This electronic collection of documents is provided for the convenience of the user and is Not a Certified Document –

The documents contained herein were originally issued and sealed by the individuals whose names and license numbers appear on each page, on the dates appearing with their signature on that page.
This file or an individual page shall not be considered a certified document.

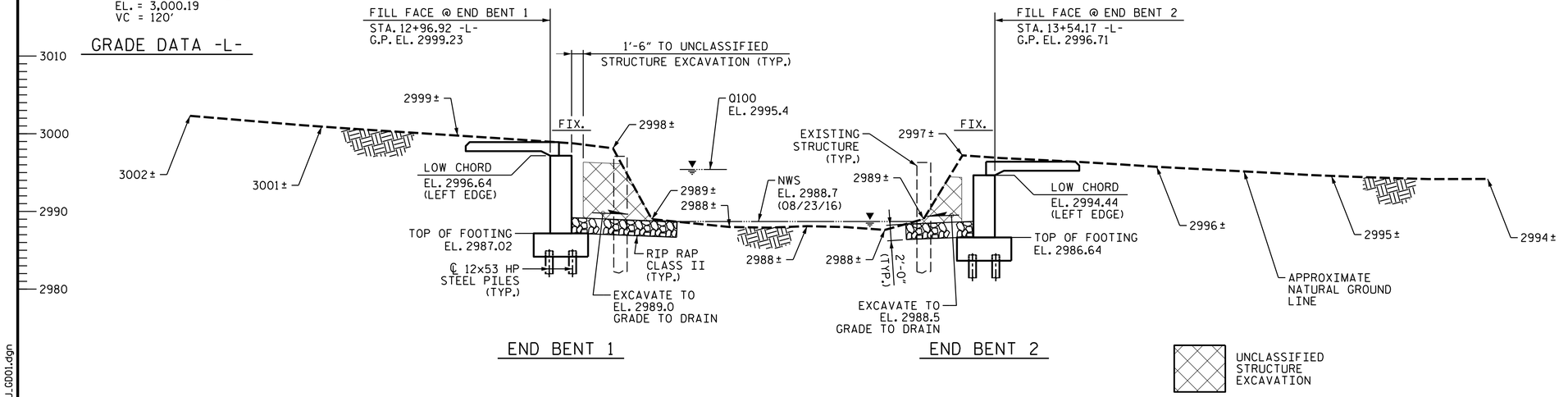
12+50 12+75 13+00 13+25 13+50 13+75 14+00 14+25

(-)10.1634% (-)3.9979%

STA. = 12+67.00 -L-
EL. = 3,000.19
VC = 120'

GRADE DATA -L-

SPAN A



SECTION ALONG -L-

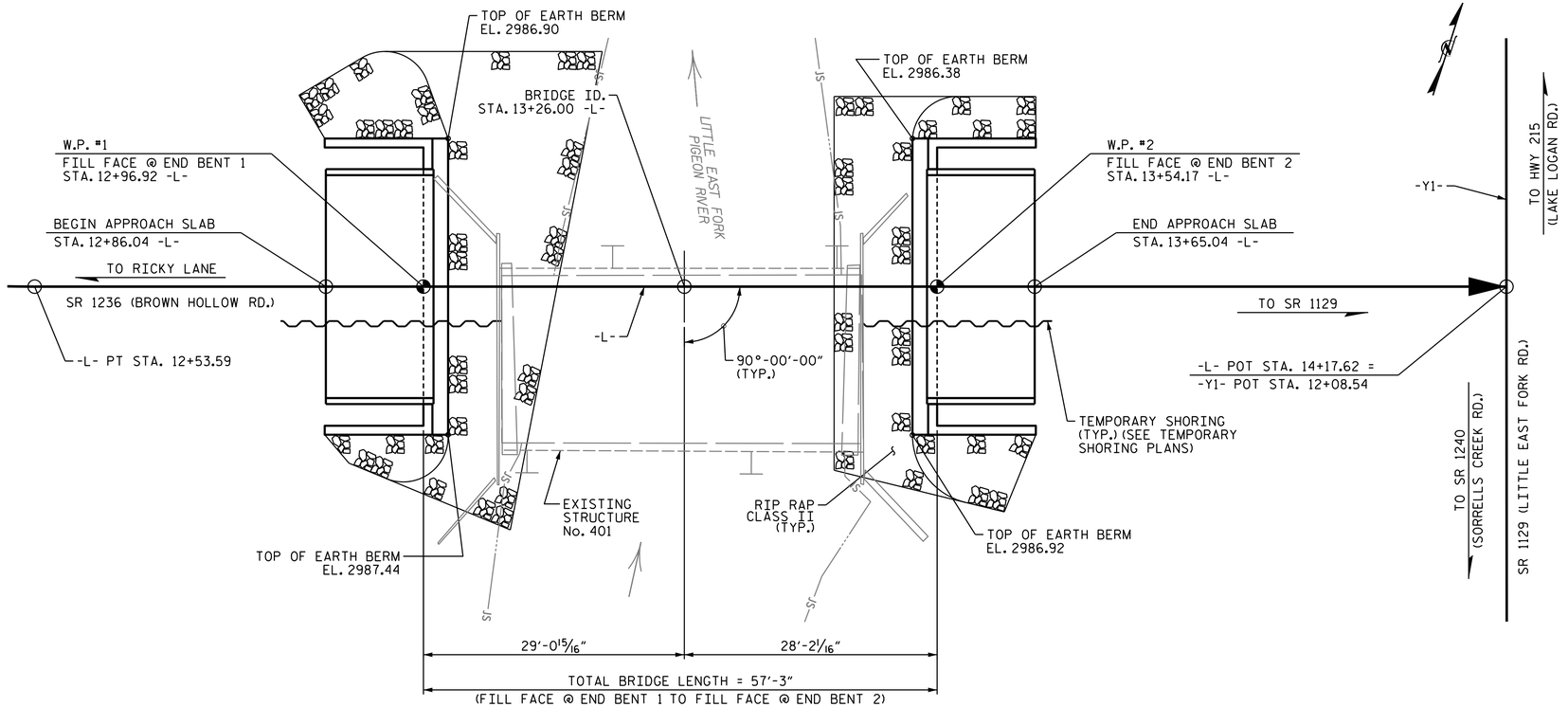
(SECTION TAKEN AT RIGHT ANGLES TO END BENTS)

HYDRAULIC DATA

DESIGN DISCHARGE	2400 CFS
FREQUENCY OF DESIGN FLOOD	25 YRS.
DESIGN HIGH WATER ELEVATION	2994.4
DRAINAGE AREA	12.2 SQ.MI.
BASE DISCHARGE (Q100)	3400 CFS
BASE HIGH WATER ELEVATION	2995.4

OVERTOPPING FLOOD DATA

OVERTOPPING FLOOD DISCHARGE	4600 CFS
FREQUENCY OF OVERTOPPING FLOOD	± 500 YRS.
OVERTOPPING FLOOD ELEVATION @ STA. 13+56 -L-	2997.5



PLAN

(FOR CLARITY, FOOTINGS & PILES ARE NOT SHOWN IN PLAN VIEW)

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. 17BP.14.R.174

HAYWOOD COUNTY

STATION: 13+26.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 401

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1236 (BROWN HOLLOW RD.) OVER LITTLE EAST FORK PIGEON RIVER BETWEEN RICKY LANE & SR 1129

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris 0B0B9699648B403...

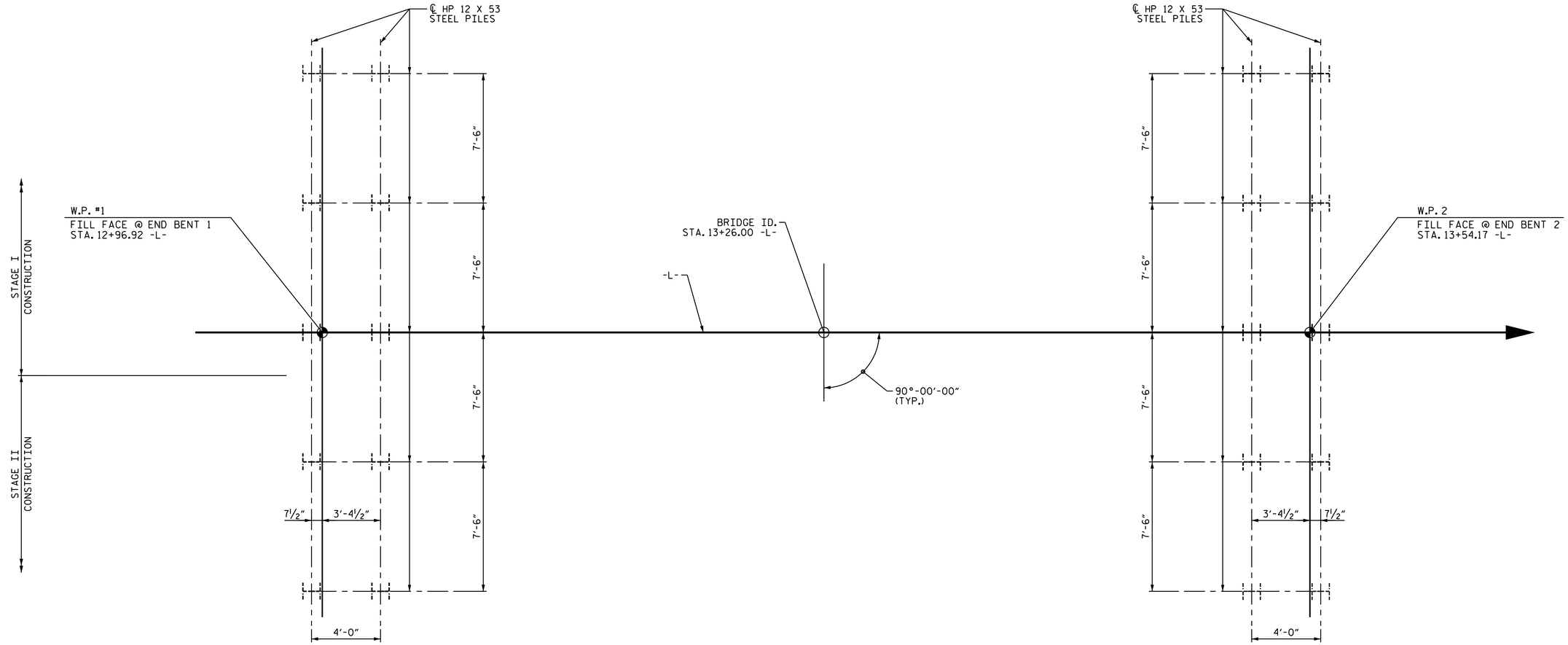
WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			23

DESIGNED BY:	N.A. PIERCE	DATE :	MAR 2017
DRAWN BY:	M.J.OSTRISHKO	DATE :	MAR 2017
CHECKED BY:	T.M. HARRIS	DATE :	OCT 2018
DESIGN ENGINEER OF RECORD:	S. NATARAJAN	DATE :	OCT 2018

3/26/2019
J:\188360C - 2015 W Divisions Planning & Design On-Call\188360C Group 3 Bridges\17BP.R174.43040\Structures\Drafting\DGNs\401.001.17BP.14.R.174_SMU.GD01.dgn



FOUNDATION LAYOUT

NOTES

FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 85 TONS PER PILE.

DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 145 TONS PER PILE.

PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 85 TONS PER PILE.

DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 145 TONS PER PILE.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

IF NECESSARY, PREDRILL PILE LOCATIONS AT END BENT 2 TO AN ELEVATION NO LOWER THAN 2980 FT WITH EQUIPMENT THAT WILL RESULT IN A MAXIMUM PREDRILLING DIAMETER OF 12". FOR PREDRILLING FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

SPUDDING MAY BE USED INSTEAD OF PREDRILLING AT END BENT 2.

PROJECT NO. 17BP.14.R.174

HAYWOOD COUNTY

STATION: 13+26.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1236 (BROWN HOLLOW RD.) OVER LITTLE EAST FORK PIGEON RIVER BETWEEN RICKY LANE & SR 1129

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			23

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS

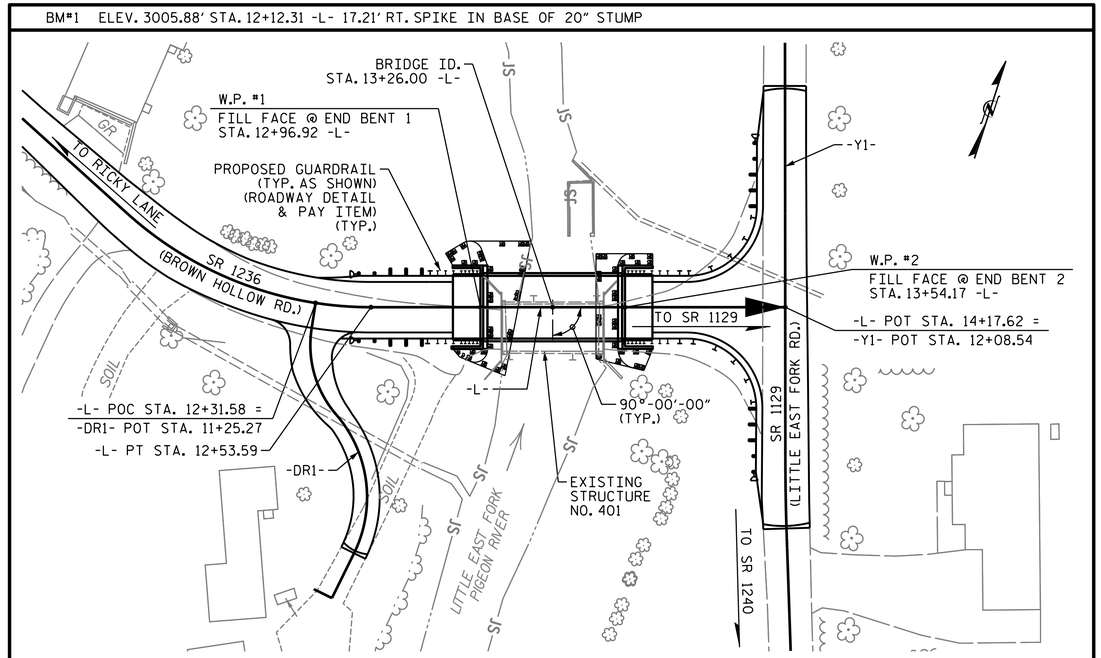
DocuSigned by: Thomas M. Harris

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

DESIGNED BY:	N.A. PIERCE	DATE :	MAR 2017
DRAWN BY:	M.J.OSTRISHKO	DATE :	MAR 2017
CHECKED BY:	T.M. HARRIS	DATE :	OCT 2018
DESIGN ENGINEER OF RECORD:	S. NATARAJAN	DATE :	OCT 2018

3/26/2019
J:\188360C - 2015 W Divisions Planning & Design On-Call\188360C Group 3 Bridges\17BP.R.T4.430401\Structures\Drafting\DGNs\401_003_17BP_14_R_174_SMU_GD02.dgn



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

THE EXISTING STRUCTURE CONSISTING OF A SINGLE SPAN 40'-8", WITH A CLEAR ROADWAY WIDTH OF 19'-10"; TIMBER DECK WITH ASPHALT WEARING SURFACE ON STEEL I-BEAMS WITH TIMBER CAPS, TIMBER POSTS AND SILLS/CONC. FOOTINGS END BENTS AND LOCATED AT PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE FOR END BENT 1 OF 27 FT (LEFT) AND 27 FT. (RIGHT) AND END BENT 2 OF 22 FT (LEFT) AND 21 FT (RIGHT) 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 SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

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

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

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.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

TEMPORARY SHORING WILL BE REQUIRED IN THE AREA INDICATED IN THE PLAN VIEW.

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

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE @ STA. 13+26.00 -L-	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES	HP 12 X 53 STEEL PILES		STEEL PILE POINTS	PREDRILLING FOR PILES	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2FT 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.	No.	LIN. FT.	EACH	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	No.	LIN. FT.	LUMP SUM
SUPERSTRUCTURE				LUMP SUM							110.26			LUMP SUM	9	495.00	
END BENT 1		LUMP SUM	70.0		6,488	10	10	300				90	97				
END BENT 2		LUMP SUM	61.7		5,944	10	10	180	10	30		65	70				
TOTAL	LUMP SUM	LUMP SUM	131.7	LUMP SUM	12,432	20	20	480	10	30	110.26	155	167	LUMP SUM	9	495.00	LUMP SUM

PROJECT NO. 17BP.14.R.174

HAYWOOD COUNTY

STATION: 13+26.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1236 (BROWN HOLLOW RD.) OVER LITTLE EAST FORK PIGEON RIVER BETWEEN RICKY LANE & SR 1129

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			23

DESIGNED BY: N.A. PIERCE DATE : FEB 2017
DRAWN BY: M.J. OSTRISHKO DATE : MAR 2017
CHECKED BY: T.M. HARRIS DATE : OCT 2018
DESIGN ENGINEER OF RECORD: S. NATARAJAN DATE : OCT 2018

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris

3/26/2019
J:\18836OC - 2015 W Divisions Planning & Design On-Call\18836OC Group 3 Bridges\17BP.R.T4.43040I\Structures\Drafting\DGNs\401_005_17BP_14_R_171_SMU_GD03.dgn

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**	1.055	--	1.75	0.275	1.23	55′	EL	27	0.523	1.23	55′	EL	5.4	0.80	0.275	**1.05**	55′	EL	**27**	
		HL-93(Opr)	N/A	--	1.591	--	1.35	0.275	1.59	55′	EL	27	0.523	1.59	55′	EL	5.4	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	**2**	1.322	47.585	1.75	0.275	1.54	55′	EL	27	0.523	1.47	55′	EL	5.4	0.80	0.275	**1.32**	55′	EL	**27**	
		HS-20(Opr)	36.000	--	1.9	68.396	1.35	0.275	1.99	55′	EL	27	0.523	1.9	55′	EL	5.4	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.776	37.476	1.4	0.275	4.04	55′	EL	27	0.523	4.17	55′	EL	5.4	0.80	0.275	2.78	55′	EL	27	
		SNGARBS2	20.000	--	2.155	43.095	1.4	0.275	3.14	55′	EL	27	0.523	3.02	55′	EL	5.4	0.80	0.275	2.15	55′	EL	27	
		SNAGRIS2	22.000	--	2.079	45.734	1.4	0.275	3.03	55′	EL	27	0.523	2.83	55′	EL	5.4	0.80	0.275	2.08	55′	EL	27	
		SNCOTTS3	27.250	--	1.384	37.708	1.4	0.275	2.01	55′	EL	27	0.523	2.09	55′	EL	5.4	0.80	0.275	1.38	55′	EL	27	
		SNAGGRS4	34.925	--	1.189	41.527	1.4	0.275	1.73	55′	EL	27	0.523	1.77	55′	EL	5.4	0.80	0.275	1.19	55′	EL	27	
		SNS5A	35.550	--	1.16	41.255	1.4	0.275	1.69	55′	EL	27	0.523	1.82	55′	EL	5.4	0.80	0.275	1.16	55′	EL	27	
		SNS6A	39.950	--	1.079	43.102	1.4	0.275	1.57	55′	EL	27	0.523	1.68	55′	EL	5.4	0.80	0.275	1.08	55′	EL	27	
		SNS7B	42.000	--	1.028	43.175	1.4	0.275	1.5	55′	EL	27	0.523	1.67	55′	EL	5.4	0.80	0.275	1.03	55′	EL	27	
	TTST	TNAGRIT3	33.000	--	1.32	43.556	1.4	0.275	1.92	55′	EL	27	0.523	1.98	55′	EL	5.4	0.80	0.275	1.32	55′	EL	27	
		TNT4A	33.075	--	1.33	43.979	1.4	0.275	1.94	55′	EL	27	0.523	1.91	55′	EL	5.4	0.80	0.275	1.33	55′	EL	27	
		TNT6A	41.600	--	1.101	45.811	1.4	0.275	1.6	55′	EL	27	0.523	1.83	55′	EL	5.4	0.80	0.275	1.10	55′	EL	27	
		TNT7A	42.000	--	1.114	46.804	1.4	0.275	1.62	55′	EL	27	0.523	1.71	55′	EL	5.4	0.80	0.275	1.11	55′	EL	27	
		TNT7B	42.000	--	1.163	48.848	1.4	0.275	1.69	55′	EL	27	0.523	1.62	55′	EL	5.4	0.80	0.275	1.16	55′	EL	27	
		TNAGRIT4	43.000	--	1.101	47.33	1.4	0.275	1.6	55′	EL	27	0.523	1.56	55′	EL	5.4	0.80	0.275	1.10	55′	EL	27	
		TNAGT5A	45.000	--	1.031	46.405	1.4	0.275	1.5	55′	EL	27	0.523	1.58	55′	EL	5.4	0.80	0.275	1.03	55′	EL	27	
		TNAGT5B	45.000	**3**	1.013	45.582	1.4	0.275	1.47	55′	EL	27	0.523	1.48	55′	EL	5.4	0.80	0.275	**1.01**	55′	EL	**27**	

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)

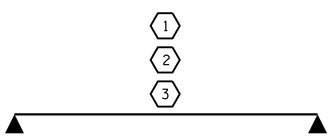
(2) DESIGN LOAD RATING (HS-20)

(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.174

HAYWOOD COUNTY

STATION: 13+26.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR 55′ CORED SLAB UNIT 90° SKEW (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			23

