

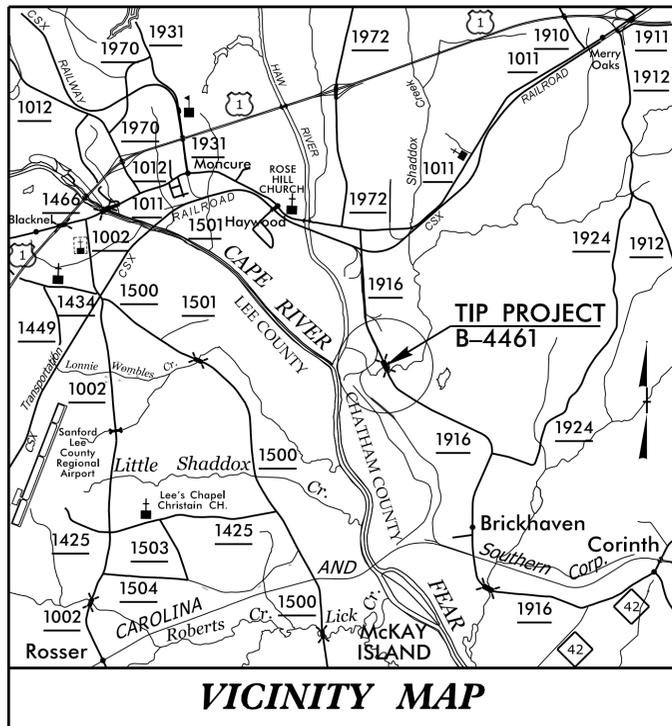
**This electronic collection of documents is provided  
for the convenience of the user  
and is Not a Certified Document –**

**The documents contained herein were originally issued  
and sealed by the individuals whose names and license  
numbers appear on each page, on the dates appearing  
with their signature on that page.**

**This file or an individual page  
shall not be considered a certified document.**

**CONTRACT: C203748 TIP PROJECT: B-4461**

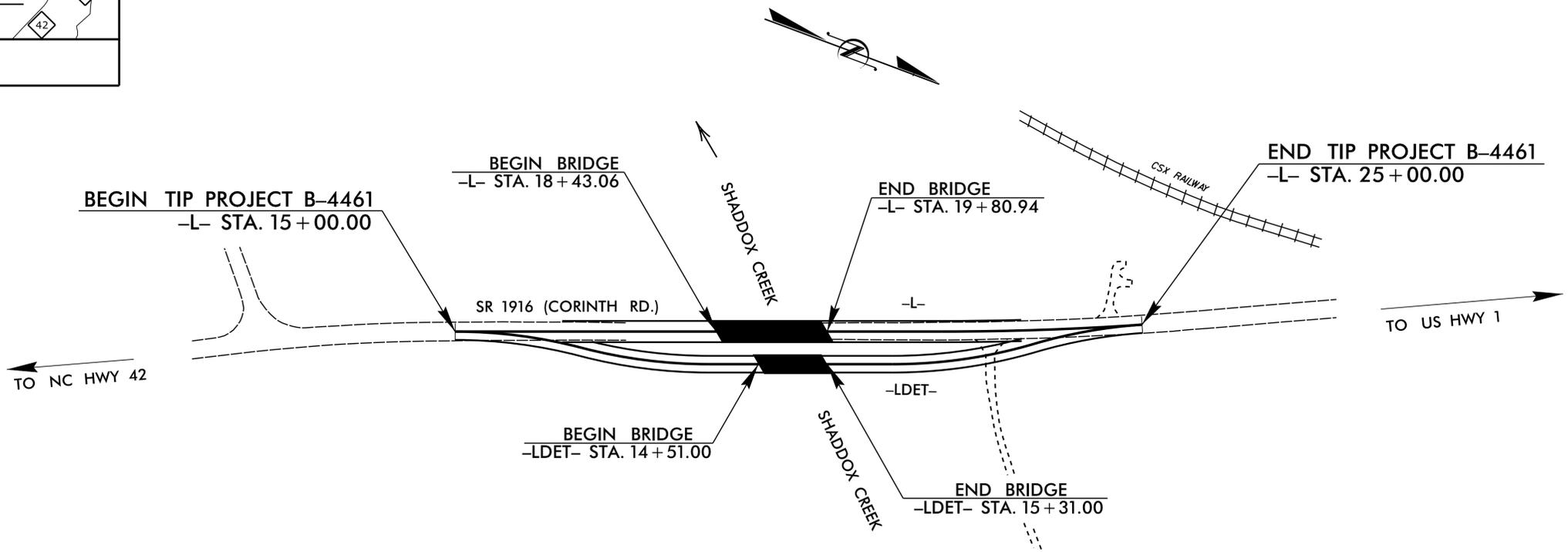
**STRUCTURE**



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**CHATHAM COUNTY**

**LOCATION: BRIDGE #10 OVER SHADDOX CREEK ON SR 1916 (CORINTH RD.)**  
**TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4461		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33712.1.1	BRSTP-1916(6)	P.E.	
33712.2.FD1		UTIL & RW	
33712.3.2		CONST.	



**DESIGN DATA**

ADT 2016 =	3,100
ADT 2030 =	4,000
K =	12 %
D =	65 %
T =	20 % *
V =	55 MPH
V <sub>DET</sub> =	45 MPH
* TTST	13% DUAL 7%
FUNC CLASS =	COLLECTOR
Sub-Regional Tier	

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4461 = 0.163 MI  
LENGTH STRUCTURE TIP PROJECT B-4461 = 0.026 MI  
TOTAL LENGTH TIP PROJECT B-4461 = 0.189 MI

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**  
STRUCTURES MANAGEMENT UNIT  
1000 BIRCH RIDGE DR.  
RALEIGH, N.C. 27610

---

2012 STANDARD SPECIFICATIONS

LETTING DATE : JUNE, 21 2016

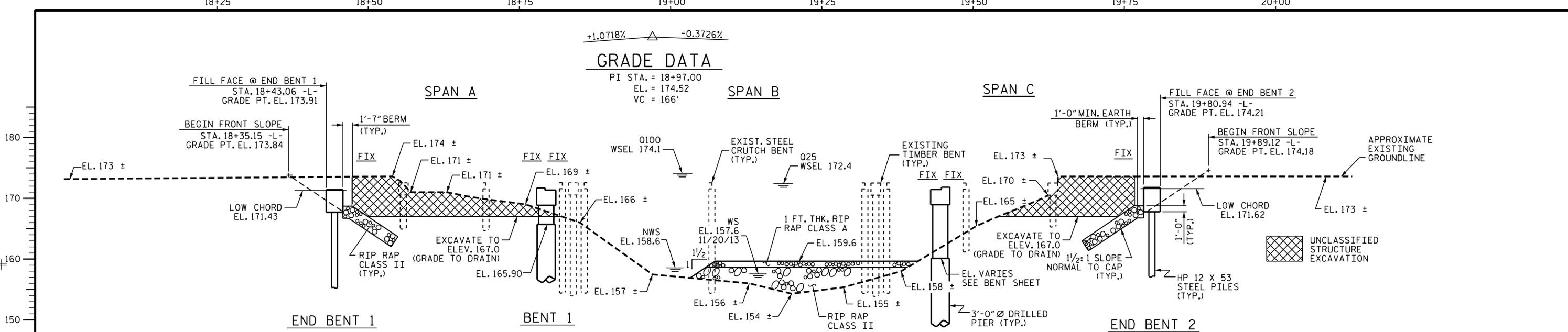
J. M. BAILEY, P.E.  
PROJECT ENGINEER

T. H. FANG, P.E.  
PROJECT DESIGN ENGINEER

+1.0718% -0.3726%

**GRADE DATA**

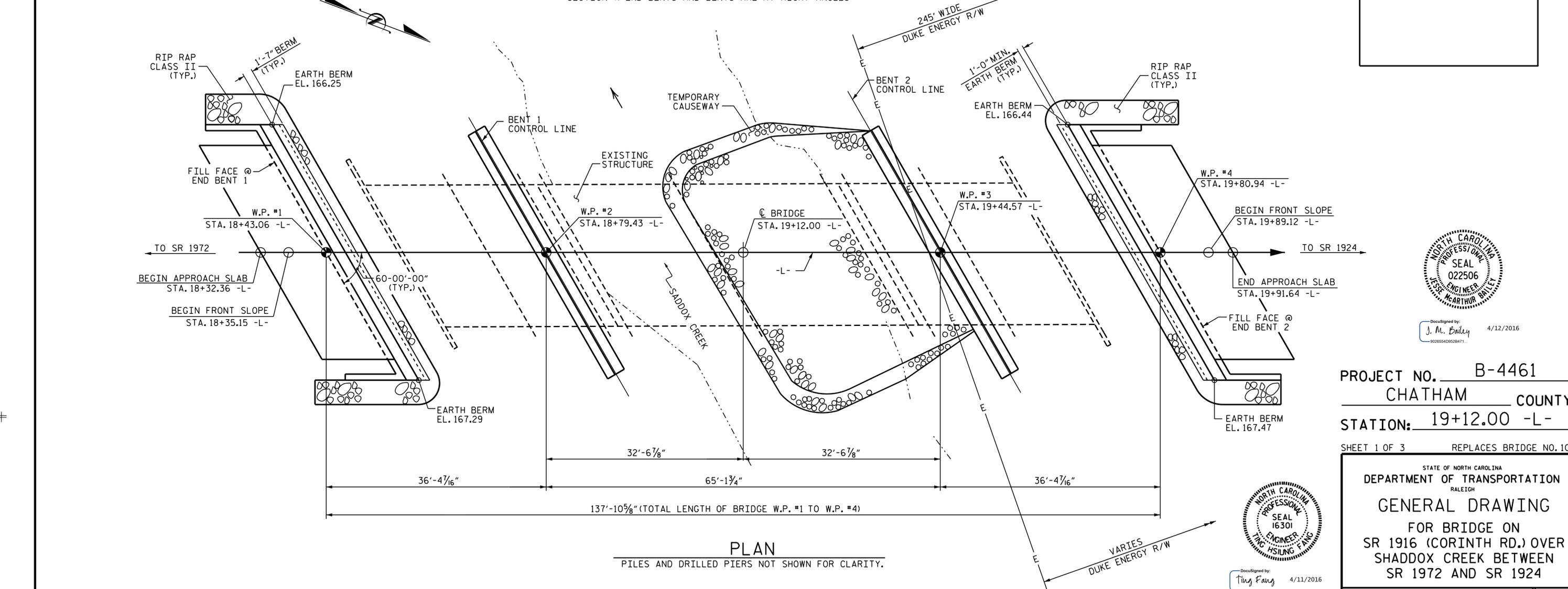
PI STA. = 18+97.00  
 EL. = 174.52  
 VC = 166'



**SECTION ALONG -L-**

SECTION @ END BENTS AND BENTS ARE AT RIGHT ANGLES

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



**PLAN**

PILES AND DRILLED PIERS NOT SHOWN FOR CLARITY.



DocuSigned by: J. M. Bailey 4/12/2016

PROJECT NO. B-4461  
 CHATHAM COUNTY  
 STATION: 19+12.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 10

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON  
 SR 1916 (CORINTH RD.) OVER  
 SHADDOX CREEK BETWEEN  
 SR 1972 AND SR 1924

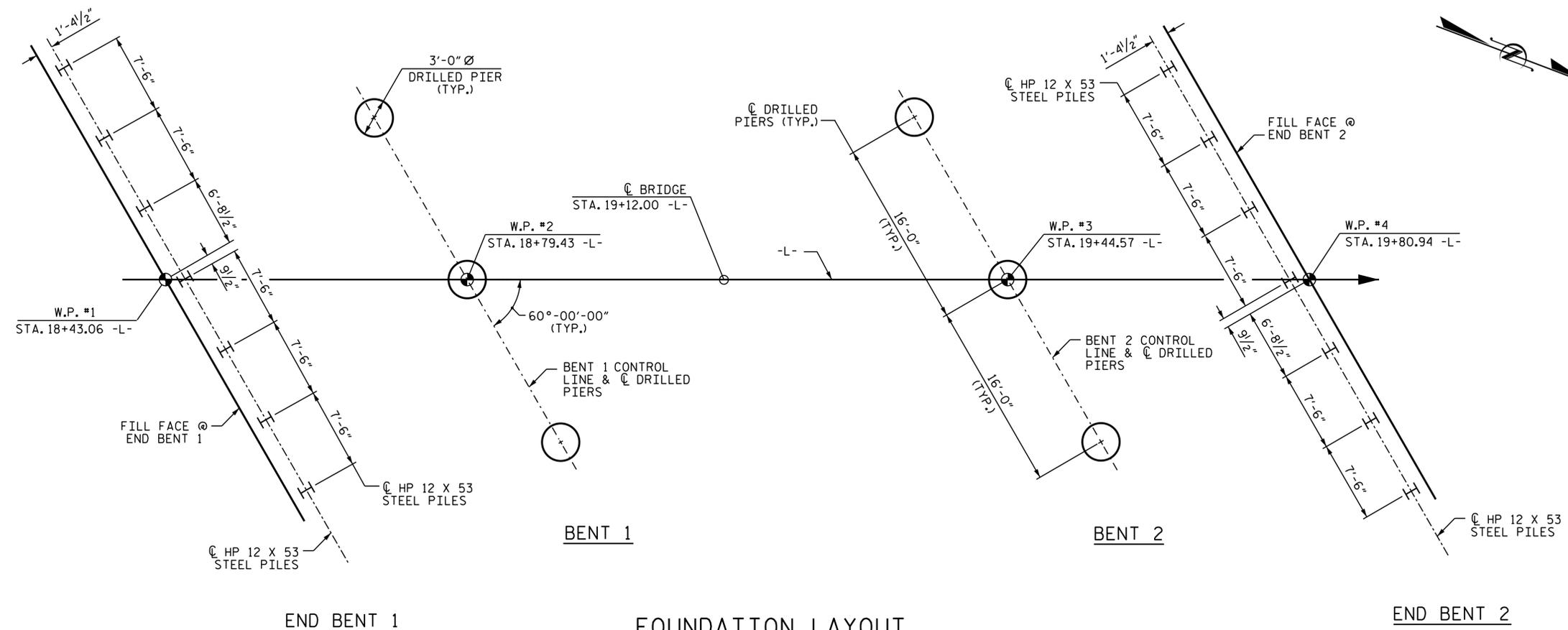


DocuSigned by: Ting Fang 4/11/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

DRAWN BY: S. WANCE DATE: 02/14  
 CHECKED BY: T. H. FANG DATE: 06/26



**FOUNDATION LAYOUT**  
 DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE SHOWN TO THE CENTERLINE OF PILES & DRILLED PIERS.

**NOTES:**

FOR DRILLED PIERS, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 395 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 70 TSF.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT 1. IF REQUIRED, DO NOT EXTEND PERMANENT STEEL CASINGS BELOW ELEVATION 148 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

INSTALL DRILLED PIERS AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN 130.9 FT AND WITH THE REQUIRED TIP RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS 145.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRILLED PIERS AT BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 395 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 70 TSF.

PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT BENT 2. DO NOT EXTEND PERMANENT STEEL CASINGS BELOW ELEVATION 149.9 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

INSTALL DRILLED PIERS AT BENT 2 TO A TIP ELEVATION NO HIGHER THAN 135.9 FT FOR LEFT PIER AND 130.9 FOR RIGHT PIER AND CENTER PIER, AND WITH THE REQUIRED TIP RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT 2 IS 144.2 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

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

DRILLED PIER EXCAVATIONS AT BENTS 1 & 2 WILL EXTEND INTO MATERIAL THAT DETERIORATES WHEN EXPOSED TO THE ELEMENTS. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE AND PLACE CONCRETE IMMEDIATELY AFTER THE EXCAVATION IS COMPLETED.

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

PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 60 TONS PER PILE. DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 100 TONS PER PILE.

PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 65 TONS PER PILE. DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 110 TONS PER PILE.

PROJECT NO. B-4461  
CHATHAM COUNTY  
 STATION: 19+12.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON  
 SR 1916 (CORINTH RD.) OVER  
 SHADDOX CREEK BETWEEN  
 SR 1972 AND SR 1924



DocuSigned by:  
 Ting Fang 4/11/2016  
 E72088400977435

DRAWN BY : S. WANCE DATE : 03/14  
 CHECKED BY : T. H. FANG DATE : 03/16

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

**TOTAL BILL OF MATERIAL**

	CONST. MAINT. & REMOVAL OF TEMPORARY STRUCTURE	CONST. MAINT. & REMOVAL OF TEMP. ACCESS	REMOVAL OF EXISTING STRUCTURE	3'-0" Ø DRILLED PIERS IN SOIL	3'-0" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	SID INSPECTIONS	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CONCRETE WEARING SURFACE	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	HP 12 X 53 STEEL PILES	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	ASBESTOS ASSESSMENT				
	LUMP SUM	LUMP SUM	LUMP SUM	LINE FT.	LINE FT.	LINE FT.	EA.	EA.	EA.	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LINE FT.	LINE FT.	TON	SQ. YD.	LUMP SUM	NO.	LINE FT.	NO.	LINE FT.	LUMP SUM	
SUPERSTRUCTURE											4,577	4,840		LUMP SUM					270.87			LUMP SUM	24	840	12	780		
END BENT 1													25.5		3,105		7	175		60	65							
BENT 1				83.0	22.0	57.0							18.7		11,015	1,965												
BENT 2				55.0	28.0	33.3							21.9		11,917	1,898												
END BENT 2													25.5		3,105		7	180		60	65							
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	138.0	50.0	90.3	1	2	2	LUMP SUM	4,577	4,840	91.6	LUMP SUM	29,142	3,863	14	355	270.87	120	130	LUMP SUM	24	840	12	780	LUMP SUM	

**NOTES:**

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 32 FT. EACH SIDE OF CENTERLINE ROADWAY AT END BENT 1 AND 30 FT. LEFT SIDE, 25 FT. RIGHT SIDE OF CENTERLINE ROADWAY AT END BENT 2 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.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 19+12.00 -L-".

THE EXISTING STRUCTURE CONSISTING OF 3 SPANS: 2 @ 30'-0", 1 @ 50'-0", WITH A 4" AWS CLEAR ROADWAY WIDTH OF 22'-0" AND REINFORCED CONCRETE DECK ON I-BEAMS; WITH SUBSTRUCTURE CONSISTING OF END BENTS AND TWO INTERIOR BENTS WITH REINFORCED CONCRETE CAPS AND TIMBER PILES AND SEVEN STEEL CRUTCH BENTS LOCATED AT MIDSPAN AND ST INTERIOR BENTS AT THE PROPOSED STRUCTURE SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

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

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 19+12.00 -L-.

THE CONTRACTOR'S ATTENTION IS DRAWN TO THE FACT THAT A 115KV TRANSMISSION LINE NEAR END BENT 2 SHALL REMAIN IN PLACE. FOR "CONSTRUCTABILITY IN CLOSE PROXIMITY OF OVERHEAD POWER LINES", SEE SPECIAL PROVISIONS.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STATION 14+91.00 -LDET- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

THE BRIDGE RAILS ON THE TEMPORARY STRUCTURE SHALL BE DESIGNED FOR THE AASHTO LRFD TEST LEVEL 3 (TL-3) CRASH TEST CRITERIA. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

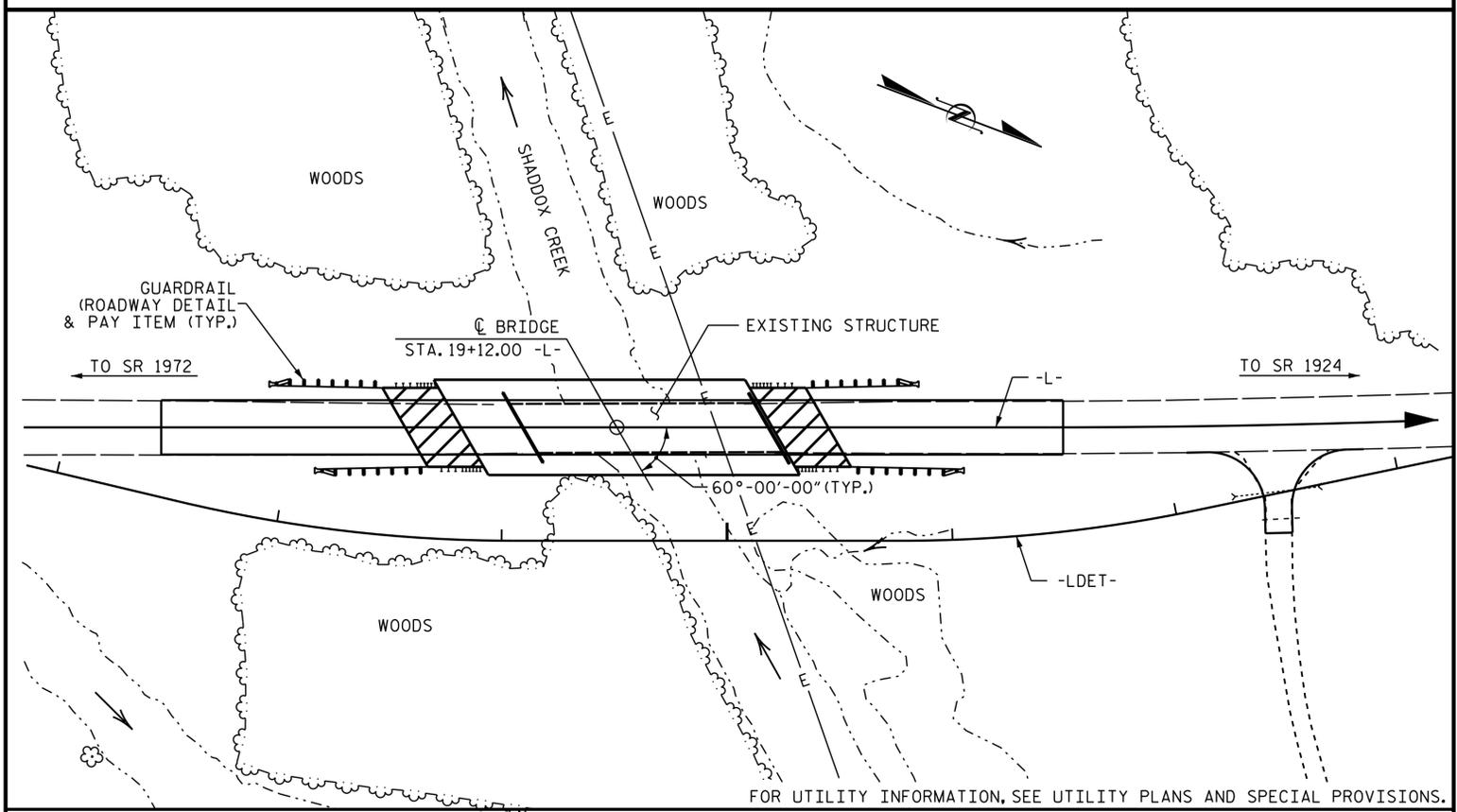
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

