

09/08/99

2/27/2012
m:\projects\2009\09012_campjeune\U5132.nc24\structures.nc24\don\find\U5132_r.dwg_tsh.dgn

TIP PROJECT: U-5132

CONTRACT: C202816

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

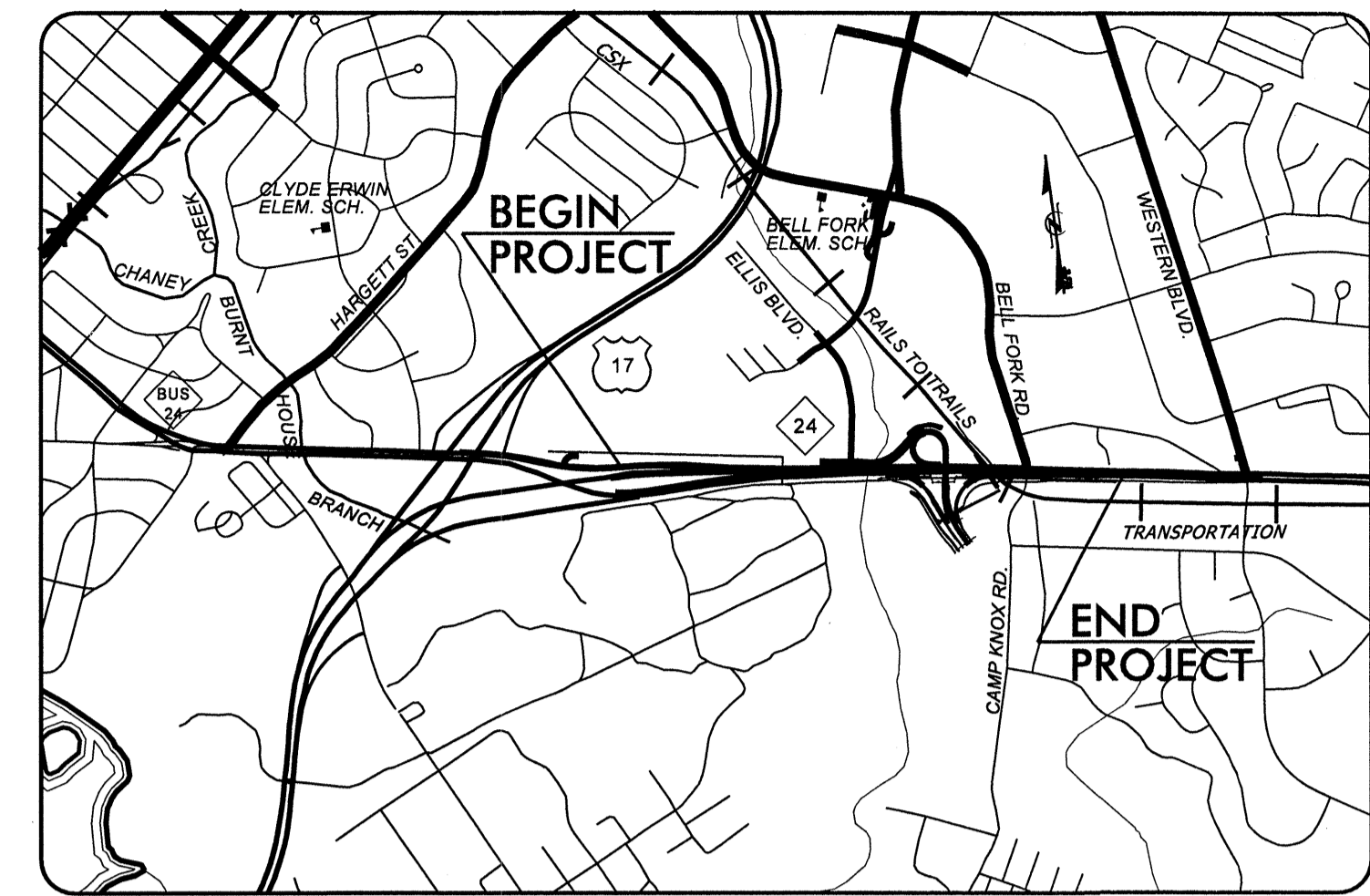
ONSLOW COUNTY

LOCATION: NEW NC 24 ACCESS AND NEW BASE ENTRY ROAD
FOR CAMP LEJEUNE MARINE CORPS BASE

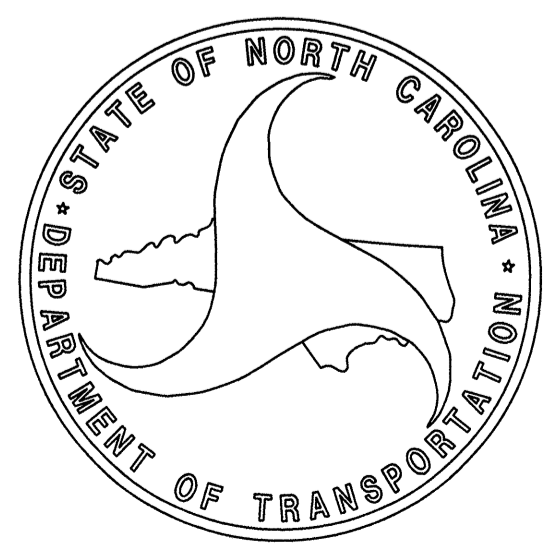
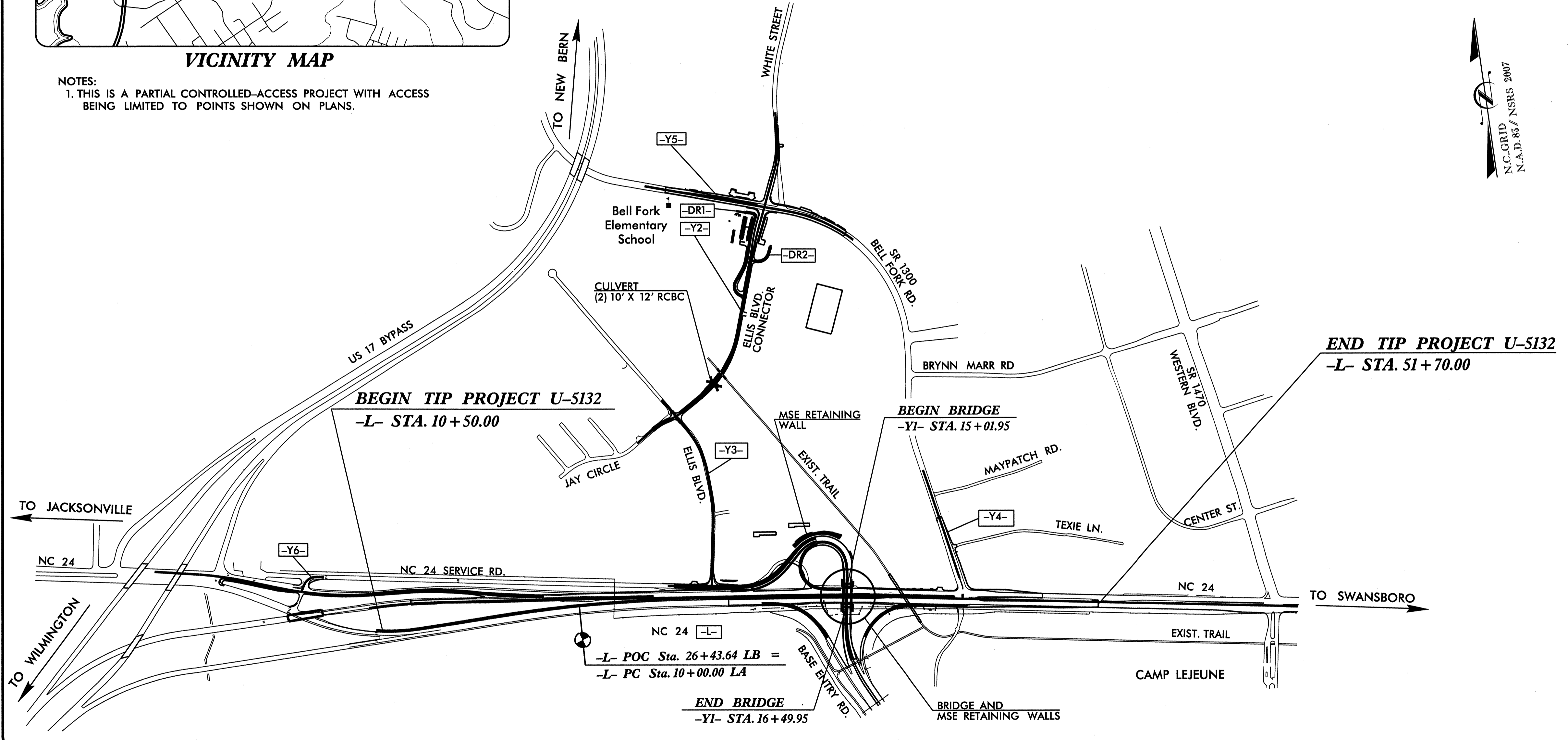
TYPE OF WORK: GRADING, PAVING, WIDENING, RESURFACING,
GUARDRAIL, DRAINAGE, STRUCTURES
SIGNALS, & LIGHTING

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5132		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
45155.1.1	DOD-0024(39)	P.E.	
45155.2.1	DOD-0024(44)	UTILITIES	
45155.2.1	DOD-0024(44)	R /W	
45155.3.1	DOD-0024(44)	CONST.	

STRUCTURES



NOTES:
1. THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS
BEING LIMITED TO POINTS SHOWN ON PLANS.



DESIGN DATA

ADT 2012 =	70,950
ADT 2035 =	83,650
DHV =	8.7 %
D =	60 %
*T =	8 %
V =	50 MPH
*TTST =	5% DUAL 3%
FUNC CLASS =	URBAN ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-5132.....	0.780 mi
LENGTH STRUCTURE TIP PROJECT U-5132.....	0.000 mi
TOTAL LENGTH TIP PROJECT U-5132.....	0.780 mi

NCDOT CONTACT

CHRIS HAIRE, PE
PROJECT ENGINEER - ROADWAY DESIGN

PLANS PREPARED BY :

RK&K RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609
NC LICENSE NO. F-0112