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS W. HARRIS

DocuSigned by: Thomas W. Harris

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

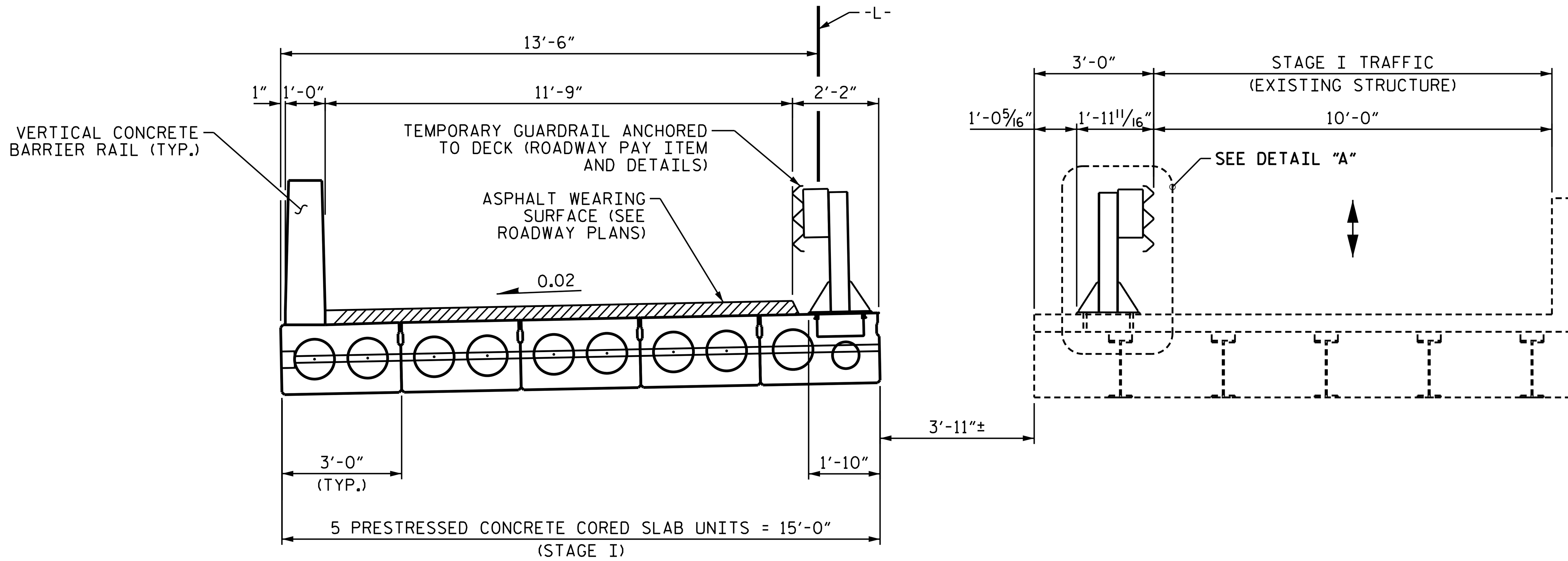
LICENSE NO. F-0165

DRAWN BY : CVC 6/10
CHECKED BY : DNS 6/10

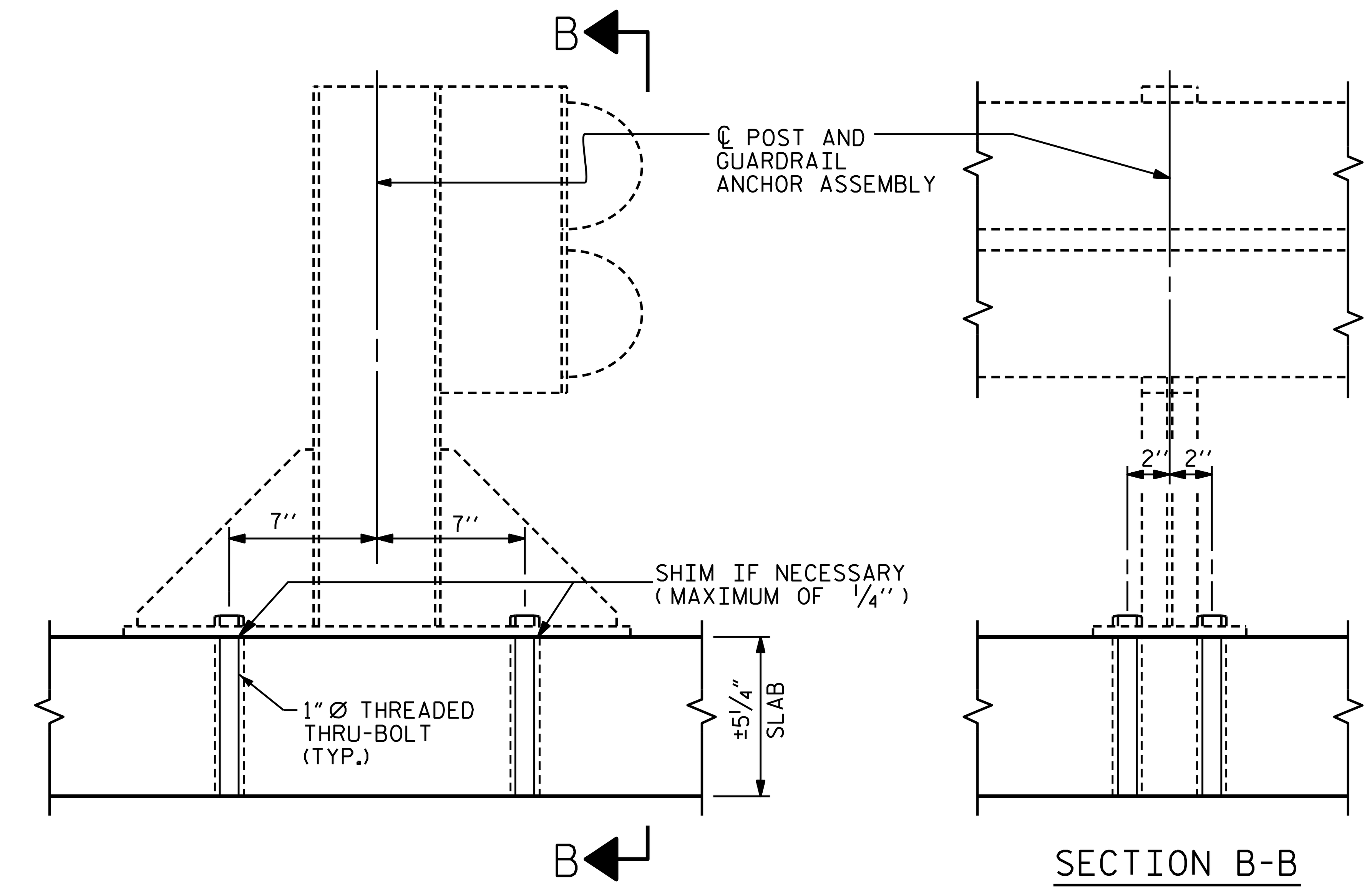
ASSEMBLED BY: M.J. OSTRISHKO DATE : MAY 2017
CHECKED BY: T.M. HARRIS DATE : OCT 2018
DESIGN ENGINEER OF RECORD: S. NATARAJAN DATE : OCT 2018

STD. NO. 21LRFR1_90S_55L

3/26/2019
J:\17BP.14.R.174_SMU_LRFR01.dgn
J:\17BP.R174.430401\Structures\Drafting\DGNs\401.007.17BP.14.R.174_SMU_LRFR01.dgn - 2015 W Divisions Planning & Design On-Call\17BP.14.R.174_SMU_LRFR01.dgn

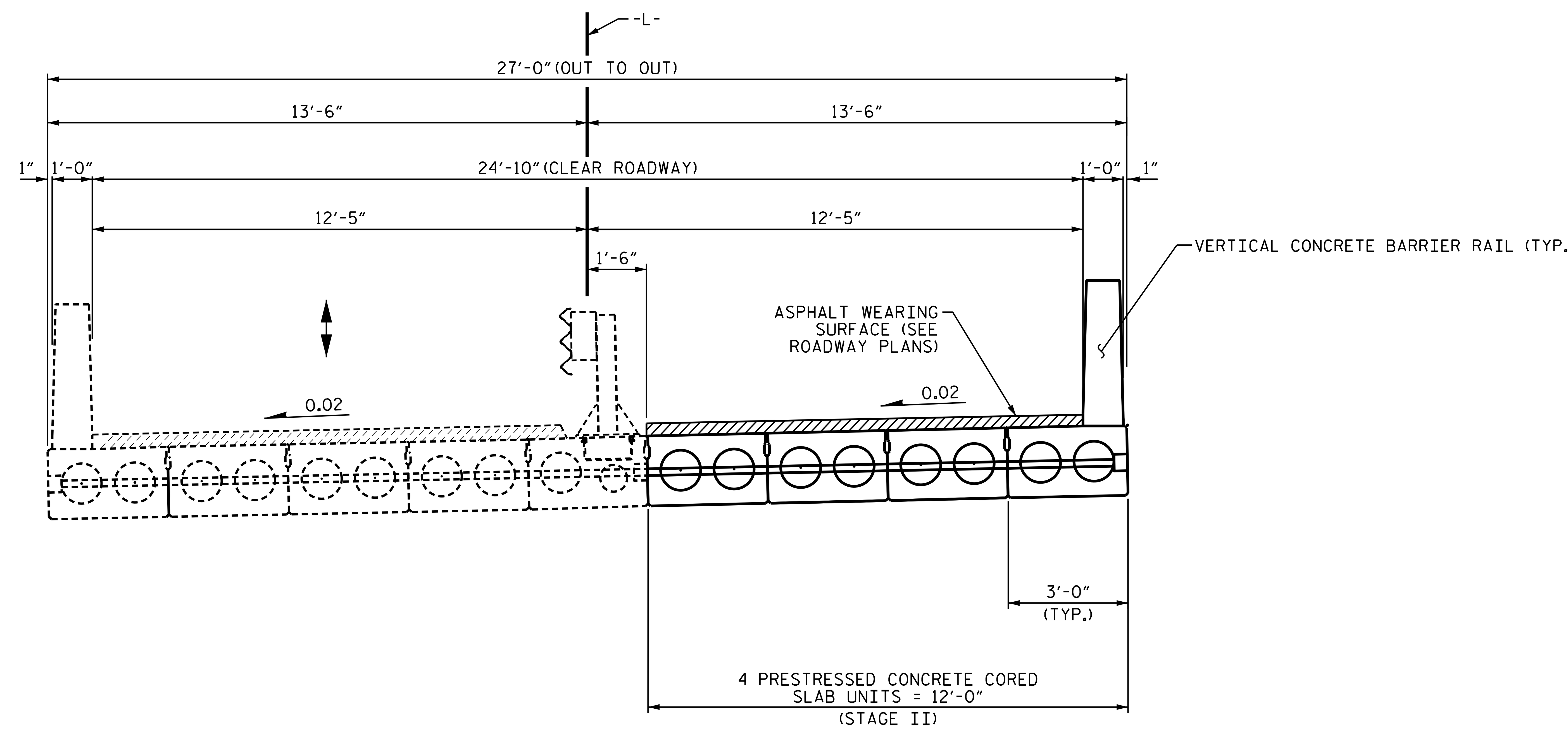


STAGE I



SECTION B-B

DETAIL A



STAGE II

STAGING SEQUENCE

PROJECT NO. 17BP.14.R.174

HAYWOOD COUNTY

STATION: 13+26.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION STAGING

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF... 2/1/2021

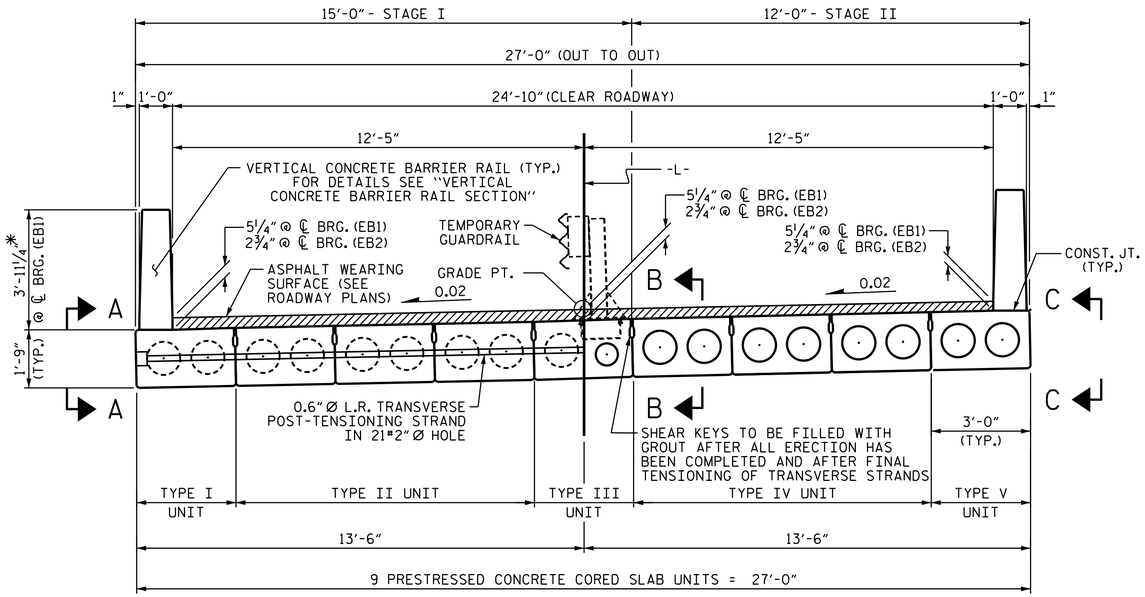
WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DESIGNED BY:	J. WHEATLEY	DATE :	JAN 2021
DRAWN BY:	J. WHEATLEY	DATE :	JAN 2021
CHECKED BY:	T.M. HARRIS	DATE :	JAN 2021
DESIGN ENGINEER OF RECORD:	T.M. HARRIS	DATE :	JAN 2021

REVISIONS

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

SHEET NO. S-5
TOTAL SHEETS 23



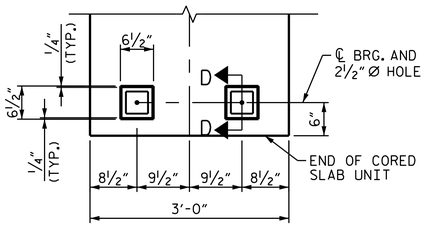
HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

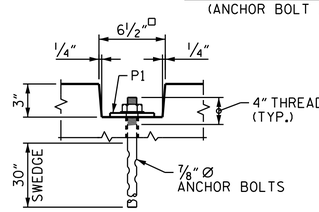
TYPICAL SECTION

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

SEE SHEET 2 OF 5 FOR SECTION VIEWS A-A, B-B, AND C-C.



TYPICAL PLAN
(ANCHOR BOLT BLOCKOUTS)



SECTION D-D
(FIXED)

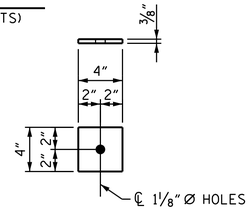
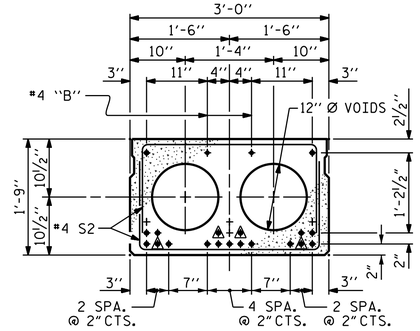


PLATE DETAILS - P1
(FIXED)
P1 (36 REQ'D)

BLOCKOUT DETAIL FOR ANCHOR BOLTS



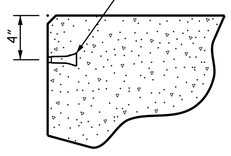
INTERIOR SLAB SECTION
TYPE II AND TYPE IV
(19 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT

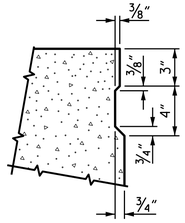
△ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

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



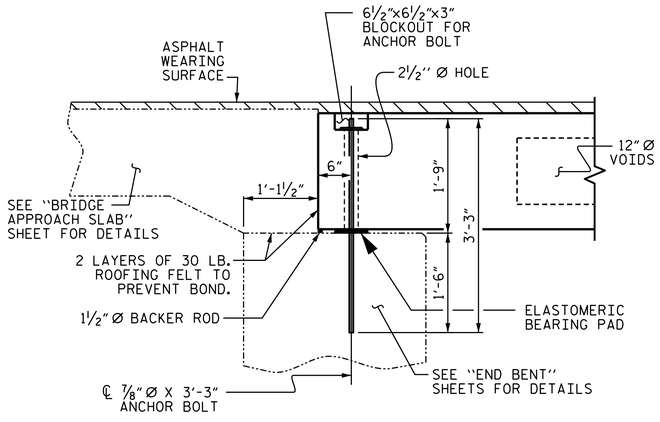
THREADED INSERT DETAIL



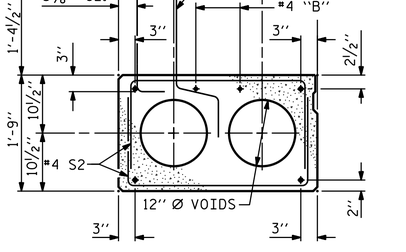
SHEAR KEY DETAIL

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

FIXED END

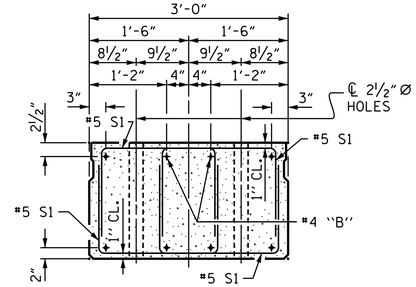


SECTION AT END BENT



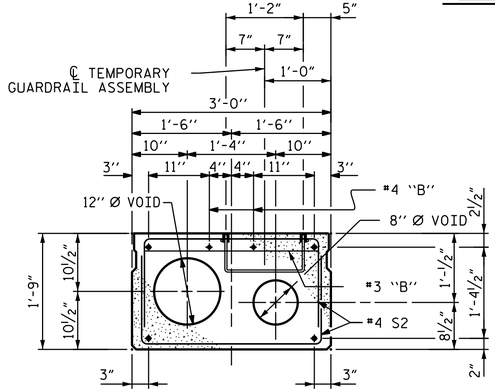
EXT. SLAB SECTION

TYPE I AND TYPE V
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTIONS - TYPE II & IV.)



END ELEVATION

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF 2½" Ø HOLES.
(STRAND LAYOUT NOT SHOWN.)
INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.



INTERIOR SLAB SECTION
TYPE III
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTIONS - TYPE II & IV.)

FOR TEMPORARY GUARDRAIL ANCHOR ASSEMBLY LOCATION, SEE SECTION OF ANCHOR ASSEMBLY LOCATION ON "ANCHORAGE DETAILS FOR TEMPORARY GUARDRAIL ANCHOR ASSEMBLY FOR TYPE III CORED SLAB UNIT" SHEET.

PROJECT NO. 17BP.14.R.174
HAYWOOD COUNTY
STATION: 13+26.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			23

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

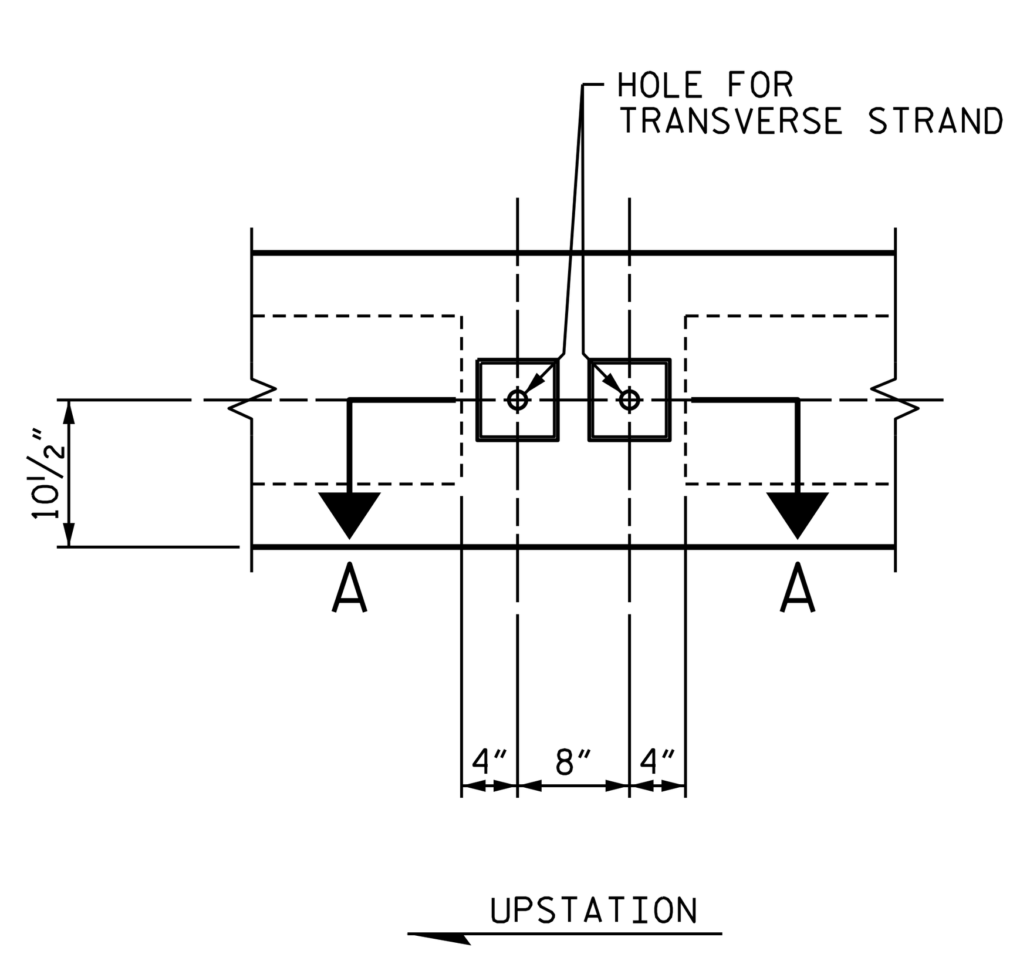
NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris
0B0B969964884D3...