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

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

**BM #2: RAILROAD SPIKE IN BASE OF POWER POLE, 260.8' LEFT OF STA. 20+72.56 -L-, EL. 171.04'.**



**LOCATION SKETCH**

**HYDRAULIC DATA**

DESIGN DISCHARGE	=	2800 CFS
FREQUENCY OF DESIGN FLOOD	=	25 YRS.
DESIGN HIGH WATER ELEVATION	=	172.4
DRAINAGE AREA	=	15.0 SQ. MI.
BASIC DISCHARGE (Q100)	=	3900 CFS
BASIC HIGH WATER ELEVATION	=	174.1

**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE	=	2247 CFS
FREQUENCY OF OVERTOPPING FLOOD	=	10 + YRS.
OVERTOPPING FLOOD ELEVATION	=	171.1 (ROADWAY STA. 12+00)

DRAWN BY : S. WANCE DATE : 03/14  
 CHECKED BY : W. F. PARKER DATE : 09/15

11-APR-2016 13:13  
 K:\TIP\Projects-B\B4461\Structures\Plans\Final plans\b4461.sd.cs.dgn  
 ffang



DocuSigned by:  
 Ting Fang  
 E7208400977435 4/11/2016

PROJECT NO. B-4461  
CHATHAM COUNTY  
 STATION: 19+12.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON  
 SR 1916 (CORINTH RD.) OVER  
 SHADDOX CREEK BETWEEN  
 SR 1972 AND SR 1924

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR PRESTRESSED CONCRETE CORED SLAB UNITS

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	$\gamma_{DC}$	$\gamma_{DW}$
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

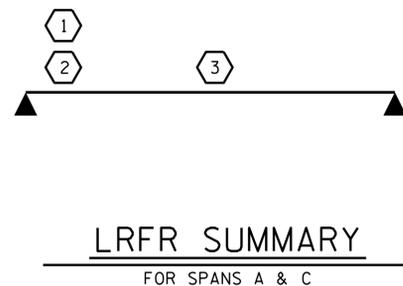
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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	



PROJECT NO. B-4461  
CHATHAM COUNTY  
 STATION: 19+12.00 -L-

SHEET 1 OF 2



DocuSigned by:  
Ting Fang  
4/11/2016

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 LRFR SUMMARY FOR  
 35' CORED SLAB UNIT  
 60° SKEW  
 (NON-INTERSTATE TRAFFIC)  
 SPANS A & C

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

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

ASSEMBLED BY : P. K. NEWTON DATE : 3/16  
 CHECKED BY : T. H. FANG DATE : 3/16  
 DRAWN BY : CVC 6/10  
 CHECKED BY : DNS 6/10

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR PRESTRESSED CONCRETE CORED SLAB UNITS

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	1.013	--	1.75	0.248	1.16	65'	EL	31.923	0.652	<b>1.01</b>	65'	EL	<b>6.385</b>	0.80	0.248	1.12	65'	EL	31.923		
	HL-93(0pr)	N/A	--	1.313	--	1.35	0.248	1.5	65'	EL	31.923	0.652	1.31	65'	EL	6.385	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.246	44.865	1.75	0.248	1.48	65'	EL	31.923	0.652	<b>1.25</b>	65'	EL	<b>6.385</b>	0.80	0.248	1.44	65'	EL	31.923		
	HS-20(0pr)	36.000	--	1.616	58.159	1.35	0.248	1.92	65'	EL	31.923	0.652	1.62	65'	EL	6.385	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.163	42.696	1.4	0.248	4.07	65'	EL	31.923	0.652	3.64	65'	EL	6.385	0.80	0.248	3.16	65'	EL	31.923	
		SNGARBS2	20.000	--	2.395	47.893	1.4	0.248	3.08	65'	EL	31.923	0.652	2.61	65'	EL	6.385	0.80	0.248	2.39	65'	EL	31.923	
		SNAGRIS2	22.000	--	2.284	50.247	1.4	0.248	2.94	65'	EL	31.923	0.652	2.43	65'	EL	6.385	0.80	0.248	2.28	65'	EL	31.923	
		SNCOTTS3	27.250	--	1.575	42.917	1.4	0.248	2.03	65'	EL	31.923	0.652	1.82	65'	EL	6.385	0.80	0.248	1.57	65'	EL	31.923	
		SNAGRS4	34.925	--	1.331	46.469	1.4	0.248	1.71	65'	EL	31.923	0.652	1.53	65'	EL	6.385	0.80	0.248	1.33	65'	EL	31.923	
		SNS5A	35.550	--	1.3	46.22	1.4	0.248	1.67	65'	EL	31.923	0.652	1.55	65'	EL	6.385	0.80	0.248	1.30	65'	EL	31.923	
		SNS6A	39.950	--	1.199	47.899	1.4	0.248	1.54	65'	EL	31.923	0.652	1.42	65'	EL	6.385	0.80	0.248	1.20	65'	EL	31.923	
	SNS7B	42.000	--	1.142	47.965	1.4	0.248	1.47	65'	EL	31.923	0.652	1.4	65'	EL	6.385	0.80	0.248	1.14	65'	EL	31.923		
	TTST	TNAGRIT3	33.000	--	1.464	48.309	1.4	0.248	1.89	65'	EL	31.923	0.652	1.69	65'	EL	6.385	0.80	0.248	1.46	65'	EL	31.923	
		TNT4A	33.075	--	1.472	48.688	1.4	0.248	1.9	65'	EL	31.923	0.652	1.64	65'	EL	6.385	0.80	0.248	1.47	65'	EL	31.923	
		TNT6A	41.600	--	1.209	50.315	1.4	0.248	1.56	65'	EL	31.923	0.652	1.51	65'	EL	6.385	0.80	0.248	1.21	65'	EL	31.923	
		TNT7A	42.000	--	1.219	51.186	1.4	0.248	1.57	65'	EL	31.923	0.652	1.46	65'	EL	6.385	0.80	0.248	1.22	65'	EL	31.923	
		TNT7B	42.000	--	1.269	53.286	1.4	0.248	1.63	65'	EL	31.923	0.652	1.37	65'	EL	6.385	0.80	0.248	1.27	65'	EL	31.923	
		TNAGRIT4	43.000	--	1.201	51.645	1.4	0.248	1.55	65'	EL	31.923	0.652	1.32	65'	EL	6.385	0.80	0.248	1.20	65'	EL	31.923	
TNAGT5A		45.000	--	1.13	50.836	1.4	0.248	1.45	65'	EL	31.923	0.652	1.32	65'	EL	6.385	0.80	0.248	1.13	65'	EL	31.923		
TNAGT5B	45.000	3	1.114	50.113	1.4	0.248	1.43	65'	EL	31.923	0.652	1.25	65'	EL	6.385	0.80	0.248	<b>1.11</b>	65'	EL	<b>31.923</b>			

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	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)

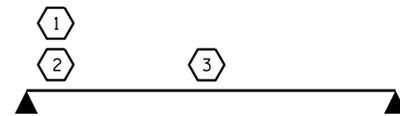
2 DESIGN LOAD RATING (HS-20)

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. B-4461  
CHATHAM COUNTY  
STATION: 19+12.00 -L-

SHEET 2 OF 2



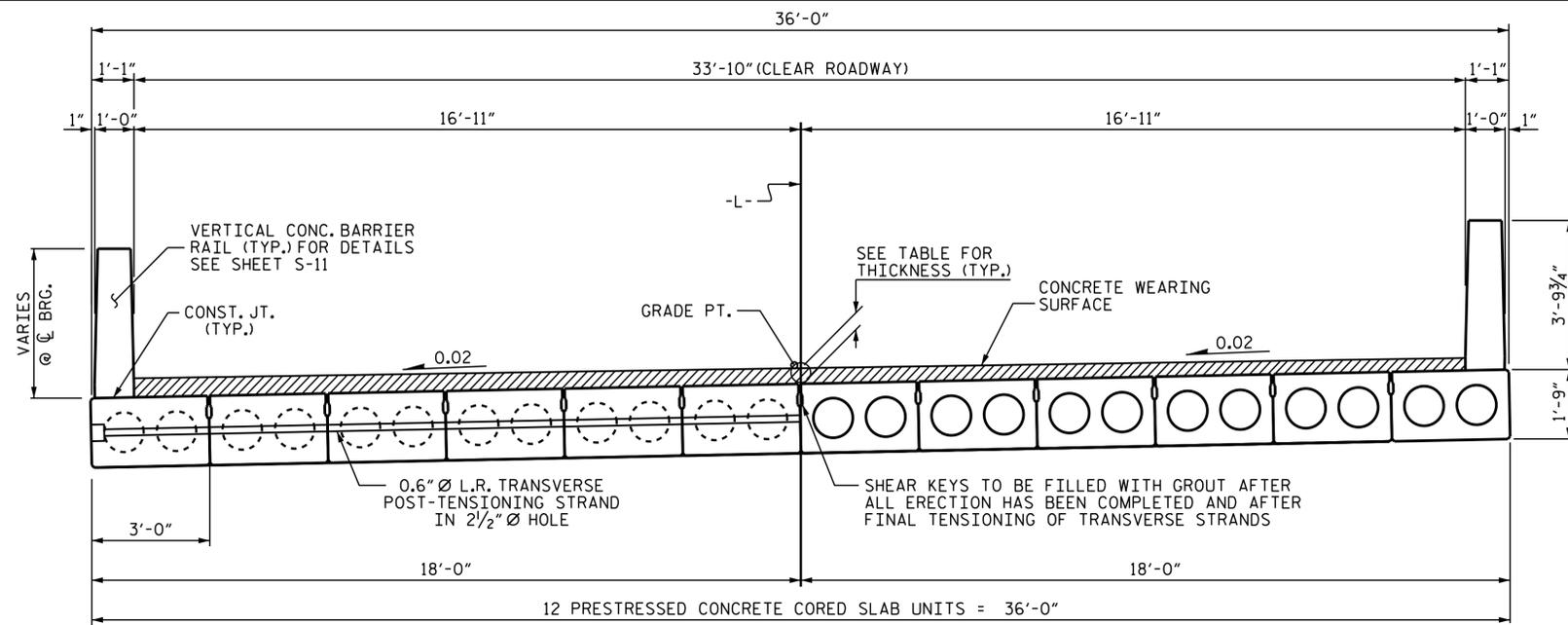
DocuSigned by:  
Ting Fang 4/11/2016

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
LRFR SUMMARY FOR  
65' CORED SLAB UNIT  
60° SKEW  
(NON-INTERSTATE TRAFFIC)  
SPAN B

ASSEMBLED BY : P. K. NEWTON DATE : 3/16  
CHECKED BY : T. H. FANG DATE : 3/16  
DRAWN BY : CVC 6/10  
CHECKED BY : DNS 6/10

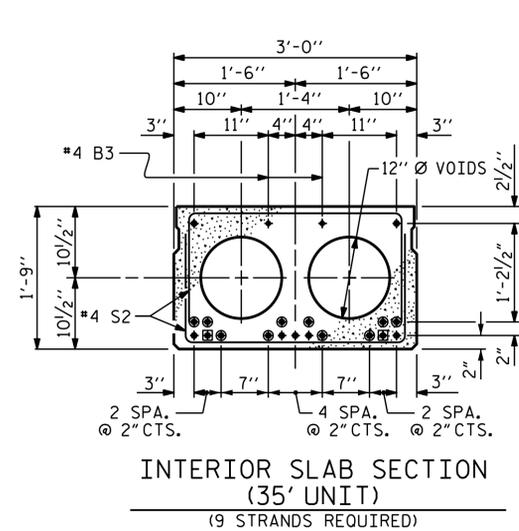
DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

REVISIONS						SHEET NO. S-5 TOTAL SHEETS 22
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

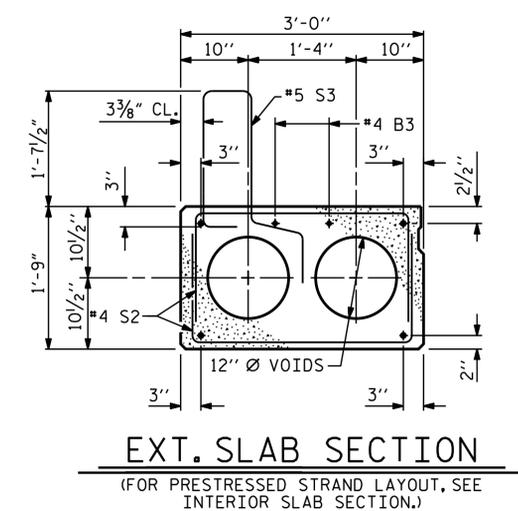


**TYPICAL SECTION**

\* - 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.



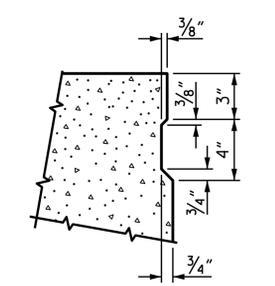
**INTERIOR SLAB SECTION (35' UNIT)**  
(9 STRANDS REQUIRED)



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

**0.6" Ø LOW RELAXATION STRAND LAYOUT**

- BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

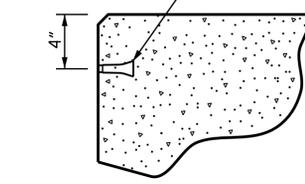


**SHEAR KEY DETAIL**

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

**DEBONDING LEGEND**

PERMITTED THREADED INSERT CAST IN OUTSIDE FACE OF EXTERIOR UNIT AND RECESSED 3/8" SIZE TO BE DETERMINED BY CONTRACTOR.



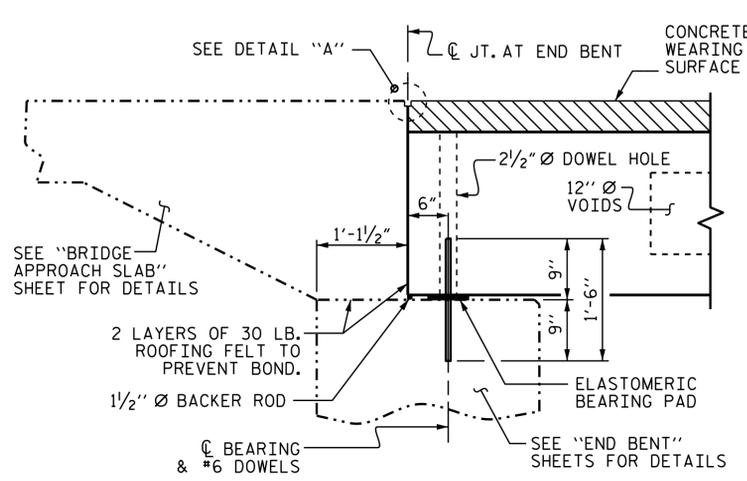
**THREADED INSERT DETAIL**

CONCRETE WEARING SURFACE THICKNESS				
SPAN	LOCATION	LT GUTTERLINE	G. P.	RT GUTTERLINE
A	BEARING (NEAR)	3 3/4"	3 3/4"	3 3/4"
	MID-SPAN	3 5/8"	3 5/8"	3 1/2"
	BEARING (FAR)	4"	3 7/8"	3 3/4"
B	BEARING (NEAR)	6 3/16"	5 7/8"	5 1/2"
	MID-SPAN	4 7/8"	4 1/6"	3 1/2"
	BEARING (FAR)	7 1/2"	6 1/2"	5 1/2"
C	BEARING (NEAR)	5 3/4"	4 3/4"	3 3/4"
	MID-SPAN	5 7/8"	4 1/16"	3 1/2"
	BEARING (FAR)	6 7/16"	5 1/16"	3 3/4"

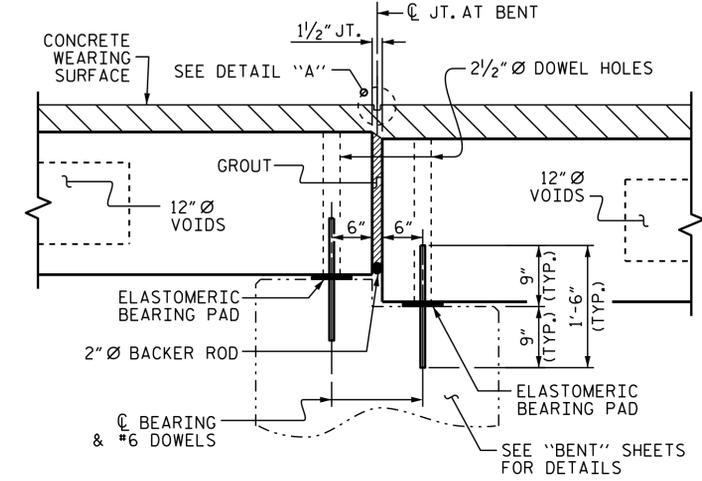
**FIXED END**

**FIXED END**

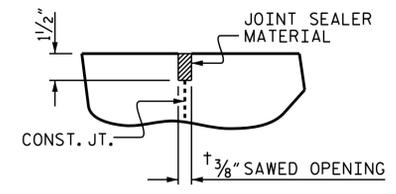
**FIXED END**



**SECTION AT END BENT**

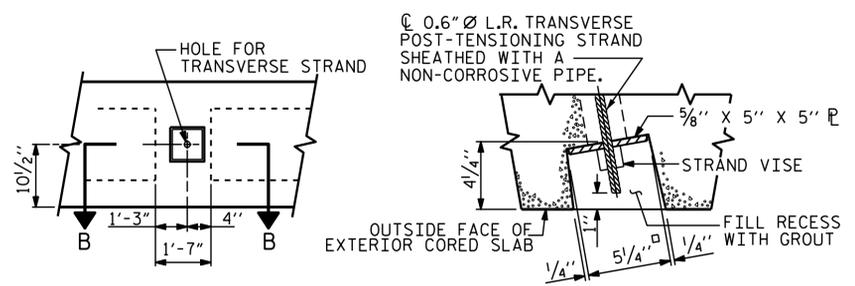


**STEPPED SECTION AT BENT 1**



**DETAIL "A"**

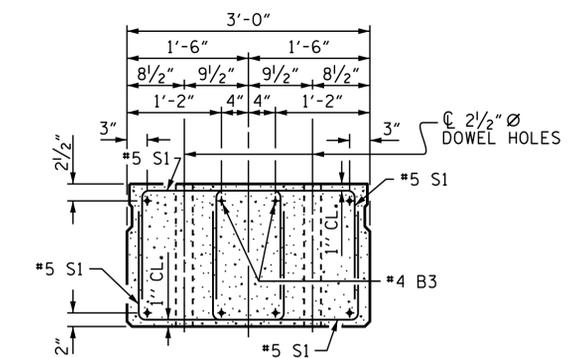
A 1/2" DEEP CONTRACTION JOINT AT EACH END BENT SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.