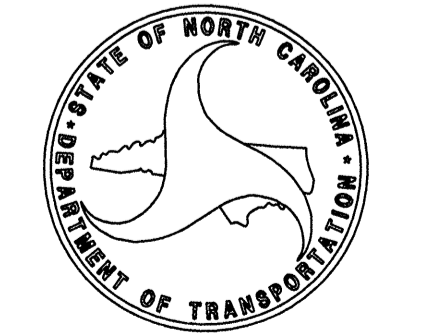
2012 STANDARD SPECIFICATIONS

LETTING DATE:
APRIL 17, 2012

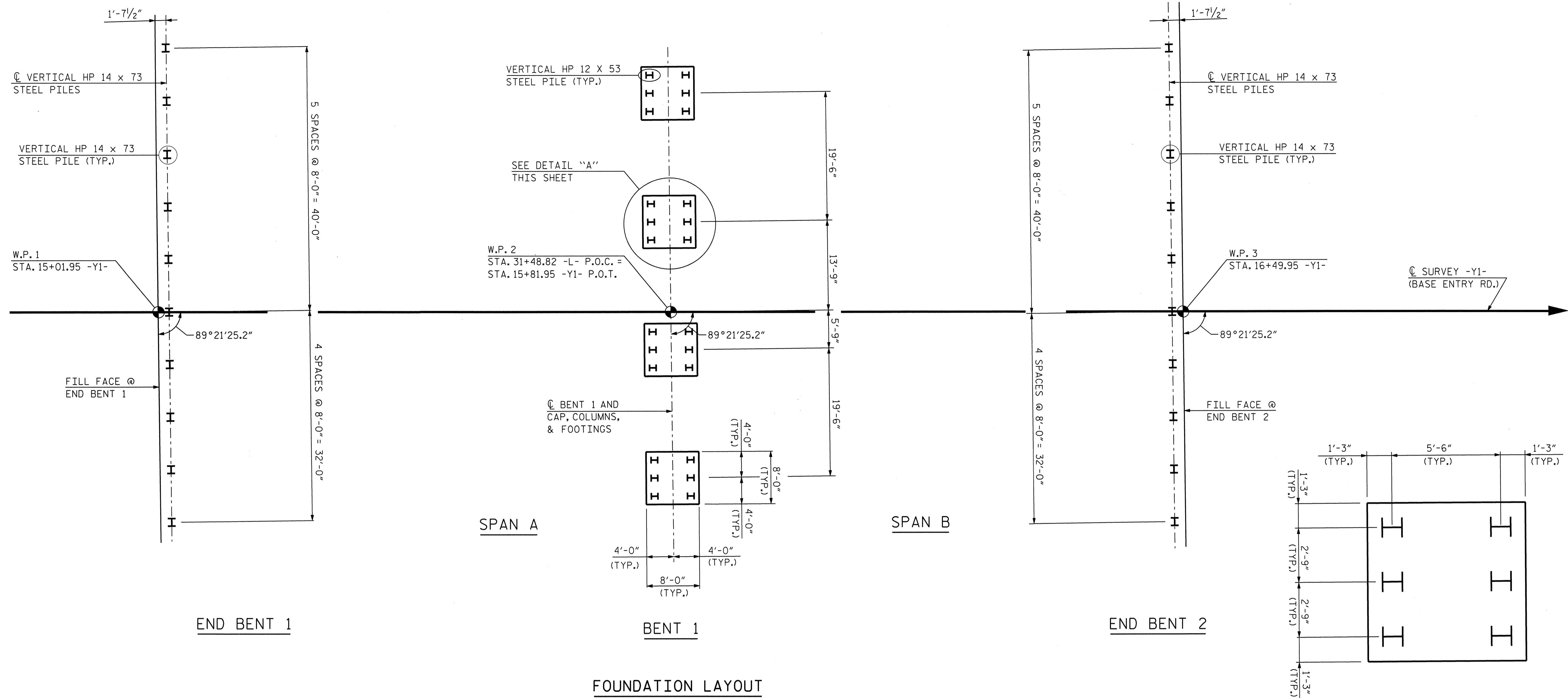
J. T. Peacock, Jr., P.E.
PROJECT ENGINEER

Michael T. Merritt, P.E.
PROJECT DESIGN ENGINEER

STRUCTURE DESIGN UNIT
1000 Birch Ridge Dr.
Raleigh, NC 27610



m:\projects\2009\09012_camplejeune\5132.nc24\structures\nc24\dgn\final\5132_sd_fl.dgn
 2/27/2012
 porr\fish



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.

ALL END BENT PILES ARE HP 14 X 73 STEEL PILES, AND ALL INTERIOR BENT PILES ARE HP 12 X 53 STEEL PILES.

FOUNDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO.1 AND END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 103 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 172 TONS PER PILE.

PILES AT INTERIOR BENT LOCATIONS ARE DESIGNED FOR A FACTORED RESISTANCE OF 101 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 169 TONS PER PILE.

TESTING THE FIRST PRODUCTION PILE FOR EACH PILE TYPE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY OF 30 TO 45 KIP-FT PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT NO.1, END BENT NO.2, AND BENT NO.1. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

DRIVE PILES BEFORE CONSTRUCTING THE MSE RETAINING WALLS AT END BENT NO.1 AND END BENT NO.2.

DRAWN BY : C.J. PIPER DATE : NOV. 11
 CHECKED BY : K.M. WING DATE : NOV. 11

RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

DWG. NO. 2
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL
 031543
 KEITH W. WING
 2/27/2012

PROJECT NO. U-5132
 ONSLOW COUNTY
 STATION: STA. 31+48.82 -L- P.O.C. = STA. 15+81.95 -Y1- P.O.T.

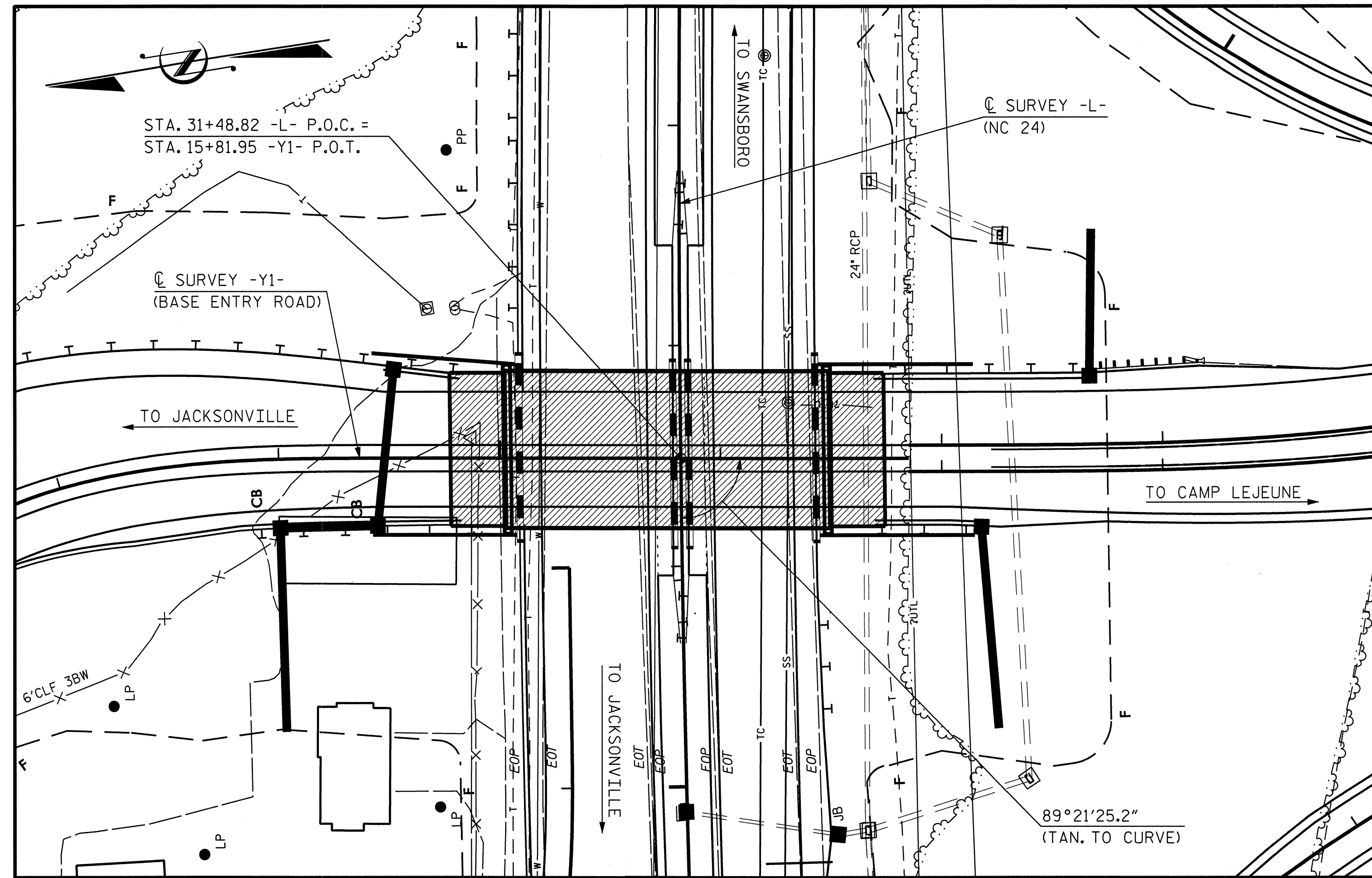
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**GENERAL DRAWING
FOUNDATION LAYOUT**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			26

BENCHMARK: CONTROL POINT MA 52101, N 365885.68, E 2483875.47, ELEV. 24.02 (SEE ROADWAY PLANS, SHEET 1C)



LOCATION SKETCH

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

GENERAL NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR SEISMIC PERFORMANCE ZONE 1.

PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLES 420-3 OF THE STANDARD SPECIFICATIONS.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

ALL METALIZED SURFACES SHALL RECEIVE A SEAL COATING AS SPECIFIED IN THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALIZATION).

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

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 BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

LOCATION	FOUNDATION EXCAVATION FOR BENT	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS "A" CONCRETE	BRIDGE APPROACH SLABS	REINF. STEEL	EPOXY COATED REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	45" PRESTRESSED CONCRETE GIRDERS		HP 12x53 STEEL PILES		HP 14x73 STEEL PILES		CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	MSE RETAINING WALLS
										NO.	L.F.	NO.	L.F.	NO.	L.F.				
SUPERSTRUCTURE			10,426	11,272						16	1,162.00					292.67		LUMP SUM	
END BENT 1		1			31.0	LUMP SUM	6,997	826					10	700			16		2,700
BENT 1	LUMP SUM	1			90.4		17,836		1,433			24	1,560						
END BENT 2					30.8	LUMP SUM	6,994	826					10	700			15		2,900
TOTAL	LUMP SUM	2	10,426	11,272	152.2	LUMP SUM	31,827	1,652	1,433	16	1,162.00	24	1,560	20	1,400	292.67	31	LUMP SUM	5,600

PROJECT NO. U-5132

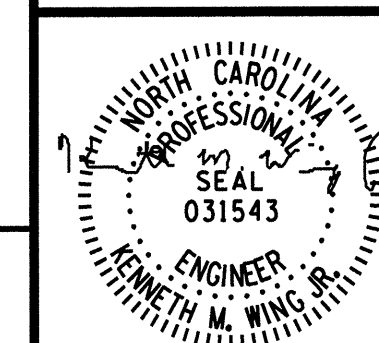
ONSLOW COUNTY

STATION: STA. 31+48.82 -L- P.O.C. =
STA. 15+81.95 -Y1- P.O.T.

