09/08/99

TIP PROJECT: BR–0115

CONTRACT: C204516

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

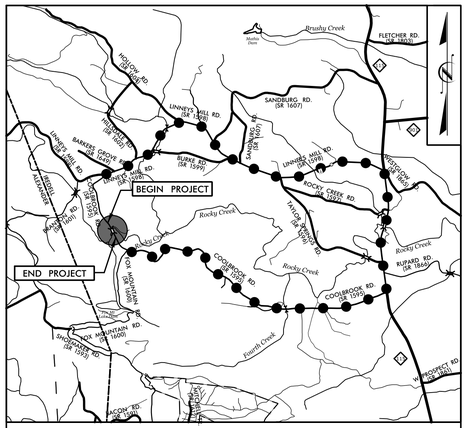
IREDELL COUNTY

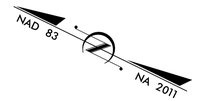
LOCATION: BRIDGE #166 OVER ROCKY CREEK ON SR 1595 (COOLBROOK RD)

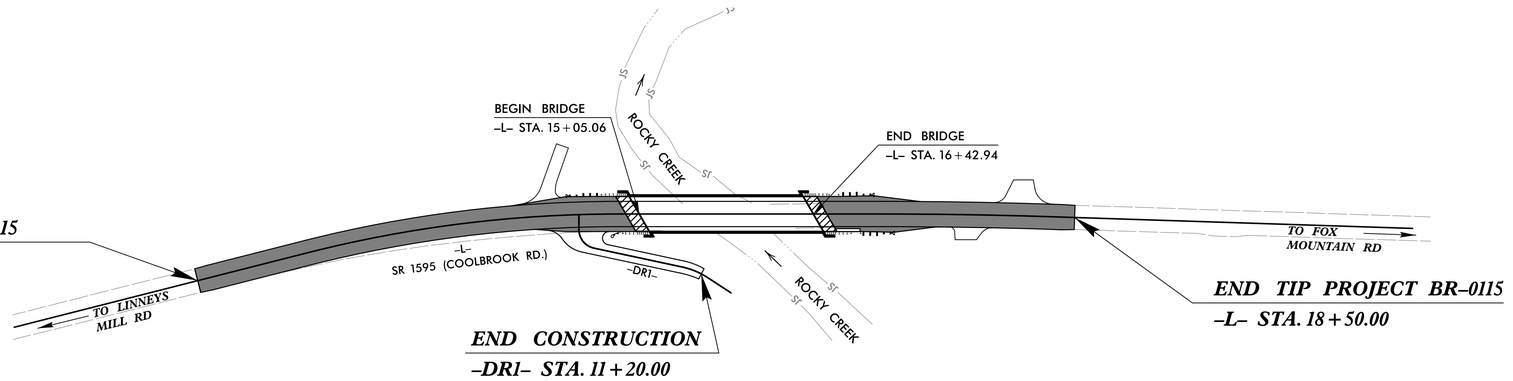
TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR–0115		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
48824.1.1		P.E.
48824.2.1		R.O.W/UTIL
48824.3.1	2020001	CONSTRUCTION







STRUCTURE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

ADT 2020 = 653
ADT 2040 = 1120
DHV = N/A
D = N/A
T = N /A
V = 35 MPH

FUNC. CLASSIFICATION:
LOCAL
SUB–REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT BR–0115 = 0.107 MILES

LENGTH OF STRUCTURE TIP PROJECT BR–0115 = 0.026 MILES

TOTAL LENGTH OF TIP PROJECT BR–0115 = 0.133 MILES

NCDOT CONTACT: DAVID STUTTS, PE
Structures Management Unit

PLANS PREPARED FOR THE NCDOT BY:

STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F–0991

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 27, 2019

LETTING DATE:
DECEMBER 15, 2020

J. WESLEY JONES, PE
PROJECT ENGINEER

LOGAN A. HEDRICK, EI
PROJECT DESIGNER

STRUCTURAL ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 ENGINEER WESLEY JONES
10/23/2020

P.E.

SIGNATURE:

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

10/23/2020
R:\Structures\Ustation\Finals\401_000_BR-0115_SMU_TSH_480166.dgn
JJones

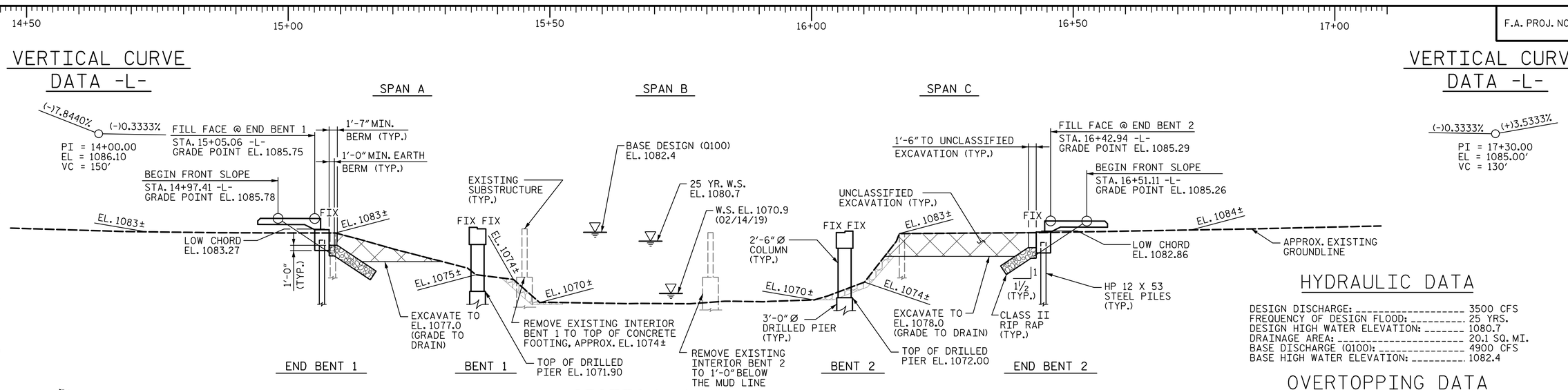
F.A. PROJ. NO. 2020001

VERTICAL CURVE DATA -L-

PI = 14+00.00
EL = 1086.10
VC = 150'

VERTICAL CURVE DATA -L-

PI = 17+30.00
EL = 1085.00'
VC = 130'



SECTION ALONG -L-

(SECTION AT BENTS TAKEN AT RIGHT ANGLES)

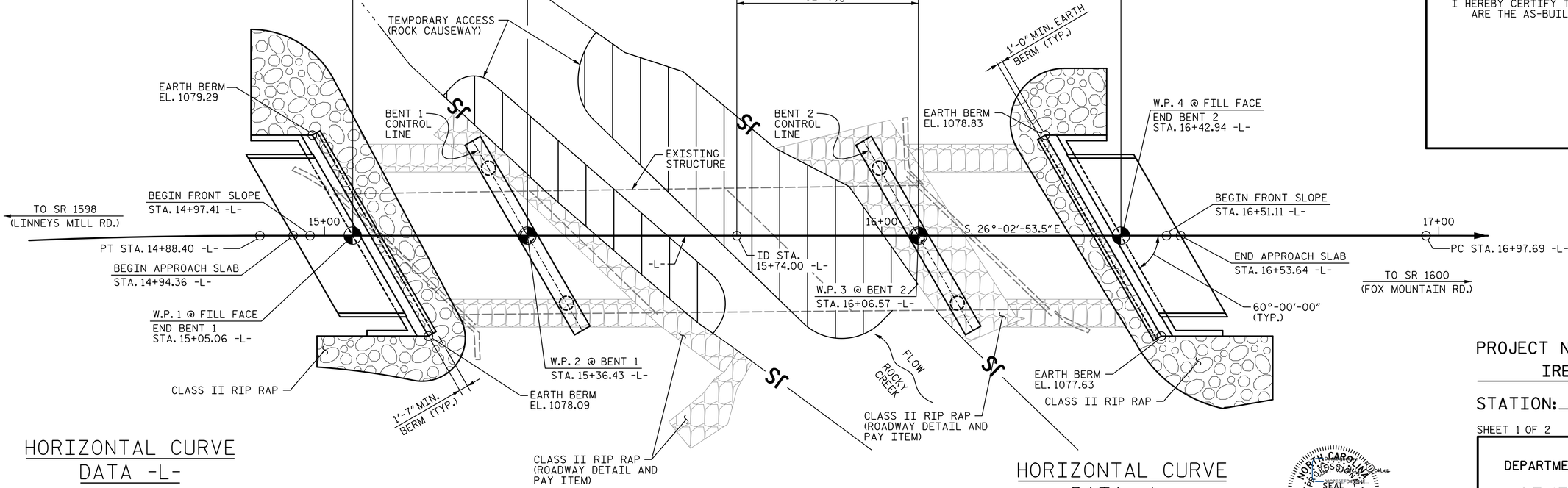
HYDRAULIC DATA

DESIGN DISCHARGE: _____ 3500 CFS
FREQUENCY OF DESIGN FLOOD: _____ 25 YRS.
DESIGN HIGH WATER ELEVATION: _____ 1080.7
DRAINAGE AREA: _____ 20.1 SQ. MI.
BASE DISCHARGE (Q100): _____ 4900 CFS
BASE HIGH WATER ELEVATION: _____ 1082.4

OVERTOPPING DATA

OVERTOPPING DISCHARGE: _____ 8400 CFS
FREQUENCY OF OVERTOPPING: _____ 500+ YRS.
OVERTOPPING FLOOD ELEVATION: _____ 1085.3
OVERTOPS @ STA. 16+76.21 -L-

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



PLAN

(STEEL PILES NOT SHOWN FOR CLARITY)

HORIZONTAL CURVE DATA -L-

PI STA. = 13+64.78
Δ = 14°-14'-23.5" (RT.)
D = 5°-43'-46.5"
L = 248.53'
T = 124.91'
R = 1,000.00'

HORIZONTAL CURVE DATA -L-

PI STA. = 17+62.06
Δ = 1°-50'-37.6" (RT.)
D = 1°-25'-56.6"
L = 128.72'
T = 64.37'
R = 4,000.00'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 J. WESLEY JONES 3/15/2020

STV 100 Years
STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : LAH DATE : 8-19
CHECKED BY : JWJ DATE : 1-20
DESIGN ENGINEER OF RECORD : JWJ DATE : 3-20

PROJECT NO. BR-0115
IREDELL COUNTY
STATION: 15+74.00 -L-

SHEET 1 OF 2 REPLACES BRIDGE NO. 166

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1595 (COOLBROOK RD.) OVER ROCKY CREEK BETWEEN SR 1598 AND SR 1600

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

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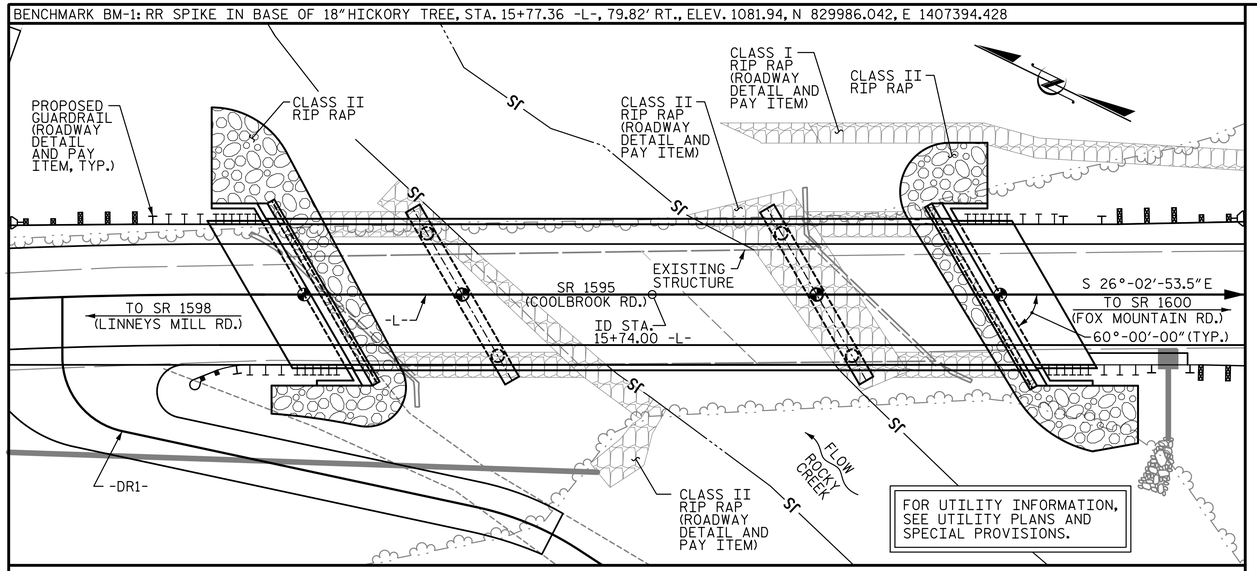
3/11/2020 5:08:54 PM
JJones

BENCHMARK BM-1: RR SPIKE IN BASE OF 18"HICKORY TREE, STA. 15+77.36 -L-, 79.82' RT., ELEV. 1081.94, N 829986.042, E 1407394.428



LOCATION SKETCH

FOUNDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 63 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 105 TONS PER PILE.

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

DRILLED PIERS AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 340 TONS/PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 120 TSF.

INSTALL DRILLED PIERS AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN 1041 FT., SATISFY THE REQUIRED TIP RESISTANCE, AND HAVE A PENETRATION OF AT LEAST 6 FT. INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT BENT NO. 1. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 1063 FT. (LT) AND 1068 FT. (RT) WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS 1061 FT. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRILLED PIERS AT BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 340 TONS/PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 120 TSF.

INSTALL DRILLED PIERS AT BENT NO. 2 TO A TIP ELEVATION NO HIGHER THAN 1041 FT., SATISFY THE REQUIRED TIP RESISTANCE, AND HAVE A PENETRATION OF AT LEAST 6 FT. INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 2 IS 1054 FT. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT BENT NO. 2. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 1060 FT. WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

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

PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 66 TONS PER PILE.

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

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE AT STA. 15+74.00 -L-	ASBESTOS ASSESSMENT	3'-0" Ø DRILLED PIERS IN SOIL
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.
SUPERSTRUCTURE				
END BENT 1				
BENT 1				41.0
BENT 2				61.0
END BENT 2				
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	102.0

TOTAL BILL OF MATERIAL (CONT'D.)

	3'-0" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	
	LIN. FT.	LIN. FT.	EA.	LUMP SUM	CU. YD.	LUMP SUM	LBS.	LBS.	EA.	NO.	LIN. FT.
SUPERSTRUCTURE											
END BENT 1					22.4		2,736		5	5	90
BENT 1	52.0	22.0			19.1		11,876	2,041			
BENT 2	32.0	36.0			19.0		11,823	2,024			
END BENT 2					22.4		2,736		5	5	150
TOTAL	84.0	58.0	1	LUMP SUM	82.9	LUMP SUM	29,171	4,065	10	10	240

TOTAL BILL OF MATERIAL (CONT'D.)

	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS		3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLABS		FIBER OPTIC CONDUIT SYSTEM
	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.	NO.	LIN. FT.	LIN. FT.
SUPERSTRUCTURE	270.57				20	750.0	10	700.0	266.6
END BENT 1		125	140						
BENT 1									
BENT 2									
END BENT 2		120	130						
TOTAL	270.57	245	270	LUMP SUM	20	750.0	10	700.0	266.6

GENERAL NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE EXISTING STRUCTURE CONSISTING OF (2) 36'-0" & (1) 35'-0" TIMBER DECK WITH ASPHALT WEARING SURFACE ON 10 LINES OF STEEL I-BEAMS SPANS WITH A CLEAR ROADWAY WIDTH OF 23'-1" ON CONCRETE ABUTMENTS AND STEEL CAPS WITH CONCRETE ENCASED STEEL H-PILES AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. FOR PARTIAL REMOVAL OF INTERIOR BENTS, SEE SHEET 1 OF 2. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 15+74.00 -L-.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA (ON SHEET 1 OF 2) SHALL BE EXCAVATED FOR A DISTANCE FROM THE CENTERLINE OF ROADWAY OF 37'± (LEFT) AND 26'± (RIGHT) AT END BENT 1 TO EL. 1077.0 AND 30'± (LEFT) AND 31'± (RIGHT) AT END BENT 2 TO EL. 1078.0, 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.

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 15+74.00 -L-".

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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.

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

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.

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

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

FOR FIBER OPTIC CONDUIT SYSTEM, SEE SPECIAL PROVISIONS.

SAMPLE BAR REPLACEMENT	
SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"
#8	12'-0"
#9	13'-2"
#10	14'-6"
#11	15'-10"

NOTE:
SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND f_y = 60ksi.