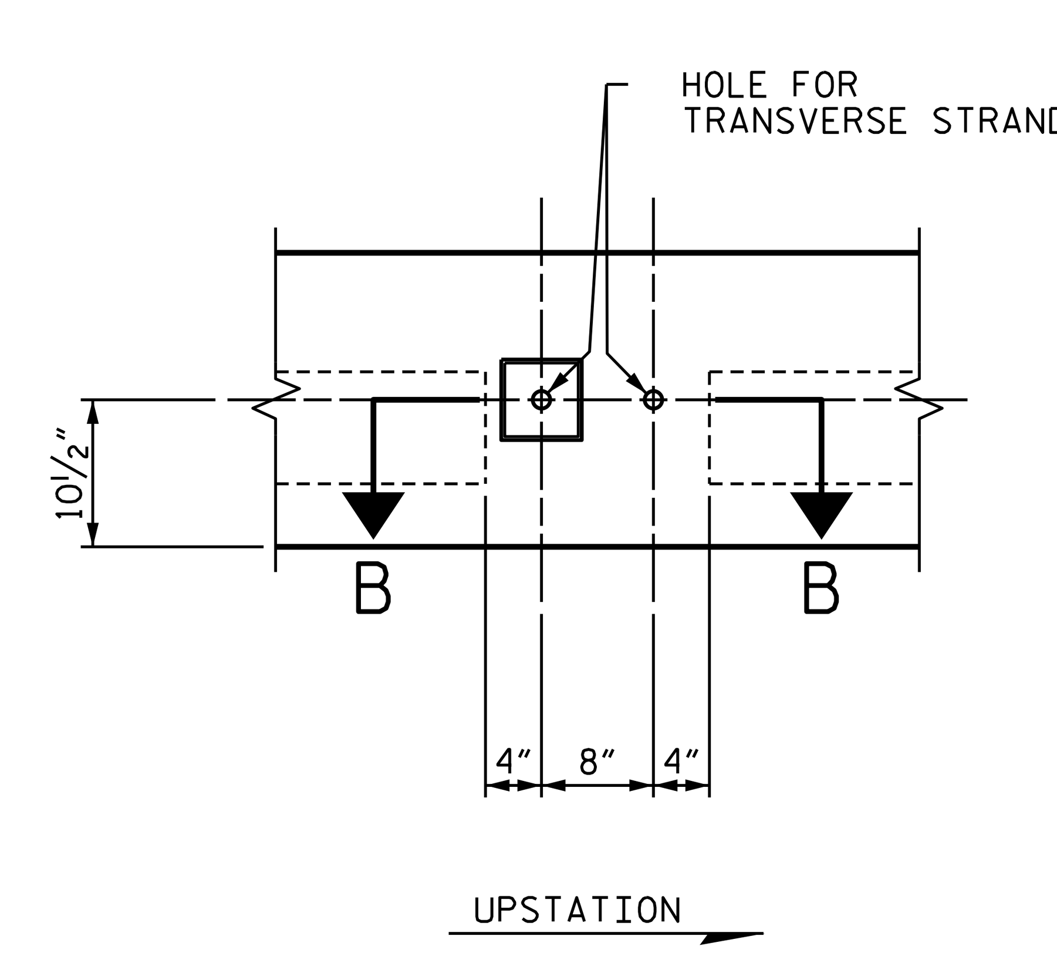
WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DESIGNED BY:	S. NATARAJAN	DATE :	MAY 2017
DRAWN BY:	M.J.OSTRISHKO	DATE :	MAY 2017
CHECKED BY:	T.M. HARRIS	DATE :	OCT 2018
DESIGN ENGINEER OF RECORD:	S. NATARAJAN	DATE :	OCT 2018

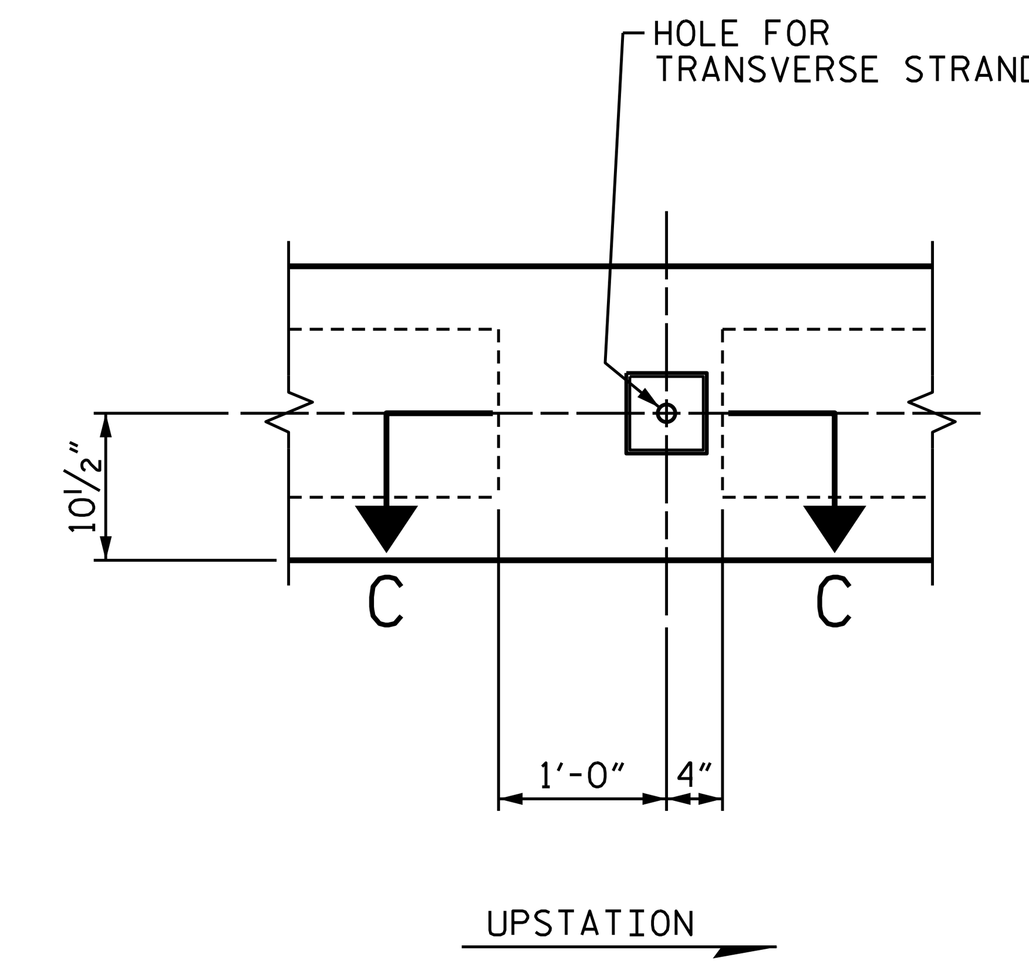
3/26/2019
J:\18836OC - 2015 W Divisions Planning & Design On-Call\18836OC Group 3 Bridges\17BP.R174.430401\Structures\Drafting\DGNs\401.011.17BP.14.R.174_SMU_CS01.dgn



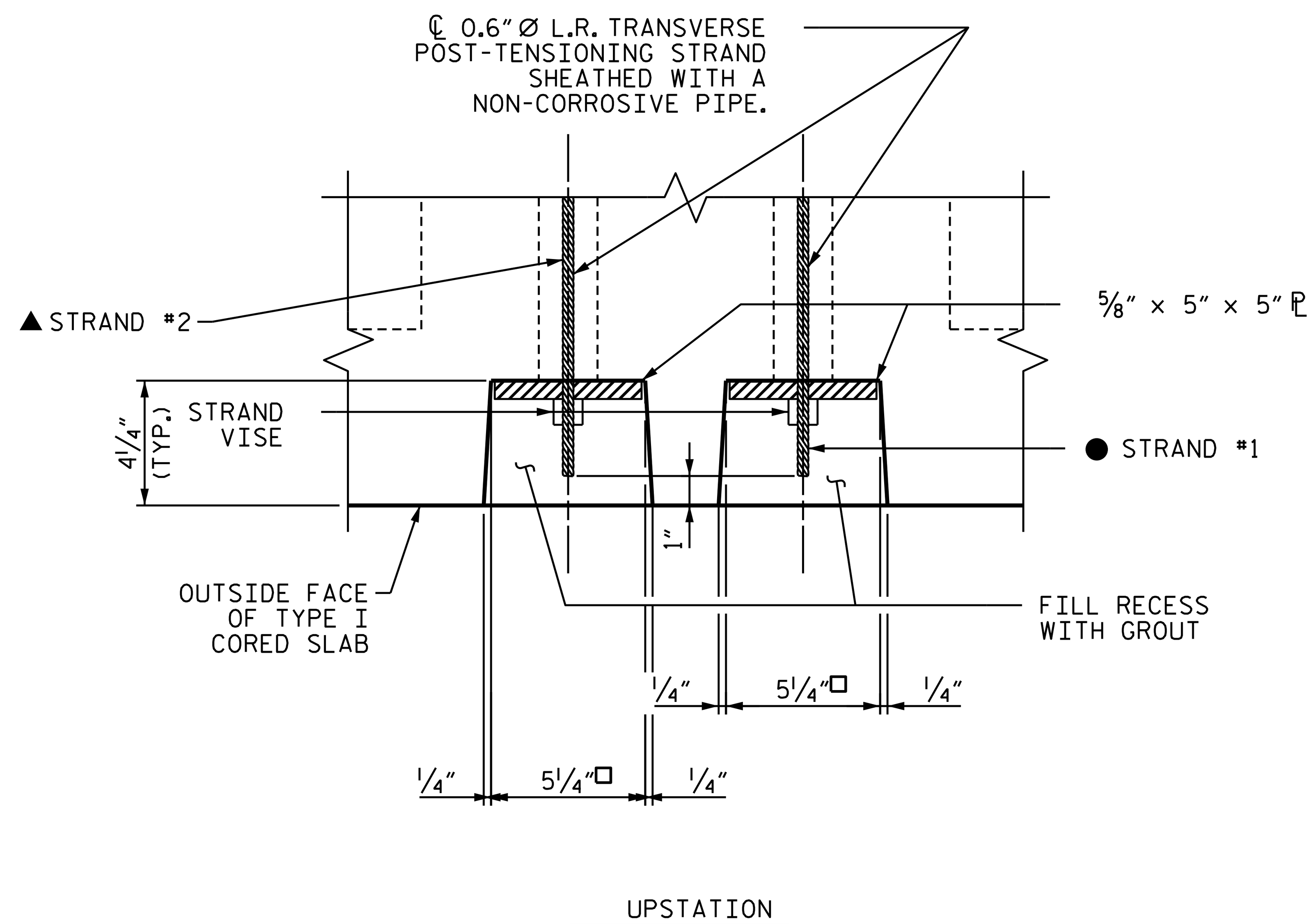
VIEW A-A
SEE SHEET 1 OF 5



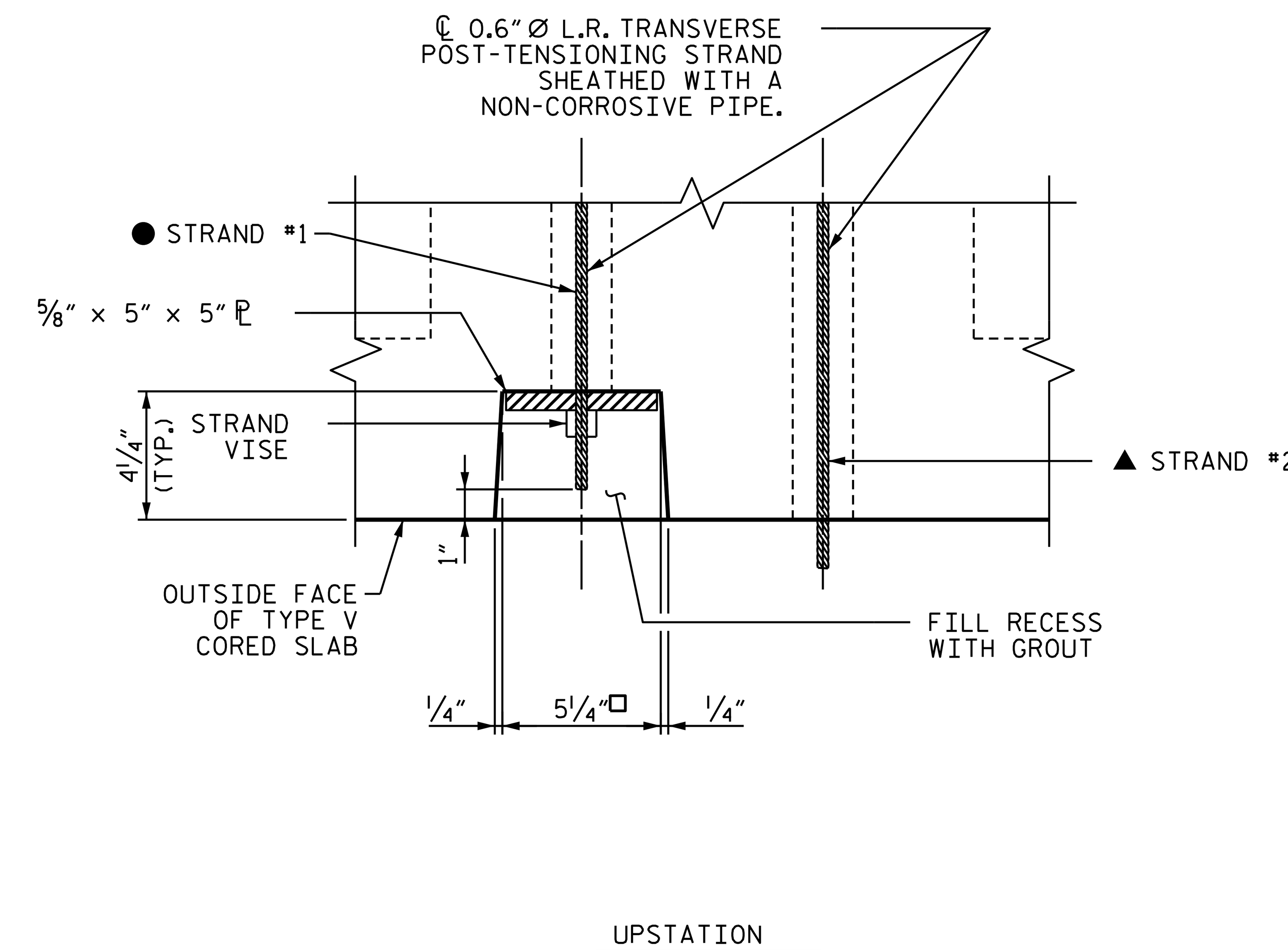
VIEW B-B
SEE SHEET 1 OF 5



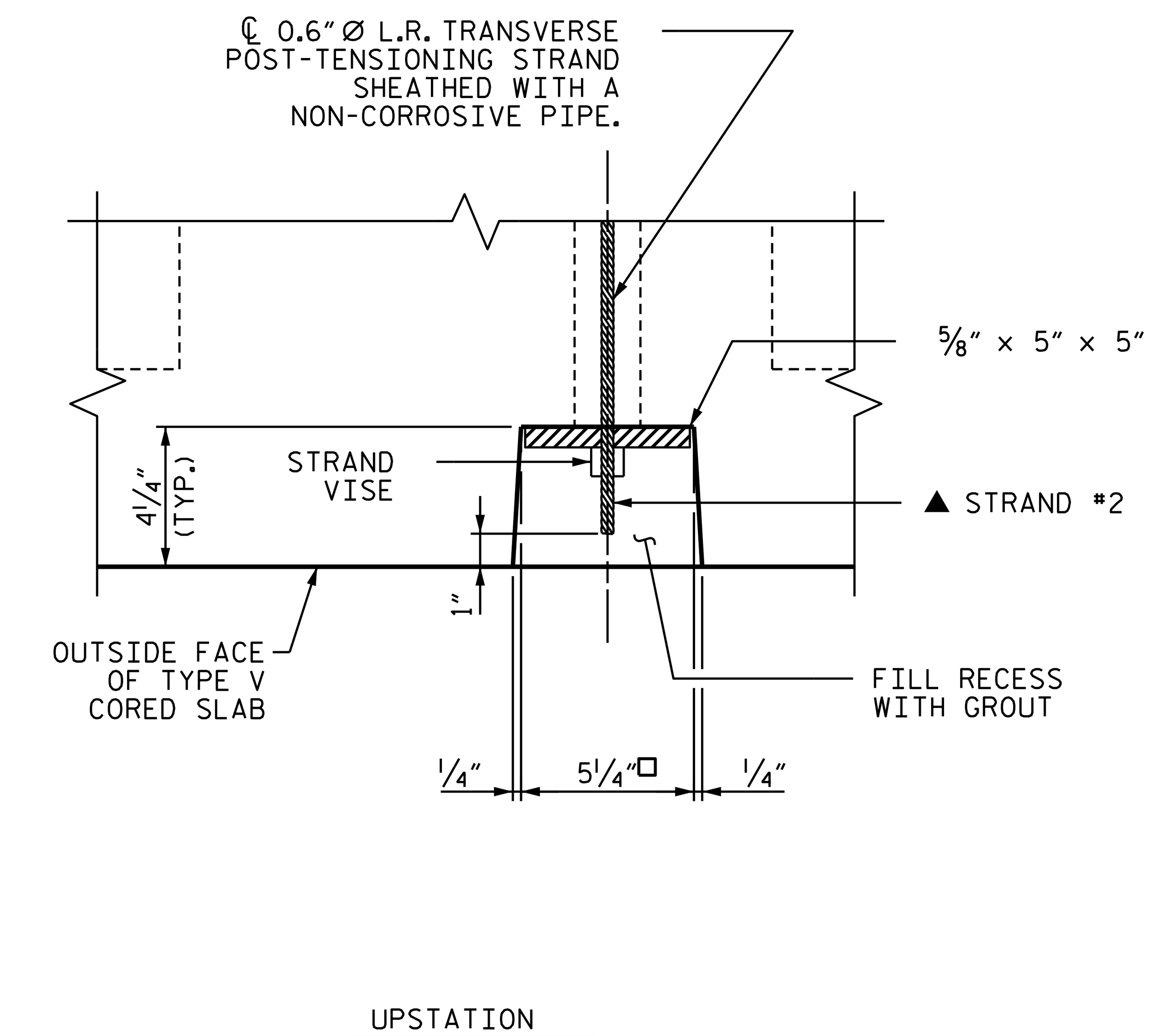
VIEW C-C
SEE SHEET 1 OF 5



VIEW A-A
(TYPE I UNIT)



VIEW B-B
(TYPE III UNIT)



VIEW C-C
(TYPE V UNIT)

GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS

● STRAND #1 GOES THROUGH 5 CORED SLAB UNITS
(TO BE TENSIONED DURING STAGE I CONSTRUCTION)

▲ STRAND #2 GOES THROUGH ALL 9 CORED SLAB UNITS
(TO BE TENSIONED DURING STAGE II CONSTRUCTION)

PROJECT NO. 17BP.14.R.174
HAYWOOD COUNTY
STATION: 13+26.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT
90° SKEW

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris

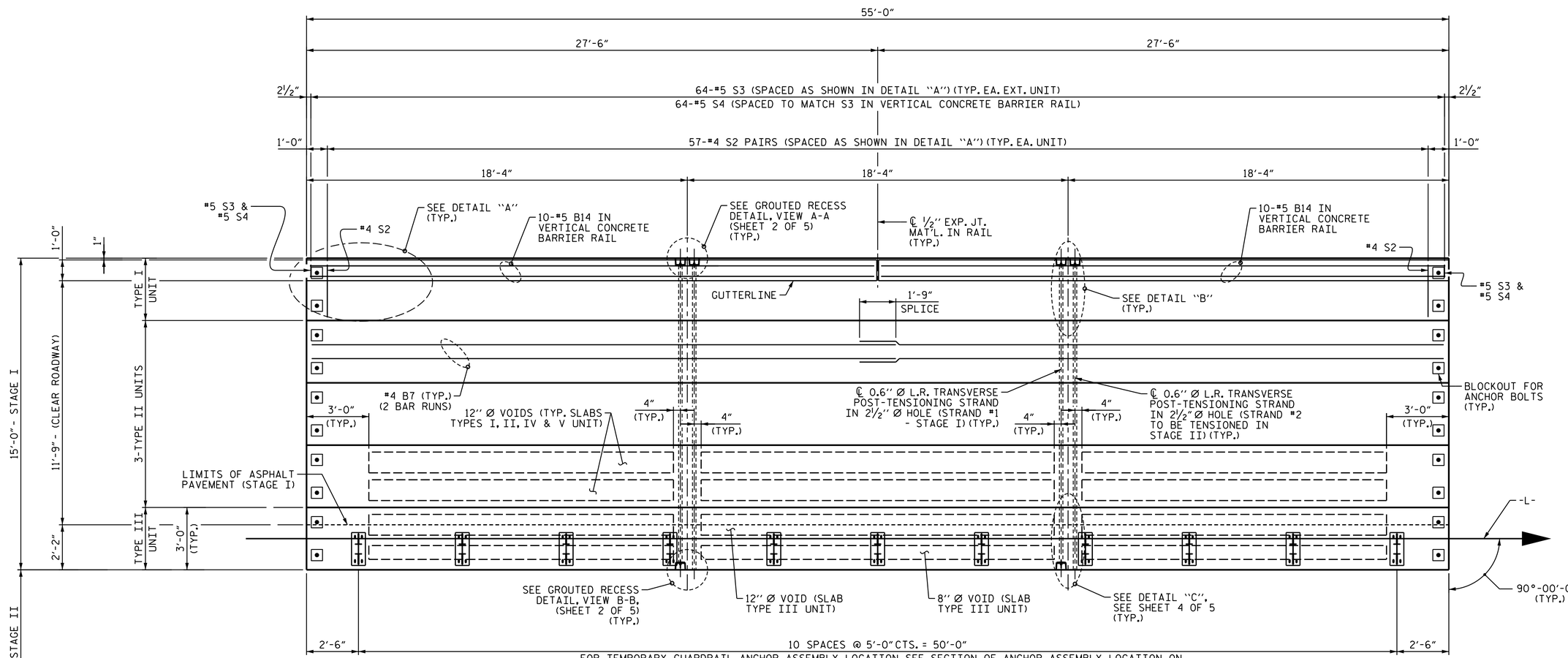
WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

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

SHEET NO. S-7
TOTAL SHEETS 23

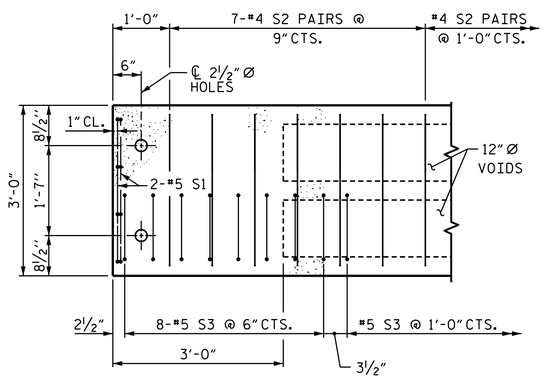
DESIGNED BY:	S. NATARAJAN	DATE :	MAY 2017
DRAWN BY:	M.J.OSTRISHKO	DATE :	MAY 2017
CHECKED BY:	T.M. HARRIS	DATE :	OCT 2018
DESIGN ENGINEER OF RECORD:	S. NATARAJAN	DATE :	OCT 2018

3/26/2019
J:\188360C - 2015 W Divisions Planning & Design On-Call\I188360C Group 3 Bridges\17BP.R174.430401\Structures\Drafting\DGNs\401.013.17BP.14.R.174_SMU_CS02.dgn



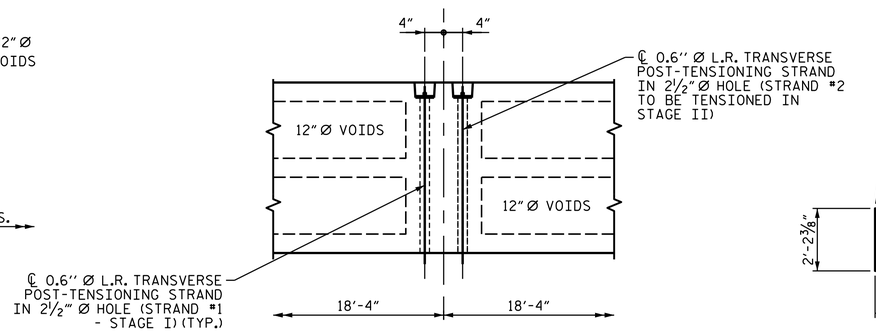
PLAN OF SPAN A

STAGE I CONSTRUCTION



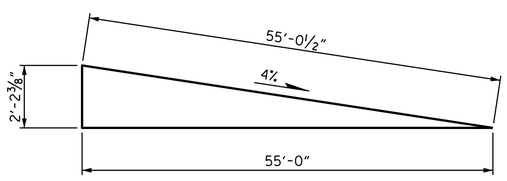
DETAIL "A"

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



DETAIL "B"

#4S2 STIRRUPS BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2½" Ø TRANSVERSE POST-TENSIONING STRAND HOLES (TYPE I UNIT SHOWN)



GRADE SLOPE TRIANGLE

PROJECT NO. 17BP.14.R.174
HAYWOOD COUNTY
STATION: 13+26.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 55' UNIT 24'-10" CLEAR ROADWAY 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			23