**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.

PROJECT NO. B-4461  
CHATHAM COUNTY  
STATION: 19+12.00 -L-

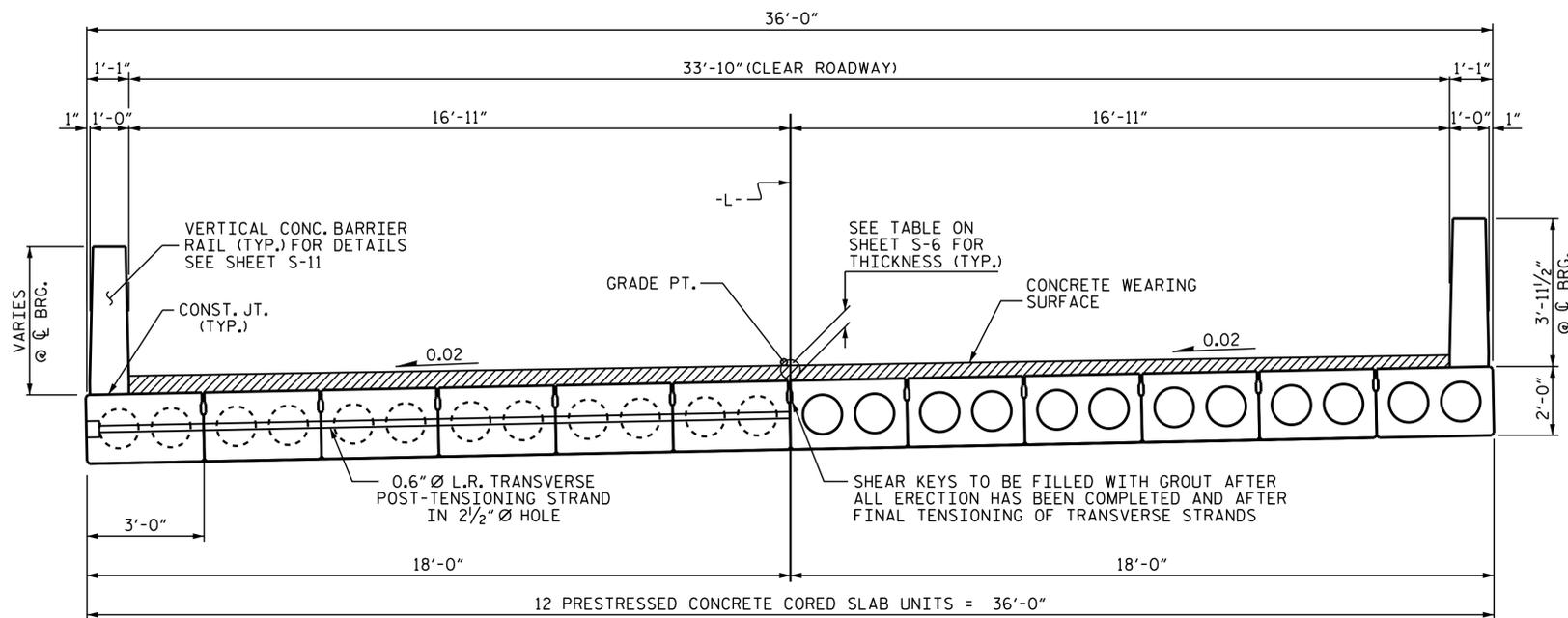
SHEET 1 OF 6



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
3'-0" X 1'-9"  
PRESTRESSED CONCRETE  
35' CORED SLAB UNIT  
60° SKEW  
SPANS A & C

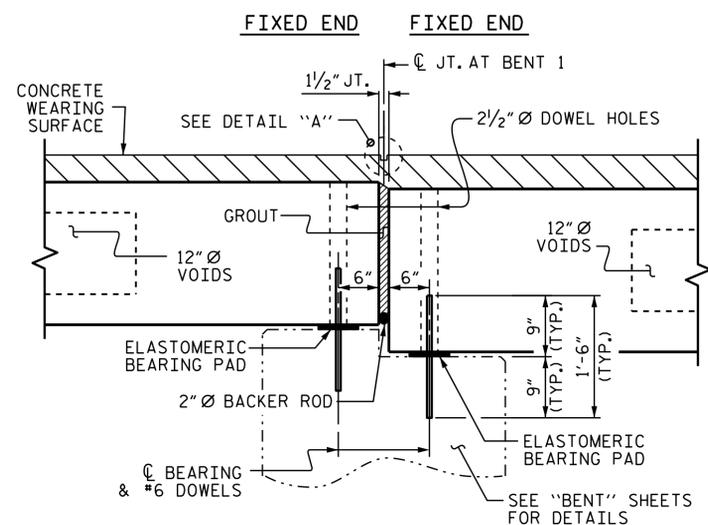
REVISIONS						SHEET NO. S-6
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 23
2			4			

ASSEMBLED BY : S. WANCE	DATE : 06/14
CHECKED BY : W. F. PARKER	DATE : 09/15
DRAWN BY : DGE 5/09	REV. 9/14
CHECKED BY : BCH 6/09	MAA/TMG

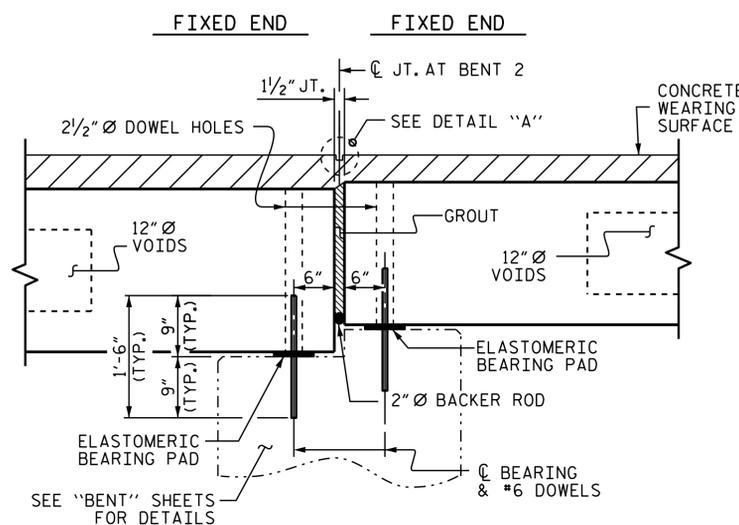


TYPICAL SECTION

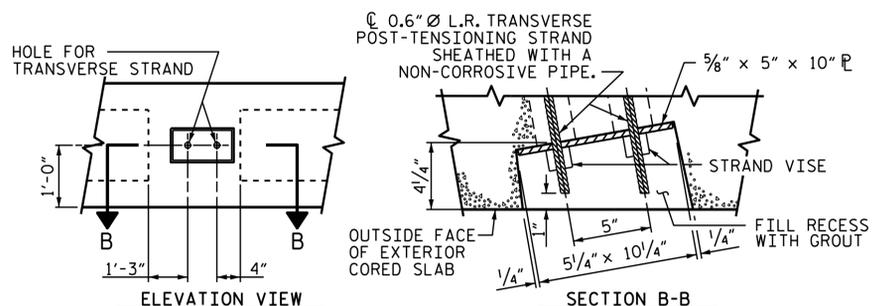
\* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE HEIGHT OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION"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



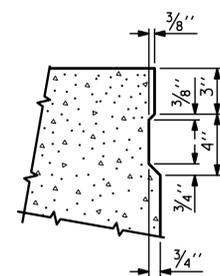
STEPPED SECTION AT BENT 1



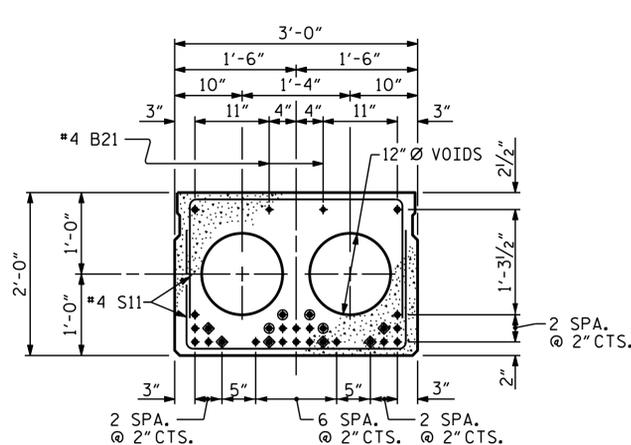
STEPPED SECTION AT BENT 2



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



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

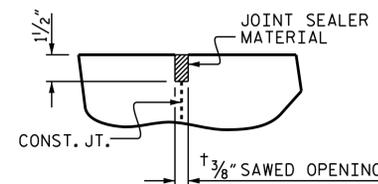


INTERIOR SLAB SECTION (65' UNIT)  
(24 STRANDS REQUIRED)

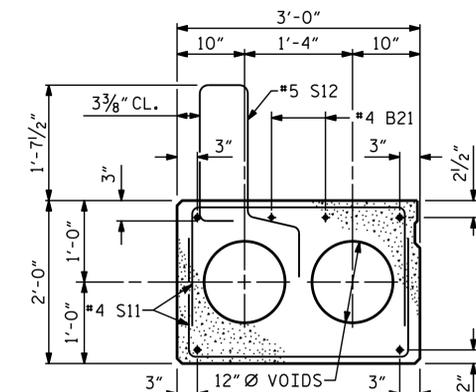
0.6" Ø LOW RELAXATION STRAND LAYOUT

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

DEBONDING LEGEND

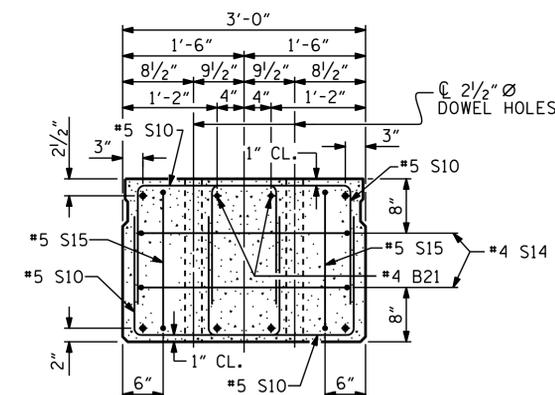


DETAIL "A"  
A 1/2" DEEP CONTRACTION JOINT AT EACH END BENT SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.



EXTERIOR SLAB SECTION

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



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.

PROJECT NO. B-4461  
CHATHAM COUNTY  
STATION: 19+12.00 -L-

SHEET 2 OF 6



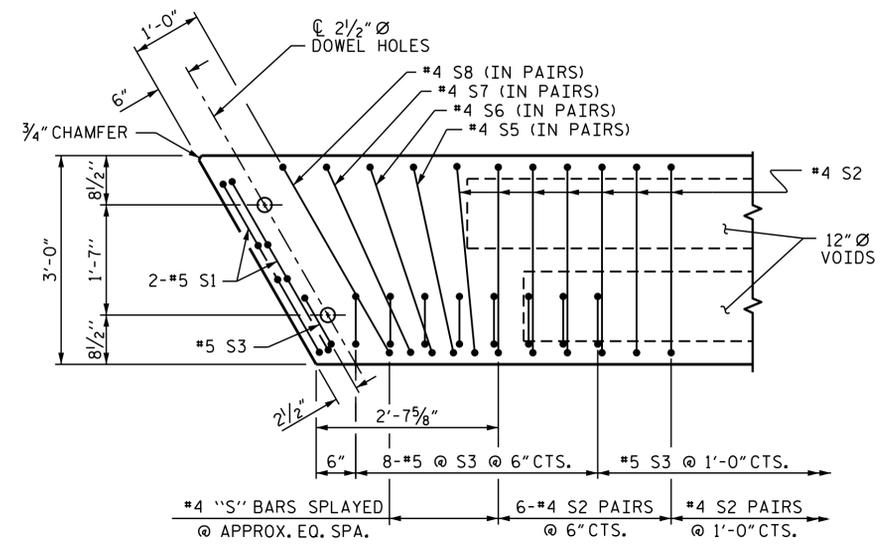
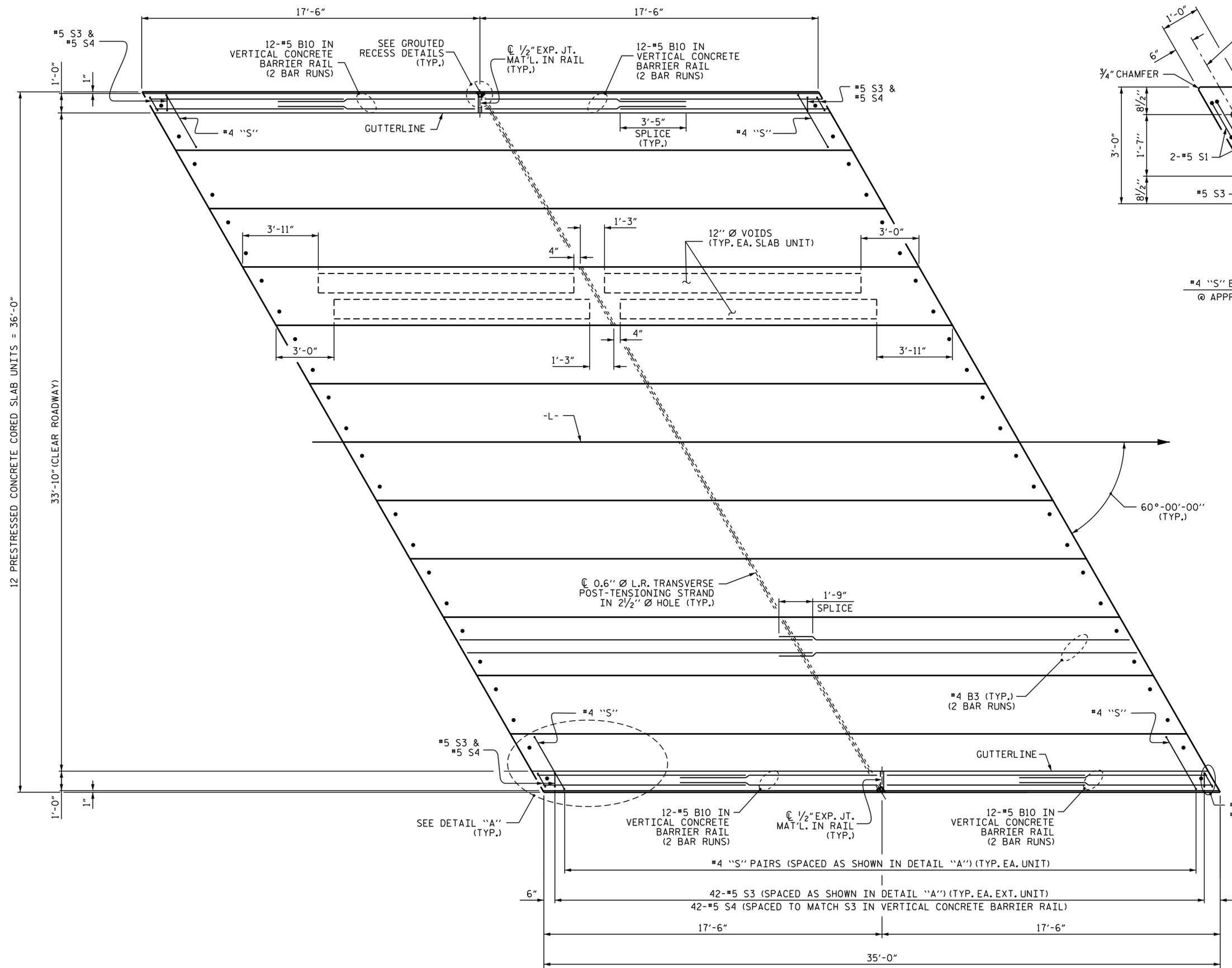
DocuSigned by:  
Ting Fang 4/11/2016

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
3'-0" X 2'-0"  
PRESTRESSED CONCRETE  
65' CORED SLAB UNIT  
60° SKEW  
SPAN B

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

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

ASSEMBLED BY : S. WANCE DATE : 06/14  
CHECKED BY : W. F. PARKER DATE : 09/15  
DRAWN BY : MAA 6/10  
CHECKED BY : MKT 7/10 REV. 9/14 MAA/TMG



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

**PLAN OF UNIT**

PROJECT NO. B-4461  
CHATHAM COUNTY  
 STATION: 19+12.00 -L-

SHEET 3 OF 6

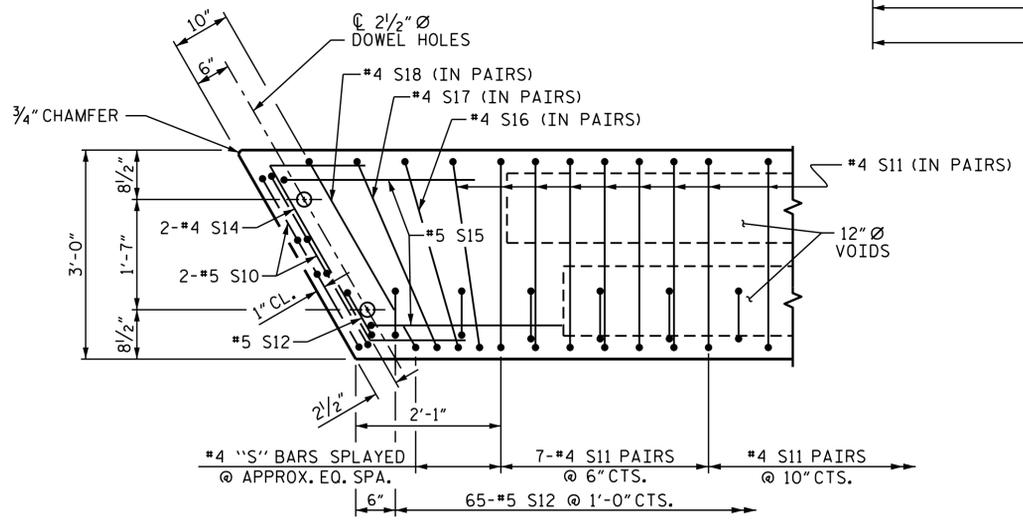
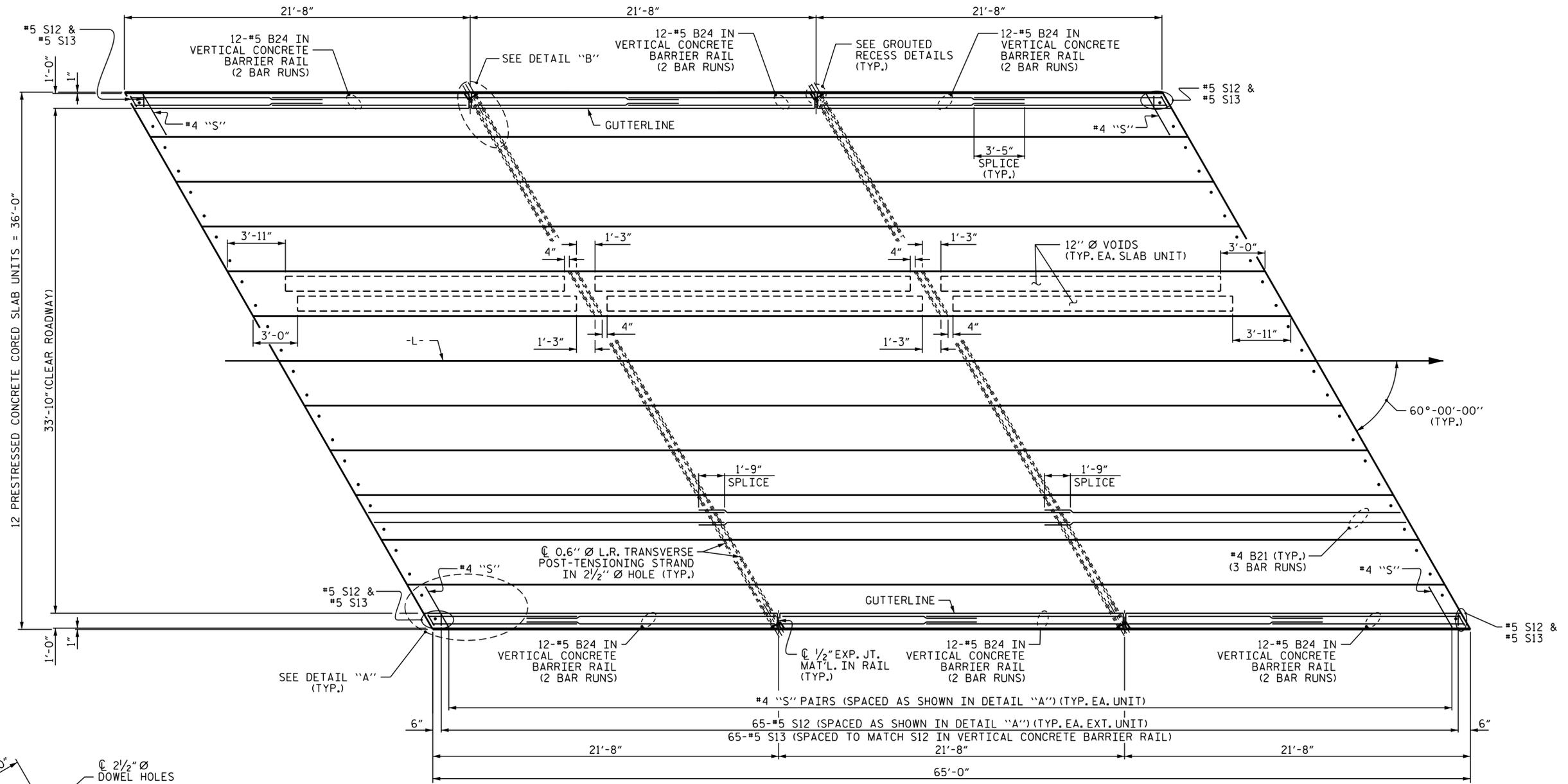


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**PLAN OF 35' UNIT**  
**33'-10" CLEAR ROADWAY**  
**60° SKEW**  
**SPANS A & C**

ASSEMBLED BY: S. WANCE	DATE: 06/14
CHECKED BY: W. F. PARKER	DATE: 09/15
DRAWN BY: DGE 5/09	REV. 12/5/11 MAA/AAC
CHECKED BY: BCH 6/09	

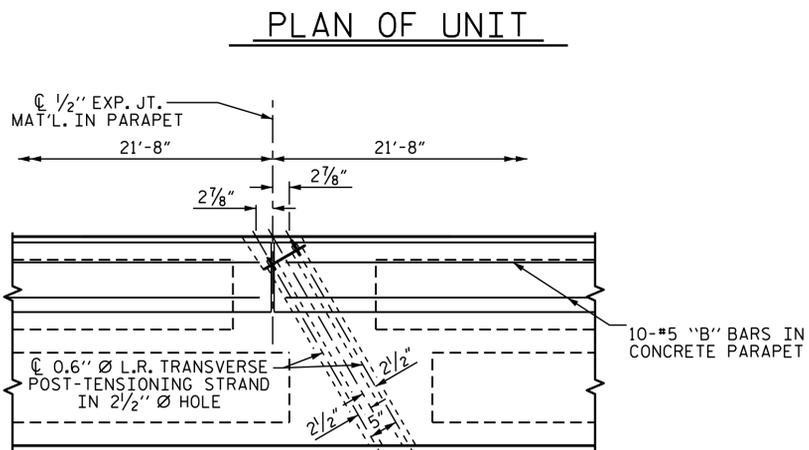
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.	S-8
TOTAL SHEETS	23



**DETAIL "A"**

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



**DETAIL "B"**

\*4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUDED RECESS AND 2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

**PLAN OF UNIT**

PROJECT NO. B-4461  
CHATHAM COUNTY  
 STATION: 19+12.00 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**PLAN OF 65' UNIT**  
**33'-10" CLEAR ROADWAY**  
**60° SKEW**  
**SPAN B**



Designed by: Ting Fang 4/11/2016  
 E7208840097435

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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

ASSEMBLED BY :	S. WANCE	DATE :	06/14
CHECKED BY :	W. F. PARKER	DATE :	09/15
DRAWN BY :	MAA 6/10	REV. 12/5/11	MAA/AAC
CHECKED BY :	MKT 7/10	REV. 8/14	MAA/TMG

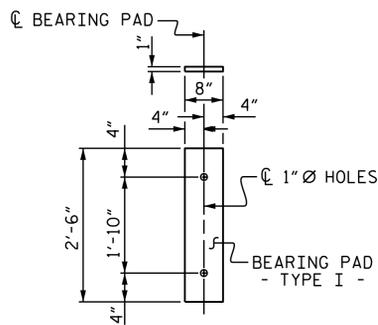
GRADE 270 STRANDS	
	0.6" Ø L.R.
AREA (SQ. INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950

