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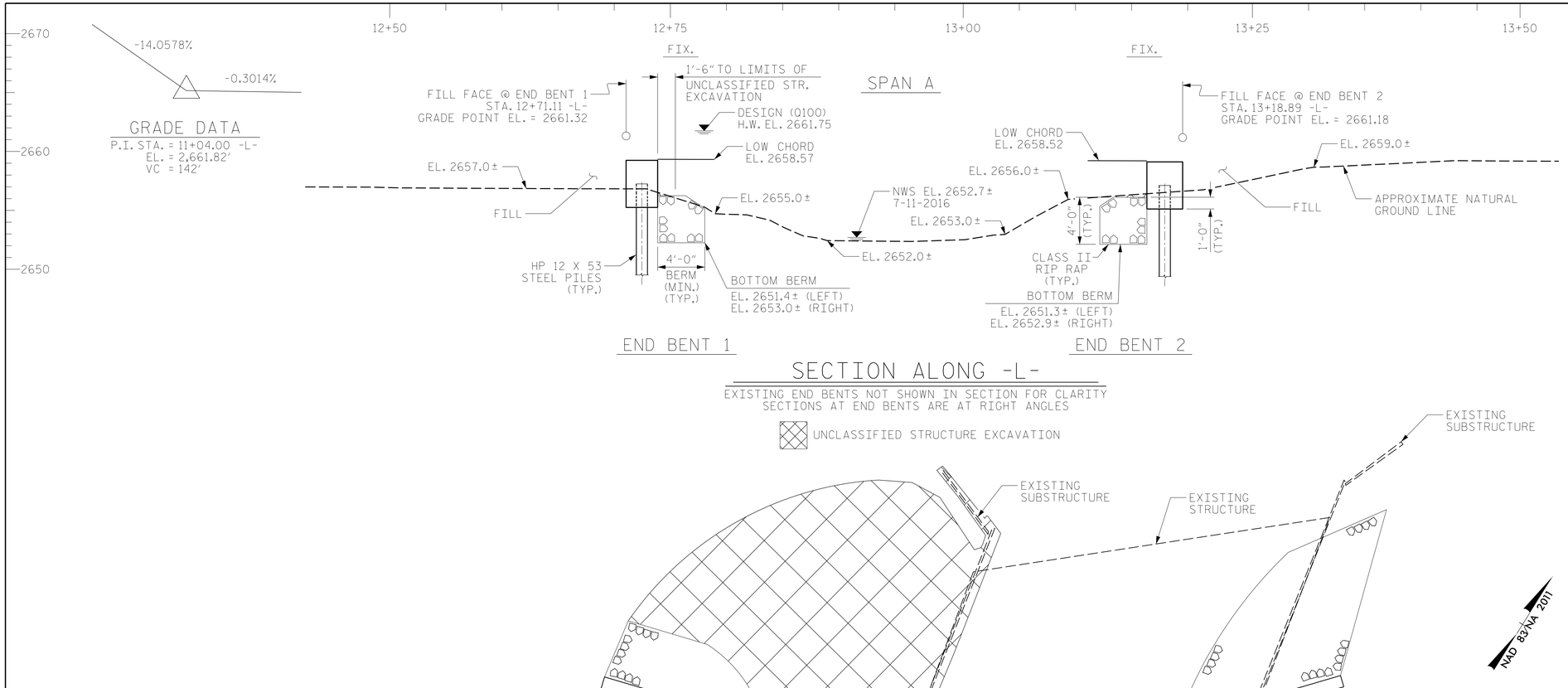
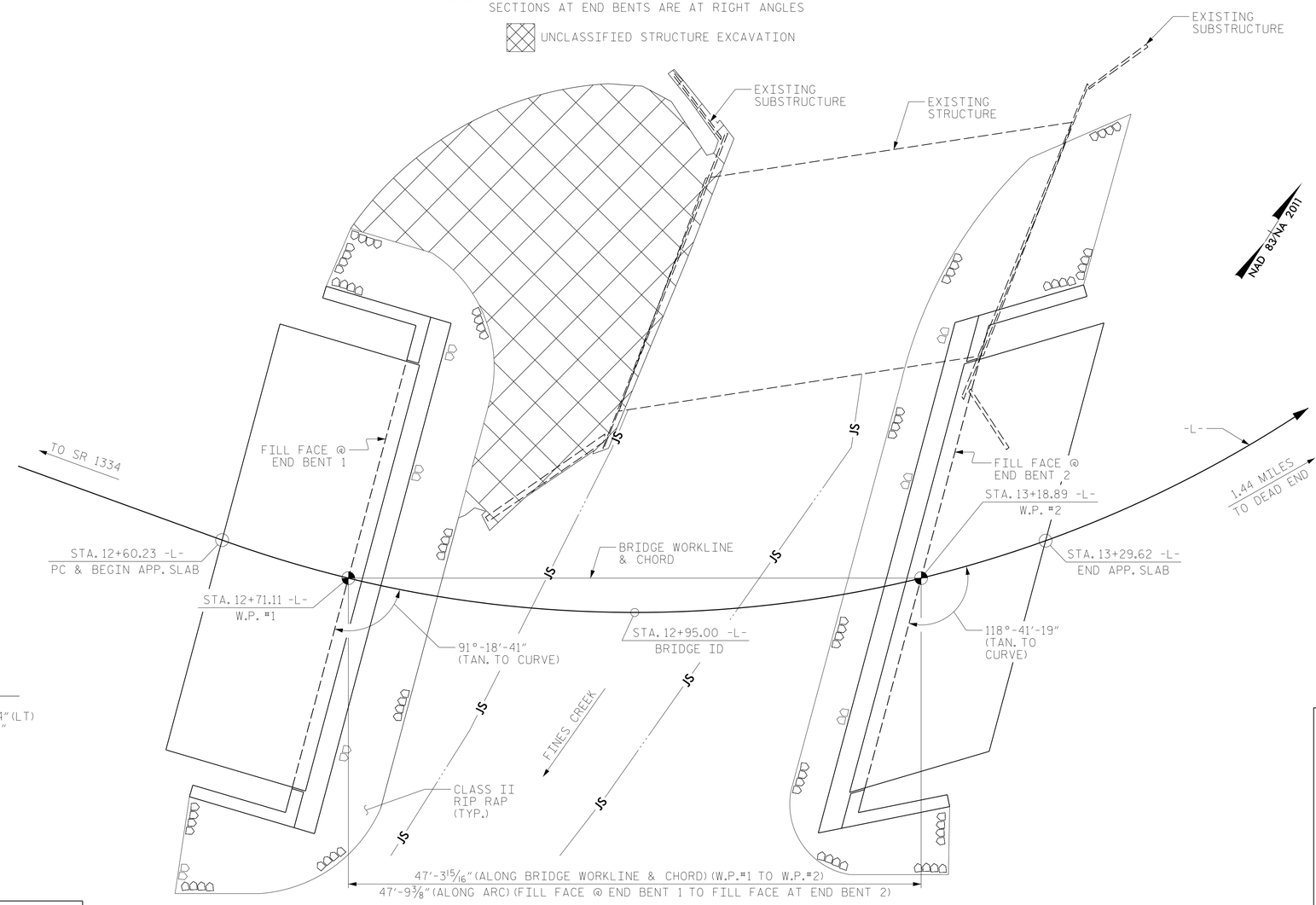


SECTION ALONG -L-

EXISTING END BENTS NOT SHOWN IN SECTION FOR CLARITY
SECTIONS AT END BENTS ARE AT RIGHT ANGLES

UNCLASSIFIED STRUCTURE EXCAVATION



PLAN

PILES NOT SHOWN IN PLAN VIEW

HORIZONTAL CURVE DATA

P.I. STA. = 13+21.31 -L-
Δ = 62°-49'-59.4"(LT)
D = 57°-17'-44.8"
L = 109.66'
T = 61.08'
R = 100.00'
SE = 0.04

PROJECT NO. 17BP.14.R.175
HAYWOOD COUNTY
STATION: 12+95.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 215

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043635 MARC A. LEBLANC
Digitally signed by Marc A. LeBlanc
4/10/2018

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www.rsandh.com
North Carolina License Nos. 50073 * F-0493 * C-28

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER FINES CREEK ON SR 1379 BETWEEN SR 1334 AND DEAD END

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			22

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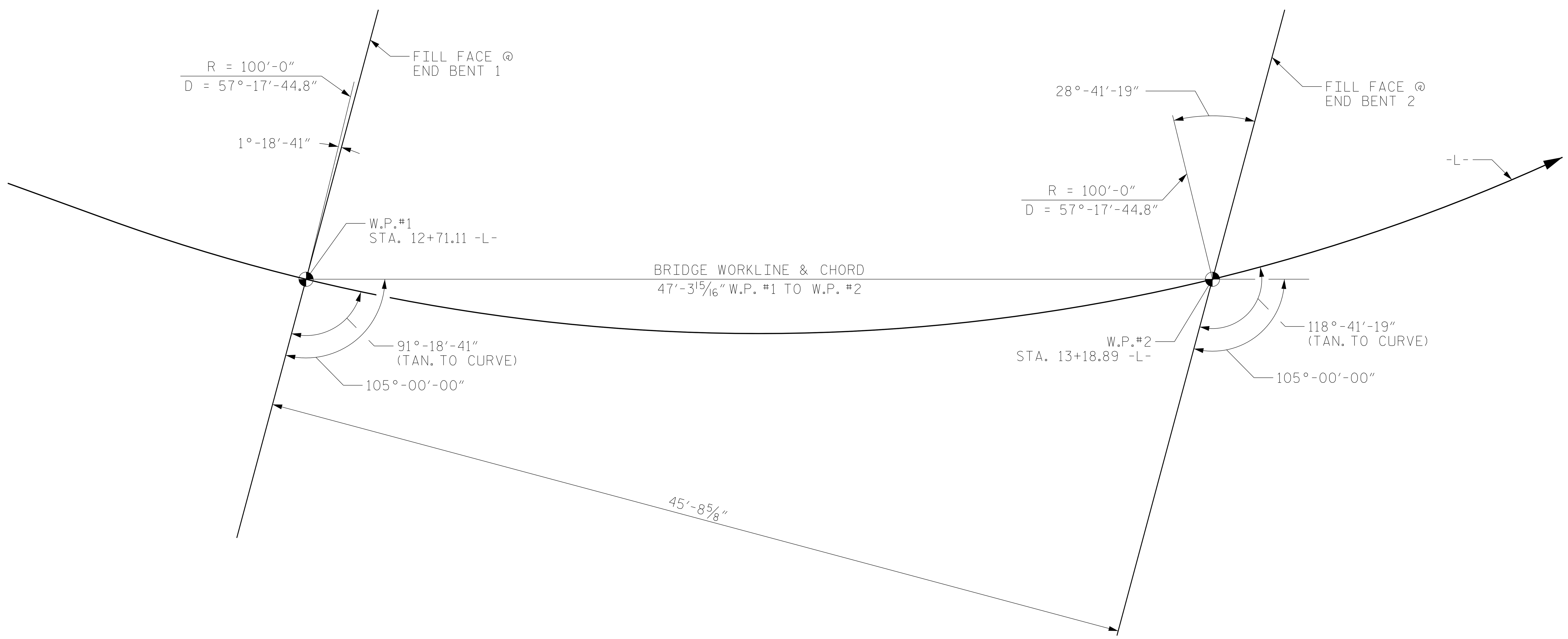
DRAWN BY : MAL DATE : 12/2016
CHECKED BY : TLC DATE : 02/2017
DESIGN ENGINEER OF RECORD: MAL DATE : 02/2017

4/6/2018
X:\P\1030014001_Div 14 Bridges_2016\1030014002_R.175 430215\Design\Structures\Working DGN\401_001_17BP.14.R.175_B215_SMU_GD01_S-1.dgn
LynnT



CHORD LAYOUT

NOTE: END BENTS ARE PARALLEL

PROJECT NO. 17BP.14.R.175

HAYWOOD COUNTY

STATION: 12+95.00 -L-

SHEET 2 OF 3

SEAL 043835 — NORTH CAROLINA PROFESSIONAL ENGINEER — MARC A. LEBLANC

DocuSigned by: Marc A. LeBlanc

4/10/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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GENERAL DRAWING

FOR BRIDGE OVER FINES CREEK ON SR 1379 BETWEEN SR 1334 AND DEAD END

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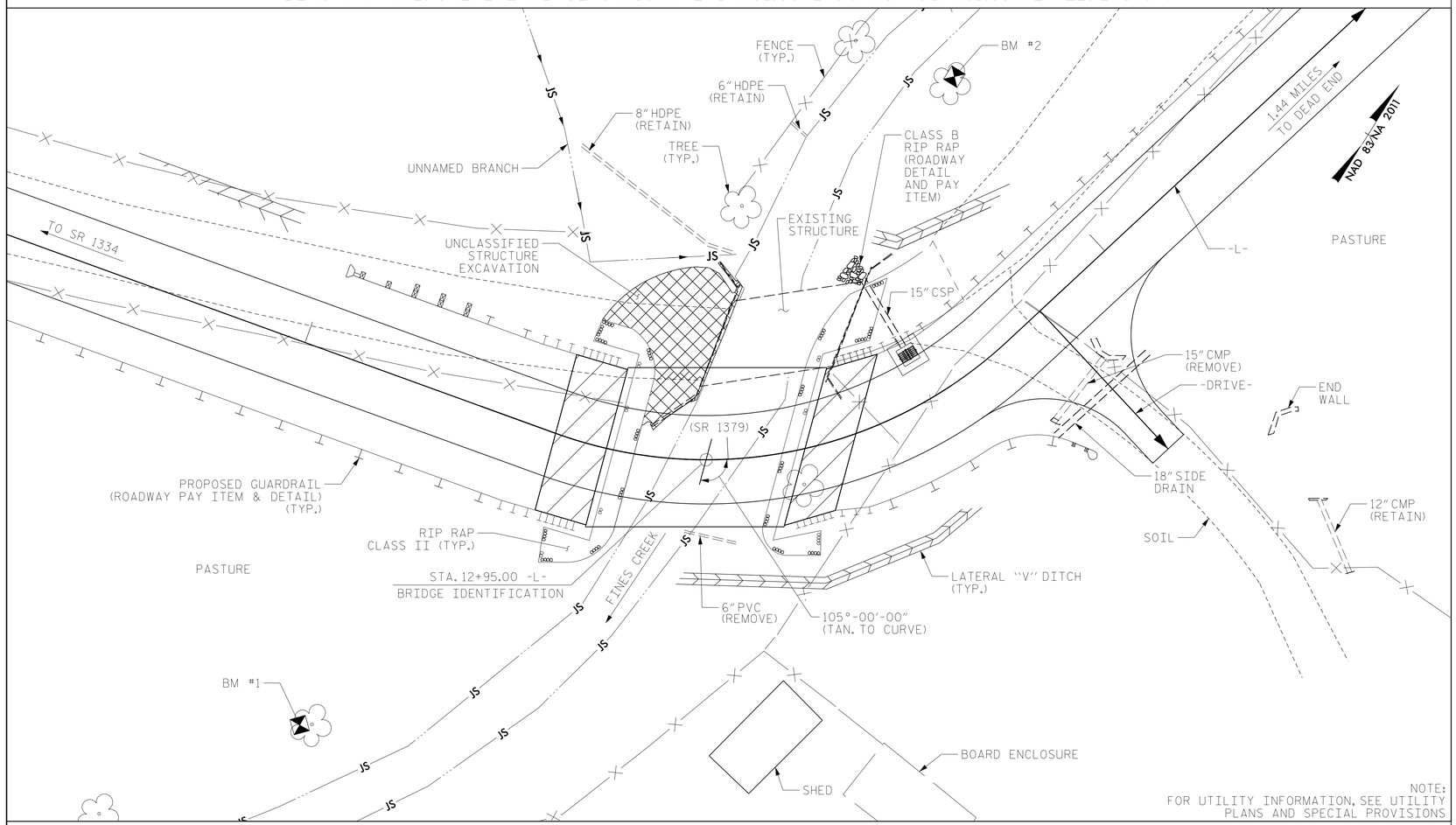
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			22

DRAWN BY :	MAL	DATE :	12/2016
CHECKED BY :	TLC	DATE :	02/2017
DESIGN ENGINEER OF RECORD:	MAL	DATE :	02/2017

BENCHMARK #2: SPIKE IN BASE OF 10" WALNUT 51.99' LT. OF STA. 14+01.93 -L- EL. 2656.76



NOTE:
FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS

LOCATION SKETCH

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 EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF ONE 30'-6" SPAN, ON A TIMBER DECK ON EIGHT STEEL I-BEAMS, ON A TIMBER CAP WITH TIMBER POSTS AND SILLS AND TIMBER END BENTS WITH A CLEAR ROADWAY WIDTH OF 16'-1½" LOCATED UPSTREAM FROM 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 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 SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 12+95.00 -L-.

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

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

AT THE CONTRACTOR'S OPTION, PRESTRESSED CONCRETE END BENT AND BENT CAPS MAY BE SUBSTITUTED IN PLACE OF THE CAST-IN-PLACE CAPS. THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER TO RECEIVE REVISED PLANS AND DETAILS FROM THE STRUCTURES MANAGEMENT UNIT. THE REDESIGN AND ANY ADDITIONAL MATERIALS NEEDED WILL BE AT NO ADDITIONAL COST TO THE CONTRACTOR.

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 45 FT ON LEFT 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.

HYDRAULIC DATA

DESIGN DISCHARGE	= 1400 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YRS
DESIGN HIGH WATER ELEVATION	= 2659.7
DRAINAGE AREA	= 5.83 SQ. MI.
BASE DISCHARGE (Q100)	= 2000 CFS
BASE HIGH WATER ELEVATION	= 2661.75

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 1550 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 25 YRS+
OVERTOPPING FLOOD ELEVATION	= 2660.8 *

* LOCATION OF OVERTOPPING @ STA. 14+75.43 -L-

TOTAL BILL OF MATERIALS

	REMOVAL OF EXISTING STRUCTURE @ STA. 12+95.00 -L-	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	HP 12 X 53 STEEL PILES		STEEL PILE POINTS	PILE DRIVING EQUIPMENT SETUP	PREDRILLING FOR PILES	42" OREGON RAIL	1'-9" X 8½" CONCRETE CURB	RIP RAP CLASS II (4'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS		ASBESTOS ASSESSMENT
	LUMP SUM	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	EACH	EACH	LIN. FT.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.	LUMP SUM
SUPERSTRUCTURE				LUMP SUM							75.0	90.0			LUMP SUM	12	540	
END BENT 1		LUMP SUM	25.0		2891	7	70	7	0	70			65	70				
END BENT 2			23.6		2892	7	120	7	7	0			70	80				
TOTAL	LUMP SUM	LUMP SUM	48.6	LUMP SUM	5783	14	190	14	7	70	75.0	90.0	135	150	LUMP SUM	12	540	LUMP SUM

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATION.

PILES AT END BENTS NO. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 65 TONS PER PILE.

DRIVE PILES AT END BENTS NO. 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 110 TONS PER PILE.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PREDRILLING FOR PILES IS REQUIRED AT END BENT NO.1, LEFT TO ELEVATION 2664 FEET WITH EQUIPMENT THAT WILL RESULT IN A MAXIMUM PREDRILLING DIAMETER OF 10 INCHES. FOR PREDRILLING FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

KEY-IN THE RIP-RAP IN FRONT OF THE ABUTMENTS AT LEAST 3 FEET BENEATH THE BOTTOM OF PILE CAP ELEVATION WITH A MINIMUM THICKNESS AS SHOWN ON THE PLANS.