DESIGNED BY: S. NATARAJAN DATE: MAY 2017
DRAWN BY: M.J.OSTRISHKO DATE: MAY 2017
CHECKED BY: T.M. HARRIS DATE: OCT 2018
DESIGN ENGINEER OF RECORD: S. NATARAJAN DATE: OCT 2018

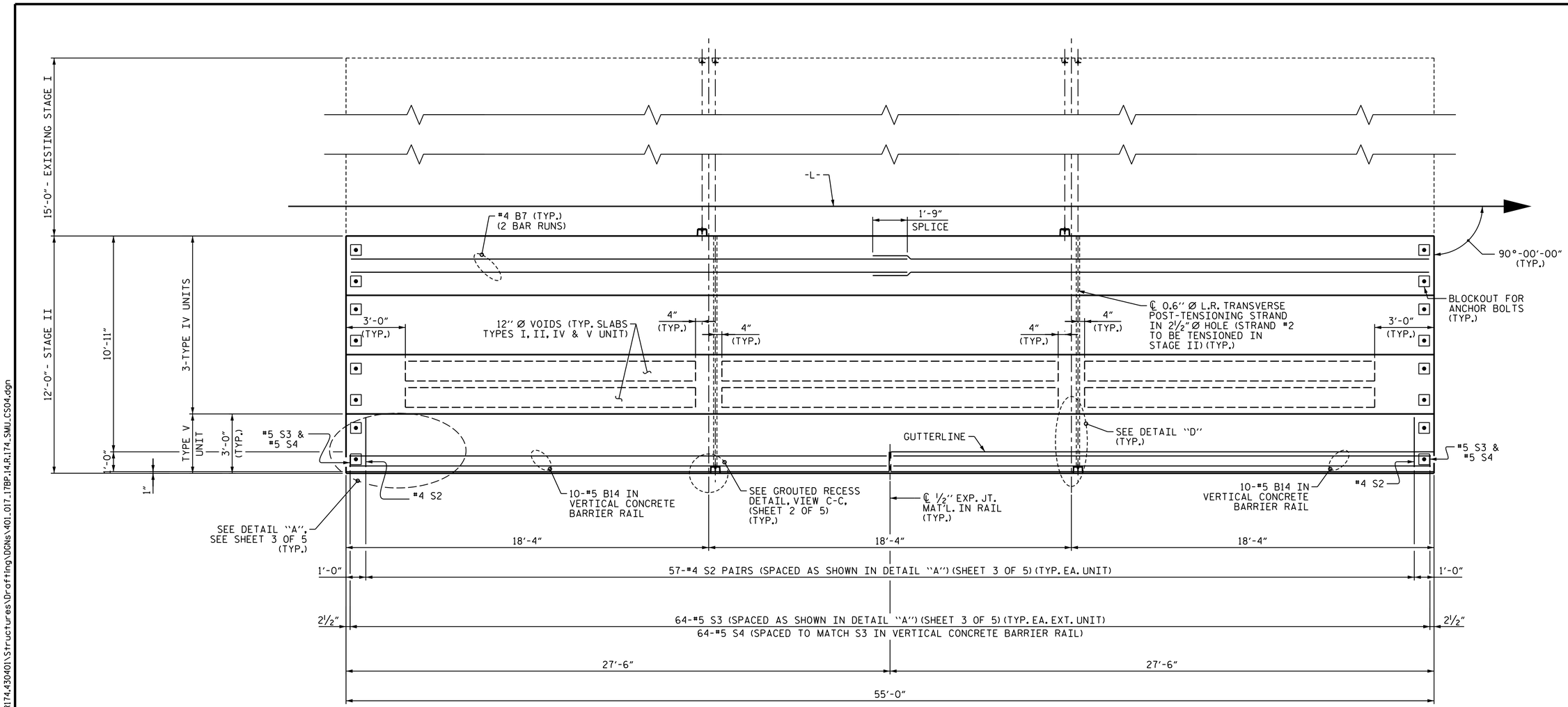
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris
0B0896996488403...

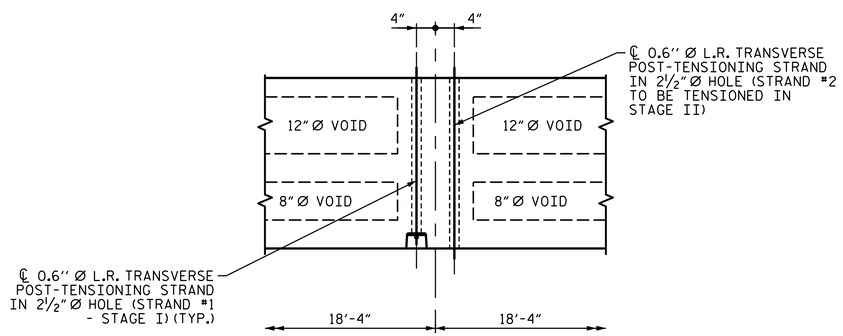
WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

3/26/2019
J:\183360C - 2015 W Divisions Planning & Design On-Call\183360C Group 3 Bridges\17BP.R.174.430401\Structures\Drafting\DGNs\401_015_17BP_14_R_174_SMU_CS03.dgn



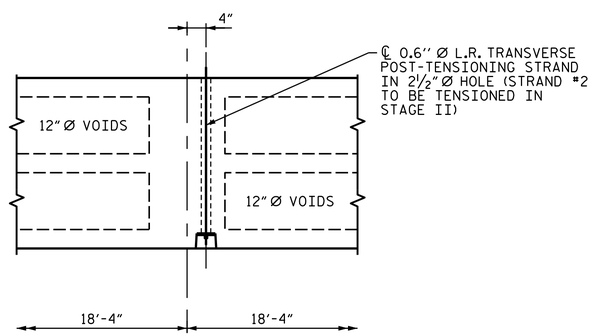
PLAN OF SPAN A

STAGE II CONSTRUCTION



DETAIL "C"

#4S2 STIRRUPS BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2½" Ø TRANSVERSE POST-TENSIONING STRAND HOLES (TYPE III UNIT SHOWN)



DETAIL "D"

#4S2 STIRRUPS BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2½" Ø TRANSVERSE POST-TENSIONING STRAND HOLES (TYPE V UNIT SHOWN)

PROJECT NO. 17BP.14.R.174

HAYWOOD COUNTY

STATION: 13+26.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 55' UNIT 24'-10" CLEAR ROADWAY 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			23

DESIGNED BY: S. NATARAJAN DATE: MAY 2017
DRAWN BY: M.J.OSTRISHKO DATE: MAY 2017
CHECKED BY: T.M. HARRIS DATE: OCT 2018
DESIGN ENGINEER OF RECORD: S. NATARAJAN DATE: OCT 2018

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris

3/26/2019
J:\188360C - 2015 W Divisions Planning & Design On-Call\188360C Group 3 Bridges\17BP.R174.430401\Structures\Drafting\DGNs\401_017_17BP_14_R_174_SMU_CS04.dgn

BILL OF MATERIAL FOR ONE 55' CORED SLAB UNIT

				STAGE I						STAGE II			
				TYPE I UNIT		TYPE II UNIT		TYPE III UNIT		TYPE IV UNIT		TYPE V UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT
B7	4	#4	STR	28'-3"	75	28'-3"	75	28'-3"	75	28'-3"	75	28'-3"	75
S1	8	#5	3	4'-3"	35	4'-3"	35	4'-3"	35	4'-3"	35	4'-3"	35
S2	114	#4	3	5'-4"	406	5'-4"	406	5'-4"	406	5'-4"	406	5'-4"	406
✱S3	64	#5	1	5'-7"	373							5'-7"	373
REINFORCING STEEL			LBS.		516		516		516		516		516
✱ EPOXY COATED REINFORCING STEEL			LBS.		373								373
6500 P.S.I. CONCRETE			CU. YDS.		7.8		7.8		7.9		7.8		7.8
0.6" Ø L.R. STRANDS			No.		19		19		19		19		19

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

STAGE I

BAR	BARS PER TYPE I UNIT	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B14	20	20	#5	STR	27'-1"	565
✱S4	64	64	#5	2	7'-2"	478
✱EPOXY COATED REINFORCING STEEL				LBS.		1043
CLASS AA CONCRETE				CU.YDS.		7.1
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		55.13

STAGE II

BAR	BARS PER TYPE V UNIT	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B14	20	20	#5	STR	27'-1"	565
✱S4	64	64	#5	2	7'-2"	478
✱EPOXY COATED REINFORCING STEEL				LBS.		1043
CLASS AA CONCRETE				CU.YDS.		7.1
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		55.13

CONCRETE RELEASE STRENGTH

UNIT	PSI
55' UNITS	4900

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

CORED SLABS REQUIRED

		NUMBER	LENGTH	TOTAL LENGTH
STAGE I	TYPE I	1	55'-0"	55'-0"
	TYPE II	3	55'-0"	165'-0"
	TYPE III	1	55'-0"	55'-0"
		NUMBER	LENGTH	TOTAL LENGTH
STAGE II	TYPE IV	3	55'-0"	165'-0"
	TYPE V	1	55'-0"	55'-0"
	TOTAL	9		495'-0"

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

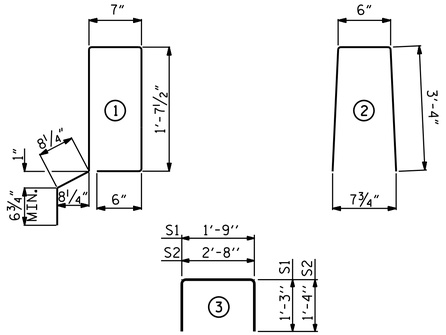
	ASPHALT OVERLAY THICKNESS	RAIL HEIGHT
	@ MID-SPAN	@ MID-SPAN
55' UNITS	1⅝"	3'-7⅝"

DEAD LOAD DEFLECTION AND CAMBER

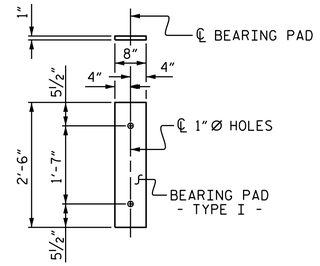
	3'-0" x 1'-9"
55' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1½" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD✱✱	⅜" ↓
FINAL CAMBER	1⅛" ↑

✱✱ INCLUDES FUTURE WEARING SURFACE

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



FIXED END
(TYPE I - 18 REQ'D)

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.

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

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

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

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

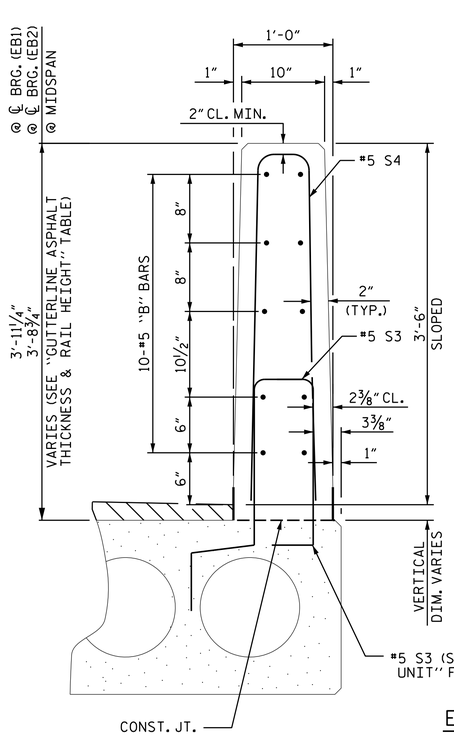
THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

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

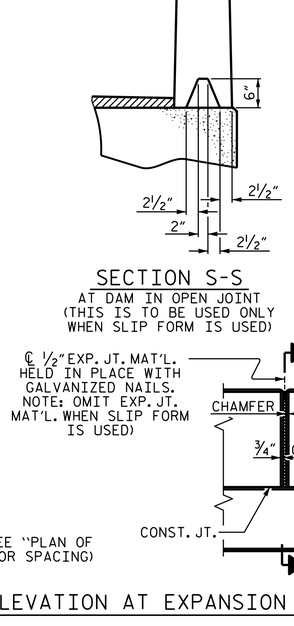
ANCHOR BOLTS, NUTS, WASHERS AND PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS, WASHER AND PLATES. SHOP INSPECTION IS REQUIRED.

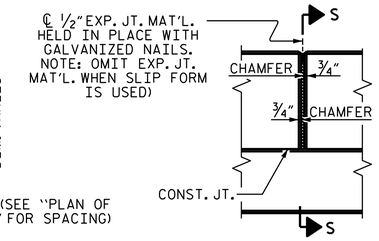
ANCHOR BOLTS, NUTS AND WASHERS SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE CORED SLABS.



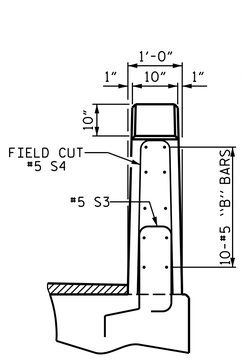
ELEVATION AT EXPANSION JOINTS



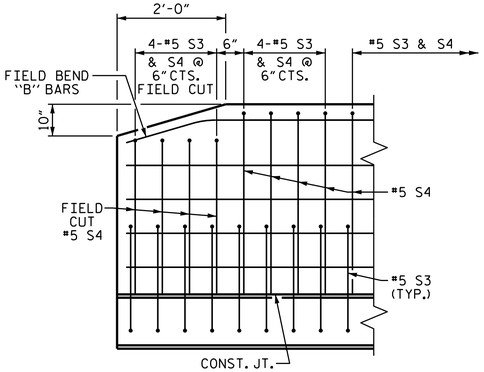
SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



VERTICAL CONCRETE BARRIER RAIL DETAILS



END VIEW



SIDE VIEW

END OF RAIL DETAILS

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

PROJECT NO. 17BP.14.R.174
HAYWOOD COUNTY
STATION: 13+26.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			23

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

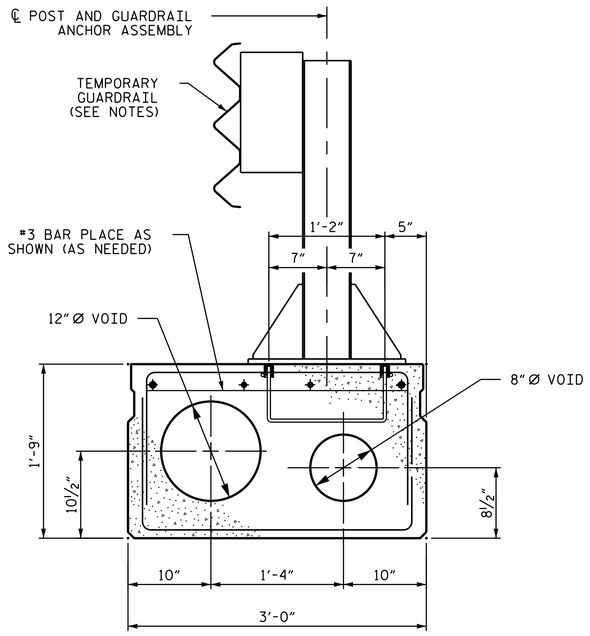
NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS W. HARRIS

DocuSigned by: Thomas W. Harris
0B0896996488403...

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

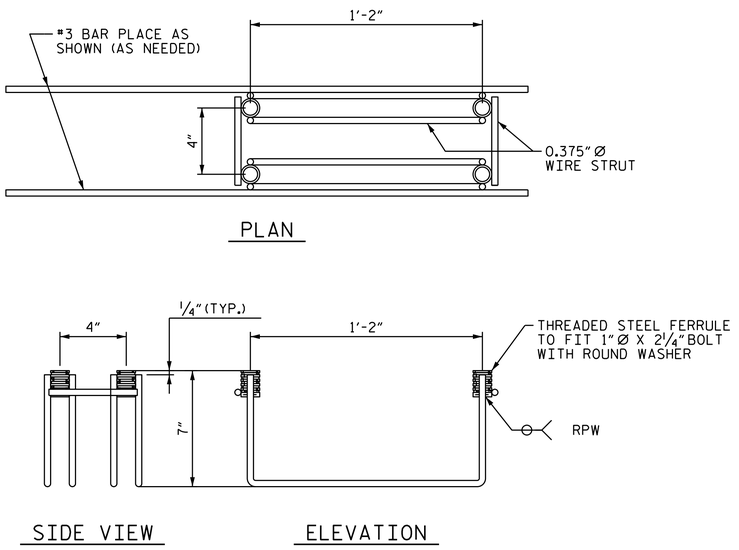
DESIGNED BY: S. NATARAJAN DATE : MAY 2017
DRAWN BY: M.J.OSTRISHKO DATE : MAY 2017
CHECKED BY: T.M. HARRIS DATE : OCT 2018
DESIGN ENGINEER OF RECORD: S. NATARAJAN DATE : OCT 2018

3/26/2019
J:\188360C - 2015 W Divisions Planning & Design On-Call\188360C Group 3 Bridges\17BP.R174.430401\Structures\Drafting\DGNs\401_019_17BP_14_R_174_SMU_CS05.dgn



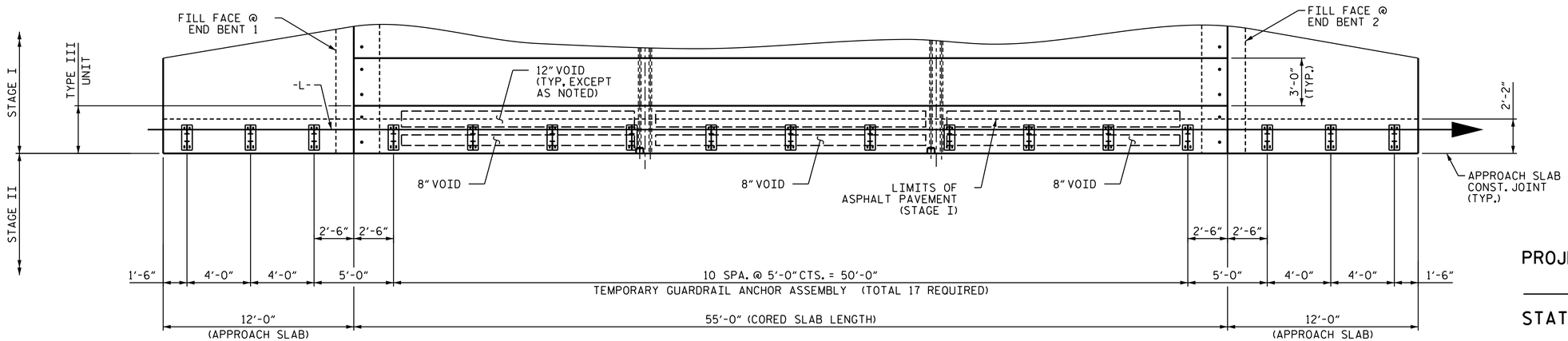
SECTION OF ANCHOR ASSEMBLY LOCATION

(TYPE III UNIT OF STAGE I)
THE #3 BARS ARE INCIDENTAL AND THEIR COST SHALL BE INCLUDED IN THE PRICE BID FOR THE PRESTRESSED CONCRETE CORED SLABS.



TEMPORARY GUARDRAIL ANCHOR ASSEMBLY

(11 ASSEMBLIES REQUIRED IN THE TYPE III CORED SLAB UNIT)
(6 ASSEMBLIES REQUIRED IN THE APPROACH SLABS)



RAIL POST SPACING FOR TEMPORARY GUARDRAIL - STAGE I

NOTES

THE TEMPORARY GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF ASSHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2½".

B. 4 - 1"Ø X 2¼" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT HE 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 TEMPORARY GUARDRAIL ANCHOR ASSEMBLY DETAIL ARE THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.

TEMPORARY 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 TEMPORARY GUARDRAIL ANCHOR ASSEMBLY COMPLETE IN PLACE, SHALL BE INCLUDED, AS APPLICABLE, IN THE UNIT CONTRACT PRICE BID FOR 3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB OR LUMP SUM PRICE BID FOR APPROACH SLABS.

FERRULES TO BE PLUGGED DURING THE CASTING OF THE CORED SLAB UNITS OR POURING OF APPROACH SLAB AS RECOMMENDED BY THE MANUFACTURER.