CONCRETE RELEASE STRENGTH	
UNIT	PSI
35' UNITS (SPANS A & C)	4,000
65' UNITS (SPAN B)	4,800

DEAD LOAD DEFLECTION AND CAMBER			
	SPAN A	SPAN B	SPAN C
ALL UNITS 0.6" Ø L.R. STRANDS	35' - 21" CORED SLAB UNIT 3'-0" x 1'-9"	65' - 24" CORED SLAB UNIT 3'-0" x 2'-0"	35' - 21" CORED SLAB UNIT 3'-0" x 1'-9"
CAMBER (SLAB ALONE IN PLACE)	1/4" ↑	1 7/8" ↑	1/4" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD **	1/8" ↓	1/2" ↓	1/8" ↓
FINAL CAMBER	1/8" ↑	1 3/8" ↑	1/8" ↑

\*\* INCLUDES FUTURE WEARING SURFACE

CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
21" C.S. UNITS (SPAN A)			
EXTERIOR C.S.	2	35'-0"	70'-0"
INTERIOR C.S.	10	35'-0"	350'-0"
TOTAL	12		420'-0"
24" C.S. UNITS (SPAN B)			
EXTERIOR C.S.	2	65'-0"	130'-0"
INTERIOR C.S.	10	65'-0"	650'-0"
TOTAL	12		780'-0"
21" C.S. UNITS (SPAN C)			
EXTERIOR C.S.	2	35'-0"	70'-0"
INTERIOR C.S.	10	35'-0"	350'-0"
TOTAL	12		420'-0"

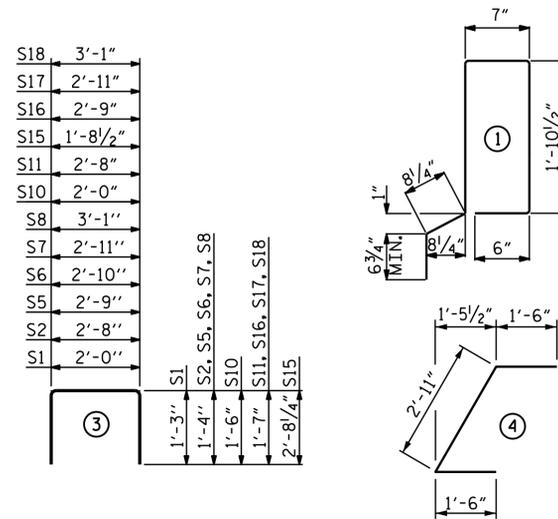


FIXED END  
(TYPE I - 72 REQ'D)

### ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

### BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

### BILL OF MATERIAL FOR ONE CORED SLAB UNIT

SPAN A (35' - 21" CS UNIT)							
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT 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	6'-1"	279		
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. 279		
5000 P.S.I. CONCRETE					CU. YDS. 5.2		5.2
0.6" Ø L.R. STRANDS					No. 9		9
SPAN B (65' - 24" UNIT)							
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B21	6	#4	STR	22'-10"	92	22'-10"	92
S10	8	#5	3	5'-0"	42	5'-0"	42
S11	158	#4	3	5'-10"	616	5'-10"	616
* S12	67	#5	1	6'-1"	425		
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. 845		845
* EPOXY COATED REINFORCING STEEL					LBS. 425		
6000 P.S.I. CONCRETE					CU. YDS. 11.2		11.2
0.6" Ø L.R. STRANDS					No. 24		24
SPAN C (35' - 21" UNIT)							
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT 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	6'-1"	279		
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. 279		
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 2 1/2" 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 SIDWAYS. 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.

WHEN A CONCRETE WEARING SURFACE IS DETAILED ON THE CORED SLAB BRIDGE TYPICAL SECTION, THE TOP SURFACE OF THE CORED SLAB UNITS SHALL HAVE A 3/8" RAKED FINISH.

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.

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM FOR 24" CS UNITS.

THE #4 S11 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS FOR 24" CS UNITS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

GROOVED CONTRACTION JOINTS, 1/2" 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 RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

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

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.

PROJECT NO. B-4461  
CHATHAM COUNTY  
STATION: 19+12.00 -L-

SHEET 5 OF 6



DocuSigned by:  
Ting Fang  
E7208400977435

4/11/2016

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
BILL OF MATERIAL FOR  
3'-0" X 1'-9" (SPAN A & C)  
3'-0" X 2'-0" (SPAN B)  
PRESTRESSED CONCRETE  
CORED SLAB UNITS

ASSEMBLED BY :	S. WANCE	DATE :	06/14
CHECKED BY :	T. H. FANG	DATE :	3/11/16
DRAWN BY :	MAA 6/10	REV. 12/11	MAA/AAC
CHECKED BY :	MKT 7/10		

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

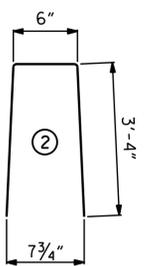
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			23

VERTICAL CONCRETE BARRIER RAIL HEIGHT TABLE			
SPAN	LOCATION	AT LEFT GUTTERLINE	AT RIGHT GUTTERLINE
A	BEARING (NEAR)	3'-9 <sup>3</sup> / <sub>4</sub> "	3'-9 <sup>3</sup> / <sub>4</sub> "
	MID-SPAN	3'-9 <sup>5</sup> / <sub>8</sub> "	3'-9 <sup>1</sup> / <sub>2</sub> "
	BEARING (FAR)	3'-10"	3'-9 <sup>3</sup> / <sub>4</sub> "
B	BEARING (NEAR)	4'-0 <sup>3</sup> / <sub>16</sub> "	3'-11 <sup>1</sup> / <sub>2</sub> "
	MID-SPAN	3'-10 <sup>7</sup> / <sub>8</sub> "	3'-9 <sup>1</sup> / <sub>2</sub> "
	BEARING (FAR)	4'-1 <sup>1</sup> / <sub>2</sub> "	3'-11 <sup>1</sup> / <sub>2</sub> "
C	BEARING (NEAR)	3'-11 <sup>3</sup> / <sub>4</sub> "	3'-9 <sup>3</sup> / <sub>4</sub> "
	MID-SPAN	3'-11 <sup>7</sup> / <sub>8</sub> "	3'-9 <sup>1</sup> / <sub>2</sub> "
	BEARING (FAR)	4'-0 <sup>7</sup> / <sub>16</sub> "	3'-9 <sup>3</sup> / <sub>4</sub> "

INCREASE STATIONING

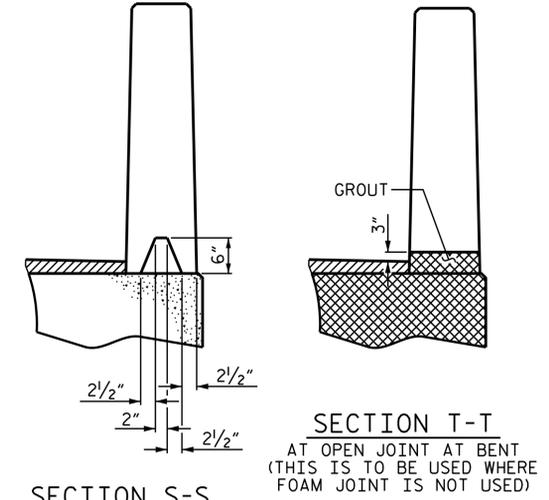
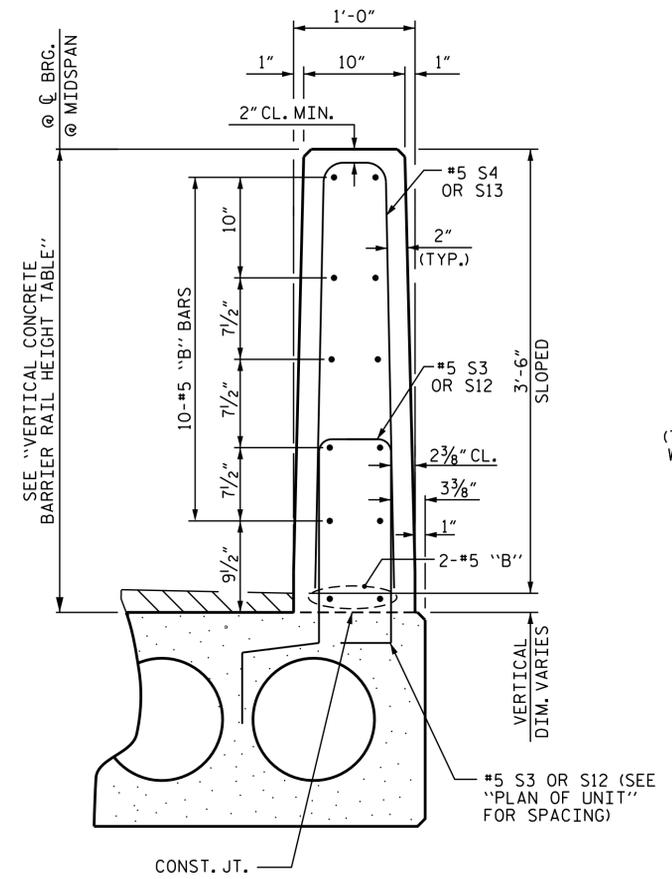
BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL						
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
<b>SPAN A (35' UNITS)</b>						
*B10	96	96	#5	STR	10'-7"	1060
*S4	88	88	#5	2	7'-2"	658
* EPOXY COATED REINFORCING STEEL					LBS.	1718
CLASS AA CONCRETE					CU.YDS.	9.1
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	70.29
<b>SPAN B (65' UNITS)</b>						
*B24	144	144	#5	STR	12'-10"	1902
*S13	134	134	#5	2	7'-2"	1002
* EPOXY COATED REINFORCING STEEL					LBS.	2904
CLASS AA CONCRETE					CU.YDS.	17.5
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	130.29
<b>SPAN C (35' UNITS)</b>						
*B10	96	96	#5	STR	10'-7"	1060
*S4	88	88	#5	2	7'-2"	658
* EPOXY COATED REINFORCING STEEL					LBS.	1718
CLASS AA CONCRETE					CU.YDS.	9.3
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	70.29

BAR TYPE

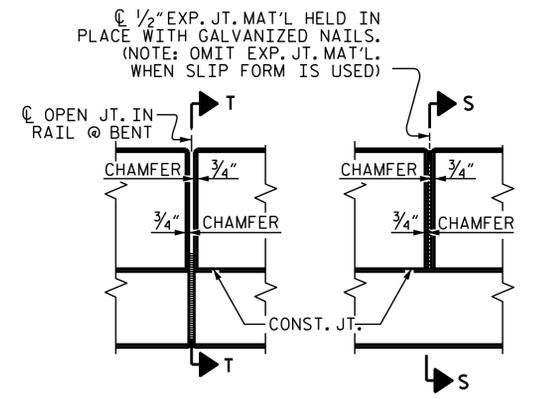


BAR DIMENSIONS ARE OUT TO OUT

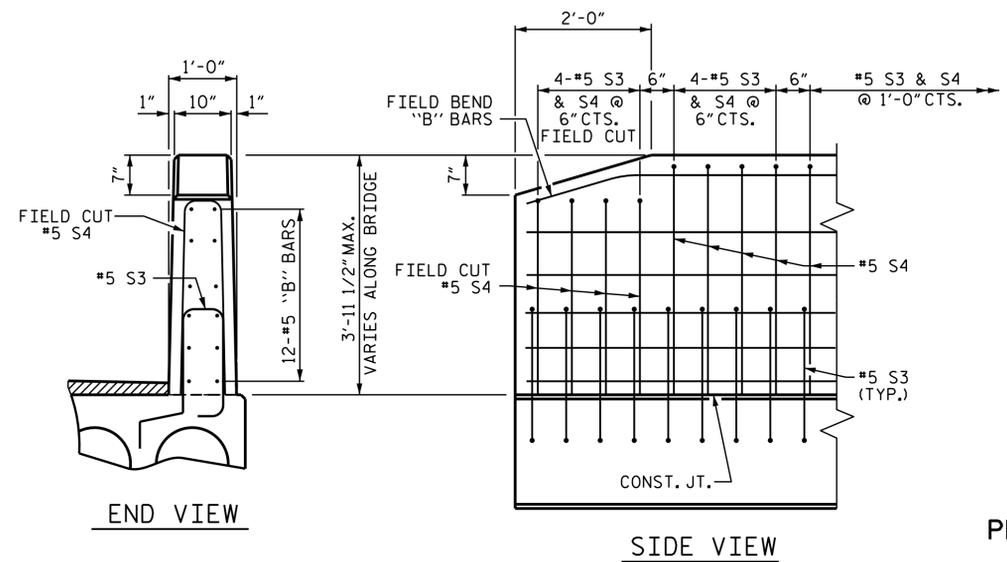
TOTAL VERTICAL CONCRETE BARRIER RAIL FOR ENTIRE BRIDGE 270.87 LN. FT.



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



ELEVATION AT EXPANSION JOINTS



END OF RAIL DETAILS

**VERTICAL CONCRETE BARRIER RAIL SECTION**

RIGHT SIDE SHOWN, LEFT SIDE SIMILAR BY ROTATION.

PROJECT NO. B-4461  
CHATHAM COUNTY  
 STATION: 19+12.00 -L-

SHEET 6 OF 6



DocuSigned by:  
Ting Fang  
E720840097743D  
4/12/2016

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
VERTICAL CONCRETE BARRIER RAIL DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

ASSEMBLED BY : P.N.HOLDER	DATE : 5/30/13
CHECKED BY : F.R.LEA	DATE : 6/4/13
DRAWN BY : DGE 5/09	REV. 12/11
CHECKED BY : BCH 6/09	MAA/AAC

**BILL OF MATERIAL**

**CONCRETE WEARING SURFACE**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* R1	540	#3	STR	20'-2"	4094
* R2	340	#3	STR	28'-3"	3611
* R3	134	#4	STR	20'-0"	1790

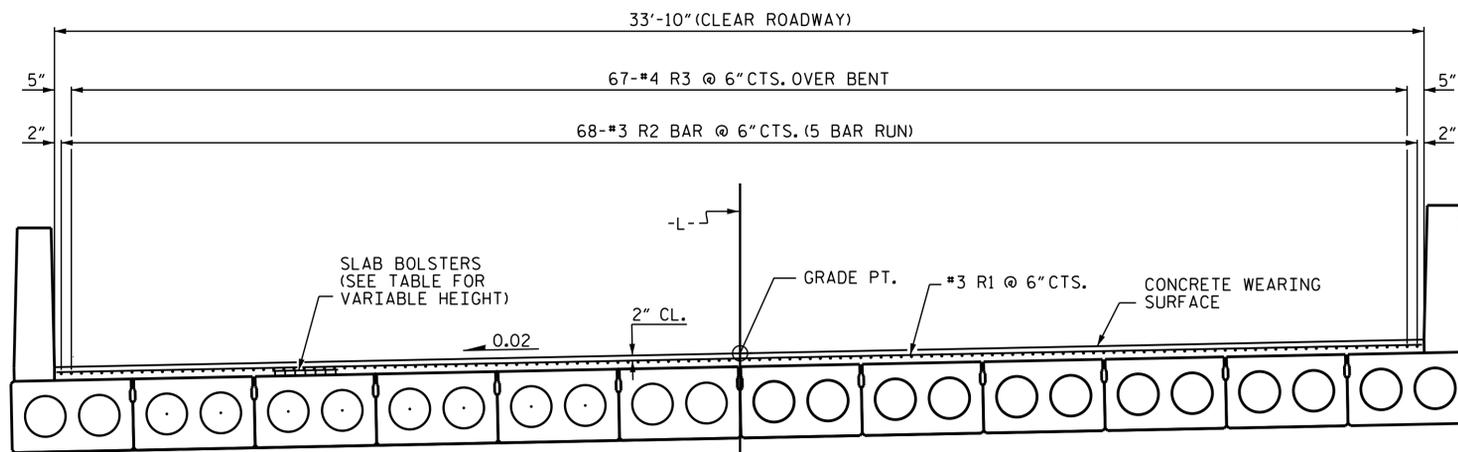
\* EPOXY COATED REINFORCING STEEL 9,495 LBS  
 CONCRETE WEARING SURFACE 4,577 SQ. FT.

**SPLICE LENGTH CHART**

BAR SIZE	EPOXY COATED
#3	1'-6"

**GROOVING BRIDGE FLOORS**

APPROACH SLABS	689 SQ. FT.
BRIDGE DECK	4,151 SQ. FT.
<b>TOTAL</b>	<b>4,840 SQ. FT.</b>

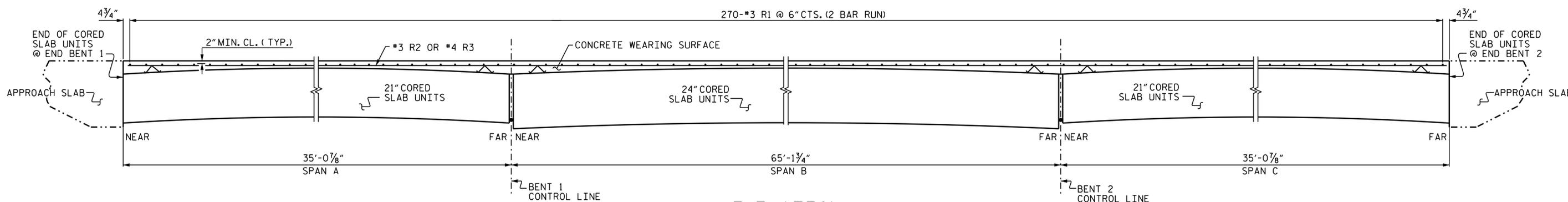


SPAN	LOCATION	LT. GUTTERLINE	GRADE PT.	RT. GUTTERLINE
A	BEARING (NEAR)	1"	1"	1"
	MID-SPAN	3/4" **	3/4" **	3/4" **
	BEARING (FAR)	1"	1"	3/4" **
B	BEARING (NEAR)	3/4"	2 3/4"	2 1/2"
	MID-SPAN	2 1/2"	1 3/4"	1"
	BEARING (FAR)	4 1/2"	3 1/2"	2 1/2"
C	BEARING (NEAR)	2 3/4"	1 3/4"	3/4" **
	MID-SPAN	3"	1 3/4"	3/4" **
	BEARING (FAR)	3 1/2"	2 1/4"	1"

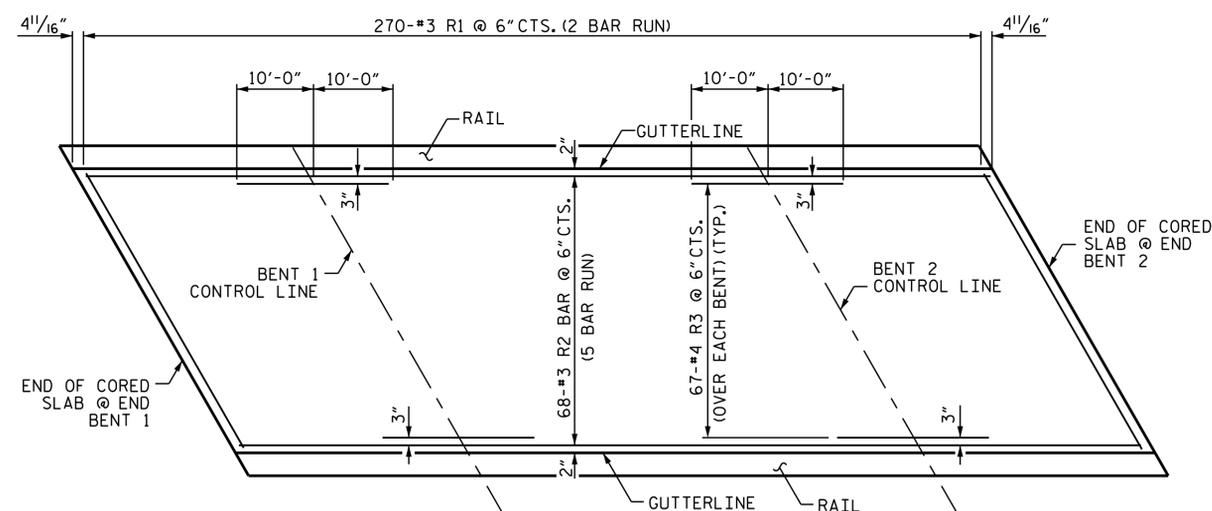
\*\* USE SLAB BOLSTER

**REINFORCING FOR CONCRETE WEARING SURFACE**

BEAM AND SLAB BOLSTER HEIGHTS BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATION AND VARY BETWEEN CL BEARING AND MID-SPAN.

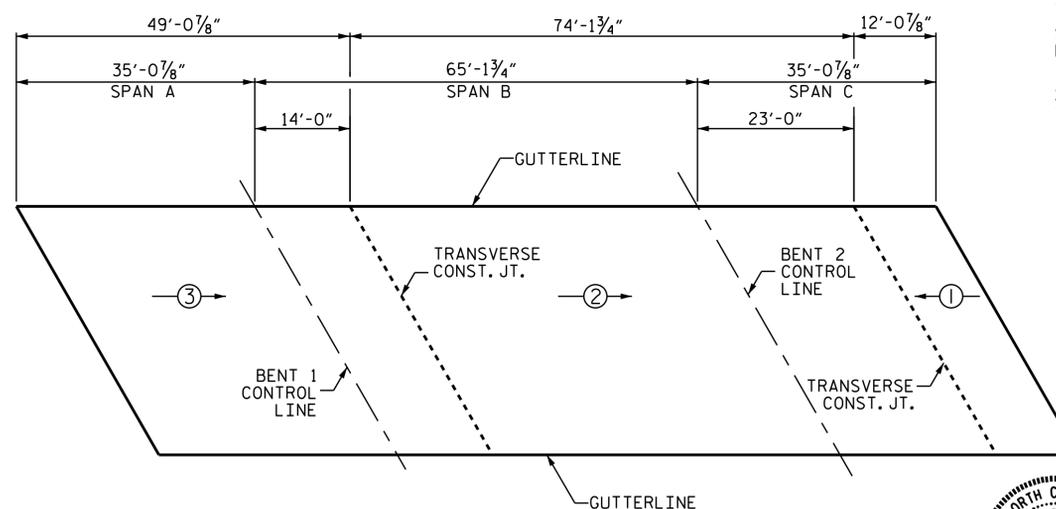


**ELEVATION**



**PLAN**

SHOWING CONTINUOUS CONCRETE OVERLAY OVER INTERIOR BENTS



**OPTIONAL POURING SEQUENCE**

① = INDICATES POUR NUMBER AND DIRECTION OF POUR

**NOTES:**

PLACEMENT OF THE CONCRETE WEARING SURFACE SHALL OCCUR AFTER CASTING THE RAILS. THE COST OF THE REINFORCING STEEL CAST WITH THE CONCRETE WEARING SURFACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE WEARING SURFACE. FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

ALL REINFORCING STEEL FOR THE CONCRETE WEARING SURFACE SHALL BE EPOXY COATED.



