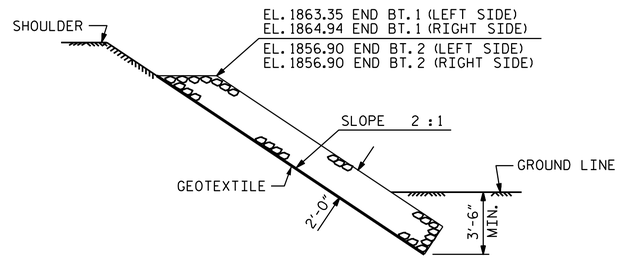
END BENT 2

ESTIMATED QUANTITIES		
BRIDGE @ STA. 13+50.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	23	26
END BENT 2	157	175



℄ SECTION

BERM RIP RAPPED



SECTION C-C

PROJECT NO. BR-0032

MADISON COUNTY

STATION: 13+50.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY C. MURRAY
Emily C. Murray
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			34

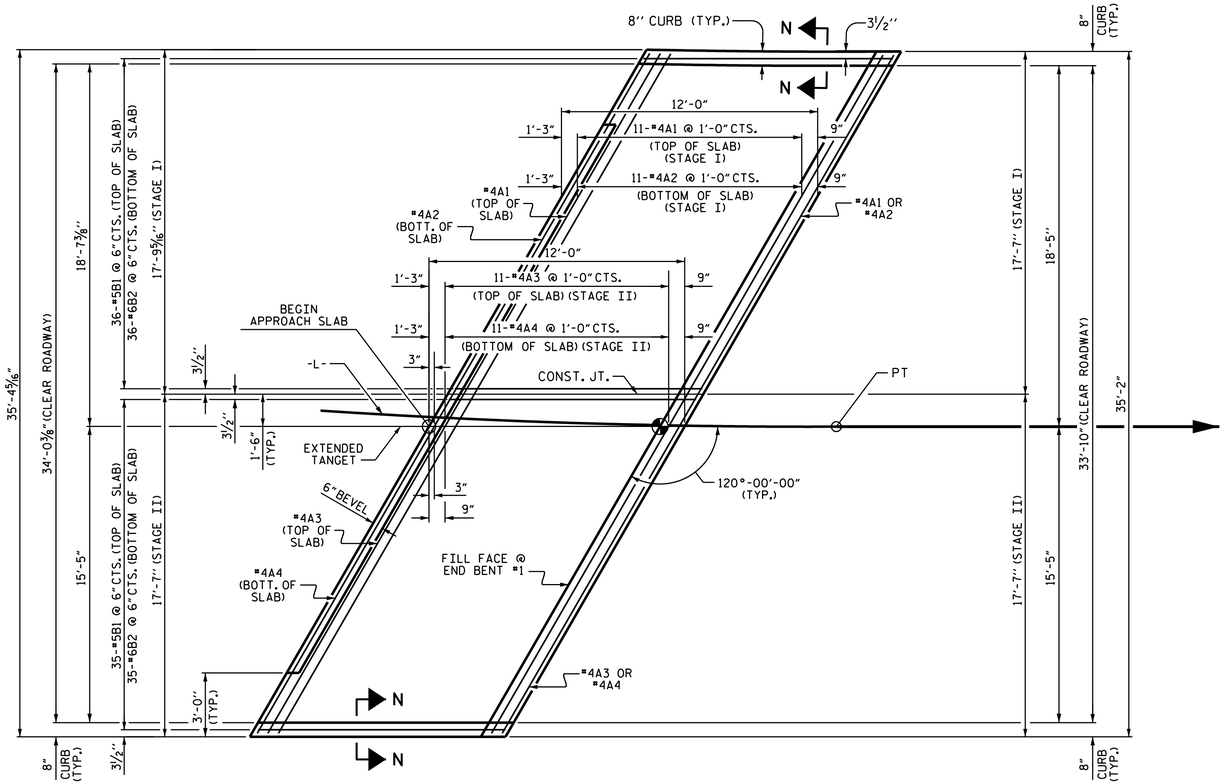
ASSEMBLED BY : D. A. GLADDEN DATE : 8/21
CHECKED BY : D. R. SMITH DATE : 12/21

DRAWN BY : REK 1/84
CHECKED BY : RDU 1/84

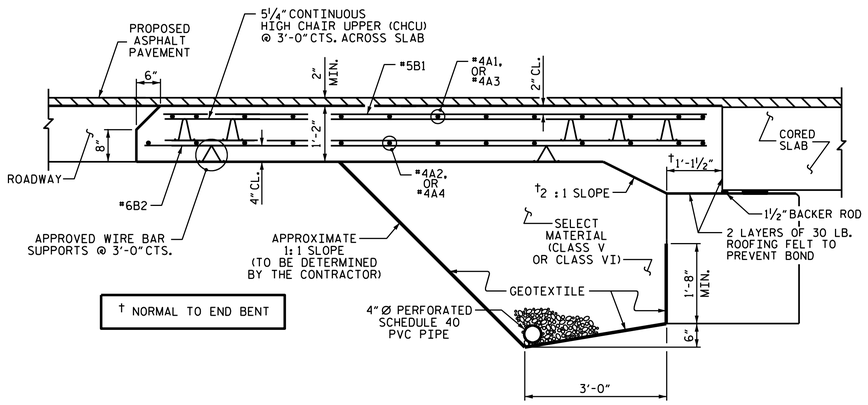
REV. 10/1/11 MAA/GM
REV. 12/21/11 MAA/GM
REV. 12/17 MAA/THC

22-FEB-2022 16:16
sssssssssssssssssssssssDGNsssssssssssssssssssssss
emily.murray AT C-1000324

STD. NO. RR1

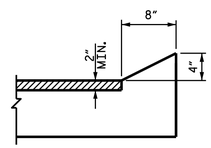


PLAN @ END BENT #1



SECTION THRU SLAB

(TYPE II - MODIFIED APPROACH FILL)



SECTION N-N

CURB DETAILS

NOTES

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

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

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

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

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

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

APPROACH SLAB GROOVING IS NOT REQUIRED.