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

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

PROJECT NO. 17BP.14.R.174
HAYWOOD COUNTY
STATION: 13+26.00 -L-

DESIGNED BY:	S. NATARAJAN	DATE :	MAY 2017
DRAWN BY:	M.J.OSTRISHKO	DATE :	MAY 2017
CHECKED BY:	T.M. HARRIS	DATE :	OCT 2018
DESIGN ENGINEER OF RECORD:	S. NATARAJAN	DATE :	OCT 2018

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

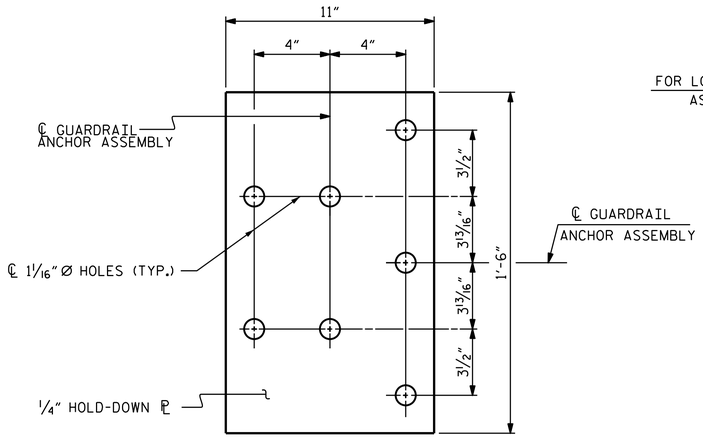
NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS
DocuSigned by: Thomas M. Harris

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

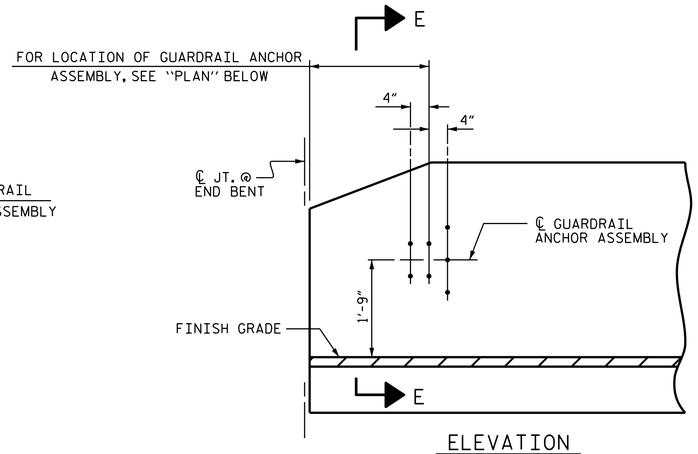
ANCHORAGE DETAILS FOR TEMPORARY GUARDRAIL ANCHOR ASSEMBLY FOR TYPE III - STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			23

3/26/2019
J:\188360C - 2015 W Divisions Planning & Design On-Call\188360C Group 3 Bridges\17BP.R174.43040I\Structures\Drafting\DGNs\401.021.17BP.14.R.174_SMU_TGRA01.dgn



PLAN



ELEVATION

NOTES

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

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

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

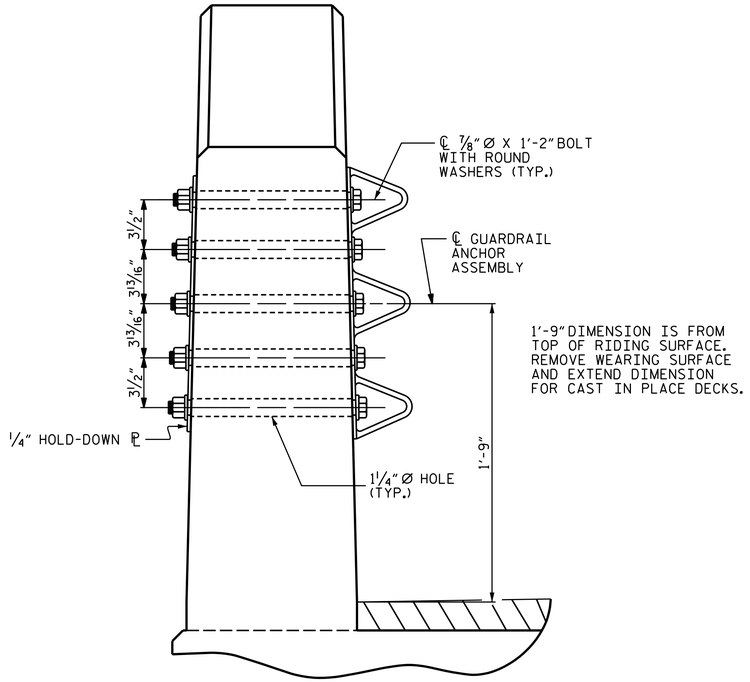
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

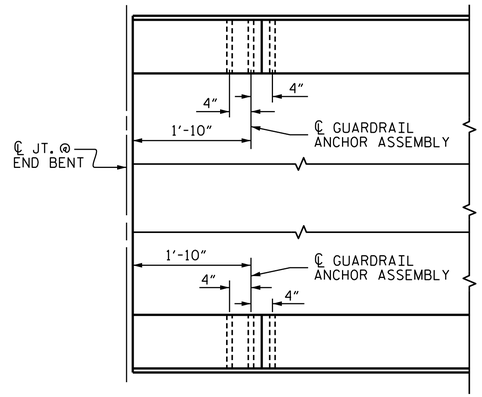
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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



SECTION E-E

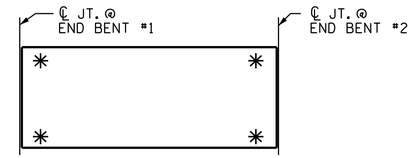
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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



SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. 17BP.14.R.174

HAYWOOD COUNTY

STATION: 13+26.00 -L-

DRAWN BY : MAA 5/10	REV. 1/15	MAA/TMG
CHECKED BY : GM 5/10	REV. 12/17	MAA/THC
	REV. 5/18	MAA/THC
ASSEMBLED BY: M.J. OSTRISHKO	DATE : MAY 2017	
CHECKED BY: T.M. HARRIS	DATE : OCT 2018	
DESIGN ENGINEER OF RECORD: S. NATARAJAN	DATE : OCT 2018	

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris

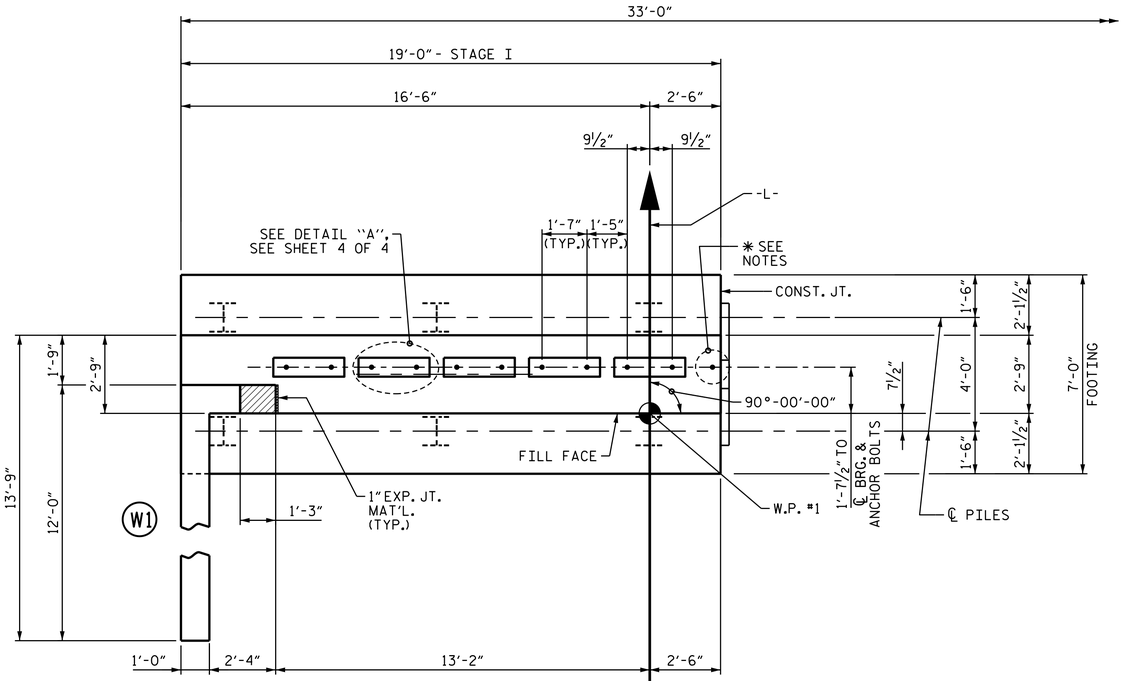
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE DETAILS FOR VERTICAL CONCRETE BARRIER RAIL

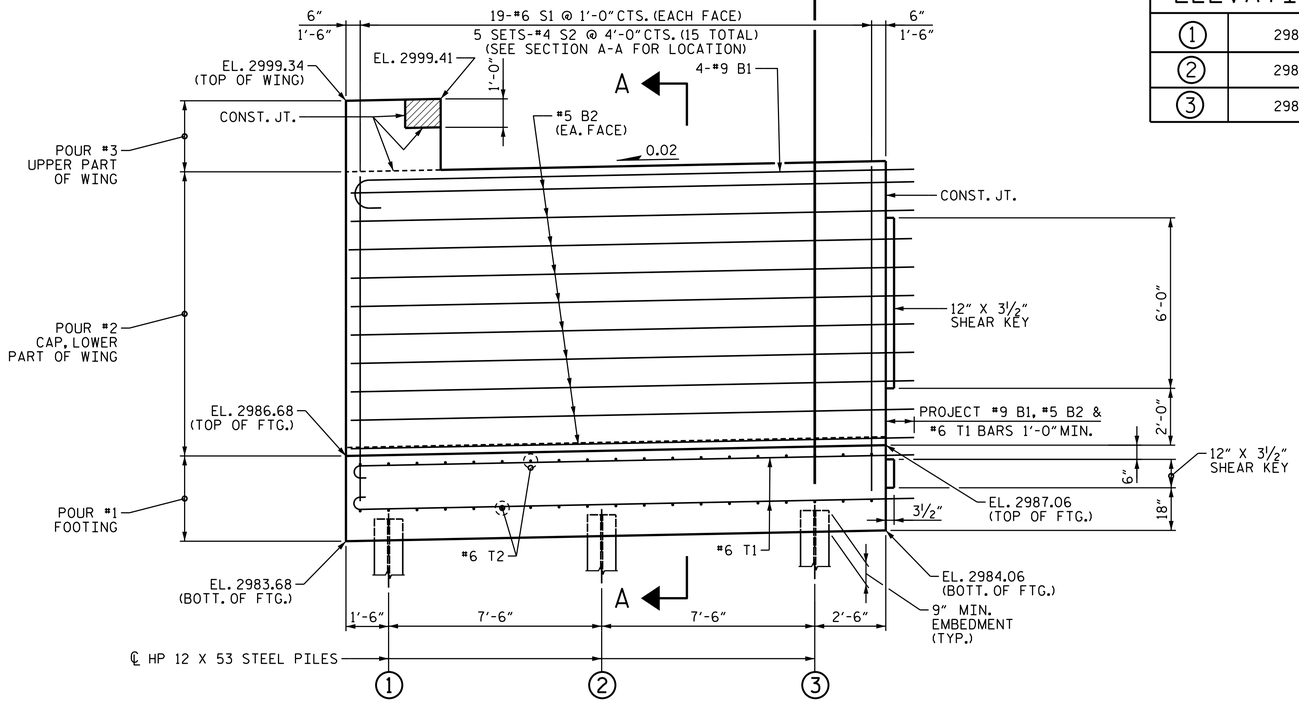
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			23

STD. NO. GRA3

3/26/2019
J:\18836OC - 2015 W Divisions Planning & Design On-Call\1188360C Group 3 Bridges\17BP.R.174,430401\Structures\Drafting\DGNs\401_023_17BP_14_R_174_SMU_gr_d01.dgn



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 2 OF 4.
FOR #6 T1 & #6 T2 PLACEMENT, SEE "FOOTING PLAN" SHEET 4 OF 4.

TOP OF PILE ELEVATIONS	
①	2984.47
②	2984.62
③	2984.77

NOTES

THE S1 BARS IN THE CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449 AND SHALL BE GALVANIZED. NO SEPARATE PAYMENT WILL BE MADE FOR THE ANCHOR BOLTS AND THE COST OF MATERIALS AND INSTALLATION SHALL BE INCLUDED IN OTHER PAY ITEMS.

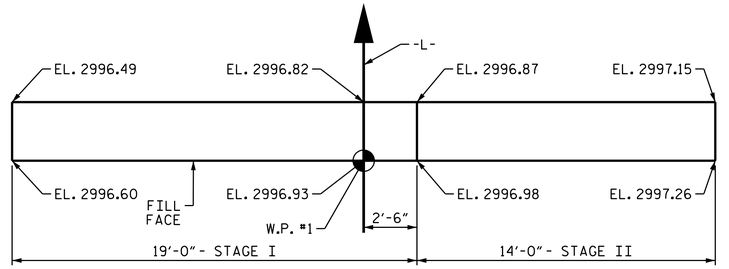
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #9 B1, #5 B2. AND #6 T1 BARS AT THE CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL BUTT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS.

MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #9 B1, #5 B2. AND #6 T1 BARS IN STAGE I WITH THE #9 B3, #5 B4. AND #6 T3 BARS IN STAGE II. THE LOCATION OF THE COUPLERS SHALL BE STAGGERED ON ALTERNATING BARS BY 1 FOOT AND THE BARS SHALL BE CUT ACCORDINGLY TO ALLOW A MINIMUM OF 1'-0" EXTENSION INTO STAGE II CONSTRUCTION.

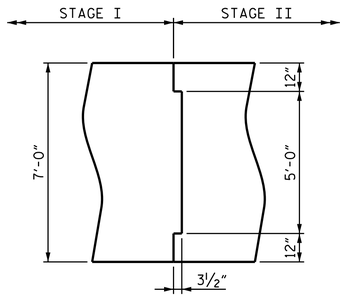
FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICES FOR REINFORCING STEEL IN STANDARD PROVISIONS.

INSTALL THE 4" DIAMETER DRAIN PIPE THROUGH THE WING AS SHOWN ON THE APPROACH SLAB SHEETS. REINFORCING STEEL IN THE WING MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

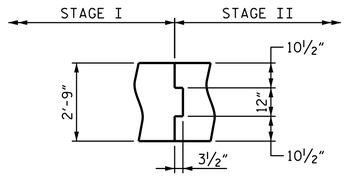
* THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THIS ANCHOR BOLT MAY BE PLACED IN STAGE I OR DRILLED AND GROUTED IN STAGE II.



TOP OF CAP ELEVATIONS
END BENT 1 - STAGES I & II



PLAN
FOOTING



PLAN
CAP

SECTION THRU SHEAR KEY

PROJECT NO. 17BP.14.R.174
HAYWOOD COUNTY
STATION: 13+26.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
STAGE I

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

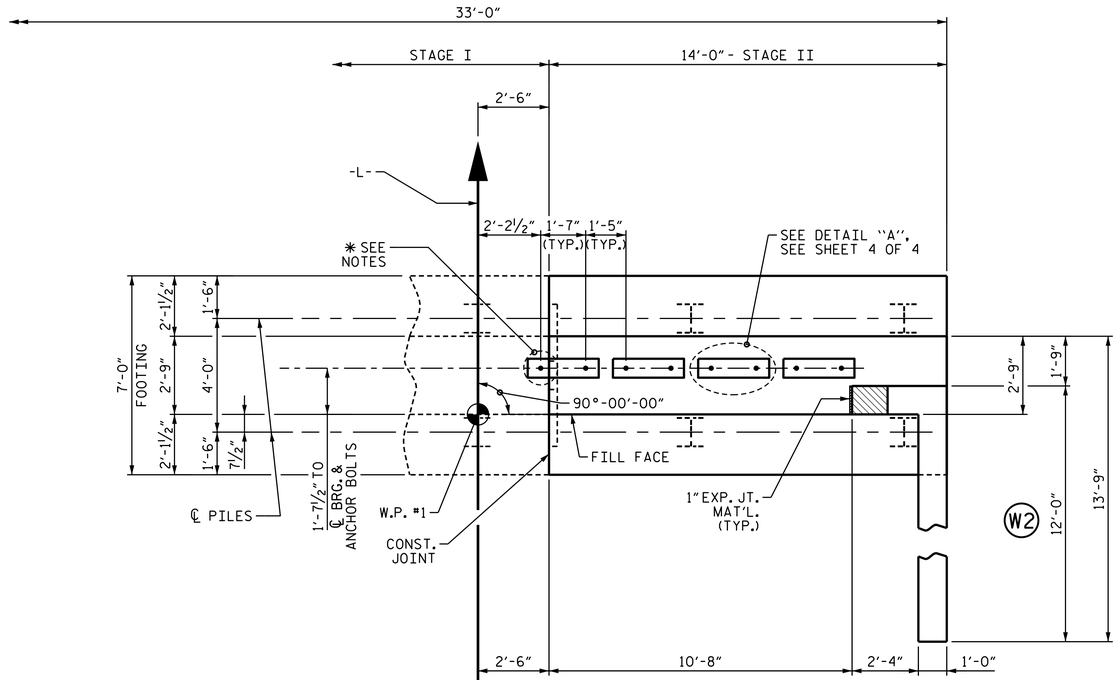
NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS
DocuSigned by: Thomas M. Harris

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

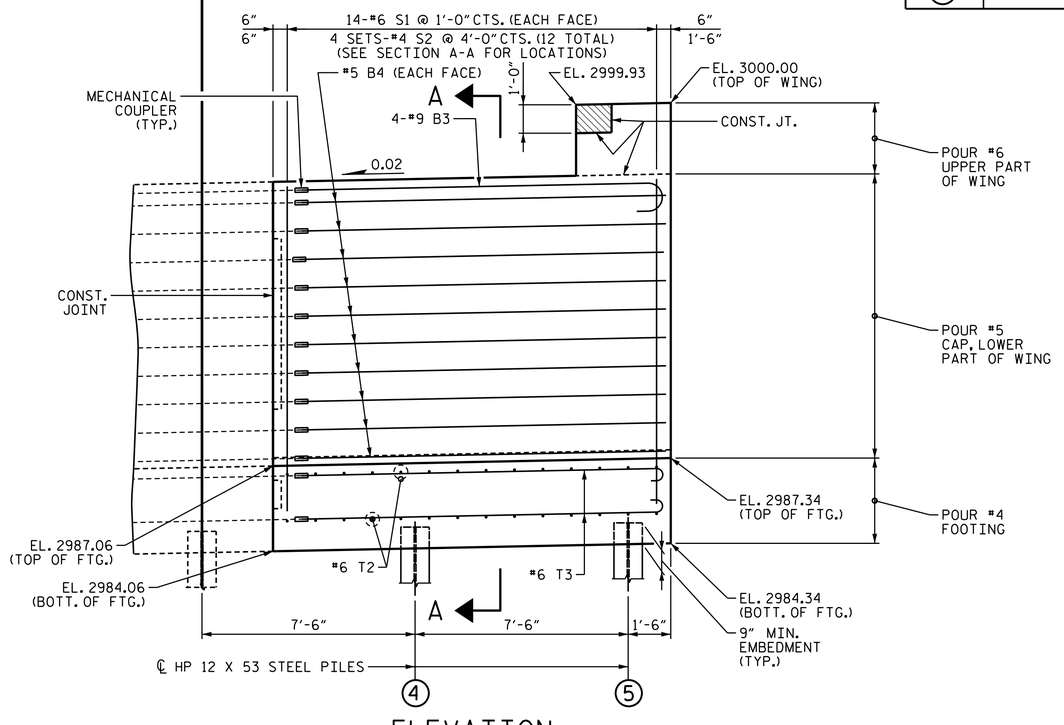
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			23

DESIGNED BY: S. NATARAJAN DATE: MAY 2017
DRAWN BY: M.J. OSTRISHKO DATE: MAY 2017
CHECKED BY: T.M. HARRIS DATE: OCT 2018
DESIGN ENGINEER OF RECORD: S. NATARAJAN DATE: OCT 2018

3/26/2019
J:\18836OC - 2015 W Divisions Planning & Design On-Call\18836OC Group 3 Bridges\17BP.R174.430401\Structures\Drafting\DGNs\401.025.17BP.14.R.174.SMU.EB101.dgn



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR #6 T2 & #6 T3 PLACEMENT, SEE "FOOTING PLAN" SHEET 4 OF 4.

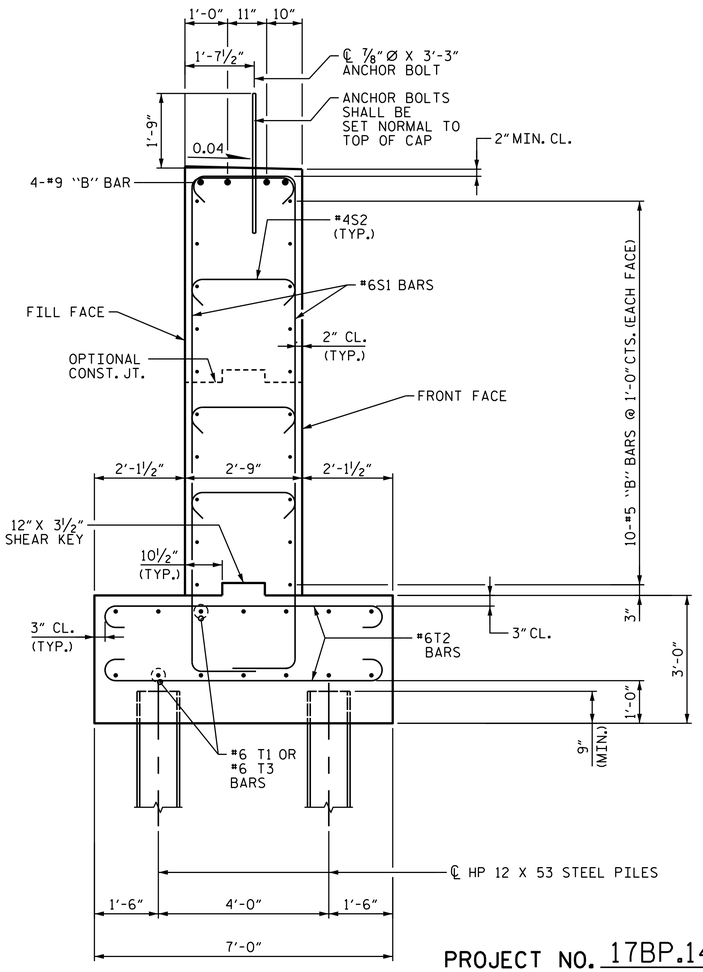
TOP OF PILE ELEVATIONS	
④	2984.92
⑤	2985.07

NOTES

FOR ADDITIONAL NOTES, SEE SHEET 1 OF 4.

✱ THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THIS ANCHOR BOLT MAY BE PLACED IN STAGE I OR DRILLED AND GROUTED IN STAGE II.

FOR TOP OF CAP ELEVATIONS SEE SHEET 1 OF 4.



