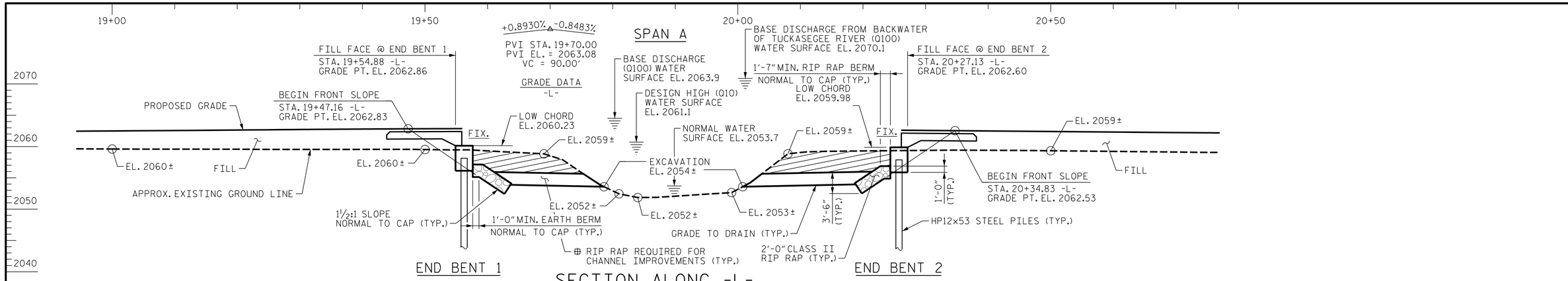
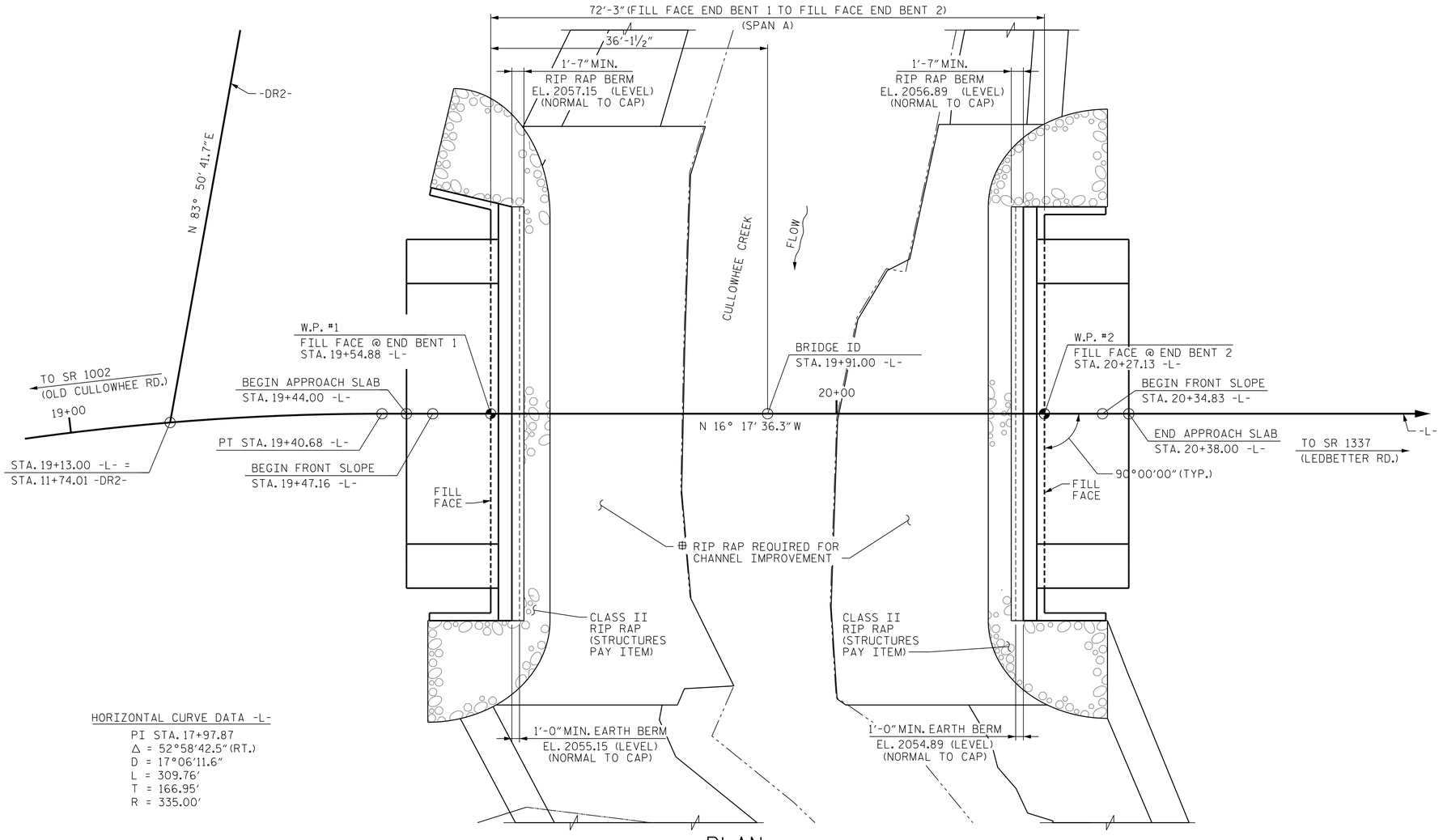


SECTION ALONG -L-

UNCLASSIFIED STRUCTURE EXCAVATION



PLAN

PILES NOT SHOWN FOR CLARITY

⊕ SEE ROADWAY DRAWINGS FOR RIP RAP REQUIRED FOR CHANNEL IMPROVEMENT (ROADWAY DETAIL AND PAY ITEM)

HORIZONTAL CURVE DATA -L-
PI STA. 17+97.87
Δ = 52°58'42.5" (RT.)
D = 17°06'11.6"
L = 309.76'
T = 166.95'
R = 335.00'

I HEREBY CERTIFY THAT THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. 17BP.14.R.212

JACKSON COUNTY

STATION: 19+91.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 159

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON SR 1336 (MONTEITH GAP RD.) OVER CULLOWHEE CREEK BETWEEN SR 1002 (OLD CULLOWHEE RD.) AND SR 1337 (LEDBETTER RD.)

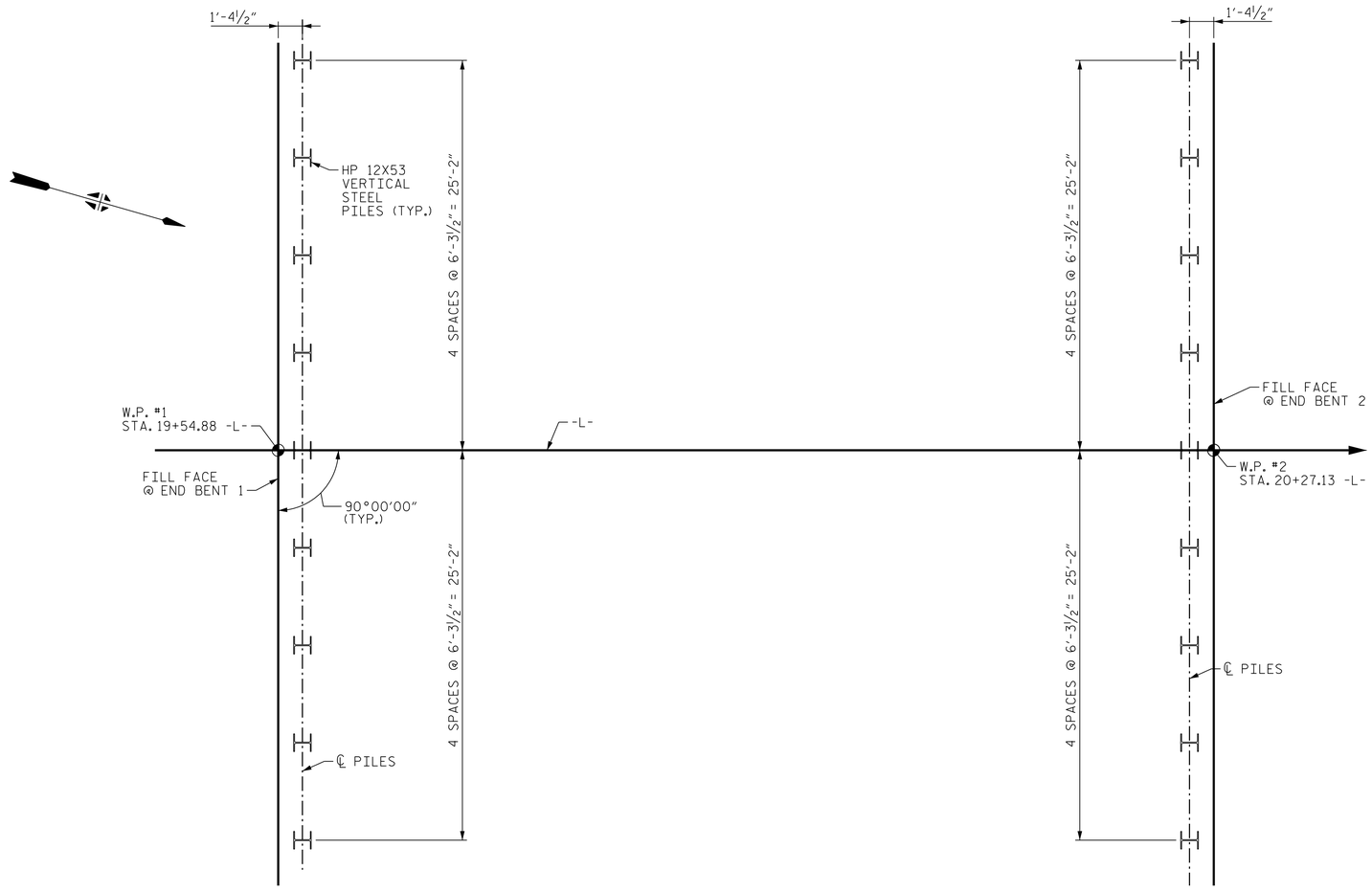
REVISIONS						SHEET NO. S-1
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 20
2	--	--	4	--	--	

NORTH CAROLINA PROFESSIONAL SEAL 040757 ENGINEER KENT DICKENS
1/25/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

DES BY:	K. DICKENS	DATE :	08/19
DES CHK:	J. ROBERTS	DATE :	09/19
DWG BY:	B. PETERSON	DATE :	08/19
CHK BY:	J. ROBERTS	DATE :	09/19



END BENT 1 END BENT 2

FOUNDATION LAYOUT

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.

PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.

DRILLED-IN PILES ARE REQUIRED FOR THE PILES AT END BENT NO. 2. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 2046 FT (LT) AND 2042 FT (RT). FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

CONCRETE IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT NO. 2.

PROJECT NO. 17BP.14.R.212

JACKSON COUNTY

STATION: 19+91.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON SR 1336 (MONTEITH GAP RD.) OVER CULLOWHEE CREEK BETWEEN SR 1002 (OLD CULLOWHEE RD.) AND SR 1337 (LEDBETTER RD.)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1	--	--	3	--	--	TOTAL SHEETS
2	--	--	4	--	--	20

NORTH CAROLINA PROFESSIONAL SEAL 040757 ENGINEER KENT DICKENS
1/25/2022

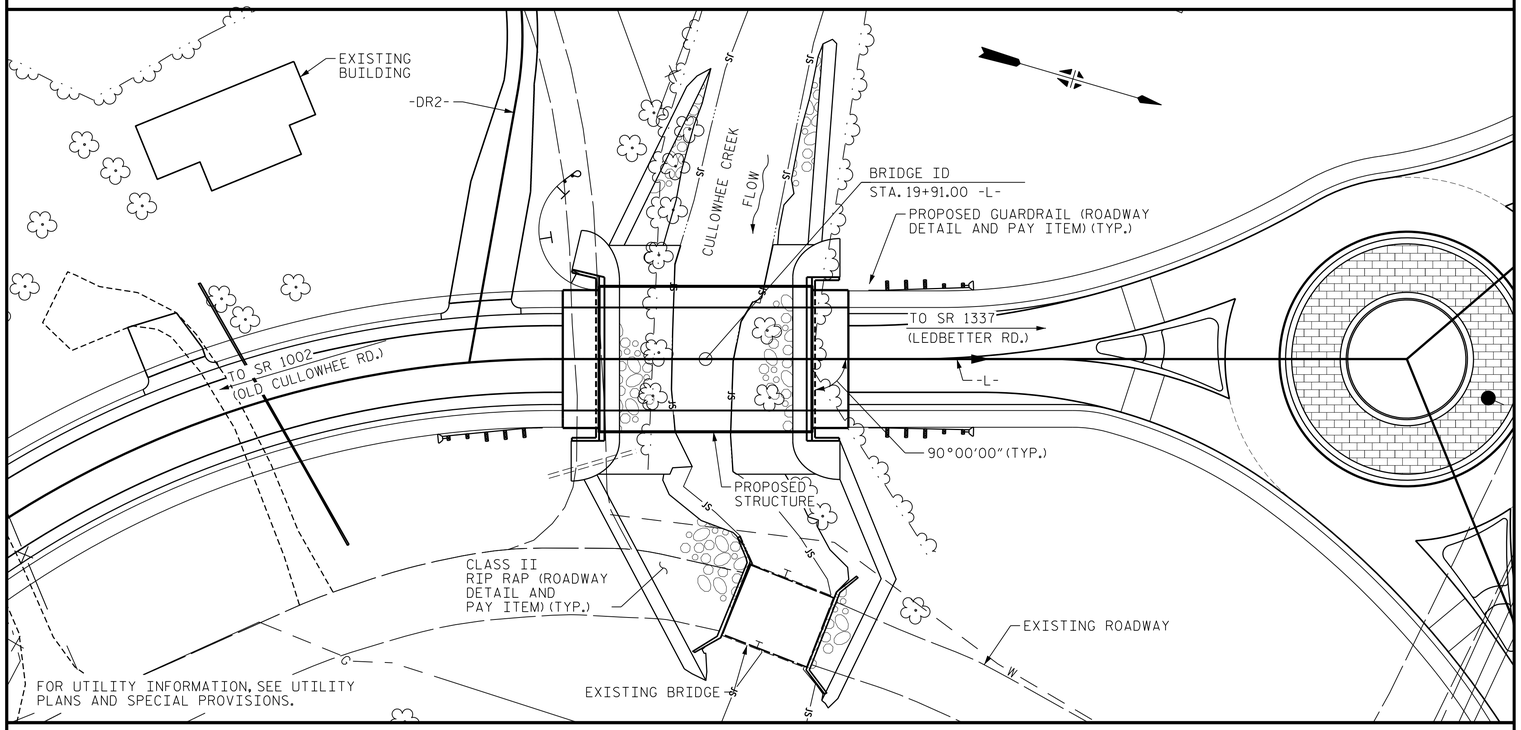
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

DES BY:	S. DHONDE	DATE :	12/19
DES CHK:	J. ROBERTS	DATE :	12/19
DWG BY:	B. PETERSON	DATE :	08/19
CHK BY:	K. DICKENS	DATE :	02/20

PLOT DRIVER: NCDOT STRUCTURES DEFAULT PLOTTER.plt PENTABLE: NCDOT STRUCTURES DEFAULT PEN.tbl
USER: DCARTER DATE: 3/31/2021 TIME: 12:18:08 PM
FILE: ...\GENERAL DRAWING - FOUNDATION LAYOUT.dgn

BENCHMARK BM2: POWER POLE 117.4894' RT OF STA. 19+56.68 -L-; N 3910390, E 301801; EL. 2062.68; (DATUM: NAVD 88)



LOCATION SKETCH

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE @ STA. 19+91.00 -L-	ASBESTOS ASSESMENT	PILE EXCAVATION		UNCLASSIFIED STRUCTURE EXCAVATION @ STA. 19+91.00 -L-	CLASS AA CONCRETE	CLASS A CONCRETE	BRIDGE APPROACH SLABS @ STA. 19+91.00 -L-	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
			IN SOIL	NOT IN SOIL						
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LUMP SUM	CU. YDS.	CU. YDS.	LUMP SUM	LBS.	LBS.
SUPERSTRUCTURE						33.5				1439
END BENT NO. 1							29.0		3378	
END BENT NO. 2			98	10			28.7		3376	
TOTAL	LUMP SUM	LUMP SUM	98	10	LUMP SUM	33.5	57.7	LUMP SUM	6754	1439

TOTAL BILL OF MATERIAL

	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	HP 12X53 STEEL PILES		TWO BAR METAL RAIL	1'-2" X 3'-4 7/8" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" x 2'-0" PRESTRESSED CONCRETE CORED SLABS	
	EA.	NO.	LIN. FT.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE				125.0	140.0				16	1120
END BENT NO. 1	9	9	225			69	76			
END BENT NO. 2	9	9	180			64	71			
TOTAL	18	18	405	125.0	140.0	133	147	LUMP SUM	16	1120

HYDRAULIC DATA

DESIGN DISCHARGE	= 2610	CFS
FREQUENCY OF DESIGN DISCHARGE	= 10	YR.
DESIGN HIGH WATER ELEVATION	= 2061.1	FT.
DRAINAGE AREA	= 23.5	SQ. MI.
BASE DISCHARGE (Q100)	= 5220	CFS
BASE HIGH WATER ELEVATION	= 2063.9	FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 3100	CFS
FREQUENCY OF OVERTOPPING	= 10+	YR.
OVERTOPPING ELEVATION	= 2061.8	FT.