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
FOR BRIDGE ON BASE ENTRY ROAD
OVER NC 24
BETWEEN JACKSONVILLE AND
CAMP LEJEUNE

DWG. NO. 3



2/27/2012

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NUMBER: F-0112

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			26

2/27/2012 m:\projects\2009\09012_camp\lejeune\U5132.nc24\structures\nc24\dgn\final\U5132_sd_loc.dgn

DRAWN BY: C.J. PIPER DATE: NOV. 11
CHECKED BY: K.M. WING DATE: NOV. 11

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

LOAD FACTORS:

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

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								
						LIVE-LOAD FACTORS (γ_{LL})	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)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.18	--	1.75	0.773	1.55	B	I	32.6	0.921	1.47	A	I	7.2	0.80	0.747	1.18	A	I	38.6		
	HL-93 (OPERATING)	N/A		1.98	--	1.35	0.773	2.01	B	I	32.6	0.921	1.98	A	I	7.2	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.56	56.16	1.75	0.773	1.99	B	I	32.6	0.921	1.94	A	I	7.2	0.80	0.747	1.56	A	I	38.6		
	HS-20 (OPERATING)	36.000		2.58	92.88	1.35	0.773	2.58	B	I	32.6	0.921	2.59	A	I	7.2	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.56	48.06	1.40	0.773	5.50	B	I	32.6	0.921	6.24	B	I	6.0	0.80	0.747	3.56	A	I	38.6	
		SNGARBS2	20.000		2.64	52.80	1.40	0.773	4.15	B	I	32.6	0.921	4.36	A	I	7.2	0.80	0.747	2.64	A	I	38.6	
		SNAGRIS2	22.000		2.49	54.78	1.40	0.773	3.95	B	I	32.6	0.921	4.01	A	I	7.2	0.80	0.747	2.49	A	I	38.6	
		SNCOTTS3	27.250		1.77	48.23	1.40	0.773	2.74	B	I	32.6	0.921	2.95	B	I	6.0	0.80	0.747	1.77	A	I	38.6	
		SNAGGRS4	34.925		1.47	51.34	1.40	0.773	2.31	B	I	32.6	0.921	2.38	A	I	7.2	0.80	0.747	1.47	A	I	38.6	
		SNS5A	35.550		1.44	51.19	1.40	0.773	2.25	B	I	32.6	0.921	2.41	A	I	7.2	0.80	0.747	1.44	A	I	38.6	
		SNS6A	39.950		1.32	52.73	1.40	0.773	2.08	B	I	32.6	0.921	2.16	A	I	7.2	0.80	0.747	1.32	A	I	38.6	
	SNS7B	42.000		1.26	52.92	1.40	0.773	1.98	B	I	32.6	0.921	2.11	A	I	7.2	0.80	0.747	1.26	A	I	38.6		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.61	53.13	1.40	0.773	2.54	B	I	32.6	0.921	2.65	A	I	7.2	0.80	0.747	1.61	A	I	38.6	
		TNT4A	33.075		1.62	53.58	1.40	0.773	2.55	B	I	32.6	0.921	2.58	A	I	7.2	0.80	0.747	1.62	A	I	38.6	
		TNT6A	41.600		1.32	54.91	1.40	0.773	2.09	B	I	32.6	0.921	2.27	A	I	7.2	0.80	0.747	1.32	A	I	38.6	
		TNT7A	42.000		1.32	55.44	1.40	0.773	2.11	B	I	32.6	0.921	2.21	A	I	7.2	0.80	0.747	1.32	A	I	38.6	
		TNT7B	42.000		1.37	57.54	1.40	0.773	2.19	B	I	32.6	0.921	2.06	A	I	7.2	0.80	0.747	1.37	A	I	38.6	
		TNAGRIT4	43.000		1.30	55.90	1.40	0.773	2.08	B	I	32.6	0.921	2.00	A	I	7.2	0.80	0.747	1.30	A	I	38.6	
TNAGT5A		45.000		1.23	55.35	1.40	0.773	1.95	B	I	32.6	0.921	1.98	A	I	7.2	0.80	0.747	1.23	A	I	38.6		
TNAGT5B	45.000		③	1.21	54.45	1.40	0.773	1.93	B	I	32.6	0.921	1.88	A	I	7.2	0.80	0.747	1.21	A	I	38.6		

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:

- END RESTRAINT FOR INTEGRAL ABUTMENTS IS NOT CONSIDERED FOR LOAD RATING ANALYSIS.
- LOAD RATING FOR SERVICE III LIMIT STATE IS BASED ON CONCRETE TENSION RATING OPTION.
- LOAD RATING ASSUMES SIMPLE SPAN CONDITIONS PER NCDOT BRIDGE DESIGN MANUAL, CHAPTER 6.

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

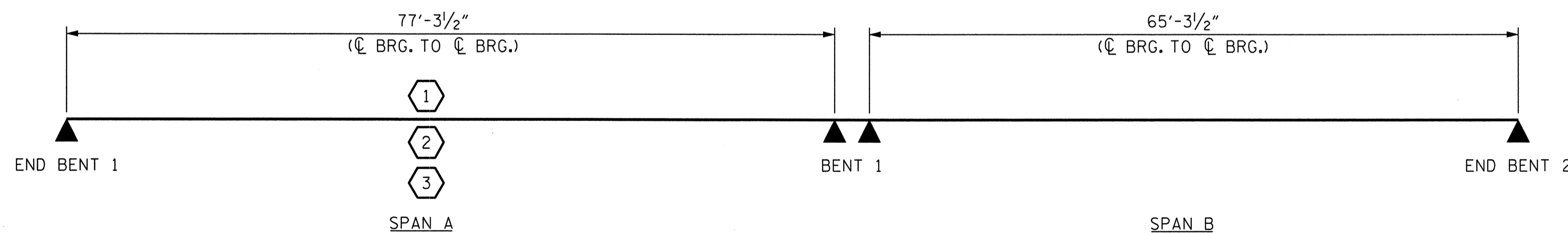
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. U-5132
ONSLOW COUNTY
 STATION: STA. 31+48.82 -L- P.O.C. =

D:\projects\2009\09012_camplejeune\U5132.nc24\structures\nc24\dgn\U5132_sd_lr_fr.dgn

DRAWN BY: C.J. PIPER DATE: NOV. 11
 CHECKED BY: K.M. WING DATE: NOV. 11

RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEMOUNT DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

DWG. NO. 4

2/27/2012

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**STANDARD
 LRFR SUMMARY FOR
 PRESTRESSED
 CONCRETE GIRDERS
 (NON-INTERSTATE TRAFFIC)**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			26

NOTES:

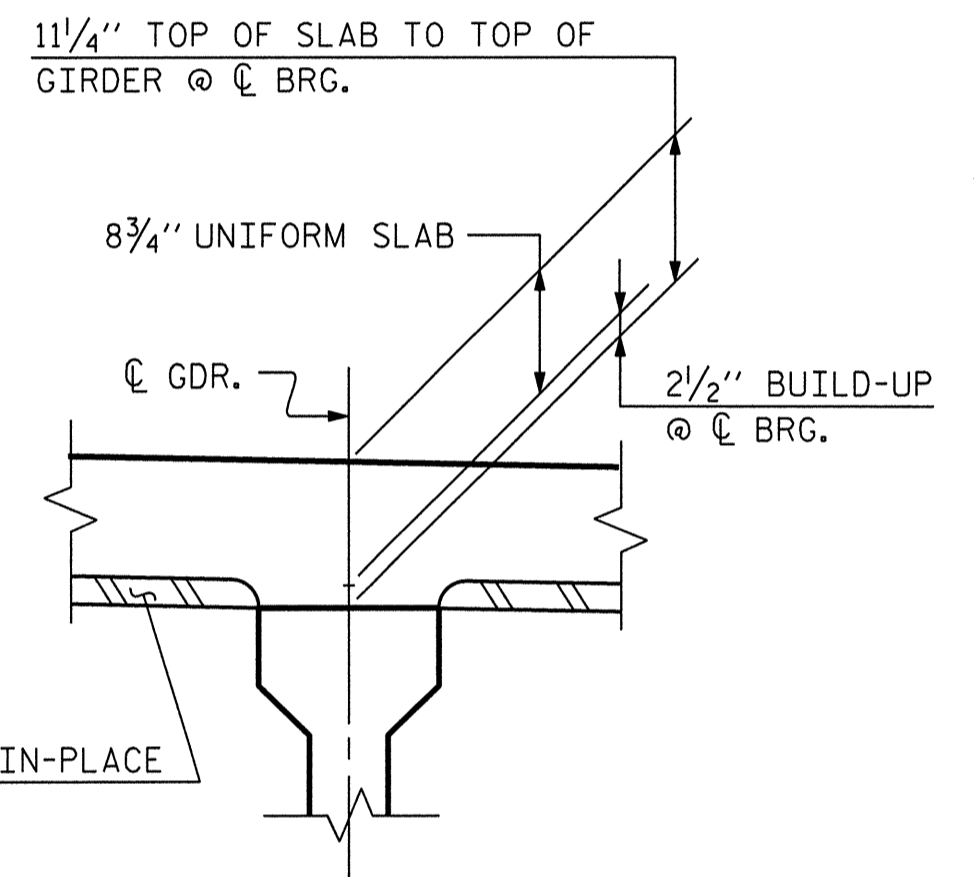
PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) AT 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE CONCRETE IS CAST IN THE UNIT.

FOR DETAILS OF INTERMEDIATE DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGM FOR TYPE III PRESTRESSED CONCRETE GIRDERS" SHEET.

FOR DETAILS OF BLOCKOUTS, SEE SHEET 2 OF 2.



DETAIL "A"

PROJECT NO. U-5132
 ONSLOW COUNTY
 STATION: STA. 31+48.82 -L- P.O.C.