DocuSigned by:  
Ting Fang  
E72088400977435... 4/12/2016

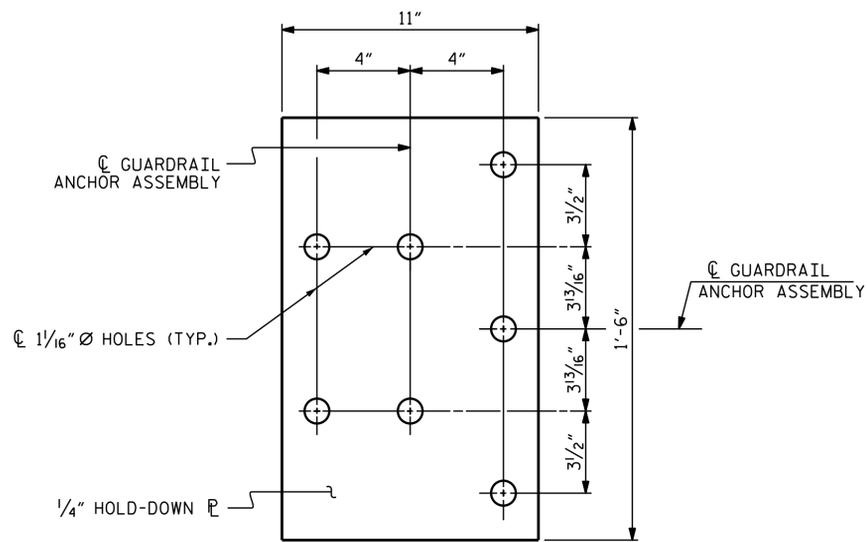
PROJECT NO. B-4461  
 CHATHAM COUNTY  
 STATION: 19+12.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 CONCRETE WEARING SURFACE DETAILS

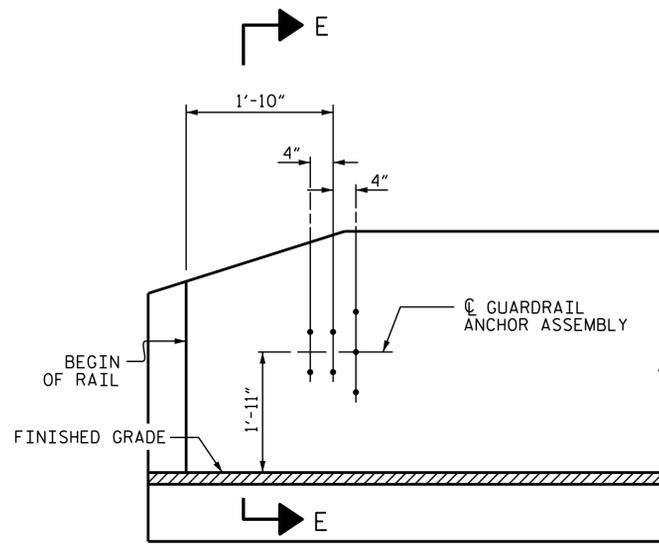
ASSEMBLED BY : T. H. FANG	DATE : 9/14/15
CHECKED BY : W. PARKER	DATE : 9/18/15
DRAWN BY : WJH 4/89	REV. 10/1/11 MAA/GM
CHECKED BY : FCJ 5/89	REV. 10/12 MAA/GM
	REV. 6/13 MAA/GM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

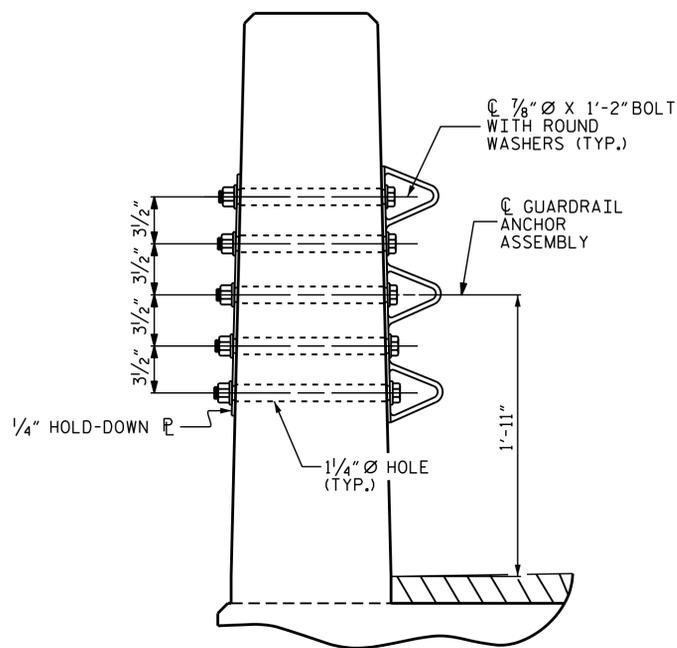
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			23
2			4			



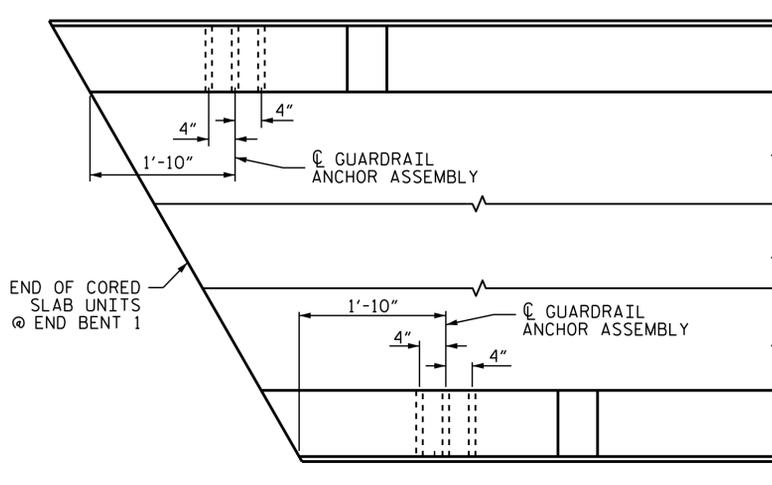
PLAN



ELEVATION



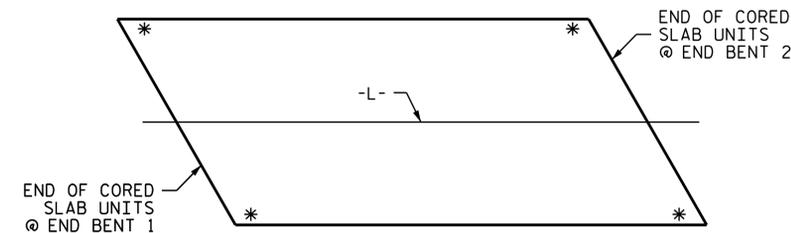
SECTION E-E



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENT

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

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.

PROJECT NO. B-4461  
CHATHAM COUNTY  
 STATION: 19+12.00 -L-



DocuSigned by:  
Ting Fang

4/11/2016

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 GUARDRAIL ANCHORAGE  
 DETAILS

ASSEMBLED BY : S. WANCE	DATE :
CHECKED BY : W. F. PARKER	DATE : 8-3-12
DRAWN BY : MAA 5/10	REV. 12/5/11 MAA/GM
CHECKED BY : GM 5/10	REV. 6/13 MAA/GM
	REV. 1/15 MAA/TMG

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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

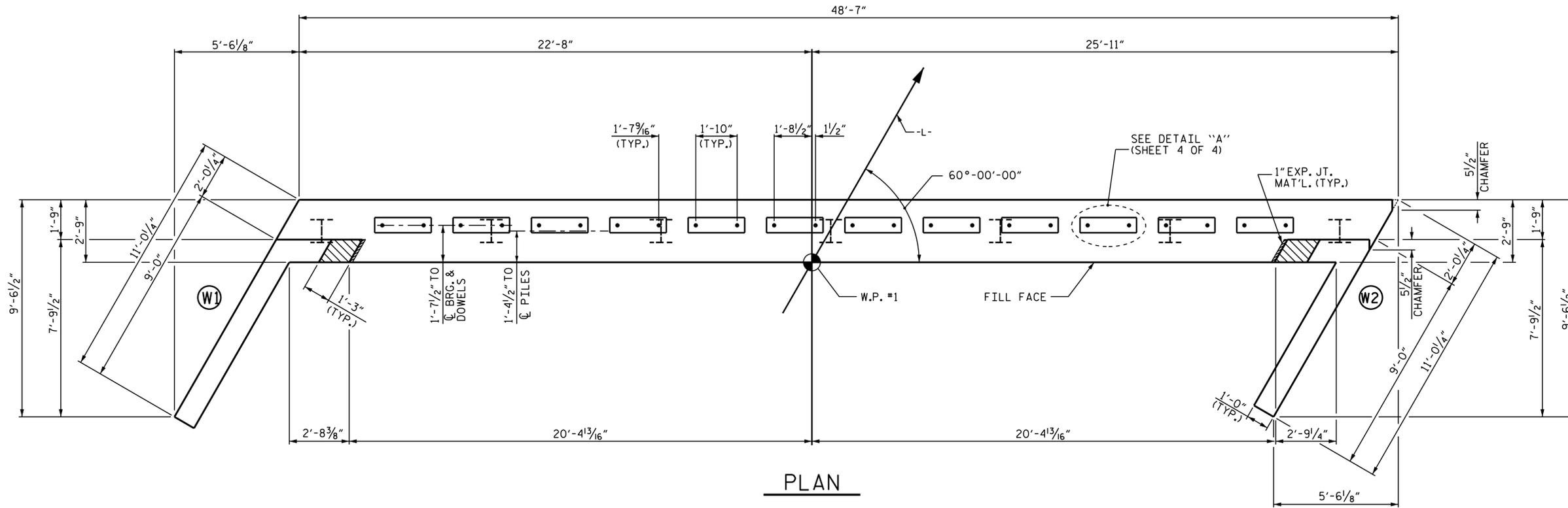
NOTES

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

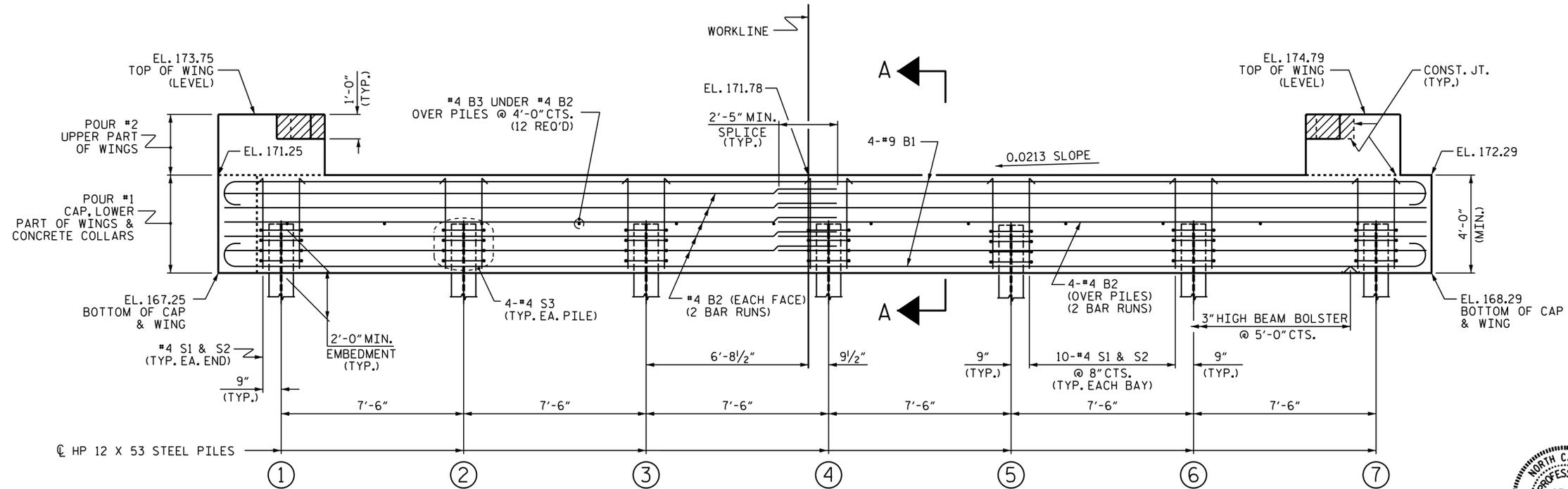
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



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.

TOP OF PILE ELEVATIONS	
①	169.30
②	169.46
③	169.62
④	169.78
⑤	169.94
⑥	170.10
⑦	170.26

PROJECT NO. B-4461  
CHATHAM COUNTY  
STATION: 19+12.00 -L-

SHEET 1 OF 4



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT 1

ASSEMBLED BY : S. WANCE DATE : 07/14  
CHECKED BY : W. F. PARKER DATE : 09/14  
DRAWN BY : WJH 12/11  
CHECKED BY : AAC 12/11  
REV. 4/15 MAA/TMG

DocuSigned by:  
Ting Fang 4/11/2016  
E720840097435

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

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

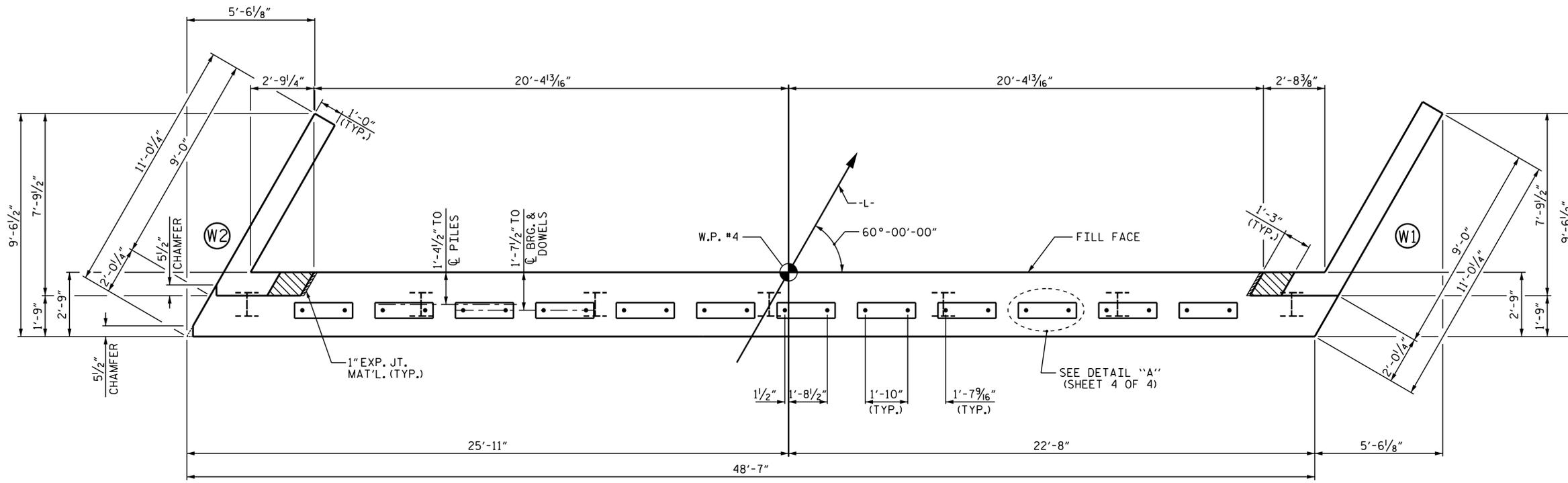
**NOTES**

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.

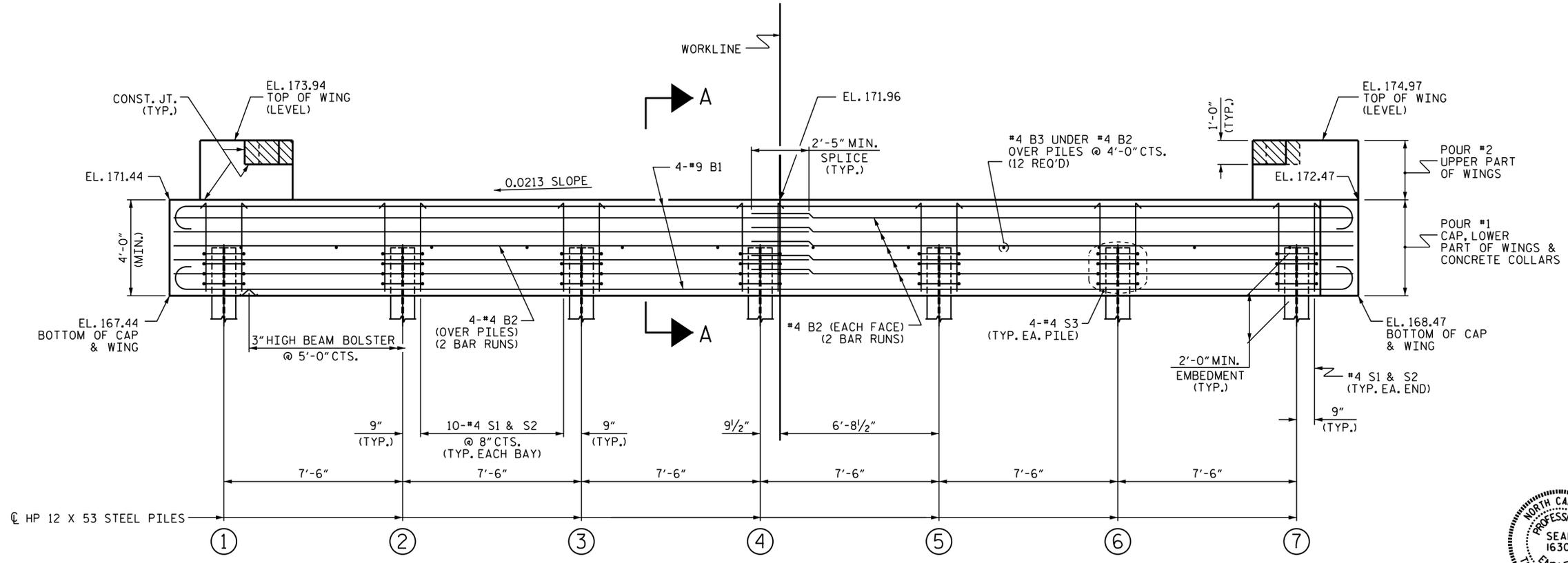
FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



**PLAN**

TOP OF PILE ELEVATIONS	
①	169.48
②	169.64
③	169.80
④	169.96
⑤	170.12
⑥	170.28
⑦	170.44



**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.

PROJECT NO. B-4461  
CHATHAM COUNTY  
STATION: 19+12.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SUBSTRUCTURE  
END BENT 2**