SECTION A-A

PROJECT NO. 17BP.14.R.174

HAYWOOD COUNTY

STATION: 13+26.00 -L-

SHEET 2 OF 4

DESIGNED BY:	S. NATARAJAN	DATE :	MAY 2017			
DRAWN BY:	M.J. OSTRISHKO	DATE :	MAY 2017			
CHECKED BY:	T.M. HARRIS	DATE :	OCT 2018			
DESIGN ENGINEER OF RECORD:	S. NATARAJAN	DATE :	OCT 2018			

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS

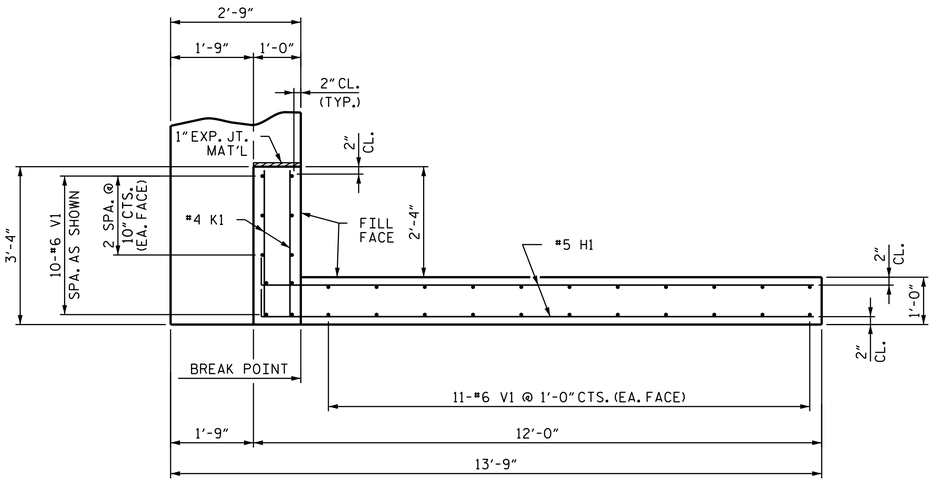
DocuSigned by: Thomas M. Harris

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

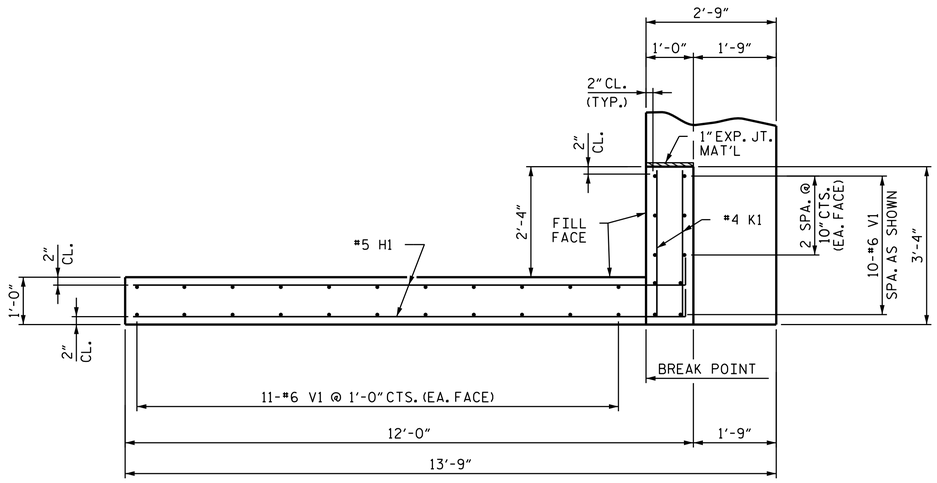
SUBSTRUCTURE
END BENT 1
STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			23

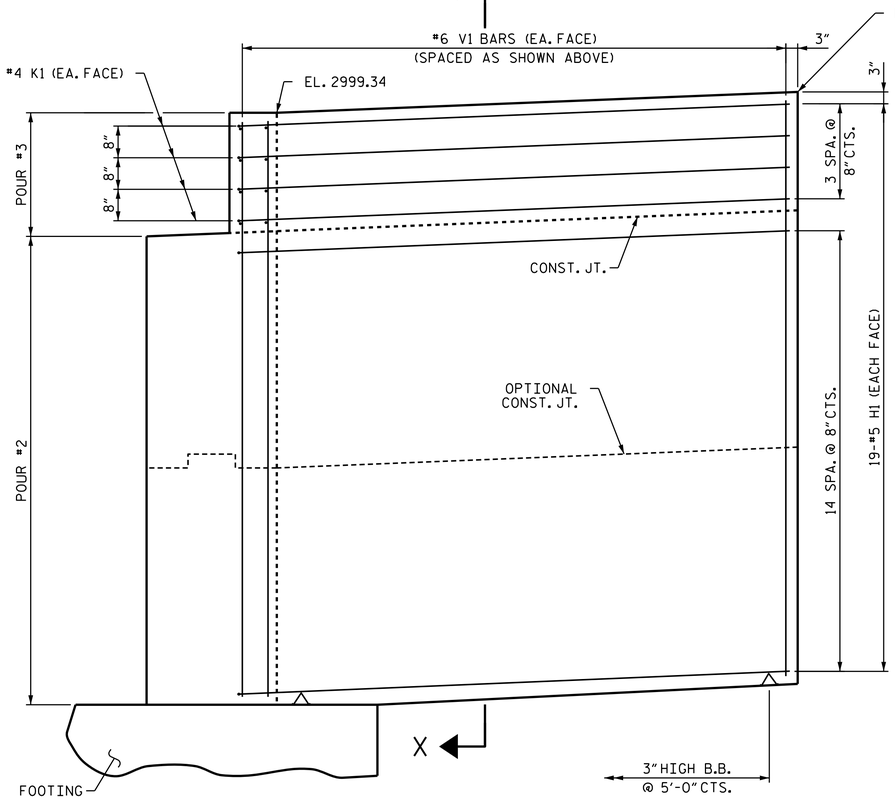
3/26/2019
J:\188360C - 2015 W Divisions Planning & Design On-Call\I188360C Group 3 Bridges\17BP.R.T74.43040\1\Structures\Drafting\DGNs\401.027.17BP.14.R.174.SMU.EB102.dgn



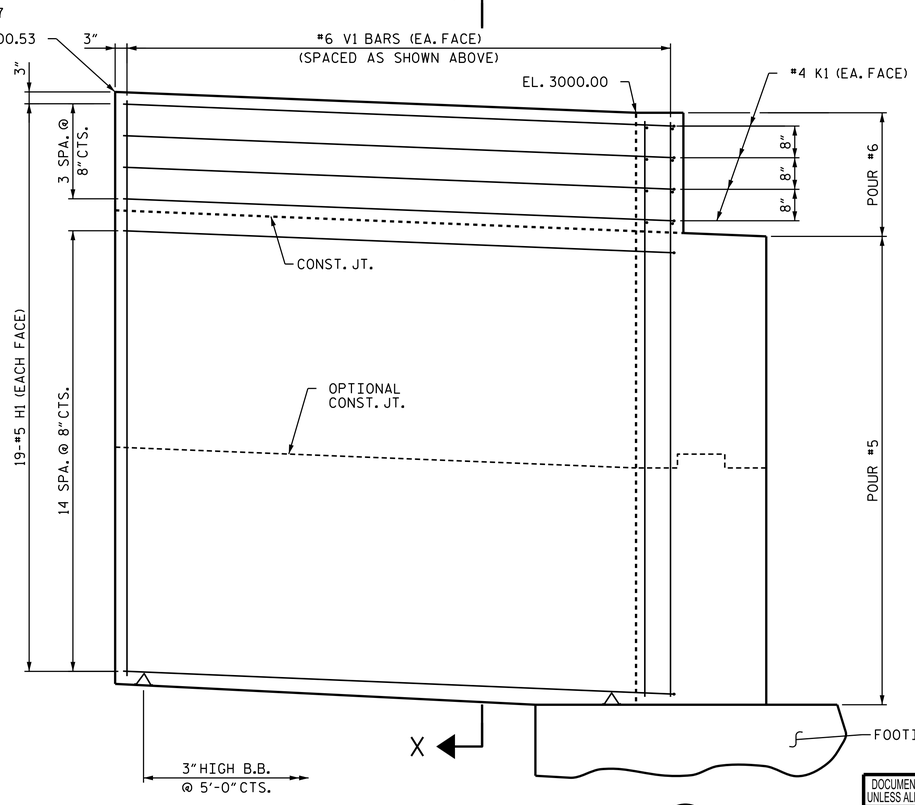
PLAN OF WING (W1)



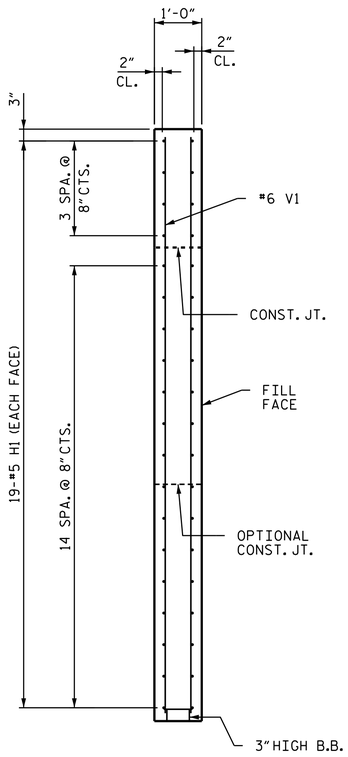
PLAN OF WING (W2)



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X

WING DETAILS

PROJECT NO. 17BP.14.R.174

HAYWOOD COUNTY

STATION: 13+26.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1

DESIGNED BY: S. NATARAJAN DATE : MAY 2017
DRAWN BY: M.J. OSTRISHKO DATE : JUN 2017
CHECKED BY: T.M. HARRIS DATE : OCT 2018
DESIGN ENGINEER OF RECORD: S. NATARAJAN DATE : OCT 2018

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

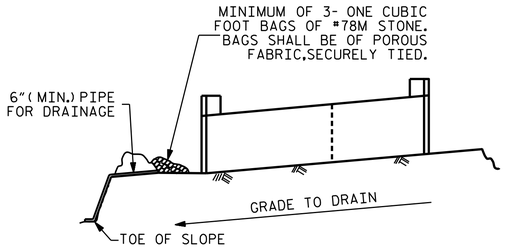
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			23

3/26/2019
J:\188360C - 2015 W Divisions Planning & Design On-Call\I188360C Group 3 Bridges\17BP.R174.430401\Structures\Drafting\DGNs\401_029_17BP_14_R_174_SMU_EB103.dgn

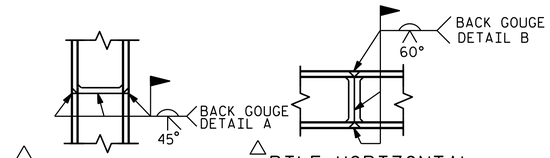


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

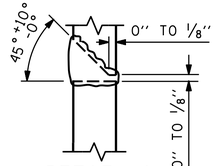
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

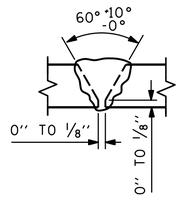


△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



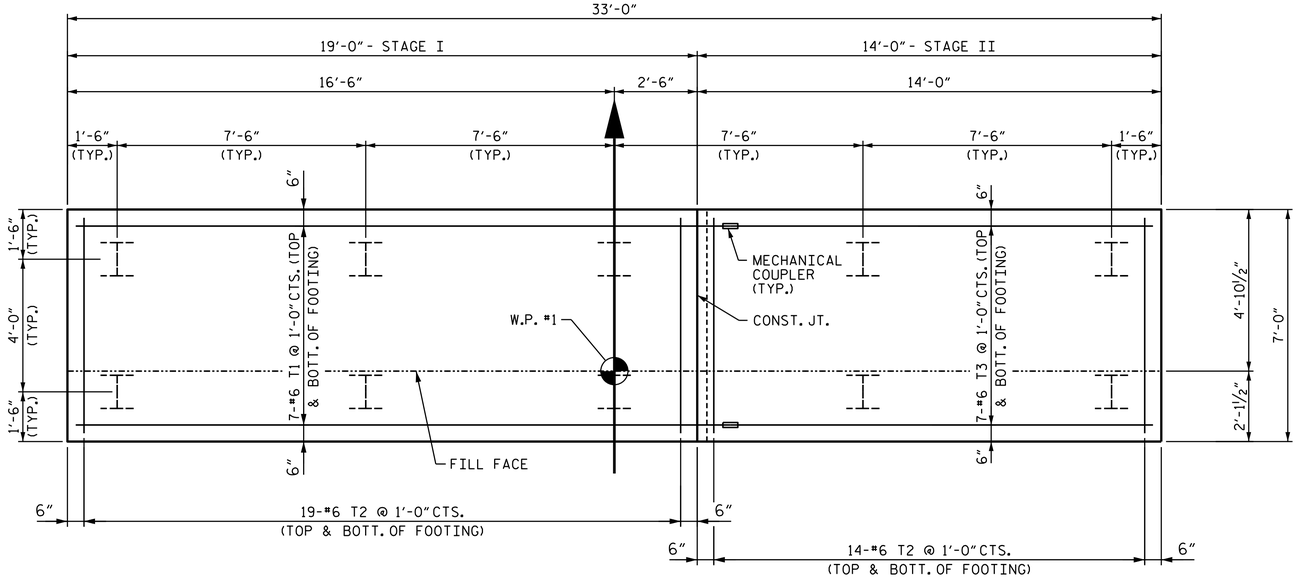
DETAIL A



DETAIL B

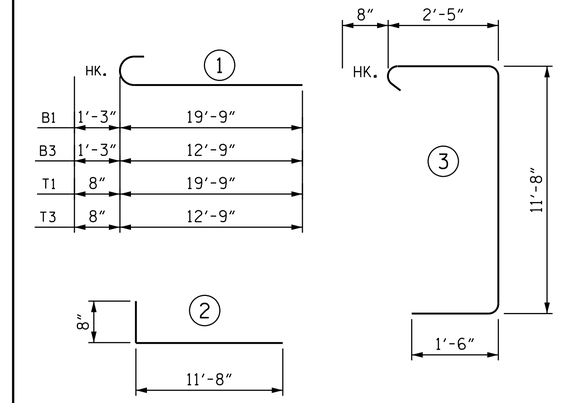
△ POSITION OF PILE DURING WELDING.

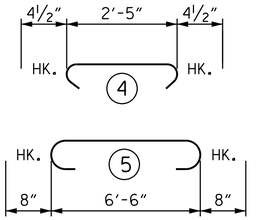
PILE SPLICE DETAILS



FOOTING PLAN

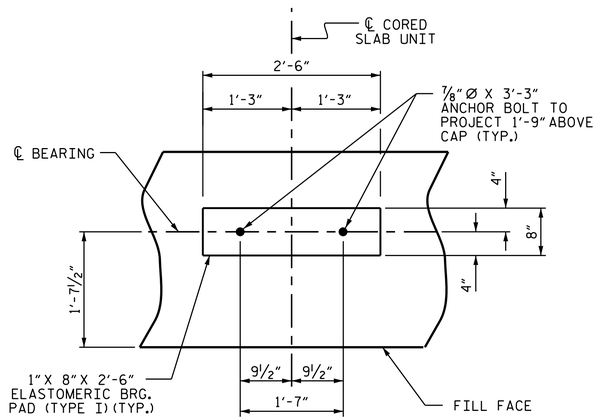
BAR TYPES





ALL BAR DIMENSIONS ARE OUT TO OUT.

STAGE I	STAGE II
HP 12 X 53 STEEL PILES NO: 6 LIN. FT.= 180	HP 12 X 53 STEEL PILES NO: 4 LIN. FT.= 120
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 6	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 4



DETAIL "A"

BILL OF MATERIAL
STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#9	1	21'-0"	286
B2	20	#5	STR	19'-9"	412
H1	38	#5	2	12'-4"	489
K1	8	#4	STR	2'-11"	16
S1	38	#6	3	16'-3"	927
S2	15	#4	4	3'-2"	32
T1	14	#6	1	20'-5"	429
T2	38	#6	5	7'-10"	447
V1	32	#6	STR	12'-2"	585
REINFORCING STEEL				LBS.	3,623

CLASS A CONCRETE BREAKDOWN

POUR #1	FOOTING	14.8 C.Y.
POUR #2	CAP, LOWER PART OF WINGS	23.5 C.Y.
POUR #3	UPPER PART OF WING	1.3 C.Y.
TOTAL CLASS A CONCRETE		39.6 C.Y.

BILL OF MATERIAL
STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3	4	#9	1	14'-0"	190
B4	20	#5	STR	12'-9"	266
H1	38	#5	2	12'-4"	489
K1	8	#4	STR	2'-11"	16
S1	28	#6	3	16'-3"	683
S2	12	#4	4	3'-2"	25
T2	28	#6	5	7'-10"	329
T3	14	#6	1	13'-5"	282
V1	32	#6	STR	12'-2"	585
REINFORCING STEEL				LBS.	2,865

CLASS A CONCRETE BREAKDOWN

POUR #4	FOOTING	10.9 C.Y.
POUR #5	CAP, LOWER PART OF WINGS	18.2 C.Y.
POUR #6	UPPER PART OF WING	1.3 C.Y.
TOTAL CLASS A CONCRETE		30.4 C.Y.

PROJECT NO. 17BP.14.R.174

HAYWOOD COUNTY

STATION: 13+26.00 -L-

SHEET 4 OF 4

DESIGNED BY:	S. NATARAJAN	DATE :	MAY 2017
DRAWN BY:	M.J. OSTRISHKO	DATE :	JUN 2017
CHECKED BY:	T.M. HARRIS	DATE :	OCT 2018
DESIGN ENGINEER OF RECORD:	S. NATARAJAN	DATE :	OCT 2018

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS

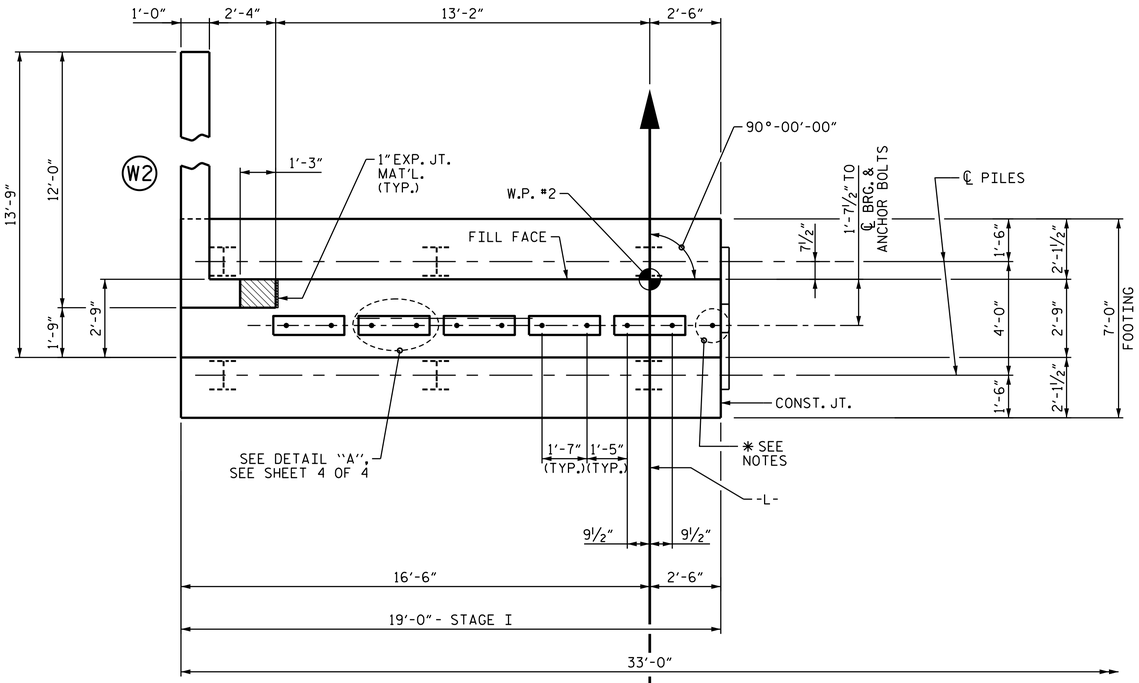
DocuSigned by: Thomas M. Harris

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

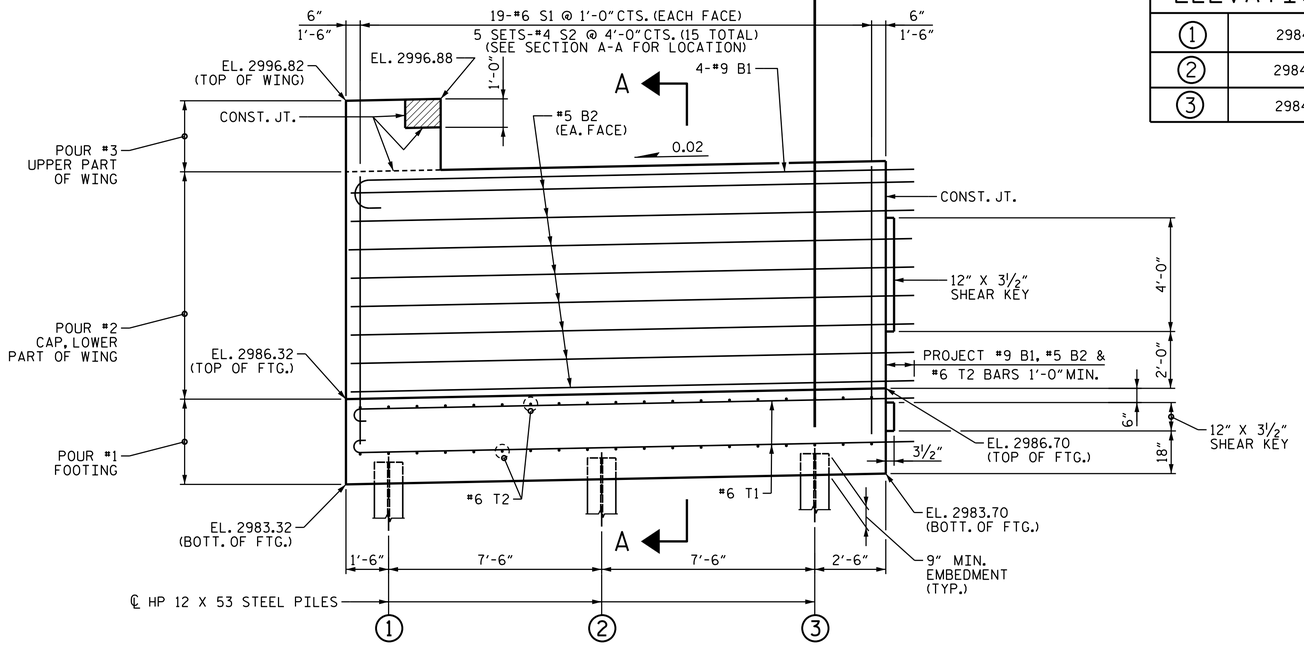
SUBSTRUCTURE
END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			23

3/26/2019
J:\188360C - 2015 W Divisions Planning & Design On-Call\188360C Group 3 Bridges\17BP.R174.43040\Structures\Drafting\DGNs\401.031.17BP.14.R.174_SMU_EB104.dgn



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 2 OF 4.
FOR #6 T1 & #6 T2 PLACEMENT, SEE "FOOTING PLAN" SHEET 4 OF 4.

TOP OF PILE ELEVATIONS

①	2984.11
②	2984.26
③	2984.41

NOTES

THE S1 BARS IN THE CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449 AND SHALL BE GALVANIZED. NO SEPARATE PAYMENT WILL BE MADE FOR THE ANCHOR BOLTS AND THE COST OF MATERIALS AND INSTALLATION SHALL BE INCLUDED IN OTHER PAY ITEMS.

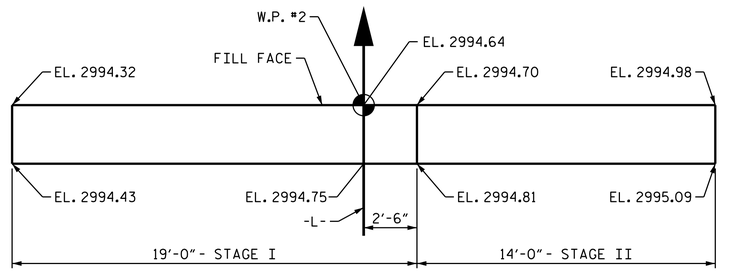
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #9 B1, #5 B2. AND #6 T1 BARS AT THE CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL BUTT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS.

MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #9 B1, #5 B2. AND #6 T1 BARS IN STAGE I WITH THE #9 B3, #5 B4. AND #6 T3 BARS IN STAGE II. THE LOCATION OF THE COUPLERS SHALL BE STAGGERED ON ALTERNATING BARS BY 1 FOOT AND THE BARS SHALL BE CUT ACCORDINGLY TO ALLOW A MINIMUM OF 1'-0" EXTENSION INTO STAGE II CONSTRUCTION.

FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICES FOR REINFORCING STEEL IN STANDARD PROVISIONS.

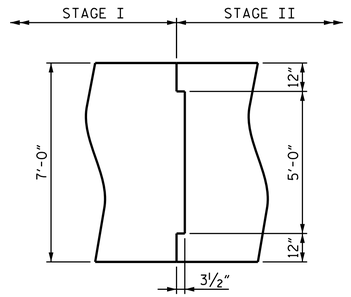
INSTALL THE 4" DIAMETER DRAIN PIPE THROUGH THE WING AS SHOWN ON THE APPROACH SLAB SHEETS. REINFORCING STEEL IN THE WING MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

✱ THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THIS ANCHOR BOLT MAY BE PLACED IN STAGE I OR DRILLED AND GROUTED IN STAGE II.