PROJECT NO. 17BP.14.R.175

HAYWOOD COUNTY

STATION: 12+95.00 -L-

SHEET 3 OF 3

DRAWN BY : MAL DATE : 12/2016
CHECKED BY : TLC DATE : 02/2017
DESIGN ENGINEER OF RECORD: MAL DATE : 02/2017

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NORTH CAROLINA PROFESSIONAL SEAL 048258 ENGINEER MARC A. LEBLANC
4/10/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER FINES CREEK ON SR 1379 BETWEEN SR 1334 AND DEAD END

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			22

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⟩	1.098	--	1.75	0.272	1.36	45′	EL	21.982	0.617	1.46	45′	EL	35.172	0.80	0.272	1.10	45′	EL	21.982	
		HL-93(Opr)	N/A	--	1.764	--	1.35	0.272	1.76	45′	EL	21.982	0.617	1.89	45′	EL	35.172	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	⟨2⟩	1.347	48.507	1.75	0.272	1.67	45′	EL	21.982	0.617	1.68	45′	EL	8.793	0.80	0.272	1.35	45′	EL	21.982	
		HS-20(Opr)	36.000	--	2.165	77.938	1.35	0.272	2.16	45′	EL	21.982	0.617	2.17	45′	EL	8.793	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.632	35.536	1.4	0.272	4.08	45′	EL	21.982	0.617	4.43	45′	EL	35.172	0.80	0.272	2.63	45′	EL	21.982	
		SNGARBS2	20.000	--	2.126	42.513	1.4	0.272	3.29	45′	EL	21.982	0.617	3.32	45′	EL	35.172	0.80	0.272	2.13	45′	EL	21.982	
		SNAGRIS2	22.000	--	2.085	45.877	1.4	0.272	3.19	45′	EL	17.586	0.617	3.15	45′	EL	35.172	0.80	0.272	2.09	45′	EL	21.982	
		SNCOTTS3	27.250	--	1.314	35.814	1.4	0.272	2.04	45′	EL	21.982	0.617	2.23	45′	EL	8.793	0.80	0.272	1.31	45′	EL	21.982	
		SNAGGRS4	34.925	--	1.16	40.51	1.4	0.272	1.8	45′	EL	21.982	0.617	1.97	45′	EL	35.172	0.80	0.272	1.16	45′	EL	21.982	
		SNS5A	35.550	--	1.13	40.167	1.4	0.272	1.75	45′	EL	21.982	0.617	2.06	45′	EL	8.793	0.80	0.272	1.13	45′	EL	21.982	
		SNS6A	39.950	--	1.064	42.522	1.4	0.272	1.65	45′	EL	21.982	0.617	1.94	45′	EL	35.172	0.80	0.272	1.06	45′	EL	21.982	
		SNS7B	42.000	⟨3⟩	1.015	42.617	1.4	0.272	1.57	45′	EL	21.982	0.617	1.98	45′	EL	35.172	0.80	0.272	1.01	45′	EL	21.982	
	TTST	TNAGRIT3	33.000	--	1.306	43.112	1.4	0.272	2.02	45′	EL	21.982	0.617	2.26	45′	EL	8.793	0.80	0.272	1.31	45′	EL	21.982	
		TNT4A	33.075	--	1.32	43.663	1.4	0.272	2.05	45′	EL	21.982	0.617	2.14	45′	EL	35.172	0.80	0.272	1.32	45′	EL	21.982	
		TNT6A	41.600	--	1.108	46.093	1.4	0.272	1.72	45′	EL	21.982	0.617	2.11	45′	EL	35.172	0.80	0.272	1.11	45′	EL	21.982	
		TNT7A	42.000	--	1.129	47.436	1.4	0.272	1.75	45′	EL	21.982	0.617	1.96	45′	EL	35.172	0.80	0.272	1.13	45′	EL	21.982	
		TNT7B	42.000	--	1.176	49.384	1.4	0.272	1.82	45′	EL	21.982	0.617	1.88	45′	EL	35.172	0.80	0.272	1.18	45′	EL	21.982	
		TNAGRIT4	43.000	--	1.12	48.157	1.4	0.272	1.74	45′	EL	21.982	0.617	1.8	45′	EL	35.172	0.80	0.272	1.12	45′	EL	21.982	
		TNAGT5A	45.000	--	1.042	46.893	1.4	0.272	1.61	45′	EL	21.982	0.617	1.88	45′	EL	35.172	0.80	0.272	1.04	45′	EL	21.982	
		TNAGT5B	45.000	--	1.017	45.785	1.4	0.272	1.58	45′	EL	21.982	0.617	1.7	45′	EL	35.172	0.80	0.272	1.02	45′	EL	21.982	

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)

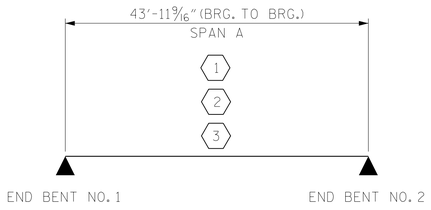
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨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. 17BP.14.R.175

HAYWOOD COUNTY

STATION: 12+95.00 -L-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043835 MARC A. LEBLANC
Digitally signed by Marc A. LeBlanc
DN: cn=Marc A. LeBlanc, o=RS&H, ou=ENGINEER, email=marc.leblanc@rsandh.com, c=US
Date: 2018.04.10 09:07:45 -04'00'
4/10/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR 45′ CORED SLAB UNIT 105° SKEW

(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			22

ASSEMBLED BY :	MAL	DATE : 12/2016
CHECKED BY :	TLC	DATE : 02/2017
DRAWN BY : CVC	6/10	
CHECKED BY : DNS	6/10	

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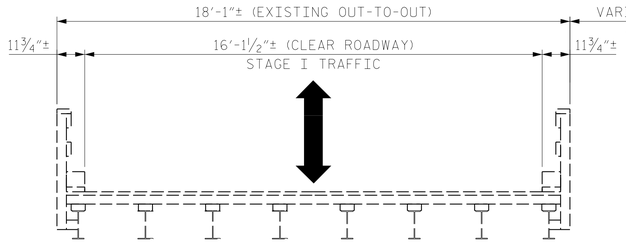
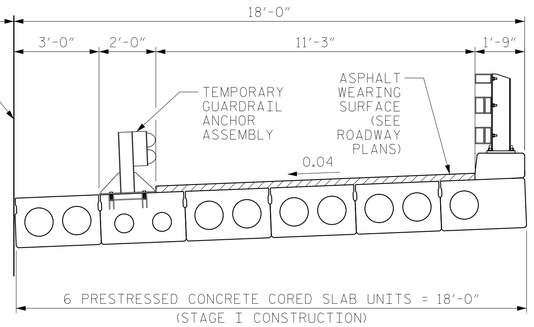
LynnT

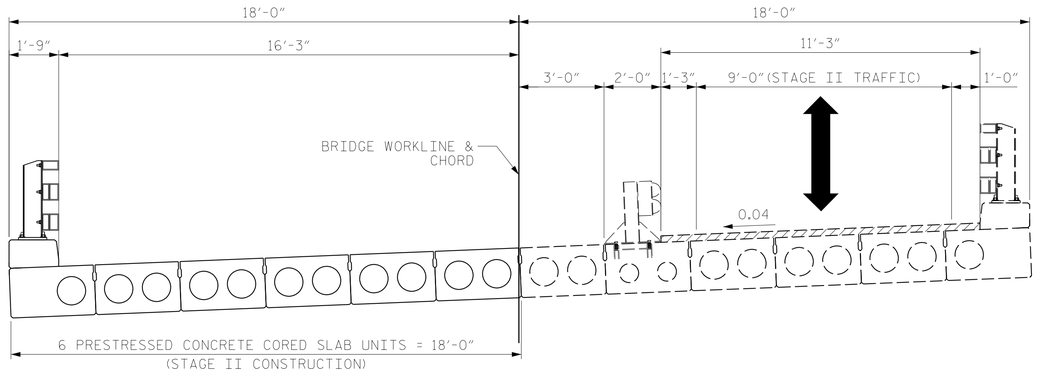
STD. NO. 21LRFR1_75&105S_45L



STAGE I TRAFFIC

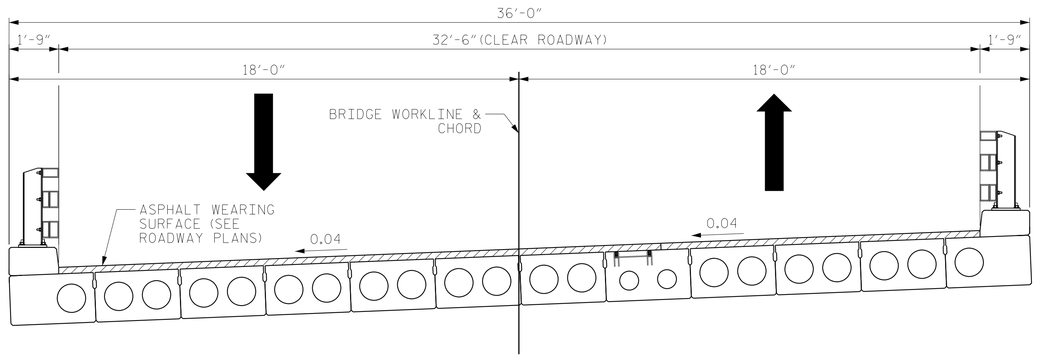


STAGE I CONSTRUCTION



STAGE II CONSTRUCTION

STAGE II TRAFFIC



FINAL CONDITION

PROJECT NO. 17BP.14.R.175

HAYWOOD COUNTY

STATION: 12+95.00 -L-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043835 MARC A. LEBLANC
Digitally signed by Marc LeBlanc
4/10/2018

RS&H

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
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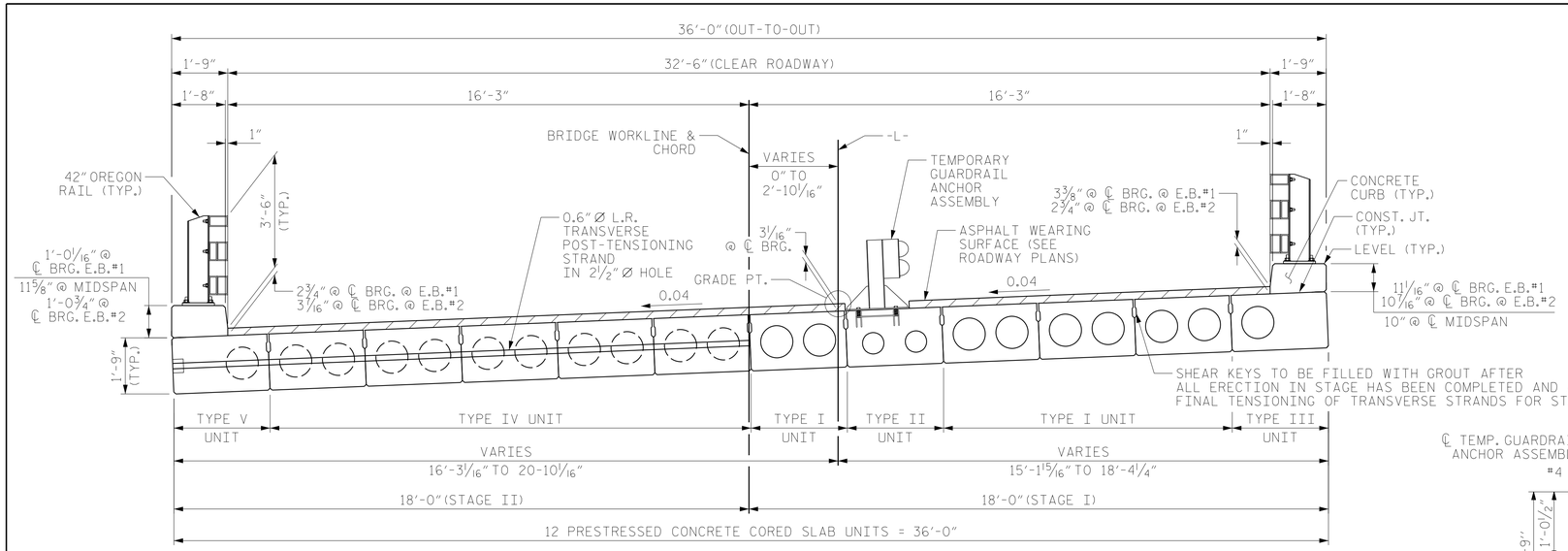
LynnT

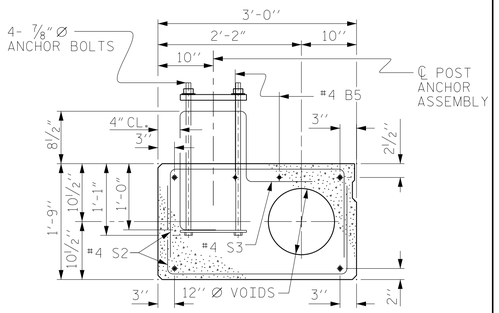


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

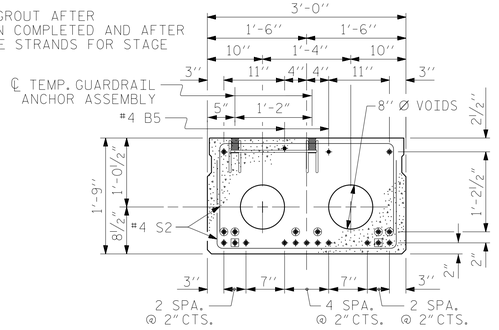
TYPICAL SECTION

THE HEIGHT OF THE CURB AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE CURB FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR CURB DETAILS AND ASPHALT THICKNESS SEE SHEET 5 OF 5.



EXT. SLAB SECTION

TYPE III & V UNITS (SIMILAR BY ROTATION)
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)



INTERIOR SLAB SECTION

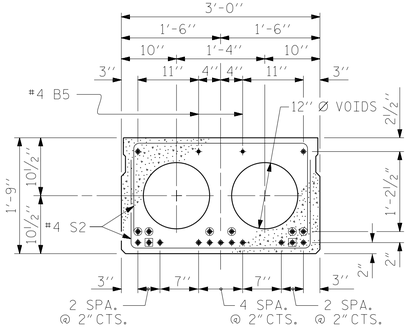
TYPE II UNIT
(13 STRANDS REQUIRED)

△ 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.

◉ 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.

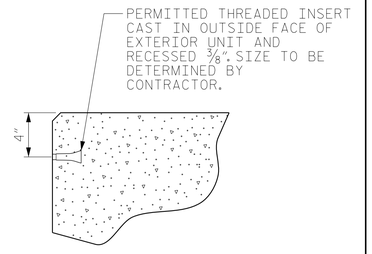
◉ OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND



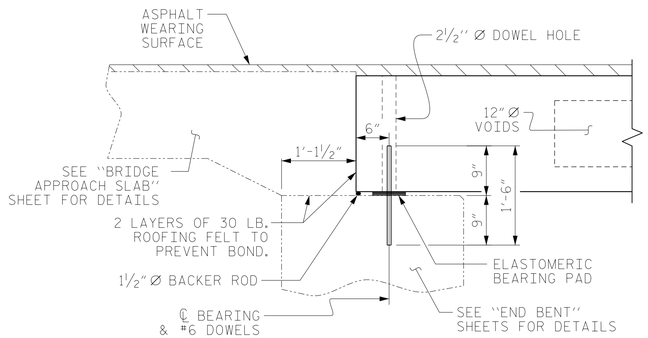
INTERIOR SLAB SECTION

TYPE I & IV UNITS
(13 STRANDS REQUIRED)

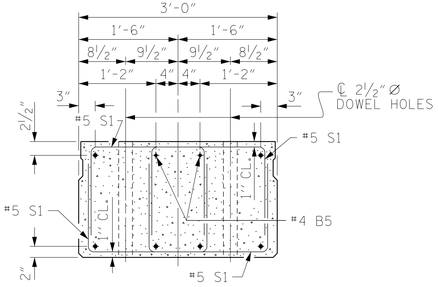


THREADED INSERT DETAIL

FIXED END

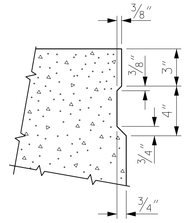


SECTION AT END BENT



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.

PROJECT NO. 17BP.14.R.175
HAYWOOD COUNTY
STATION: 12+95.00 -L-

SHEET 1 OF 5

ASSEMBLED BY :	MAL	DATE : 01/2017	
CHECKED BY :	TLC	DATE : 02/2017	
DRAWN BY : DGE	5/09	REV. 9/14	MAA/TMG
CHECKED BY : BCH	6/09		

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LynnT

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038835 MARC A. LEBLANC
Digitally signed by Marc A. LeBlanc
DN: cn=Marc A. LeBlanc, o=RS&H, ou=Engineering, email=marc.leblanc@rsandh.com, c=US
Date: 2018.04.10 09:07:44 -04'00'
4/10/2018

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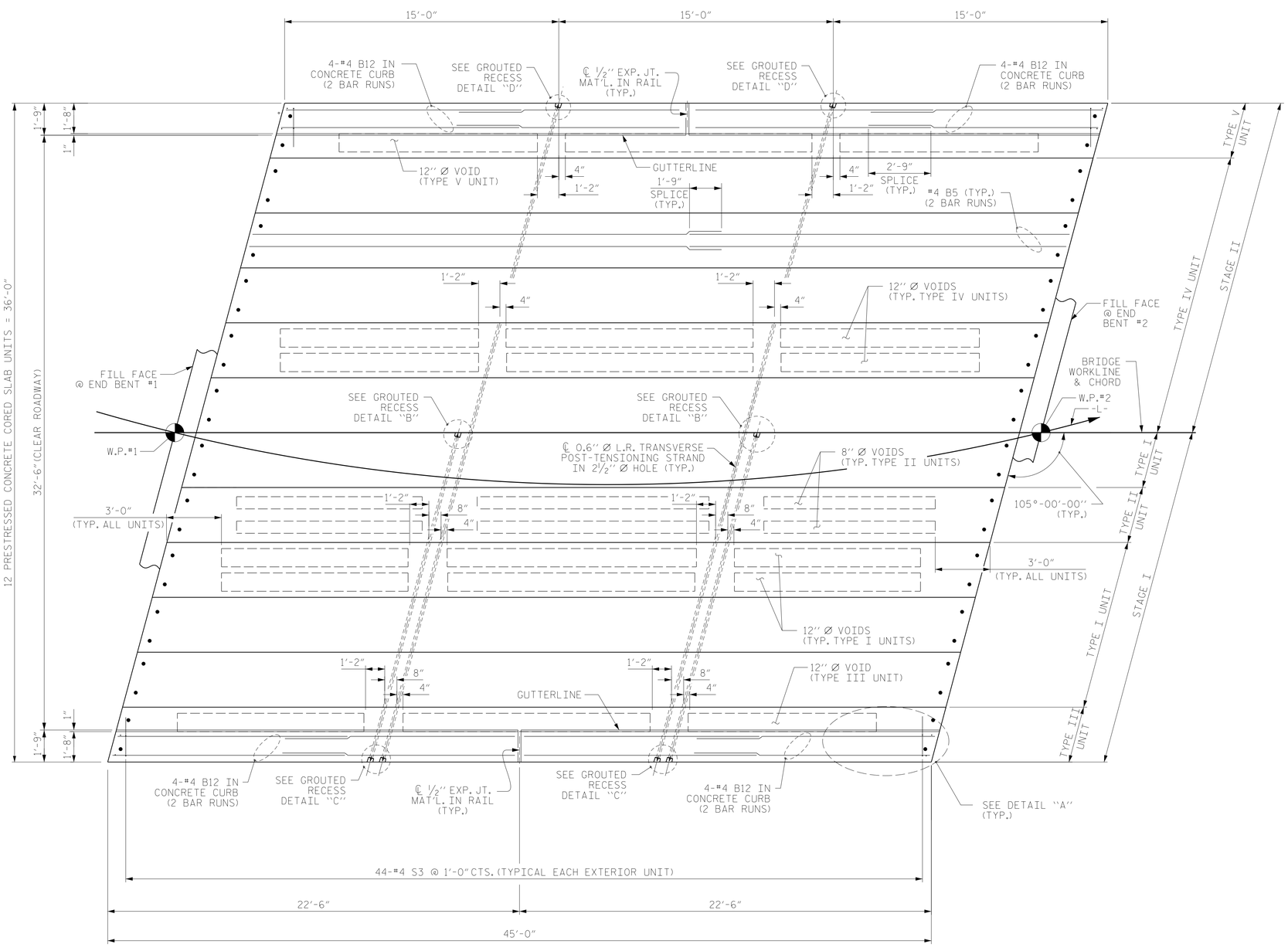
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

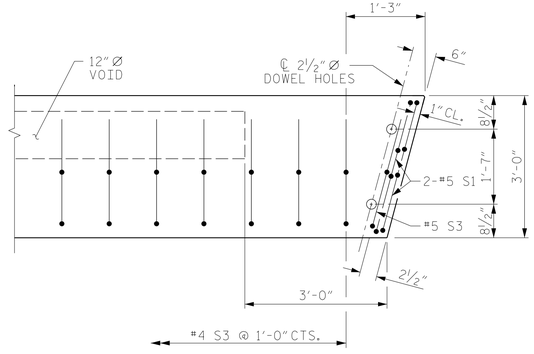
STANDARD
3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT
105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			22



PLAN OF UNIT

SPAN A



DETAIL "A"

(SIMILAR EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #4 S3.

SEE PLAN OF UNIT FOR VOID LAYOUT.

FOR #4 S2 BARS, SEE SHEET 3 OF 5.

FOR DETAILS B, C & D, SEE SHEET 3 OF 5.