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

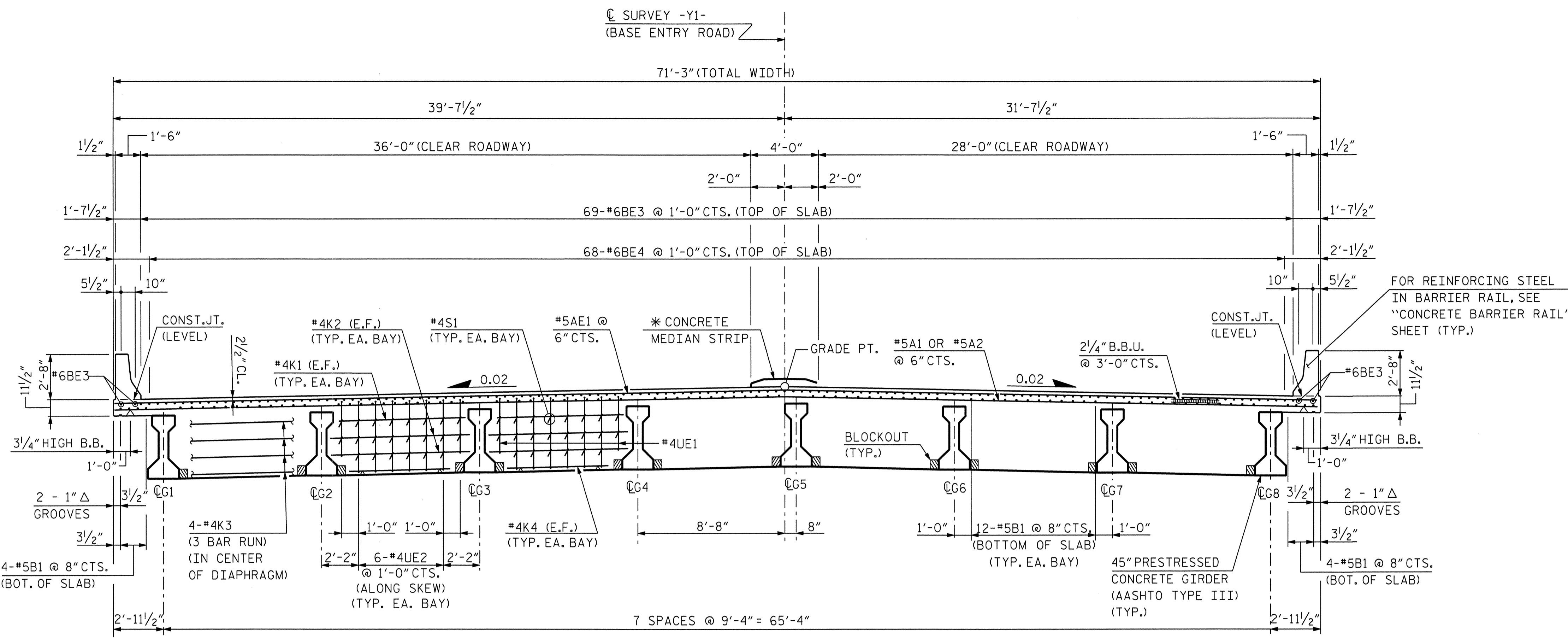
**SUPERSTRUCTURE
 TYPICAL SECTION**

DWG. NO. 5

2/27/2012

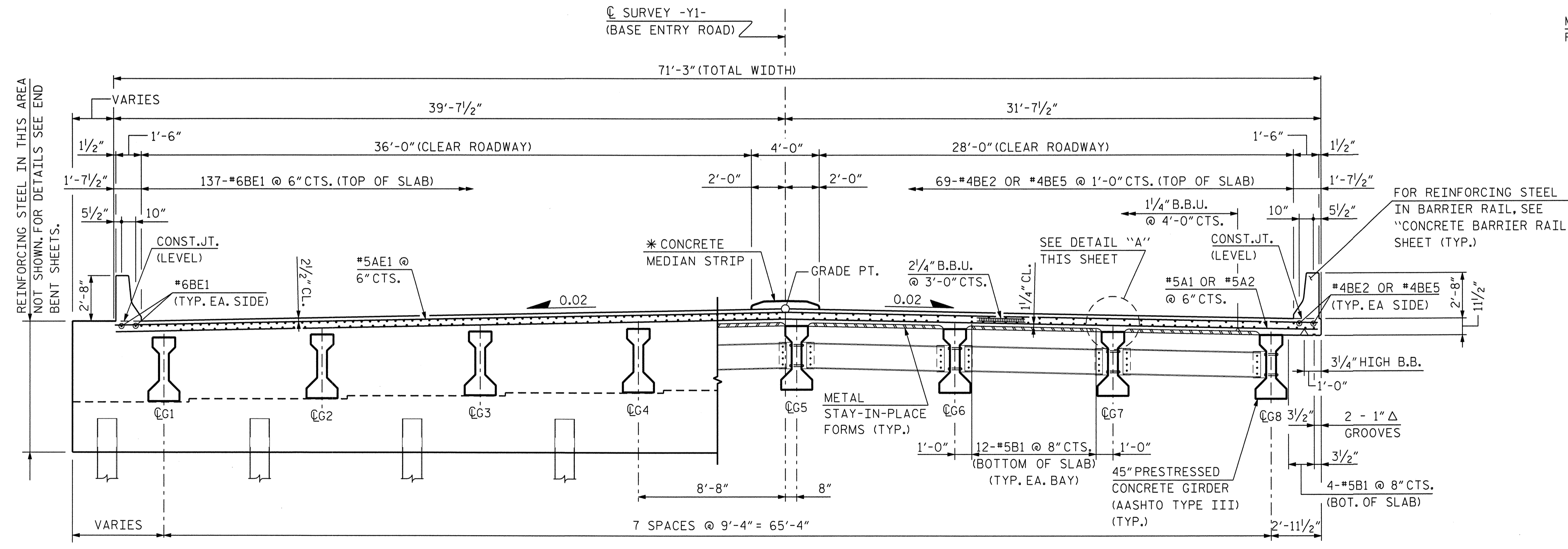
RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

REVISIONS						SHEET NO. S-5
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			



TYPICAL SECTION AT BENT DIAPHRAGM

* FOR CONCRETE MEDIAN STRIP DETAILS AND REINFORCEMENT LAYOUT, SEE "CONCRETE MEDIAN DETAILS" SHEET.



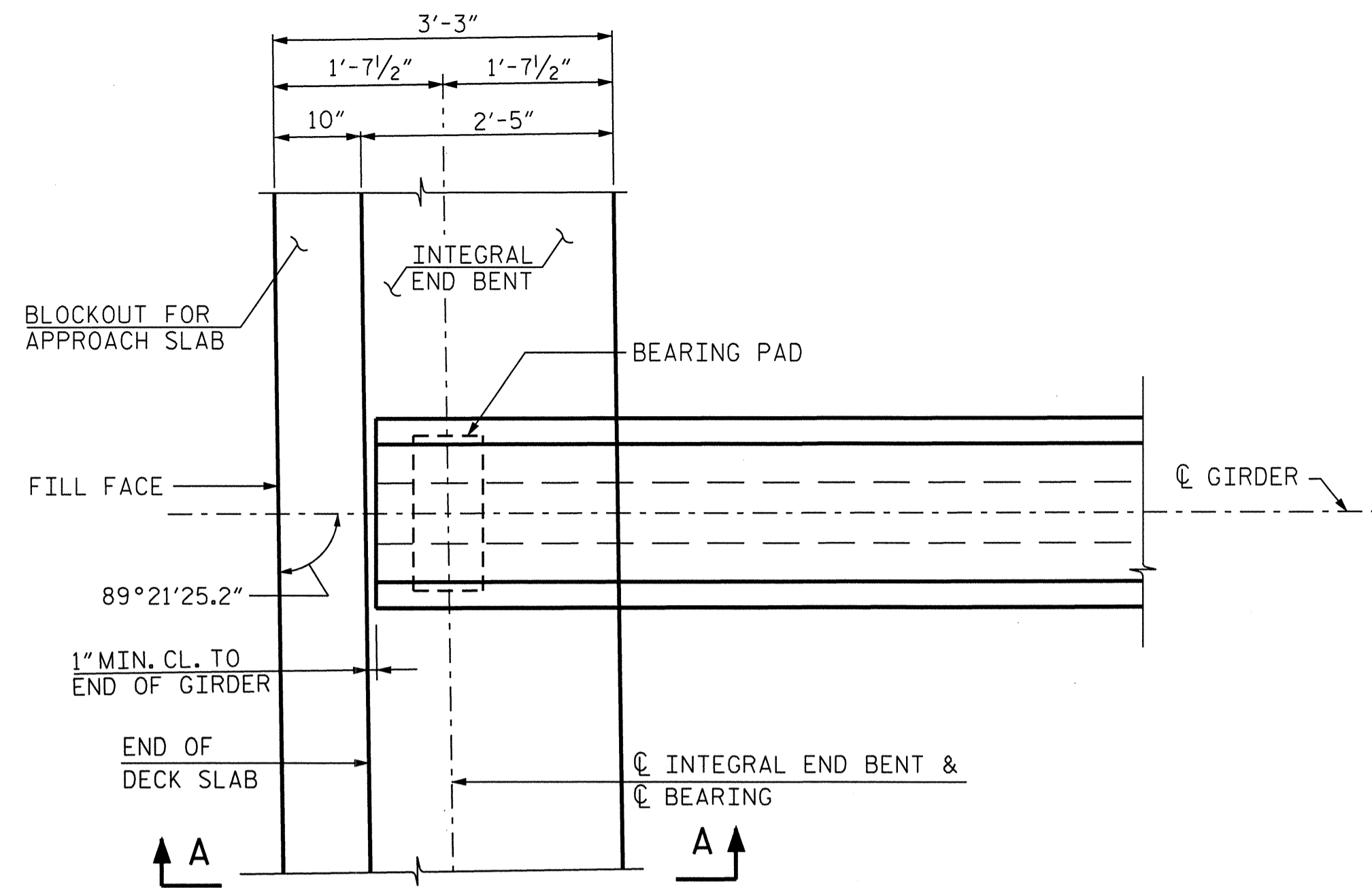
TYPICAL HALF SECTION AT INTEGRAL END BENT

TYPICAL HALF SECTION AT INTERMEDIATE DIAPHRAGM

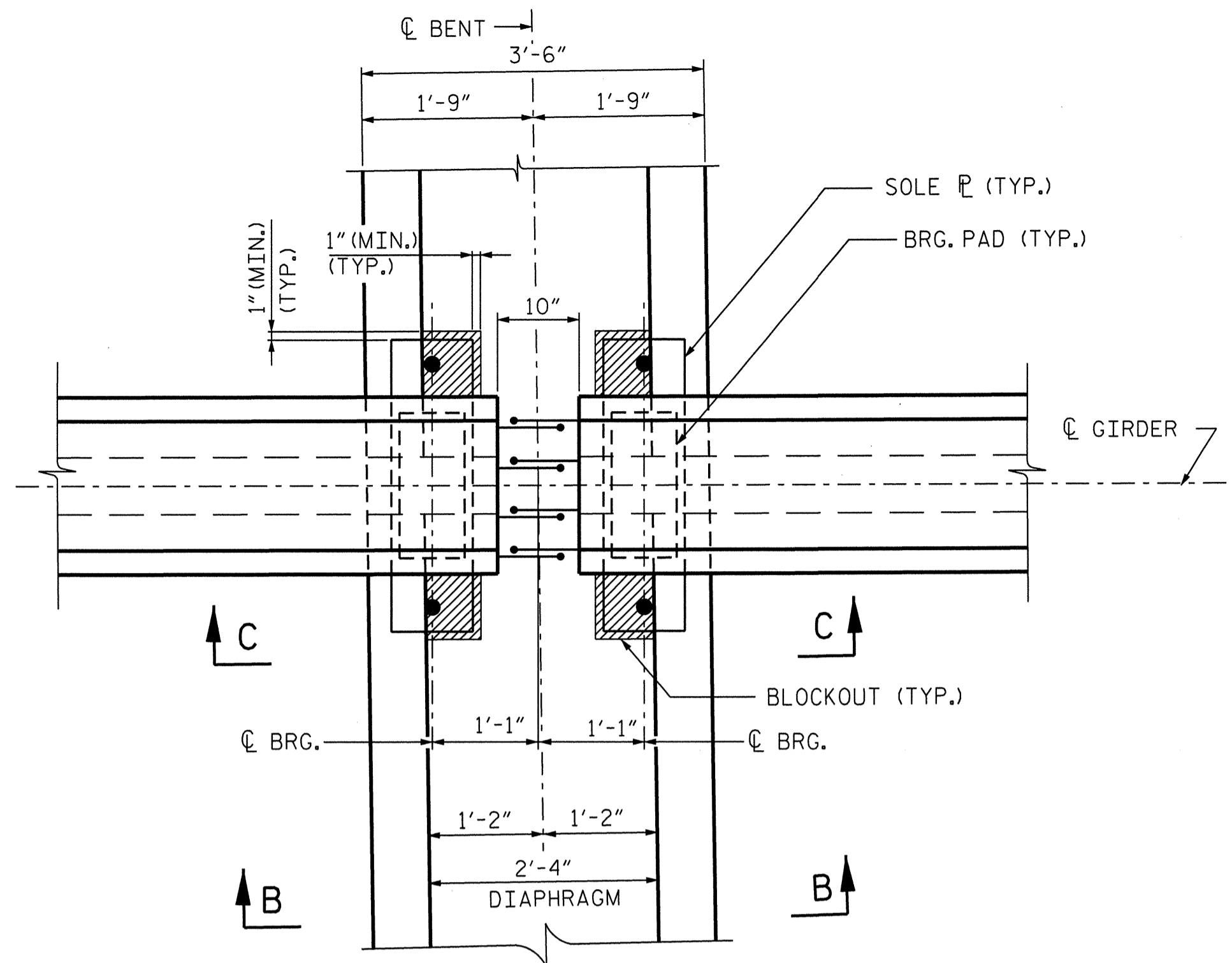
* FOR CONCRETE MEDIAN STRIP DETAILS AND REINFORCEMENT LAYOUT, SEE "CONCRETE MEDIAN DETAILS" SHEET.