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR 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.

ALL PAVEMENT MARKING WILL BE IN ACCORDANCE WITH THE PAVEMENT MARKING PLANS AND SHALL PROVIDE FOR BICYCLES.

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 19+91.00 -L-."

THE MATERIAL SHOWN IN THE HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 50FT EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE EXISTING STRUCTURE CONSISTING OF A SINGLE 32'-8" STEEL I-BEAM SPAN WITH TIMBER DECKING ON MASONRY ABUTMENTS AND LOCATED DOWNSTREAM OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONITRACTOR 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.

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

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

PROJECT NO. 17BP.14.R.212

JACKSON COUNTY

STATION: 19+91.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON SR 1336 (MONTEITH GAP RD.) OVER CULLOWHEE CREEK BETWEEN SR 1002 (OLD CULLOWHEE RD.) AND SR 1337 (LEDBETTER RD.)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1	--	--	3	--	--	TOTAL SHEETS
2	--	--	4	--	--	20

NORTH CAROLINA PROFESSIONAL SEAL 040757 ENGINEER KENT DICKENS
Kent Dickens
1/25/2022

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DES BY: K. DICKENS DATE: 08/19
DES CHK: J. ROBERTS DATE: 09/19
DWG BY: B. PETERSON DATE: 08/19
CHK BY: J. ROBERTS DATE: 09/19

PLOT DRIVER: NCDOT STRUCTURES DEFAULT PLOTTER.plt PENTABLE: NCDOT STRUCTURES DEFAULT PEN.tbl
USER: DCARTER DATE: 3/31/2021 TIME: 12:15:13 PM
FILE: ...\GENERAL DRAWING LOCATION SKETCH

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**	1.38	--	1.75	0.226	**1.38**	70′	EL	**34.5**	0.507	1.57	70′	EL	6.9	0.80	0.226	1.47	70′	EL	34.5	1
		HL-93(Opr)	N/A	--	1.79	--	1.35	0.226	1.79	70′	EL	34.5	0.507	2.09	70′	EL	6.9	N/A	--	--	--	--	--	1
		HS-20(Inv)	36.000	**2**	1.79	64.44	1.75	0.226	**1.79**	70′	EL	**34.5**	0.507	2.00	70′	EL	6.9	0.80	0.226	1.91	70′	EL	34.5	1
		HS-20(Opr)	36.000	--	2.32	83.52	1.35	0.226	2.32	70′	EL	34.5	0.507	2.65	70′	EL	6.9	N/A	--	--	--	--	--	1
LEGAL LOAD RATING	SV	SNSH	13.500	--	4.27	57.65	1.4	0.226	5.00	70′	EL	34.5	0.507	6.30	70′	EL	6.9	0.80	0.226	4.27	70′	EL	34.5	1
		SNGARBS2	20.000	--	3.20	64.00	1.4	0.226	3.75	70′	EL	34.5	0.507	4.45	70′	EL	6.9	0.80	0.226	3.20	70′	EL	34.5	1
		SNAGRIS2	22.000	--	3.04	66.88	1.4	0.226	3.56	70′	EL	34.5	0.507	4.12	70′	EL	6.9	0.80	0.226	3.04	70′	EL	34.5	1
		SNCOTTS3	27.250	--	2.13	58.04	1.4	0.226	2.49	70′	EL	34.5	0.507	3.07	70′	EL	6.9	0.80	0.226	2.13	70′	EL	34.5	1
		SNAGGRS4	34.925	--	1.78	62.17	1.4	0.226	2.09	70′	EL	34.5	0.507	2.52	70′	EL	6.9	0.80	0.226	1.78	70′	EL	34.5	1
		SNS5A	35.550	--	1.74	61.86	1.4	0.226	2.04	70′	EL	34.5	0.507	2.54	70′	EL	6.9	0.80	0.226	1.74	70′	EL	34.5	1
		SNS6A	39.950	--	1.60	63.92	1.4	0.226	1.88	70′	EL	34.5	0.507	2.32	70′	EL	6.9	0.80	0.226	1.60	70′	EL	34.5	1
		SNS7B	42.000	--	1.53	64.26	1.4	0.226	1.79	70′	EL	34.5	0.507	2.28	70′	EL	6.9	0.80	0.226	1.53	70′	EL	34.5	1
	TTST	TNAGRIT3	33.000	--	1.96	64.68	1.4	0.226	2.29	70′	EL	34.5	0.507	2.80	70′	EL	6.9	0.80	0.226	1.96	70′	EL	34.5	1
		TNT4A	33.075	--	1.97	65.16	1.4	0.226	2.30	70′	EL	34.5	0.507	2.72	70′	EL	6.9	0.80	0.226	1.97	70′	EL	34.5	1
		TNT6A	41.600	--	1.61	66.98	1.4	0.226	1.89	70′	EL	34.5	0.507	2.44	70′	EL	6.9	0.80	0.226	1.61	70′	EL	34.5	1
		TNT7A	42.000	--	1.62	68.04	1.4	0.226	1.90	70′	EL	34.5	0.507	2.38	70′	EL	6.9	0.80	0.226	1.62	70′	EL	34.5	1
		TNT7B	42.000	--	1.68	70.56	1.4	0.226	1.97	70′	EL	34.5	0.507	2.21	70′	EL	6.9	0.80	0.226	1.68	70′	EL	34.5	1
		TNAGRIT4	43.000	--	1.60	68.80	1.4	0.226	1.87	70′	EL	34.5	0.507	2.14	70′	EL	6.9	0.80	0.226	1.60	70′	EL	34.5	1
		TNAGT5A	45.000	--	1.50	67.50	1.4	0.226	1.76	70′	EL	34.5	0.507	2.13	70′	EL	6.9	0.80	0.226	1.50	70′	EL	34.5	1
		TNAGT5B	45.000	**3**	1.48	66.60	1.4	0.226	**1.74**	70′	EL	**34.5**	0.507	2.03	70′	EL	6.9	0.80	0.226	1.48	70′	EL	34.5	1

LOAD FACTORS:

	LIMIT STATE	γ_{DC}	γ_{DW}
DESIGN LOAD RATING FACTORS	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. LIVE LOAD DISTRUBTION FACTORS CALCULATED PER AASHTO LRFD 8TH EDITION.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

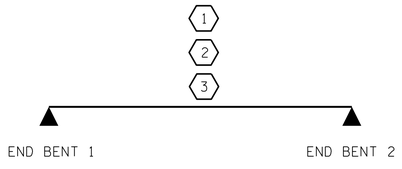
(2) DESIGN LOAD RATING (HS-20)

(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. 17BP.14.R.212

JACKSON COUNTY

STATION: 19+91.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR 70′ CORED SLAB UNIT 90° SKEW (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO. S-4
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 20
1	--	--	3	--	--	
2	--	--	4	--	--	

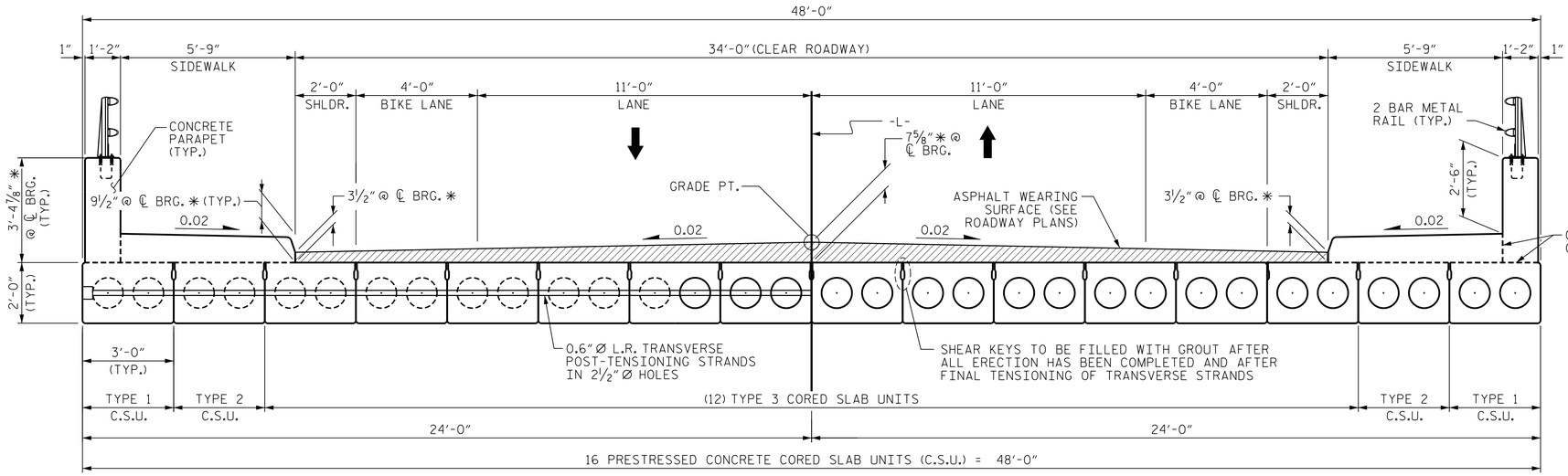
NORTH CAROLINA PROFESSIONAL SEAL 040757 ENGINEER KENT DICKENS

1/25/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

DES BY: S. DHONDE	DATE: 12/19	DWG BY: B. PETERSON	DATE: 08/19
DES CHK: J. ROBERTS	DATE: 12/19	CHK BY: K. DICKENS	DATE: 02/20



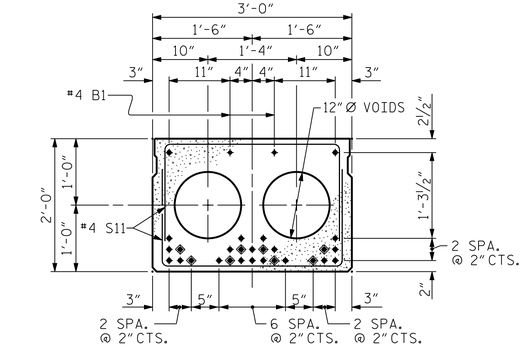
HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

TYPICAL SECTION

✱ THE MAXIMUM CONCRETE PARAPET HEIGHT, SIDEWALK THICKNESS, AND ASPHALT THICKNESS IS SHOWN. THE CONCRETE PARAPET HEIGHT, SIDEWALK THICKNESS, AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE CONCRETE PARAPET, AND SIDEWALK FOLLOWS THE PROFILE OF THE GUTTERLINE.

FOR CONCRETE PARAPET HEIGHT DETAILS SEE "CONCRETE PARAPET DETAILS" SHEETS.
FOR SIDEWALK THICKNESS DETAILS, SEE "SIDEWALK PLAN AND SECTION" SHEET



TYPE 3 INTERIOR SLAB SECTION (70' UNIT)

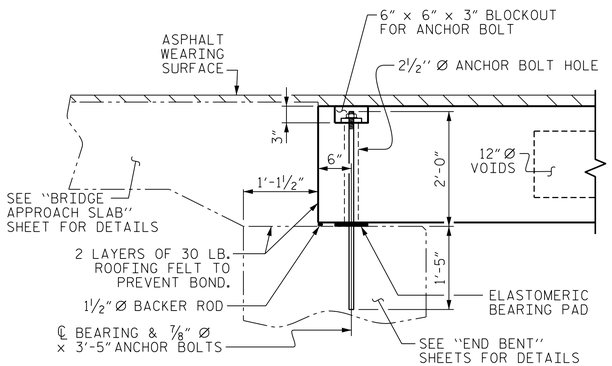
(28 STRANDS REQUIRED)

0.6'' Ø LOW RELAXATION STRAND LAYOUT

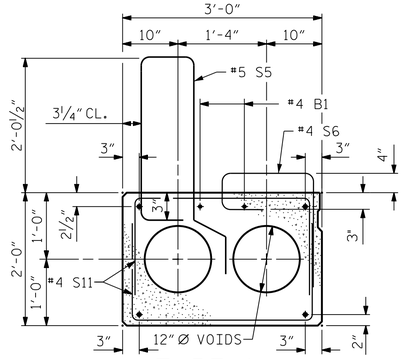
◈ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

FIXED END

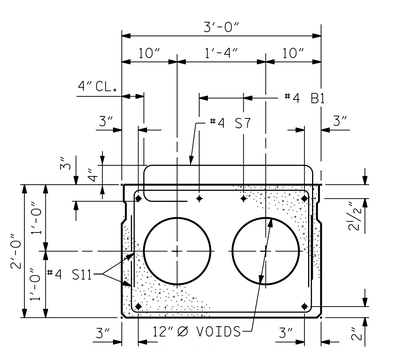


SECTION AT END BENT



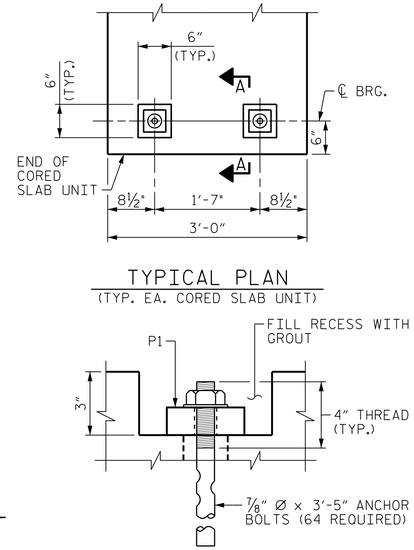
TYPE 1 EXTERIOR SLAB SECTION

(SEE TYPE 3 INTERIOR SLAB SECTION FOR GENERAL DIMENSIONS, STRAND LAYOUT, AND BAR MARKS NOT SHOWN)



TYPE 2 INTERIOR SLAB SECTION

(SEE TYPE 3 INTERIOR SLAB SECTION FOR GENERAL DIMENSIONS, STRAND LAYOUT, AND BAR MARKS NOT SHOWN)

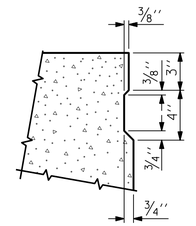


TYPICAL PLAN

(TYP. EA. CORED SLAB UNIT)

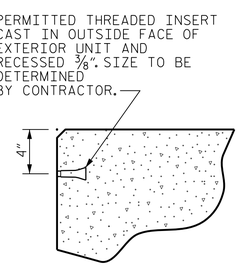
SECTION A-A

BLOCKOUT DETAIL FOR ANCHOR BOLTS

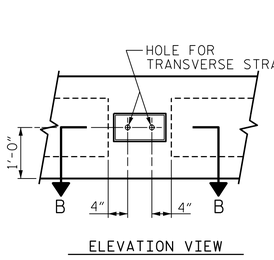


SHEAR KEY DETAIL

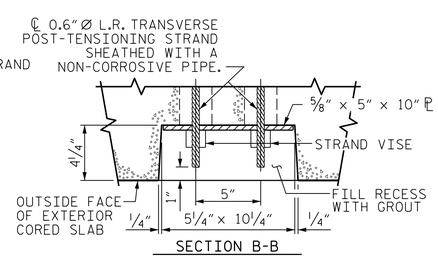
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.