PROJECT NO. 17BP.14.R.175

HAYWOOD COUNTY

STATION: 12+95.00 -L-

SHEET 2 OF 5

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STATE OF NORTH CAROLINA
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RALEIGH

PLAN OF 45' UNIT 32'-6" CLEAR ROADWAY

105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			22

DRAWN BY : MAL DATE : 12/2016
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DESIGN ENGINEER OF RECORD: MAL DATE : 02/2017

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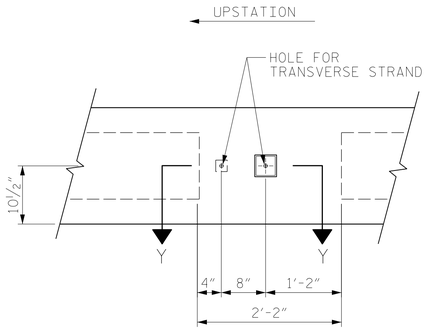
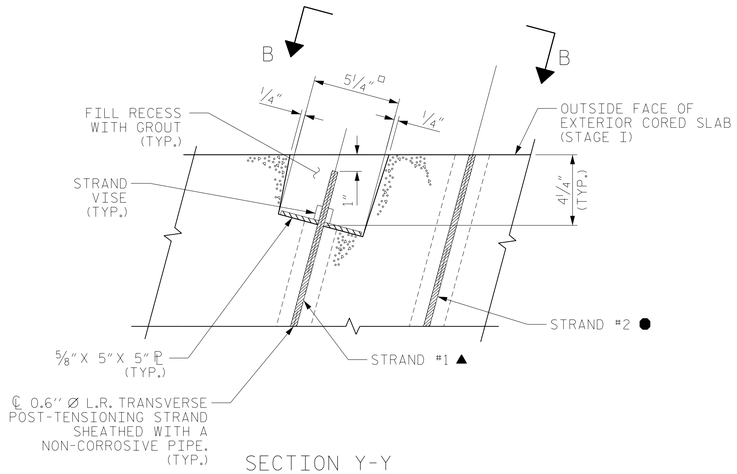
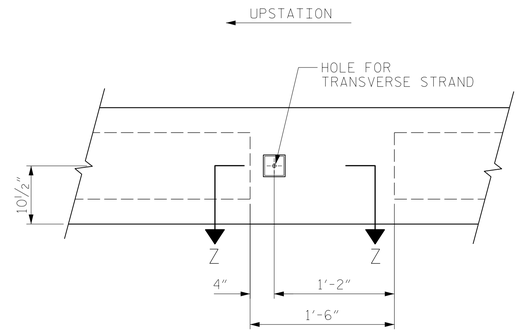
Lynn



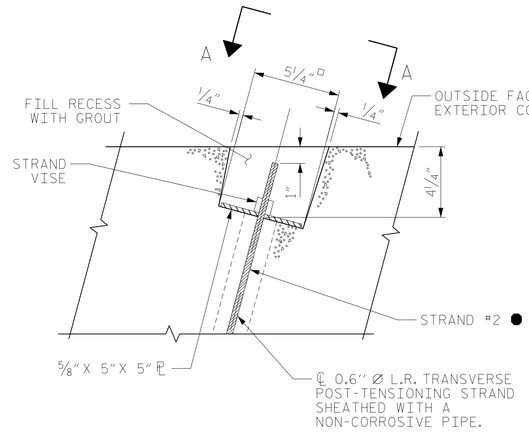
VIEW B-B



SECTION Y-Y



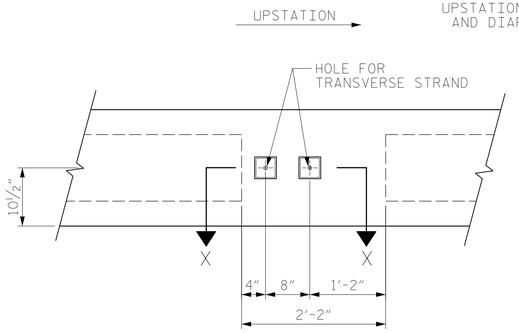
VIEW A-A



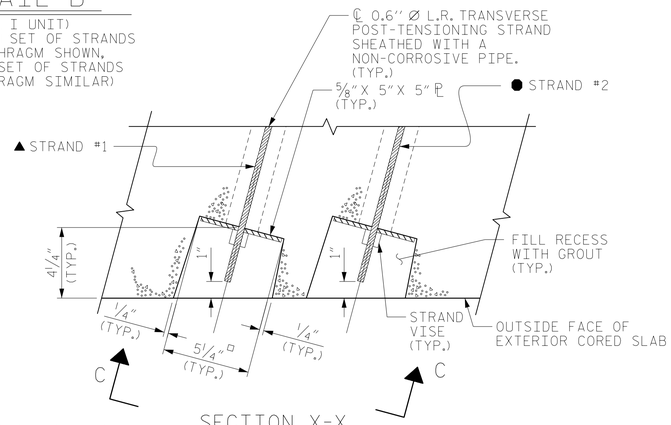
SECTION Z-Z

DETAIL B

(TYPE I UNIT)
(DOWNSTATION SET OF STRANDS AND DIAPHRAGM SHOWN, UPSTATION SET OF STRANDS AND DIAPHRAGM SIMILAR)



VIEW C-C



SECTION X-X

DETAIL C

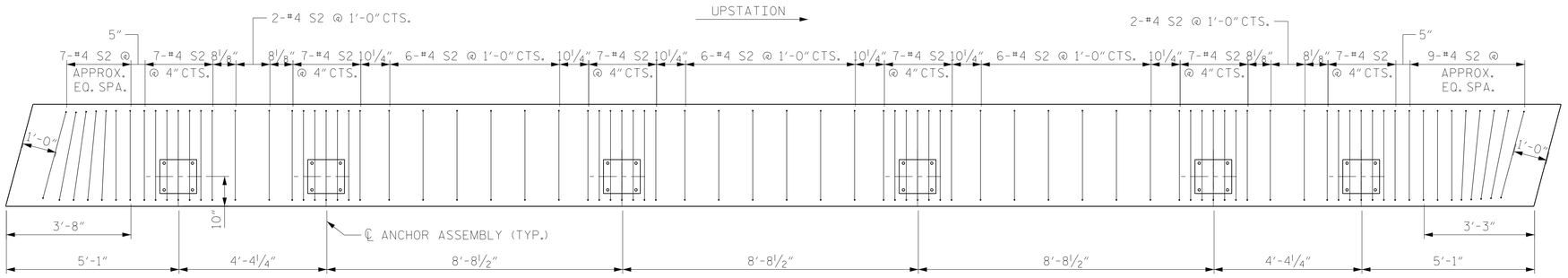
(TYPE III UNIT)
(DOWNSTATION SET OF STRANDS AND DIAPHRAGM SHOWN, UPSTATION SET OF STRANDS AND DIAPHRAGM SIMILAR)

DETAIL D

(TYPE V UNIT)

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

- ▲ STRAND #1 GOES THRU 6 CORED SLAB UNITS (TO BE TENSIONED DURING STAGE I CONSTRUCTION)
- ● STRAND #2 GOES THRU ALL 12 CORED SLAB UNITS (TO BE TENSIONED DURING STAGE II CONSTRUCTION)



PLAN OF EXTERIOR CORED SLAB UNITS (TYPE III AND TYPE V)

TYPE III SHOWN, TYPE V SIMILAR BY ROTATION
VOIDS NOT SHOWN FOR CLARITY

ALL #4-S2 BARS IN PAIRS

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HAYWOOD COUNTY
STATION: 12+95.00 -L-

SHEET 3 OF 5

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STATE OF NORTH CAROLINA
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RALEIGH

3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT
105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
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2			4			22

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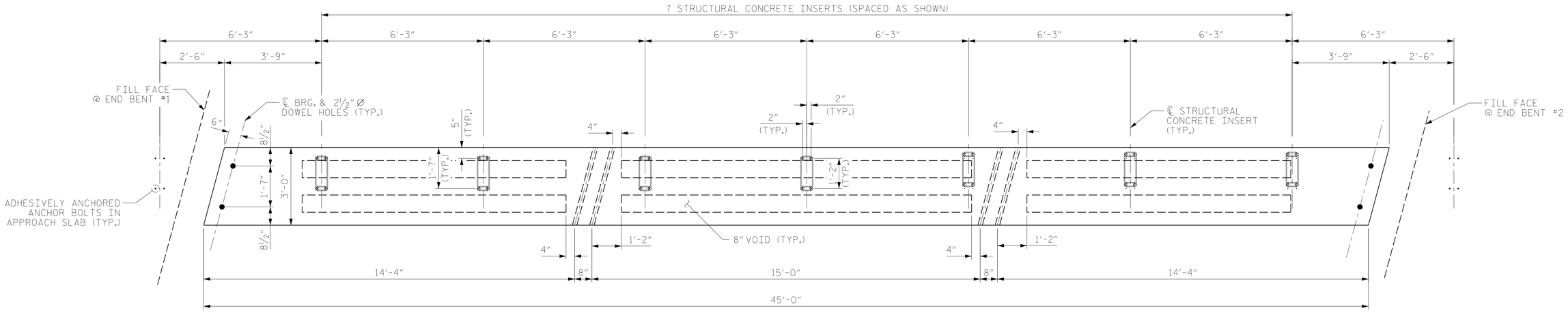
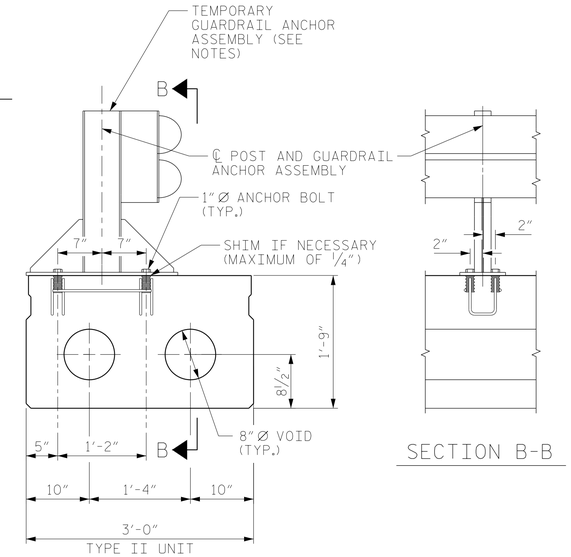


PLAN OF STAGE I CORED SLAB UNIT (TYPE II)



CONCRETE INSERT LOCATION

NOTES

THE GUARDRAIL 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 2½".

B. 4 - 1" Ø X 2 ¼" 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 1" Ø X 2¼" 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 STRUTS SHOWN IN THE GUARDRAIL ANCHOR ASSEMBLY ARE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 P.S.I. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

GUARDRAIL ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

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

FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

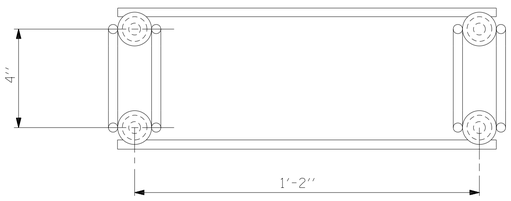
AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

PAYMENT FOR GUARDRAIL, POSTS, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.

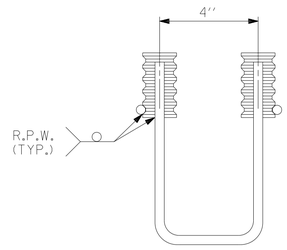
SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL ANCHOR ASSEMBLY. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 1" Ø BOLT IS 21.8 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.

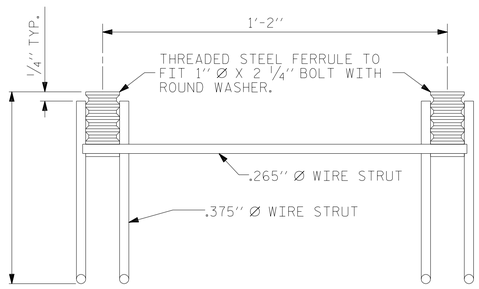
AFTER REMOVAL OF TEMPORARY GUARDRAIL ANCHOR ASSEMBLY, THE STRUCTURAL CONCRETE INSERTS SHALL BE FILLED WITH GROUT.



PLAN



ELEVATION



SIDE VIEW

STRUCTURAL CONCRETE INSERT

PROJECT NO. 17BP.14.R.175

HAYWOOD COUNTY

STATION: 12+95.00 -L-

SHEET 4 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC
Digitally signed by Marc A. Leblanc
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT DETAILS

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1			3			TOTAL SHEETS
2			4			22

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DESIGN ENGINEER OF RECORD: MAL DATE : 02/2017

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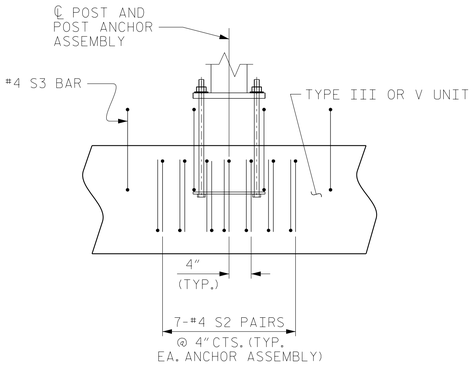
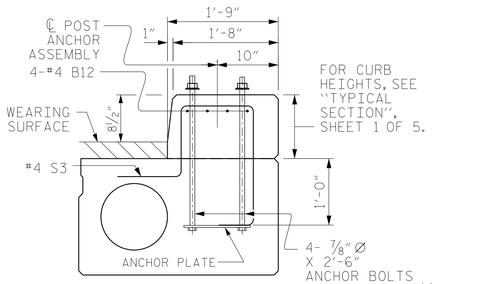


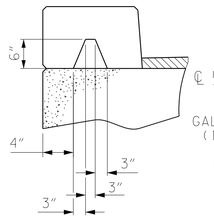
SIDE VIEW AT POST LOCATION

(SHOWING ADDITIONAL S2 BARS AT EACH POST ASSEMBLY)



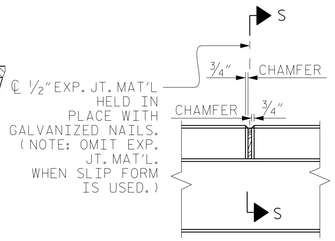
OREGON RAIL CURB SECTION

CONTRACTORS ATTENTION SHALL BE CALLED TO THE CROSS SLOPE OF THE ROADWAY, WHILE MAINTAINING PLUMB ANCHOR BOLTS.



SECTION S-S

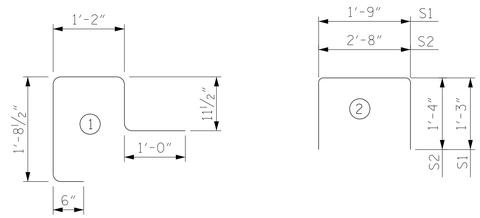
AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



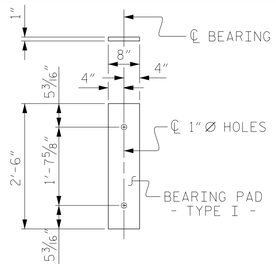
ELEVATION AT EXPANSION JOINTS

CONCRETE CURB SECTION

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 50 DUROMETER HARDNESS.

CONCRETE RELEASE STRENGTH	
UNIT	PSI
45' UNITS	4000

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
45' UNITS	2⅝"	▲

▲ = SEE "TYPICAL SECTION", SHEET 1 OF 5, FOR HEIGHTS @ MID-SPAN.

CORED SLABS REQUIRED				
		NUMBER	LENGTH	TOTAL LENGTH
STAGE I	TYPE I	4	45'-0"	180'-0"
	TYPE II	1	45'-0"	45'-0"
	TYPE III	1	45'-0"	45'-0"
	STAGE I TOTAL	6		270'-0"
STAGE II	TYPE IV	5	45'-0"	225'-0"
	TYPE V	1	45'-0"	45'-0"
	STAGE II TOTAL	6		270'-0"
TOTAL		12		540'-0"

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 CONCRETE CURB 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 CURB AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN CONCRETE CURB 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 #4 S2 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS.

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.

THE COST OF THE METAL RAIL ANCHOR ASSEMBLY CAST WITH THE CORED SLAB SECTIONS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

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

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 1'-9"
45' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	⅞" ▲
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	⅛" ▼
FINAL CAMBER	¾" ▲

** INCLUDES FUTURE WEARING SURFACE

BILL OF MATERIAL FOR ONE 45' CORED SLAB UNIT

				STAGE I							STAGE II				
				TYPE I		TYPE II		TYPE III			TYPE IV		TYPE V		
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	NUMBER	LENGTH	WEIGHT	LENGTH	WEIGHT	NUMBER	LENGTH	WEIGHT
B5	4	#4	STR	23'-3"	62	23'-3"	62	4	23'-3"	62	23'-3"	62	4	23'-3"	62
S1	8	#5	2	4'-3"	35	4'-3"	35	8	4'-3"	35	4'-3"	35	8	4'-3"	35
S2	108	#4	2	5'-4"	385	5'-4"	385	80	5'-4"	281	5'-4"	385	80	5'-4"	281
* S3	-	#4	1	-	-	-	-	46	5'-4"	166	-	-	46	5'-4"	166
REINFORCING STEEL		LBS.			482		482			375		482			375
* EPOXY COATED REINFORCING STEEL		LBS.			-		-			164		-			164
5000 P.S.I. CONCRETE		CU. YDS.			6.7		7.8			7.7		6.7			7.7
0.6" Ø L.R. STRANDS		No.			13		13			13		13			13

ASSEMBLED BY :	MAL	DATE : 01/2017
CHECKED BY :	TLC	DATE : 02/2017
DRAWN BY : DGE 5/09	REV. 12/11	MAA/AAC
CHECKED BY : BCH 6/09	REV. 8/14	MAA/TMG

4/6/2018
X:\PJ\1030014001_Div 14 Bridges_2016\1030014002_R.175 430215\Design\Structures\Working DGN\401_021_17BP.14.R.175_B215_SMU_BOM11_S-11.dgn
LynnT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. 17BP.14.R.175

HAYWOOD COUNTY

STATION: 12+95.00 -L-

SHEET 5 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 038381 ENGINEER MARC A. LEBLANC
DocuSigned by: 4/10/2018

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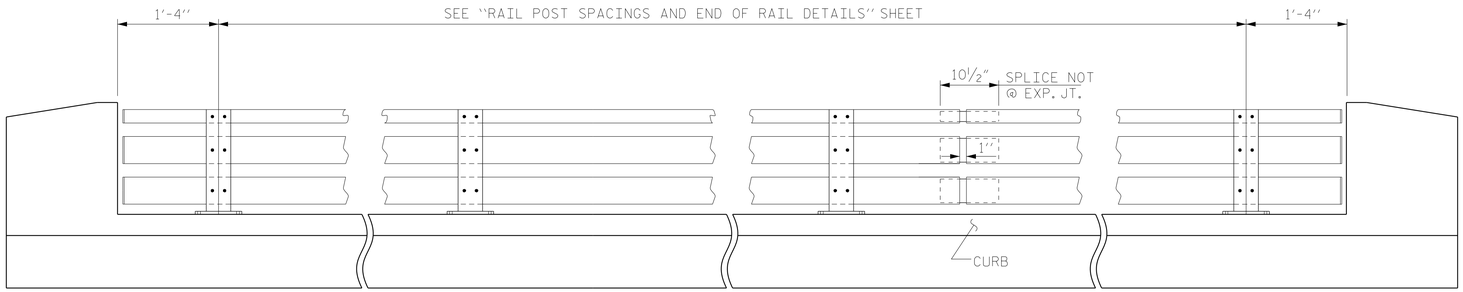
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0" X 1'-9"
PRESTRESSED CONCRETE CORED SLAB UNIT DETAILS

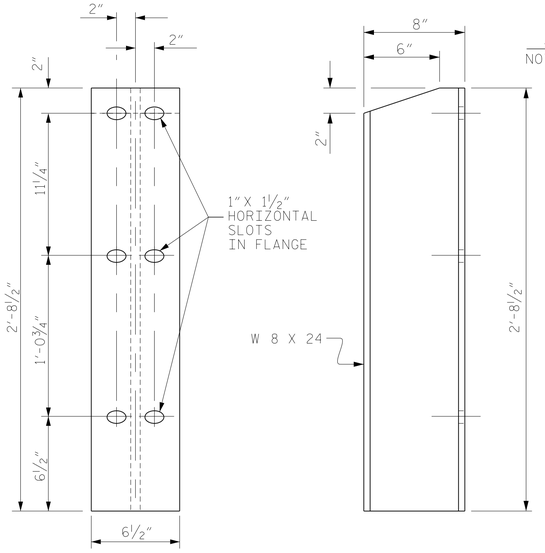
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			22

STD. NO. PCS3



ELEVATION

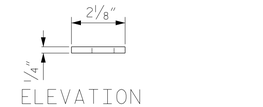
NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR11.