PROJECT NO. BR-0115

IREDELL COUNTY

STATION: 15+74.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1595 (COOLBROOK RD.) OVER ROCKY CREEK BETWEEN SR 1598 AND SR 1600

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 J. WESLEY JONES
9/15/2020

STV 100 Years
STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

DRAWN BY : WAW DATE : 10-19
CHECKED BY : JWJ DATE : 1-20
DESIGN ENGINEER OF RECORD : JWJ DATE : 3-20

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	**1**	1.202	--	1.75	0.256	2.04	30′	EL	14.423	0.655	**1.2**	30′	EL	**1.442**	0.80	0.256	1.75	30′	EL	14.423	
		HL-93(Opr)	N/A	--	1.558	--	1.35	0.256	2.64	30′	EL	14.423	0.655	1.56	30′	EL	1.442	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	**2**	1.365	49.124	1.75	0.256	2.82	30′	EL	11.538	0.655	**1.36**	30′	EL	**1.442**	0.80	0.256	2.45	30′	EL	11.538	
		HS-20(Opr)	36.000	--	1.769	63.679	1.35	0.256	3.65	30′	EL	11.538	0.655	1.77	30′	EL	1.442	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.333	45.002	1.4	0.256	5.76	30′	EL	14.423	0.655	3.33	30′	EL	1.442	0.80	0.256	3.95	30′	EL	14.423	
		SNGARBS2	20.000	--	2.581	51.624	1.4	0.256	5.04	30′	EL	11.538	0.655	2.58	30′	EL	1.442	0.80	0.256	3.50	30′	EL	11.538	
		SNAGRIS2	22.000	--	2.487	54.723	1.4	0.256	5.13	30′	EL	11.538	0.655	2.49	30′	EL	1.442	0.80	0.256	3.56	30′	EL	11.538	
		SNCOTTS3	27.250	--	1.684	45.891	1.4	0.256	2.89	30′	EL	14.423	0.655	1.68	30′	EL	1.442	0.80	0.256	1.99	30′	EL	14.423	
		SNAGGRS4	34.925	--	1.551	54.185	1.4	0.256	2.79	30′	EL	14.423	0.655	1.55	30′	EL	1.442	0.80	0.256	1.91	30′	EL	14.423	
		SNS5A	35.550	--	1.645	58.469	1.4	0.256	2.7	30′	EL	14.423	0.655	1.64	30′	EL	1.442	0.80	0.256	1.85	30′	EL	14.423	
		SNS6A	39.950	--	1.547	61.791	1.4	0.256	2.55	30′	EL	14.423	0.655	1.55	30′	EL	1.442	0.80	0.256	1.75	30′	EL	14.423	
		SNS7B	42.000	--	1.578	66.285	1.4	0.256	2.48	30′	EL	14.423	0.655	1.58	30′	EL	1.442	0.80	0.256	1.70	30′	EL	14.423	
	TTST	TNAGRIT3	33.000	--	1.838	60.67	1.4	0.256	3.31	30′	EL	14.423	0.655	1.84	30′	EL	1.442	0.80	0.256	2.27	30′	EL	14.423	
		TNT4A	33.075	--	1.71	56.559	1.4	0.256	3.13	30′	EL	14.423	0.655	1.71	30′	EL	1.442	0.80	0.256	2.15	30′	EL	14.423	
		TNT6A	41.600	--	1.652	68.714	1.4	0.256	2.85	30′	EL	14.423	0.655	1.65	30′	EL	1.442	0.80	0.256	1.96	30′	EL	14.423	
		TNT7A	42.000	--	1.573	66.067	1.4	0.256	2.94	30′	EL	14.423	0.655	1.57	30′	EL	1.442	0.80	0.256	2.02	30′	EL	14.423	
		TNT7B	42.000	--	1.536	64.525	1.4	0.256	2.77	30′	EL	14.423	0.655	1.54	30′	EL	1.442	0.80	0.256	1.90	30′	EL	14.423	
		TNAGRIT4	43.000	--	1.486	63.9	1.4	0.256	2.87	30′	EL	14.423	0.655	1.49	30′	EL	1.442	0.80	0.256	1.97	30′	EL	14.423	
		TNAGT5A	45.000	--	1.594	71.736	1.4	0.256	2.79	30′	EL	14.423	0.655	1.59	30′	EL	1.442	0.80	0.256	1.92	30′	EL	14.423	
		TNAGT5B	45.000	**3**	1.399	62.946	1.4	0.256	2.68	30′	EL	11.538	0.655	**1.4**	30′	EL	**1.442**	0.80	0.256	1.85	30′	EL	11.538	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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

LRFR SUMMARY
FOR SPAN 'A'

PROJECT NO. BR-0115
IREDELL COUNTY
STATION: 15+74.00 -L-

STV 100 Years
STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
LRFR SUMMARY FOR 30′ CORED SLAB UNIT 60° SKEW
(NON-INTERSTATE TRAFFIC)

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

DRAWN BY :	WAW	DATE : 10-19
CHECKED BY :	JWJ	DATE : 12-19
DESIGN ENGINEER OF RECORD :	JWJ	DATE : 3-20
DRAWN BY : CVC 6/10		
CHECKED BY : DNS 6/10		

STD. NO. 21LRFR1_60&120S_30L

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	**1**	1.06	--	1.75	0.248	1.14	70′	EL	34.423	0.655	**1.06**	70′	EL	**6.885**	0.80	0.248	1.11	70′	EL	34.423	
		HL-93(Opr)	N/A	--	1.374	--	1.35	0.248	1.48	70′	EL	34.423	0.655	1.37	70′	EL	6.885	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	**2**	1.32	47.508	1.75	0.248	1.48	70′	EL	34.423	0.655	**1.32**	70′	EL	**6.885**	0.80	0.248	1.44	70′	EL	34.423	
		HS-20(Opr)	36.000	--	1.711	61.585	1.35	0.248	1.91	70′	EL	34.423	0.655	1.71	70′	EL	6.885	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.204	43.258	1.4	0.248	4.12	70′	EL	34.423	0.655	3.9	70′	EL	6.885	0.80	0.248	3.20	70′	EL	34.423	
		SNGARBS2	20.000	--	2.403	48.063	1.4	0.248	3.09	70′	EL	34.423	0.655	2.78	70′	EL	6.885	0.80	0.248	2.40	70′	EL	34.423	
		SNAGRIS2	22.000	--	2.282	50.21	1.4	0.248	2.94	70′	EL	34.423	0.655	2.58	70′	EL	6.885	0.80	0.248	2.28	70′	EL	34.423	
		SNCOTTS3	27.250	--	1.595	43.463	1.4	0.248	2.05	70′	EL	34.423	0.655	1.95	70′	EL	6.885	0.80	0.248	1.59	70′	EL	34.423	
		SNAGGRS4	34.925	--	1.339	46.755	1.4	0.248	1.72	70′	EL	34.423	0.655	1.62	70′	EL	6.885	0.80	0.248	1.34	70′	EL	34.423	
		SNS5A	35.550	--	1.309	46.526	1.4	0.248	1.68	70′	EL	34.423	0.655	1.65	70′	EL	6.885	0.80	0.248	1.31	70′	EL	34.423	
		SNS6A	39.950	--	1.203	48.069	1.4	0.248	1.55	70′	EL	34.423	0.655	1.5	70′	EL	6.885	0.80	0.248	1.20	70′	EL	34.423	
		SNS7B	42.000	--	1.146	48.129	1.4	0.248	1.47	70′	EL	34.423	0.655	1.48	70′	EL	6.885	0.80	0.248	1.15	70′	EL	34.423	
	TTST	TNAGRIT3	33.000	--	1.468	48.444	1.4	0.248	1.89	70′	EL	34.423	0.655	1.79	70′	EL	6.885	0.80	0.248	1.47	70′	EL	34.423	
		TNT4A	33.075	--	1.475	48.79	1.4	0.248	1.9	70′	EL	34.423	0.655	1.74	70′	EL	6.885	0.80	0.248	1.48	70′	EL	34.423	
		TNT6A	41.600	--	1.208	50.272	1.4	0.248	1.55	70′	EL	34.423	0.655	1.58	70′	EL	6.885	0.80	0.248	1.21	70′	EL	34.423	
		TNT7A	42.000	--	1.216	51.061	1.4	0.248	1.56	70′	EL	34.423	0.655	1.55	70′	EL	6.885	0.80	0.248	1.22	70′	EL	34.423	
		TNT7B	42.000	--	1.261	52.955	1.4	0.248	1.62	70′	EL	34.423	0.655	1.44	70′	EL	6.885	0.80	0.248	1.26	70′	EL	34.423	
		TNAGRIT4	43.000	--	1.197	51.476	1.4	0.248	1.54	70′	EL	34.423	0.655	1.4	70′	EL	6.885	0.80	0.248	1.20	70′	EL	34.423	
		TNAGT5A	45.000	--	1.128	50.745	1.4	0.248	1.45	70′	EL	34.423	0.655	1.39	70′	EL	6.885	0.80	0.248	1.13	70′	EL	34.423	
		TNAGT5B	45.000	**3**	1.113	50.088	1.4	0.248	1.43	70′	EL	34.423	0.655	1.33	70′	EL	6.885	0.80	0.248	**1.11**	70′	EL	**34.423**	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

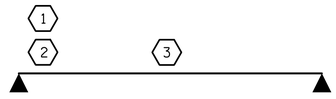
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

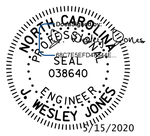
GIRDER LOCATION

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



LRFR SUMMARY
FOR SPAN 'B'

PROJECT NO. BR-0115
IREDELL COUNTY
STATION: 15+74.00 -L-



STV 100 Years
STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
LRFR SUMMARY FOR 70′ CORED SLAB UNIT 60° SKEW
(NON-INTERSTATE TRAFFIC)

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

DRAWN BY :	WAW	DATE : 10-19
CHECKED BY :	JWJ	DATE : 12-19
DESIGN ENGINEER OF RECORD :	JWJ	DATE : 3-20
DRAWN BY : CVC	6/10	
CHECKED BY : DNS	6/10	

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STD. NO. 24LRFR1_60&120S_70L

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**	1.142	--	1.75	0.254	1.5	35′	EL	16.923	0.653	**1.14**	35′	EL	**1.692**	0.80	0.254	1.16	35′	EL	16.923	
		HL-93(Opr)	N/A	--	1.48	--	1.35	0.254	1.95	35′	EL	16.923	0.653	1.48	35′	EL	1.692	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	**2**	1.318	47.43	1.75	0.254	1.99	35′	EL	13.538	0.653	**1.32**	35′	EL	**1.692**	0.80	0.254	1.54	35′	EL	16.923	
		HS-20(Opr)	36.000	--	1.708	61.484	1.35	0.254	2.57	35′	EL	13.538	0.653	1.71	35′	EL	1.692	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.649	35.758	1.4	0.254	4.3	35′	EL	16.923	0.653	3.39	35′	EL	1.692	0.80	0.254	2.65	35′	EL	16.923	
		SNGARBS2	20.000	--	2.276	45.521	1.4	0.254	3.64	35′	EL	13.538	0.653	2.56	35′	EL	1.692	0.80	0.254	2.28	35′	EL	13.538	
		SNAGRIS2	22.000	--	2.27	49.949	1.4	0.254	3.61	35′	EL	13.538	0.653	2.44	35′	EL	1.692	0.80	0.254	2.27	35′	EL	13.538	
		SNCOTTS3	27.250	--	1.326	36.138	1.4	0.254	2.15	35′	EL	16.923	0.653	1.71	35′	EL	1.692	0.80	0.254	1.33	35′	EL	16.923	
		SNAGGRS4	34.925	--	1.228	42.883	1.4	0.254	1.99	35′	EL	16.923	0.653	1.53	35′	EL	1.692	0.80	0.254	1.23	35′	EL	16.923	
		SNS5A	35.550	--	1.192	42.369	1.4	0.254	1.93	35′	EL	16.923	0.653	1.61	35′	EL	1.692	0.80	0.254	1.19	35′	EL	16.923	
		SNS6A	39.950	--	1.15	45.932	1.4	0.254	1.87	35′	EL	16.923	0.653	1.52	35′	EL	1.692	0.80	0.254	1.15	35′	EL	16.923	
		SNS7B	42.000	**3**	1.098	46.1	1.4	0.254	1.78	35′	EL	16.923	0.653	1.55	35′	EL	1.692	0.80	0.254	**1.10**	35′	EL	**16.923**	
	TTST	TNAGRIT3	33.000	--	1.422	46.913	1.4	0.254	2.31	35′	EL	16.923	0.653	1.77	35′	EL	1.692	0.80	0.254	1.42	35′	EL	16.923	
		TNT4A	33.075	--	1.419	46.934	1.4	0.254	2.3	35′	EL	16.923	0.653	1.67	35′	EL	1.692	0.80	0.254	1.42	35′	EL	16.923	
		TNT6A	41.600	--	1.244	51.758	1.4	0.254	2.02	35′	EL	16.923	0.653	1.64	35′	EL	1.692	0.80	0.254	1.24	35′	EL	16.923	
		TNT7A	42.000	--	1.286	54.015	1.4	0.254	2.09	35′	EL	16.923	0.653	1.52	35′	EL	1.692	0.80	0.254	1.29	35′	EL	16.923	
		TNT7B	42.000	--	1.263	53.051	1.4	0.254	2.05	35′	EL	16.923	0.653	1.48	35′	EL	1.692	0.80	0.254	1.26	35′	EL	16.923	
		TNAGRIT4	43.000	--	1.279	55.012	1.4	0.254	2.06	35′	EL	13.538	0.653	1.42	35′	EL	1.692	0.80	0.254	1.28	35′	EL	16.923	
		TNAGT5A	45.000	--	1.182	53.19	1.4	0.254	1.92	35′	EL	16.923	0.653	1.5	35′	EL	1.692	0.80	0.254	1.18	35′	EL	16.923	
		TNAGT5B	45.000	--	1.14	51.296	1.4	0.254	1.85	35′	EL	16.923	0.653	1.34	35′	EL	1.692	0.80	0.254	1.14	35′	EL	16.923	

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:

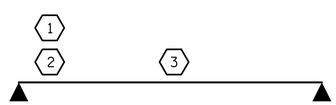
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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 'C'

PROJECT NO. BR-0115

IREDELL COUNTY

STATION: 15+74.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR 35′ CORED SLAB UNIT 60° SKEW

(NON-INTERSTATE TRAFFIC)

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 J. WESLEY JONES
3/15/2020

STV 100 Years
STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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

SHEET NO. S-5

TOTAL SHEETS 23

DRAWN BY :	WAW	DATE : 10-19
CHECKED BY :	JWJ	DATE : 12-19
DESIGN ENGINEER OF RECORD :	JWJ	DATE : 3-20
DRAWN BY : CVC	6/10	
CHECKED BY : DNS	6/10	

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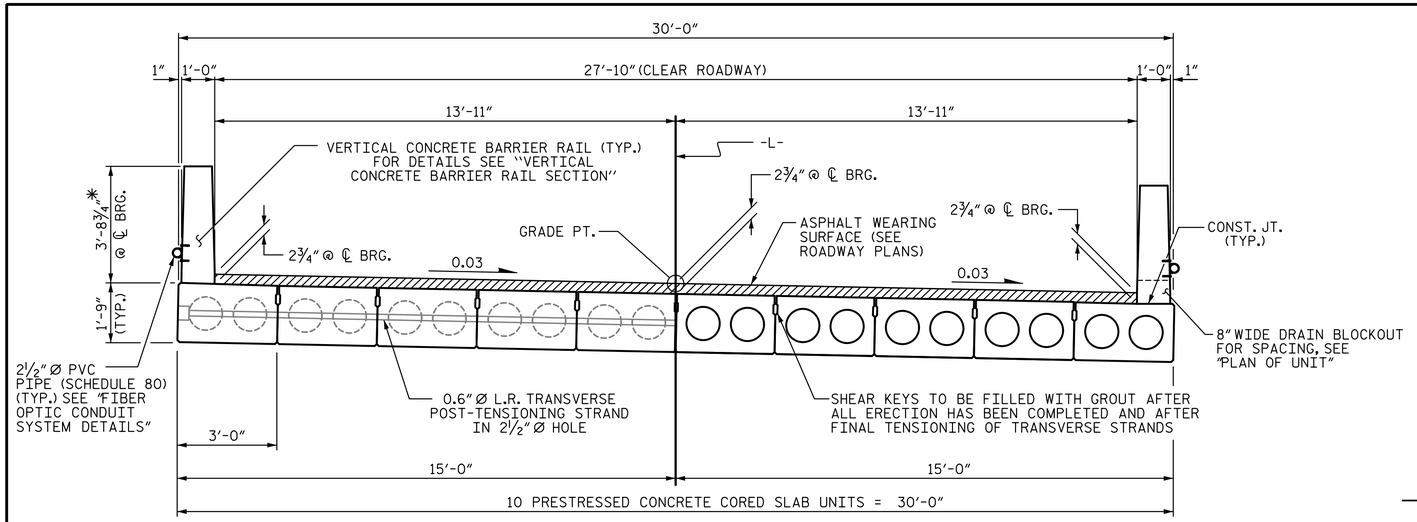
JJones

STD. NO. 21LRFR1_60&120S_35L

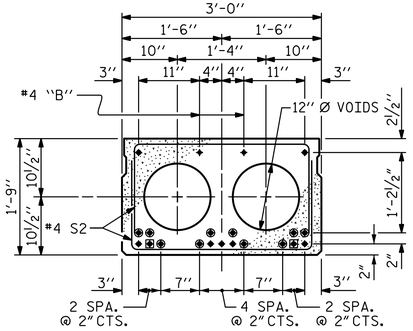


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

TYPICAL SECTION

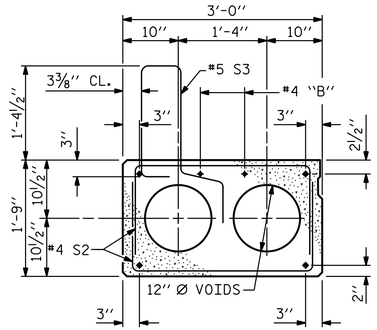
* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.



INTERIOR SLAB SECTION (30' & 35' UNIT)

(9 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT



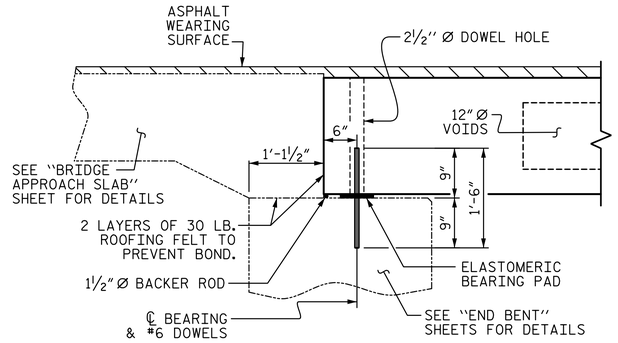
EXT. SLAB SECTION

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

◉ 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.

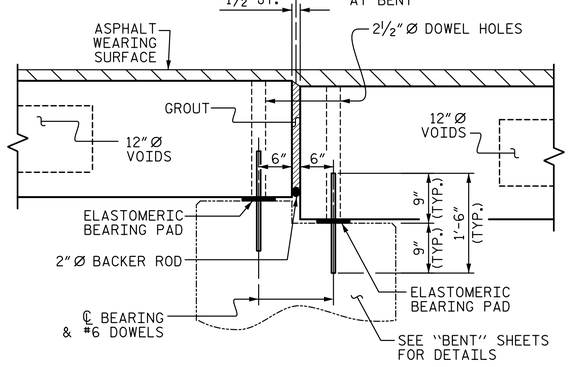
◉ OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

FIXED END



SECTION AT END BENT

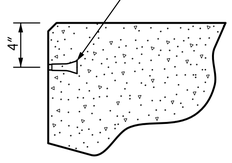
FIXED END FIXED END



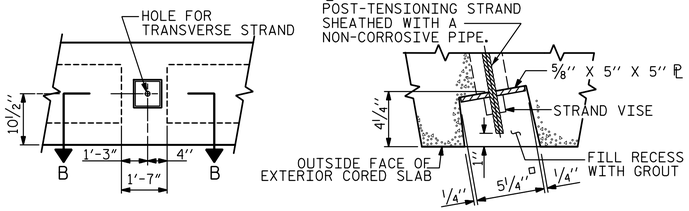
SECTION AT BENT

DEBONDING LEGEND

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



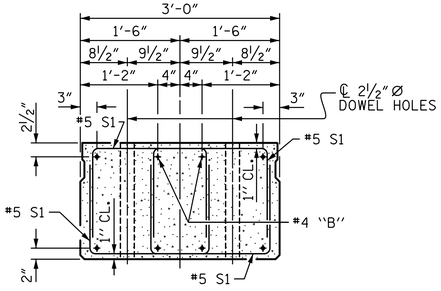
THREADED INSERT DETAIL



ELEVATION VIEW

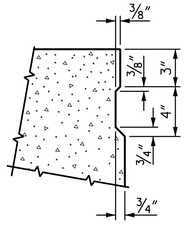
SECTION B-B

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



END ELEVATION

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



SHEAR KEY DETAIL

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

PROJECT NO. BR-0115

IREDELL COUNTY

STATION: 15+74.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT (SPANS A & C)