THREADED INSERT DETAIL

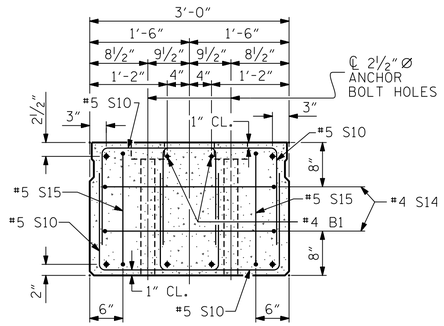


ELEVATION VIEW



SECTION B-B

GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS



END ELEVATION

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

PROJECT NO. 17BP.14.R.212

JACKSON COUNTY

STATION: 19+91.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1	--	--	3	--	--	TOTAL SHEETS
2	--	--	4	--	--	20

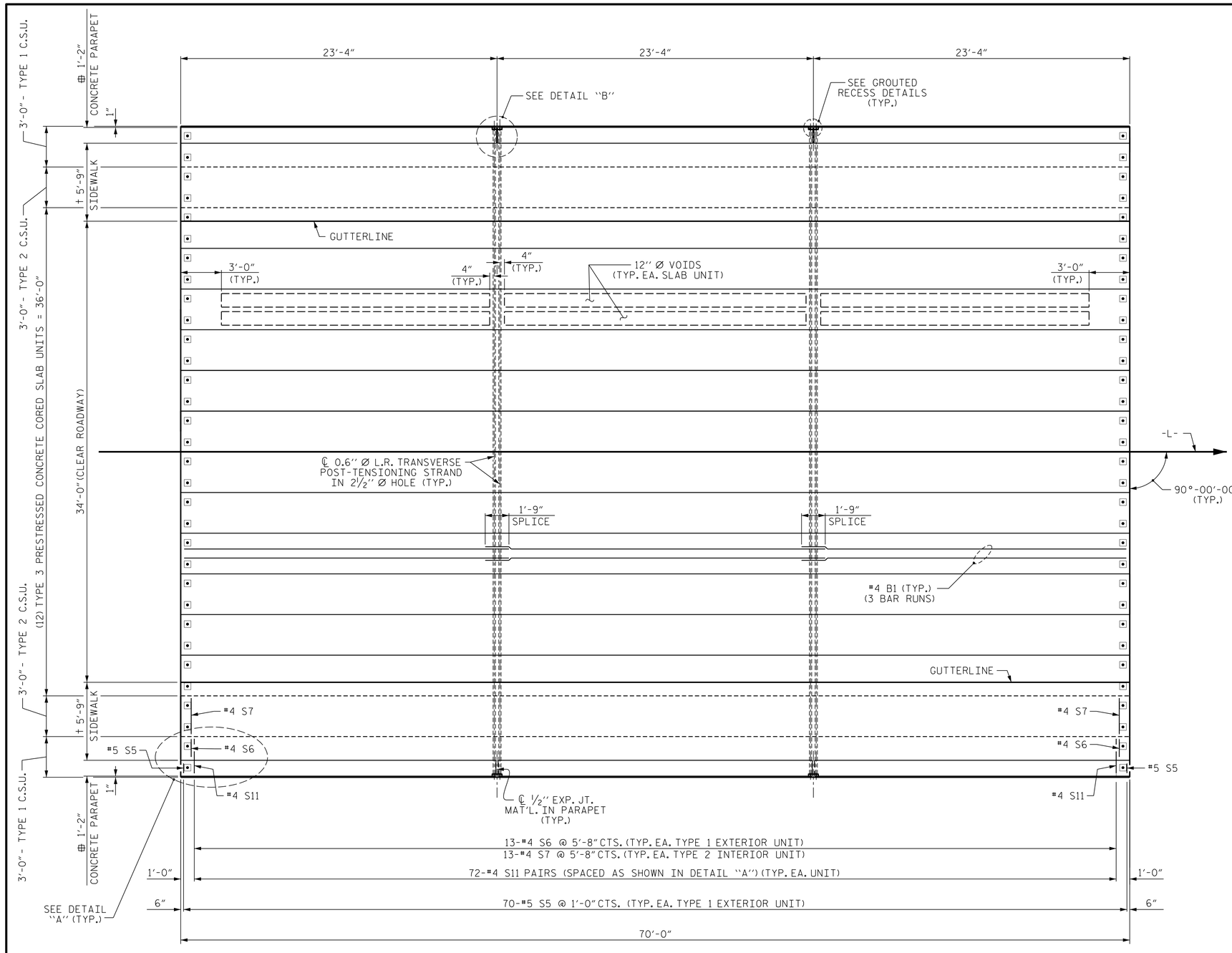
NORTH CAROLINA PROFESSIONAL SEAL 040757 ENGINEER KENT DICKENS
1/25/2022

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DES BY:	S. DHONDE	DATE :	12/19
DES CHK:	J. ROBERTS	DATE :	12/19
DWG BY:	B. PETERSON	DATE :	08/19
CHK BY:	K. DICKENS	DATE :	02/20

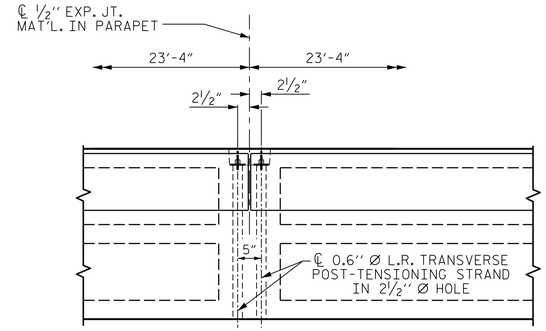
PLOT DRIVER: NCDOT STRUCTURES DEFAULT PLOTTER.plt PENTABLE: NCDOT STRUCTURES DEFAULT PEN.tbl
USER: DCARTER DATE: 3/31/2021 TIME: 12:40:45 PM
FILE: ...\SUPERSTRUCTURE TYPICAL SECTION



PLAN OF UNIT

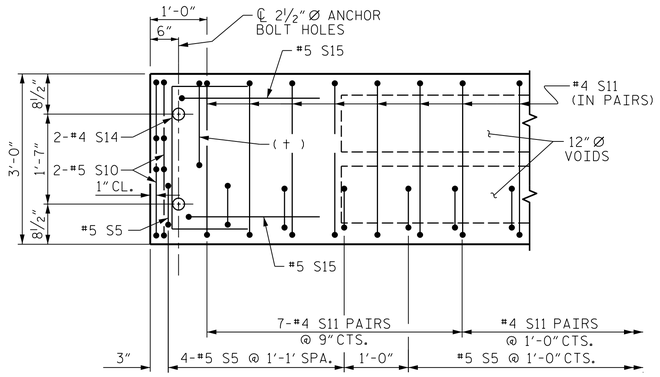
† = FOR DETAILS AND REINFORCING STEEL IN SIDEWALK, SEE "SIDEWALK DETAILS" SHEET.

⊕ = FOR DETAILS AND REINFORCING STEEL IN CONCRETE PARAPET, SEE "CONCRETE PARAPET DETAILS" SHEET.



DETAIL "B"

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



DETAIL "A"

(TYPICAL EACH END OF UNIT)
NOTE: TYPE 1 EXTERIOR UNIT SHOWN - TYPE 2 AND 3 INTERIOR UNITS SIMILAR EXCEPT OMIT #5 S5 & #4 S6 BARS.

(†) = #4S6 @ TYPE 1 UNITS
#4S7 @ TYPE 2 UNITS

PROJECT NO. 17BP.14.R.212

JACKSON COUNTY

STATION: 19+91.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1	--	--	3	--	--	TOTAL SHEETS
2	--	--	4	--	--	20

NORTH CAROLINA PROFESSIONAL SEAL 040757 ENGINEER KENT DICKENS
1/25/2022

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DES CHK:	J. ROBERTS	DATE :	12/19
DWG BY:	B. PETERSON	DATE :	08/19
CHK BY:	K. DICKENS	DATE :	02/20

PLOT DRIVER: NCDOT STRUCTURES DEFAULT PLOTTER.plt PENTABLE: NCDOT STRUCTURES DEFAULT PEN.tbl
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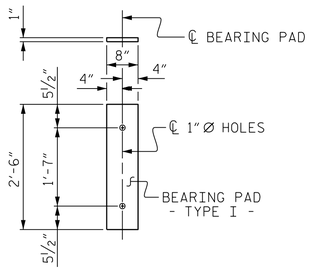
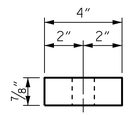
FILE: ...\SUPERSTRUCTURE PLAN OF SPAN A



FIXED END
(TYPE I - 32 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



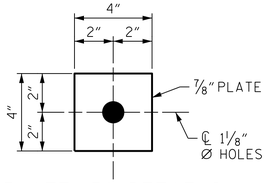
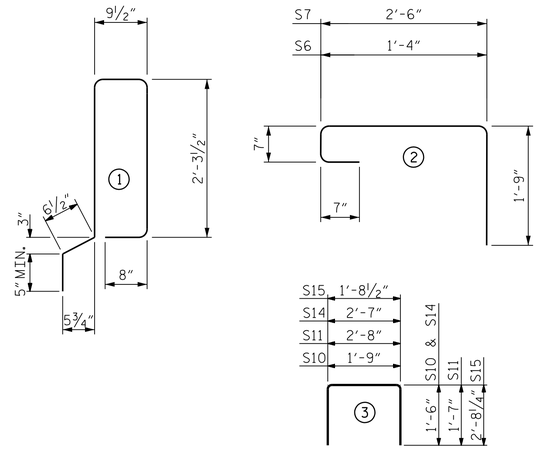


PLATE "P1" DETAILS
(64 REQUIRED)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE 70' CORED SLAB UNIT

				TYPE 1 EXTERIOR UNIT		TYPE 2 INTERIOR UNIT		TYPE 3 INTERIOR UNIT	
BAR	SIZE	TYPE	LENGTH	NUMBER	WEIGHT	NUMBER	WEIGHT	NUMBER	WEIGHT
B1	#4	STR	24'-6"	6	98	6	98	6	98
✳ S5	#5	1	7'-0"	70	511	--	--	--	--
✳ S6	#4	2	4'-3"	13	37	--	--	--	--
✳ S7	#4	2	5'-5"	--	--	13	47	--	--
S10	#5	3	4'-9"	8	40	8	40	8	40
S11	#4	3	5'-10"	144	561	144	561	144	561
S14	#4	3	5'-7"	4	15	4	15	4	15
S15	#5	3	7'-1"	4	30	4	30	4	30
REINFORCING STEEL			LBS.		744		744		744
✳ EPOXY COATED REINFORCING STEEL			LBS.		548		47		
8000 P.S.I. CONCRETE			CU. YDS.		11.9		11.9		11.9
0.6" Ø L.R. STRANDS			No.		28		28		28

CORED SLABS REQUIRED

70' UNIT	NUMBER	LENGTH	TOTAL LENGTH
TYPE 1 (EXTERIOR) C.S.	2	70'-0"	140'-0"
TYPE 2 (INTERIOR) C.S.	2	70'-0"	140'-0"
TYPE 3 (INTERIOR) C.S.	12	70'-0"	840'-0"
TOTAL	16	70'-0"	1120'-0"

DEAD LOAD DEFLECTION AND CAMBER

	3'-0" x 2'-0"
70' CORED SLAB UNIT	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

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

CONCRETE RELEASE STRENGTH

UNIT	PSI
70' UNITS	5500

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 ANCHOR BOLT 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 CONCRETE PARAPET AND SIDEWALK 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 CONCRETE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN CONCRETE PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF CONCRETE PARAPET 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.

1/25/2022

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PROJECT NO. 17BP.14.R.212
JACKSON COUNTY
STATION: 19+91.00 -L-

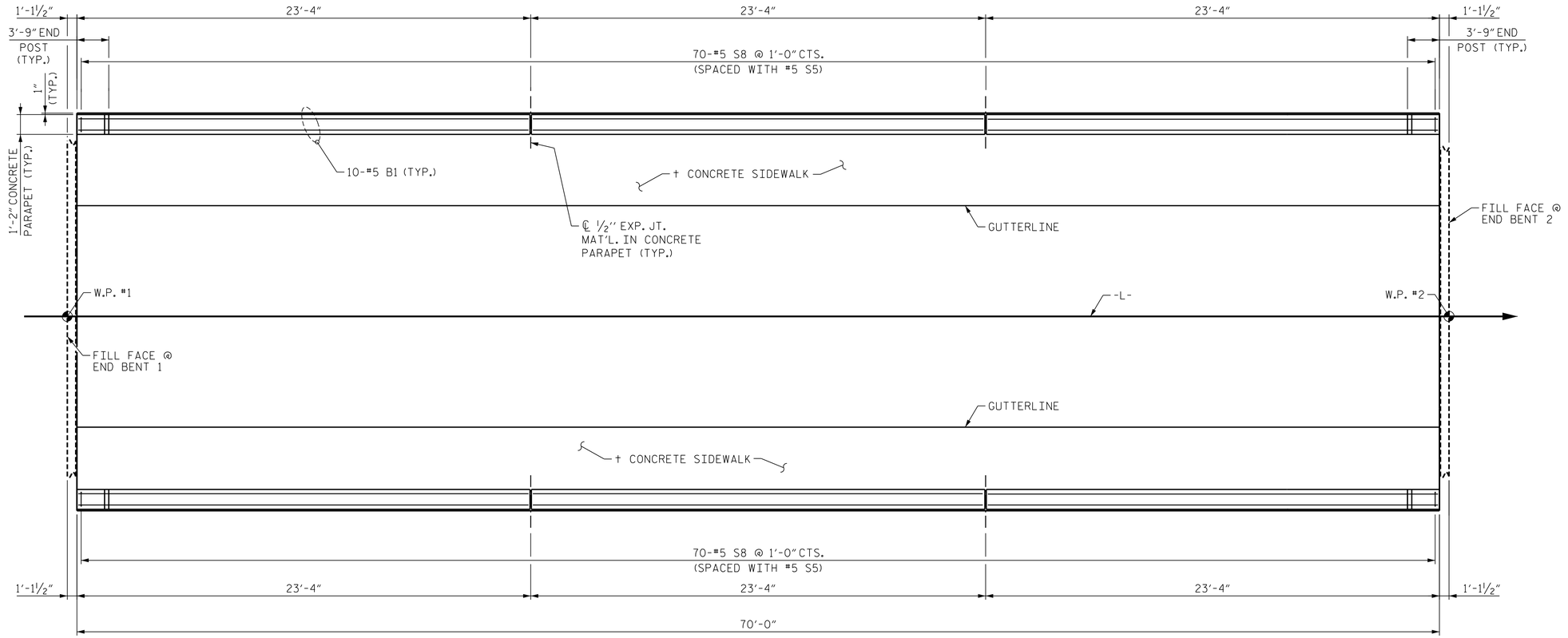
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

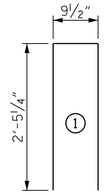
SUPERSTRUCTURE 3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT

REVISIONS						SHEET NO. S-7
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 20
2	--	--	4	--	--	

DES BY: S. DHONDE DATE: 12/19
DES CHK: J. ROBERTS DATE: 12/19
DWG BY: B. PETERSON DATE: 08/19
CHK BY: K. DICKENS DATE: 02/20



BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
✳B1	60	#5	STR.	22'-11"	1435
✳E1	8	#7	STR.	3'-4"	55
✳E2	8	#7	STR.	3'-10"	63
✳E3	8	#7	STR.	4'-4"	71
✳E4	8	#7	STR.	4'-10"	80
✳E5	8	#7	STR.	5'-2"	85
✳F1	8	#6	STR.	1'-10"	23
✳F2	8	#6	STR.	3'-0"	37
✳F3	8	#6	STR.	3'-8"	45
✳S8	140	#5	1	5'-8"	828

✳EPOXY COATED REINF. STEEL	2722	LBS.
CLASS AA CONCRETE	21.1	CU. YDS.
1'-2" X 3'-4⅞" CONCRETE PARAPET	140.0	LIN. FT.

NOTES

ALL REINFORCING STEEL IN CONCRETE PARAPET AND END POSTS SHALL BE EPOXY COATED.

THE #5 "S" BARS MAY BE SHIFTED SLIGHTY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE ½" EXPANSION JOINT MATERIAL IN THE CONCRETE PARAPET.

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

FOR DETAILS OF CONCRETE INSERTS, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.

FOR GUARDRAIL ANCHOR ASSEMBLY, SEE "GUARDRAIL ANCHORAGE DETAILS" SHEET.