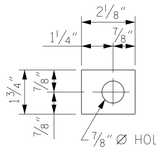
FRONT ELEVATION

SIDE ELEVATION

DETAILS OF POST

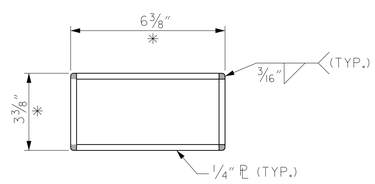


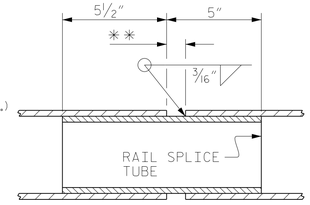
ELEVATION



PLAN

PLATE WASHER

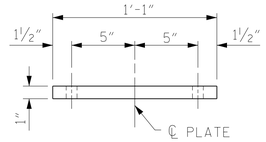




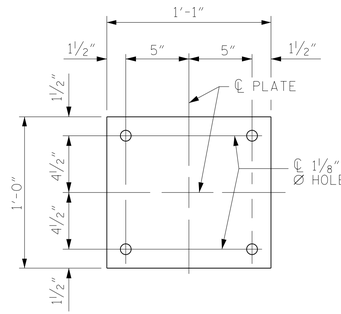
RAIL SPLICE DETAILS

* - DIMENSION AFTER GRINDING RADIUS ON CORNERS TO MATCH INSIDE OF METAL RAIL. GRIND ALL EDGES PRIOR TO GALVANIZING TO ASSURE FIT.

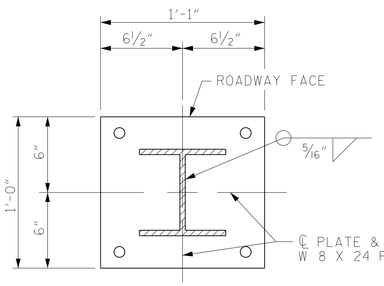
** -1" FOR SPLICE NOT AT EXPANSION JOINT; SEE TABLE 1 FOR OPENING FOR SPLICES AT EXPANSION JOINTS.



FRONT ELEVATION

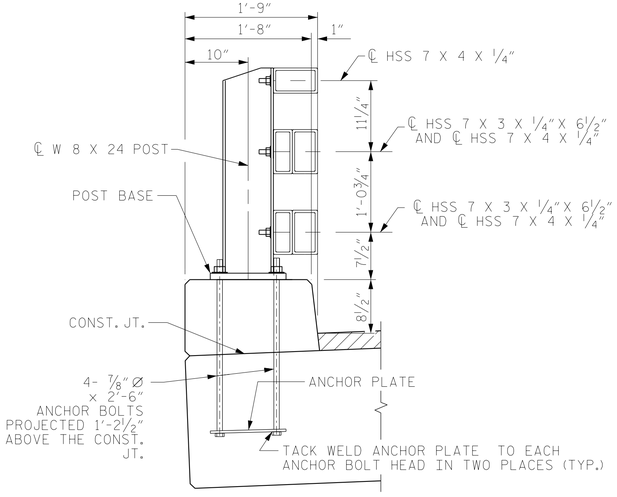


PLAN

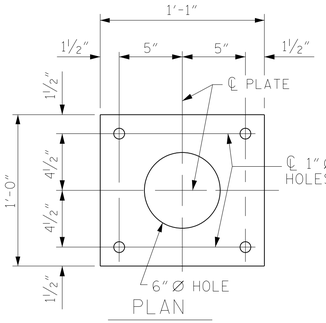


POST ATTACHMENT DETAIL

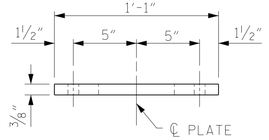
POST BASE DETAILS



SECTION THRU RAIL



PLAN



ELEVATION

ANCHOR PLATE DETAILS

NOTES

METAL RAIL SHALL BE GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS. ALUMINUM RAIL WILL NOT BE AN OPTION.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, ANCHOR PLATES, AND RAIL SPLICE TUBES: AASHTO M270 GRADE 36 STRUCTURAL STEEL-GALVANIZED TO AASHTO M111.

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.

RAILS: ASTM A500 GRADE B - GALVANIZED TO AASHTO M111.

WELDED RAIL STUDS: ASTM A108-GALVANIZED TO AASHTO M111.

HIGH STRENGTH ANCHOR BOLTS SHALL CONFORM TO ASTM F1554 GRADE 105. HEAVY HEX NUTS SHALL CONFORM TO ASTM A563 DH, AND WASHERS TO ASTM F436, TYPE 1. NUTS AND WASHERS SHALL BE GALVANIZED TO 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. BMR11.

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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.

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

THE RAIL SECTIONS SHALL BE ATTACHED TO THE POSTS BY TWO THREADED ¾" Ø WELDED STUDS, PLATE WASHERS, LOCKWASHERS, AND NUTS.

FOR 42" OREGON RAIL, SEE THE STANDARD SPECIFICATIONS.

PAY LENGTH 90 LIN. FT.

PROJECT NO. 17BP.14.R.175

HAYWOOD COUNTY

STATION: 12+95.00 -L-

SHEET 1 OF 2

ASSEMBLED BY :	MAL	DATE :	01/2017
CHECKED BY :	TLC	DATE :	02/2017
DRAWN BY :	RWW 7/14	ADDED	1/15
CHECKED BY :	TMG 7/14		

4/6/2018
X:\P\1030014001_Div 14 Bridges_2016\1030014002_R.175 430215\Design\Structures\Working DGN\401_024_17BP.14.R.175_B215_SMU_BMR11a_S-11a.dgn
Lynn T

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043835 MARC A. LEBLANC
Digitally Signed by: Marc A LeBlanc
4/10/2018

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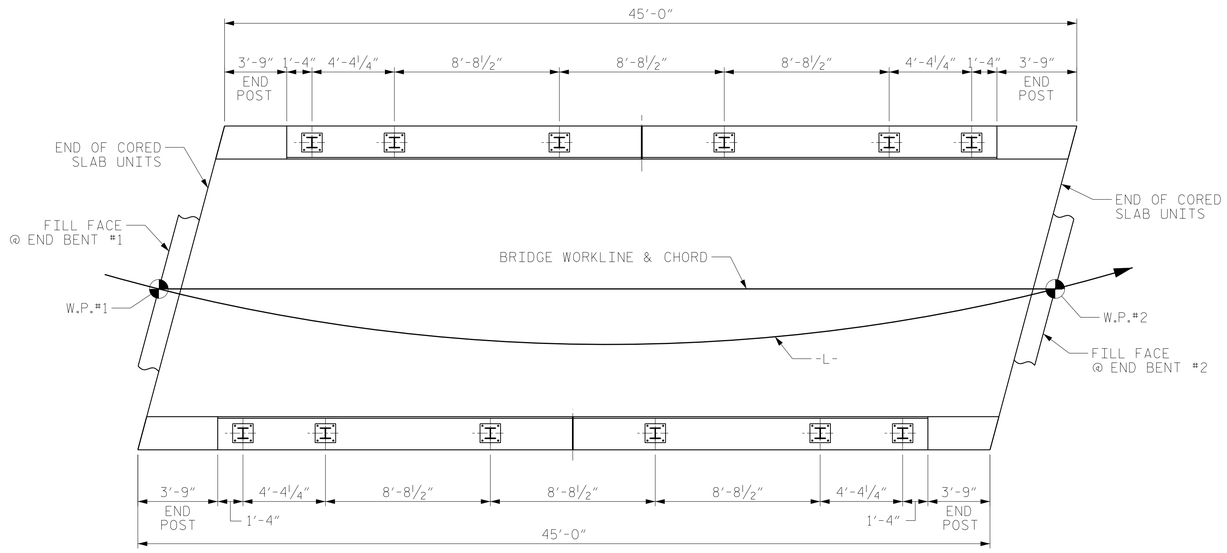
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

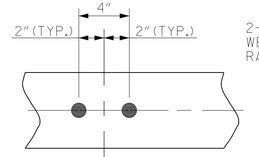
42" OREGON RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			22

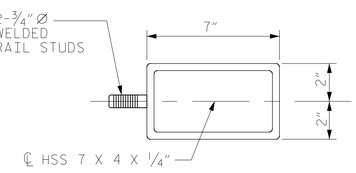
STD. NO. BMR10



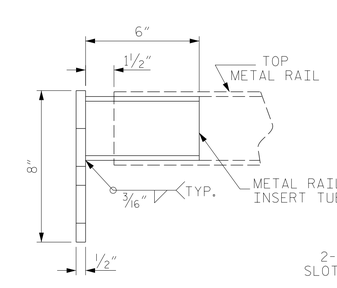
PLAN OF RAIL POST SPACINGS

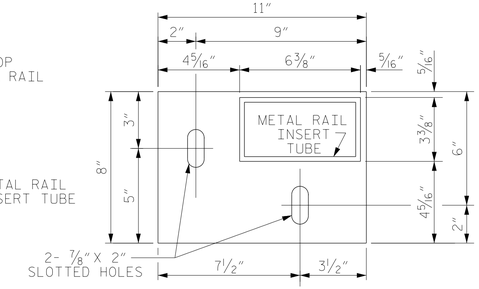


ELEVATION



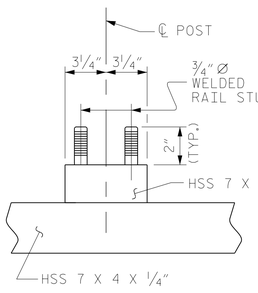
TOP RAIL SECTION



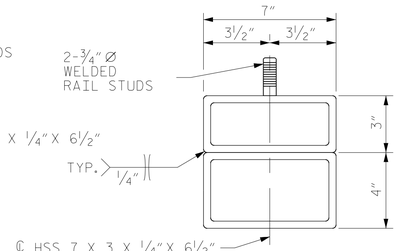


TOP METAL RAIL ATTACHMENT BRACKET

THE METAL RAIL INSERT TUBE SHALL BE FABRICATED FROM ¼" PLATES.

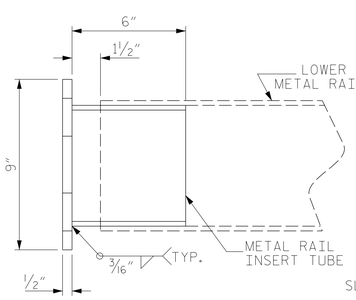


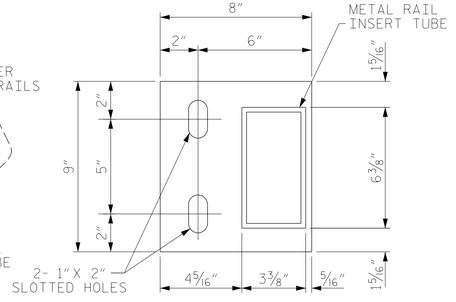
PLAN



SECTION OF LOWER RAILS

RAIL STUD DETAILS





LOWER METAL RAILS ATTACHMENT BRACKET

THE METAL RAIL INSERT TUBE SHALL BE FABRICATED FROM ¼" PLATES.

NOTES

STRUCTURAL CONCRETE INSERT

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

A. FERRULE 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 STRUCTURAL CONCRETE INSERT 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

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

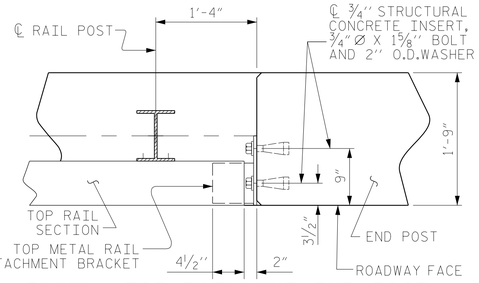
A. ½" METAL BRACKET PLATE AND ¼" METAL RAIL INSERT TUBE SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION TO AASHTO M111.

B. ¾" STRUCTURAL CONCRETE INSERTS 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.

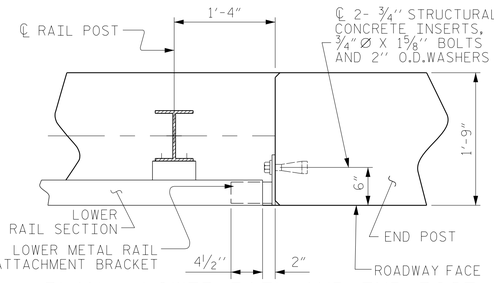
THE ¾" STRUCTURAL CONCRETE INSERTS WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP.

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

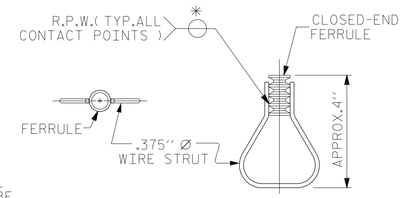
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾" Ø X 1⅝" BOLTS WITH WASHERS SHALL BE REPLACED WITH ¾" Ø X 6½" BOLTS AND 2" O.D. WASHERS. ALL SPECIFICATIONS THAT APPLY TO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



PLAN - TOP RAIL AND END POST



PLAN - LOWER RAIL AND END POST



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. 17BP.14.R.175

HAYWOOD COUNTY

STATION: 12+95.00 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043835 Digitally signed by: Mary Kate Blaine Date: 2018.04.10 MARY KATE A. LEBLANC

4/10/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RAIL POST SPACINGS AND END OF RAIL DETAILS

FOR 42" OREGON RAIL

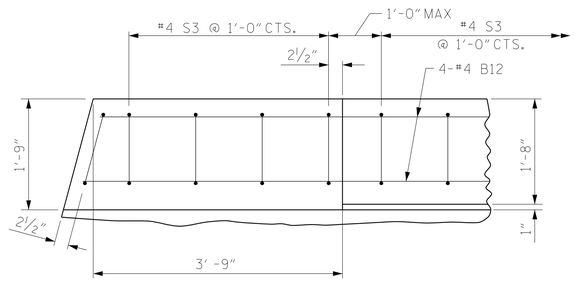
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			22

ASSEMBLED BY :	MAL	DATE : 01/2017
CHECKED BY :	TLC	DATE : 02/2017
DRAWN BY : RWW 7/14	ADDED	1/15
CHECKED BY : TMG 7/14		

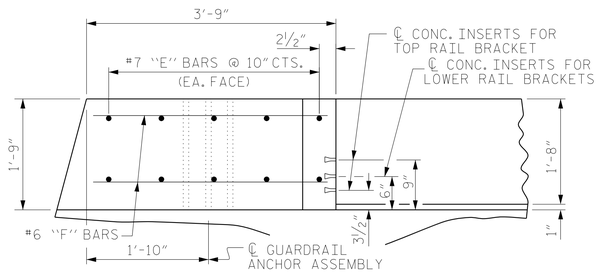
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

4/6/2018
X:\P\1030014001_Div 14 Bridges_2016\1030014002_R.175 430215\Design\Structures\Working DGN\401_024_17BP.14.R.175_B215_SMU_BMR11b_S-11b.dgn
Lynn1

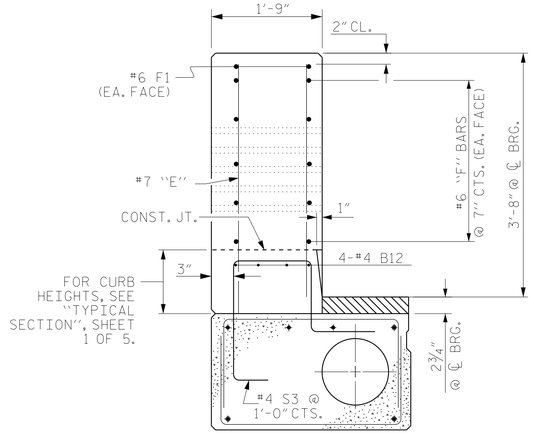
STD. NO. BMR11



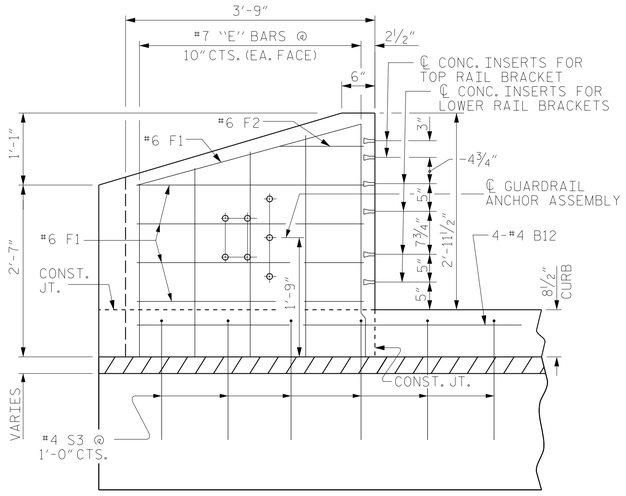
PLAN OF CURB



PLAN OF END POST



END VIEW



ELEVATION

CURB AND END POST FOR 42" OREGON RAIL

BILL OF MATERIAL FOR CONCRETE CURB & END POSTS

STAGE I						STAGE II					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
✳B12	16	#4	STR	12'-5"	133	✳B12	16	#4	STR	12'-5"	133
✳E1	4	#7	STR	3'-6"	9	✳E1	4	#7	STR	3'-6"	9
✳E2	4	#7	STR	3'-3"	9	✳E2	4	#7	STR	3'-3"	9
✳E3	4	#7	STR	3'-0"	8	✳E3	4	#7	STR	3'-0"	8
✳E4	4	#7	STR	2'-9"	7	✳E4	4	#7	STR	2'-9"	7
✳E5	4	#7	STR	2'-6"	7	✳E5	4	#7	STR	2'-6"	7
✳F1	20	#6	STR	2'-11"	39	✳F1	20	#6	STR	2'-11"	39
✳F2	4	#6	STR	1'-0"	3	✳F2	4	#6	STR	1'-0"	3
✳EPOXY COATED REINFORCING STEEL				LBS.	215	✳EPOXY COATED REINFORCING STEEL				LBS.	215
CLASS AA CONCRETE				CU.YDS.	3.4	CLASS AA CONCRETE				CU.YDS.	3.2
TOTAL CONCRETE CURB				LN. FT.	45.00	TOTAL CONCRETE CURB				LN. FT.	45.00

PROJECT NO. 17BP.14.R.175

HAYWOOD COUNTY

STATION: 12+95.00 -L-

DRAWN BY : MAL DATE : 12/2016

CHECKED BY : TLC DATE : 02/2017

DESIGN ENGINEER OF RECORD: MAL DATE : 02/2017

4/6/2018
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4/10/2018

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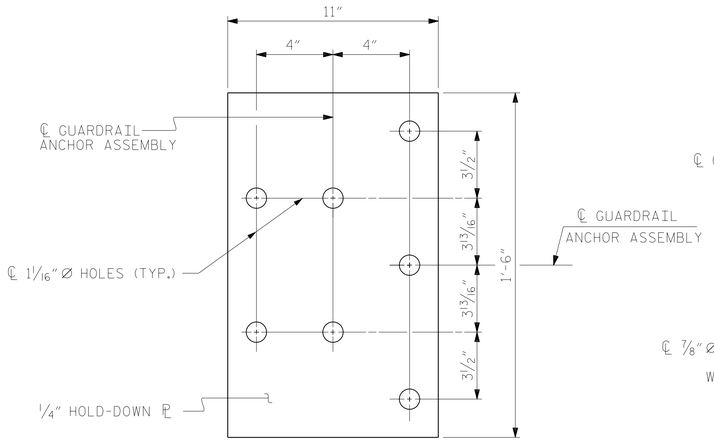
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CURB AND END POST DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			22



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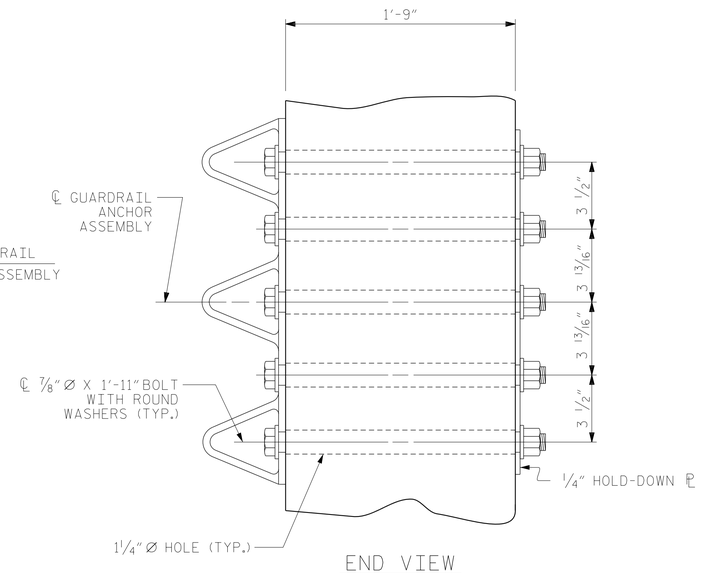


END VIEW

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.