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

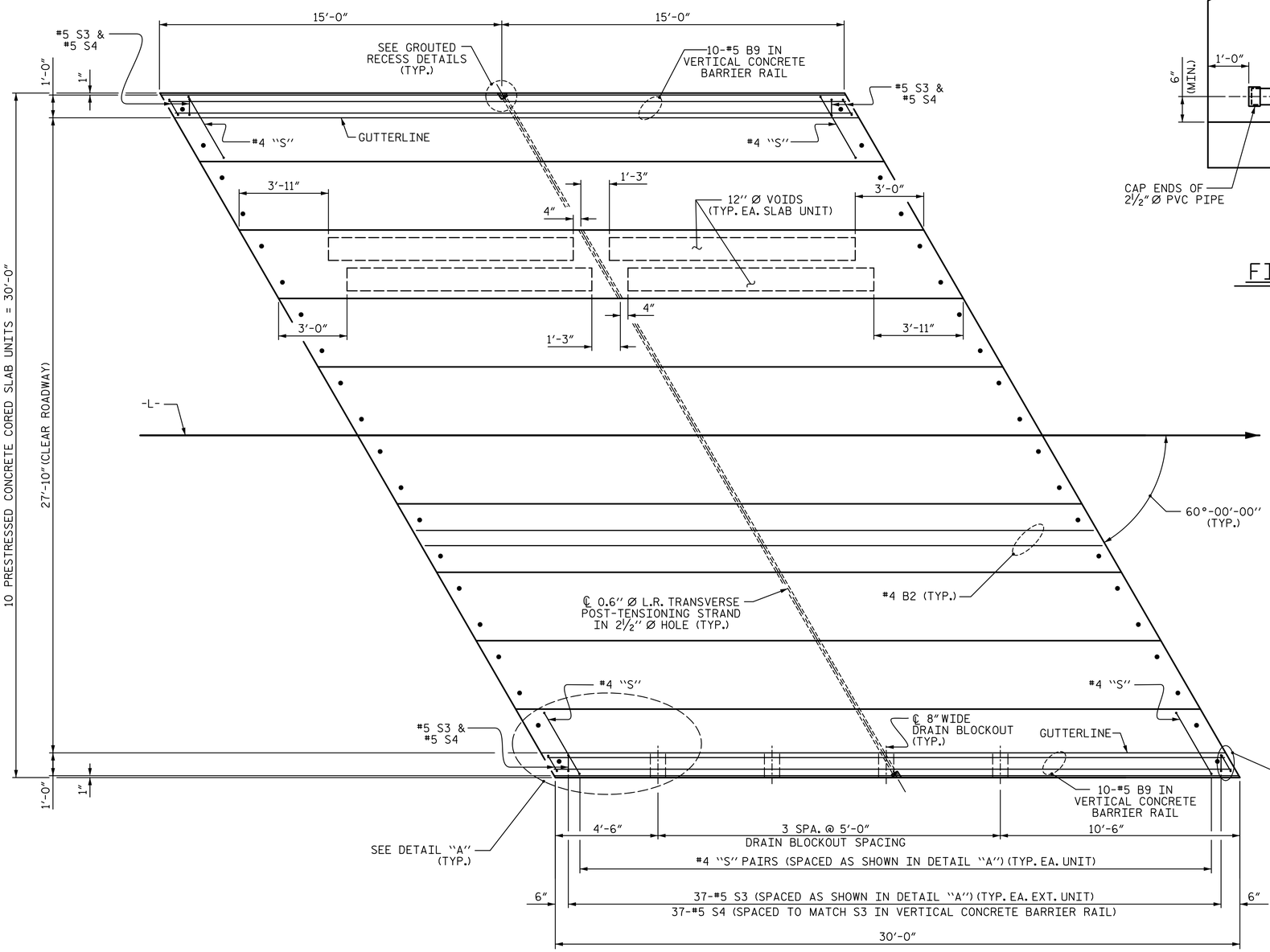
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 J. WESLEY JONES 3/15/2020

STV 100 Years
STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

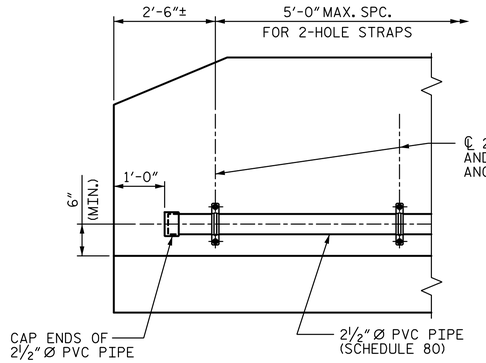
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY :	WAW	DATE :	10-19
CHECKED BY :	JWJ	DATE :	12-19
DESIGN ENGINEER OF RECORD :	JWJ	DATE :	3-20
DRAWN BY : DGE	5/09	REV. 8/14	MAA/TMG
CHECKED BY : BCH	6/09		

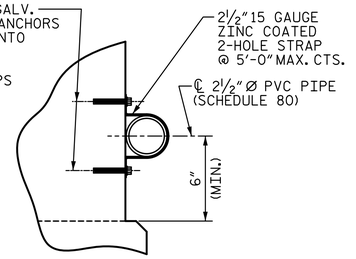
STD. NO. 21"PCS2_30_60S



PLAN OF UNIT



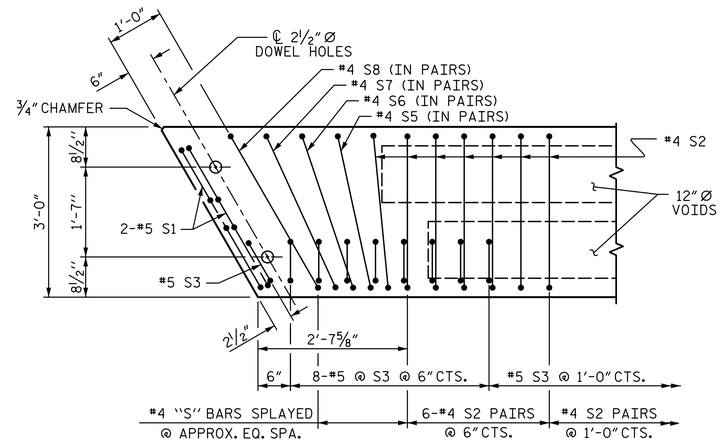
ELEVATION



SECTION

FIBER OPTIC CONDUIT SYSTEM DETAILS

2½" Ø SCHEDULE 80 PVC PIPE ATTACHED TO THE BACK OF BOTH RAILS FOR FUTURE FIBER OPTIC CABLE.



DETAIL "A"

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

PROJECT NO. BR-0115

IREDELL COUNTY

STATION: 15+74.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 30' UNIT 27'-10" CLEAR ROADWAY (SPAN A)

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 WESLEY JONES 3/13/2020

STV 100 Years
STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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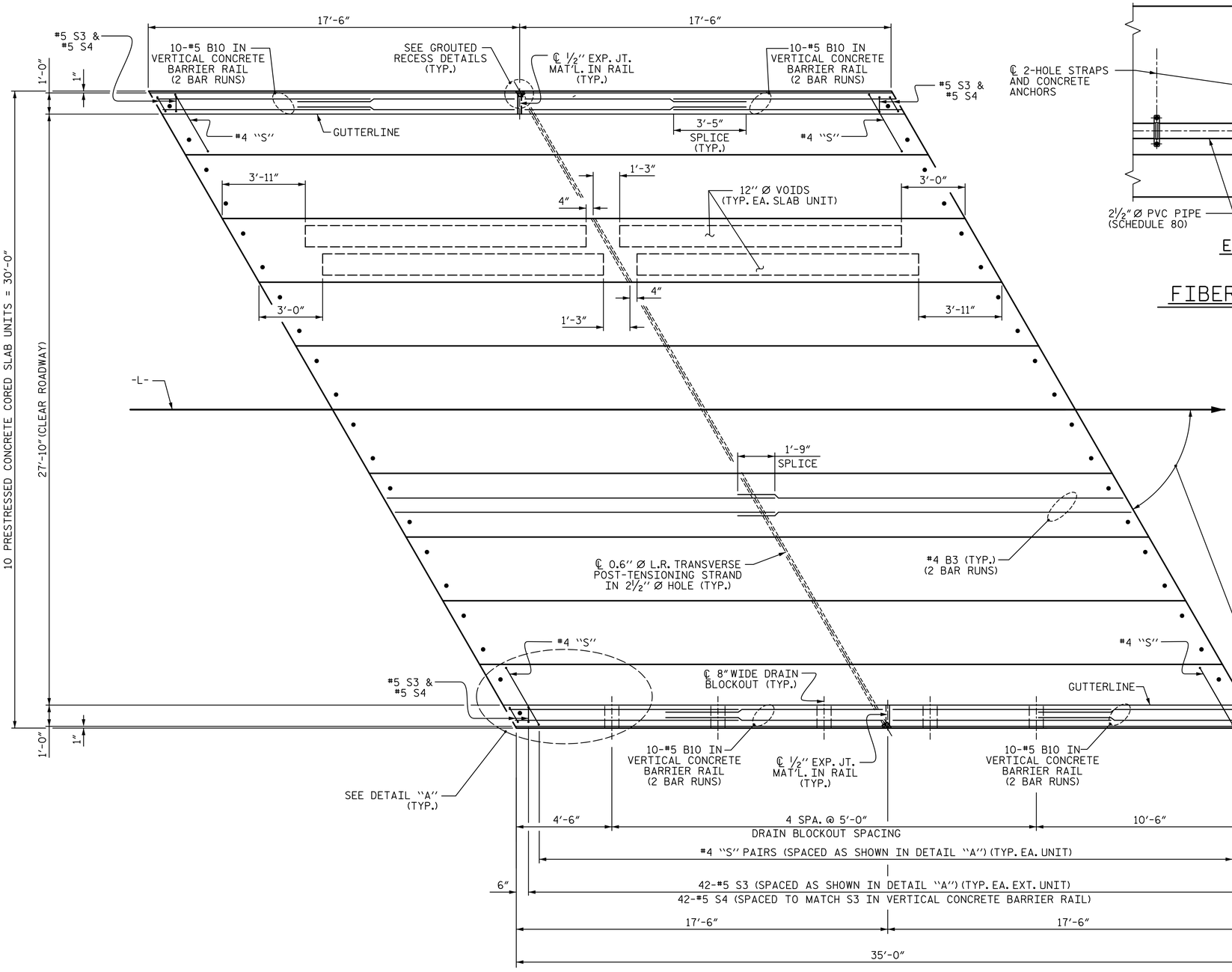
CHECKED BY :	JWJ	DATE :	12-19
DESIGN ENGINEER OF RECORD :	JWJ	DATE :	3-20

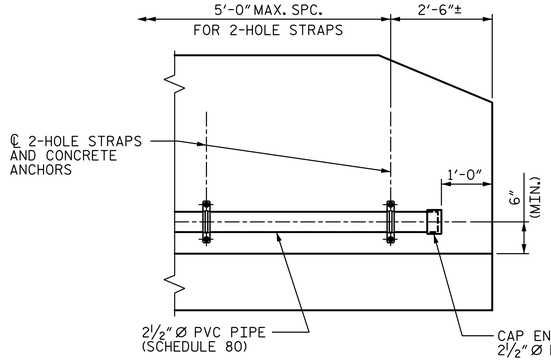
DRAWN BY : DGE	3/09	REV. 12/5/11	MAA/AAC
CHECKED BY : BCH	3/09	REV. 8/14	MAA/TMG

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			23

STD.NO. 21"PCS_30_60S_30L



PLAN OF UNIT



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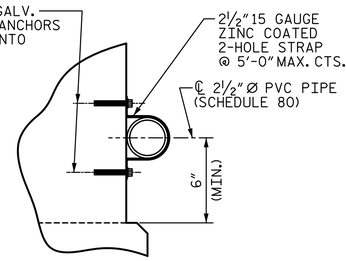
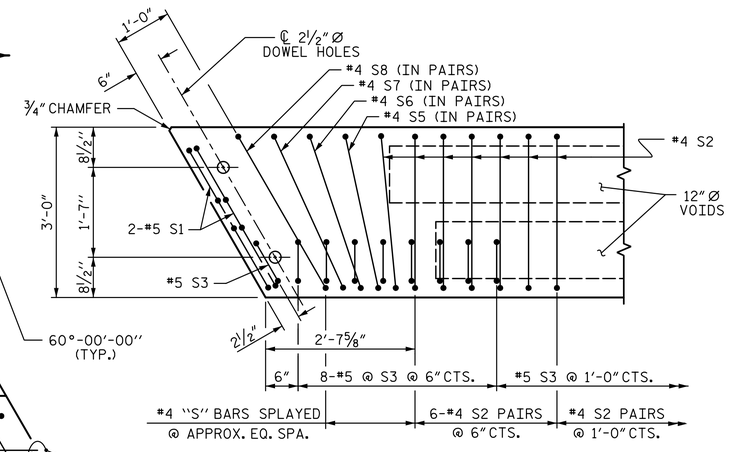


SECTION

FIBER OPTIC CONDUIT SYSTEM DETAILS

2½" Ø SCHEDULE 80 PVC PIPE ATTACHED TO THE BACK OF BOTH RAILS FOR FUTURE FIBER OPTIC CABLE.



DETAIL "A"

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

PROJECT NO. BR-0115

IREDELL COUNTY

STATION: 15+74.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 35' UNIT 27'-10" CLEAR ROADWAY (SPAN C)

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 J. WESLEY JONES 3/15/2020

STV 100 Years
STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
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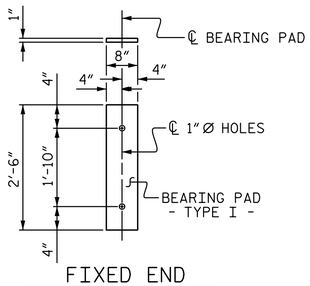
DESIGN ENGINEER OF RECORD :	JWJ	DATE :	3-20

DRAWN BY : DGE	3/09	REV. 12/5/11 MAA/AAC
CHECKED BY : BCH	3/09	REV. 8/14 MAA/TMG

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

STD.NO. 21"PCS_30_60S_35L



FIXED END
(TYPE I - 40 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

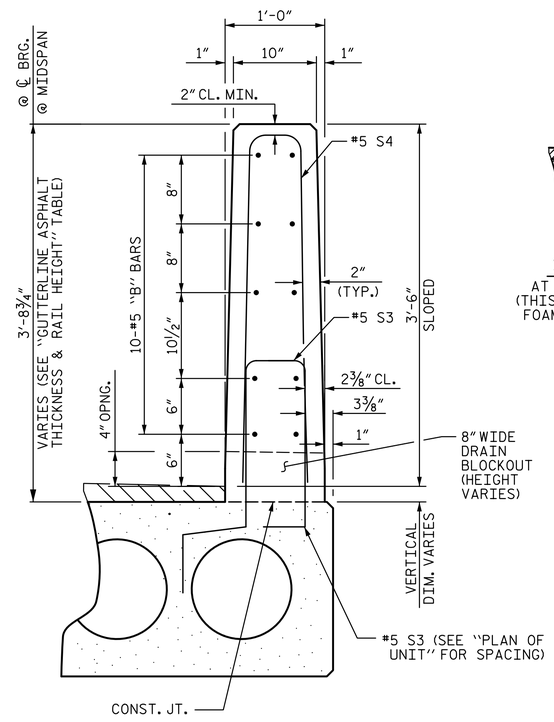
DEAD LOAD DEFLECTION AND CAMBER

	3'-0" x 1'-9"
30' & 35' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1/4" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/8" ↓
FINAL CAMBER	1/8" ↑

** INCLUDES FUTURE WEARING SURFACE

CONCRETE RELEASE STRENGTH

UNIT	PSI
30' & 35' UNITS	4000



VERTICAL CONCRETE BARRIER RAIL SECTION

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	30' UNIT					
✳ B9	20	20	#5	STR	29'-6"	615
✳ S4	78	78	#5	2	7'-2"	583
✳ EPOXY COATED REINFORCING STEEL				LBS.		1198
CLASS AA CONCRETE				CU.YDS.		7.7
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		60.14

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	35' UNIT					
✳ B10	80	80	#5	STR	10'-5"	869
✳ S4	88	88	#5	2	7'-2"	658
✳ EPOXY COATED REINFORCING STEEL				LBS.		1527
CLASS AA CONCRETE				CU.YDS.		9.0
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		70.14

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS	RAIL HEIGHT
	@ MID-SPAN	@ MID-SPAN
30' & 35' UNITS	2⅝"	3'-8⅝"

CORED SLABS REQUIRED

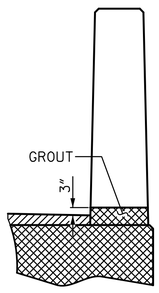
30' UNIT	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	30'-0"	60'-0"
INTERIOR C.S.	8	30'-0"	240'-0"
TOTAL	10		300'-0"

CORED SLABS REQUIRED

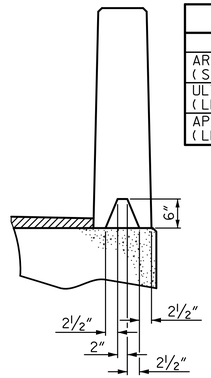
35' UNIT	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	35'-0"	70'-0"
INTERIOR C.S.	8	35'-0"	280'-0"
TOTAL	10		350'-0"

GRADE 270 STRANDS

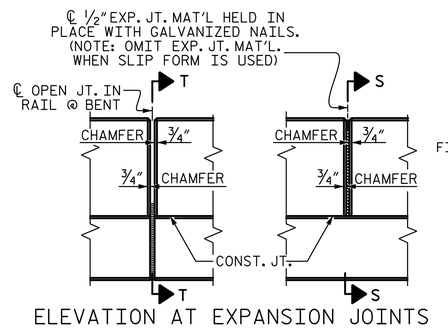
	0.6" Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950



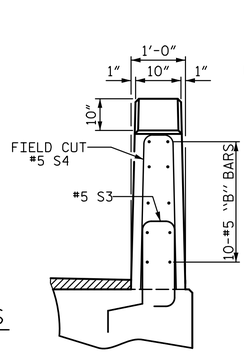
SECTION T-T
AT OPEN JOINT AT BENT
(THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)



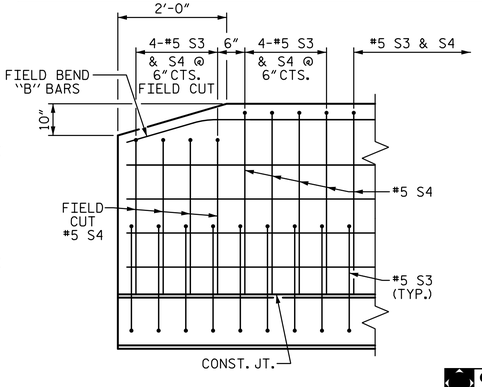
SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS



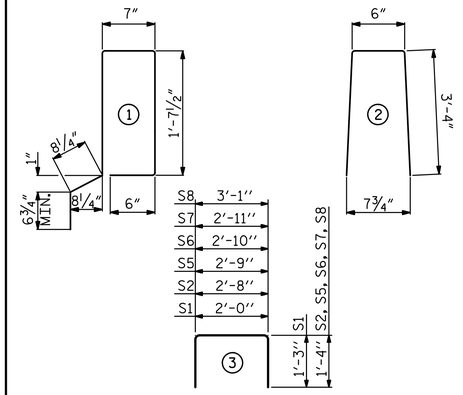
END VIEW



SIDE VIEW

END OF RAIL DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE 30' CORED SLAB UNIT

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B2	2	#4	STR	29'-7"	40	29'-7"	40
S1	8	#5	3	4'-6"	38	4'-6"	38
S2	62	#4	3	5'-4"	221	5'-4"	221
✳ S3	39	#5	1	5'-7"	227		
S5	4	#4	3	5'-5"	14	5'-5"	14
S6	4	#4	3	5'-6"	15	5'-6"	15
S7	4	#4	3	5'-7"	15	5'-7"	15
S8	4	#4	3	5'-9"	15	5'-9"	15
REINFORCING STEEL		LBS.			358		358
✳ EPOXY COATED REINFORCING STEEL		LBS.			227		
5000 P.S.I. CONCRETE		CU. YDS.			4.5		4.5
0.6" Ø L.R. STRANDS		No.			9		9

BILL OF MATERIAL FOR ONE 35' CORED SLAB UNIT

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B3	4	#4	STR	18'-3"	49	18'-3"	49
S1	8	#5	3	4'-6"	38	4'-6"	38
S2	72	#4	3	5'-4"	257	5'-4"	257
✳ S3	44	#5	1	5'-7"	256		
S5	4	#4	3	5'-5"	14	5'-5"	14
S6	4	#4	3	5'-6"	15	5'-6"	15
S7	4	#4	3	5'-7"	15	5'-7"	15
S8	4	#4	3	5'-9"	15	5'-9"	15
REINFORCING STEEL		LBS.			403		403
✳ EPOXY COATED REINFORCING STEEL		LBS.			256		
5000 P.S.I. CONCRETE		CU. YDS.			5.2		5.2
0.6" Ø L.R. STRANDS		No.			9		9

NOTES

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

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

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

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

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

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

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

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

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

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

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

THE DRAIN OPENING AT THE GUTTERLINE SHALL BE 4" X 8". THE HEIGHT OF THE BLOCKOUT IN THE VERTICAL CONCRETE BARRIER RAIL SHALL EXTEND FROM THE TOP OF CORED SLAB UNIT TO THE TOP OF THE DRAIN OPENING.