DRAWN BY: C.J. PIPER DATE: NOV. 11
 CHECKED BY: K.M. WING DATE: NOV. 11

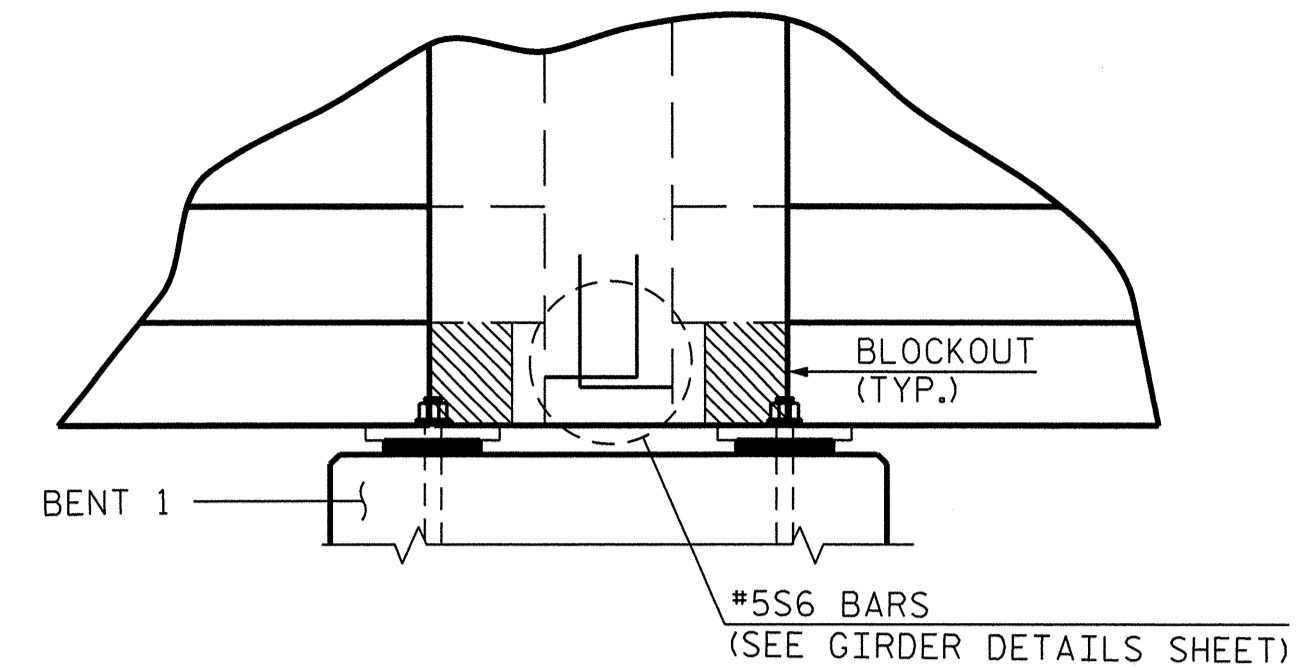
2/27/2012 m:\projects\2009\09012-complejeune\U5132.nc24\structures\nc24\dgn\Final\U5132.sd.tsl.dgn
 REINFORCING STEEL IN THIS AREA NOT SHOWN FOR DETAILS SEE END BENT SHEETS.



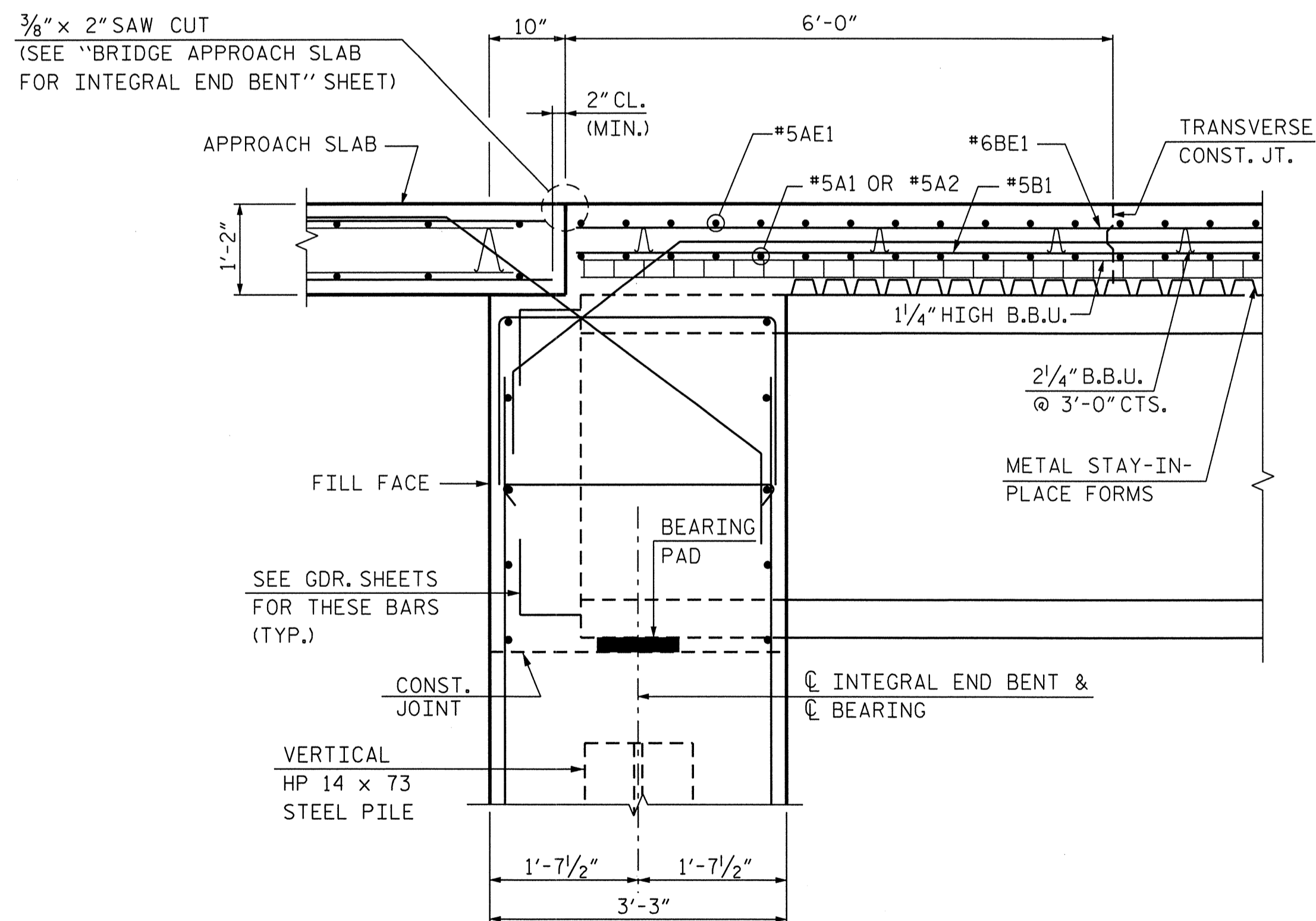
PLAN DETAIL OF END BENT
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



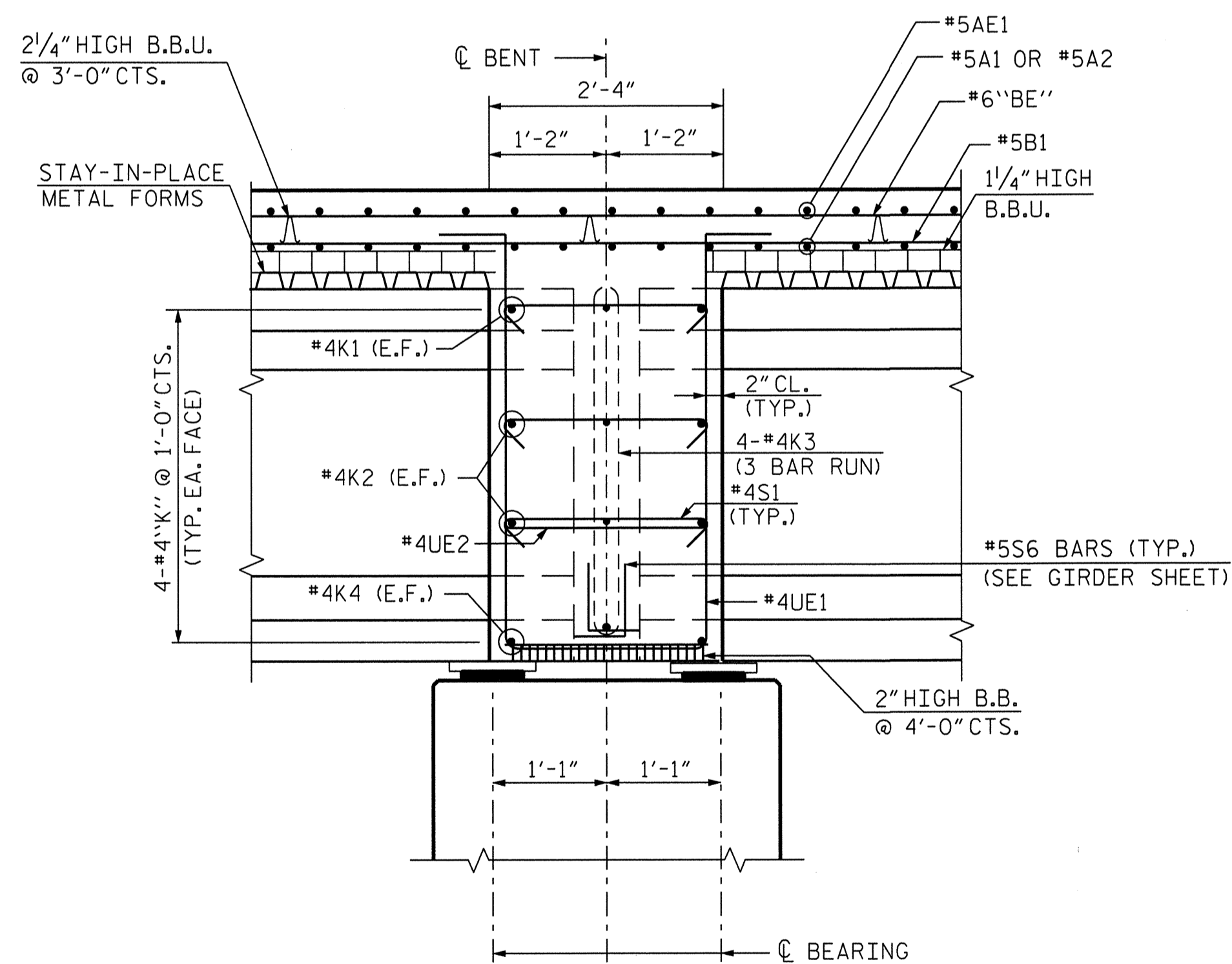
PLAN DETAIL OF INTERIOR BENT 1
(CONTINUOUS DECK SLAB NOT SHOWN FOR CLARITY)



SECTION C-C
BLOCKOUT DETAIL AT BENT 1 DIAPHRAGMS



SECTION A-A
(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)
(END BENT 1 SHOWN, END BENT 2 SIMILAR)
(SEE END BENT SHEETS FOR INTEGRAL END BENT REINFORCEMENT DETAILS)



SECTION B-B
SECTION THROUGH INTERIOR BENT DIAPHRAGM
(DIMENSIONS SHOWN ARE NORMAL TO THE BENT)

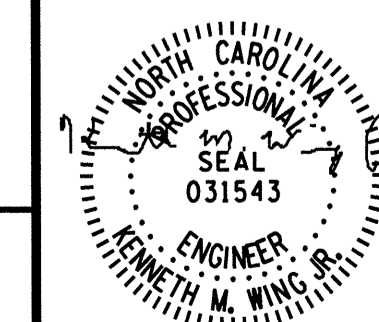
PROJECT NO. U-5132
ONSLOW COUNTY
STATION: STA. 31+48.82 -L- P.O.C.