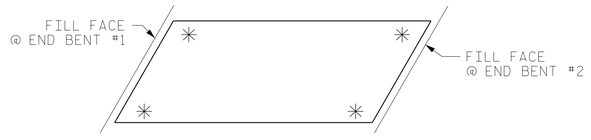
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

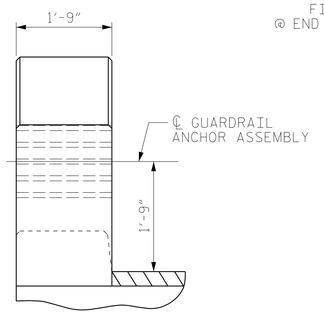
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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.

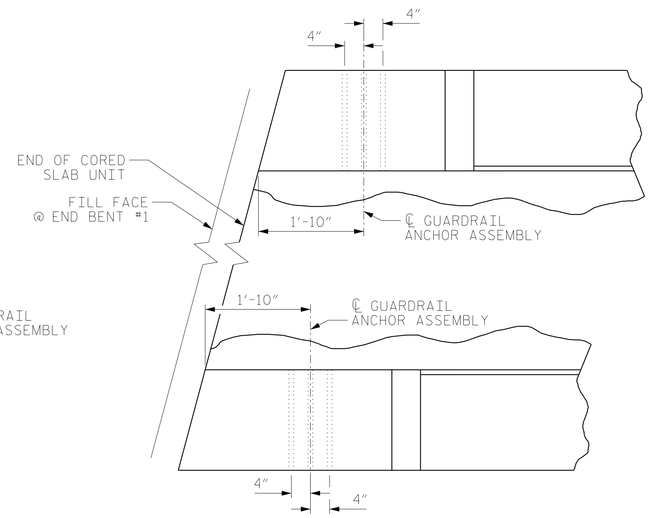


SKETCH SHOWING POINTS OF ATTACHMENT

✳ LOCATION OF GUARDRAIL ATTACHMENT



END VIEW



PLAN OF END POST

END BENT #1 SHOWN, END BENT #2 SIMILAR

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. 17BP.14.R.175

HAYWOOD COUNTY

STATION: 12+95.00 -L-

ASSEMBLED BY :	MAL	DATE :	01/2017
CHECKED BY :	TLC	DATE :	02/2017
DRAWN BY : MAA 5/10	REV. 12/5/11		MAA/GM
CHECKED BY : GM 5/10	REV. 6/13		MAA/GM
	REV. 1/15		MAA/TMG

NORTH CAROLINA PROFESSIONAL SEAL 043633 ENGINEER MARC A. LEBLANC
4/10/2018

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DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE DETAILS
FOR METAL TUBE RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			22

STD. NO. GRA3

4/6/2018
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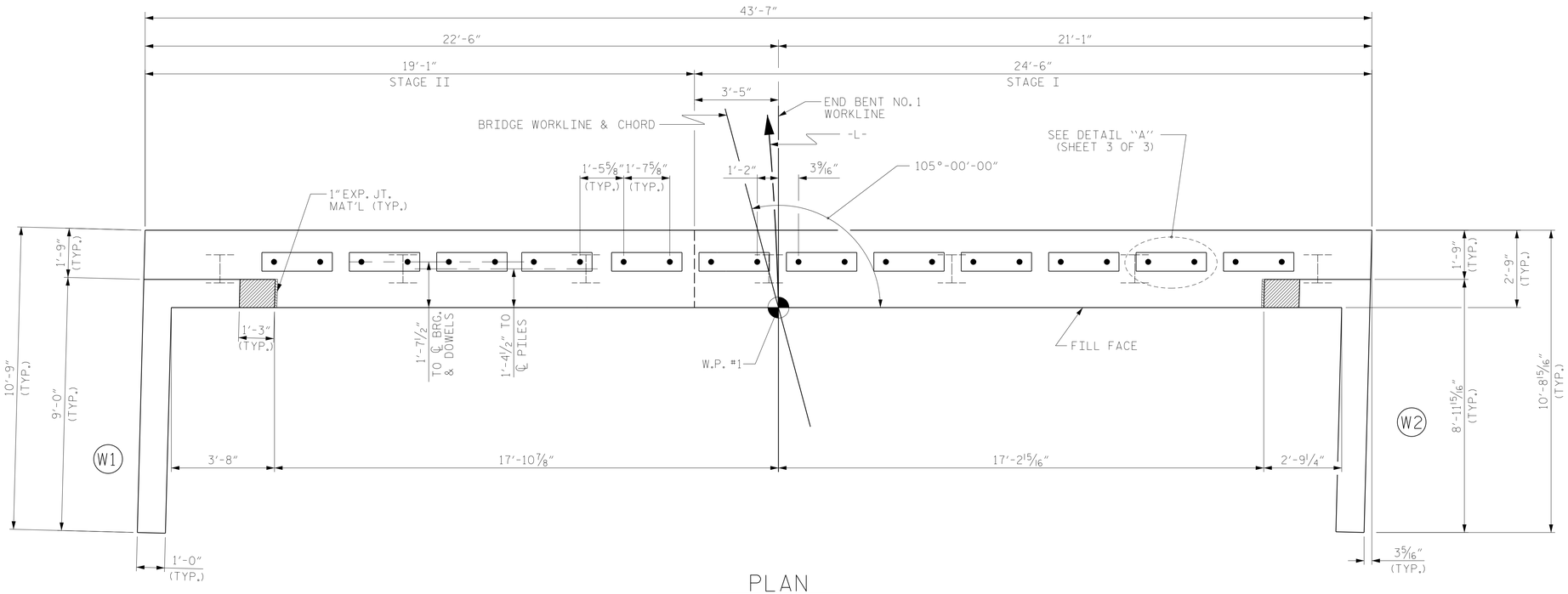
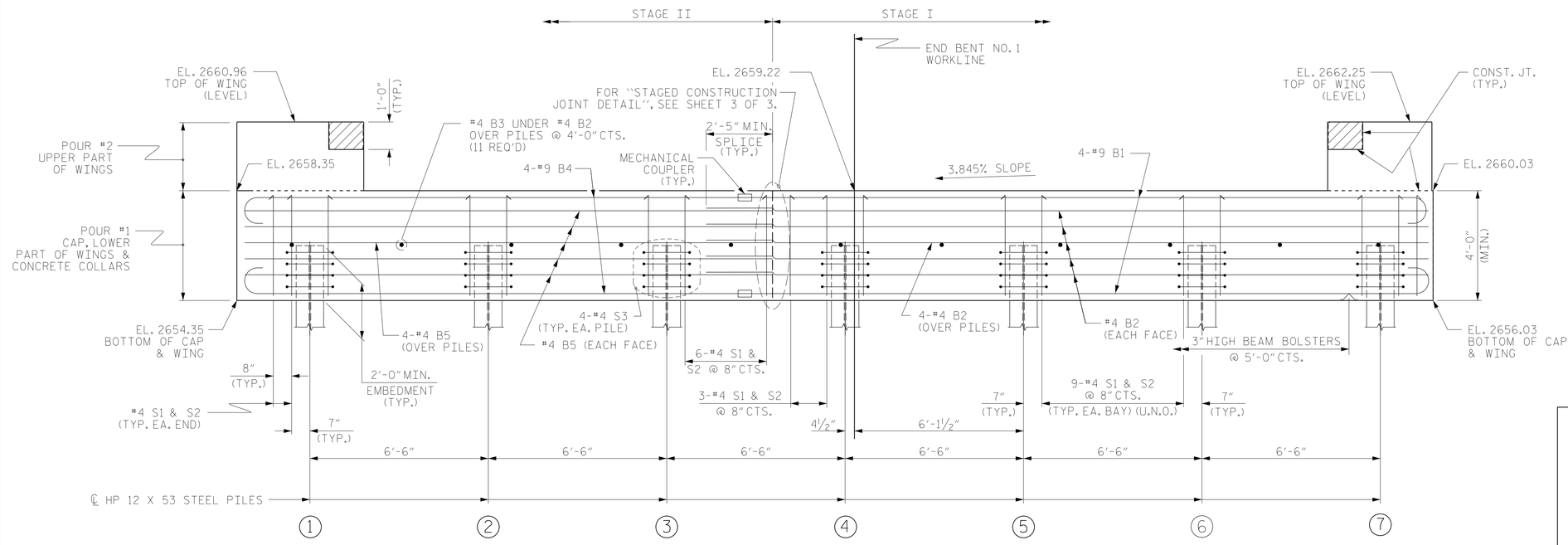


PLAN



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.

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 CONCRETE CURB IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR WING DETAILS, SEE SHEET 2 OF 3.

IF SLIP FORMING IS USED, "K" AND "V" BARS MAY BE FIELD CUT TO FIT AS NECESSARY.

TOP OF PILE ELEVATIONS

1	2656.46
2	2656.71
3	2656.96
4	2657.21
5	2657.46
6	2657.71
7	2657.96

PROJECT NO. 17BP.14.R.175
HAYWOOD COUNTY
STATION: 12+95.00 -L-

SHEET 1 OF 3

ASSEMBLED BY :	MAL	DATE :	01/2017
CHECKED BY :	TLC	DATE :	02/2017
DRAWN BY : WJH 12/11	REV. 4/15	MAA/TMG	
CHECKED BY : AAC 12/11			

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SUBSTRUCTURE

END BENT NO. 1

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1			3			TOTAL SHEETS
2			4			22

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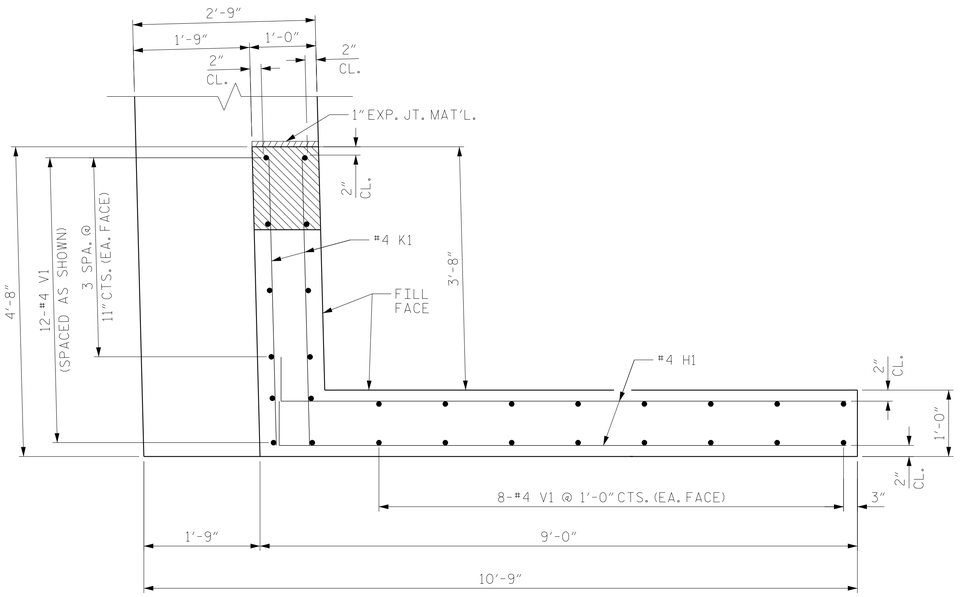
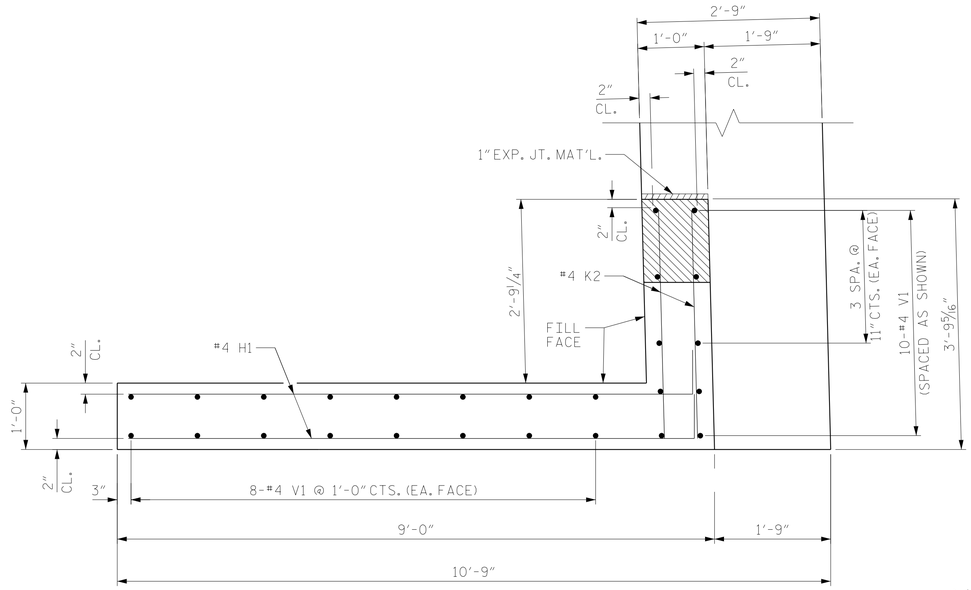
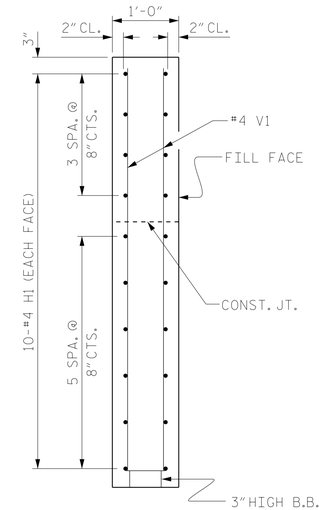


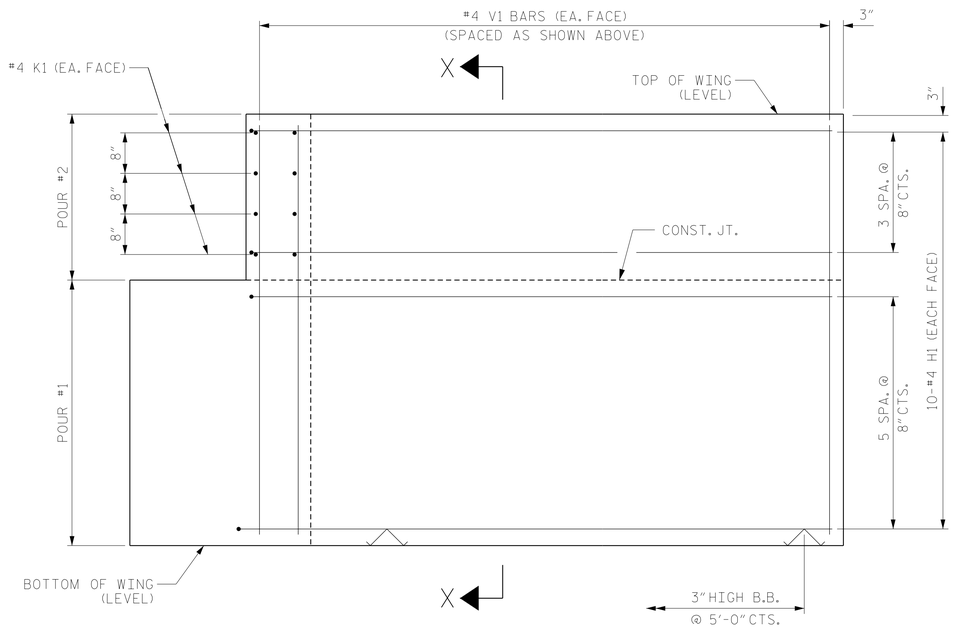
PLAN OF WING (W1)



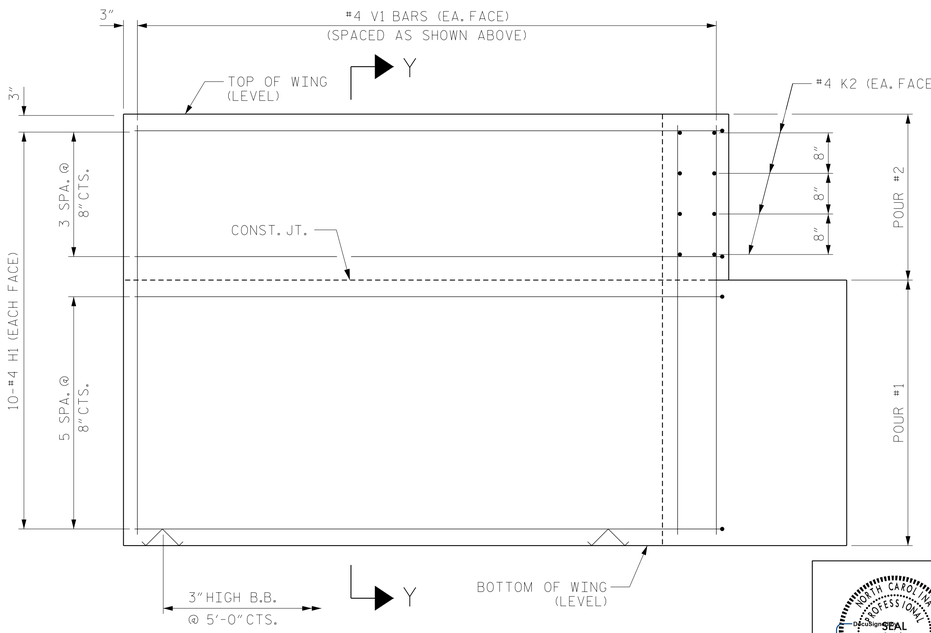
PLAN OF WING (W2)



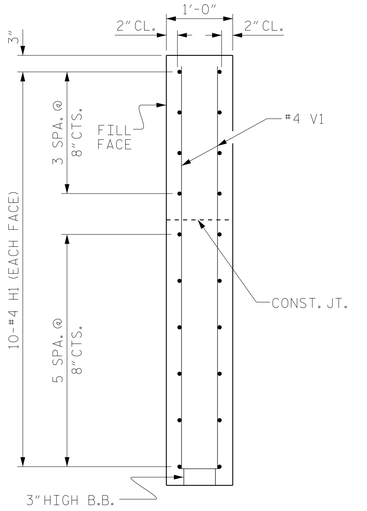
SECTION X-X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION Y-Y

WING DETAILS

PROJECT NO. 17BP.14.R.175

HAYWOOD COUNTY

STATION: 12+95.00 -L-

SHEET 2 OF 3

ASSEMBLED BY :	MAL	DATE :	01/2017
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DRAWN BY : WJH 12/11	REV. 4/15 MAA/TMG		
CHECKED BY : AAC 12/11			

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4/10/2018

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RALEIGH

SUBSTRUCTURE

END BENT NO. 1
WING DETAILS

REVISIONS						SHEET NO.
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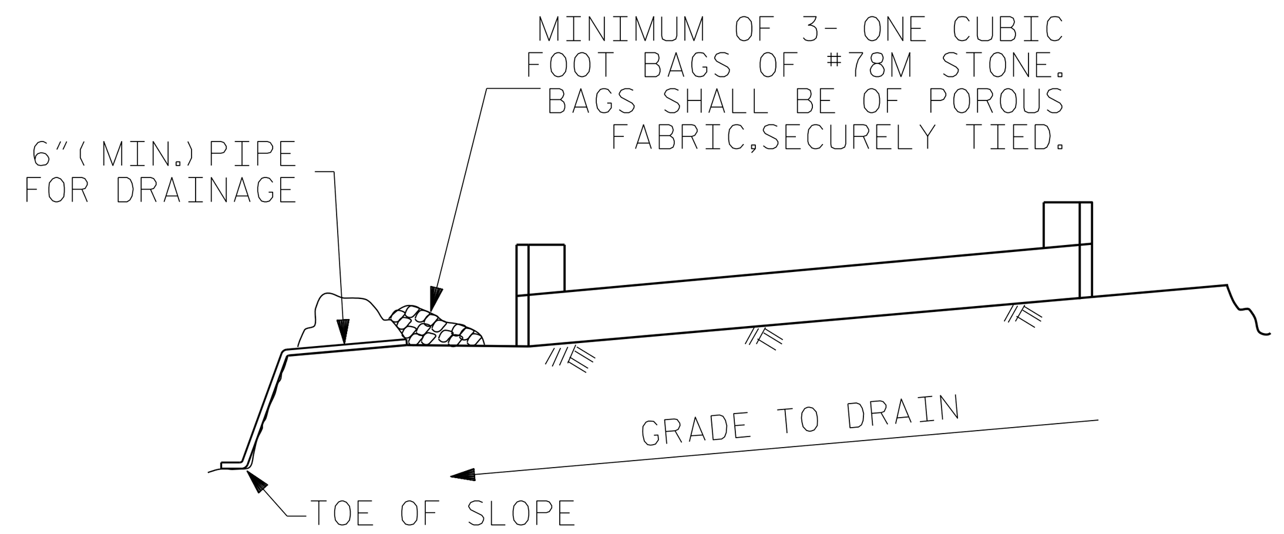
1			3			TOTAL SHEETS
2			4			22