APPLY EPOXY PROTECTIVE COATING TO EXTERIOR FACE OF THE EXTERIOR CORED SLAB UNITS THAT REQUIRE DRAINS IN THE BARRIER RAIL.

FOR FIBER OPTIC CONDUIT SYSTEM, SEE SPECIAL PROVISIONS.

2½"PVC PIPE SHALL BE RAISED ABOVE THE TOP OF DECK DRAIN OPENINGS AS REQUIRED.

PROJECT NO. BR-0115

IREDELL COUNTY

STATION: 15+74.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT
(SPANS A & C)

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CHECKED BY : BCH 6/09			

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 J. WESLEY JONES
3/15/2020

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STD. NO. 21' PCS3_30_60S

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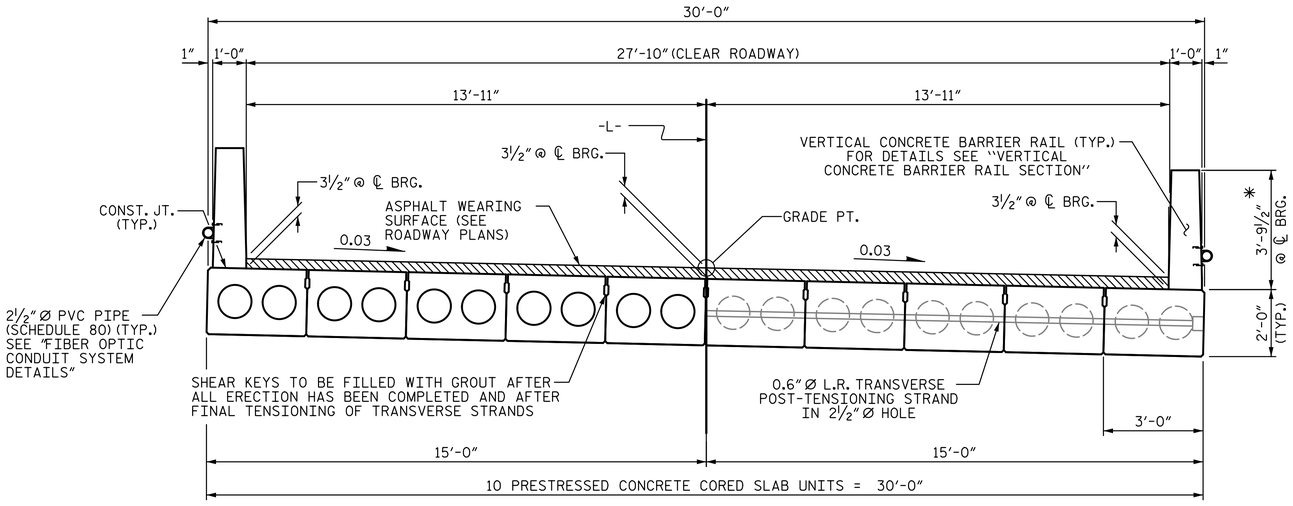
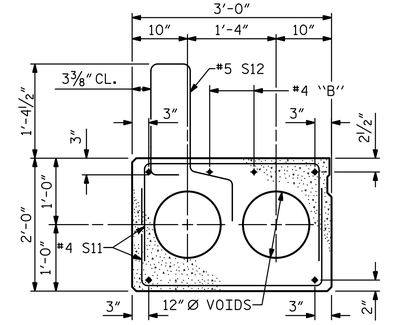


HALF SECTION
THROUGH VOIDS

HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

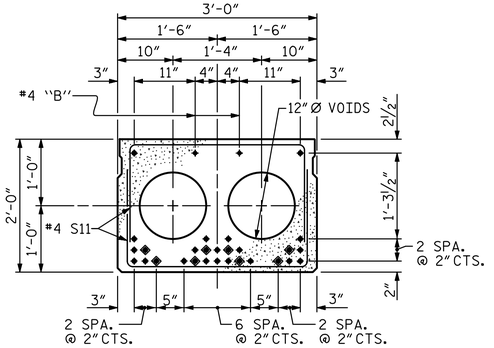
TYPICAL SECTION

* - 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.



EXTERIOR SLAB SECTION

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



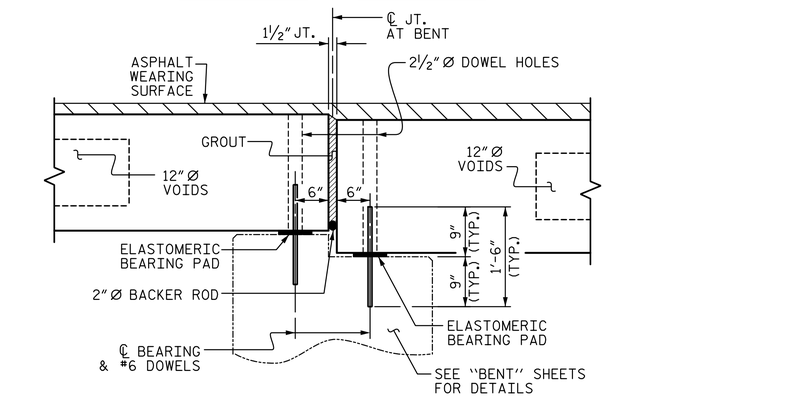
INTERIOR SLAB SECTION (70′ UNIT)

(28 STRANDS REQUIRED)

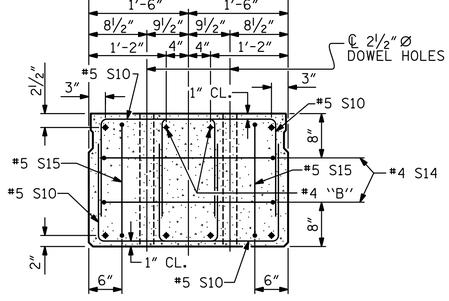
0.6″ Ø LOW RELAXATION STRAND LAYOUT

◈ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 12′-0″ FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

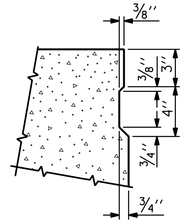


SECTION AT BENT



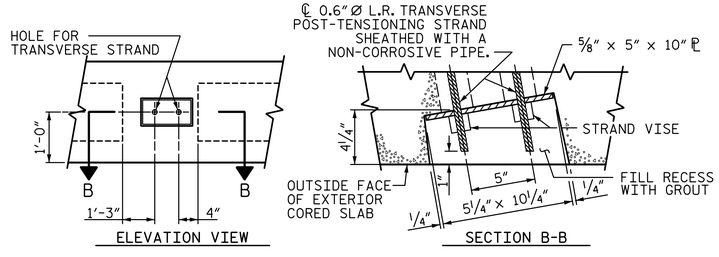
END ELEVATION

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.

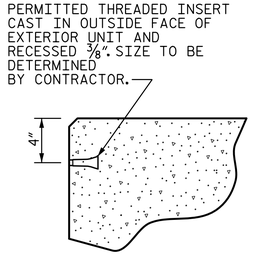


SHEAR KEY DETAIL

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



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



THREADED INSERT DETAIL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 J. WESLEY JONES 3/15/2020

STV 100 Years

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PROJECT NO. BR-0115

IREDELL COUNTY

STATION: 15+74.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

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

DRAWN BY :	WAW	DATE : 10-19
CHECKED BY :	JWJ	DATE : 12-19
DESIGN ENGINEER OF RECORD :	JWJ	DATE : 3-20
DRAWN BY : MAA	6/10	REV. 8/14 MAA/TMG
CHECKED BY : MKT	7/10	

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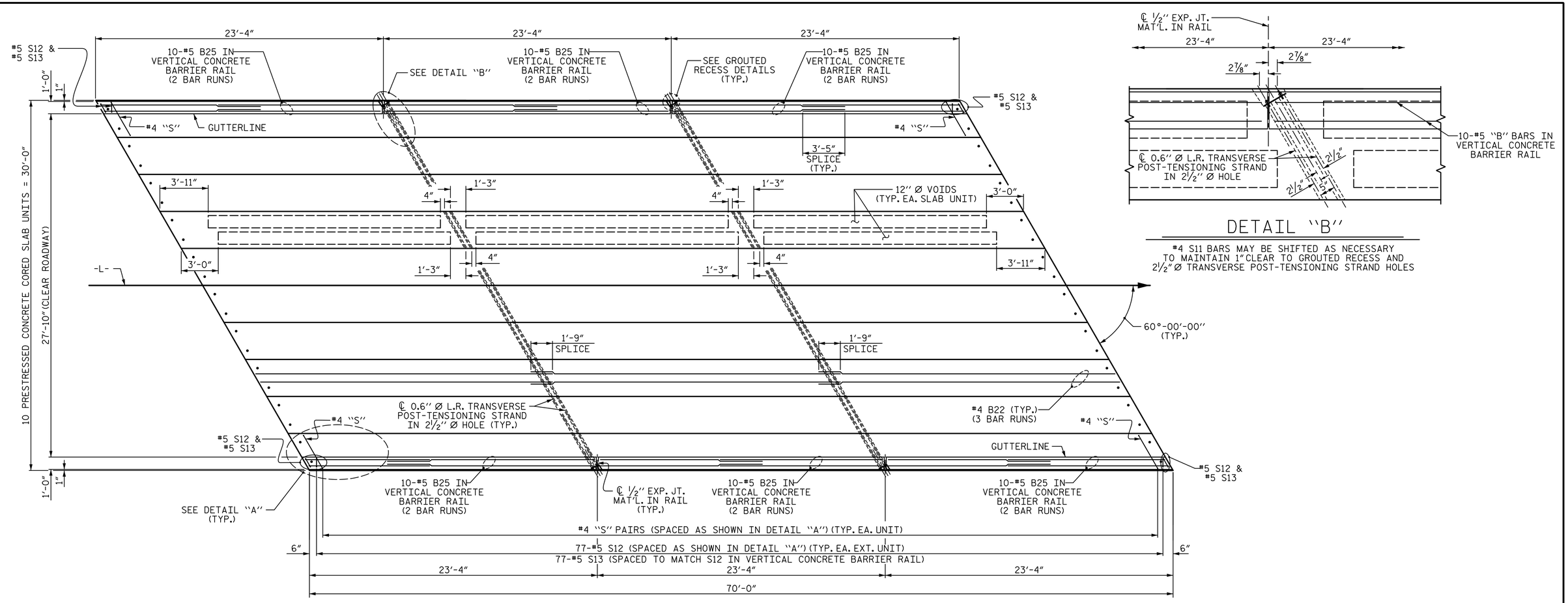
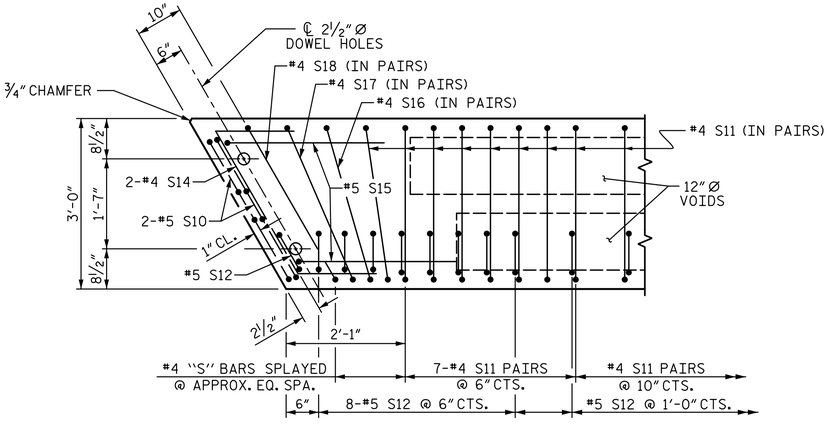


DETAIL "B"

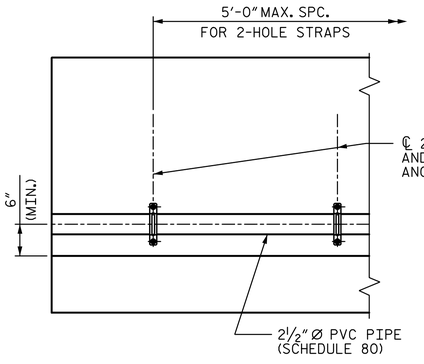
#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2½" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

PLAN OF UNIT

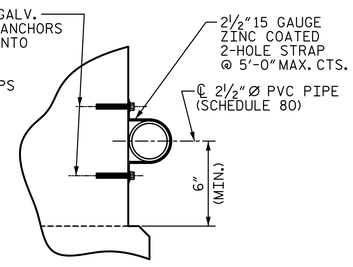


DETAIL "A"

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



ELEVATION



SECTION

FIBER OPTIC CONDUIT SYSTEM DETAILS

2½" Ø SCHEDULE 80 PVC PIPE ATTACHED TO THE BACK OF BOTH RAILS FOR FUTURE FIBER OPTIC CABLE.

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PROJECT NO. BR-0115
IREDELL COUNTY
STATION: 15+74.00 -L-
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 70' UNIT 27'-10" CLEAR ROADWAY 60° SKEW (SPAN B)

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			23

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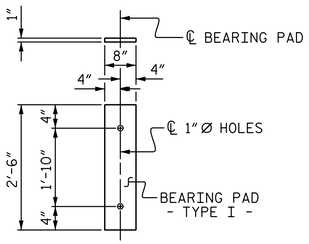
DESIGN ENGINEER OF RECORD :	JWJ	DATE : 3-20
DRAWN BY : MAA	6/10	REV. 12/5/11 MAA/AAC
CHECKED BY : MKT	7/10	REV. 8/14 MAA/TMG

JJones 3/11/2020 5:09:05 PM R:\Structures\ustation\Finals\40I_02I_BR-0115_SMU_CS6_0II_480166.dgn

STD. NO. 24PCS_30_60S_70L



FIXED END
(TYPE I - 20 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

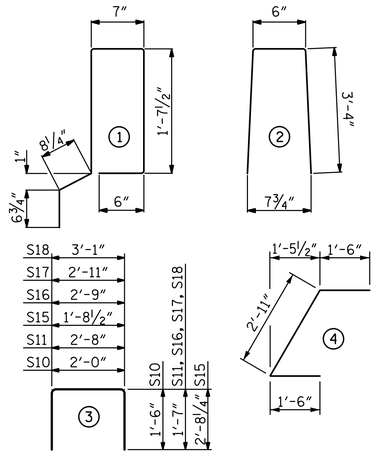
BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

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

BILL OF MATERIAL FOR ONE 70' CORED SLAB UNIT

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B22	6	#4	STR	24'-6"	98	24'-6"	98
S10	8	#5	3	5'-0"	42	5'-0"	42
S11	170	#4	3	5'-10"	662	5'-10"	662
✳S12	79	#5	1	5'-7"	460		
S14	4	#4	4	5'-11"	16	5'-11"	16
S15	4	#5	3	7'-1"	30	7'-1"	30
S16	4	#4	3	5'-11"	16	5'-11"	16
S17	4	#4	3	6'-1"	16	6'-1"	16
S18	4	#4	3	6'-3"	17	6'-3"	17
REINFORCING STEEL				LBS.	897		897
✳EPOXY COATED REINFORCING STEEL				LBS.	460		
7000 P.S.I. CONCRETE				CU. YDS.	12.0		12.0
0.6"Ø L.R. STRANDS				No.	28		28

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
70' UNITS	2"	3'-8"

CONCRETE RELEASE STRENGTH

UNIT	PSI
70' UNITS	5500

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
70' UNIT			
EXTERIOR C.S.	2	70'-0"	140'-0"
INTERIOR C.S.	8	70'-0"	560'-0"
TOTAL	10		700'-0"

DEAD LOAD DEFLECTION AND CAMBER

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

✳✳ INCLUDES FUTURE WEARING SURFACE

GRADE 270 STRANDS

	0.6"Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950

NOTES

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

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

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

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

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

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

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

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

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

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

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

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

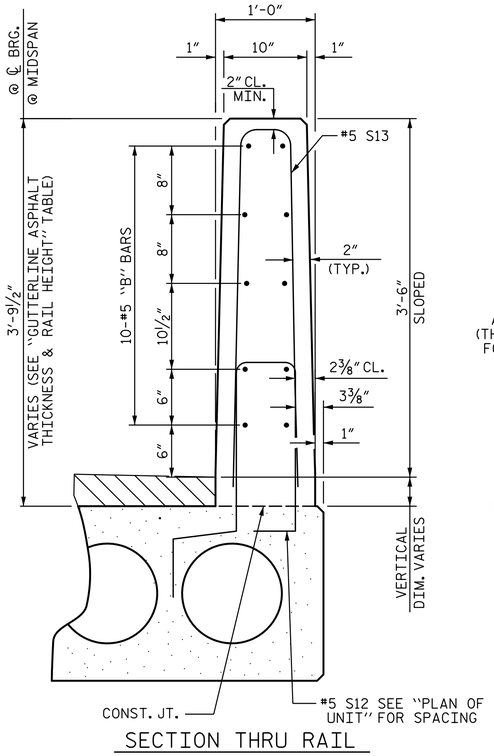
THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

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

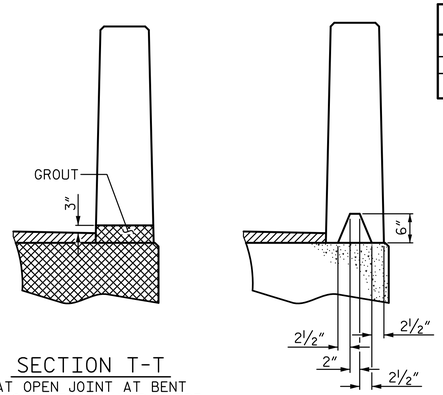
THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

FOR FIBER OPTIC CONDUIT SYSTEM, SEE SPECIAL PROVISIONS.