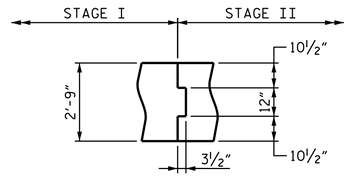


TOP OF CAP ELEVATIONS

END BENT 2 - STAGES I & II



PLAN
FOOTING



PLAN
CAP

SECTION THRU SHEAR KEY

PROJECT NO. 17BP.14.R.174
HAYWOOD COUNTY
STATION: 13+26.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
STAGE I

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS

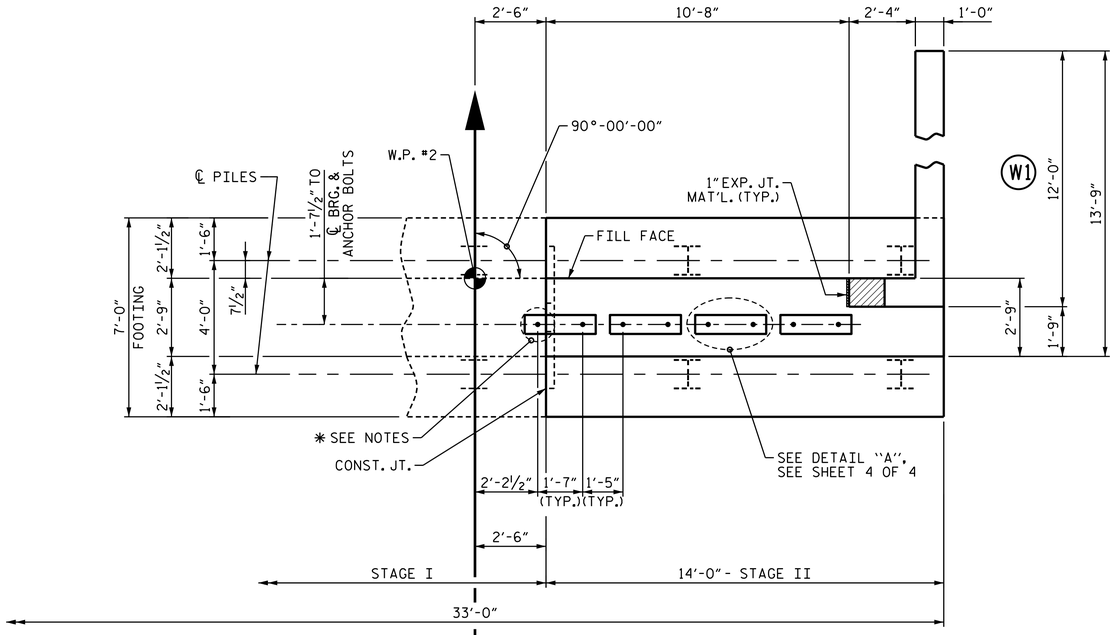
DocuSigned by: Thomas M. Harris

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

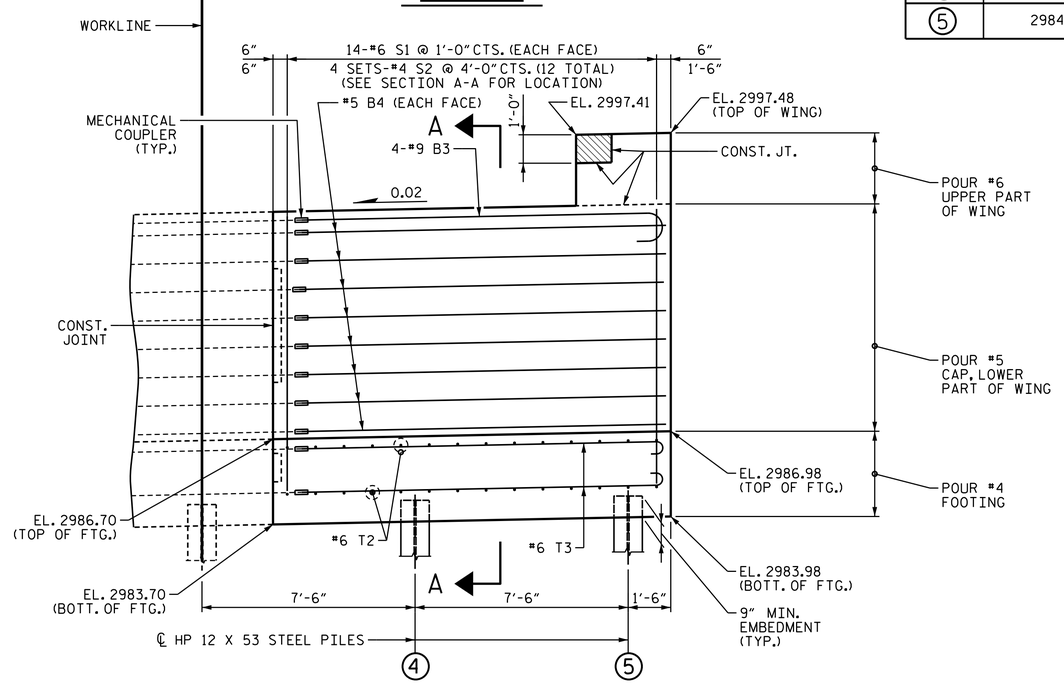
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			23

DESIGNED BY: S. NATARAJAN DATE: MAY 2017
DRAWN BY: M.J. OSTRISHKO DATE: MAY 2017
CHECKED BY: T.M. HARRIS DATE: OCT 2018
DESIGN ENGINEER OF RECORD: S. NATARAJAN DATE: OCT 2018

3/26/2019
J:\18836OC - 2015 W Divisions Planning & Design On-Call\18836OC Group 3 Bridges\17BP.R174.430401\Structures\Drafting\DGNs\401.033.17BP.14.R.174.SMU.EB201.dgn



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR #6 T2 & #6 T3 PLACEMENT, SEE "FOOTING PLAN" SHEET 4 OF 4.

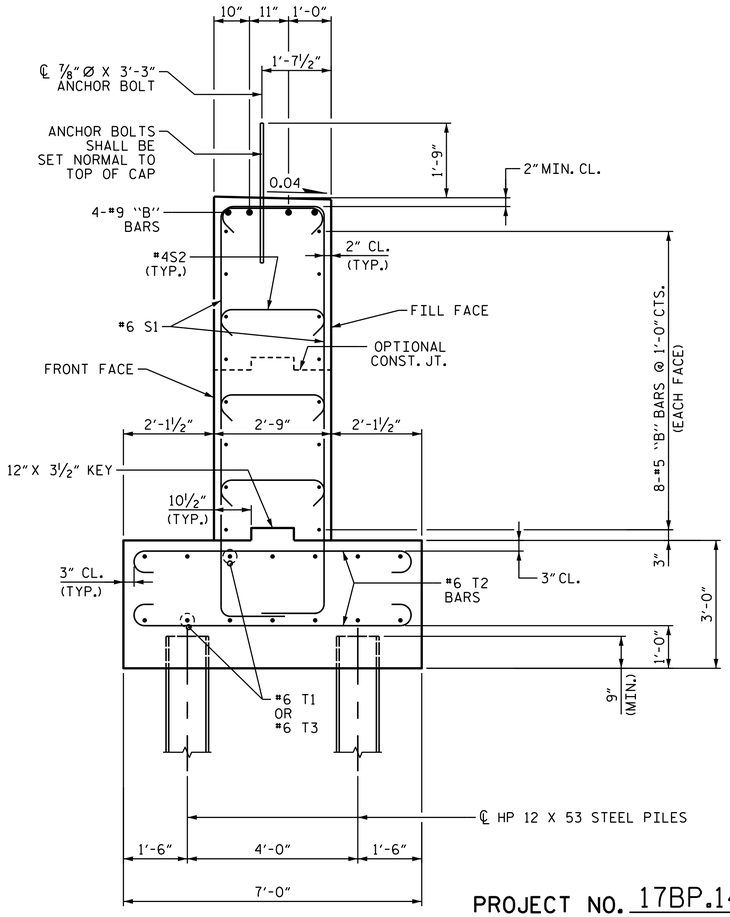
TOP OF PILE ELEVATIONS	
④	2984.56
⑤	2984.71

NOTES

FOR ADDITIONAL NOTES, SEE SHEET 1 OF 4.

✱ THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THIS ANCHOR BOLT MAY BE PLACED IN STAGE I OR DRILLED AND GROUTED IN STAGE II.

FOR TOP OF CAP ELEVATIONS SEE SHEET 1 OF 4.



SECTION A-A

PROJECT NO. 17BP.14.R.174
HAYWOOD COUNTY
STATION: 13+26.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
STAGE II

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

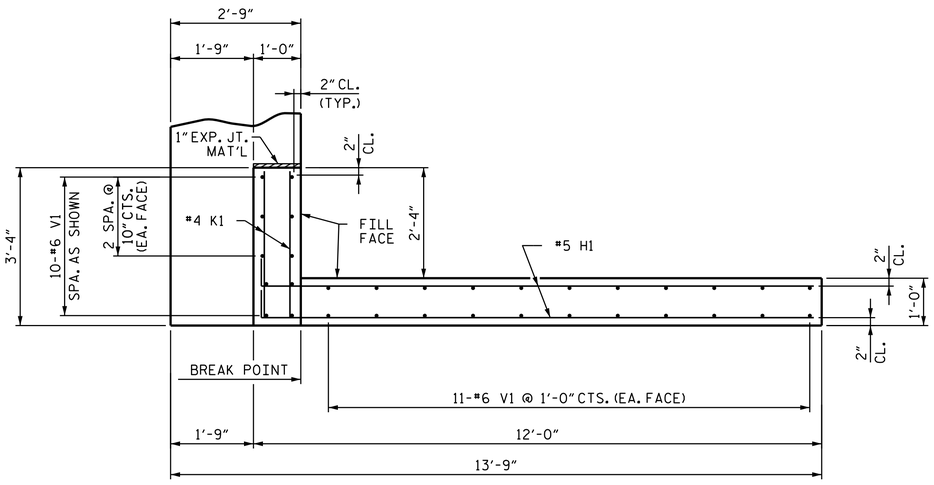
NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS
DocuSigned by: Thomas M. Harris
0B08969964884D3...

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

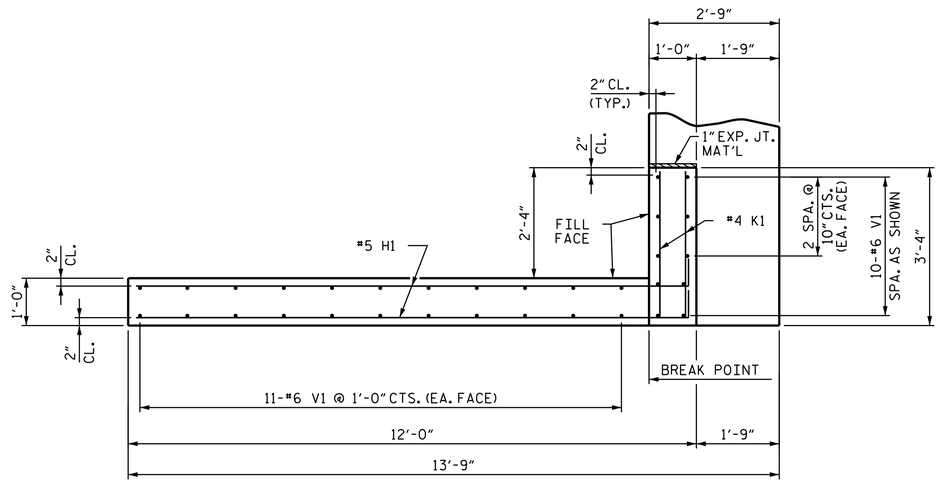
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			23

DESIGNED BY:	S. NATARAJAN	DATE :	MAY 2017
DRAWN BY:	M.J. OSTRISHKO	DATE :	MAY 2017
CHECKED BY:	T.M. HARRIS	DATE :	OCT 2018
DESIGN ENGINEER OF RECORD:	S. NATARAJAN	DATE :	OCT 2018

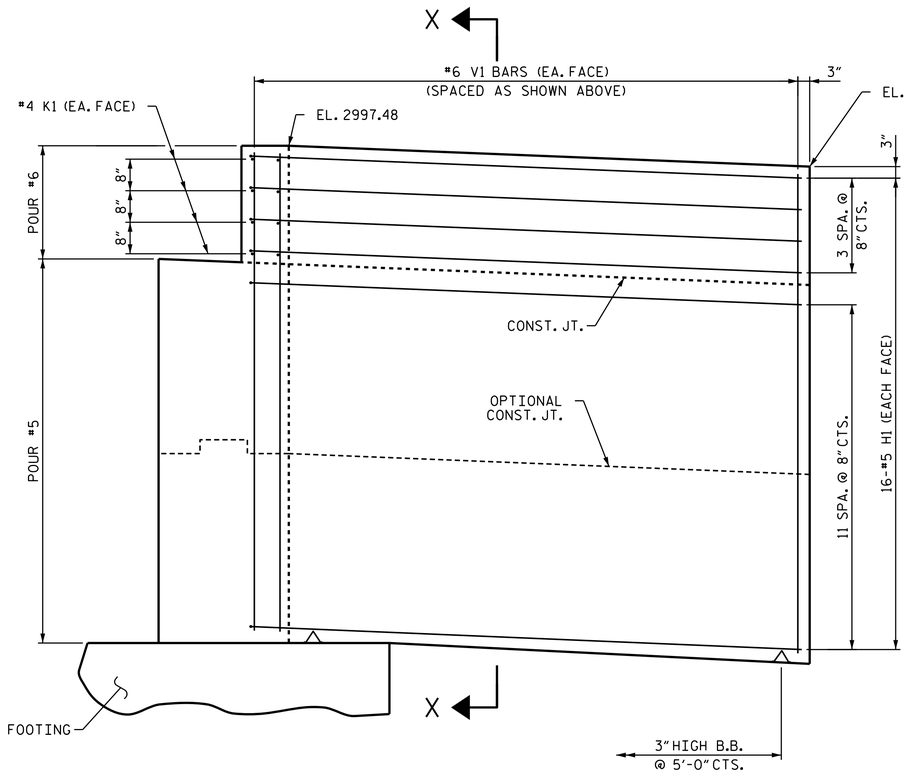
3/26/2019
J:\188360C - 2015 W Divisions Planning & Design On-Call\188360C Group 3 Bridges\17BP.R.T74.43040\Structures\Drafting\DGNs\401_035_17BP_14_R_174_SMU_EB202.dgn



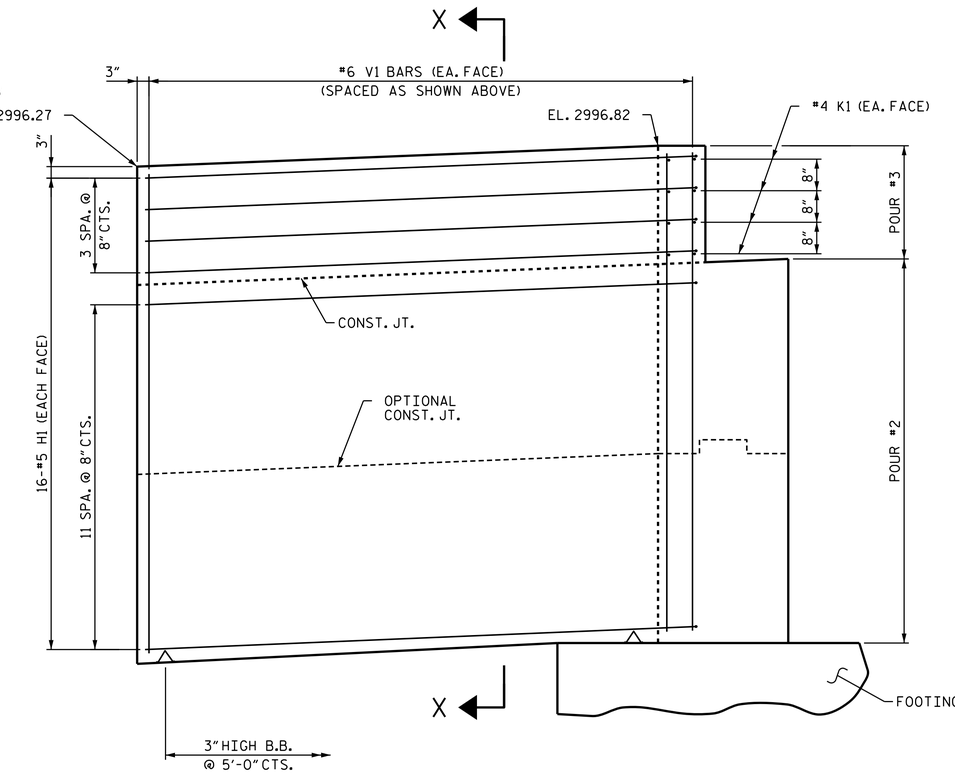
PLAN OF WING (W1)



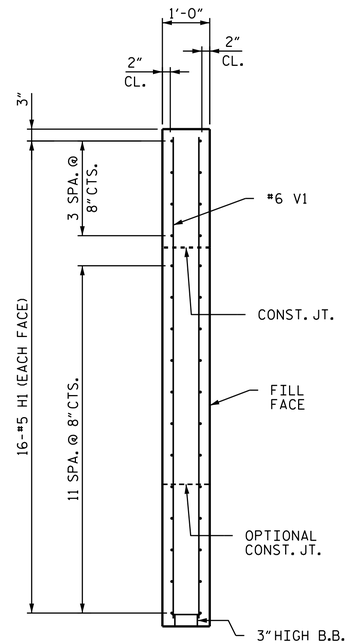
PLAN OF WING (W2)



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X

WING DETAILS

DESIGNED BY:	S. NATARAJAN	DATE :	MAY 2017
DRAWN BY:	M.J. OSTRISHKO	DATE :	JUN 2017
CHECKED BY:	T.M. HARRIS	DATE :	OCT 2018
DESIGN ENGINEER OF RECORD:	S. NATARAJAN	DATE :	OCT 2018

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris

PROJECT NO. 17BP.14.R.174

HAYWOOD COUNTY

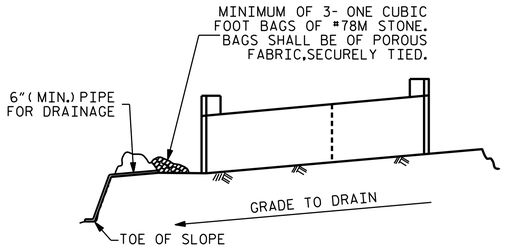
STATION: 13+26.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			23

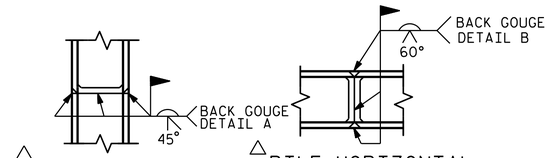


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

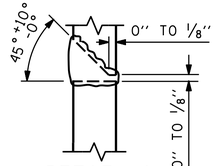
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

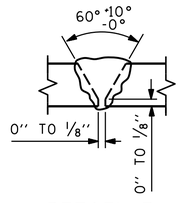


△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



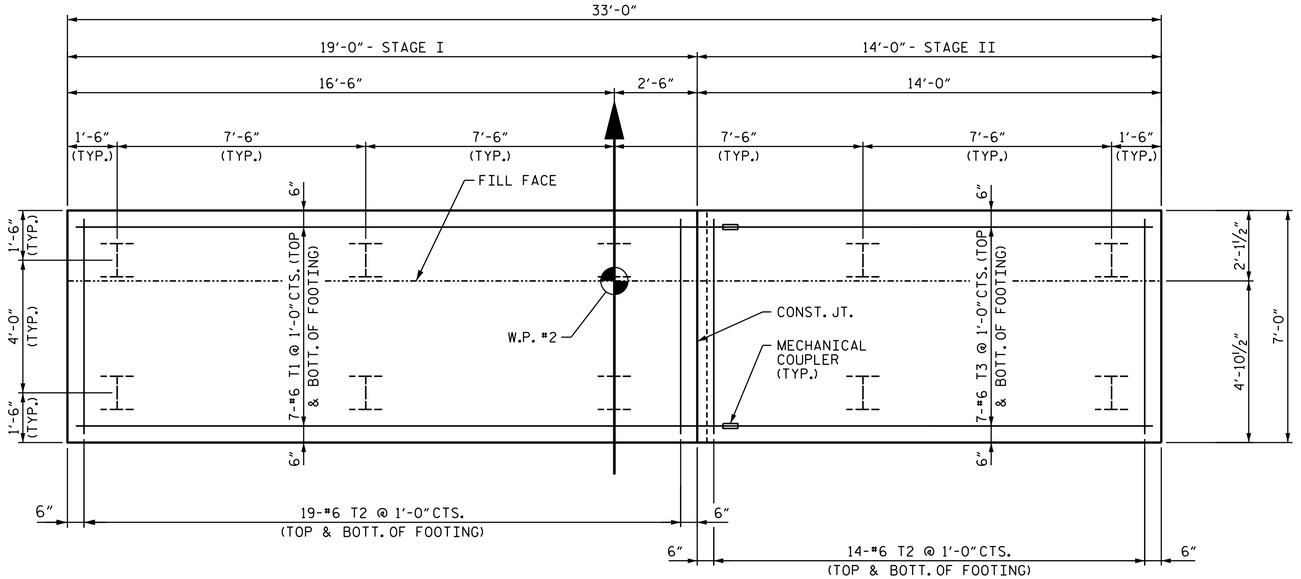
DETAIL A



DETAIL B

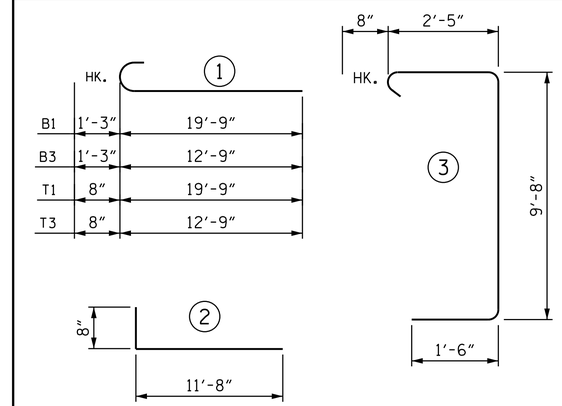
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



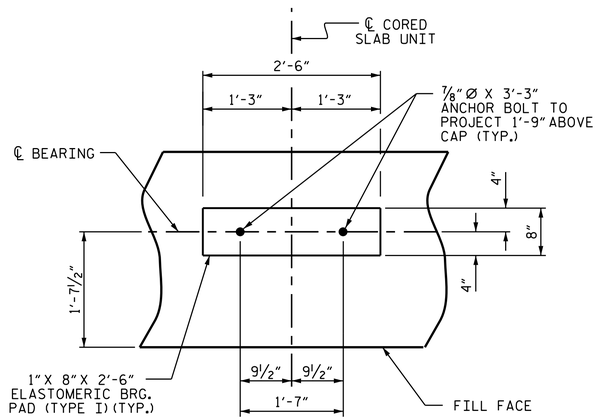
FOOTING PLAN

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

STAGE I	STAGE II
HP 12 X 53 STEEL PILES NO: 6 LIN. FT.= 120	HP 12 X 53 STEEL PILES NO: 4 LIN. FT.= 60
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 6	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 4
STEEL PILES POINTS NO. 6	STEEL PILES POINTS NO. 4
PREDRILLING FOR PILES LIN. FT. = 15	PREDRILLING FOR PILES LIN. FT. = 15



DETAIL "A"

BILL OF MATERIAL
STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#9	1	21'-0"	286
B2	20	#5	STR	19'-9"	412
H1	32	#5	2	12'-4"	412
K1	8	#4	STR	2'-11"	16
S1	38	#6	3	14'-3"	813
S2	15	#4	4	3'-2"	32
T1	14	#6	1	20'-5"	429
T2	38	#6	5	7'-10"	447
V1	32	#6	STR	10'-2"	489
REINFORCING STEEL				LBS.	3,336

CLASS A CONCRETE BREAKDOWN

POUR #1	FOOTING	14.8 C.Y.
POUR #2	CAP, LOWER PART OF WINGS	18.8 C.Y.
POUR #3	UPPER PART OF WING	1.3 C.Y.
TOTAL CLASS A CONCRETE		34.9 C.Y.