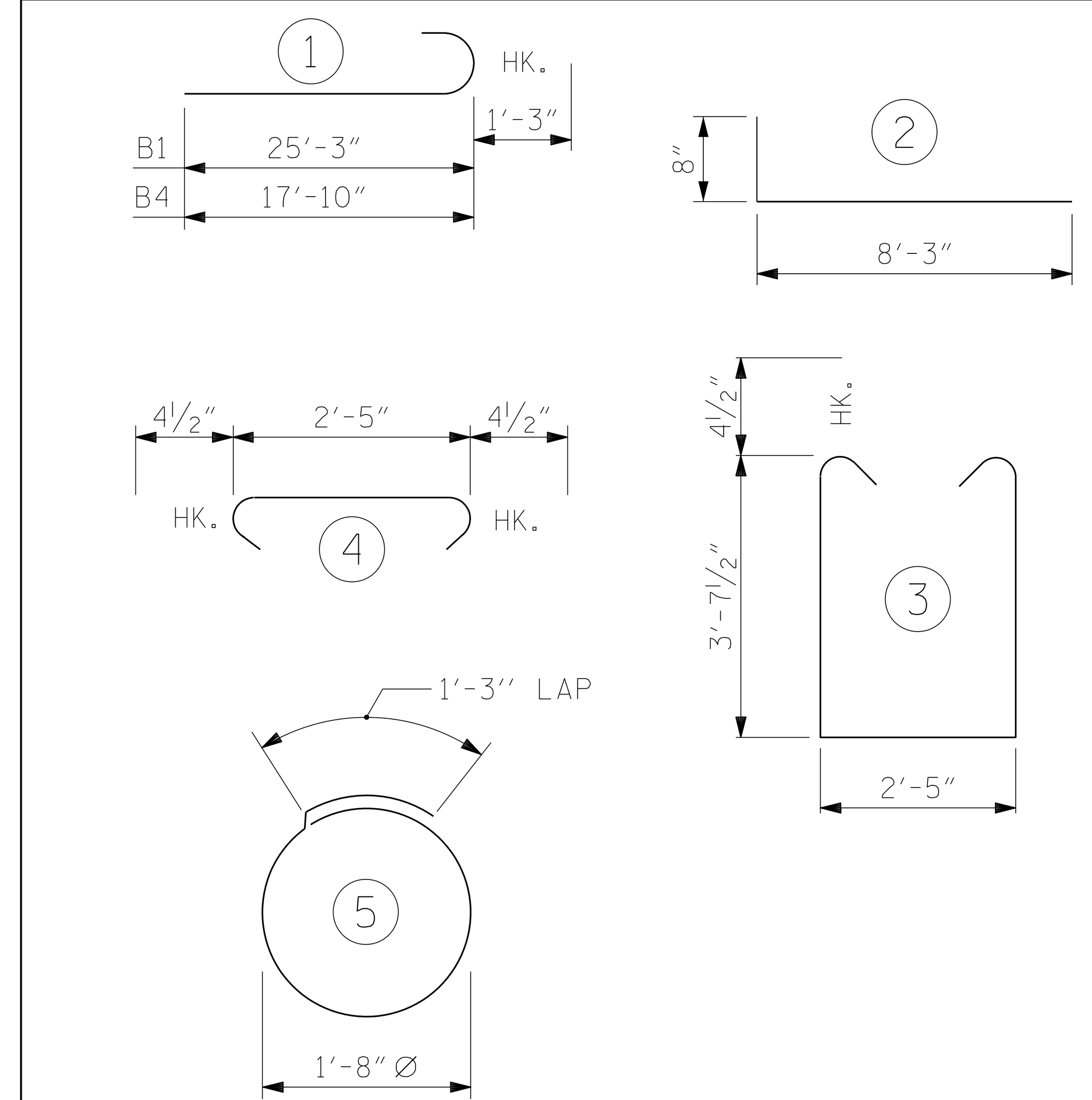
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

BAR TYPES



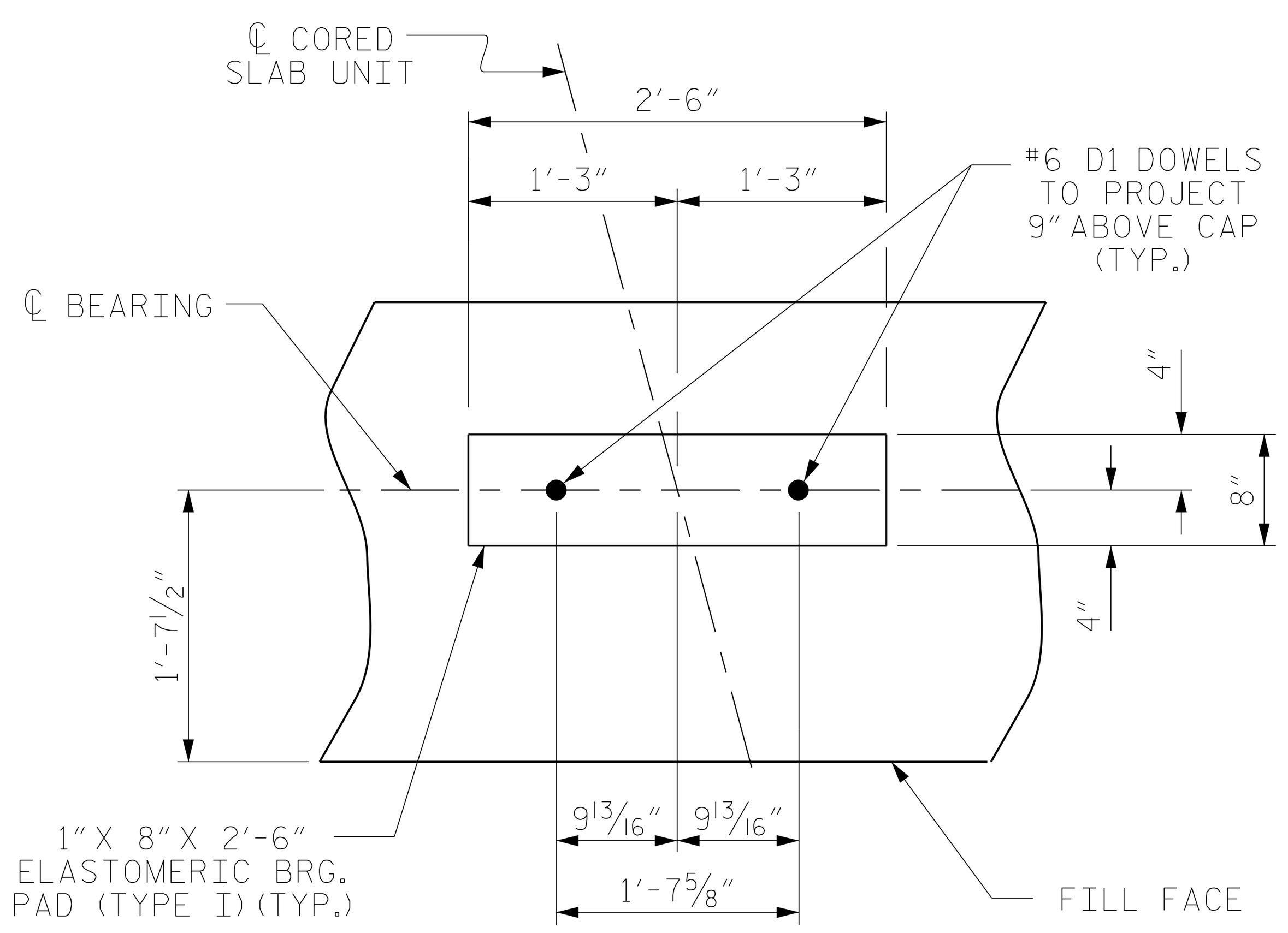
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #1

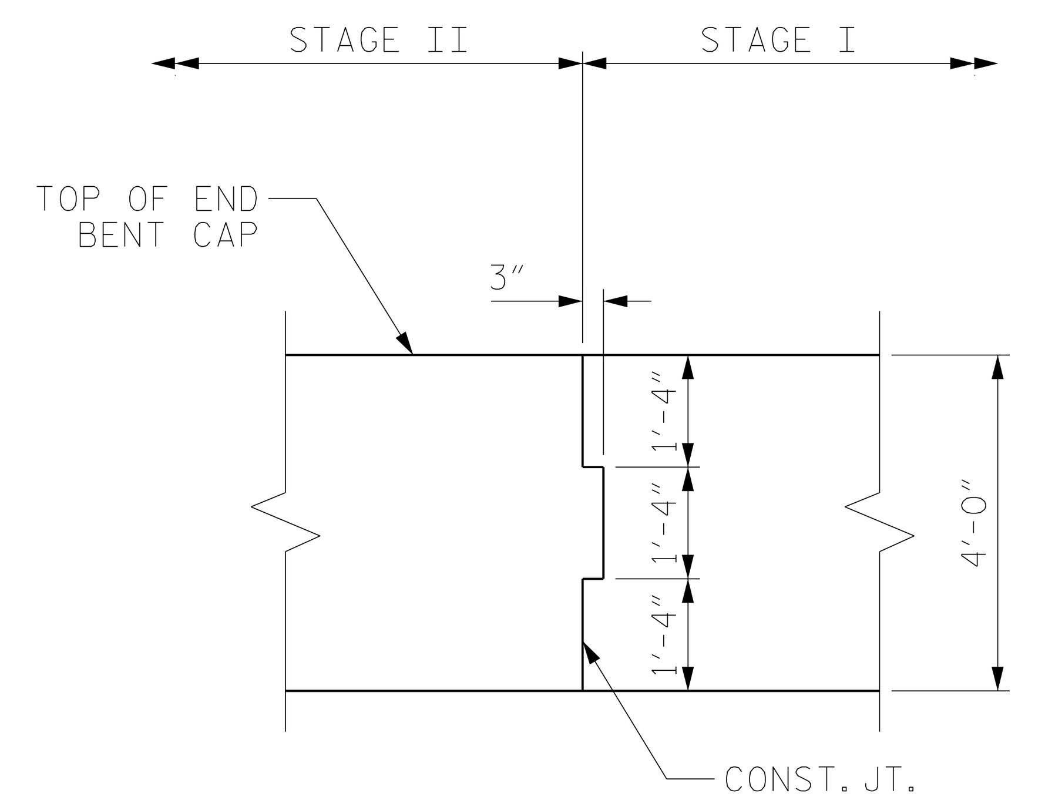
STAGE I						STAGE II					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	26'-6"	721	B3	5	#4	STR	2'-5"	8
B2	14	#4	STR	26'-8"	249	B4	8	#9	1	19'-1"	519
B3	6	#4	STR	2'-5"	10	B5	14	#4	STR	18'-10"	176
D1	14	#6	STR	1'-6"	32	D1	10	#6	STR	1'-6"	23
H1	20	#4	2	9'-3"	124	H1	20	#4	2	9'-3"	124
K2	8	#4	STR	3'-5"	18	K1	8	#4	STR	4'-4"	23
S1	32	#4	3	10'-5"	223	S1	26	#4	3	10'-5"	181
S2	32	#4	4	3'-2"	68	S2	26	#4	4	3'-2"	55
S3	16	#4	5	6'-6"	69	S3	12	#4	5	6'-6"	52
V1	26	#4	STR	6'-0"	104	V1	28	#4	STR	6'-0"	112
REINFORCING STEEL					1,618 LBS.	REINFORCING STEEL					1,273 LBS.

STAGE I		STAGE II	
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)		CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)	
POUR #1 CAP, LOWER PART OF WINGS & COLLARS	12.6 C.Y.	POUR #1 CAP, LOWER PART OF WINGS & COLLARS	10.2 C.Y.
POUR #2 UPPER PART OF WINGS	1.0 C.Y.	POUR #2 UPPER PART OF WINGS	1.2 C.Y.
TOTAL CLASS A CONCRETE	13.6 C.Y.	TOTAL CLASS A CONCRETE	11.4 C.Y.
END BENT No. 1 - STAGE I HP 12 X 53 STEEL PILES		END BENT No. 1 - STAGE II HP 12 X 53 STEEL PILES	
NO: 4	LIN. FT.= 40	NO: 3	LIN. FT.= 30
STEEL PILE POINTS	NO: 4	STEEL PILE POINTS	NO: 3
PREDRILLING FOR PILES	LIN. FT.= 40	PREDRILLING FOR PILES	LIN. FT.= 30
PILE DRIVING EQUIPMENT SETUP	NO. 4	PILE DRIVING EQUIPMENT SETUP	NO. 3



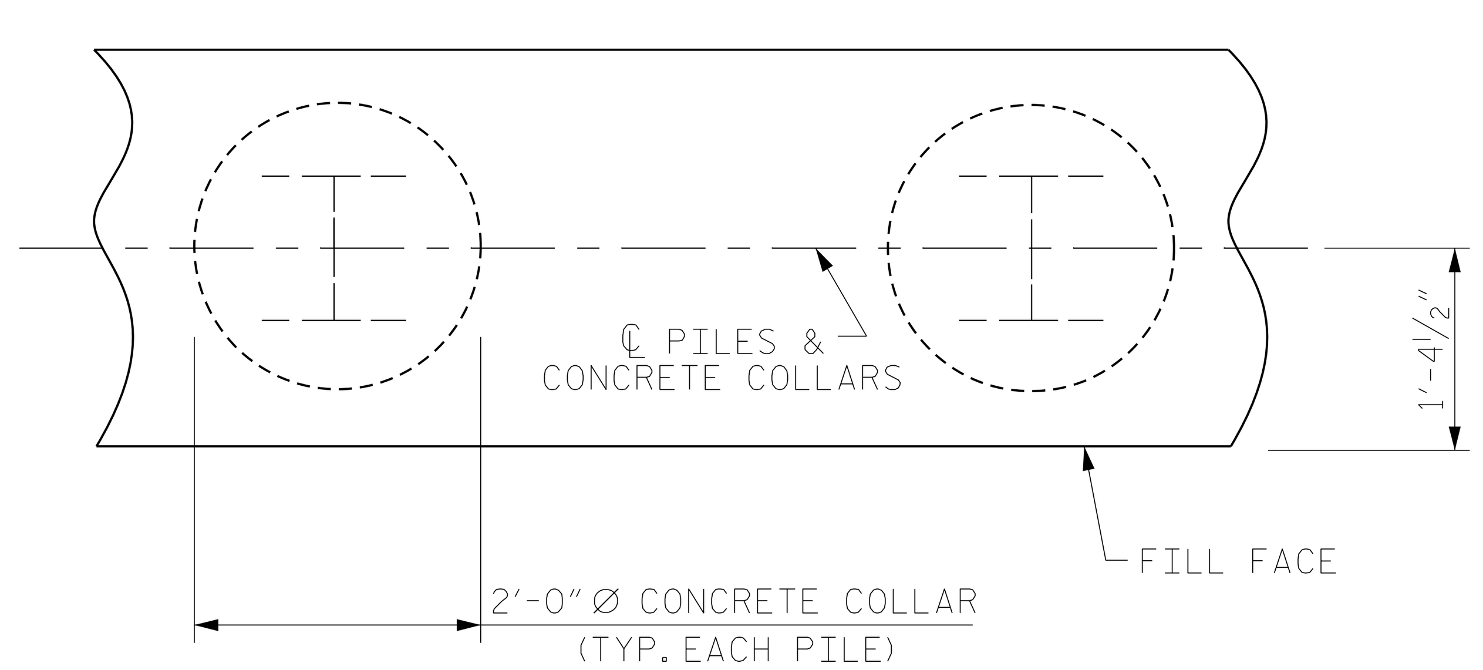
DETAIL "A"

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

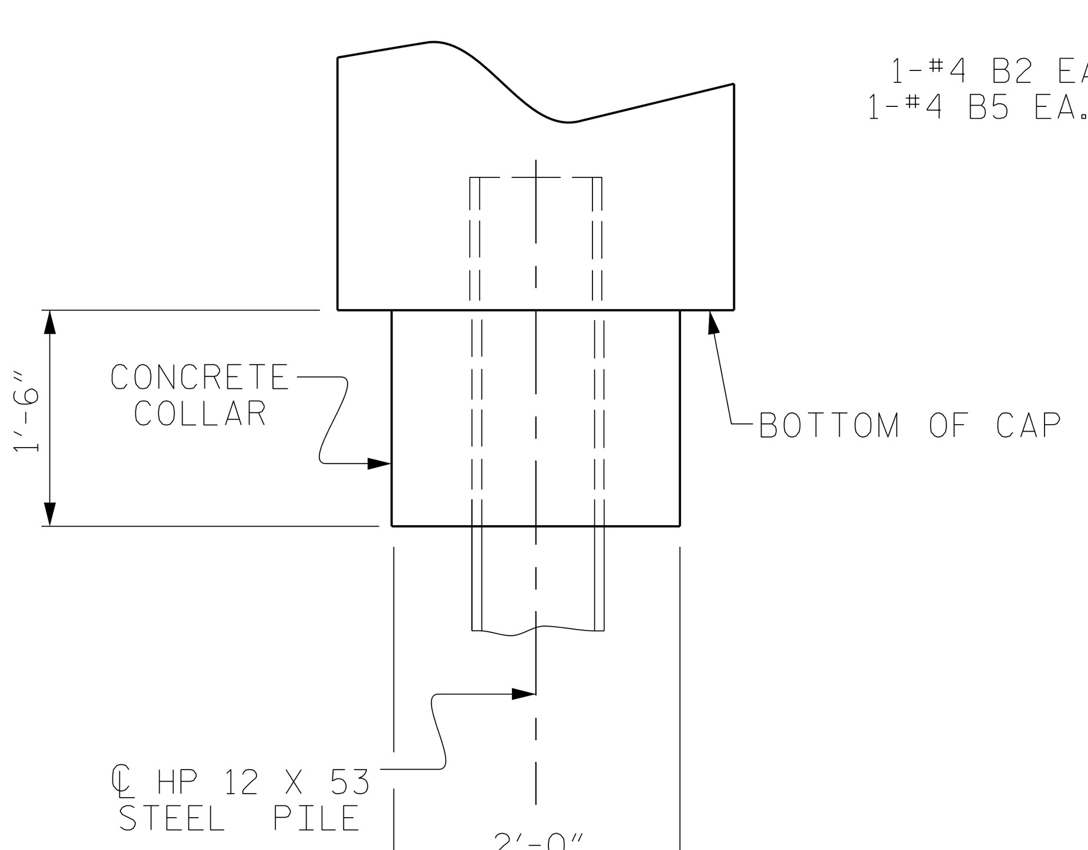


STAGED CONSTRUCTION JOINT DETAIL

STOP KEY 6" FROM FACE OF CAP



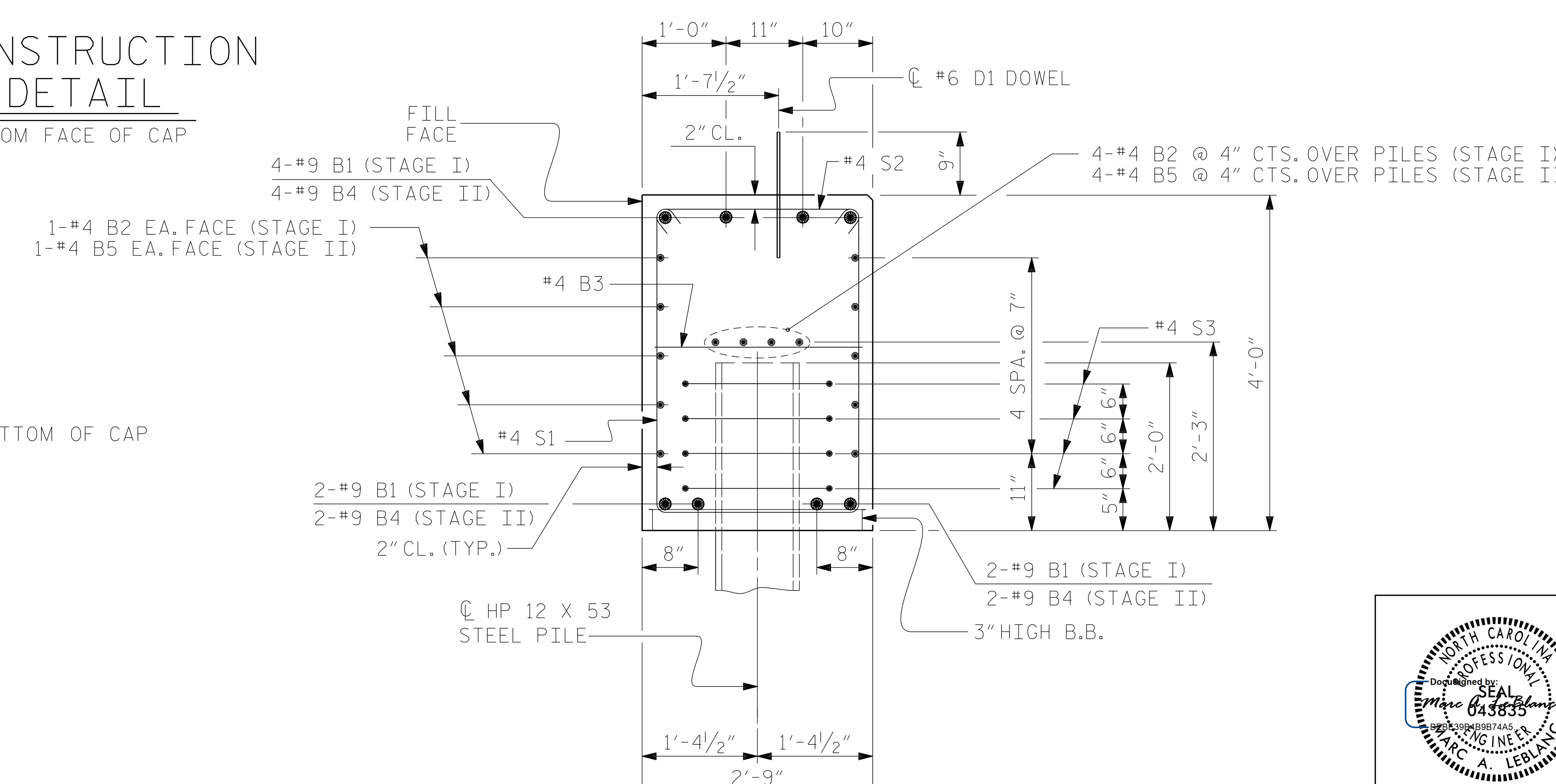
PLAN



ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL

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



SECTION THRU CAP

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

PROJECT NO. 17BP.14.R.175

HAYWOOD COUNTY

STATION: 12+95.00 -L-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043835 MARC A. LEBLANC