FOR ANCHORED PORTABLE CONCRETE BARRIER AND CONCRETE INSERT LOCATIONS, SEE SHEET 3 OF 3.

BILL OF MATERIAL

APPROACH SLAB AT EB #1 STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	11	#4	STR	22'-7"	166
A2	11	#4	STR	21'-3"	163
* B1	36	#5	STR	11'-1"	416
B2	36	#6	STR	11'-7"	626
REINFORCING STEEL				LBS.	789
* EPOXY COATED REINFORCING STEEL				LBS.	582
CLASS AA CONCRETE				C.Y.	11.5

APPROACH SLAB AT EB #1 STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	11	#4	STR	20'-0"	147
A4	11	#4	STR	19'-8"	145
* B1	35	#5	STR	11'-1"	405
B2	35	#6	STR	11'-7"	609
REINFORCING STEEL				LBS.	754
* EPOXY COATED REINFORCING STEEL				LBS.	552
CLASS AA CONCRETE				C.Y.	11.5

SPLICE LENGTHS

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

PROJECT NO. BR-0032

MADISON COUNTY

STATION: 13+50.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB
FOR PRESTRESSED CONCRETE
CORED SLAB UNIT
(SUB-REGIONAL TIER)
120° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			34

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
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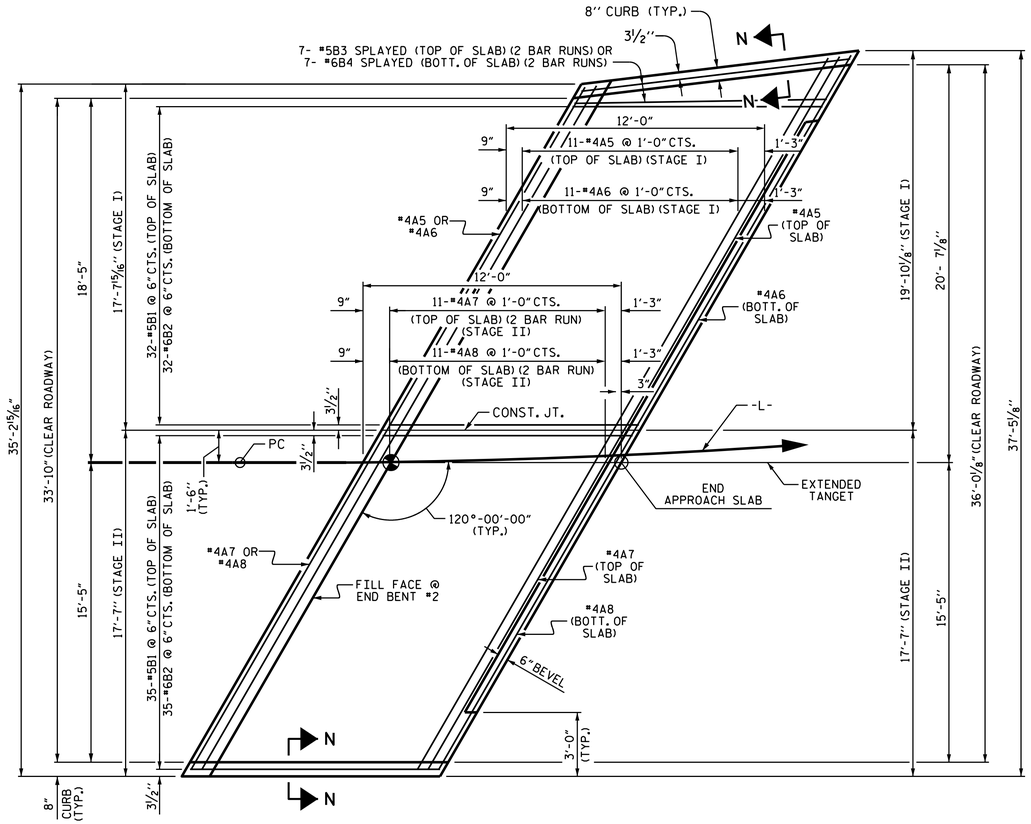
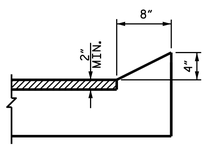
ASSEMBLED BY : R.G.BEAUCHAMP/ D.A.G.	DATE : 6/19		
CHECKED BY : P. N. HOLDER	DATE : 12/21		
DRAWN BY : SHS/MAA 5-09	REV. 12-17	MAA/THC	
CHECKED BY : BCH 5-09			