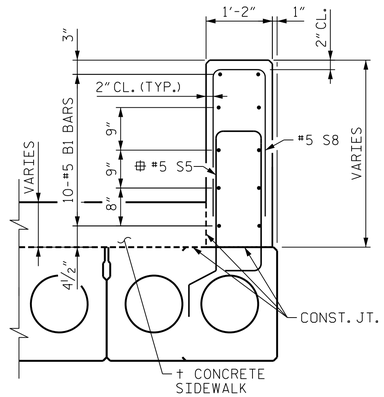
† = FOR DETAILS AND REINFORCING STEEL IN SIDEWALK, SEE "SIDEWALK DETAILS" SHEET.

✳ = BASED ON THEORETICAL ANTICIPATED CAMBER. ADJUST AS NECESSARY BASED ON ACTUAL MEASURED CAMBER.

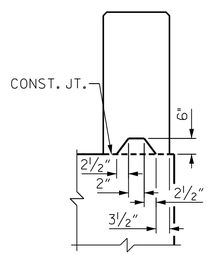
⊕ = FOR #5 S5 BARS IN CORED SLAB UNITS, SEE "PRESTRESSED CONCRETE CORED SLAB UNIT" SHEETS.

PLAN OF PARAPET

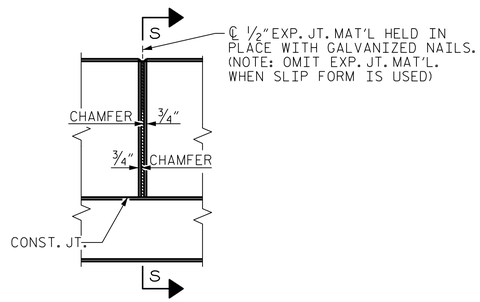
GUTTERLINE ASPHALT THICKNESS & CONCRETE PARAPET HEIGHT				
3'-0" x 2'-0" CORED SLAB UNIT	ASPHALT THICKNESS		CONCRETE PARAPET HEIGHT	
	@ ℄ BEARING	@ MID-SPAN	@ ℄ BEARING	@ MID-SPAN
70' UNITS	3½"	2"✳	3'-4⅞"✳	3'-3⅜"✳



SECTION THRU PARAPET



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



ELEVATION AT EXPANSION JOINTS

PARAPET RAIL DETAILS

PROJECT NO. 17BP.14.R.212

JACKSON COUNTY

STATION: 19+91.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE CONCRETE PARAPET DETAILS

REVISIONS						SHEET NO. S-8
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 20
2	--	--	4	--	--	

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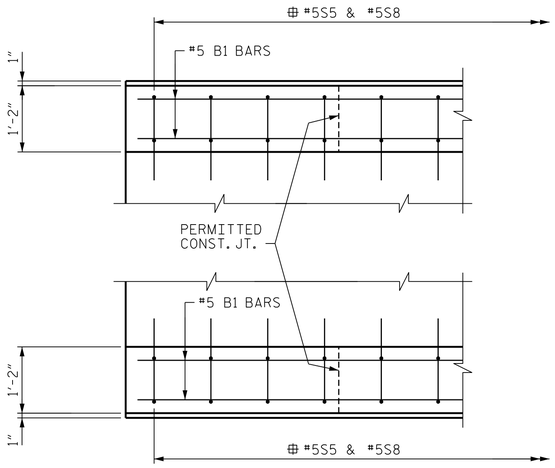
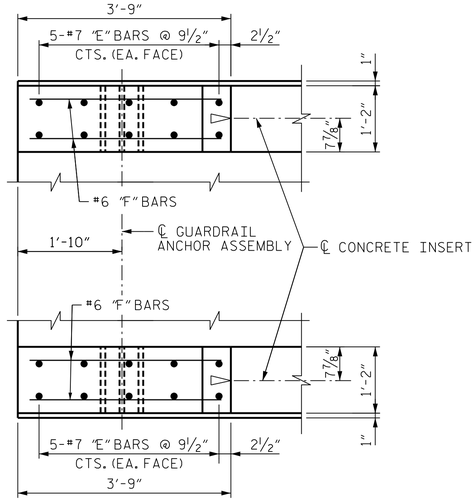
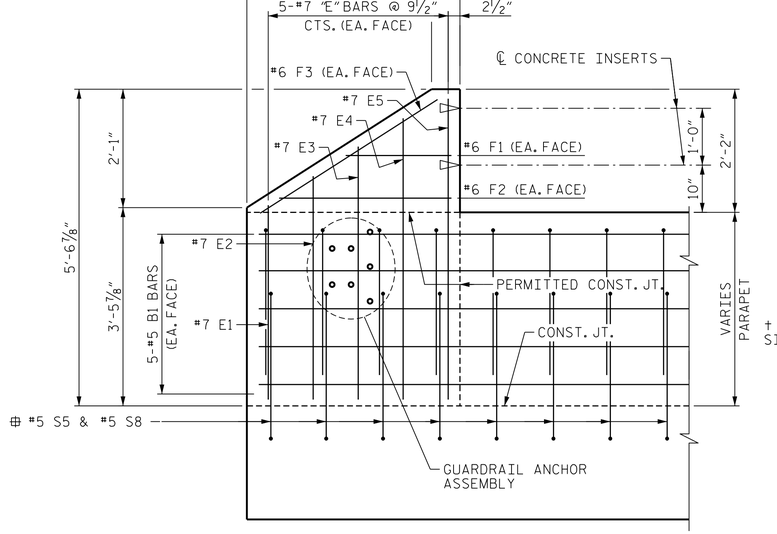


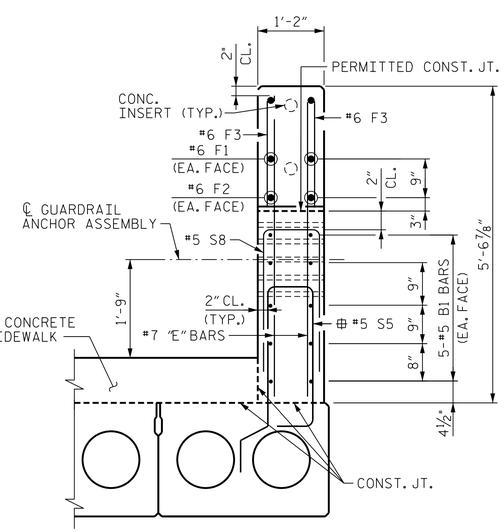
PLAN OF PARAPET
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



PLAN OF END POST
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



ELEVATION
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



END VIEW
(SHOWN AT RIGHT SIDE - SIMILAR AT LEFT SIDE)

⊕ = FOR #5 S5 BARS IN CORED SLAB UNITS, SEE "PRESTRESSED CONCRETE CORED SLAB UNIT" SHEETS.

† = FOR DETAILS AND REINFORCING STEEL IN SIDEWALK, SEE "SIDEWALK DETAILS" SHEET.

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SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE CONCRETE PARAPET DETAILS

REVISIONS						SHEET NO. S-9
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 20
2	--	--	4	--	--	

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USER: DCARTER DATE: 3/31/2021 TIME: 2:42:05 PM
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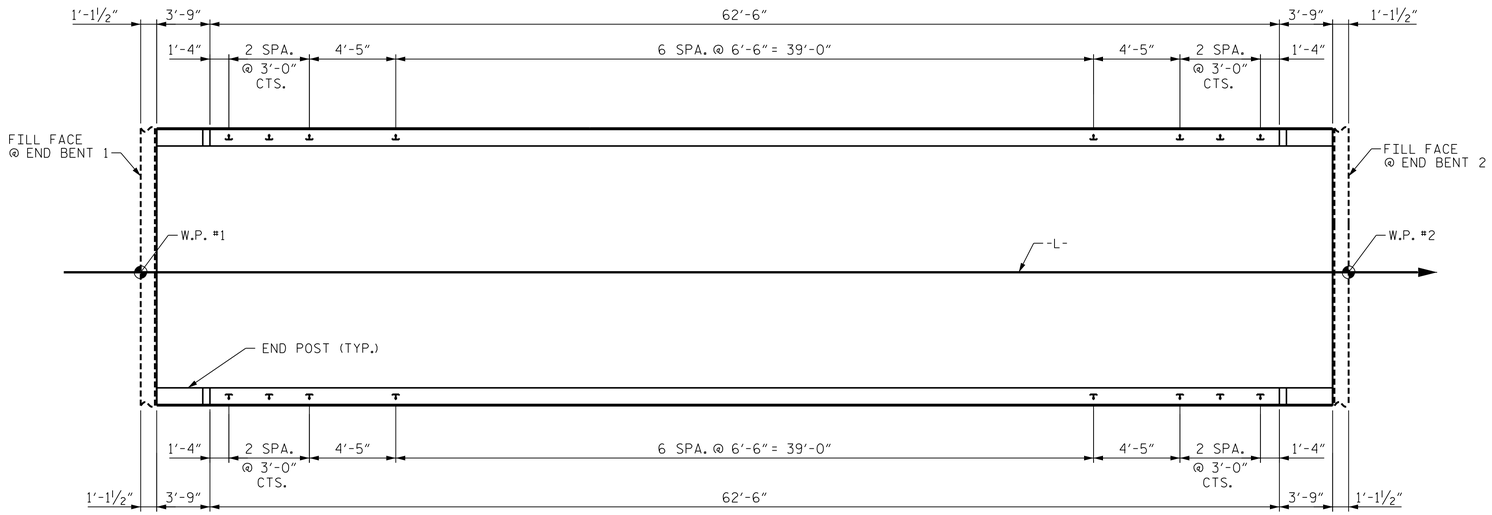
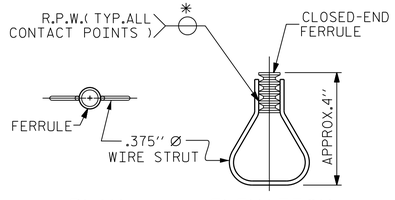


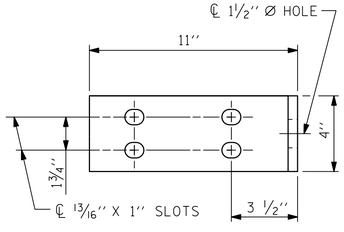
PLAN OF RAIL POST SPACINGS



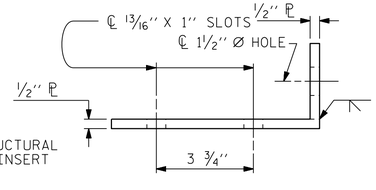
PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

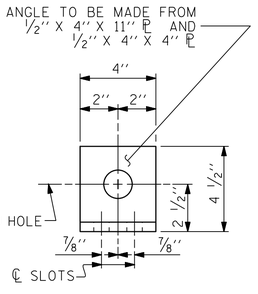
*EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.



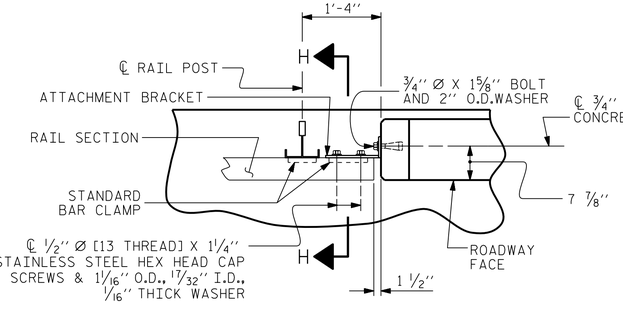
ELEVATION



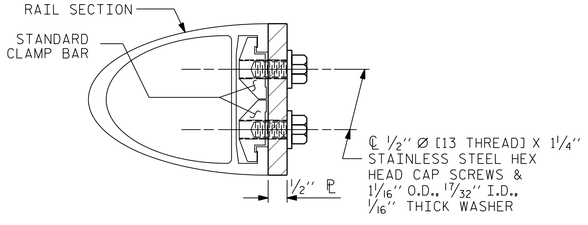
TOP VIEW



END VIEW



PLAN - RAIL AND END POST



SECTION H-H

NOTES

STRUCTURAL CONCRETE INSERT

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 1½".

B. 1 - ¾" Ø X 1⅝" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE ¾" Ø X 1⅝" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. 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. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. ½" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. ¾" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A ¾"Ø X 1⅝" BOLT WITH 2" O.D. WASHER IN PLACE. THE ¾"Ø X 1⅝" BOLT SHALL HAVE N. C. THREADS.

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.

D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).

E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

THE ¾" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE ¾" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE ½" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾" Ø X 1⅝" BOLT WITH WASHER SHALL BE REPLACED WITH A ¾"Ø X 6½" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾" Ø X 1⅝" BOLT SHALL APPLY TO THE ¾"Ø X 6 ½" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

DETAILS FOR ATTACHING METAL RAIL TO END POST

PROJECT NO. 17BP.14.R.212

JACKSON COUNTY

STATION: 19+91.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE RAIL POST SPACINGS & END OF RAIL DETAILS

REVISIONS						SHEET NO. S-10
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 20
2	--	--	4	--	--	

NORTH CAROLINA PROFESSIONAL SEAL 040757 ENGINEER KENT DICKENS

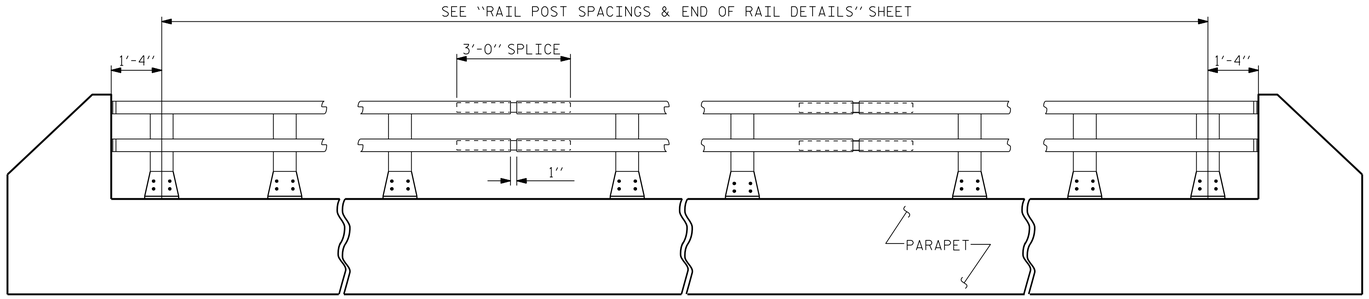
1/25/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

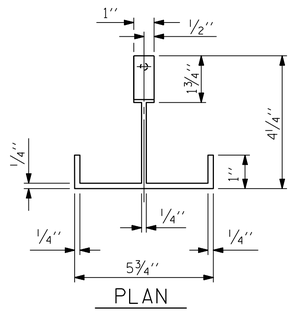
DES BY:	S. DHONDE	DATE :	12/19
DES CHK:	J. ROBERTS	DATE :	12/19
DWG BY:	B. PETERSON	DATE :	08/19
CHK BY:	K. DICKENS	DATE :	02/20

PLOT DRIVER: NCDOT STRUCTURES DEFAULT PLOTTER.plt PENTABLE: NCDOT STRUCTURES DEFAULT PEN.tbl
USER: DCARTER DATE: 3/31/2021 TIME: 2:20:42 PM
FILE: ...\SUPERSTRUCTURE - RAIL POST SPACINGS AND END OF RAIL DETAILS

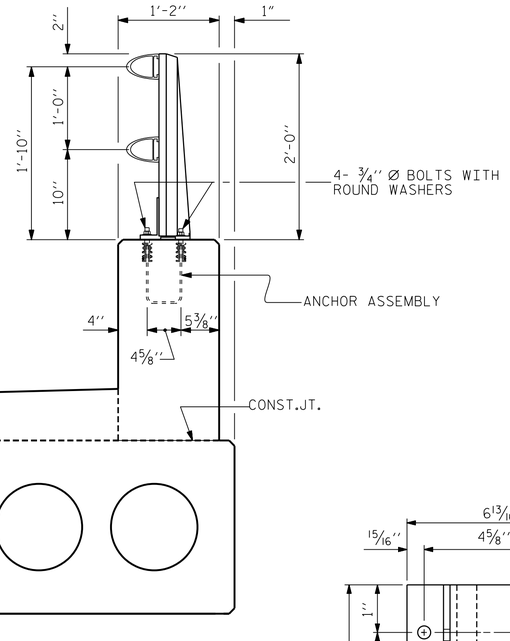


ELEVATION

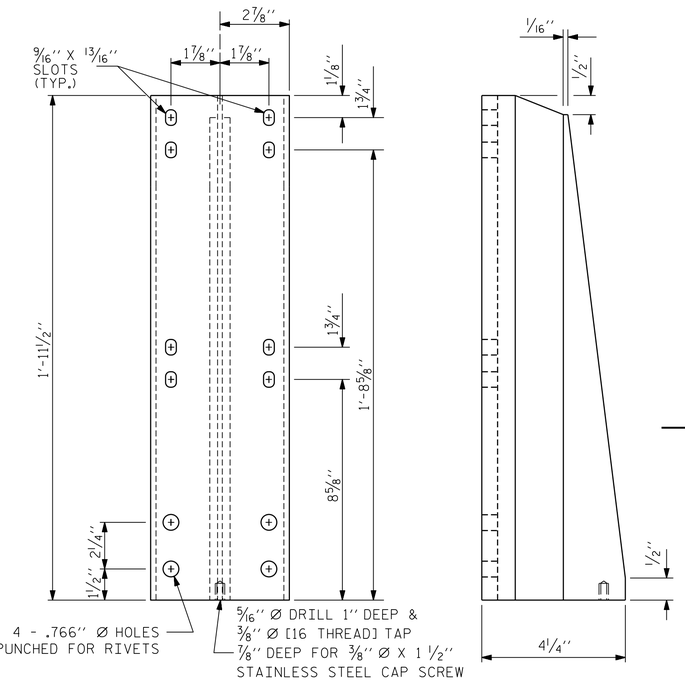
NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE "RAIL POST SPACINGS & END OF RAIL DETAILS" SHEET.