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION
DETAILS

DWG. NO. 6



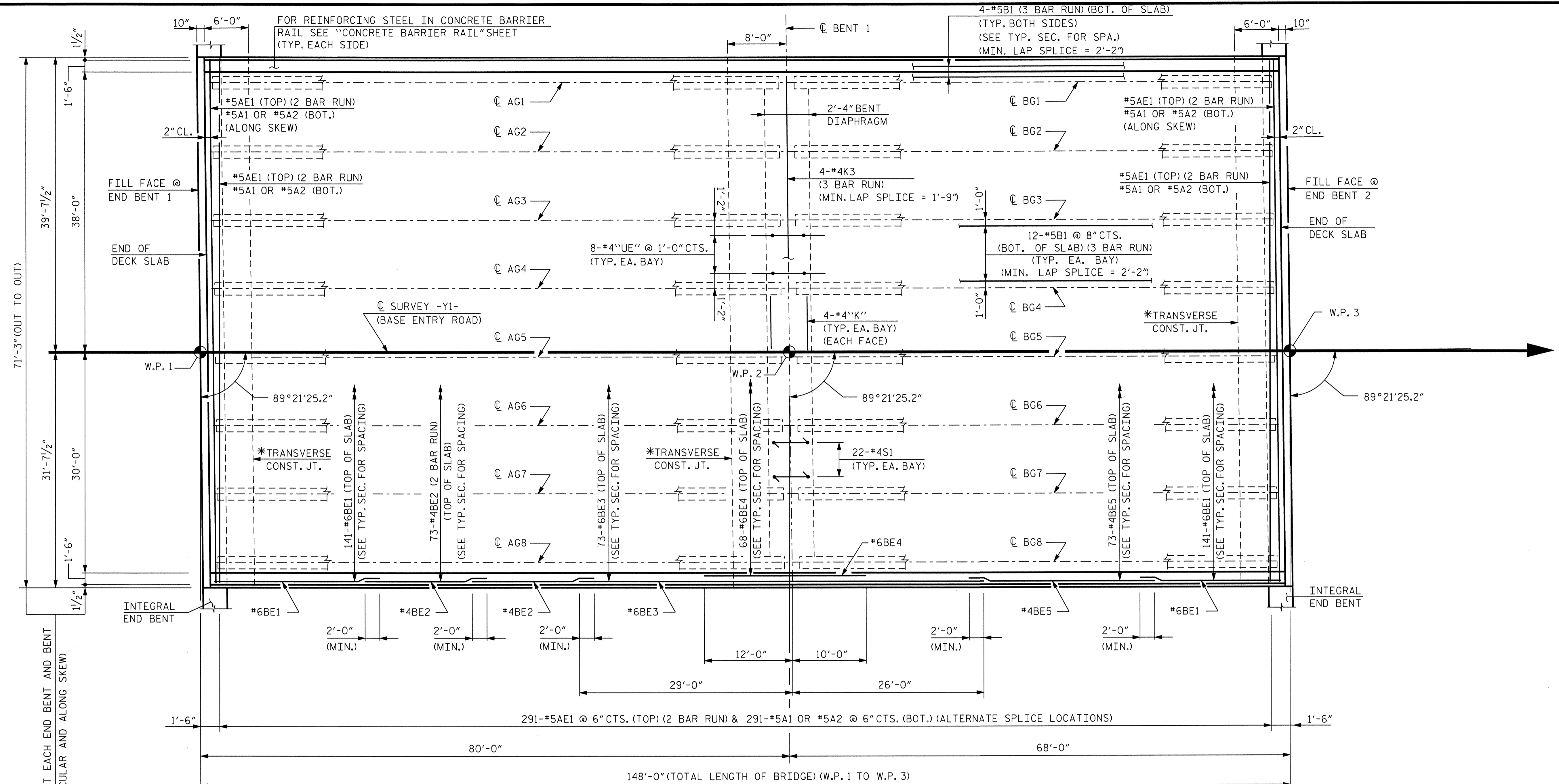
2/27/2012

REVISIONS						SHEET NO. S-6
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NUMBER: F-0112

2/27/2012 10:27:12 am \\projects\2009\09012.camp\jeune\5132.nc24\structures\nc24\dgn\Final\U5132.sd+ts2.dgn

DRAWN BY: C.J. PIPER DATE: NOV. 11
 CHECKED BY: K.M. WING DATE: NOV. 11



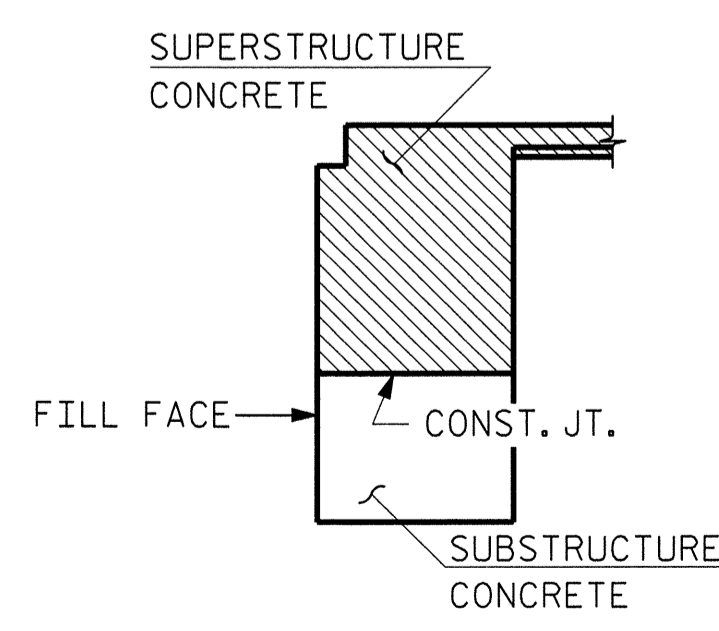
SPAN A

SPAN B

PLAN OF SPANS

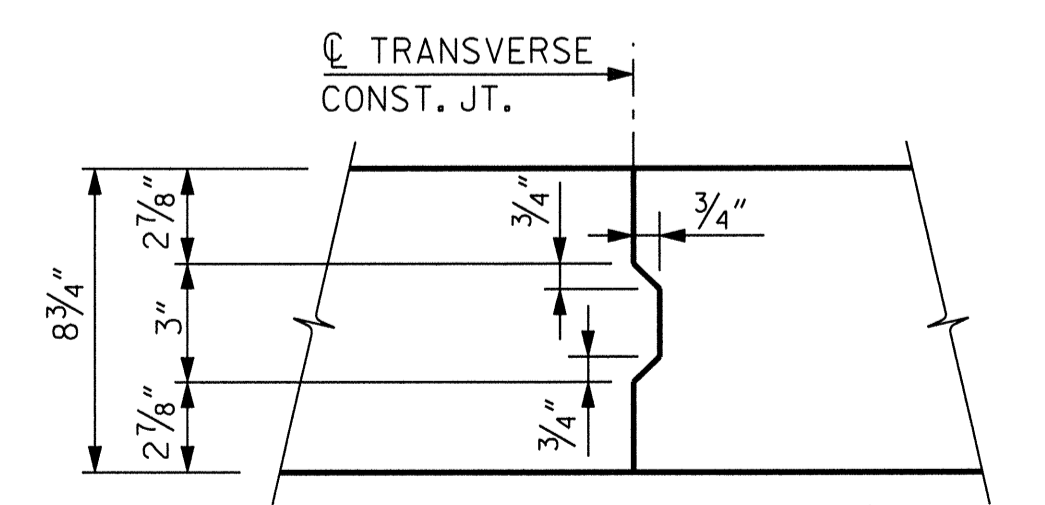
PROJECT NO. U-5132
 ONSLOW COUNTY
 STATION: STA. 31+48.82 -L- P.O.C.

* FOR TRANSVERSE CONSTRUCTION JOINTS AND SLAB POURING SEQUENCE DETAILS, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.



CONCRETE QUANTITY DETAIL

NOTE: CONCRETE QUANTITIES OF INTEGRAL END BENT CAP ABOVE CONSTRUCTION JOINT ARE INCLUDED IN SUPERSTRUCTURE QUANTITIES. REINFORCING STEEL IN THESE AREAS IS INCLUDED IN THE END BENT QUANTITIES.



TRANSVERSE CONST. JOINT IN DECK SLAB

NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL AND TRANSVERSE REINFORCING STEEL SHALL BE CONTINUOUS THROUGH JOINT.

RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

DWG. NO. 7

 2/27/2012

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 PLAN OF SPANS A & B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			26

2/27/2012 m:\projects\2009\09012.cmp\jeune\5132.nc24\structures\nc24\dgn\final\U5132.sd.ps.dgn
 DRAWN BY: C.J. PIPER DATE: NOV. 11
 CHECKED BY: K.M. WING DATE: NOV. 11

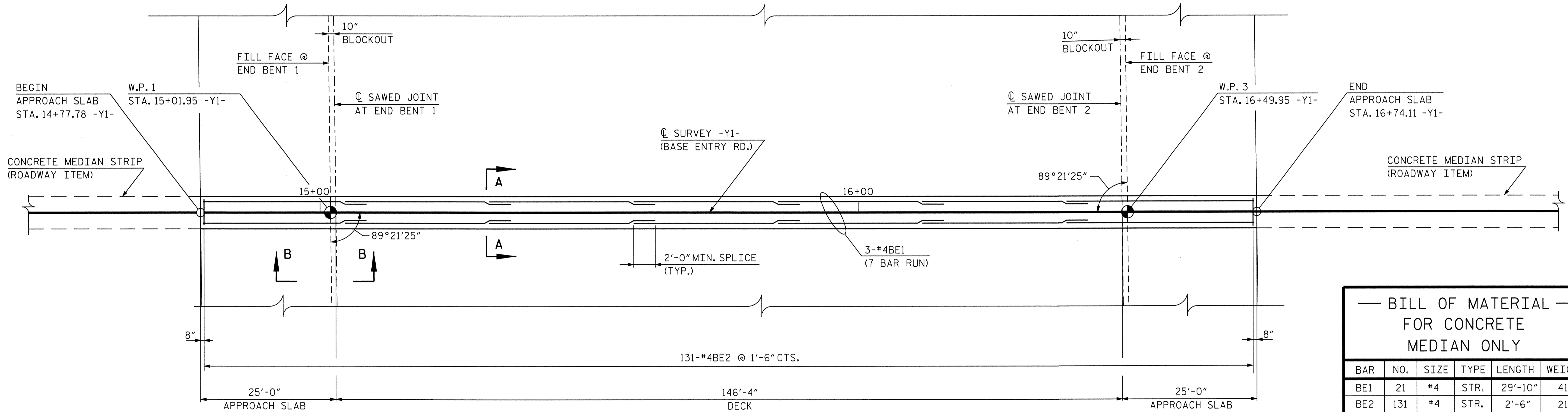
NOTES:

ALL REINFORCING STEEL IN CONCRETE MEDIAN SHALL BE EPOXY COATED.

THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO CASTING THE CONCRETE MEDIAN STRIP.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE CONCRETE MEDIAN STRIP IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FT. IN LENGTH. TOOL A GROOVED CONTRACTION JOINT DIRECTLY OVER THE CENTERLINE OF THE SAWED JOINT AT EACH APPROACH SLAB/DECK INTERFACE.