BILL OF MATERIAL
STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3	4	#9	1	14'-0"	190
B4	20	#5	STR	12'-9"	266
H1	32	#5	2	12'-4"	412
K1	8	#4	STR	2'-11"	16
S1	28	#6	3	14'-3"	599
S2	12	#4	4	3'-2"	25
T2	28	#6	5	7'-10"	329
T3	14	#6	1	13'-5"	282
V1	32	#6	STR	10'-2"	489
REINFORCING STEEL				LBS.	2,608

CLASS A CONCRETE BREAKDOWN

POUR #4	FOOTING	10.9 C.Y.
POUR #5	CAP, LOWER PART OF WINGS	14.6 C.Y.
POUR #6	UPPER PART OF WING	1.3 C.Y.
TOTAL CLASS A CONCRETE		26.8 C.Y.

PROJECT NO. 17BP.14.R.174

HAYWOOD COUNTY

STATION: 13+26.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

DESIGNED BY: S. NATARAJAN DATE : MAY 2017
DRAWN BY: M.J. OSTRISHKO DATE : JUN 2017
CHECKED BY: T.M. HARRIS DATE : OCT 2018
DESIGN ENGINEER OF RECORD: S. NATARAJAN DATE : OCT 2018

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

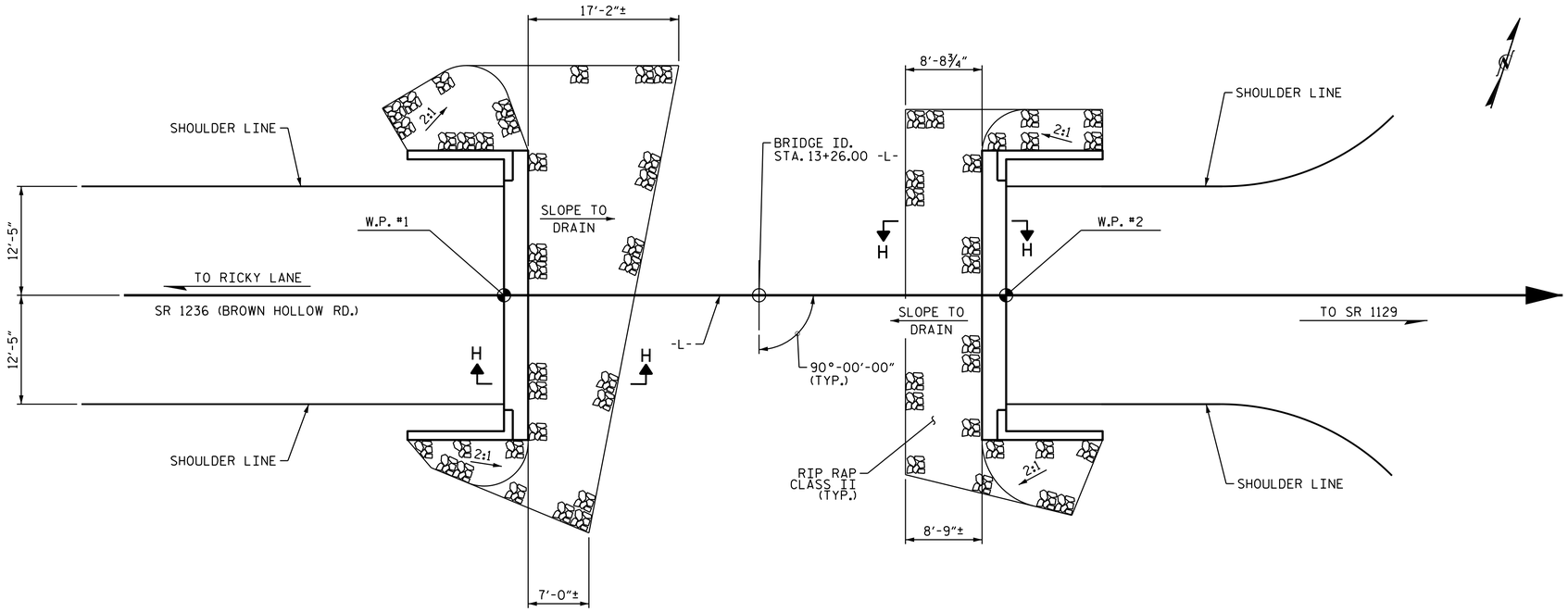
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris

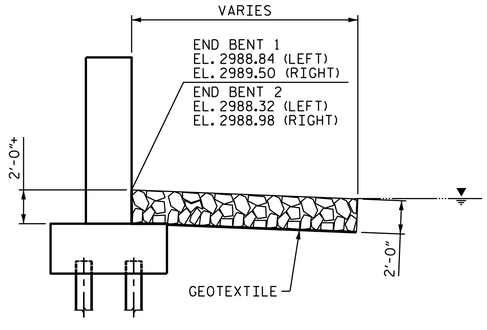
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			23

3/26/2019
J:\1883600 - 2015 W Divisions Planning & Design On-Call\1883600 Group 3 Bridges\17BP.R.T4.43040\1\Structures\Drafting\DGNs\401.039.17BP.14.R.174.SMU.EB204.dgn



PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 13+26.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	90	97
END BENT 2	65	70



SECTION H-H

PROJECT NO. 17BP.14.R.174

HAYWOOD COUNTY

STATION: 13+26.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

DESIGNED BY: S. NATARAJAN DATE : JUN 2017
DRAWN BY: M.J. OSTRISHKO DATE : JUN 2017
CHECKED BY: T.M. HARRIS DATE : OCT 2018
DESIGN ENGINEER OF RECORD: S. NATARAJAN DATE : OCT 2018

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

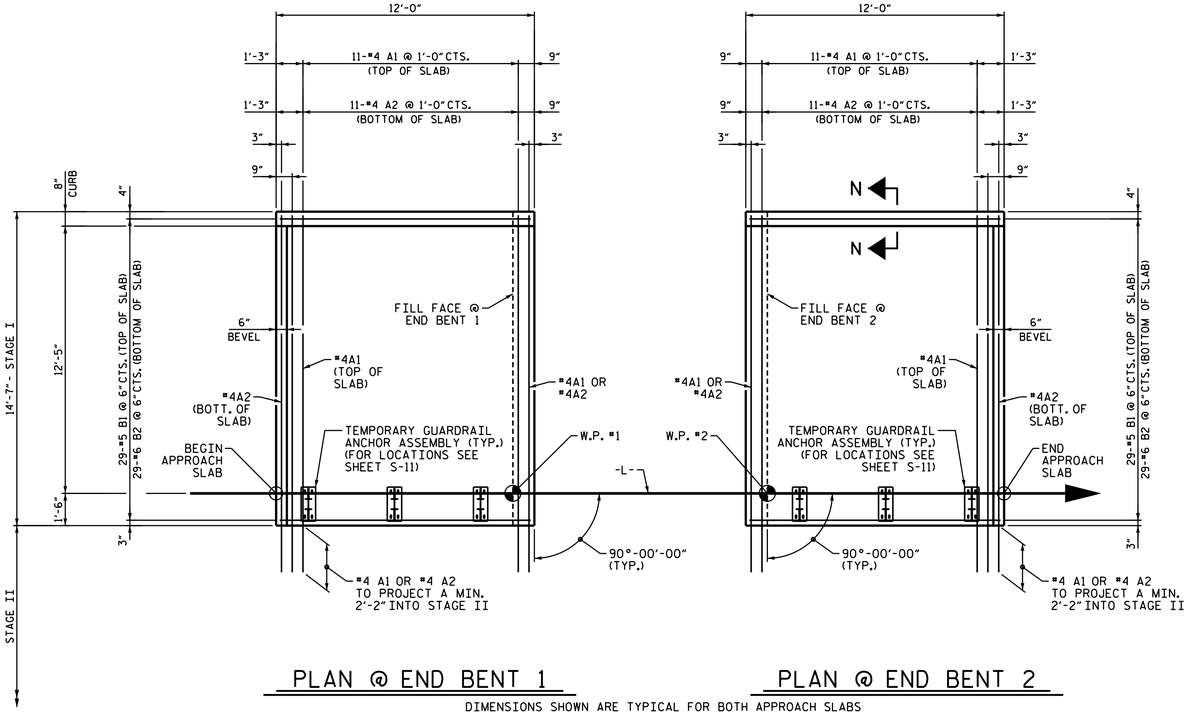
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			23

3/26/2019 J:\188360C - 2015 W Divisions Planning & Design On-Call\188360C Group 3 Bridges\17BP.R.174.43040I\Structures\Drafting\DGNs\401.041.17BP.14.R.174_SMU_RR01.dgn



PLAN @ END BENT 1

PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

NOTES

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

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

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

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

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

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

APPROACH SLAB GROOVING IS NOT REQUIRED.

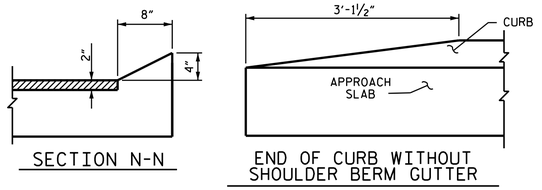
BILL OF MATERIAL

APPROACH SLAB AT END BENT 1 - STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	16'-7"	144
A2	13	#4	STR	16'-7"	144
* B1	29	#5	STR	11'-1"	335
B2	29	#6	STR	11'-7"	505
REINFORCING STEEL				LBS.	649
* EPOXY COATED REINFORCING STEEL				LBS.	479
CLASS AA CONCRETE				C.Y.	8.4

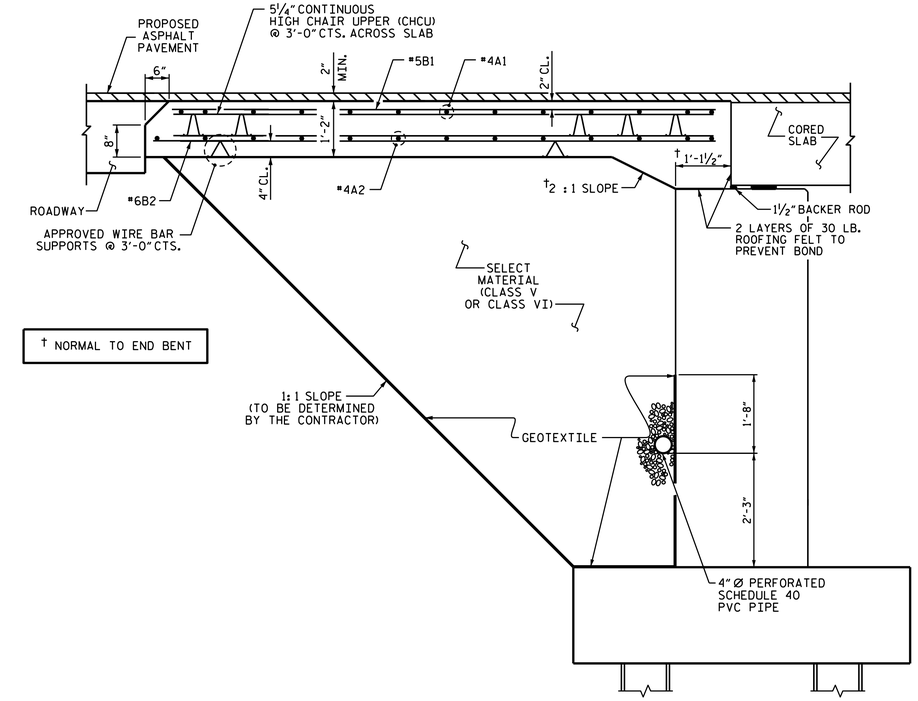
APPROACH SLAB AT END BENT 2 - STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	16'-7"	144
A2	13	#4	STR	16'-7"	144
* B1	29	#5	STR	11'-1"	335
B2	29	#6	STR	11'-7"	505
REINFORCING STEEL				LBS.	649
* EPOXY COATED REINFORCING STEEL				LBS.	479
CLASS AA CONCRETE				C.Y.	8.4

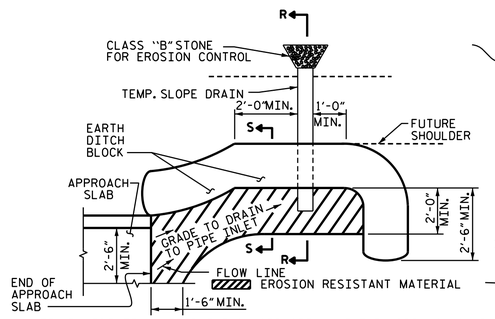


CURB DETAILS

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"

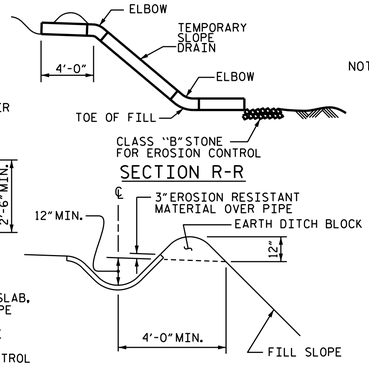


SECTION THRU SLAB



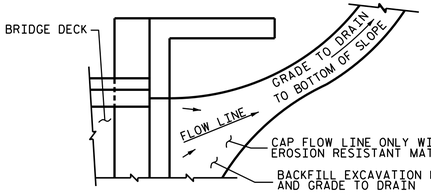
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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



TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. 17BP.14.R.174

HAYWOOD COUNTY

STATION: 13+26.00 -L-

DESIGNED BY:	S. NATARAJAN	DATE :	MAY 2017
DRAWN BY:	M.J. OSTRISHKO	DATE :	MAY 2017
CHECKED BY:	T.M. HARRIS	DATE :	OCT 2018
DESIGN ENGINEER OF RECORD:	S. NATARAJAN	DATE :	OCT 2018

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

1/7/2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

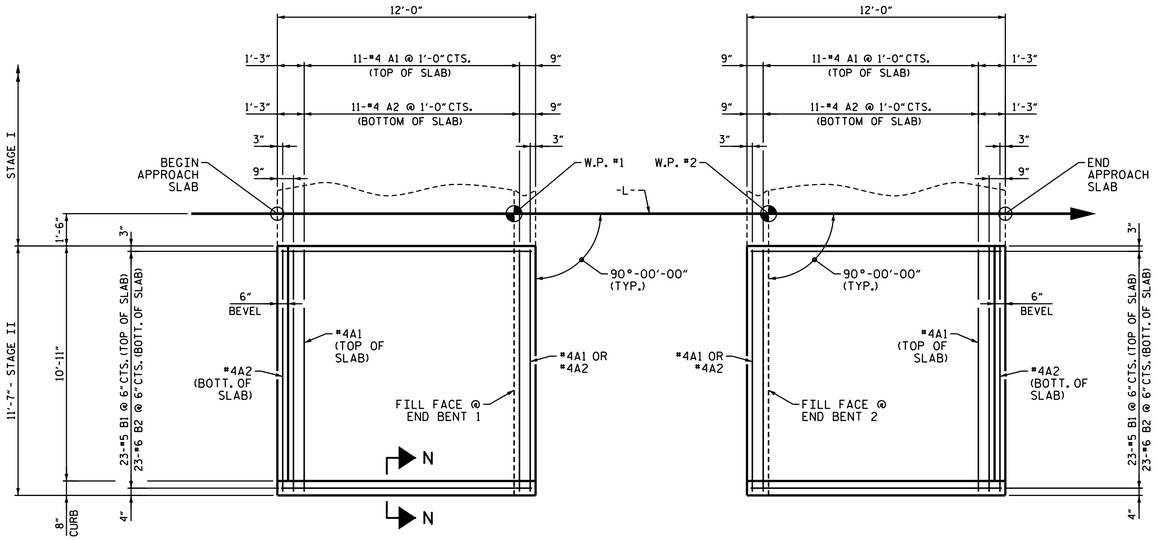
STAGE I

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			23

1/6/2021
J:\188360C - 2015 W Divisions Planning & Design On-Call\188360C Group 3 Bridges\17BP.R174,430401\Structures\Drafting\DGNs\401.043.17BP.14.R.174_SMU.AS01_REV1.dgn



PLAN @ END BENT 1 PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

NOTES

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

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

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

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

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

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

APPROACH SLAB GROOVING IS NOT REQUIRED.

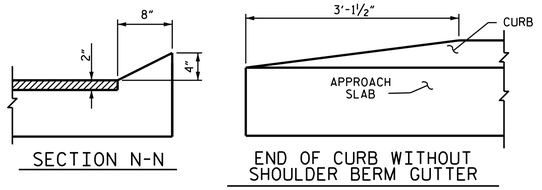
BILL OF MATERIAL

APPROACH SLAB AT END BENT 1 - STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	11'-3"	98
A2	13	#4	STR	11'-3"	98
* B1	23	#5	STR	11'-1"	266
B2	23	#6	STR	11'-7"	400
REINFORCING STEEL				LBS.	498
* EPOXY COATED REINFORCING STEEL				LBS.	364
CLASS AA CONCRETE				C.Y.	6.7

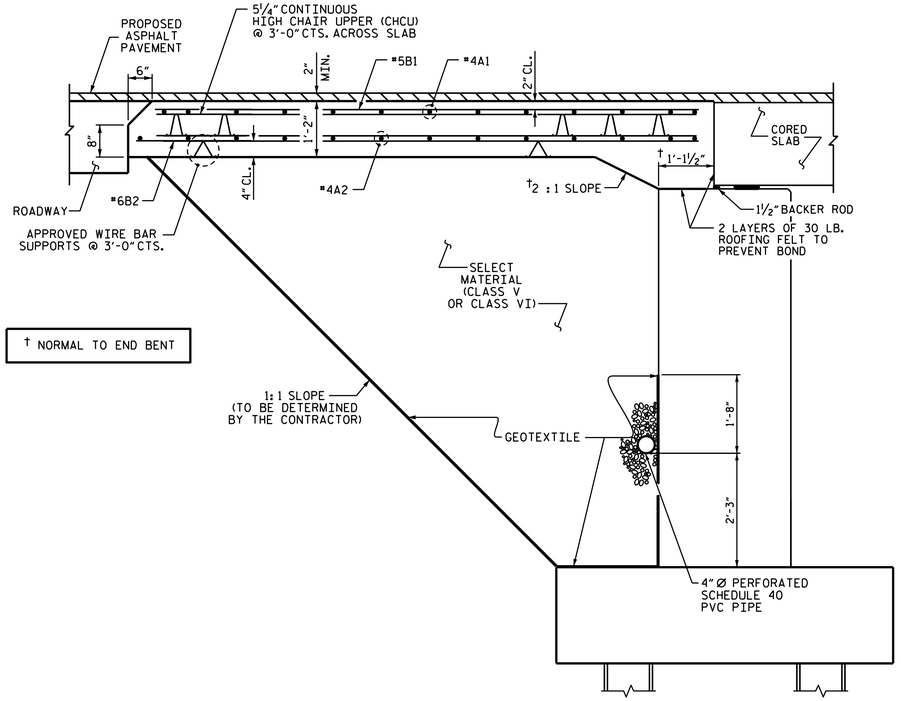
APPROACH SLAB AT END BENT 2 - STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	11'-3"	98
A2	13	#4	STR	11'-3"	98
* B1	23	#5	STR	11'-1"	266
B2	23	#6	STR	11'-7"	400
REINFORCING STEEL				LBS.	498
* EPOXY COATED REINFORCING STEEL				LBS.	364
CLASS AA CONCRETE				C.Y.	6.7

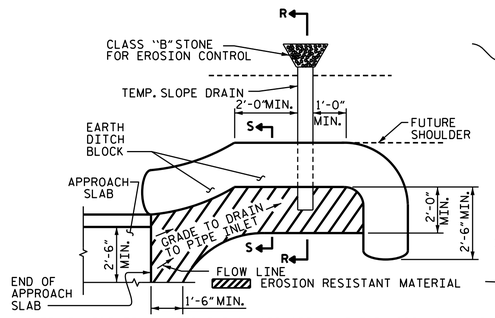


CURB DETAILS

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"

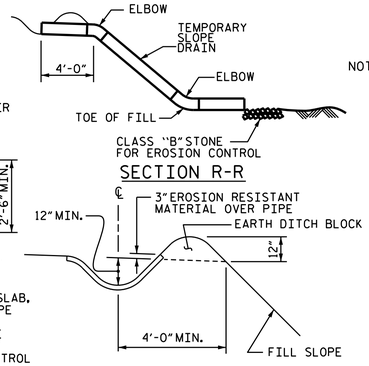


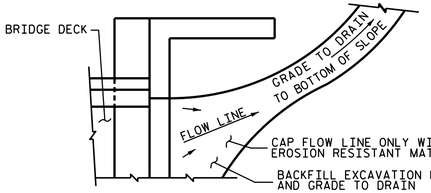
SECTION THRU SLAB



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





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

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. 17BP.14.R.174

HAYWOOD COUNTY

STATION: 13+26.00 -L-

DESIGNED BY:	S. NATARAJAN	DATE :	MAY 2017		
DRAWN BY:	M.J. OSTRISHKO	DATE :	MAY 2017		
CHECKED BY:	T.M. HARRIS	DATE :	OCT 2018		
DESIGN ENGINEER OF RECORD:	S. NATARAJAN	DATE :	OCT 2018		

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS W. HARRIS

DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

1/7/2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STAGE II

BRIDGE APPROACH SLAB

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			23

1/6/2021
J:\188360C - 2015 W Divisions Planning & Design On-Call\188360C Group 3 Bridges\17BP.R174,430401\Structures\Drafting\DGNs\401.045.17BP.14.R.174_SMU.AS02_REV1.dgn

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	

3/28/2019
J:\I88360C - 2015 W Divisions Planning & Design On-Call\I88360C Group 3 Bridges\17BP.R174.430401\Structures\Drafting\DGNs\401_047_17BP.14.R.174_SMU_SN.dgn
USM004281