PLAN

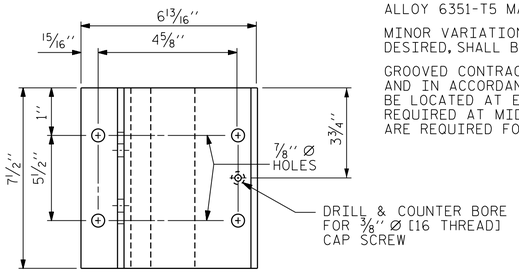


SECTION THRU PARAPET AND RAIL

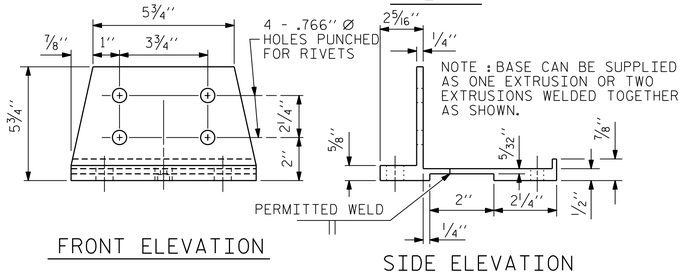


FRONT ELEVATION SIDE ELEVATION

DETAILS OF POST

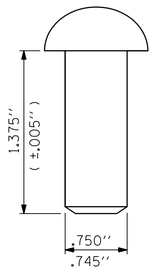


PLAN



FRONT ELEVATION SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

UNLESS OTHERWISE REQUIRED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR HAS THE OPTION TO USE AN ALTERNATE TO THE 2 BAR METAL RAIL. THE ALTERNATE RAIL SHALL MEET THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST (APL) UNDER "2 BAR METAL RAIL ALTERNATE". ADJUSTMENTS TO THE CONCRETE PARAPET WILL NOT BE ALLOWED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

PAY LENGTH = 125.0 LIN. FT.

PROJECT NO. 17BP.14.R.212

JACKSON COUNTY

STATION: 19+91.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
2 BAR METAL RAIL

REVISIONS						SHEET NO. S-11
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 20
2	--	--	4	--	--	

DES BY: S. DHONDE	DATE : 12/19	DWG BY: B. PETERSON	DATE : 08/19
DES CHK: J. ROBERTS	DATE : 12/19	CHK BY: K. DICKENS	DATE : 02/20

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

NORTH CAROLINA PROFESSIONAL SEAL 040757 ENGINEER KENT DICKENS
1/25/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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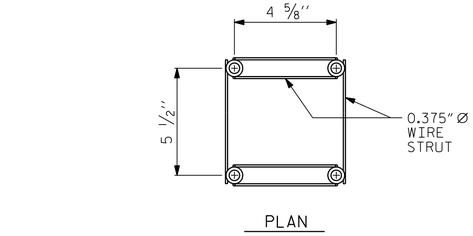


4-BOLT METAL RAIL ANCHOR ASSEMBLY

(26 ASSEMBLIES REQUIRED)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

THE STRUCTURAL CONCRETE ANCHOR 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 2'' FOR 3/4'' FERRULES.

B. 4 - 3/4'' Ø X 2 1/2'' BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4'' Ø X 2 1/2'' GALVANIZED BOLTS 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.

C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16'' Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

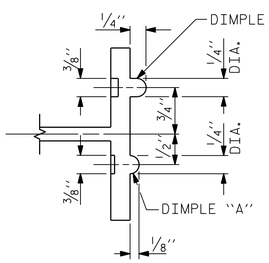
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.

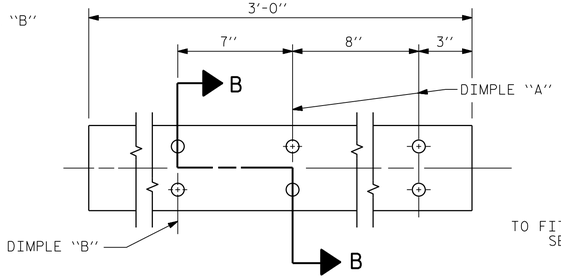
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

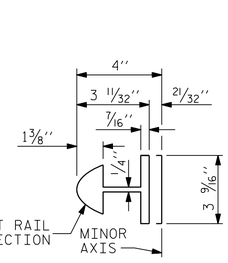
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.



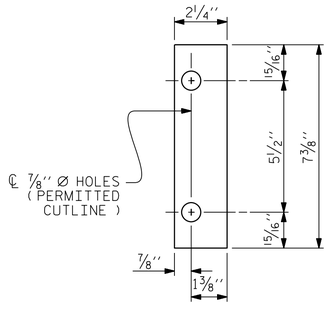
SECTION B - B



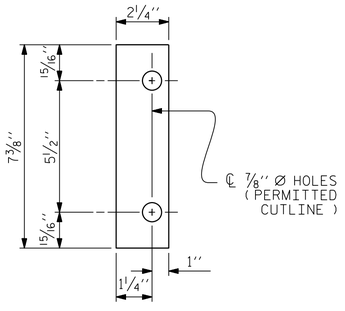


BAR SECTION

EXPANSION BAR DETAILS



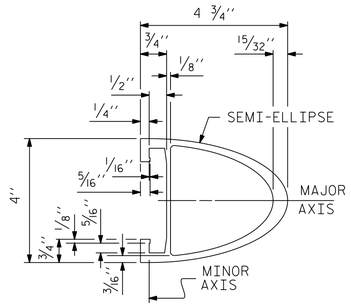
FRONT PLATE



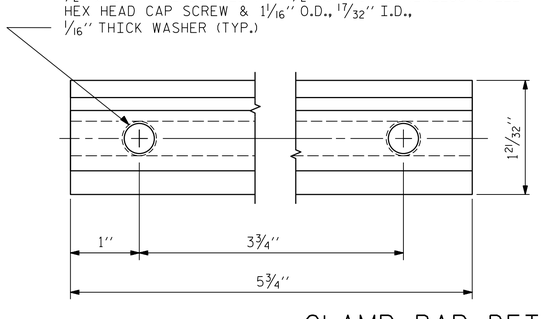
REAR PLATE

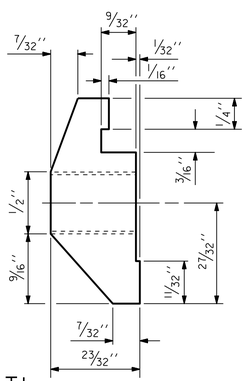
SHIM DETAILS

NOTE :
SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



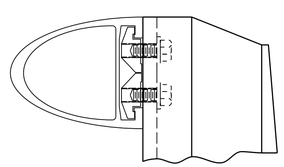
RAIL SECTION



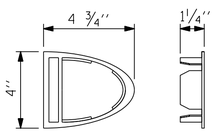


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. 17BP.14.R.212

JACKSON COUNTY

STATION: 19+91.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
2 BAR METAL RAIL

REVISIONS						SHEET NO. S-12
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 20
2	--	--	4	--	--	

NORTH CAROLINA PROFESSIONAL SEAL 040757 ENGINEER KENT DICKENS

1/25/2022

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

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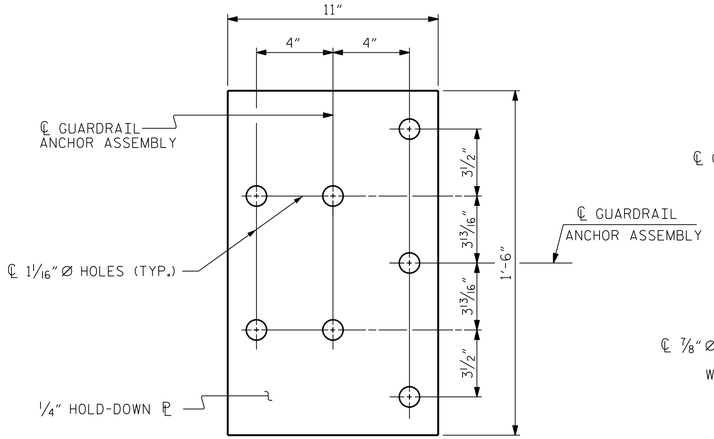
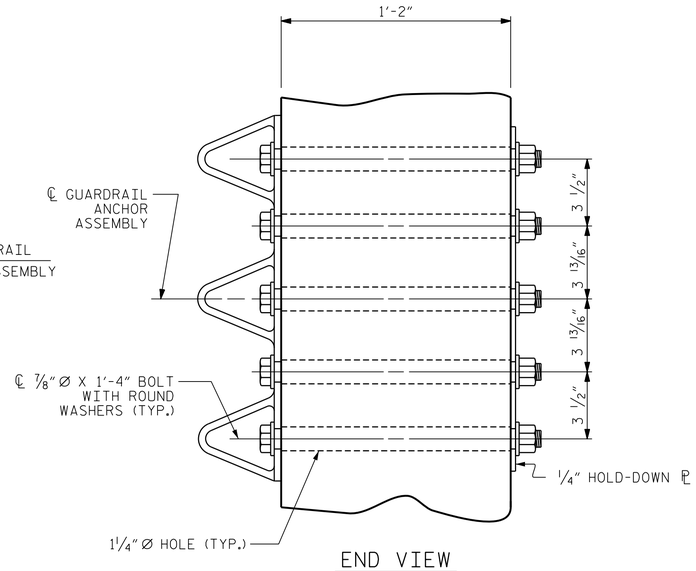
DES BY: S. DHONDE	DATE : 12/19	DWG BY: B. PETERSON	DATE : 08/19
DES CHK: J. ROBERTS	DATE : 12/19	CHK BY: K. DICKENS	DATE : 02/20

PLOT DRIVER: NCDOT STRUCTURES DEFAULT PLOTTER.plt PENTABLE: NCDOT STRUCTURES DEFAULT PEN.tbl
USER: DCARTER DATE: 3/31/2021 TIME: 2:25:57 PM
FILE: ...\SUPERSTRUCTURE - 2 BAR METAL RAIL (2 of 2)



PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

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.

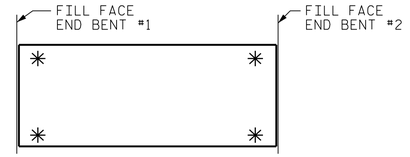
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

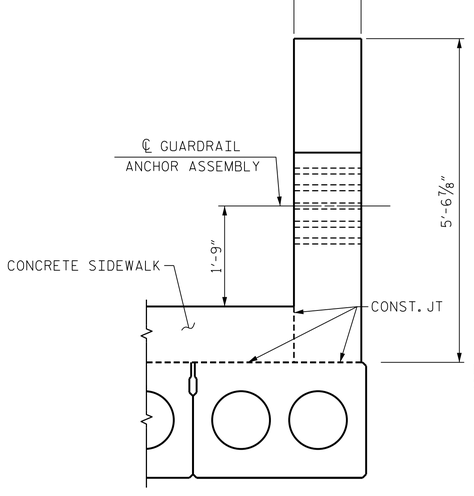
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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.



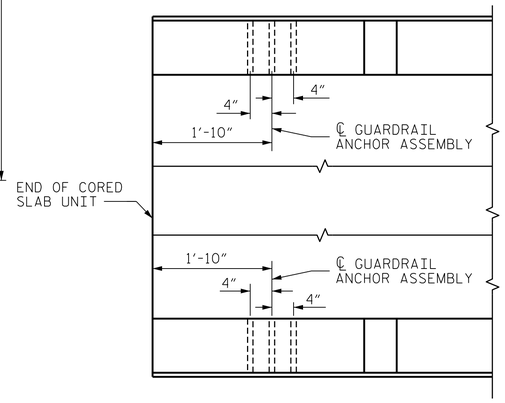
SKETCH SHOWING POINTS OF ATTACHMENT

✳ LOCATION OF GUARDRAIL ATTACHMENT



END VIEW

(SHOWN AT RIGHT SIDE - SIMILAR AT LEFT SIDE)



PLAN

(END BENT 1 SHOWN, END BENT 2 SIMILAR)

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. 17BP.14.R.212

JACKSON COUNTY

STATION: 19+91.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE GUARDRAIL ANCHORAGE DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1	--	--	3	--	--	TOTAL SHEETS
2	--	--	4	--	--	20

NORTH CAROLINA PROFESSIONAL SEAL 040757 ENGINEER KENT DICKENS

1/25/2022

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

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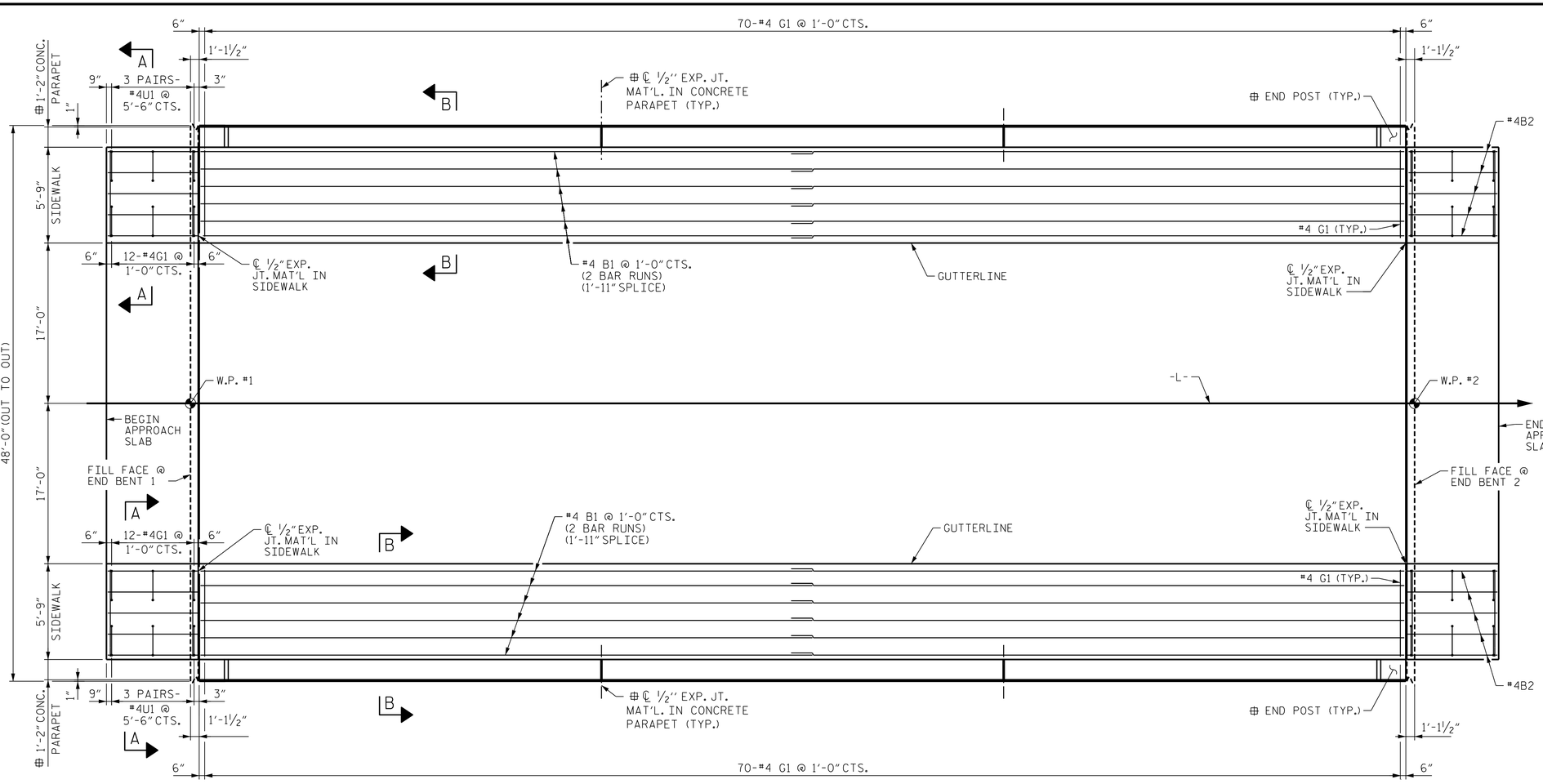
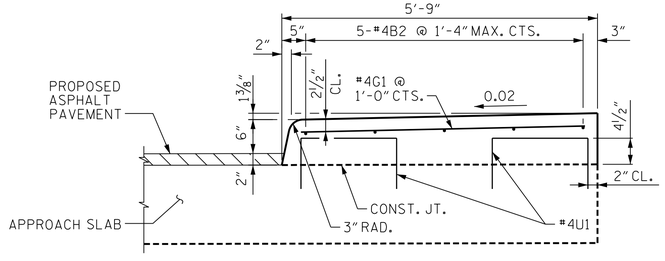
DES BY:	S. DHONDE	DATE : 12/19	DWG BY:	B. PETERSON	DATE : 08/19
DES CHK:	J. ROBERTS	DATE : 12/19	CHK BY:	K.DICKENS	DATE : 02/20