2½ PVC PIPE SHALL BE RAISED ABOVE TOP OF DECK DRAIN OPENINGS AS REQUIRED.

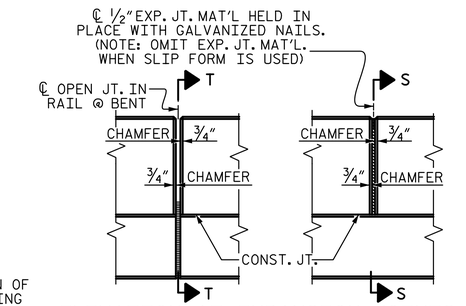


SECTION THRU RAIL

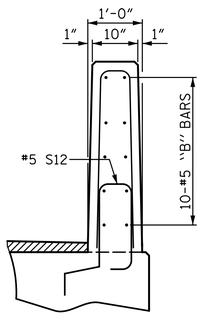


SECTION T-T
AT OPEN JOINT AT BENT
(THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)

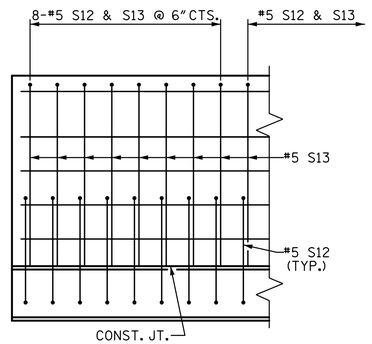
SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS



END VIEW



SIDE VIEW

VERTICAL CONCRETE BARRIER RAIL DETAILS

END OF RAIL DETAILS

DRAWN BY :	WAW	DATE :	10-19
CHECKED BY :	JWJ	DATE :	12-19
DESIGN ENGINEER OF RECORD :	JWJ	DATE :	3-20
DRAWN BY : MAA 6/10	CHECKED BY : MKT 7/10	REV. 5/18	MAA/THC

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

PROJECT NO. BR-0115
IREDELL COUNTY
STATION: 15+74.00 -L-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 WESLEY JONES 3/15/2020

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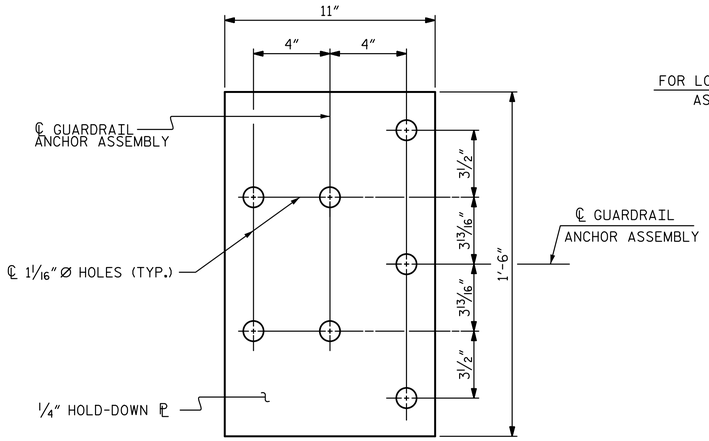
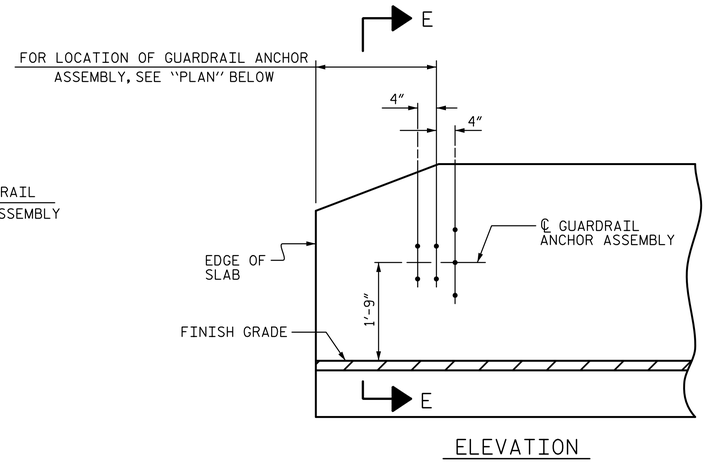
1			3			TOTAL SHEETS
2			4			23

STD. NO. 24PCS3_30_60&120S



PLAN



ELEVATION

NOTES

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

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

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

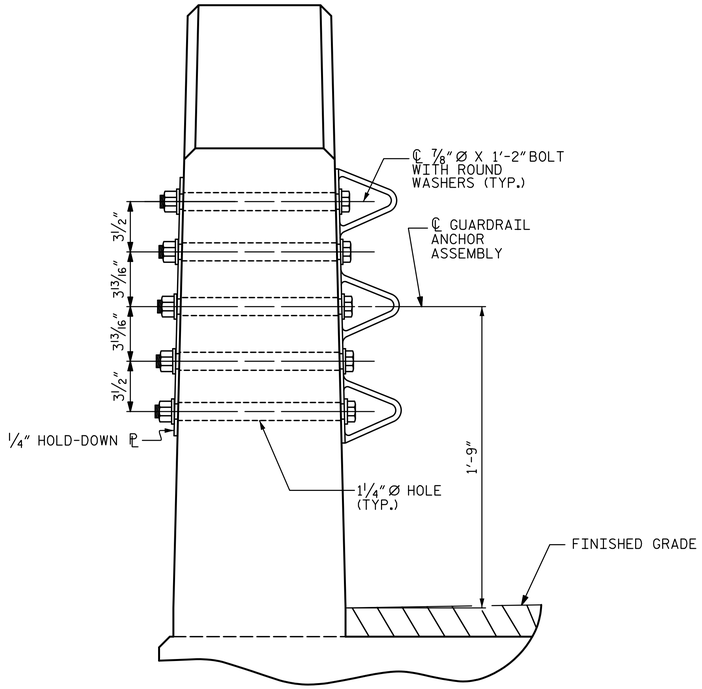
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

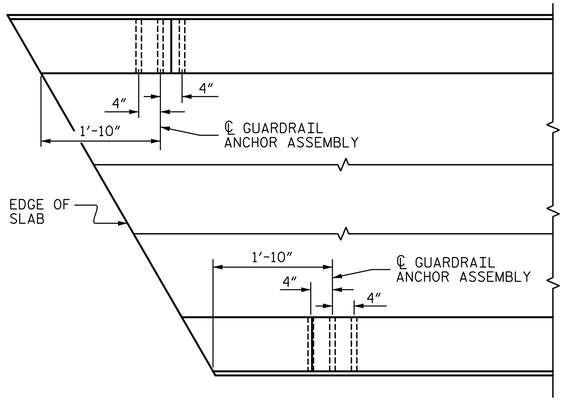
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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

SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. BR-0115

IREDELL COUNTY

STATION: 15+74.00 -L-

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CHECKED BY : JWJ	DATE : 12-19		
DESIGN ENGINEER OF RECORD : JWJ	DATE : 3-20		
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CHECKED BY : GM 5/10	REV. 12/17	MAA/THC	
	REV. 5/18	MAA/THC	

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE DETAILS FOR VERTICAL CONCRETE BARRIER RAIL

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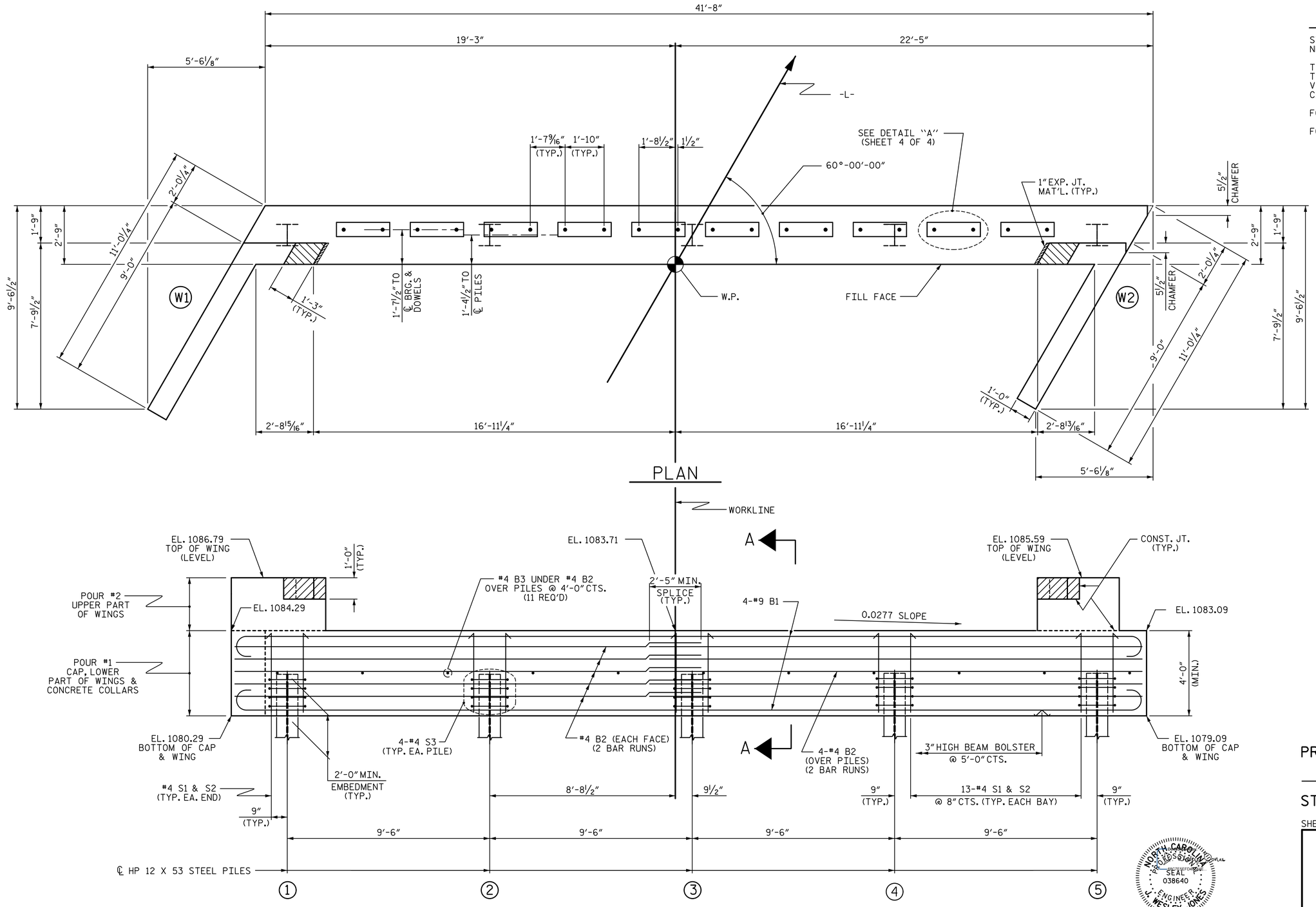
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			23

STD. NO. GRA3



ELEVATION

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

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR 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 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

TOP OF PILE ELEVATIONS	
①	1082.24
②	1081.98
③	1081.71
④	1081.45
⑤	1081.19

PROJECT NO. BR-0115
IREDELL COUNTY
STATION: 15+74.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

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1			3			TOTAL SHEETS
2			4			23

DRAWN BY : WAW	DATE : 10-19	
CHECKED BY : JWJ	DATE : 1-20	
DESIGN ENGINEER OF RECORD : JWJ	DATE : 3-20	
DRAWN BY : WJH 12/11	REV. 4/15 MAA/TMG	
CHECKED BY : AAC 12/11		

STD. NO. EB_30_60S4

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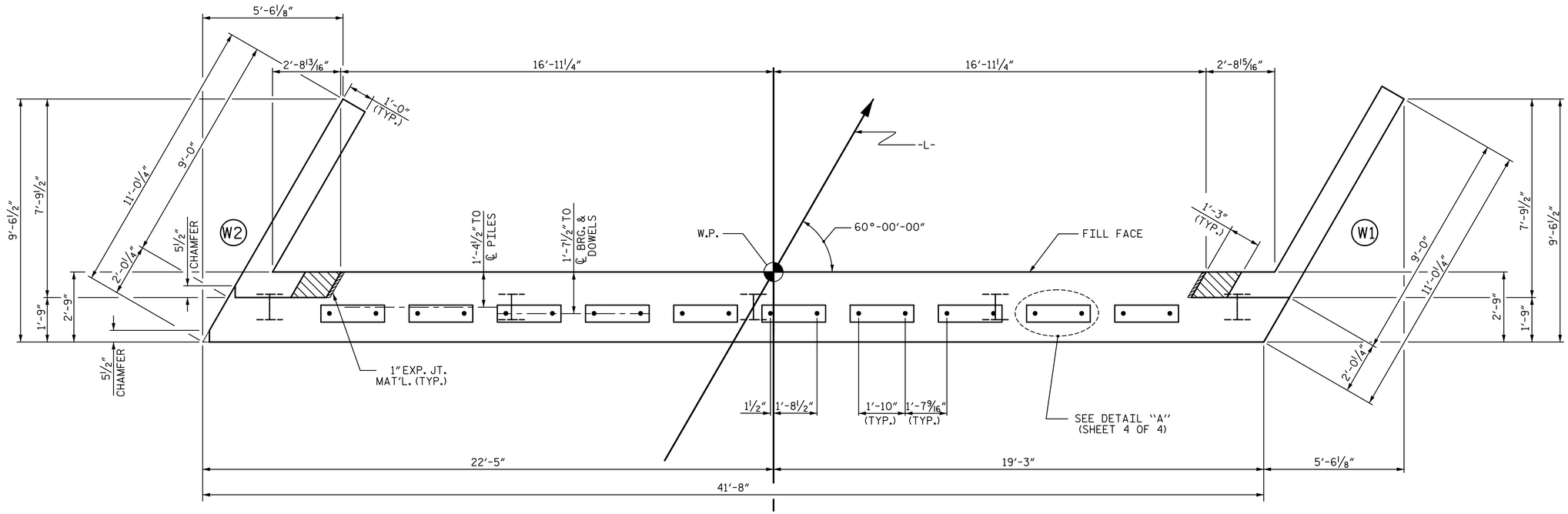
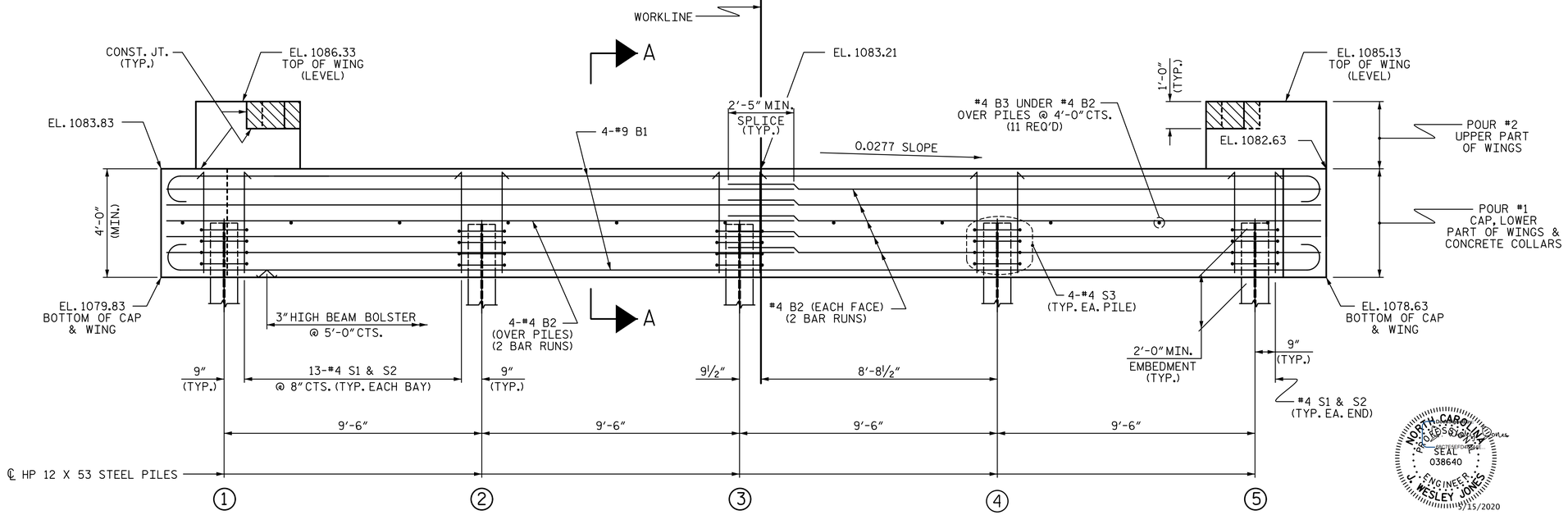


PLAN



ELEVATION

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

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR 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 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

TOP OF PILE ELEVATIONS

①	1081.78
②	1081.52
③	1081.25
④	1080.99
⑤	1080.73

PROJECT NO. BR-0115
IREDELL COUNTY
STATION: 15+74.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 2

DRAWN BY :	WAW DATE : 10-19
CHECKED BY :	JWJ DATE : 1-20
DESIGN ENGINEER OF RECORD :	JWJ DATE : 3-20
DRAWN BY : WJH	12/11
CHECKED BY : AAC	12/11
REV. 4/15	MAA/TMG

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1			3			TOTAL SHEETS
2			4			23