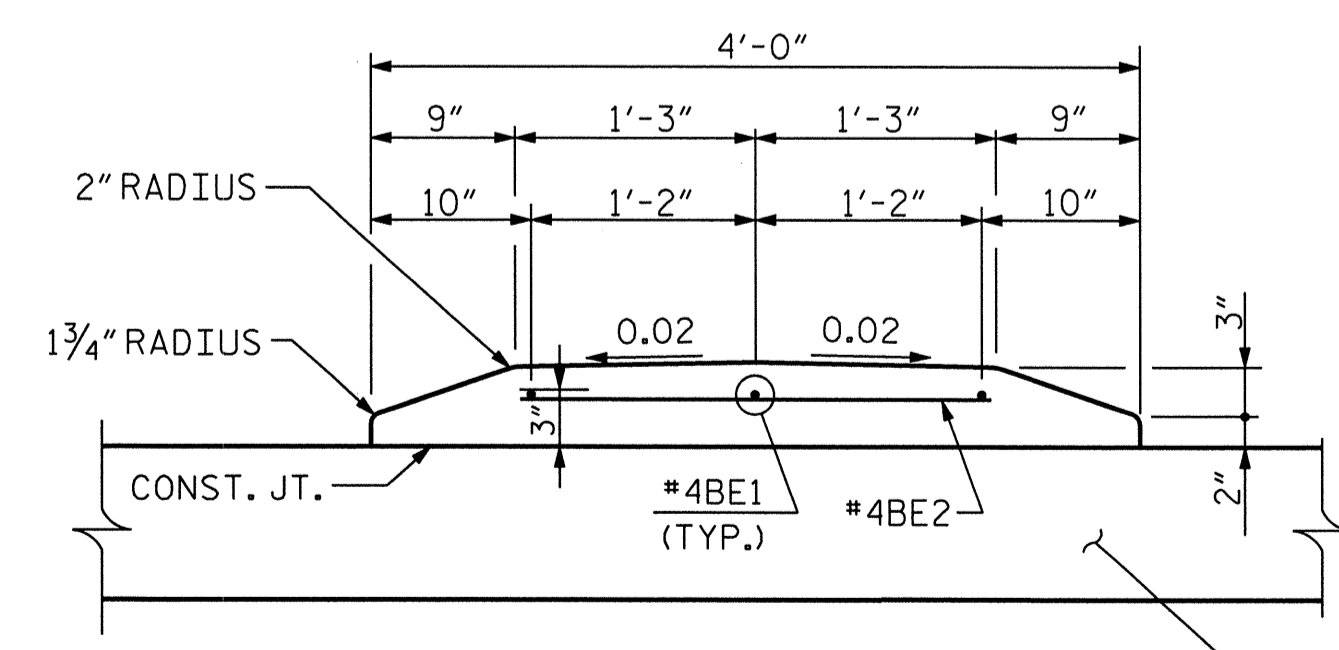
NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR MATERIALS OR LABOR TO CONSTRUCT THE CONCRETE MEDIAN. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE SQUARE FOOT CONTRACT PRICE BID FOR THE REINFORCED CONCRETE DECK SLAB.



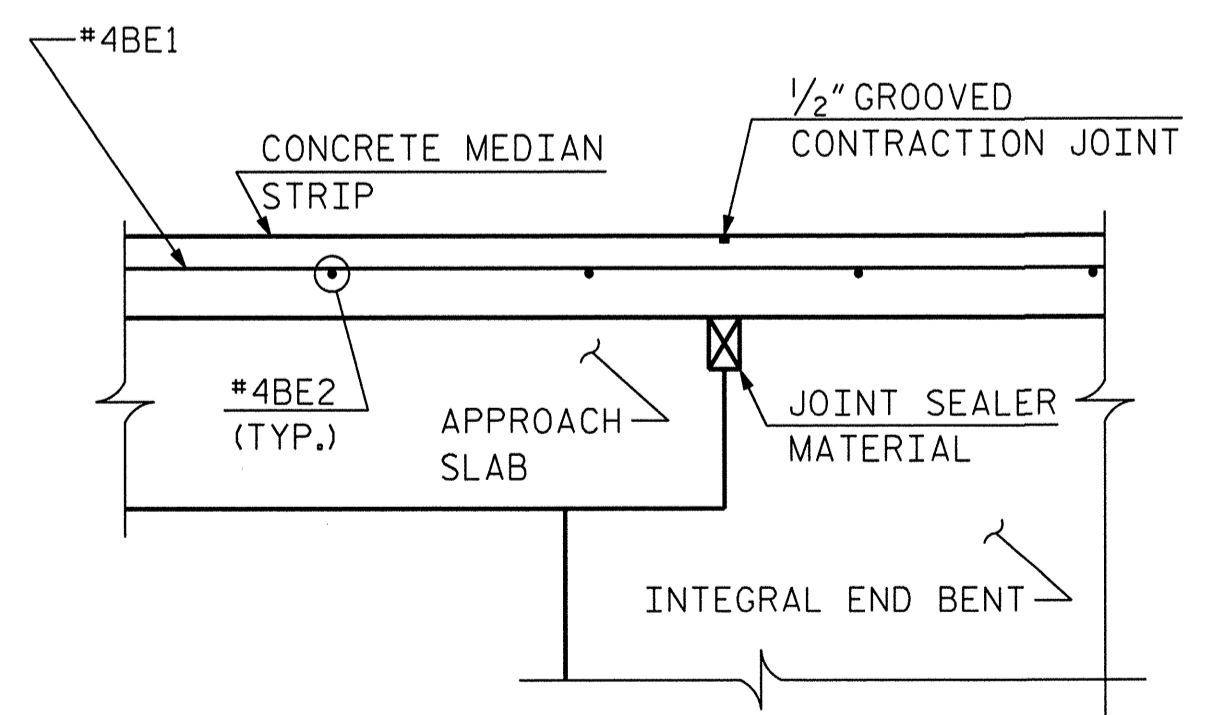
PLAN

— BILL OF MATERIAL —
FOR CONCRETE
MEDIAN ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
BE1	21	#4	STR.	29'-10"	419
BE2	131	#4	STR.	2'-6"	219
EPOXY COATED REINFORCING STEEL					638 LBS.
CLASS AA CONCRETE					10.8 CY



SECTION A-A



SECTION B-B

APPROACH SLAB AT END BENT 1 SHOWN, APPROACH SLAB AT END BENT 2 SIMILAR.

PROJECT NO. U-5132
ONSLOW COUNTY
 STATION: STA. 31+48.82 -L- P.O.C.

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**SUPERSTRUCTURE
 CONCRETE MEDIAN STRIP
 DETAILS**

DWG. NO. 8

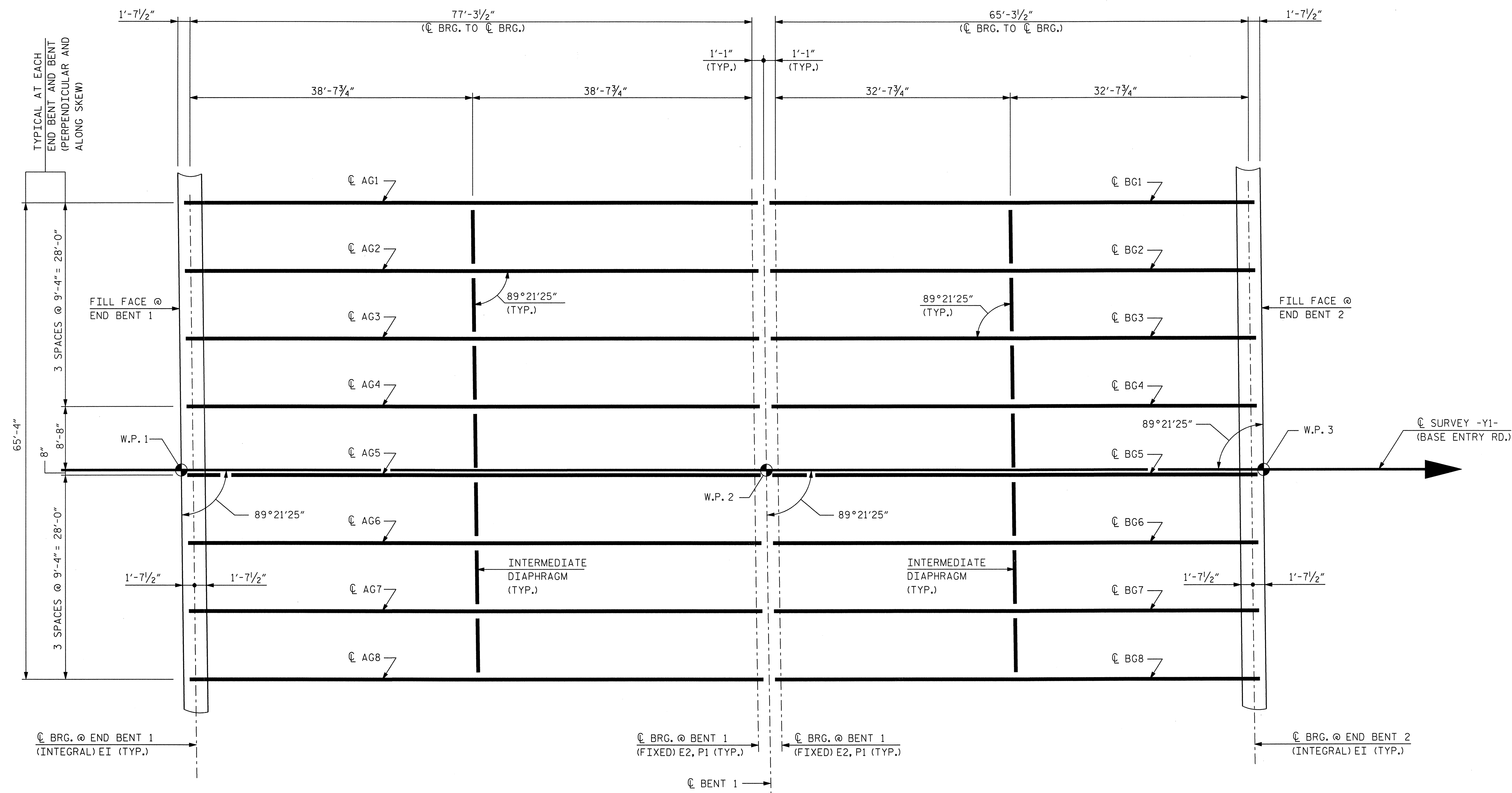
2/27/2012

RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			26

D:\projects\2009\09012_camplejeune\5132.nc24\structures\nc24\dgn\U5132_sd_med.dgn

DRAWN BY: C.J. PIPER DATE: NOV. 11
 CHECKED BY: K.M. WING DATE: NOV. 11



SPAN A

SPAN B

GIRDER FRAMING PLAN

NOTE: GIRDERS ARE STRAIGHT AND PARALLEL TO ONE ANOTHER.

PROJECT NO. U-5132
ONSLOW COUNTY
 STATION: STA. 31+48.82 -L- P.O.C.