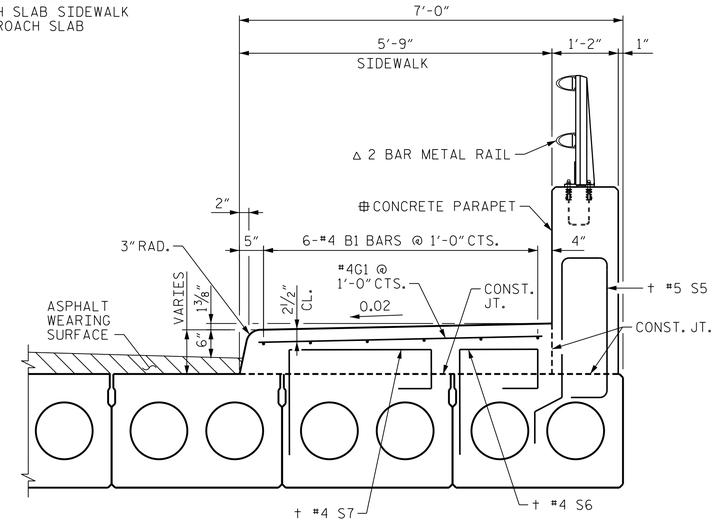


PLAN OF SIDEWALKS

REINFORCING STEEL IN APPROACH SLAB SIDEWALK IS TYPICAL FOR EACH APPROACH SLAB



SECTION A-A



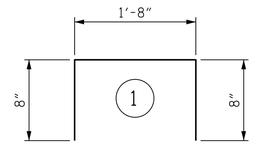
SECTION B-B

SECTION THRU SIDEWALK

BILL OF MATERIAL

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
✳ B1	24	#4	STR	35'-10"	575
✳ B2	20	#4	STR	11'-7"	155
✳ G1	188	#4	STR	5'-3"	660
✳ U1	24	#4	1	3'-0"	49
✳ EPOXY COATED REINF. STEEL					1439 LBS.
CLASS AA CONCRETE					33.5 CU. YDS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

NOTES

ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN ½" EXPANSION JOINT MATERIAL. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

GUTTERLINE SIDEWALK THICKNESS

3'-0" X 2'-0" CORED SLAB UNIT	MIN. SIDEWALK THICKNESS	
	@ ℄ BEARING	@ MID-SPAN
70' UNITS	9½"	8"✳

† = FOR #5 S5, #4 S6 & #4 S7 BARS IN CORED SLAB UNITS, SEE "PRESTRESSED CONCRETE CORED SLAB UNIT" SHEETS.

℄ = FOR DETAILS AND REINFORCING STEEL IN CONCRETE PARAPET AND END POSTS, SEE "CONCRETE PARAPET DETAILS" SHEETS.

△ = FOR 2 BAR METAL RAIL DETAILS, SEE "2 BAR METAL RAIL" SHEETS.

✳ = BASED ON THEORETICAL ANTICIPATED CAMBER. ADJUST AS NECESSARY BASED ON ACTUAL MEASURED CAMBER.

PROJECT NO. 17BP.14.R.212

JACKSON COUNTY

STATION: 19+91.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE SIDEWALK DETAILS

REVISIONS						SHEET NO. S-14
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 20
2	--	--	4	--	--	

NORTH CAROLINA PROFESSIONAL SEAL 040757 ENGINEER KENT DICKENS
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DES BY:	S. DHONDE	DATE :	12/19
DES CHK:	J. ROBERTS	DATE :	12/19
DWG BY:	B. PETERSON	DATE :	08/19
CHK BY:	K. DICKENS	DATE :	02/20

PLOT DRIVER: NCDOT STRUCTURES DEFAULT PLOTTER.plt PENTABLE: NCDOT STRUCTURES DEFAULT PEN.tbl
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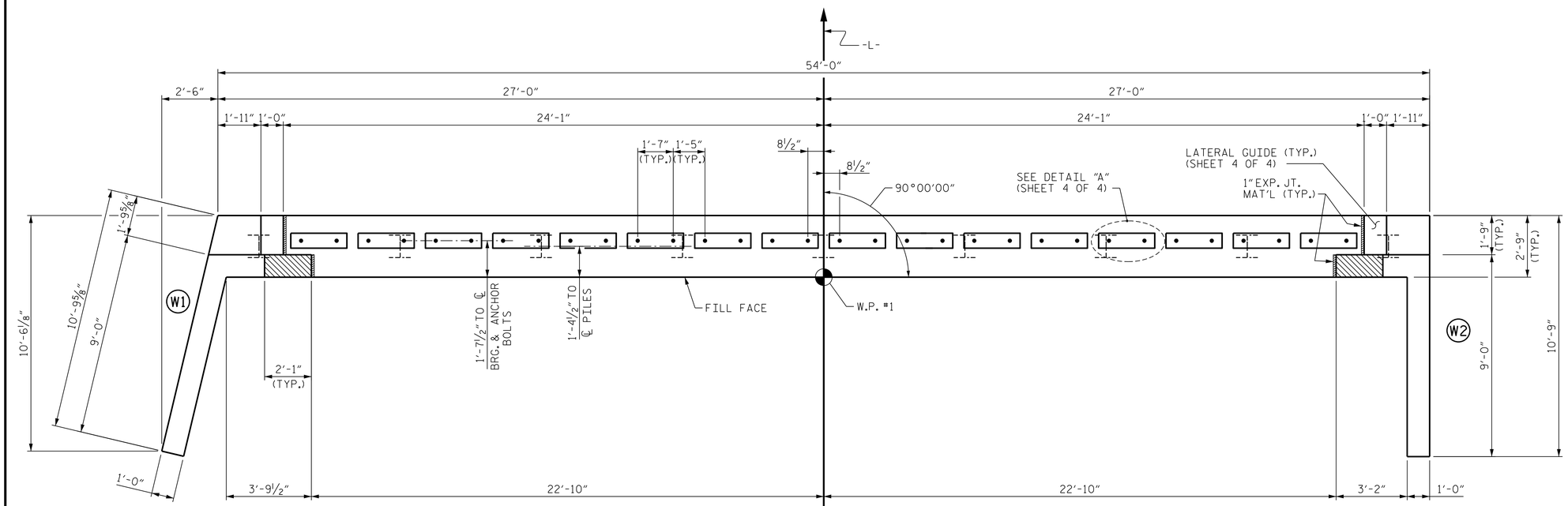
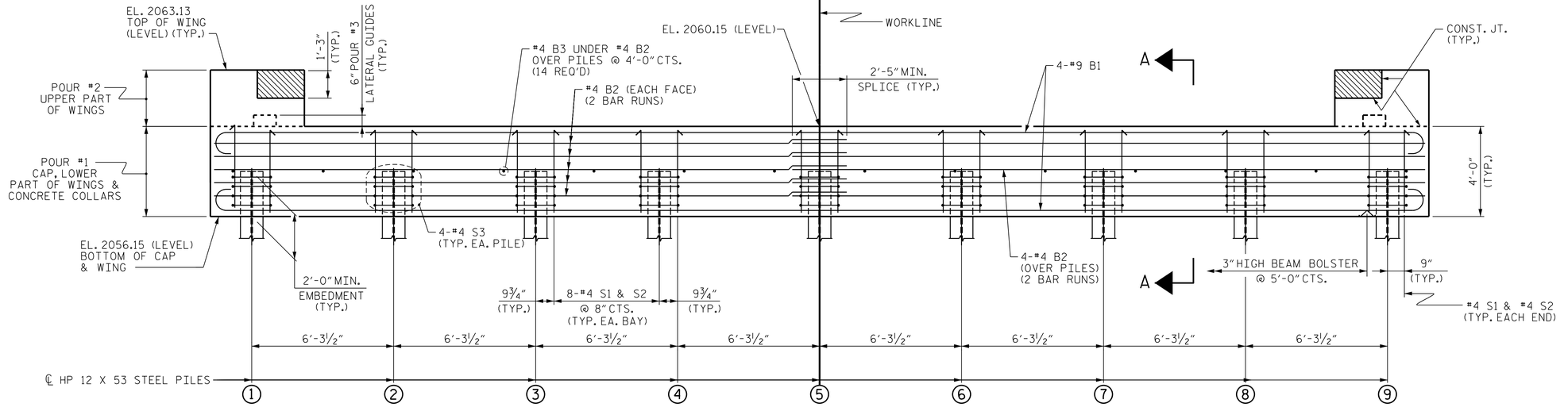


PLAN



ELEVATION

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

NOTES

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

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER CORED SLAB UNITS ARE IN PLACE.

THE COST OF THE ⅞" Ø ANCHOR BOLTS, NUTS, WASHERS, AND PLATES CAST WITH THE END BENT CAP SHALL BE INCLUDED IN THE CORED SLAB PAY ITEM.

PROJECT NO. 17BP.14.R.212

JACKSON COUNTY

STATION: 19+91.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1	--	--	3	--	--	TOTAL SHEETS
2	--	--	4	--	--	20

DES BY: S. DHONDE	DATE: 12/19	DWG BY: B. PETERSON	DATE: 08/19
DES CHK: J. ROBERTS	DATE: 12/19	CHK BY: K. DICKENS	DATE: 02/20

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1/25/2022

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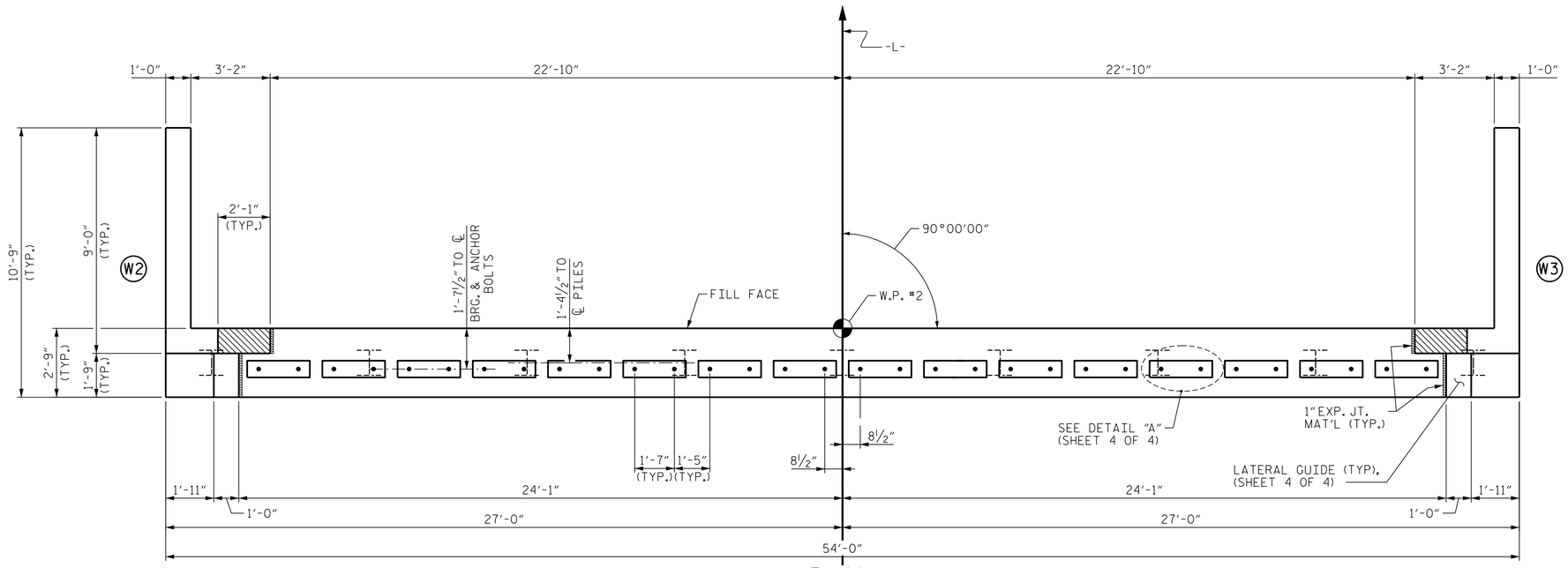
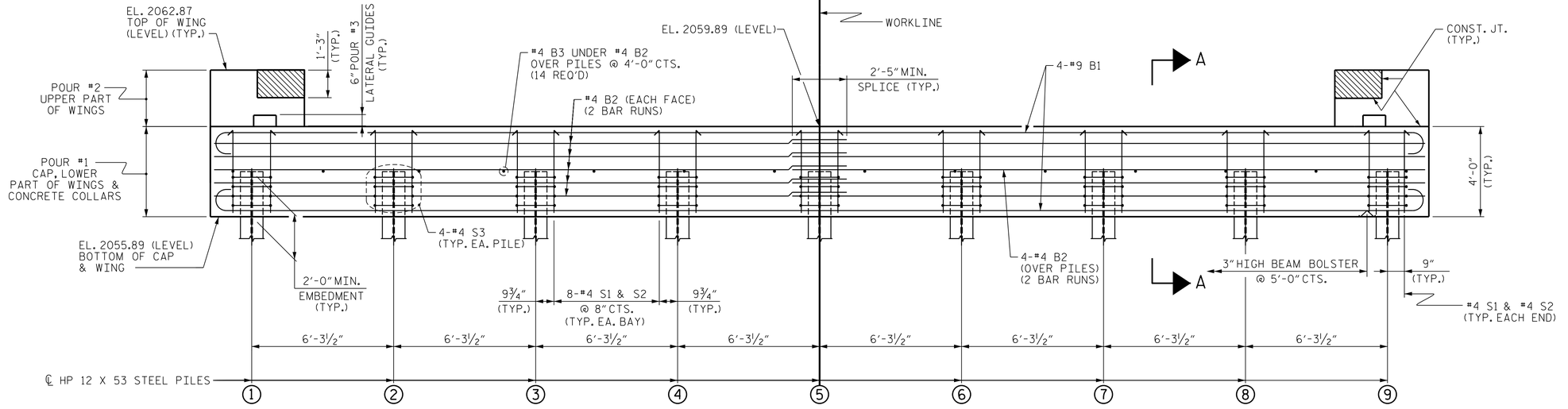


PLAN



ELEVATION

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

NOTES

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

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER CORED SLAB UNITS ARE IN PLACE.