PLAN @ END BENT #2



SECTION N-N

CURB DETAILS

NOTES

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

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

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

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

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

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

APPROACH SLAB GROOVING IS NOT REQUIRED.

FOR ANCHORED PORTABLE CONCRETE BARRIER AND CONCRETE INSERT LOCATIONS, SEE SHEET 3 OF 3.

BILL OF MATERIAL

APPROACH SLAB AT EB #2 STAGE I

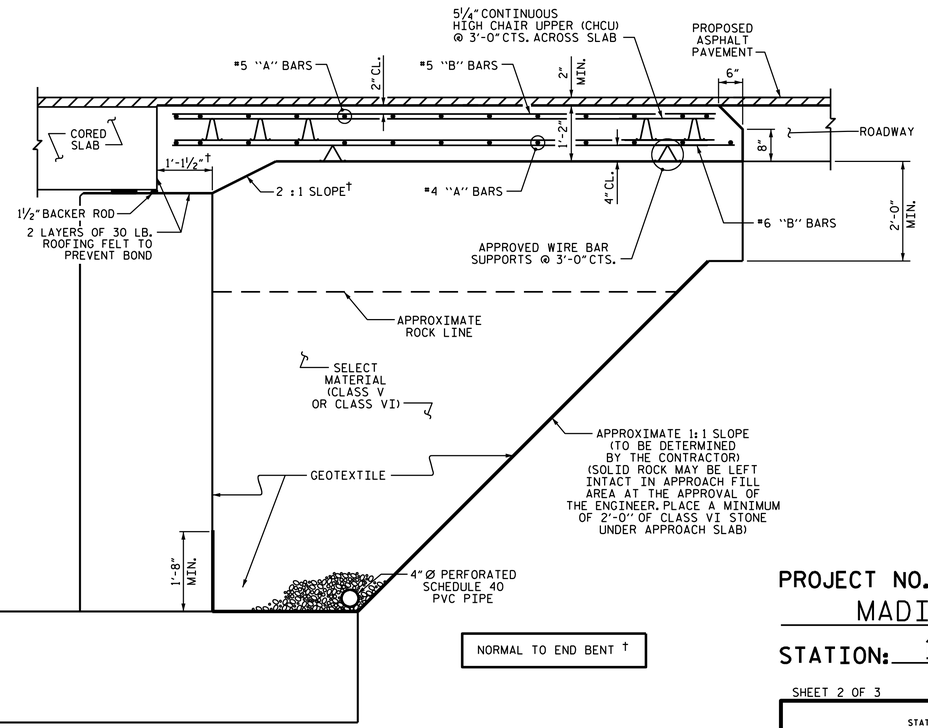
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A5	11	#4	STR	25'-0"	184
A6	11	#4	STR	24'-8"	181
* B1	32	#5	STR	11'-1"	370
B2	32	#6	STR	11'-7"	557
* B3	14	#5	STR	7'-3"	106
B4	14	#6	STR	7'-9"	163
REINFORCING STEEL				LBS.	901
* EPOXY COATED REINFORCING STEEL				LBS.	660
CLASS AA CONCRETE				C. Y.	12.2

APPROACH SLAB AT EB #2 STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A7	11	#4	STR	19'-11"	146
A8	11	#4	STR	19'-7"	144
* B1	35	#5	STR	11'-1"	405
B2	35	#6	STR	11'-7"	609
REINFORCING STEEL				LBS.	753
* EPOXY COATED REINFORCING STEEL				LBS.	551
CLASS AA CONCRETE				C. Y.	11.5