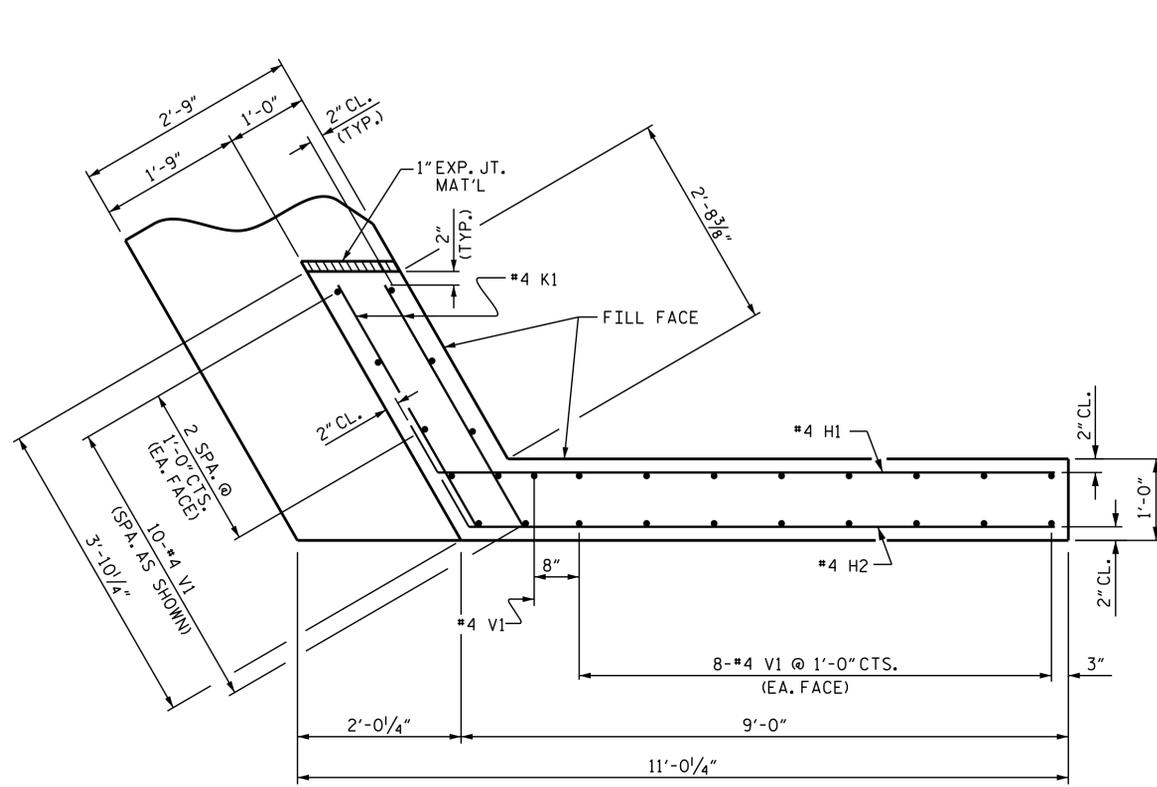


DocuSigned by:  
*Ting Fang*  
4/11/2016

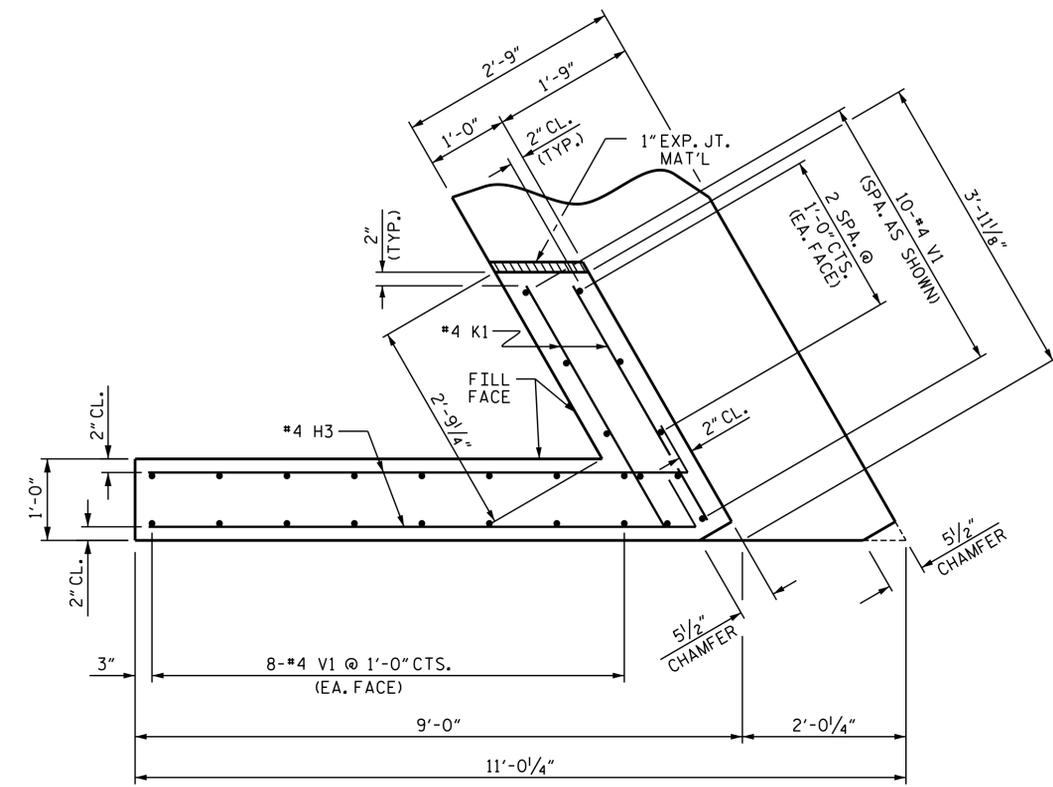
ASSEMBLED BY : S. WANCE	DATE : 7/14
CHECKED BY : W. F. PARKER	DATE : 9/15
DRAWN BY : WJH 12/11	REV. 4/15
CHECKED BY : AAC 12/11	MAA/TMG

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

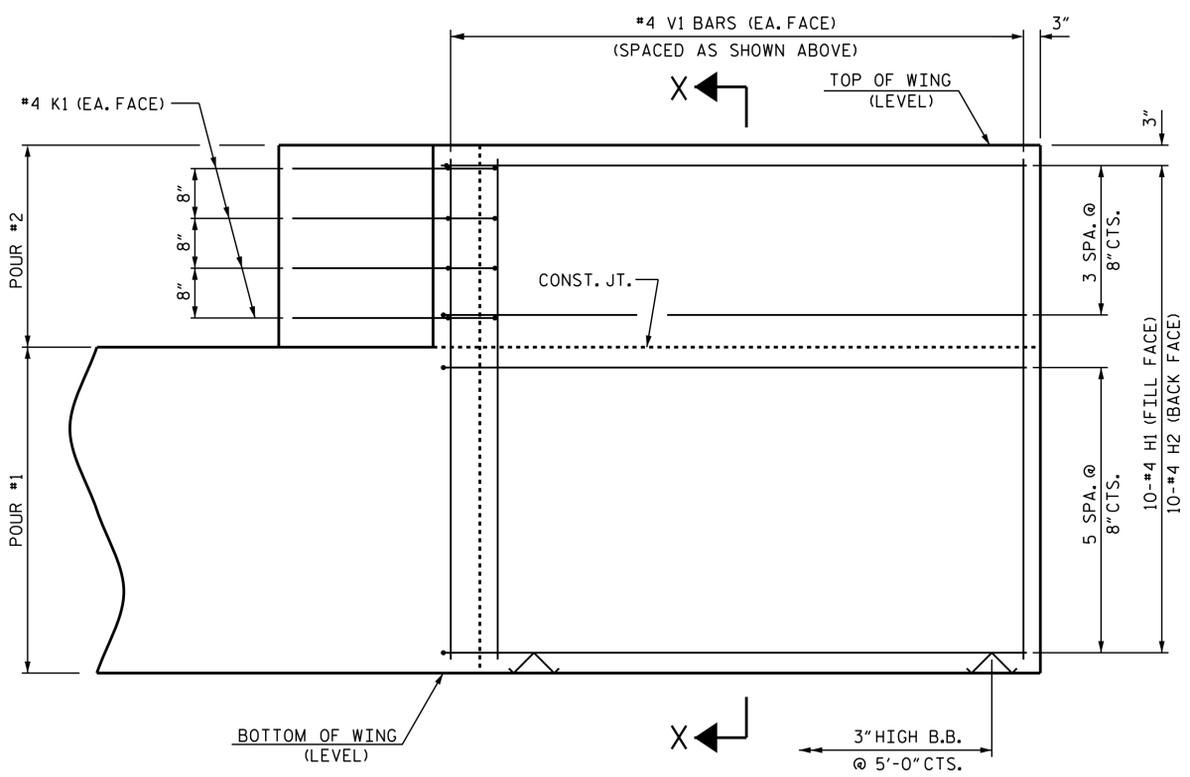
DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED



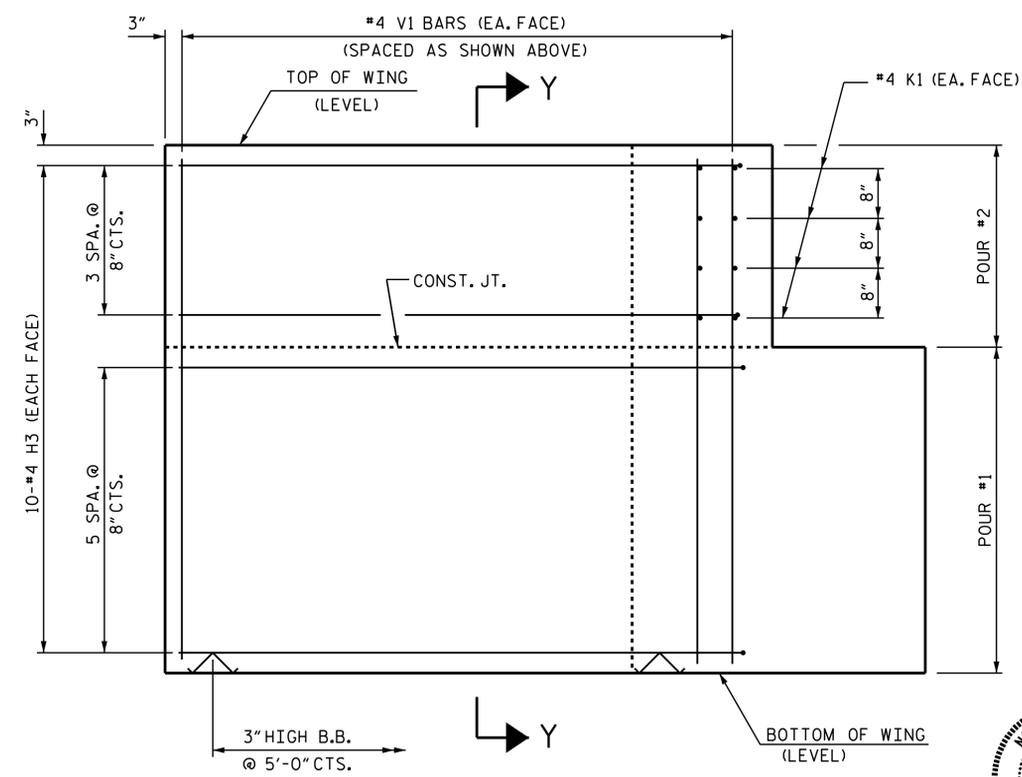
PLAN OF WING (W1)



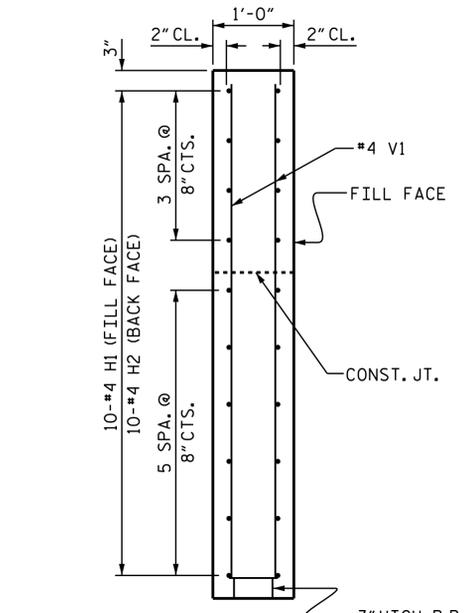
PLAN OF WING (W2)



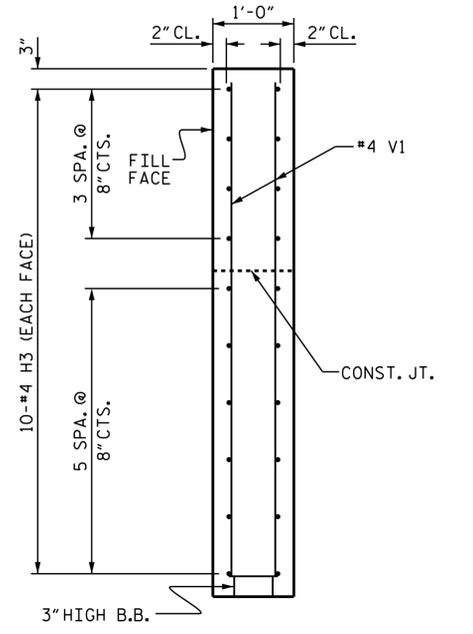
ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X



SECTION Y-Y

PROJECT NO. B-4461  
 CHATHAM COUNTY  
 STATION: 19+12.00 -L-

SHEET 3 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT  
 WING DETAILS

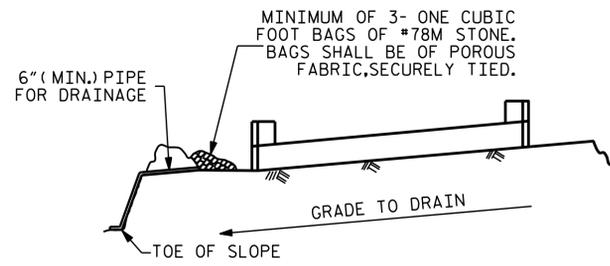
ASSEMBLED BY : S. WANCE	DATE : 07/14
CHECKED BY : W. F. PARKER	DATE : 09/15
DRAWN BY : WJH 12/11	REV. 4/15
CHECKED BY : AAC 12/11	MAA/TMG

WING DETAILS

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

SHEET NO.		S-16
TOTAL SHEETS		23

11-APR-2016 13:13  
 K:\TIP\Projects-B\B4461\Structures\Plans\Final plans\b4461.sd.cs.dgn  
 f.fang

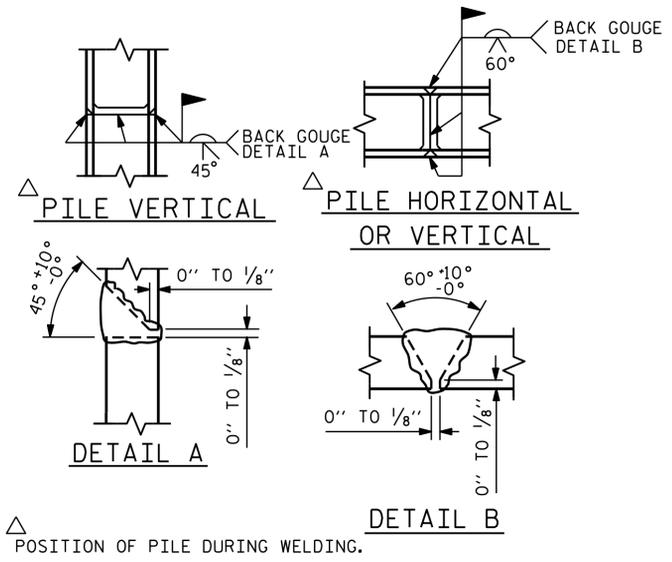


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

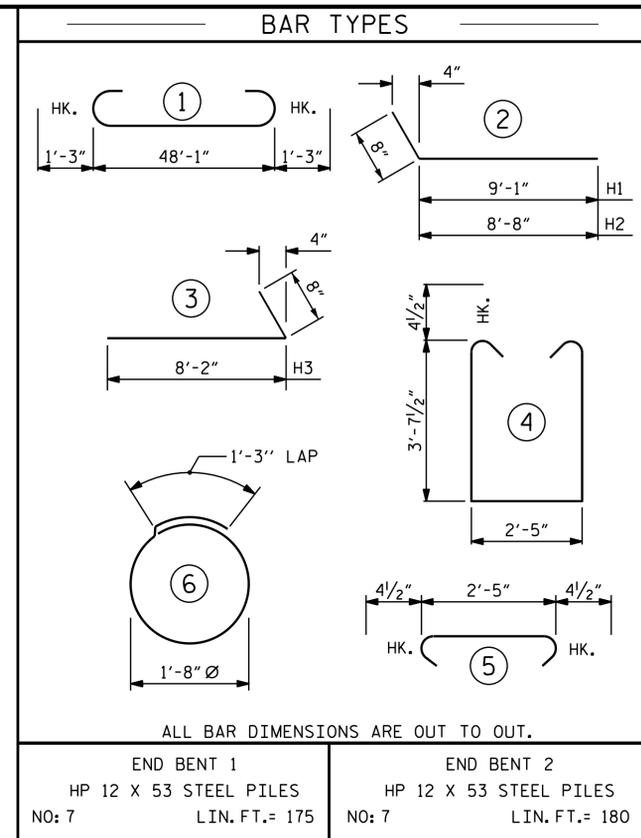
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

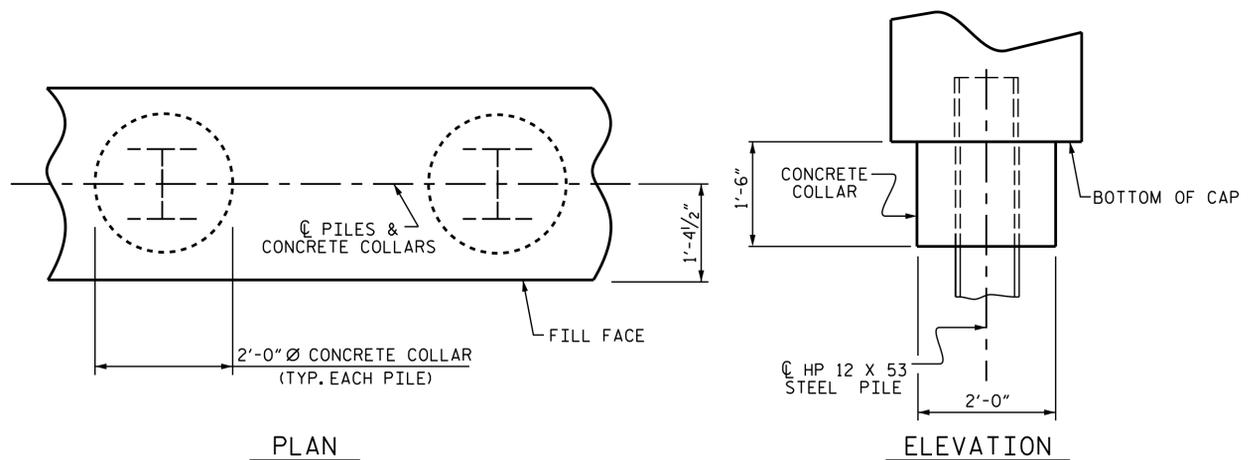
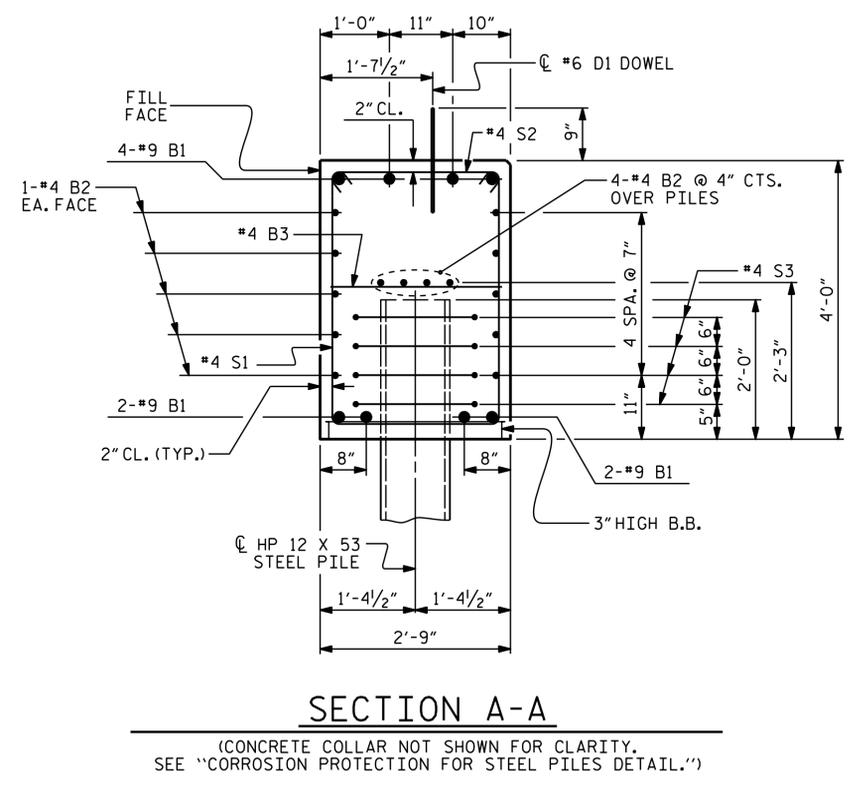
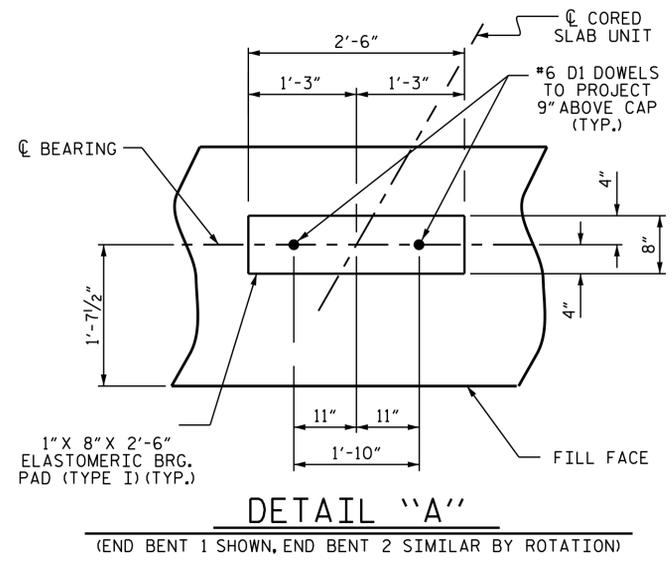
**TEMPORARY DRAINAGE AT END BENT**



**PILE SPLICE DETAILS**



BILL OF MATERIAL FOR ONE END BENT					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9		50'-7"	1376
B2	28	#4	STR	25'-4"	474
B3	12	#4	STR	2'-5"	19
D1	24	#6	STR	1'-6"	54
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	62	#4	4	10'-5"	431
S2	62	#4	5	3'-2"	131
S3	28	#4	6	6'-6"	122
V1	53	#4	STR	6'-2"	218
REINFORCING STEEL (FOR ONE END BENT)					3105 LBS.
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS					23.3 C.Y.
POUR #2 UPPER PART OF WINGS					2.2 C.Y.
TOTAL CLASS A CONCRETE					25.5 C.Y.