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SUBSTRUCTURE

END BENT NO. 1 DETAILS

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1			3			TOTAL SHEETS
2			4			22

ASSEMBLED BY : MAL	DATE : 01/2017
CHECKED BY : TLC	DATE : 02/2017
DRAWN BY : WJH 12/11	
CHECKED BY : AAC 12/11	

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LynnT

NOTES

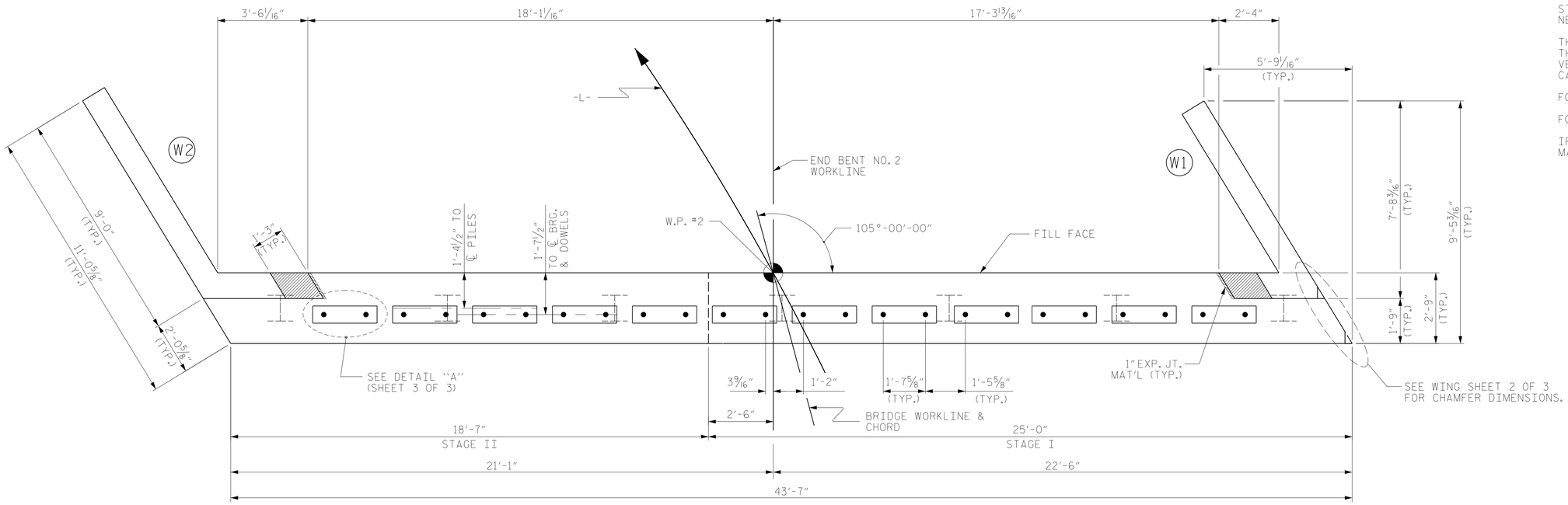
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

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.

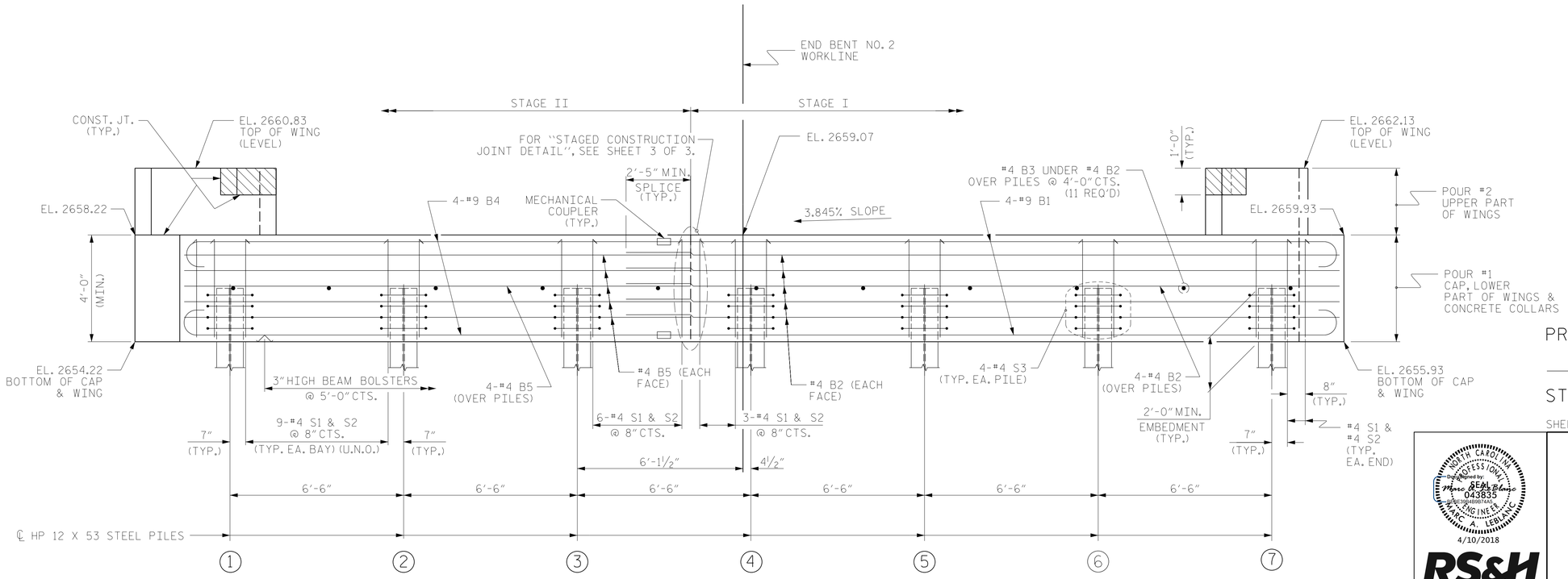
FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR WING DETAILS, SEE SHEET 2 OF 3.

IF SLIP FORMING IS USED, "K" AND "V" BARS MAY BE FIELD CUT TO FIT AS NECESSARY.



PLAN



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.

TOP OF PILE ELEVATIONS

1	2656.33
2	2656.58
3	2656.83
4	2657.08
5	2657.33
6	2657.58
7	2657.83

PROJECT NO. 17BP.14.R.175
HAYWOOD COUNTY
STATION: 12+95.00 -L-
SHEET 1 OF 3

ASSEMBLED BY :	MAL	DATE :	01/2017
CHECKED BY :	TLC	DATE :	02/2017
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CHECKED BY : AAC 12/11			

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Digitally signed by Marc A. LeBlanc
4/10/2018

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SUBSTRUCTURE

END BENT NO. 2

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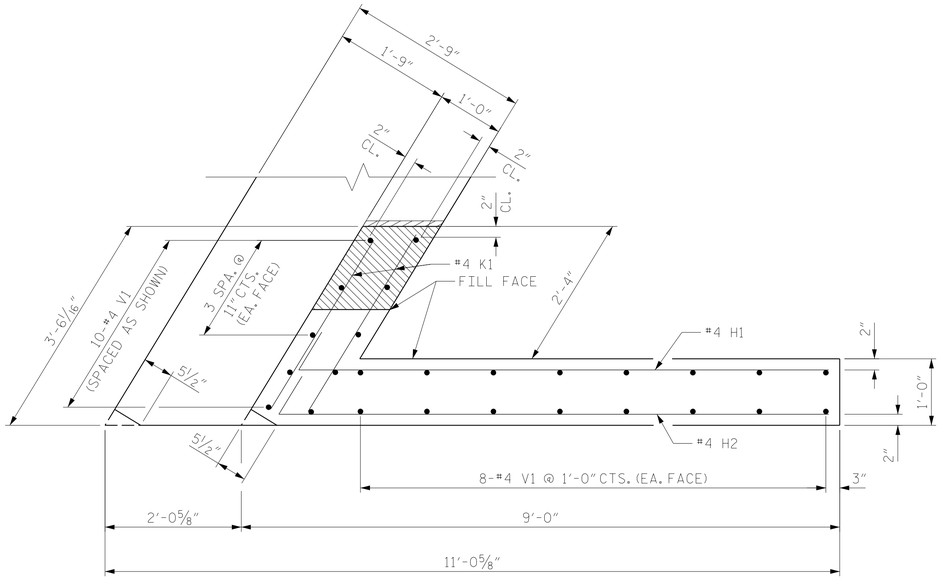
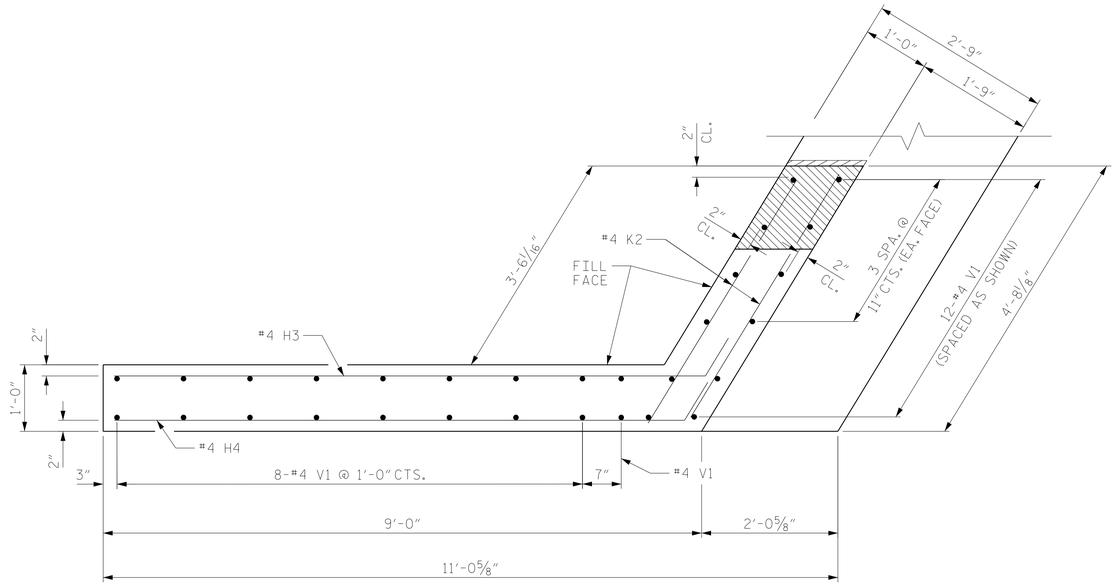
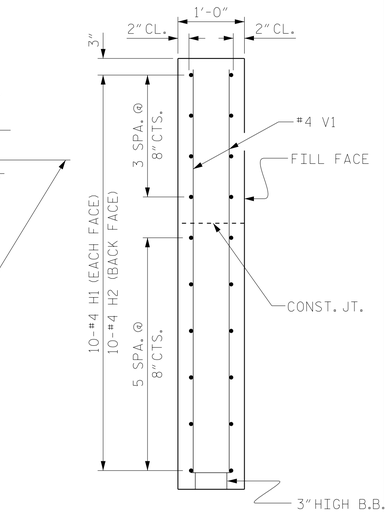
1			3			TOTAL SHEETS
2			4			22



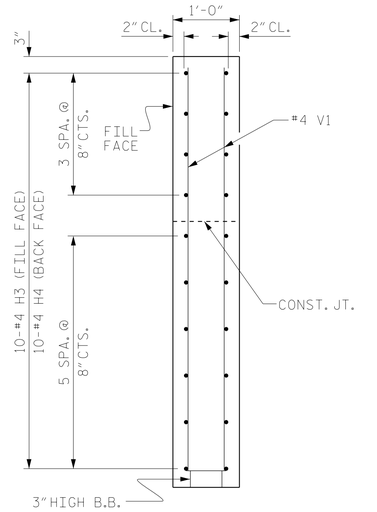
PLAN OF WING (W1)



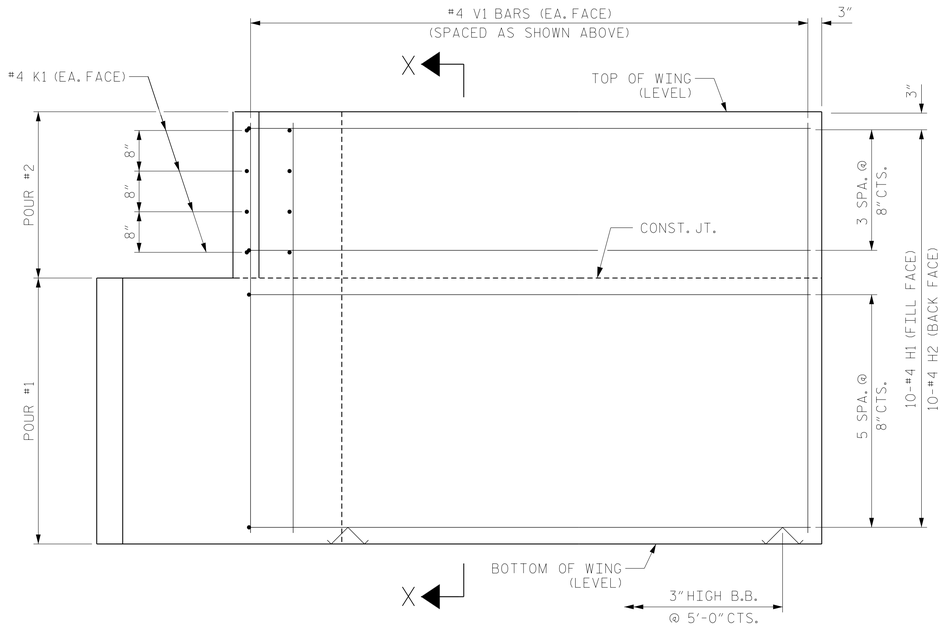
PLAN OF WING (W2)



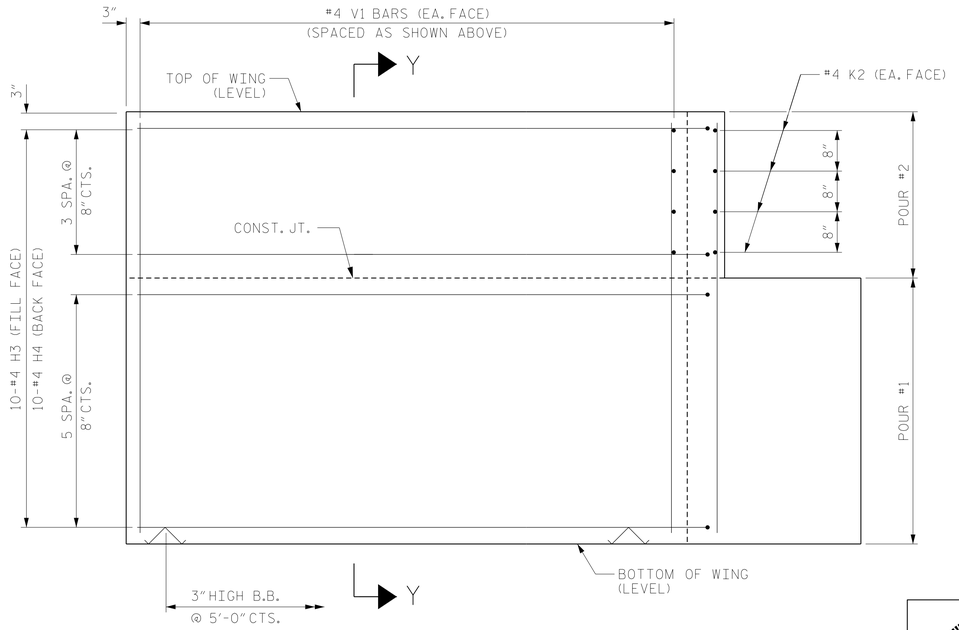
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

PROJECT NO. 17BP.14.R.175

HAYWOOD COUNTY

STATION: 12+95.00 -L-

SHEET 2 OF 3

ASSEMBLED BY :	MAL	DATE :	01/2017
CHECKED BY :	TLC	DATE :	02/2017
DRAWN BY :	WJH 12/11	REV. 4/15	MAA/TMG
CHECKED BY :	AAC 12/11		

4/6/2018
X:\P\1030014001_Div 14 Bridges_2016\1030014002_R.175 430215\Design\Structures\Working DGN\401_033_17BP.14.R.175_B215_SMU_E2*17_S-17.dgn
LynnT

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043635 MARC A. LEBLANC
4/10/2018

RS&H

RS&H Architects-Engineers-Planners, Inc.
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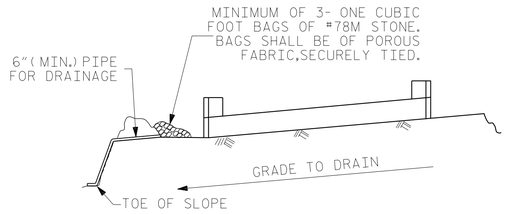
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT NO. 2
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			22

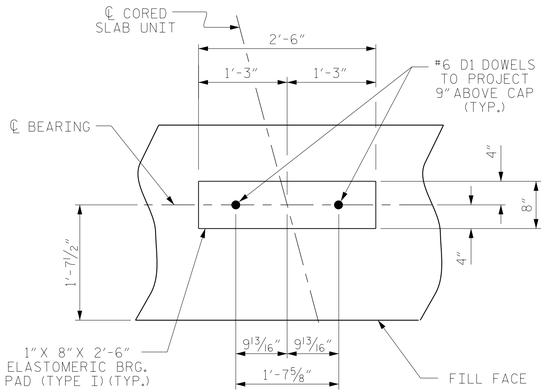


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

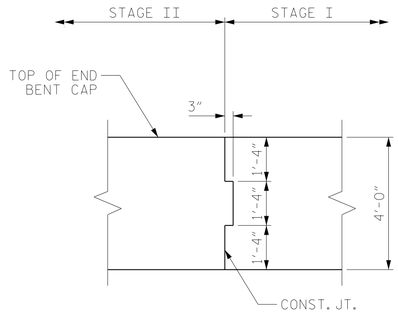
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



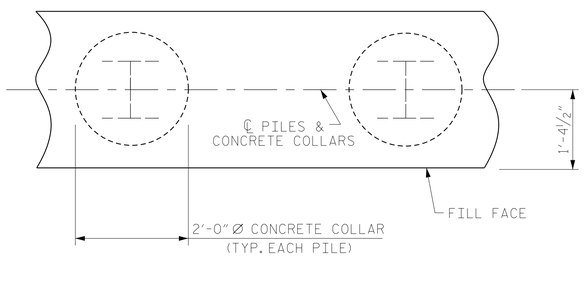
DETAIL "A"

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

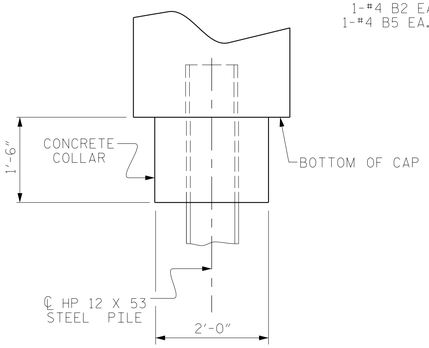


STAGED CONSTRUCTION JOINT DETAIL

STOP KEY 6"FROM FACE OF CAP



PLAN

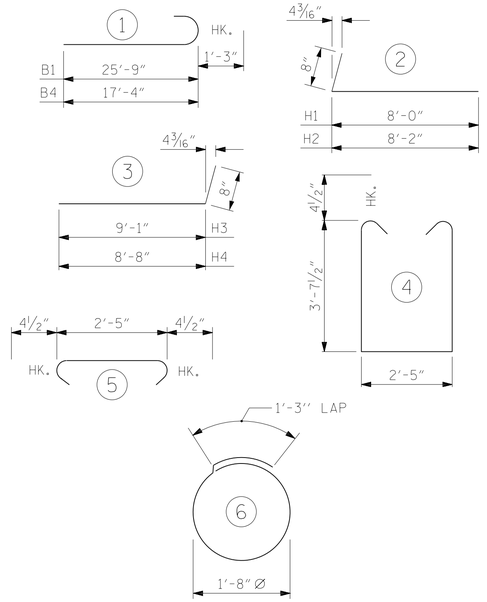


ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	27'-0''	734
B2	14	#4	STR	27'-2''	254
B3	6	#4	STR	2'-5''	10
D1	14	#6	STR	1'-6''	32
H1	10	#4	2	8'-8''	58
H2	10	#4	2	8'-10''	59
K1	8	#4	STR	3'-1''	16
S1	32	#4	4	10'-5''	223
S2	32	#4	5	3'-2''	68
S3	16	#4	6	6'-6''	69
V1	26	#4	STR	6'-0''	104

REINFORCING STEEL 1,627 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 12.1 C.Y.