PROJECT NO. 17BP.14.R.212

JACKSON COUNTY

STATION: 19+91.00 -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-16
1	--	--	3	--	--	TOTAL SHEETS
2	--	--	4	--	--	20

DES BY: S. DHONDE	DATE: 12/19	DWG BY: B. PETERSON	DATE: 08/19
DES CHK: J. ROBERTS	DATE: 12/19	CHK BY: K. DICKENS	DATE: 02/20

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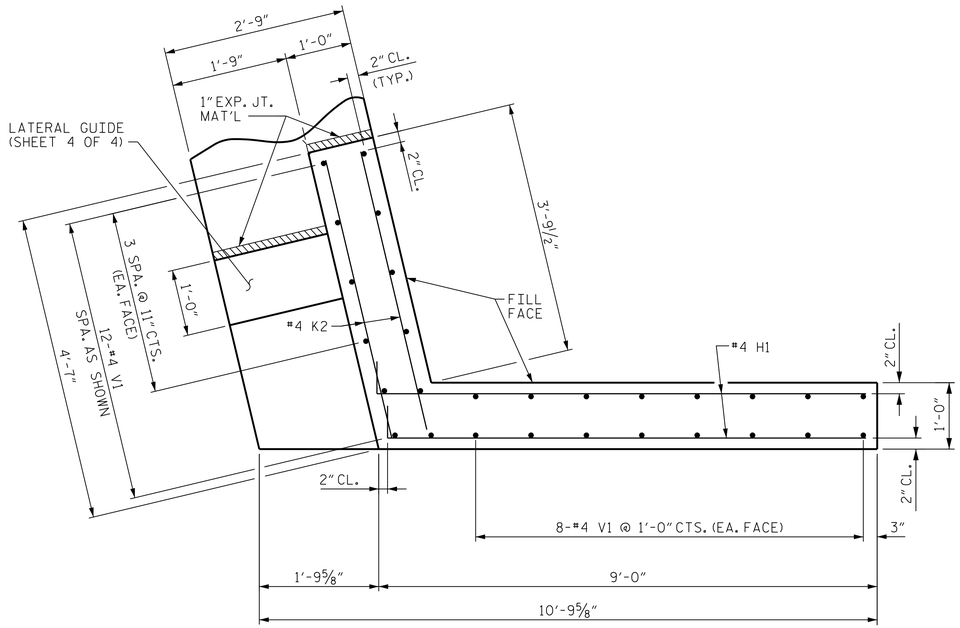
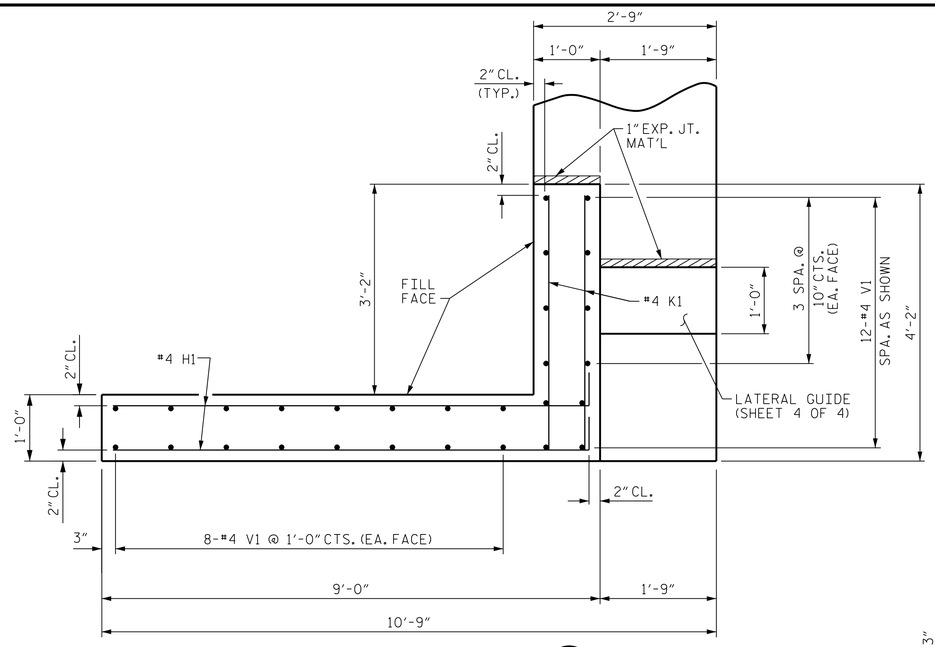
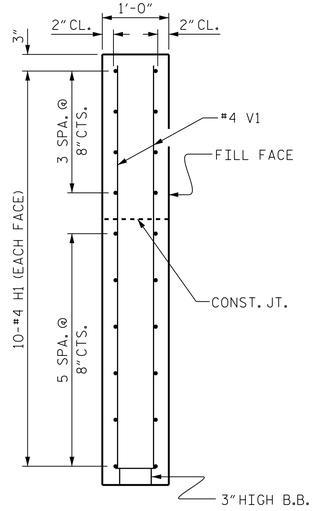


PLAN OF WING (W1)

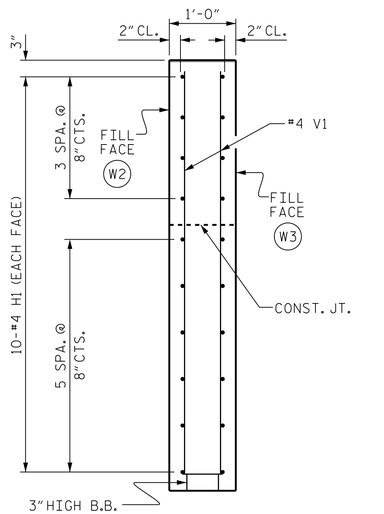


PLAN OF WING (W2)

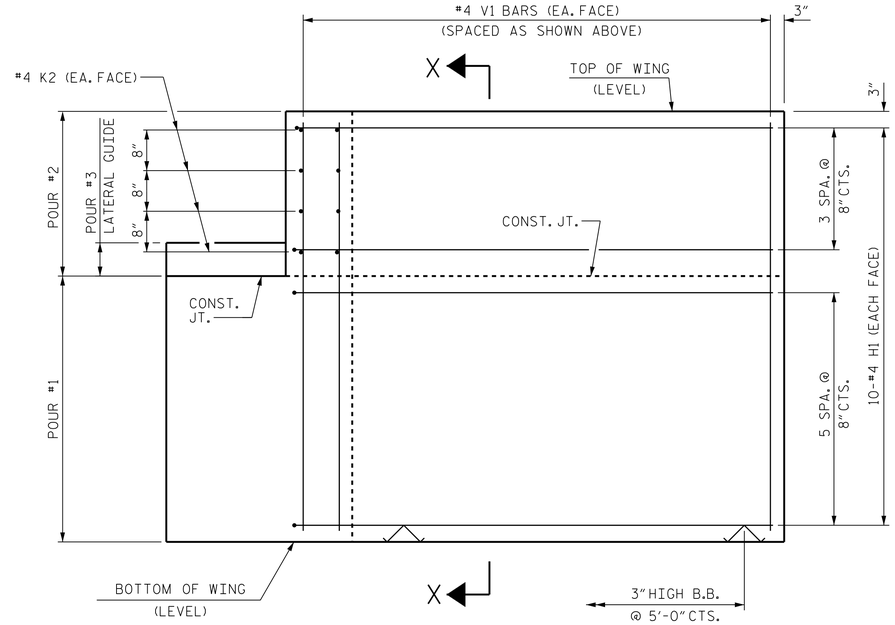
(WING W2 SHOWN, WING W3 SIMILAR BUT MIRRORED)



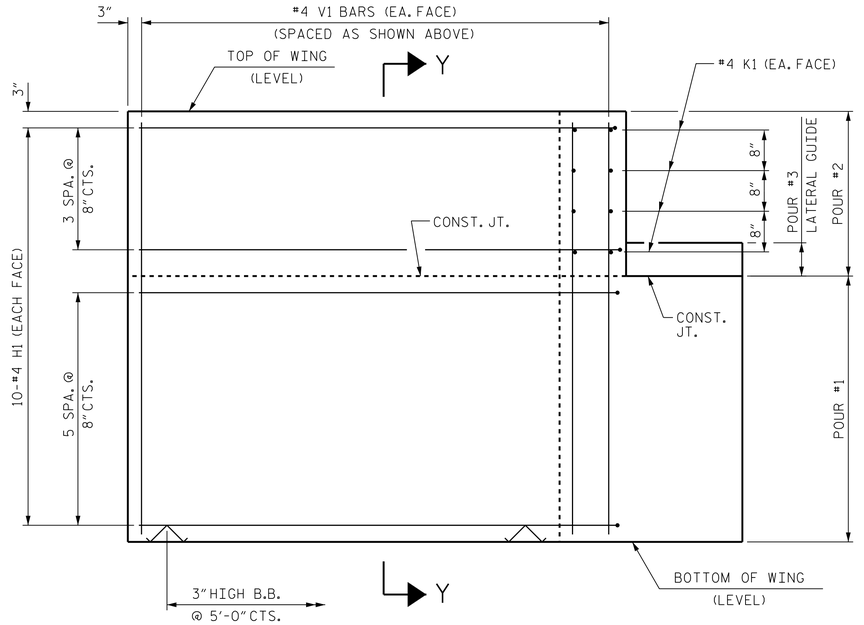
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2) & (W3)

WING DETAILS

PROJECT NO. 17BP.14.R.212

JACKSON COUNTY

STATION: 19+91.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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SUBSTRUCTURE END BENT 1 AND 2 WING DETAILS

REVISIONS						SHEET NO. S-17
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 20
2	--	--	4	--	--	

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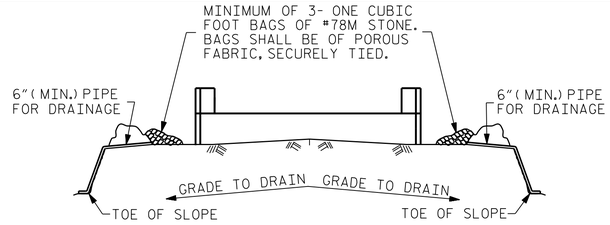
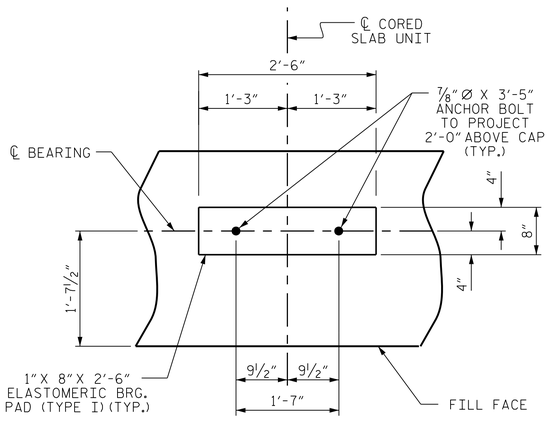


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

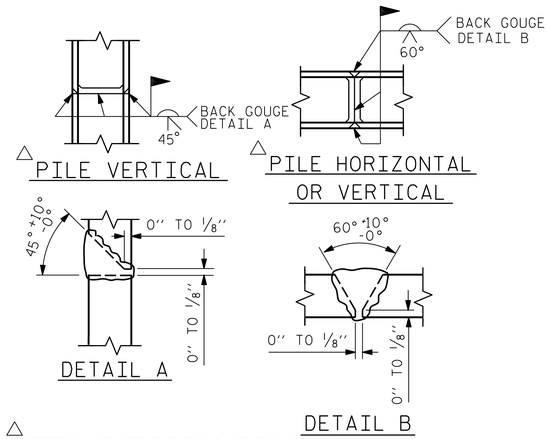
TEMPORARY DRAINAGE AT END BENT



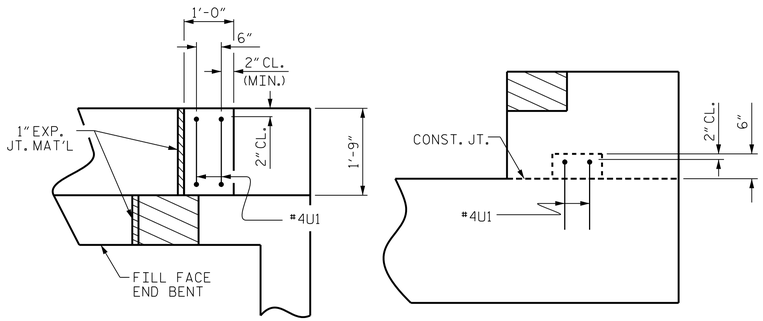
DETAIL "A"

(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)

△ POSITION OF PILE DURING WELDING.

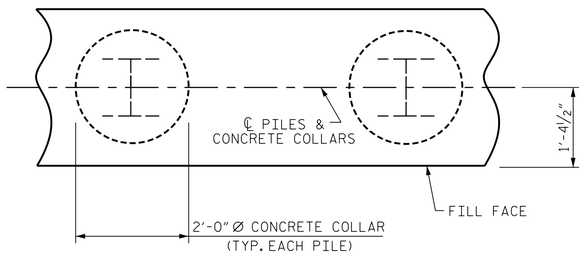


PILE SPLICE DETAILS

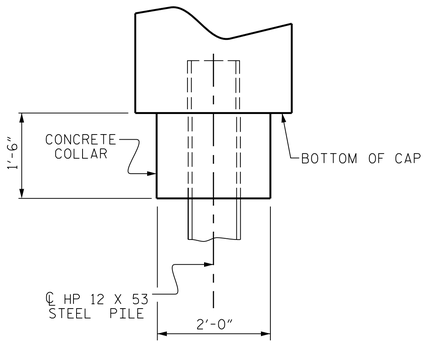


LATERAL GUIDE DETAILS

(EACH END SIMILAR)



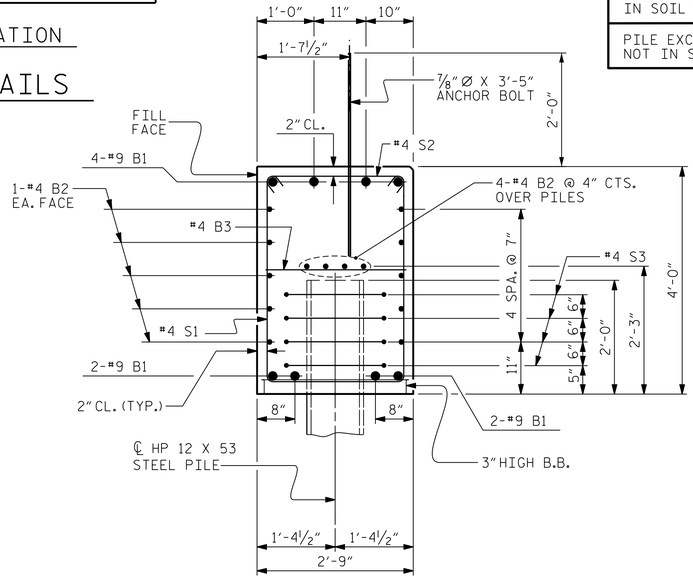
PLAN



ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL

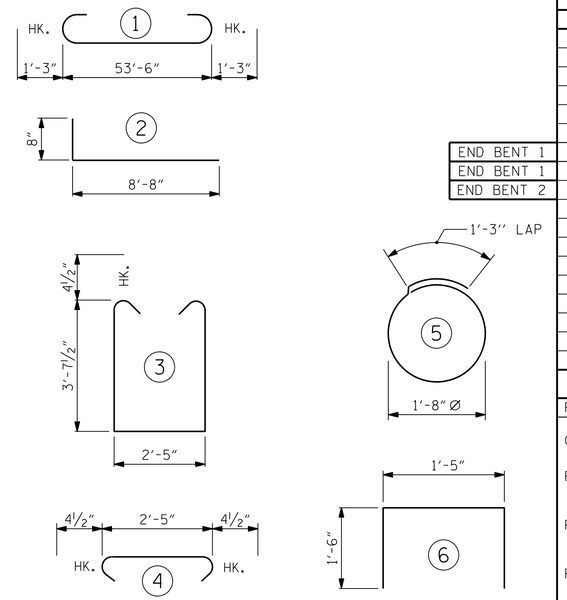
(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



SECTION A-A

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT No. 1	END BENT No. 2
HP 12 X 53 STEEL PILES NO: 9 LIN. FT.= 225	HP 12 X 53 STEEL PILES NO: 9 LIN. FT.= 180
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 9	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 9
	PILE EXCAVATION IN SOIL LIN. FT = 98
	PILE EXCAVATION NOT IN SOIL LIN. FT = 10

BILL OF MATERIAL

FOR ONE END BENT

	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
	B1	8	#9	1	56'-0"	1524
	B2	28	#4	STR	28'-4"	530
	B3	14	#4	STR	2'-5"	23
	H1	40	#4	2	9'-4"	249
END BENT 1	K1	8	#4	STR	3'-10"	21
END BENT 1	K2	8	#4	STR	4'-3"	23
END BENT 2	K1	16	#4	STR	3'-10"	41
	S1	66	#4	3	10'-5"	460
	S2	66	#4	4	3'-2"	140
	S3	36	#4	5	6'-6"	157
	V1	56	#4	STR	6'-6"	244
	U1	4	#4	6	4'-5"	12

QUANTITIES FOR END BENT 1

REINFORCING STEEL		3378 LBS.
CLASS A CONCRETE BREAKDOWN		
POUR #1	CAP, LOWER PART OF WINGS & COLLARS	26.1 C.Y.
POUR #2	UPPER PART OF WINGS	2.8 C.Y.
POUR #3	LATERAL GUIDES	0.1 C.Y.
TOTAL CLASS A CONCRETE		29.0 C.Y.