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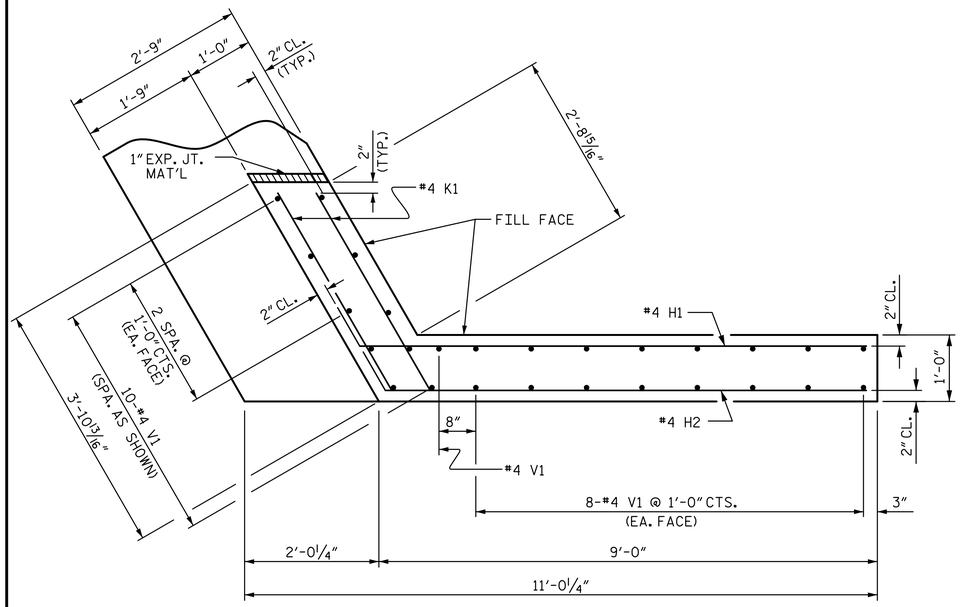
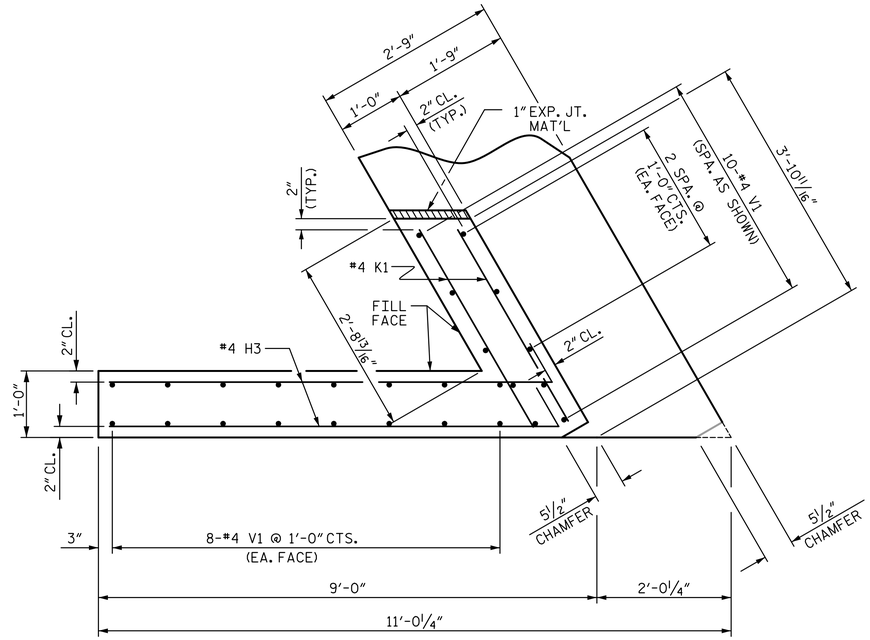
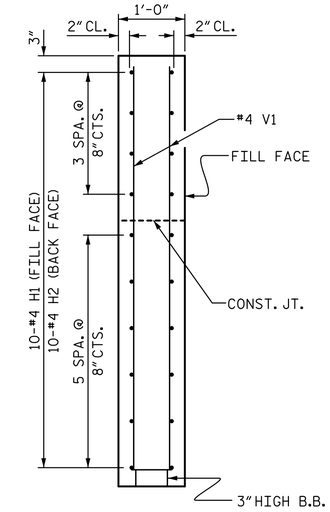


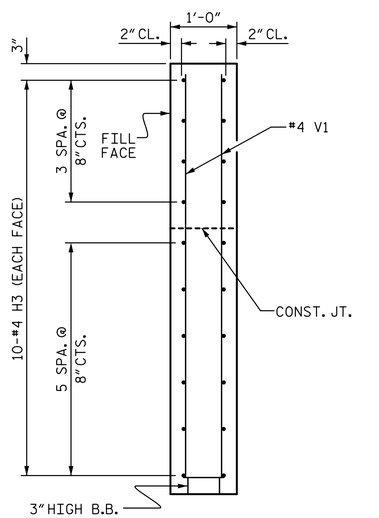
PLAN OF WING (W1)



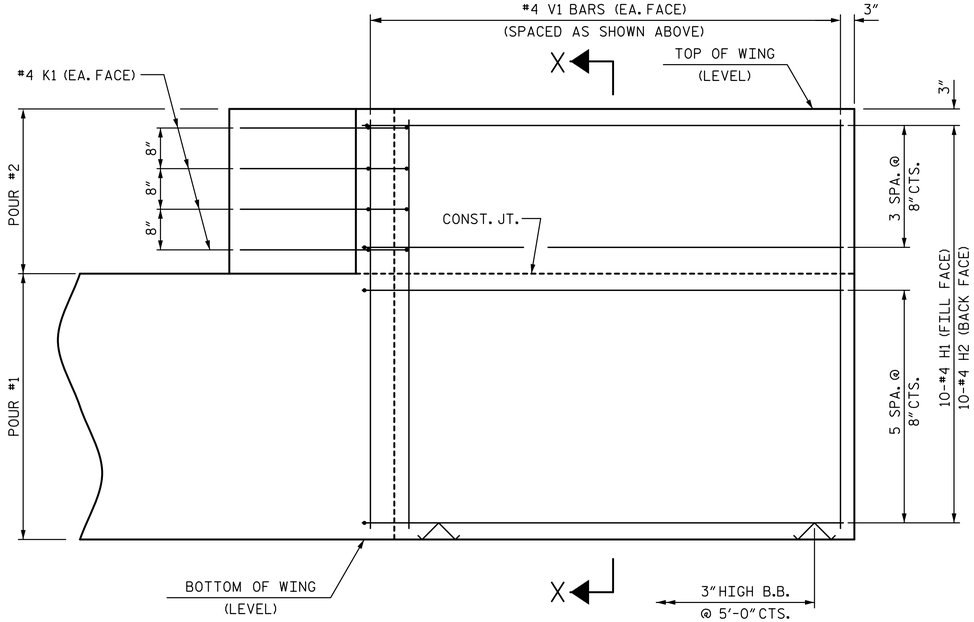
PLAN OF WING (W2)



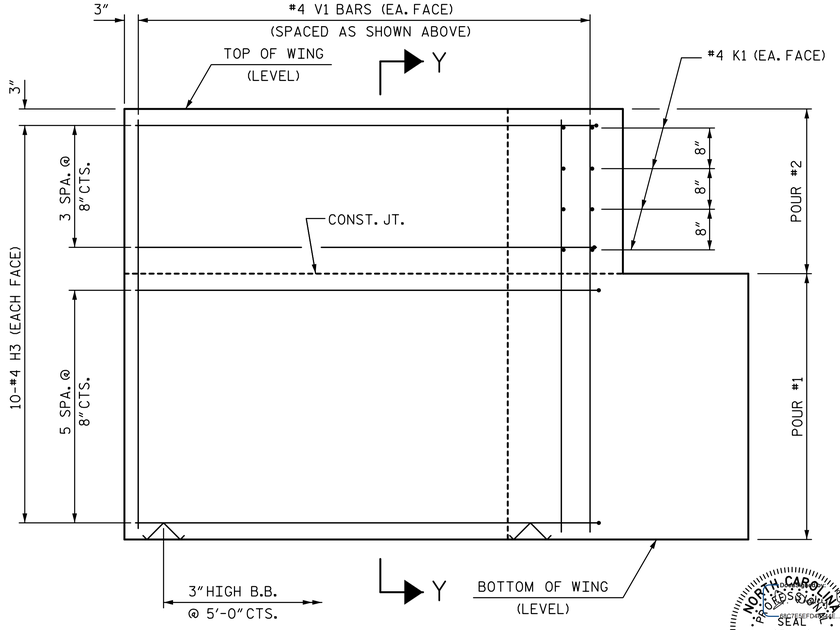
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

PROJECT NO. BR-0115

IREDELL COUNTY

STATION: 15+74.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT
WING DETAILS

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

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 J. WESLEY JONES 3/15/2020

STV 100 Years
STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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DRAWN BY : WJH 12/11	REV. 4/15 MAA/TMG		
CHECKED BY : AAC 12/11			

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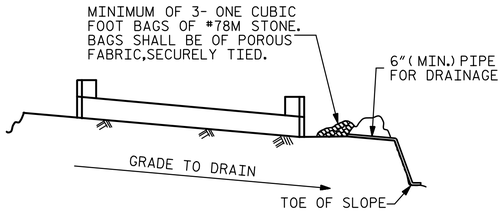
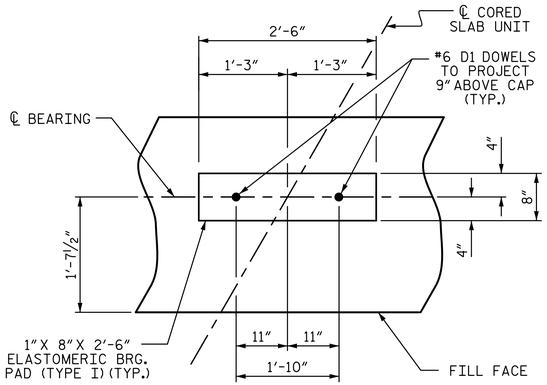


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

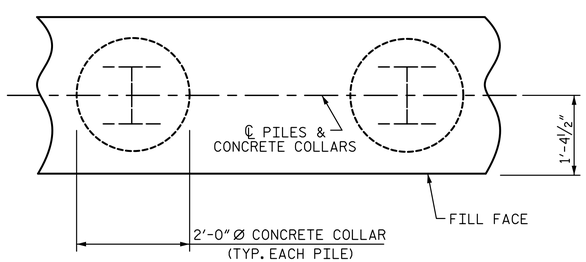
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

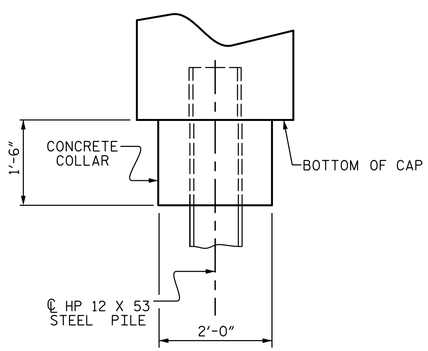


DETAIL "A"

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



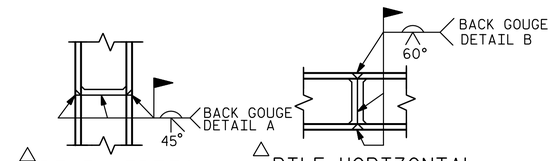
PLAN



ELEVATION

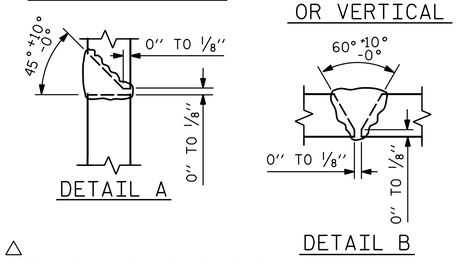
CORROSION PROTECTION FOR STEEL PILES DETAIL

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



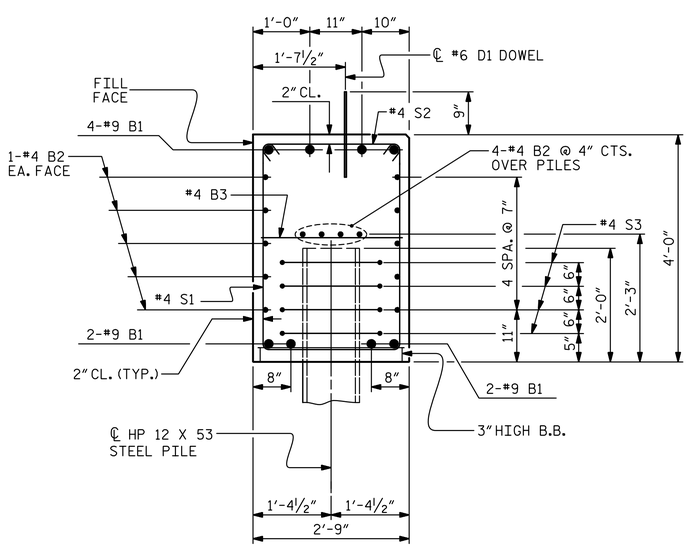
△PILE VERTICAL

△PILE HORIZONTAL OR VERTICAL



△POSITION OF PILE DURING WELDING.

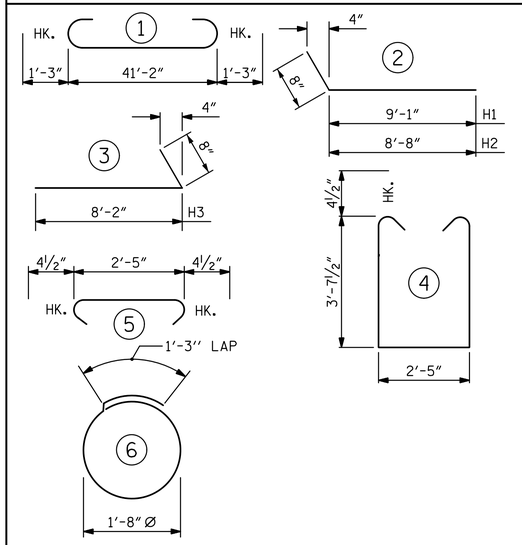
PILE SPLICE DETAILS



SECTION A-A

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT No. 1	END BENT No. 2
HP 12 X 53 STEEL PILES NO: 5 LIN. FT.= 90	HP 12 X 53 STEEL PILES NO: 5 LIN. FT.= 150
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 5	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 5

BILL OF MATERIAL

FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	43'-8"	1188
B2	28	#4	STR	21'-11"	410
B3	11	#4	STR	2'-5"	18
D1	20	#6	STR	1'-6"	45
H1	10	#4	2	9'-9"	65
H2	10	#4	2	9'-4"	62
H3	20	#4	3	8'-10"	118
K1	16	#4	STR	3'-3"	35
S1	54	#4	4	10'-5"	376
S2	54	#4	5	3'-2"	114
S3	20	#4	6	6'-6"	87
V1	53	#4	STR	6'-2"	218

REINFORCING STEEL (FOR ONE END BENT) 2736 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 20.2 C.Y.

POUR #2 UPPER PART OF WINGS 2.2 C.Y.

TOTAL CLASS A CONCRETE 22.4 C.Y.

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Charlotte, NC 28202
NC License Number F-0991

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PROJECT NO. BR-0115

IREDELL COUNTY

STATION: 15+74.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1 & 2 DETAILS

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

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CHECKED BY :	JWJ	DATE :	1-20
DESIGN ENGINEER OF RECORD :	JWJ	DATE :	3-20
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CHECKED BY : AAC 12/11			

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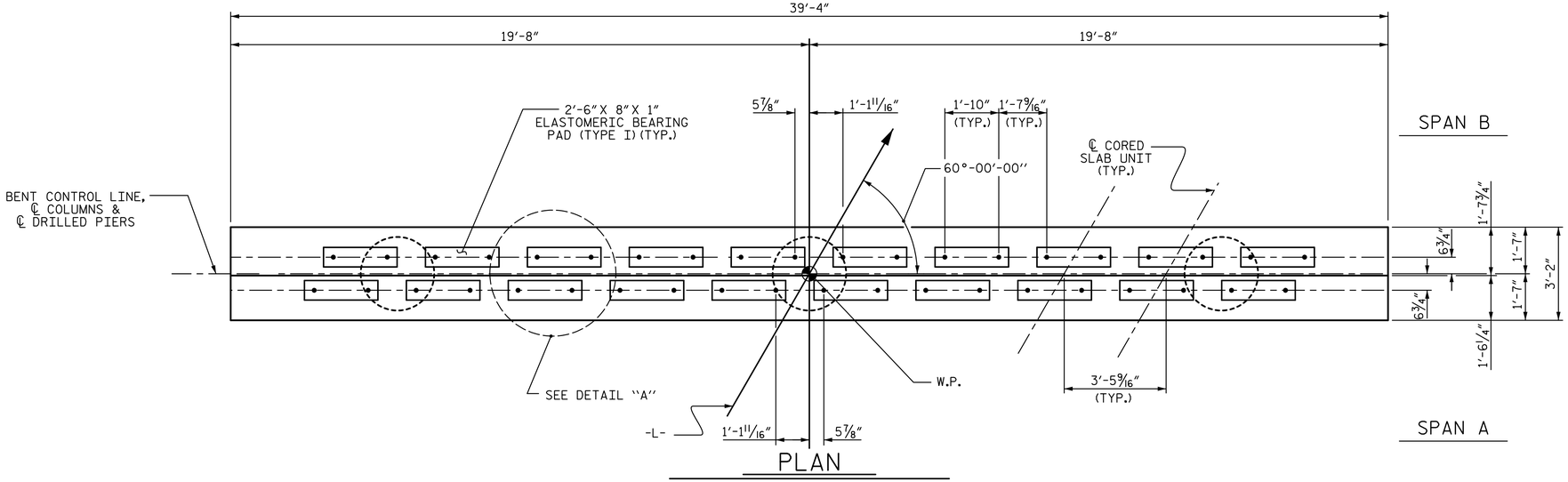
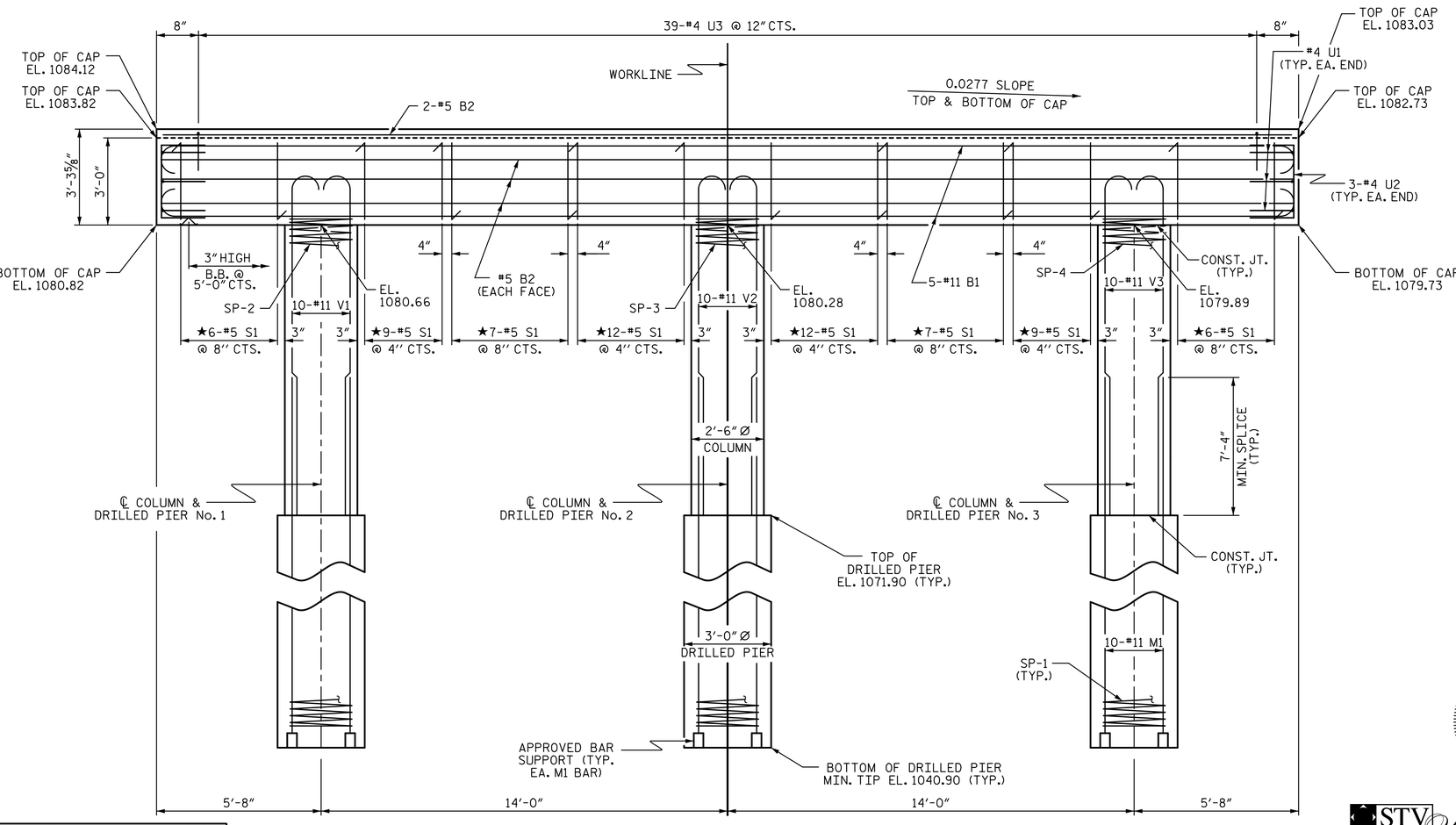


PLAN



ELEVATION

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

NOTES

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

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

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

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

★ INVERT ALTERNATE STIRRUPS.