**CORROSION PROTECTION FOR STEEL PILES DETAIL**

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

PROJECT NO. B-4461  
CHATHAM COUNTY  
 STATION: 19+12.00 -L-  
 SHEET 4 OF 4



DocuSigned by:  
 Ting Fang  
 E7208400977435 4/11/2016

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE

END BENTS 1 & 2  
 DETAILS

ASSEMBLED BY : S. WANCE	DATE : 07/14
CHECKED BY : W. F. PARKER	DATE : 09/15
DRAWN BY : WJH 12/11	
CHECKED BY : AAC 12/11	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

**NOTES**

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

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

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

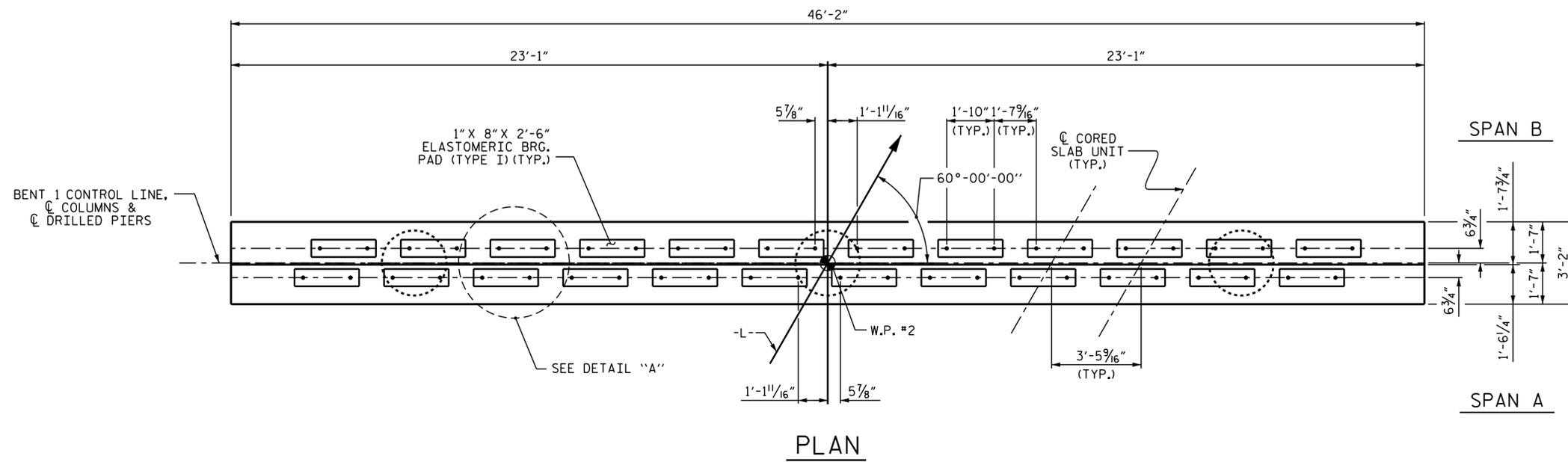
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

★ INVERT ALTERNATE STIRRUPS.

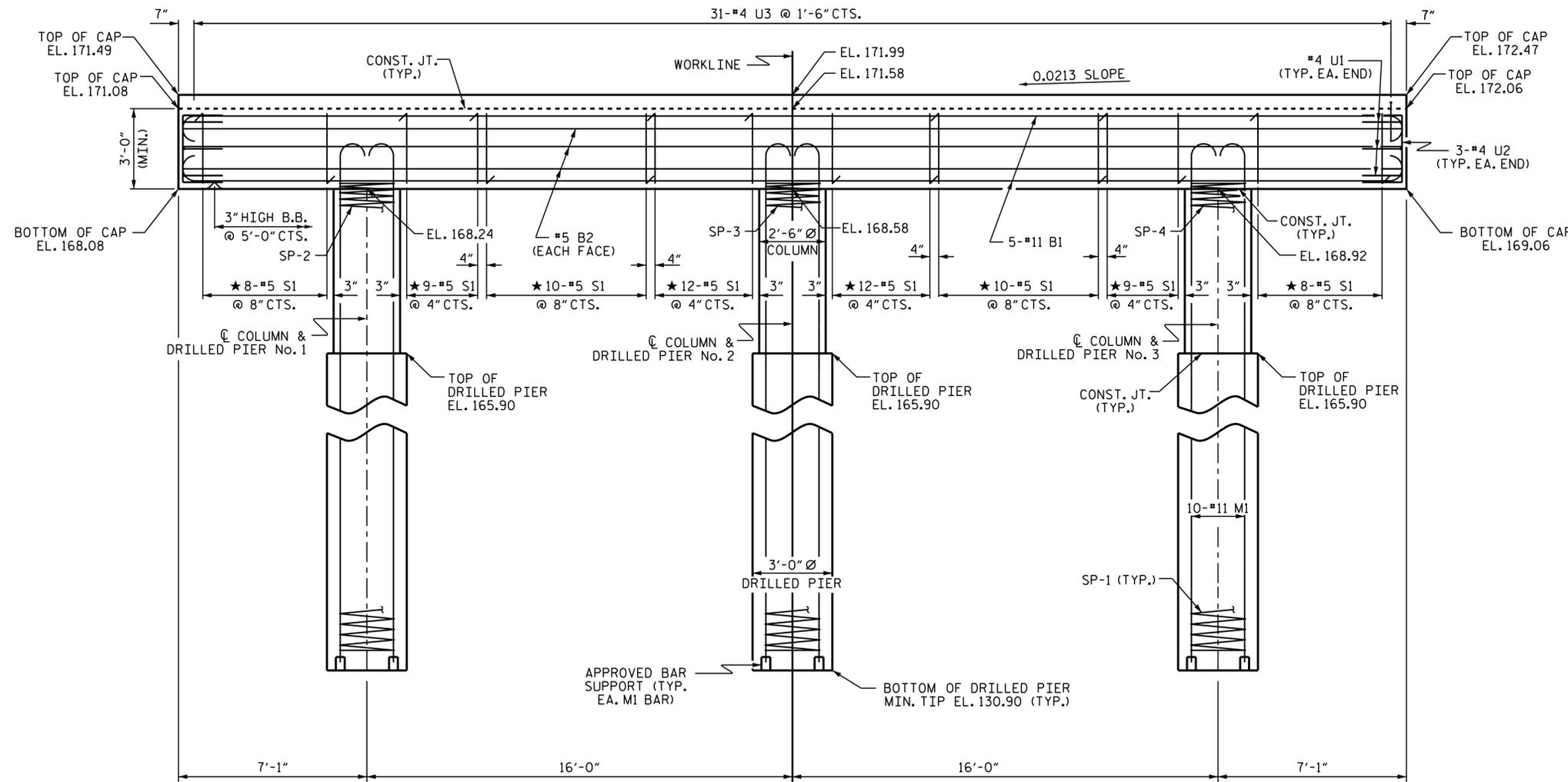
SPLICING OF THE LONGITUDINAL BARS IN THE DRILLED PIER WILL NOT BE PERMITTED.

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.

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

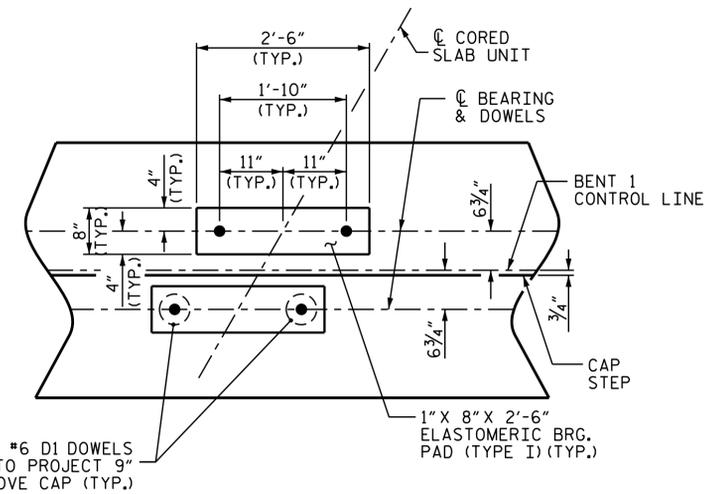


**PLAN**



**ELEVATION**

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



**DETAIL "A"**

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. B-4461  
 CHATHAM COUNTY  
 STATION: 19+12.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE

BENT 1



DocuSigned by:  
 Ting Fang 4/11/2016

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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

ASSEMBLED BY : S. WANCE	DATE : 07/14
CHECKED BY : W. F. PARKER	DATE : 09/15
DRAWN BY : DGE 4/10	REV. 11/14 MAA/TMG
CHECKED BY : MKT 4/10	



**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 SPECIAL PROVISIONS AND SECTION 411 OF THE STANDARD SPECIFICATIONS.

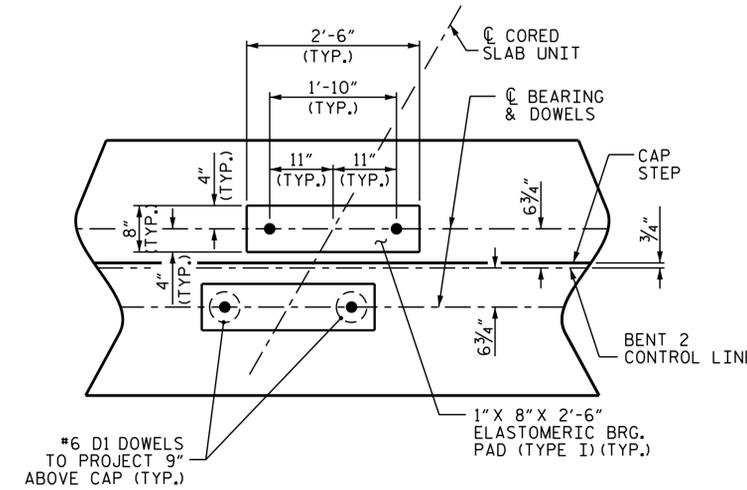
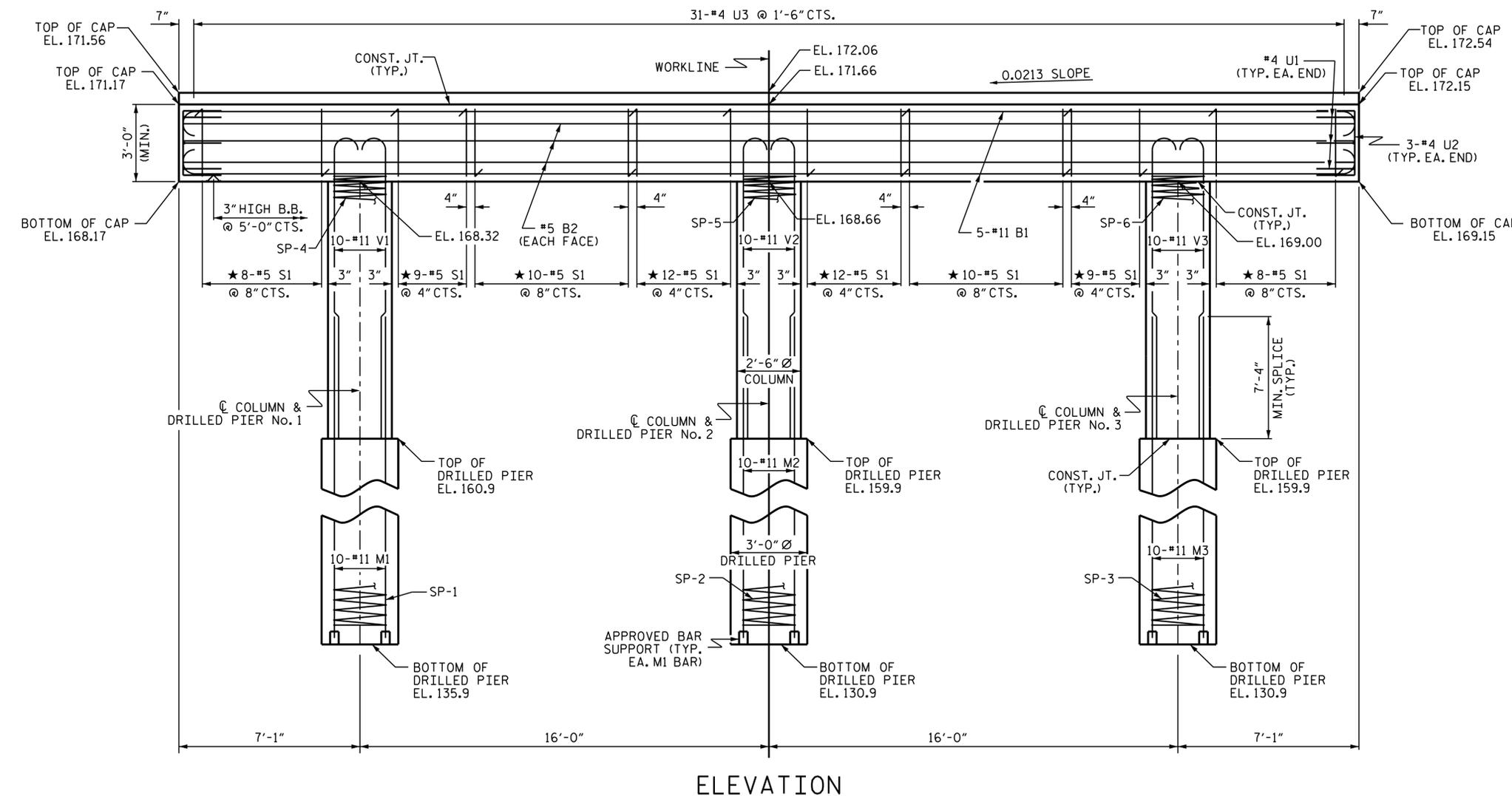
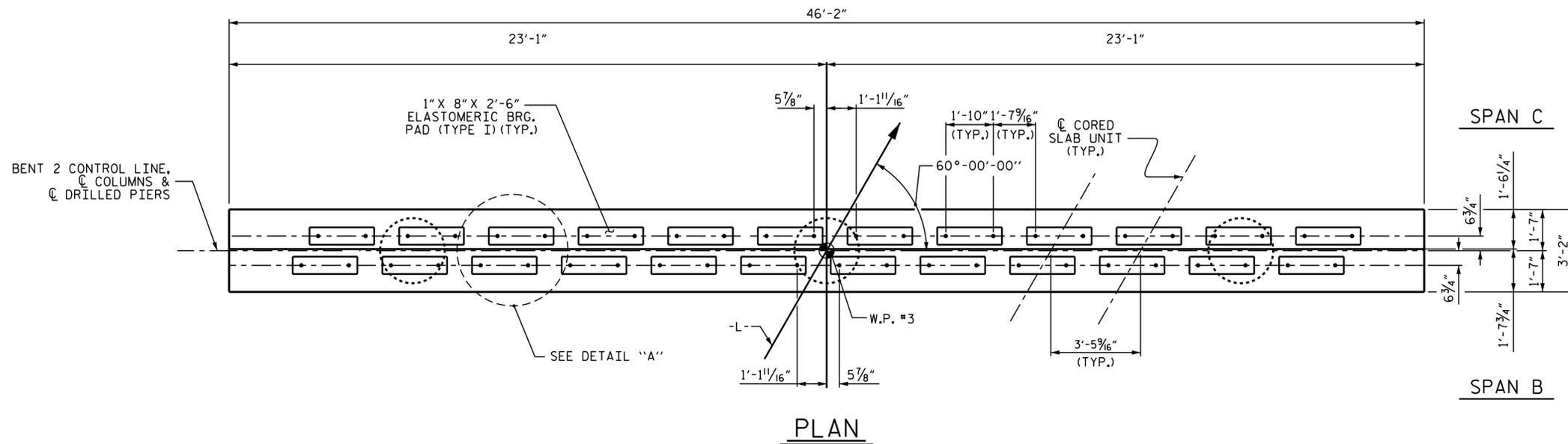
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

★ INVERT ALTERNATE STIRRUPS.

SPLICING OF THE LONGITUDINAL BARS IN THE DRILLED PIER WILL NOT BE PERMITTED.

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.

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



PROJECT NO. B-4461  
 CHATHAM COUNTY  
 STATION: 19+12.00 -L-

SHEET 1 OF 2



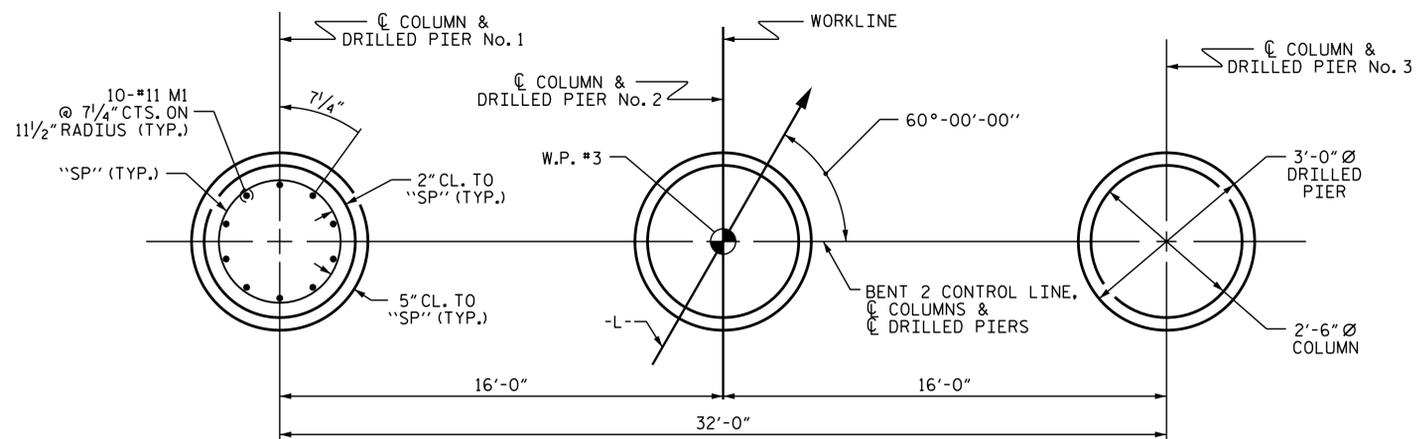
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
**BENT 2**

ASSEMBLED BY : S. WANCE DATE : 07/14  
 CHECKED BY : W. F. PARKER DATE : 09/15  
 DRAWN BY : DGE 4/10  
 CHECKED BY : MKT 4/10 REV. 11/14 MAA/TMG

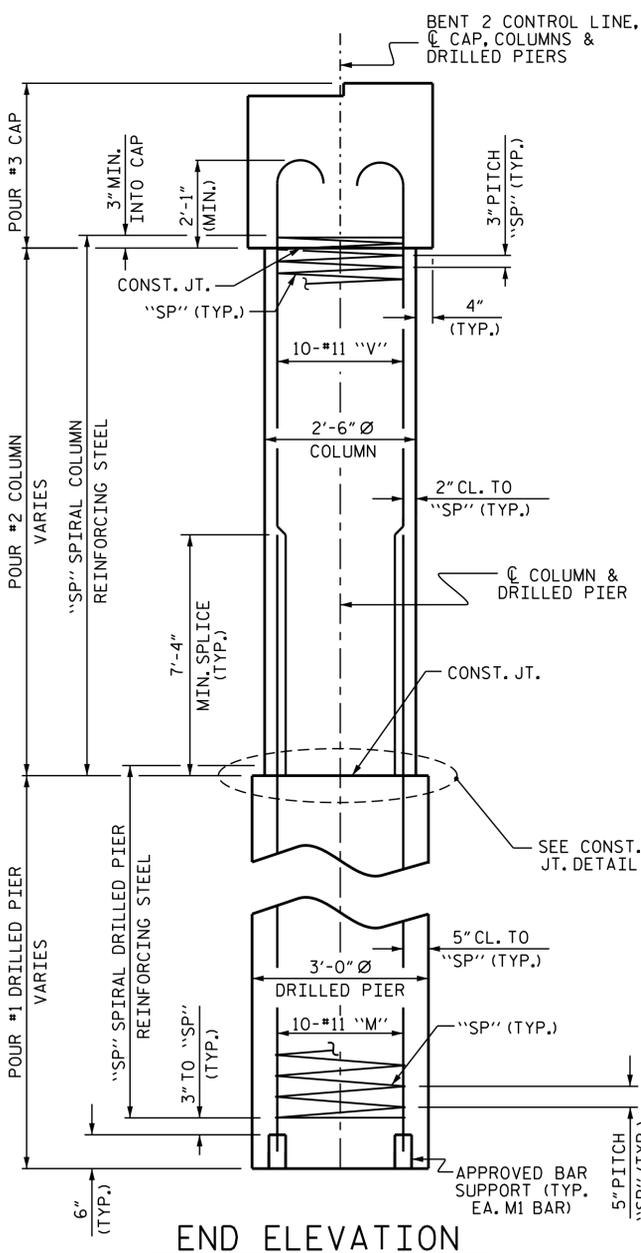
DocuSigned by:  
 Ting Fang  
 4/11/2016

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

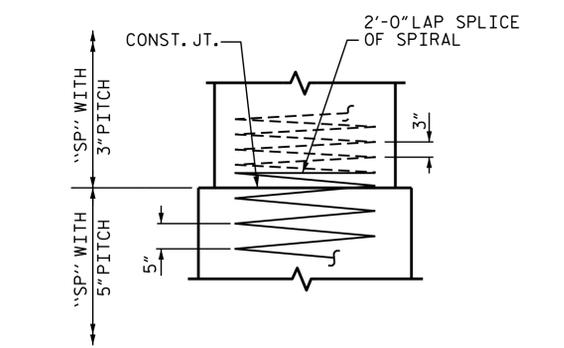
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