SPLICE LENGTHS

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



SECTION THRU SLAB

(TYPE II - MODIFIED APPROACH FILL)

PROJECT NO. BR-0032

MADISON COUNTY

STATION: 13+50.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB UNIT (SUB-REGIONAL TIER) 120° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			34

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY L. MURRAY
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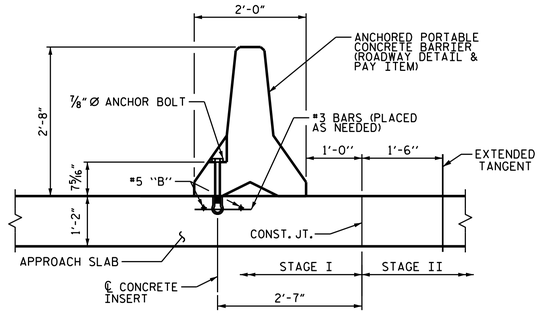
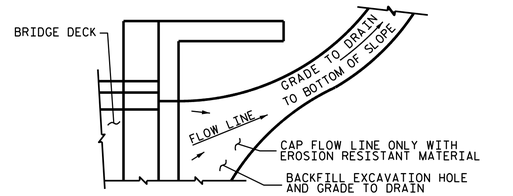
ASSEMBLED BY : R.G.BEAUCHAMP/ D.A.G.	DATE : 6/19		
CHECKED BY : P. N. HOLDER	DATE : 12/21		
DRAWN BY : SHS/MAA 5-09	REV. 12-17	MAA/THC	
CHECKED BY : BCH 5-09			



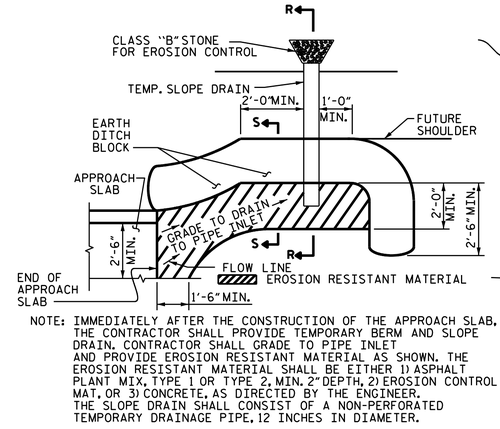
SECTION THRU TEMPORARY CONCRETE BARRIER

SHOWING BARRIER AND CONCRETE INSERT LOCATION
(SEE SHEETS S-12 & S-14 FOR DETAILS AND NOTES FOR INSERTS.)



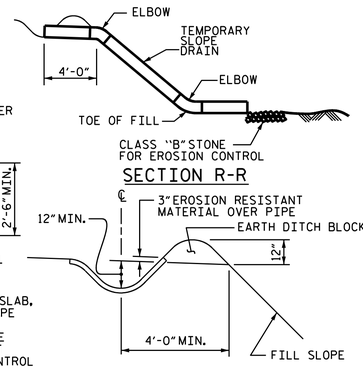
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT 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

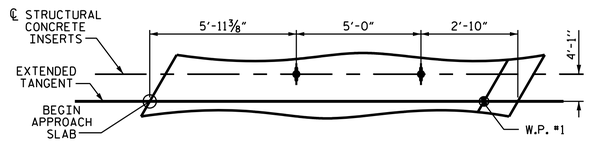


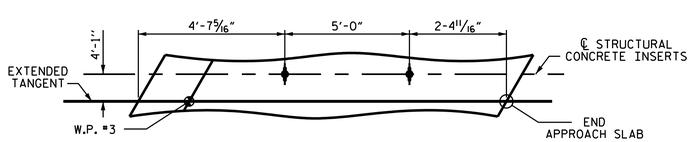
SECTION R-R

SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)





PART PLAN FOR BARRIER ANCHORAGE LOCATIONS ON APPROACH SLABS

PROJECT NO. BR-0032
MADISON COUNTY
STATION: 13+50.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB UNIT
(SUB-REGIONAL TIER)
120° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			34

ASSEMBLED BY : R.G.BEAUCHAMP/ D.A.G.	DATE : 6/19	
CHECKED BY : P. N. HOLDER	DATE : 12/21	
DRAWN BY : SHS/MAA 5-09	REV. 12-17	MAA/THC
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Emily E. Murray
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
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 A.A.S.H.T.O.
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 2018 "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 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH 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.

ENGLISH

JANUARY, 1990

STD. NO. SN

REV. 6-16-95 EEM (/) RGW
REV. 8-16-99 RWW (/) LES
REV. 5-7-03 RWW (/) JTE
REV. 5-1-06 TLA (/) GM
REV. 10-1-11 MAA (/) GM
REV. 12-17 MAA (/) THC