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

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

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

DETAIL ″A″

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. BR-0115

IREDELL COUNTY

STATION: 15+74.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT No. 1

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 J. WESLEY JONES
9/15/2020

STV 100 Years
STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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2			4			23

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CHECKED BY :	JWJ	DATE : 1-20
DESIGN ENGINEER OF RECORD :	JWJ	DATE : 3-20
DRAWN BY : DGE 4/10	REV. 11/14	MAA/TMG
CHECKED BY : MKT 4/10		

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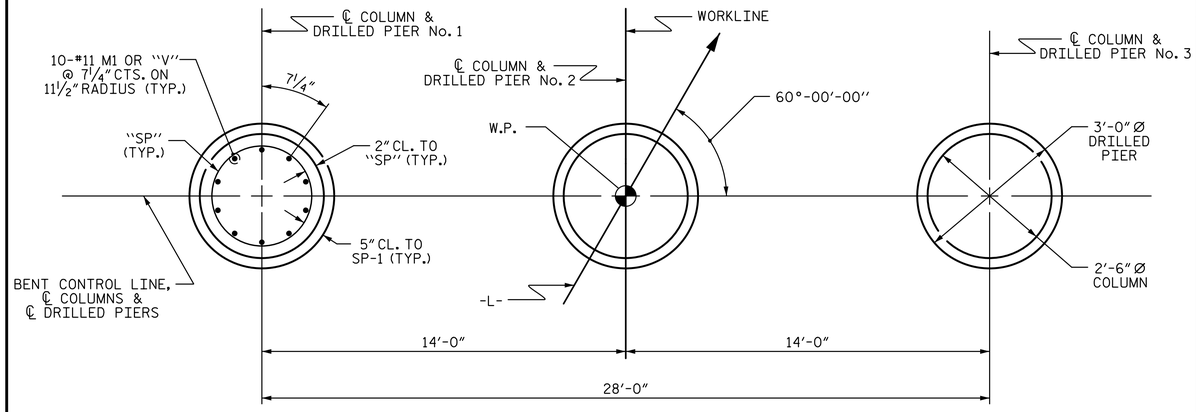
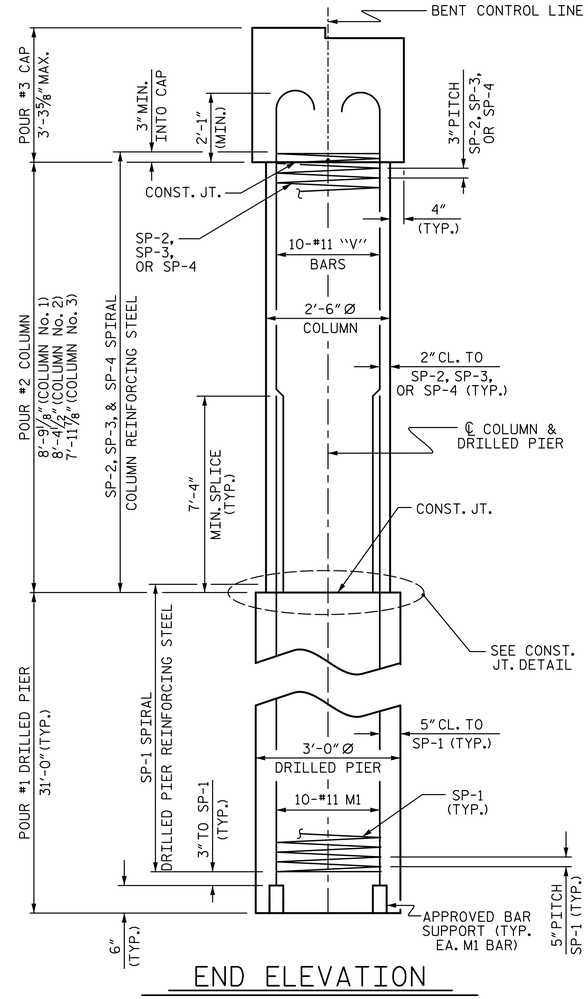
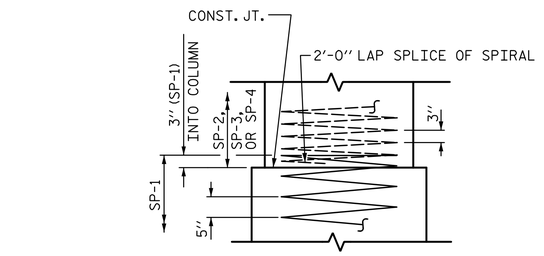


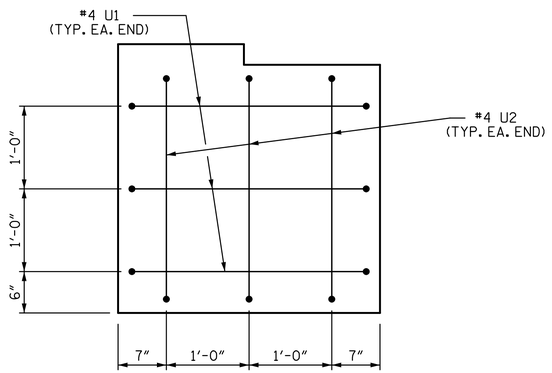
PLAN OF DRILLED PIERS & COLUMNS



END ELEVATION



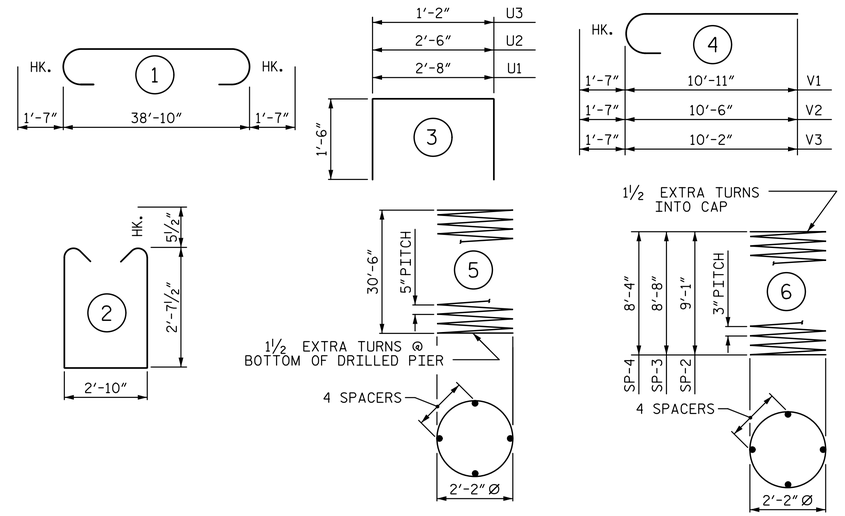
CONSTRUCTION JOINT DETAIL



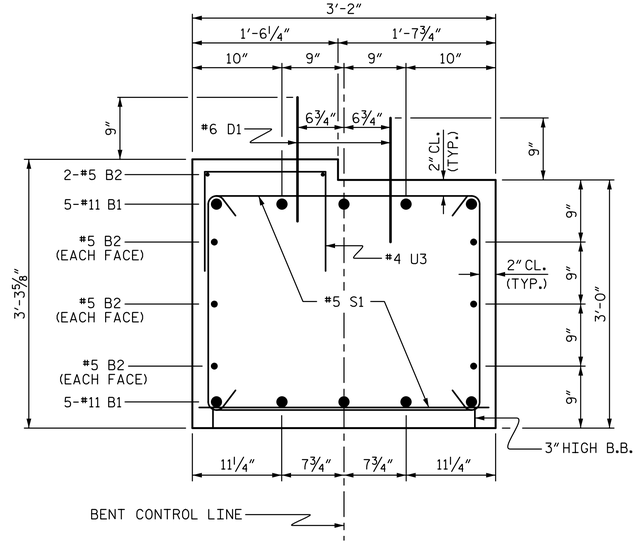
END OF CAP VIEW

(TYPICAL BOTH ENDS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



SECTION THRU CAP

BILL OF MATERIAL

FOR ONE BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	42'-0"	2231
B2	8	#5	STR	39'-0"	325
D1	40	#6	STR	1'-6"	90
M1	30	#11	STR	40'-10"	6508
S1	68	#5	2	9'-0"	638
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-6"	22
U3	39	#4	3	4'-2"	109
V1	10	#11	4	12'-6"	664
V2	10	#11	4	12'-1"	642
V3	10	#11	4	11'-9"	624

REINFORCING STEEL (FOR ONE BENT) 11876 LBS.

SP-1	3	*	5	497'-3"	1556
SP-2	1	**	6	252'-9"	169
SP-3	1	**	6	241'-8"	161
SP-4	1	**	6	232'-9"	155

SPIRAL COLUMN REINFORCING STEEL (FOR ONE BENT) 2041 LBS.

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

** THE SP-2, SP-3 & SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)

POUR #2 (COLUMNS)	4.6 C.Y.
POUR #3 (CAP)	14.5 C.Y.
TOTAL CLASS A CONCRETE	19.1 C.Y.

DRILLED PIERS: (FOR ONE BENT)

DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	24.3 C.Y.
3'-0" Ø DRILLED PIER NOT IN SOIL	52.0 LIN. FT.
3'-0" Ø DRILLED PIER IN SOIL	41.0 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	22.0 LIN. FT.
CSL TUBES	390.0 LIN. FT.

PROJECT NO. BR-0115

IREDELL COUNTY

STATION: 15+74.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 038640 ENGINEER WESLEY JONES 3/15/2020

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900 West Trade St., Suite 715
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2			4			23

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CHECKED BY :	JWJ	DATE : 1-20
DESIGN ENGINEER OF RECORD :	JWJ	DATE : 3-20
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CHECKED BY : MKT 3/10		

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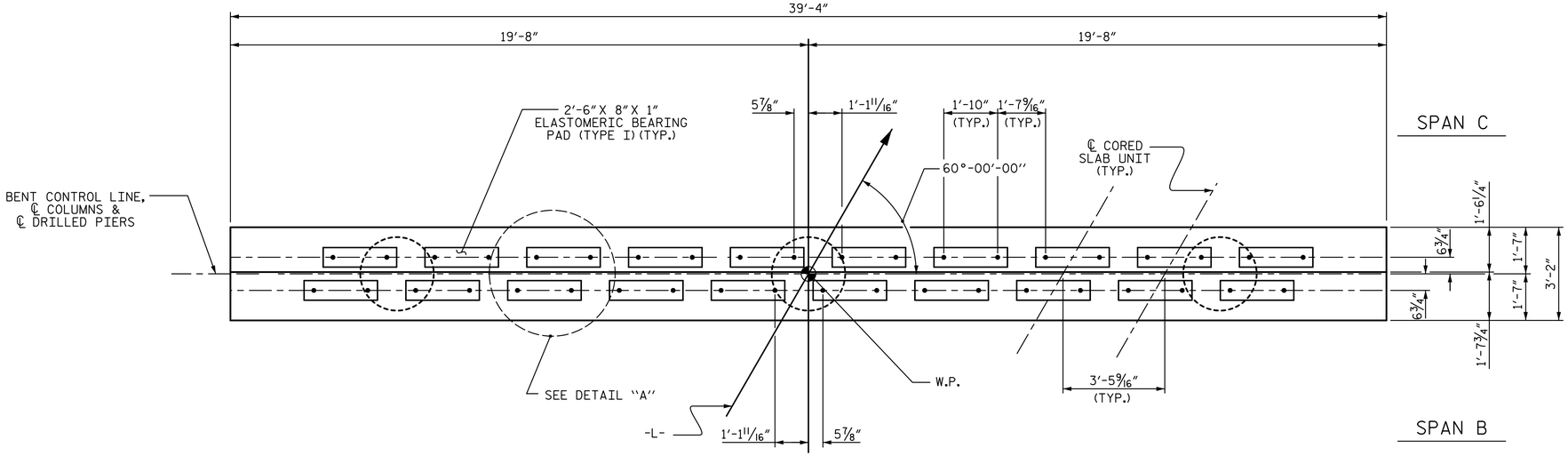

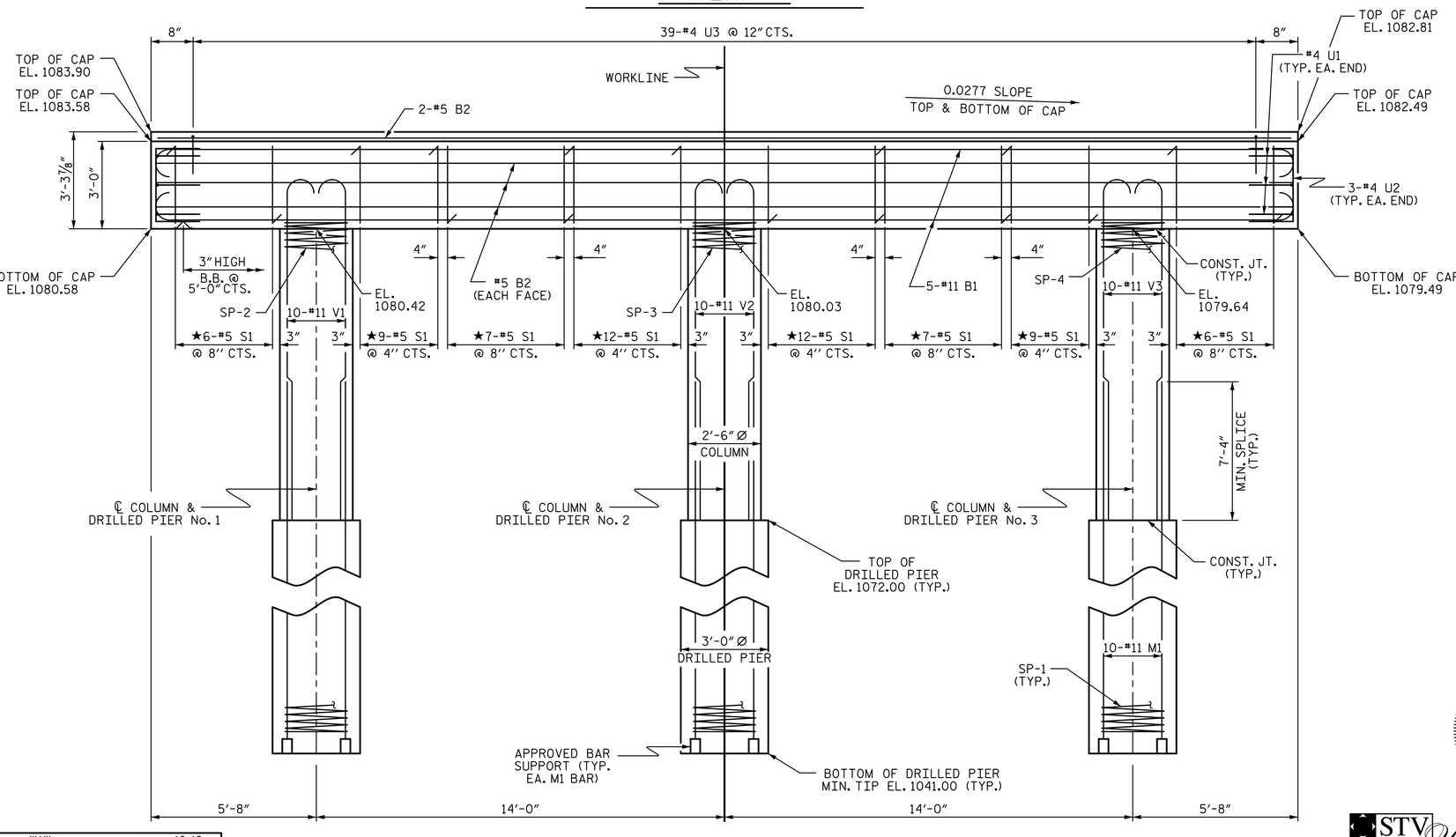

ELEVATION

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

DETAIL ″A″

(DIMENSIONS ARE TYPICAL EACH BEARING)

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PROJECT NO. BR-0115

IREDELL COUNTY

STATION: 15+74.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT No. 2

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

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 WESLEY JONES 3/13/2020

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DESIGN ENGINEER OF RECORD :	JWJ	DATE :	3-20
DRAWN BY : DGE 4/10	REV. 11/14 MAA/TMG		
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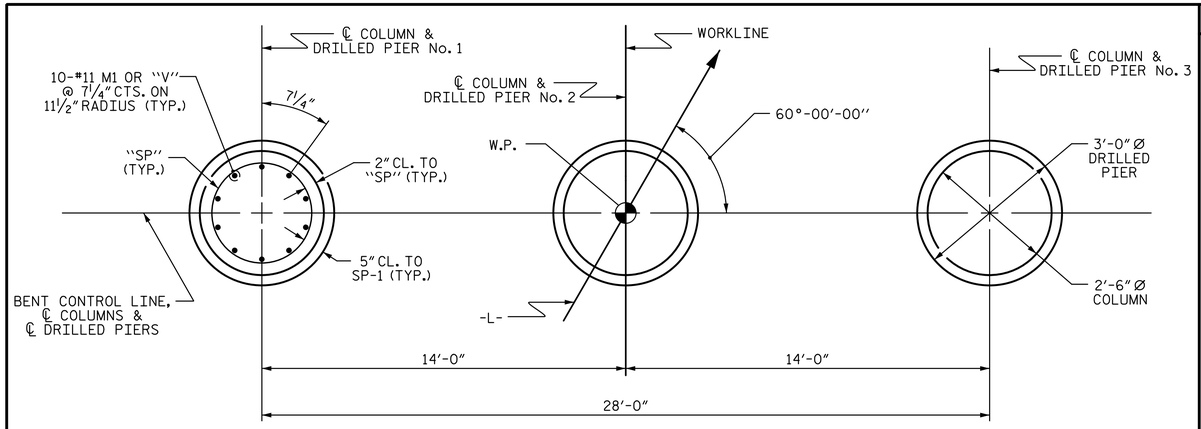
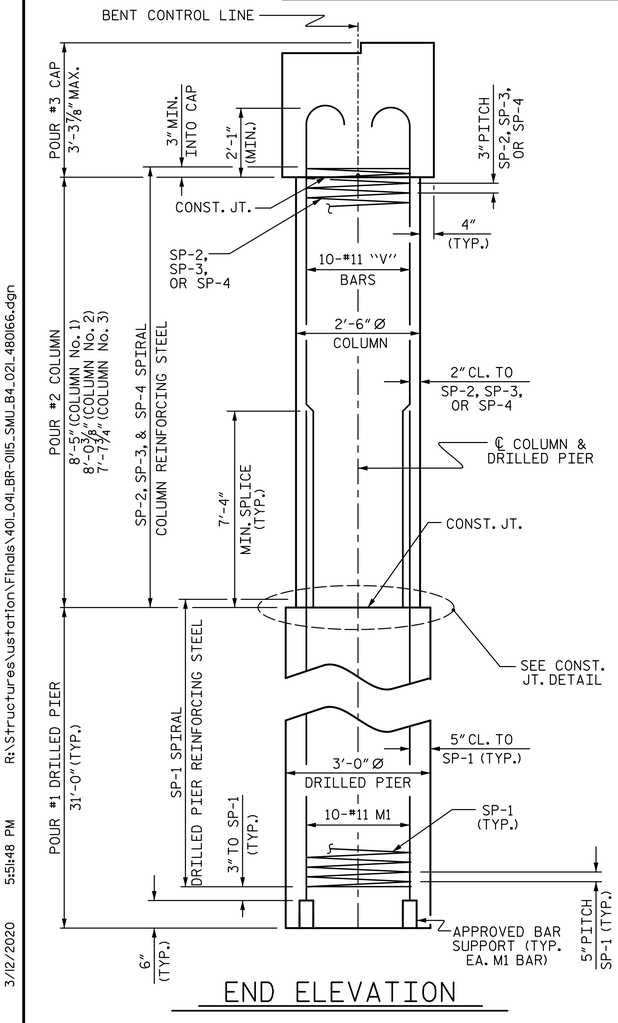
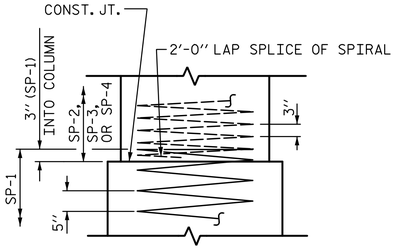