POUR #2 UPPER PART OF WINGS 1.0 C.Y.

TOTAL CLASS A CONCRETE 13.1 C.Y.

END BENT No.2 - STAGE I
HP 12 X 53 STEEL PILES

NO: 4 LIN. FT.= 60

STEEL PILE POINTS NO: 4

PREDRILLING FOR PILES LIN. FT.= 0

PILE DRIVING EQUIPMENT SETUP NO. 4

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3	5	#4	STR	2'-5''	8
B4	8	#9	1	18'-7''	505
B5	14	#4	STR	18'-4''	171
D1	10	#6	STR	1'-6''	23
H3	10	#4	3	9'-9''	65
H4	10	#4	3	9'-4''	62
K2	8	#4	STR	4'-3''	23
S1	26	#4	4	10'-5''	181
S2	26	#4	5	3'-2''	55
S3	12	#4	6	6'-6''	52
V1	30	#4	STR	6'-0''	120

REINFORCING STEEL 1,265 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 9.3 C.Y.

POUR #2 UPPER PART OF WINGS 1.2 C.Y.

TOTAL CLASS A CONCRETE 10.5 C.Y.

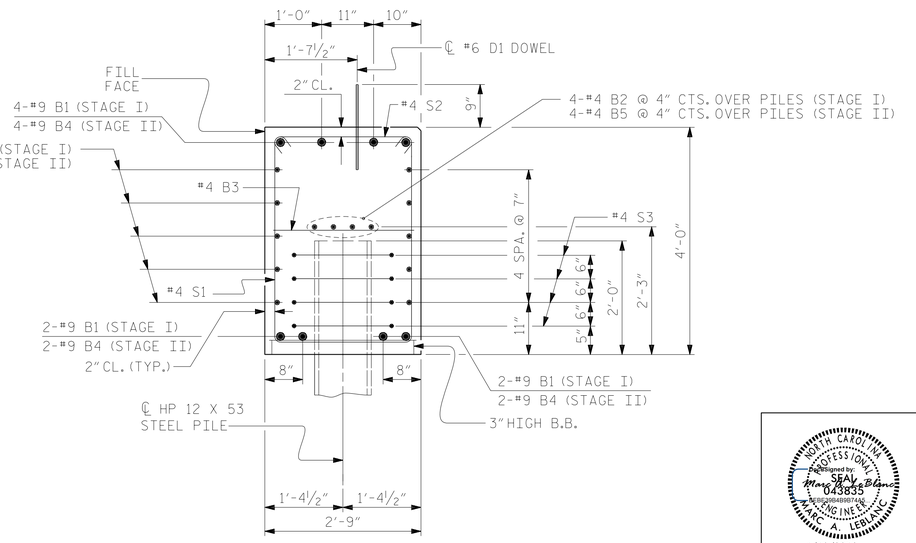
END BENT No.2 - STAGE II
HP 12 X 53 STEEL PILES

NO: 3 LIN. FT.= 60

STEEL PILE POINTS NO: 3

PREDRILLING FOR PILES LIN. FT.= 0

PILE DRIVING EQUIPMENT SETUP NO. 3



SECTION THRU CAP

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

PROJECT NO. 17BP.14.R.175

HAYWOOD COUNTY

STATION: 12+95.00 -L-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043835 MARC A LEBLANC
Designed by: Marc LeBlanc
4/10/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT NO. 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			22

ASSEMBLED BY :	MAL	DATE : 01/2017
CHECKED BY :	TLC	DATE : 02/2017
DRAWN BY : WJH 12/11		
CHECKED BY : AAC 12/11		

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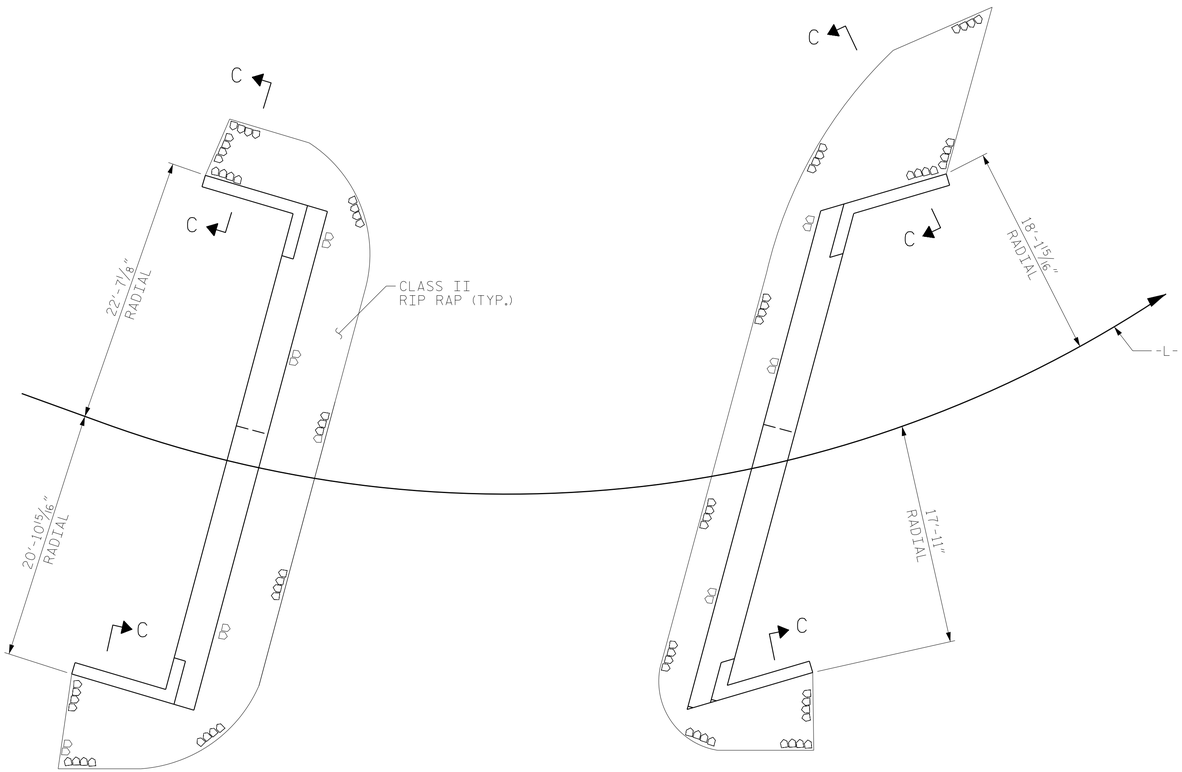
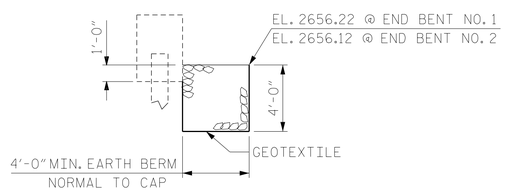
LynnT

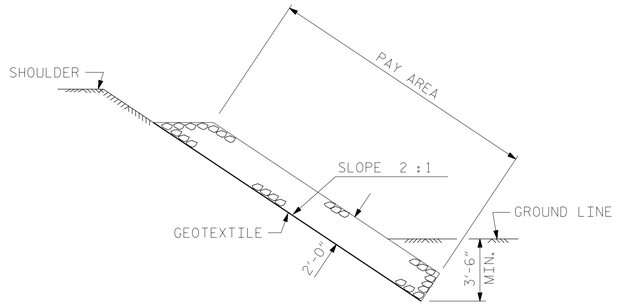


PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 12+95.00 -L-	RIP RAP CLASS II (4'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	65	70
END BENT 2	70	80



℄ SECTION @ -L-



SECTION C-C

BERM RIP RAPPED

PROJECT NO. 17BP.14.R.175
HAYWOOD COUNTY
STATION: 12+95.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 043835 ENGINEER MARC A. LEBLANC
Document Created by NCDOT
4/10/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			22

ASSEMBLED BY :	MAL	DATE :	01/2017
CHECKED BY :	TLC	DATE :	02/2017
DRAWN BY : REK 1/84	REV. 5/1/06R		TLA/GM
CHECKED BY : RDU 1/84	REV. 10/1/11		MAA/GM
	REV. 12/21/11		MAA/GM

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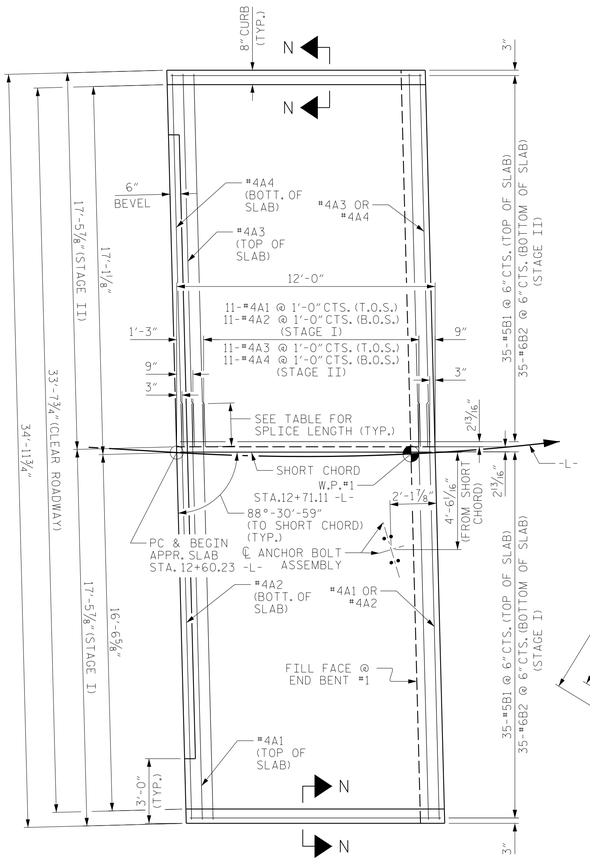
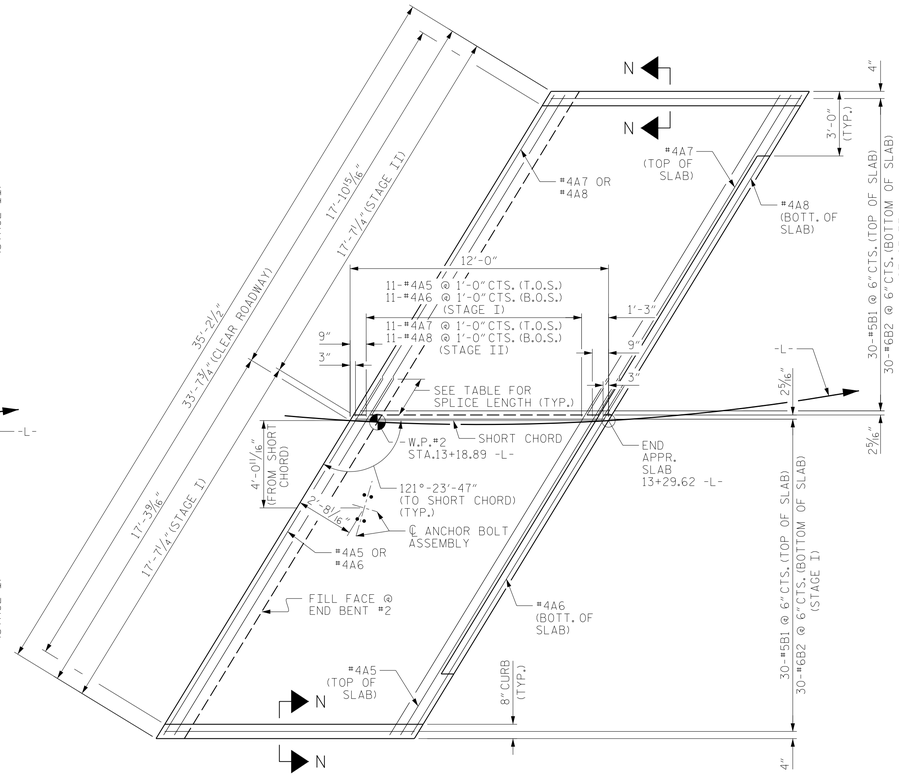
LynnT

STD. NO. RR1



PLAN @ END BENT #1



PLAN @ END BENT #2

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.

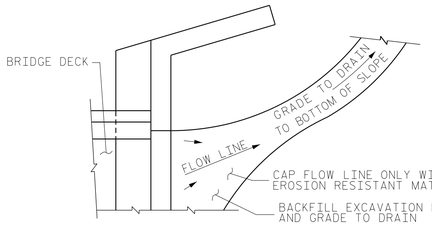
FOR THE 4"Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

FOR ANCHOR ASSEMBLY NOTES, SEE ''3'-0" X 1'-9" PRESTRESSED CONCRETE SLAB UNIT DETAILS.''

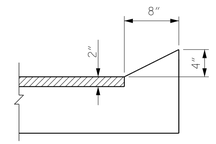
T.O.S. = TOP OF SLAB

B.O.S. = BOTTOM OF SLAB



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



SECTION N-N

CURB DETAILS

BILL OF MATERIAL

STAGE I

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	13	#4	STR	19'-4"	168
A2	13	#4	STR	19'-1"	166
✳ B1	35	#5	STR	11'-2"	408
B2	35	#6	STR	11'-8"	613

REINFORCING STEEL 779 LBS.
✳ EPOXY COATED REINFORCING STEEL 576 LBS.

CLASS AA CONCRETE C. Y. 9.9

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A5	13	#4	STR	19'-5"	169
A6	13	#4	STR	19'-2"	166
✳ B1	35	#5	STR	11'-2"	408
B2	35	#6	STR	11'-8"	613

REINFORCING STEEL 779 LBS.
✳ EPOXY COATED REINFORCING STEEL 577 LBS.

CLASS AA CONCRETE C. Y. 9.9

STAGE II

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A3	13	#4	STR	17'-3"	150
A4	13	#4	STR	17'-3"	150
✳ B1	30	#5	STR	11'-2"	349
B2	30	#6	STR	11'-8"	526

REINFORCING STEEL 676 LBS.
✳ EPOXY COATED REINFORCING STEEL 499 LBS.

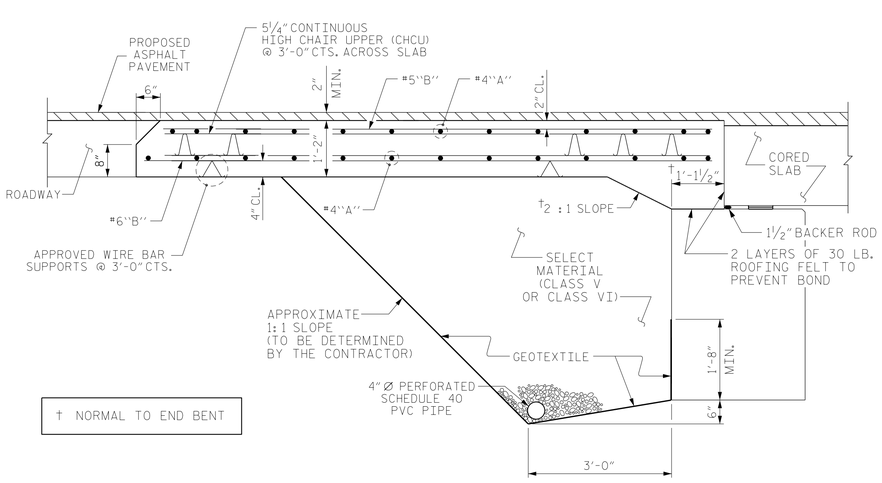
CLASS AA CONCRETE C. Y. 9.9

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A7	13	#4	STR	17'-5"	151
A8	13	#4	STR	17'-5"	151
✳ B1	30	#5	STR	11'-2"	349
B2	30	#6	STR	11'-8"	526

REINFORCING STEEL 677 LBS.
✳ EPOXY COATED REINFORCING STEEL 500 LBS.

CLASS AA CONCRETE C. Y. 9.9

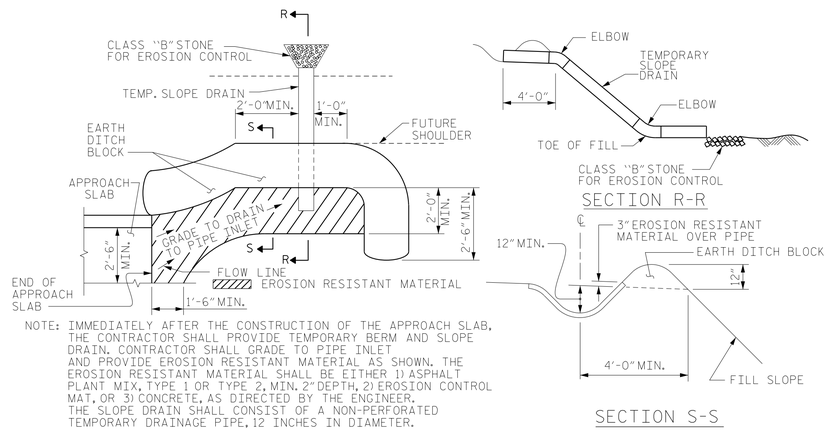


† NORMAL TO END BENT

SECTION THRU SLAB

(TYPE II - MODIFIED APPROACH FILL)

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



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

PLAN VIEW

SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. 17BP.14.R.175

HAYWOOD COUNTY

STATION: 12+95.00 -L-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043835 MARC A. LEBLANC
12/23/2020

RS&H

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			22

DRAWN BY : MAL DATE : 12/2016
CHECKED BY : TLC DATE : 02/2017
DESIGN ENGINEER OF RECORD: MAL DATE : 02/2017

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12/8/2020
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LynnT

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

4/6/2018
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