QUANTITIES FOR END BENT 2

REINFORCING STEEL		3376 LBS.
CLASS A CONCRETE BREAKDOWN		
POUR #1	CAP, LOWER PART OF WINGS & COLLARS	25.9 C.Y.
POUR #2	UPPER PART OF WINGS	2.7 C.Y.
POUR #3	LATERAL GUIDES	0.1 C.Y.
TOTAL CLASS A CONCRETE		28.7 C.Y.

PROJECT NO. 17BP.14.R.212

JACKSON COUNTY

STATION: 19+91.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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SUBSTRUCTURE END BENT 1 AND 2 DETAILS

REVISIONS						SHEET NO. S-18
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 20
2	--	--	4	--	--	

NORTH CAROLINA PROFESSIONAL SEAL 040757 ENGINEER KENT DICKENS
Kent Dickens
1/25/2022

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N.C.B.E.L.S. License Number: F-0116

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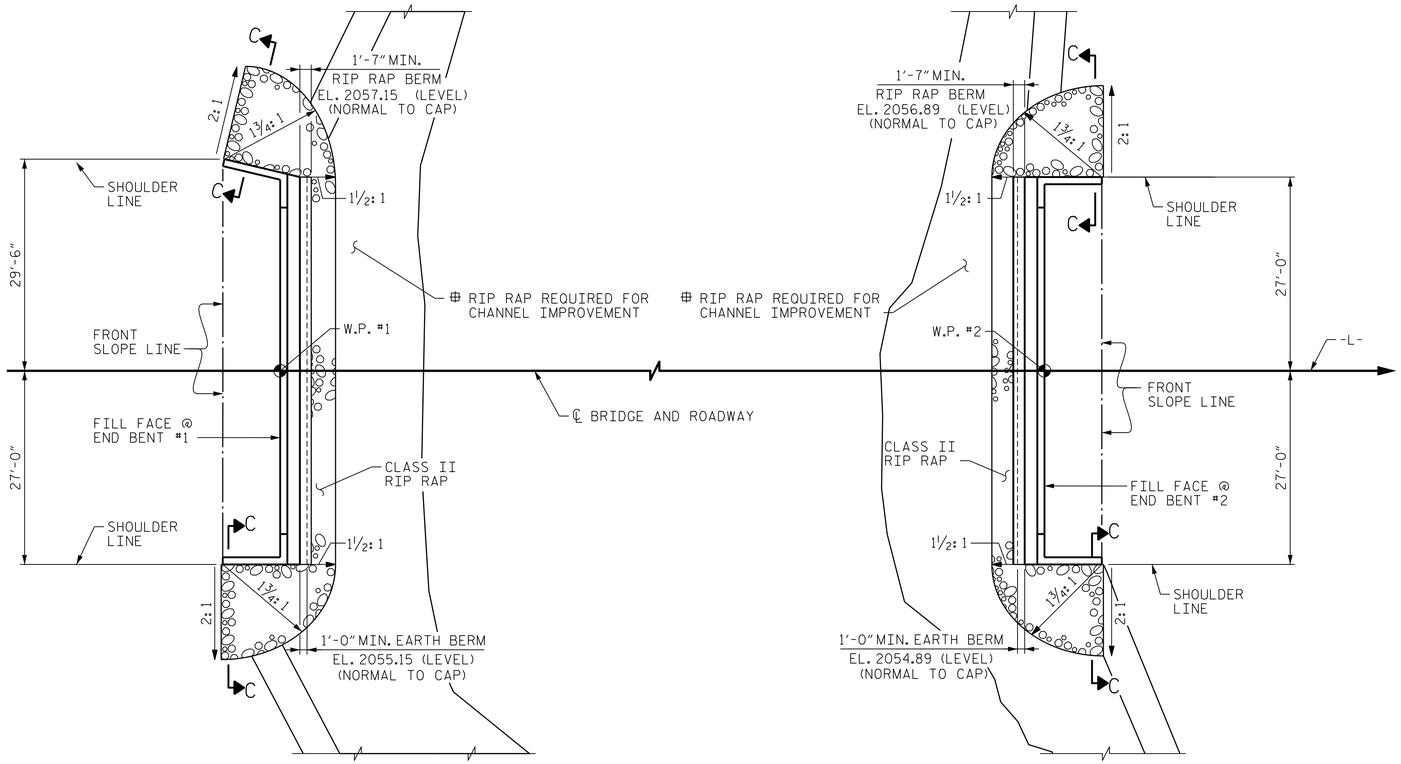
DES BY: S. DHONDE	DATE: 12/19	DWG BY: B. PETERSON	DATE: 08/19
DES CHK: J. ROBERTS	DATE: 12/19	CHK BY: K. DICKENS	DATE: 02/20

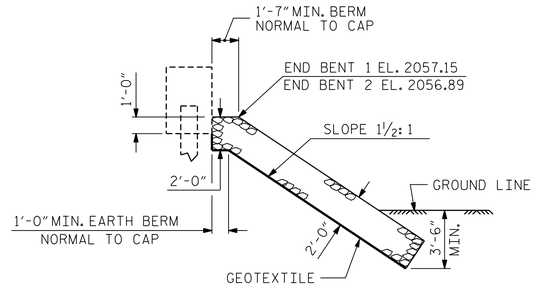


RIP RAP AT END BENT #1

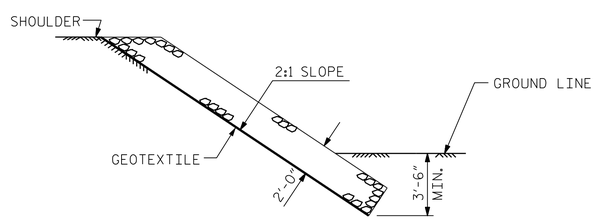
RIP RAP AT END BENT #2

⊕ SEE ROADWAY DRAWINGS FOR ADDITIONAL RIP RAP REQUIRED FOR CHANNEL IMPROVEMENT. (ROADWAY DETAIL AND PAY ITEM)

ESTIMATED QUANTITIES (⊕)		
BRIDGE @ STA. 19+91.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	69	76
END BENT 2	64	71



℄ SECTION BERM RIP RAPPED



SECTION C-C

PROJECT NO. 17BP.14.R.212

JACKSON COUNTY

STATION: 19+91.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1	--	--	3	--	--	TOTAL SHEETS
2	--	--	4	--	--	20

NORTH CAROLINA PROFESSIONAL SEAL 040757 ENGINEER KENT DICKENS
1/25/2022

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

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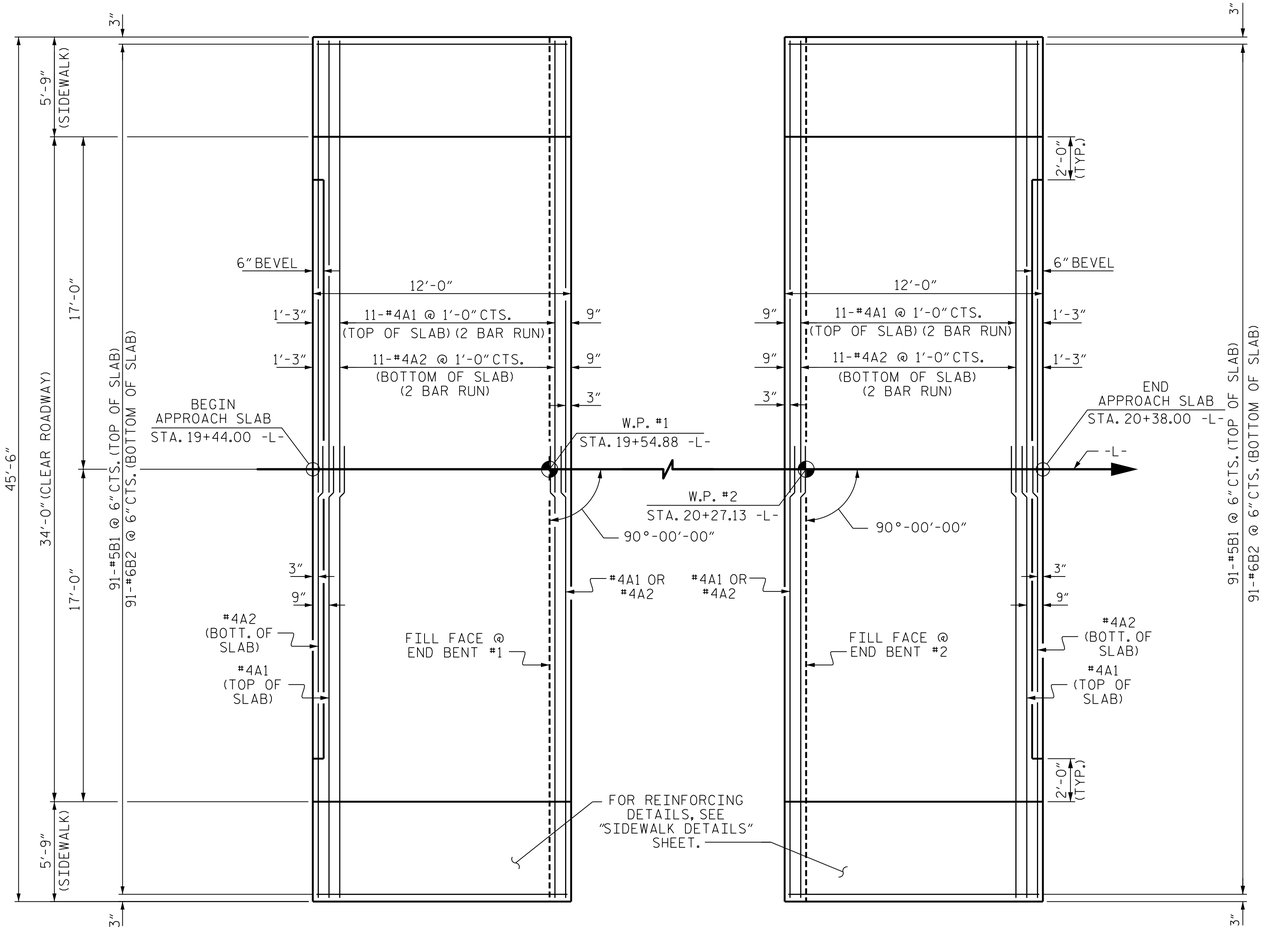
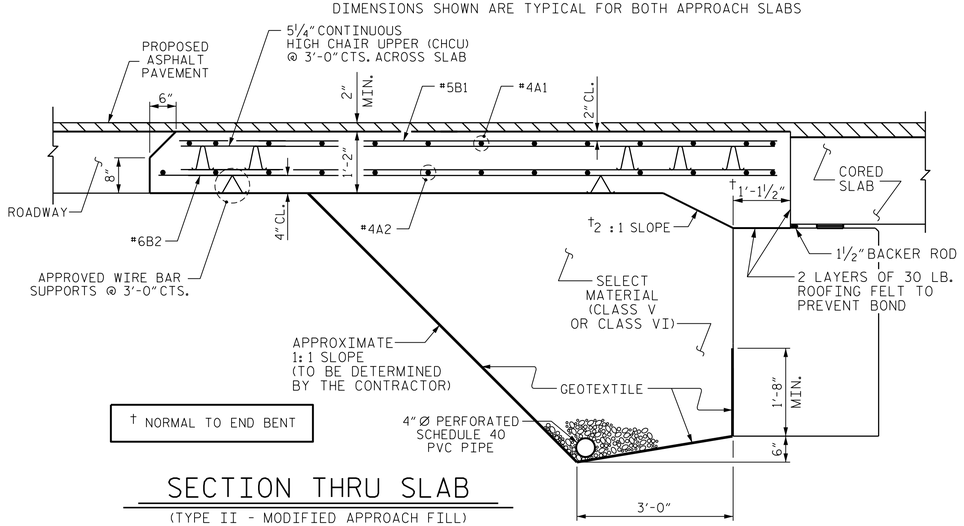
DES BY:	A. PANDOLI	DATE: 01/20	DWG BY:	B. PETERSON	DATE: 08/19
DES CHK:	K. DICKENS	DATE: 02/20	CHK BY:	K. DICKENS	DATE: 02/20



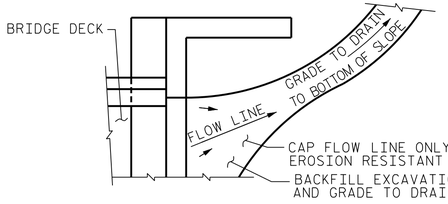
PLAN @ END BENT #1 PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



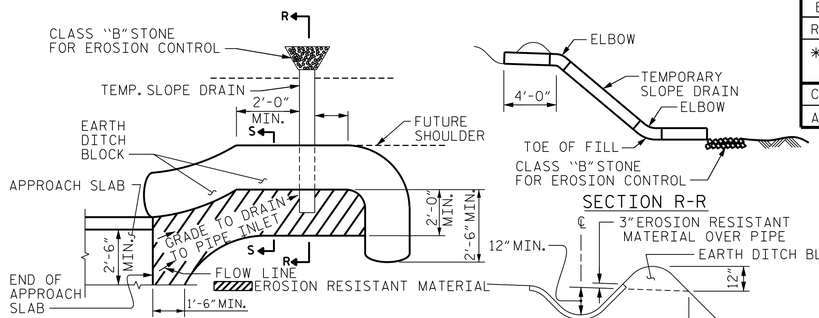
SECTION THRU SLAB

(TYPE II - MODIFIED APPROACH FILL)



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)

BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	26	#4	STR	23'-7"	410
A2	26	#4	STR	23'-5"	407
✳ B1	91	#5	STR	11'-2"	1060
B2	91	#6	STR	11'-8"	1595
REINFORCING STEEL				LBS.	2002
✳ EPOXY COATED REINFORCING STEEL				LBS.	1470
CLASS AA CONCRETE					
APPROACH SLAB				CU. YDS.	27.0
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	26	#4	STR	23'-7"	410
A2	26	#4	STR	23'-5"	407
✳ B1	91	#5	STR	11'-2"	1060
B2	91	#6	STR	11'-8"	1595
REINFORCING STEEL				LBS.	2002
✳ EPOXY COATED REINFORCING STEEL				LBS.	1470
CLASS AA CONCRETE					
APPROACH SLAB				CU. YDS.	27.0

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

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.

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.

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

APPROACH SLAB GROOVING IS NOT REQUIRED.

PROJECT NO. 17BP.14.R.212

JACKSON COUNTY

STATION: 19+91.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB (SUB-REGIONAL TIER)

REVISIONS						SHEET NO. S-20
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 20
2	--	--	4	--	--	

NORTH CAROLINA PROFESSIONAL SEAL 040757 ENGINEER KENT DICKENS
1/25/2022

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HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
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DES BY:	S. DHONDE	DATE :	12/19
DES CHK:	J. ROBERTS	DATE :	12/19
DWG BY:	B. PETERSON	DATE :	08/19
CHK BY:	K. DICKENS	DATE :	02/20

PLOT DRIVER: NCDOT STRUCTURES DEFAULT PLOTTER.plt PENTABLE: NCDOT STRUCTURES DEFAULT PEN.tbl
USER: DCARTER DATE: 3/31/2021 TIME: 3:23:20 PM
FILE: ...\BRIDGE APPROACH SLAB - PLAN AND SECTIONS

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