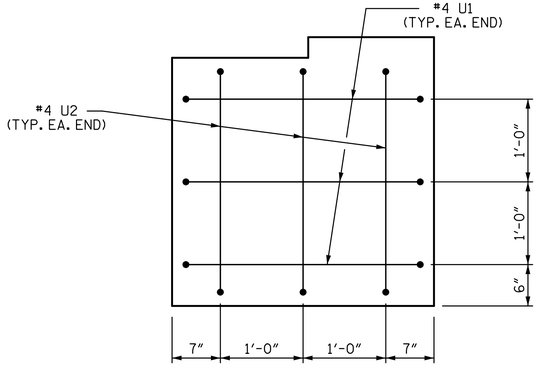
PLAN OF DRILLED PIERS & COLUMNS



END ELEVATION



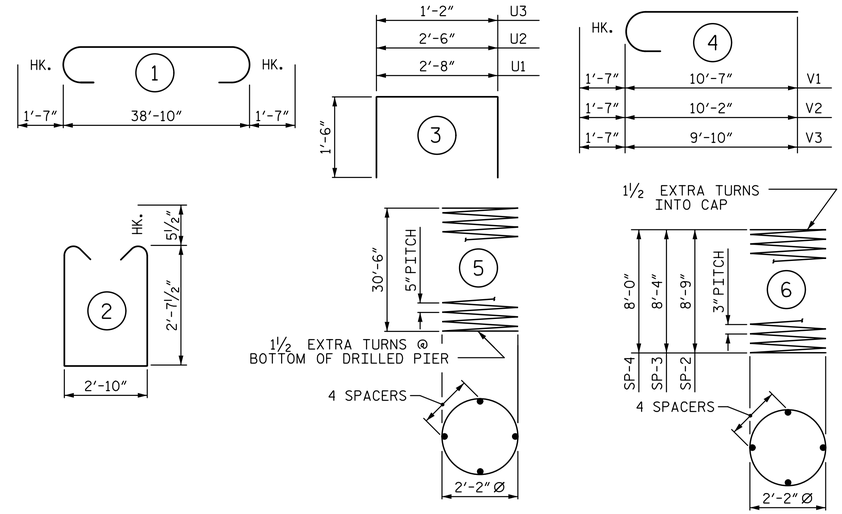
CONSTRUCTION JOINT DETAIL



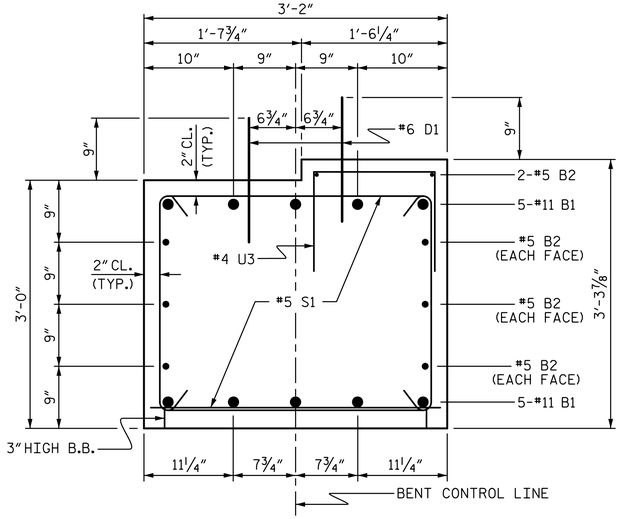
END OF CAP VIEW

(TYPICAL BOTH ENDS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



SECTION THRU CAP

BILL OF MATERIAL

FOR ONE BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	42'-0"	2231
B2	8	#5	STR	39'-0"	325
D1	40	#6	STR	1'-6"	90
M1	30	#11	STR	40'-10"	6508
S1	68	#5	2	9'-0"	638
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-6"	22
U3	39	#4	3	4'-2"	109
V1	10	#11	4	12'-2"	646
V2	10	#11	4	11'-9"	624
V3	10	#11	4	11'-5"	607

REINFORCING STEEL (FOR ONE BENT) 11823 LBS.

SP-1	3	*	5	497'-3"	1556
SP-2	1	**	6	243'-11"	163
SP-3	1	**	6	232'-9"	155
SP-4	1	**	6	223'-10"	150

SPIRAL COLUMN REINFORCING STEEL (FOR ONE BENT) 2024 LBS.

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

** THE SP-2, SP-3 & SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)

POUR #2 (COLUMNS)	4.4 C.Y.
POUR #3 (CAP)	14.6 C.Y.
TOTAL CLASS A CONCRETE	19.0 C.Y.

DRILLED PIERS: (FOR ONE BENT)

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	24.3 C.Y.
3'-0" Ø DRILLED PIER NOT IN SOIL	32.0 LIN. FT.
3'-0" Ø DRILLED PIER IN SOIL	61.0 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	36.0 LIN. FT.
CSL TUBES	390.0 LIN. FT.

DRAWN BY :	WAW	DATE :	10-19
CHECKED BY :	JWJ	DATE :	1-20
DESIGN ENGINEER OF RECORD :	JWJ	DATE :	3-20
DRAWN BY : DGE 3/10	REV. 11/14	MAA/TMG	
CHECKED BY : MKT 3/10			

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 J. WESLEY JONES 3/13/2020

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PROJECT NO. BR-0115

IREDELL COUNTY

STATION: 15+74.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 2

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

STD. NO. DP_BT_30_60S_<50'

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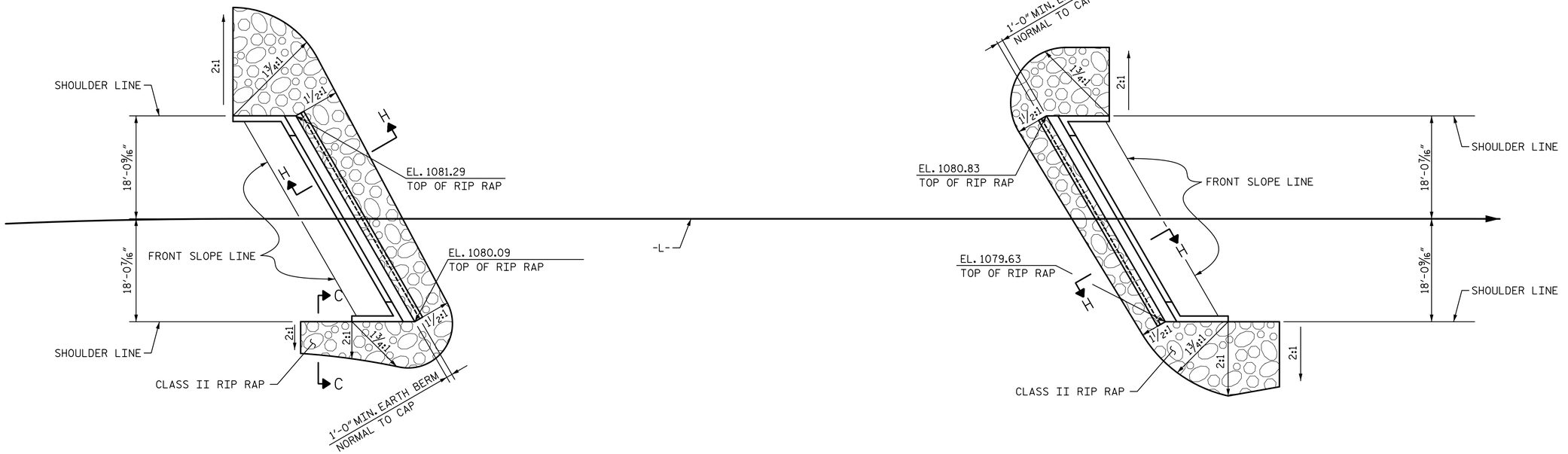
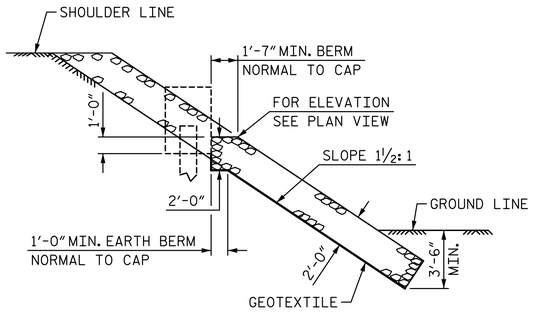


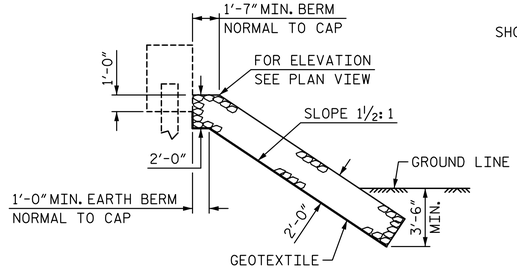
END BENT 1

END BENT 2

PLAN



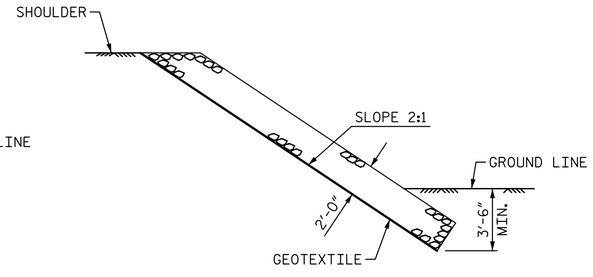
SECTION H-H



℄ SECTION

BERM RIP RAPPED

END BENT 1 SHOWN, END BENT 2 SIMILAR



SECTION C-C

ESTIMATED QUANTITIES		
BRIDGE @ STA. 15+74.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	125	140
END BENT 2	120	130

PROJECT NO. BR-0115

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STATION: 15+74.00 -L-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 J. WESLEY JONES 3/15/2020

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RALEIGH

RIP RAP DETAILS

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

SHEET NO. S-22

TOTAL SHEETS 23

DRAWN BY :	WAW	DATE :	10-19
CHECKED BY :	JWJ	DATE :	1-20
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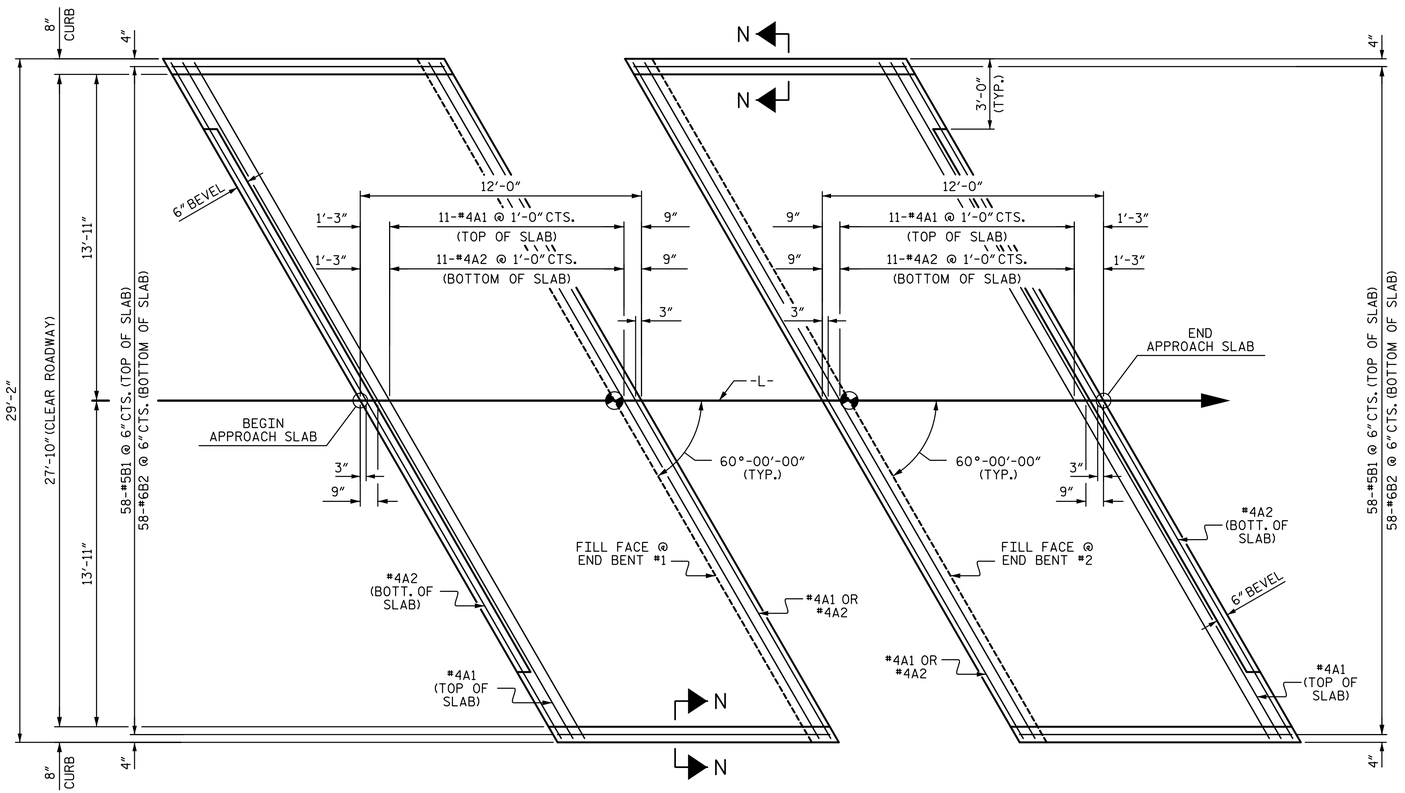
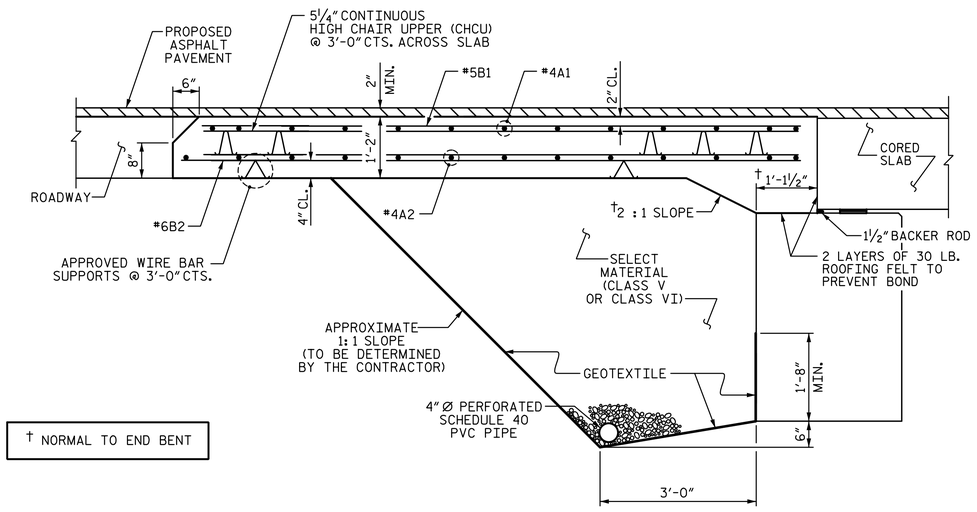


PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



† 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"

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.

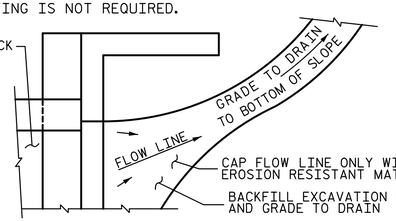
SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

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.

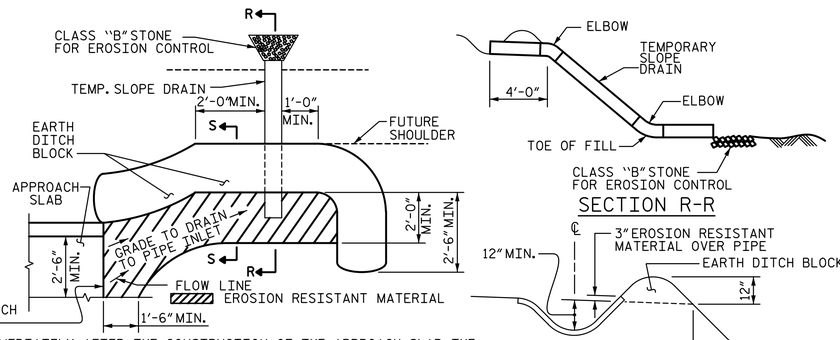
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



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

TEMPORARY DRAINAGE DETAIL

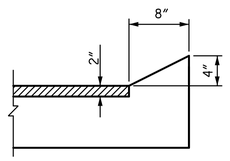


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION N-N

CURB DETAILS

BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	13	#4	STR	33'-3"	289
A2	13	#4	STR	33'-3"	289
✳ B1	58	#5	STR	11'-1"	1298
B2	58	#6	STR	11'-7"	959
REINFORCING STEEL				LBS.	1298
✳ EPOXY COATED REINFORCING STEEL				LBS.	959
CLASS AA CONCRETE				C.Y.	16.9

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	13	#4	STR	33'-3"	289
A2	13	#4	STR	33'-3"	289
✳ B1	58	#5	STR	11'-1"	670
B2	58	#6	STR	11'-7"	1009
REINFORCING STEEL				LBS.	1298
✳ EPOXY COATED REINFORCING STEEL				LBS.	959
CLASS AA CONCRETE				C.Y.	16.9

PROJECT NO. BR-0115

IREDELL COUNTY

STATION: 15+74.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB UNIT (SUB-REGIONAL TIER) 60° SKEW

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

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NC License Number F-0991

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CHECKED BY :	JWJ	DATE : 1-20
DESIGN ENGINEER OF RECORD :	JWJ	DATE : 3-20
DRAWN BY : SHS/MAA 5-09	REV. 12-17	MAA/THC
CHECKED BY : BCH 5-09	REV. 08-19	BNB/THC

STD. NO. BAS_30_60S

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