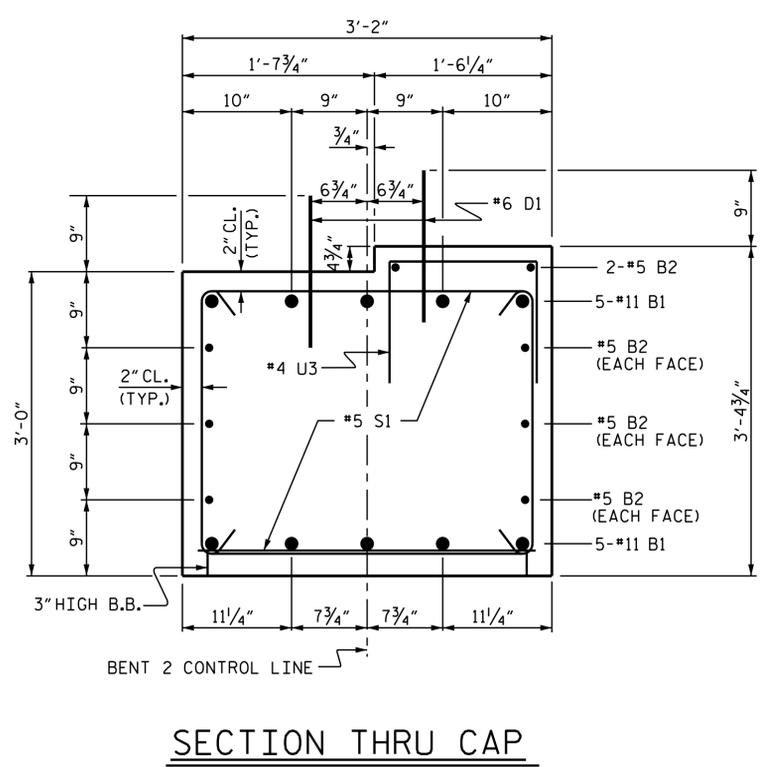
**PLAN OF DRILLED PIERS & COLUMNS**



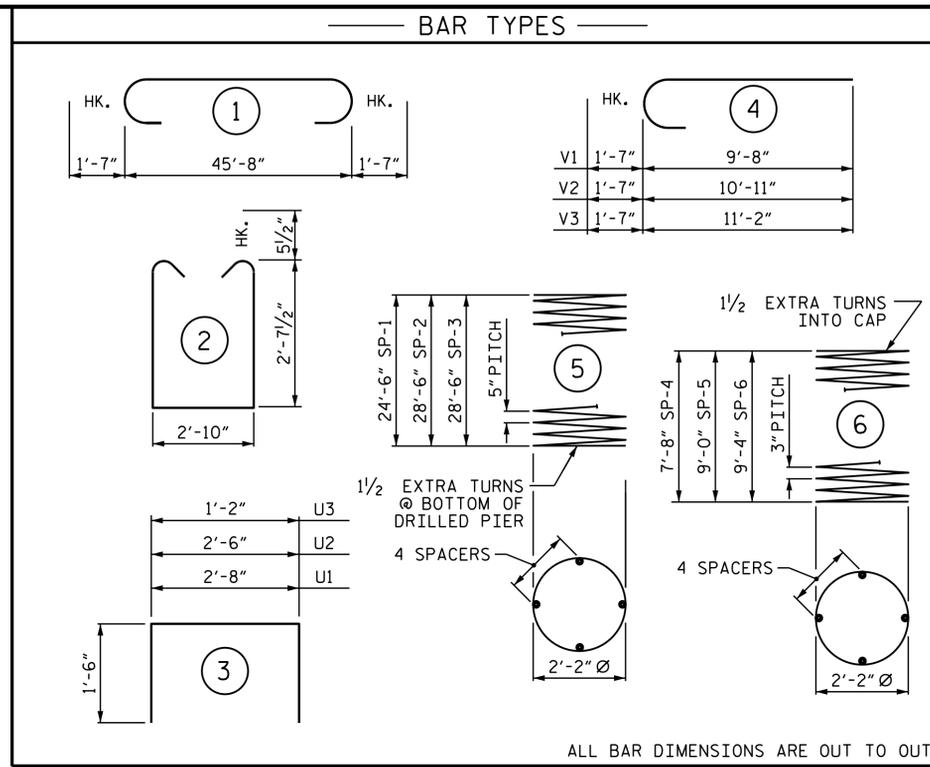
**END ELEVATION**



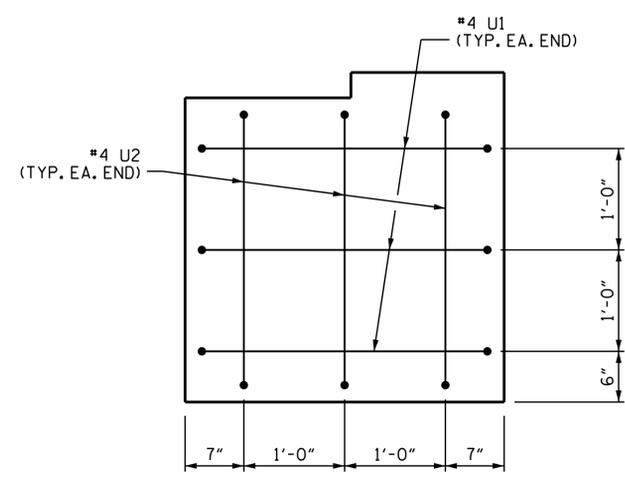
**CONSTRUCTION JOINT DETAIL**



**SECTION THRU CAP**



ALL BAR DIMENSIONS ARE OUT TO OUT



**END OF CAP VIEW**  
TYPICAL BOTH ENDS

**BILL OF MATERIAL**

BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	48'-10"	2595
B2	8	#5	STR	45'-10"	382
D1	48	#6	STR	1'-6"	108
M1	10	#11	STR	35'-2"	1868
M2	10	#11	STR	39'-2"	2081
M3	10	#11	STR	39'-2"	2081
S1	78	#5	2	9'-0"	732
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-6"	22
U3	31	#4	3	4'-2"	86
V1	10	#11	4	11'-3"	598
V2	10	#11	4	12'-6"	664
V3	10	#11	4	12'-9"	677
REINFORCING STEEL					11,917 LBS.
SP-1	1	*	5	405'-0"	422
SP-2	1	*	5	464'-10"	485
SP-3	1	*	5	464'-10"	485
SP-4	1	**	6	221'-11"	152
SP-5	1	**	6	255'-3"	175
SP-6	1	**	6	261'-11"	179
SPIRAL COLUMN REINFORCING STEEL					1,898 LBS.
* THE SP-1 THRU SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
** THE SP-4 THRU SP-6 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)					4.6 C.Y.
POUR #3 (CAP)					17.3 C.Y.
TOTAL CLASS A CONCRETE					21.9 C.Y.
DRILLED PIERS:					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)					21.7 C.Y.
3'-0" Ø DRILLED PIER NOT IN SOIL					28.0 LIN. FT.
3'-0" Ø DRILLED PIER IN SOIL					55.0 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER					33.3 LIN. FT.
CSL TUBES					350.0 LIN. FT.

PROJECT NO. B-4461  
 CHATHAM COUNTY  
 STATION: 19+12.00 -L-

SHEET 2 OF 2

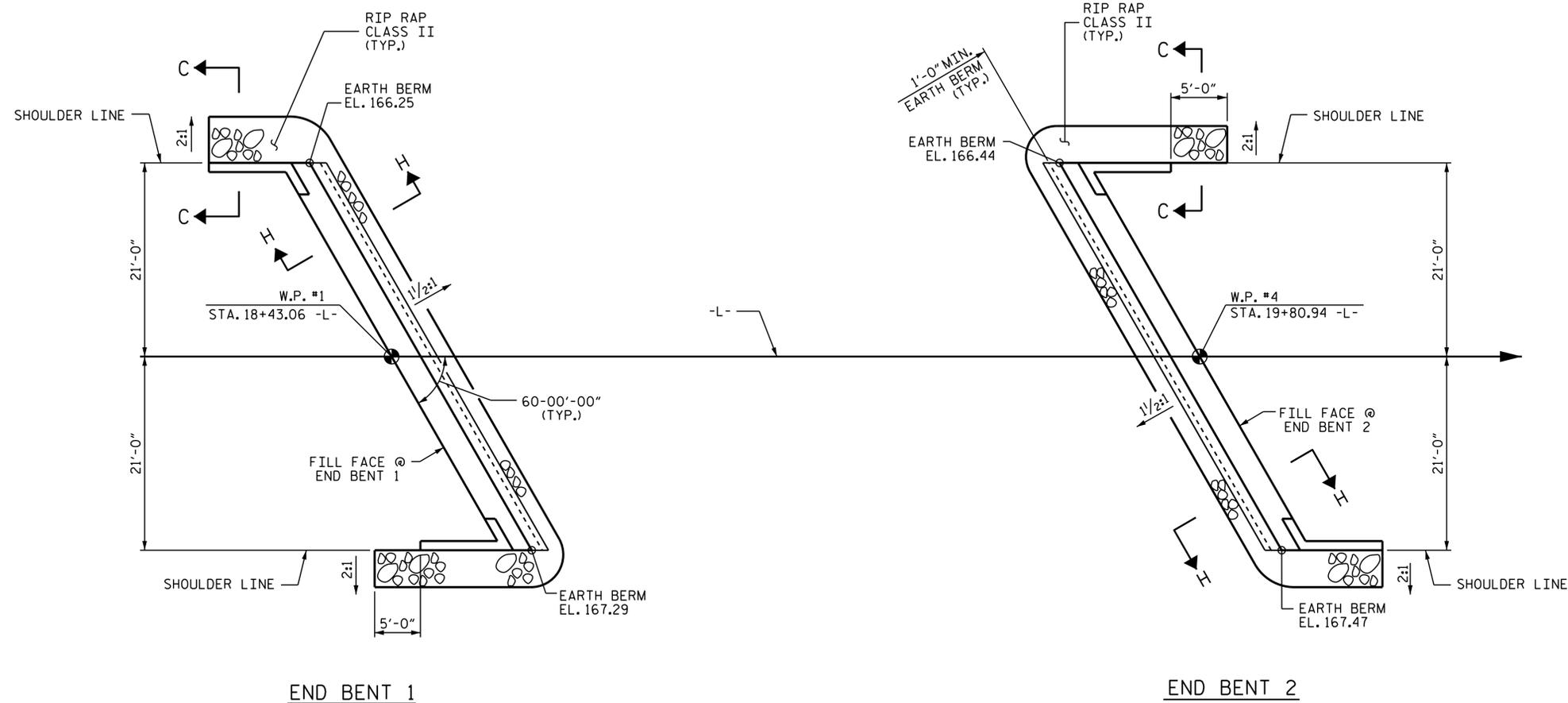


REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

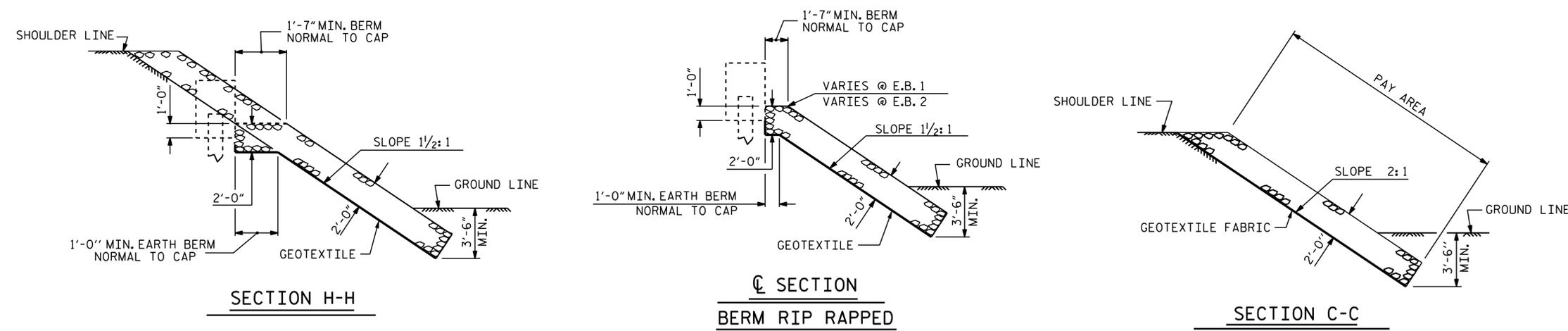
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
BENT 2					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED					TOTAL SHEETS 23

ASSEMBLED BY : S. WANCE	DATE : 7/09/13
CHECKED BY : W. F. PARKER	DATE : 09/15
DRAWN BY : DGE 3/10	REV. 11/14
CHECKED BY : MKT 3/10	MAA/TMG

ESTIMATED QUANTITIES		
BRIDGE @ STA. 19+12.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	60	65
END BENT 2	60	65



**PLAN**



**SECTION H-H**

**SECTION BERM RIP RAPPED**

**SECTION C-C**

PROJECT NO. B-4461  
CHATHAM COUNTY  
 STATION: 19+12.00 -L-

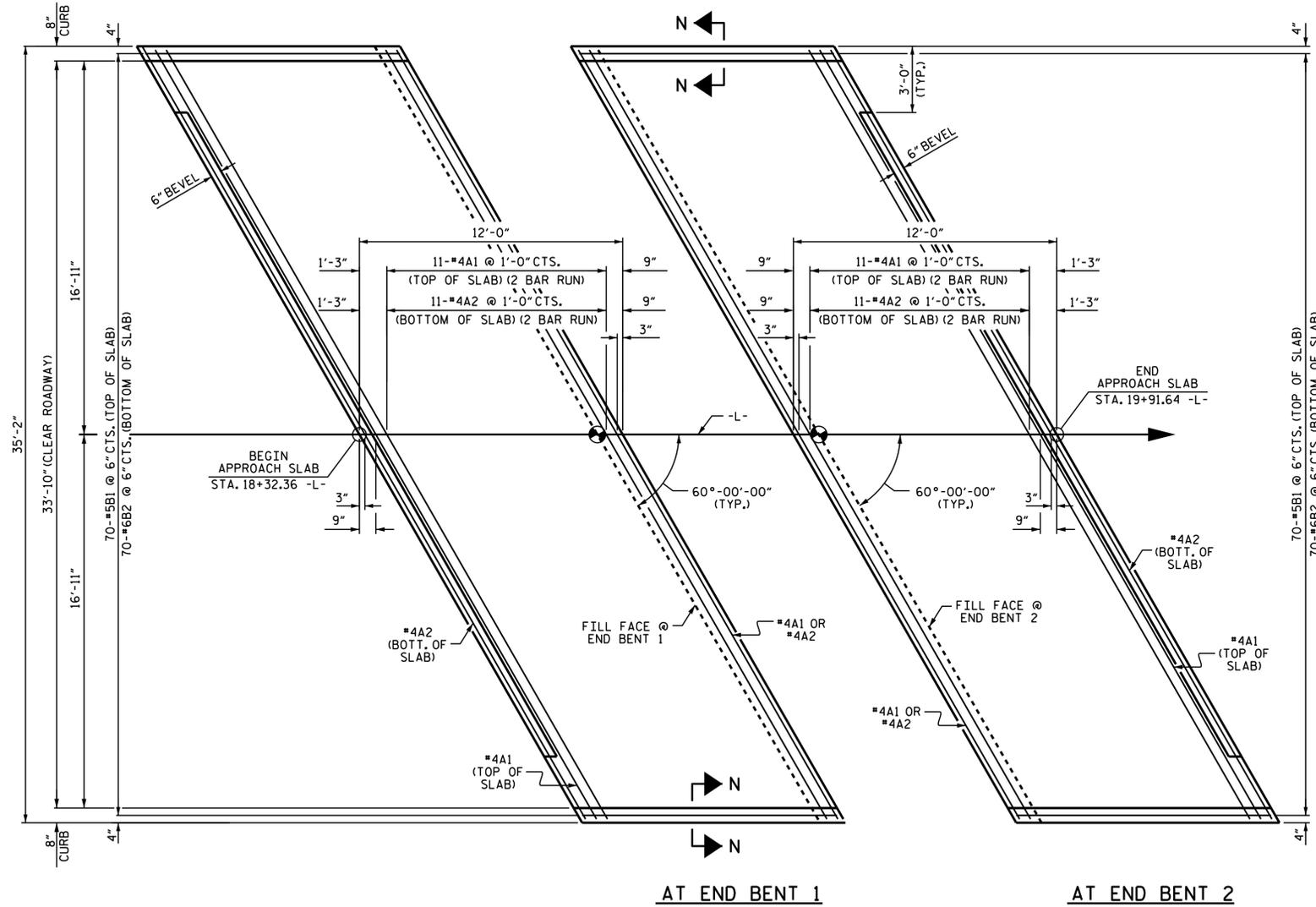


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 —RIP RAP DETAILS—

ASSEMBLED BY : S. WANCE	DATE : 07/14
CHECKED BY : W. F. PARKER	DATE : 09/15
DRAWN BY : REK 1/84	REV. 8/16/99 RWW/LES
CHECKED BY : RDU 1/84	REV. 10/17/00 RWW/LES
	REV. 5/1/06R TLA/GM

DocuSigned by:  
 Ting Fang  
 E7208840097435  
 4/11/2016  
 DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

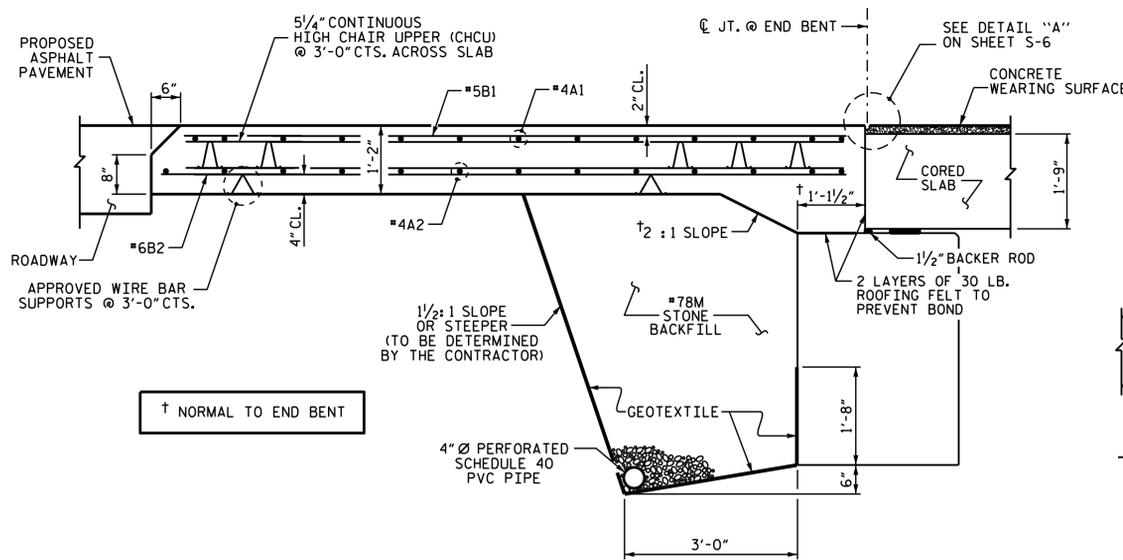
REVISIONS						SHEET NO. S-22
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 23
2			4			



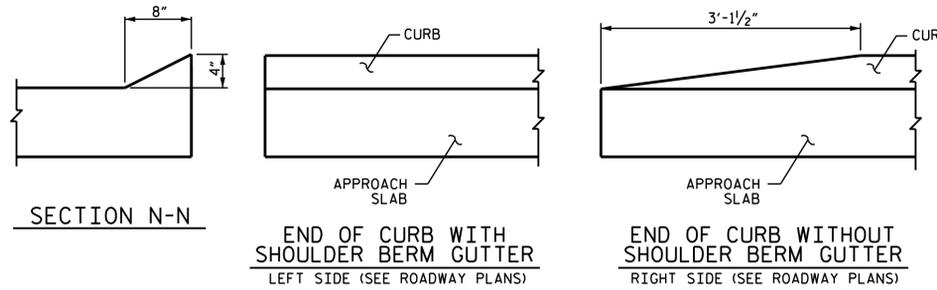
AT END BENT 1 AT END BENT 2

PLAN

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB



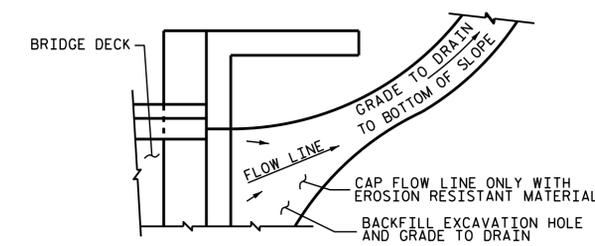
CURB DETAILS

NOTES

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, AND #78M STONE. SEE ROADWAY PLANS.

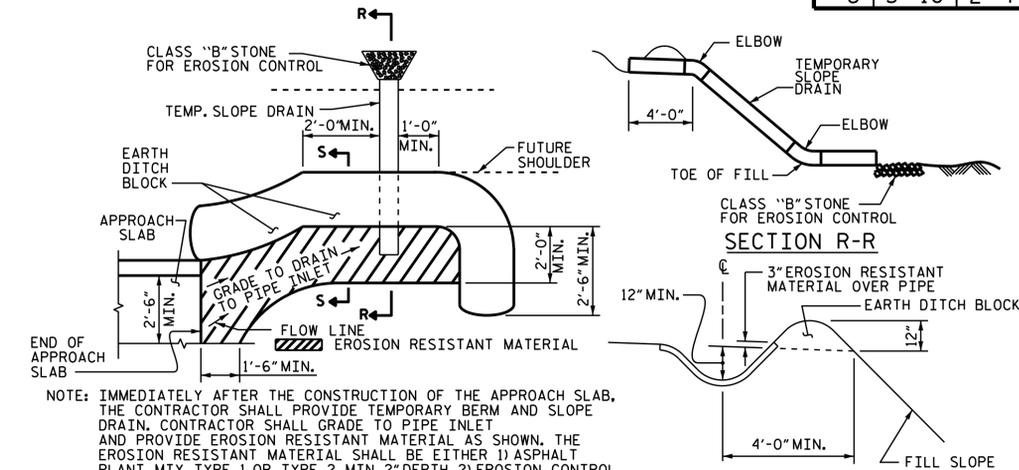
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

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)

PROJECT NO. B-4461  
CHATHAM COUNTY  
STATION: 19+12.00 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
BRIDGE APPROACH SLAB  
FOR PRESTRESSED CONCRETE  
CORED SLAB UNIT  
(SUB-REGIONAL TIER)  
60° SKEW



DocuSigned by:  
Ting Fang 4/11/2016  
E7208400977435...

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

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

ASSEMBLED BY : S. WANCE	DATE : 07/14
CHECKED BY : W. F. PARKER	DATE : 09/15
DRAWN BY : SHS/MAA 5-09	REV. 9-15
CHECKED BY : BCH 5-09	MAA/TMG

## 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 2012 "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 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" 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 1/4" 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 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" 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. FINISHERS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

### SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

# ENGLISH

JANUARY, 1990

STD. NO. SN