D:\projects\2009\09012_camplejeune\5132.nc24\structures\nc24\dgn\final\5132.sd-fp.dgn

DRAWN BY: C.J. PIPER DATE: NOV. 11
 CHECKED BY: K.M. WING DATE: NOV. 11

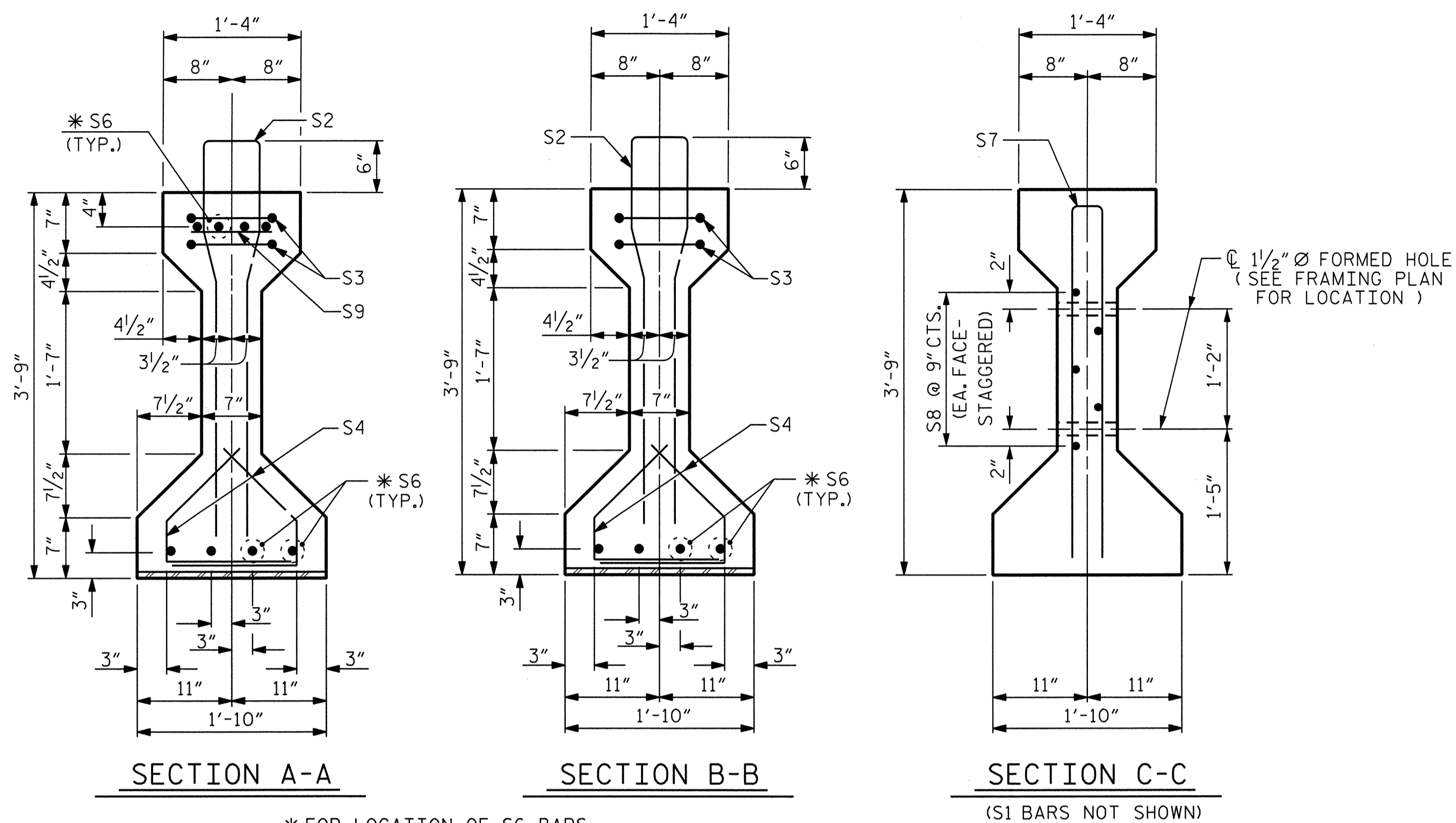
RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

DWG. NO. 9
 NORTH CAROLINA
 PROFESSIONAL
 SEAL
 031543
 ENGINEER
 KENNETH M. WING, JR.
 2/27/2012

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

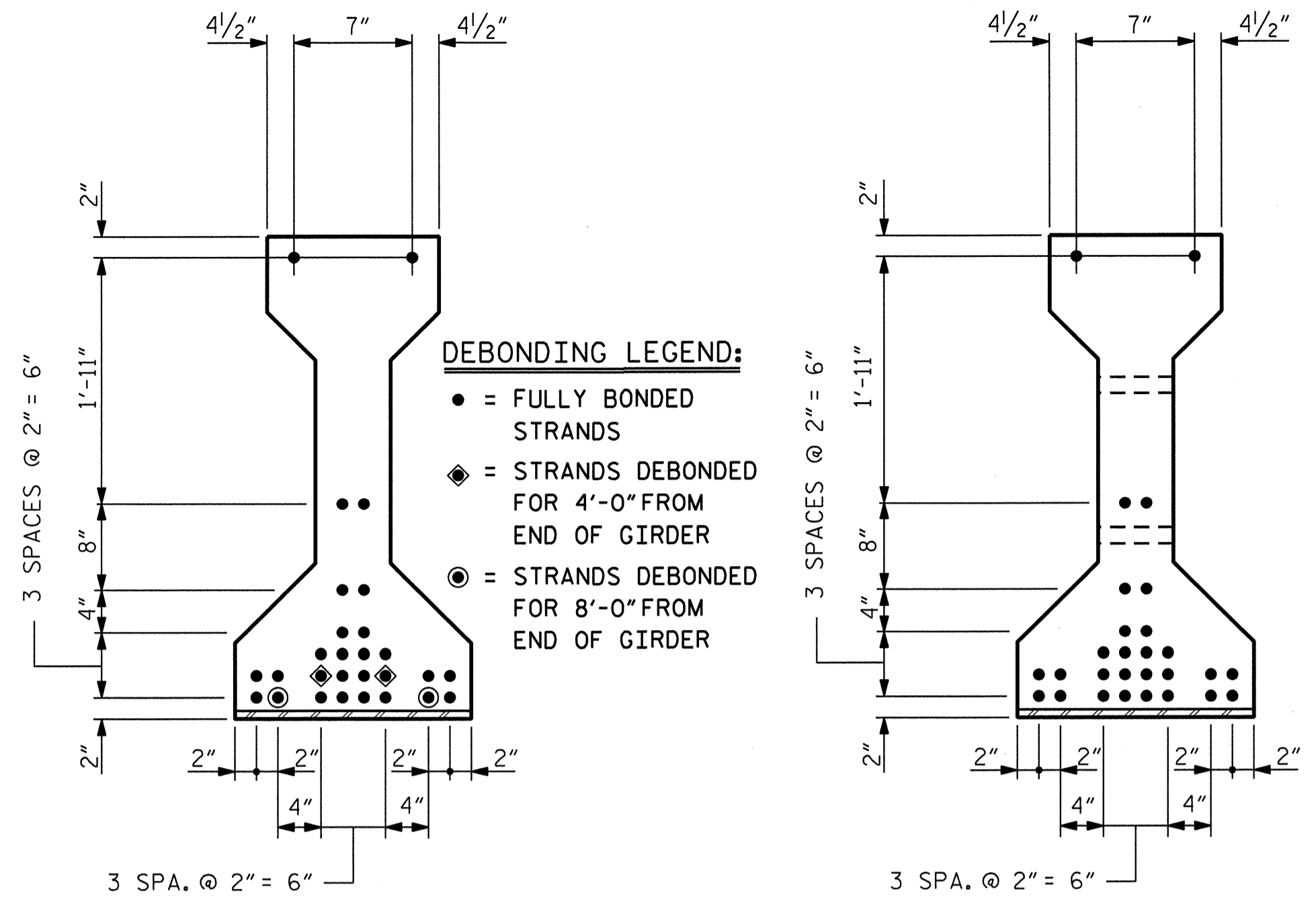
**SUPERSTRUCTURE
 GIRDER
 FRAMING PLAN**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			26



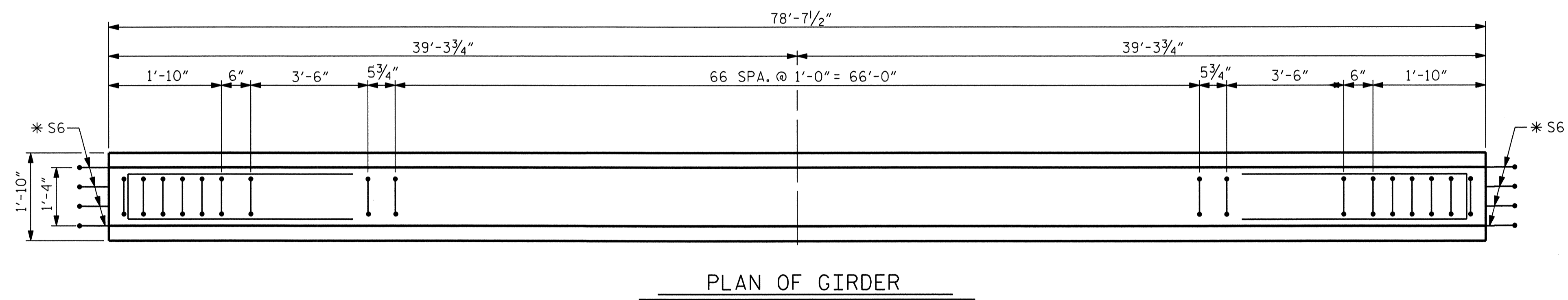
* FOR LOCATION OF S6 BARS, SEE DETAIL "A", SHEET 3 OF 3.

(S1 BARS NOT SHOWN)

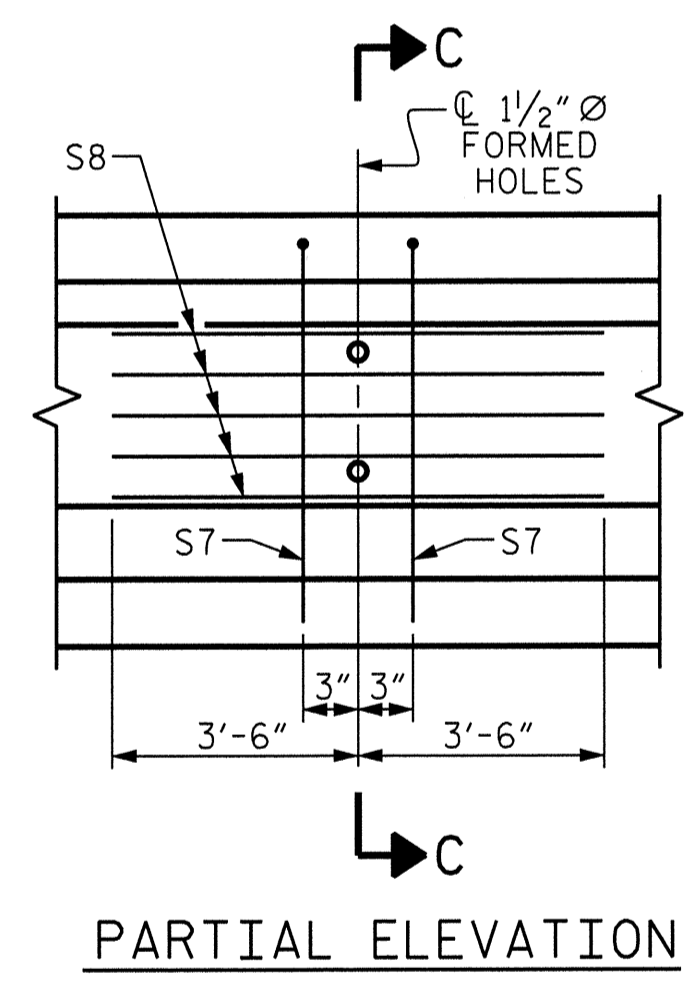


AT END OF GIRDER AT C OF GIRDER
0.6" Ø LOW RELAXATION STRAND LAYOUT

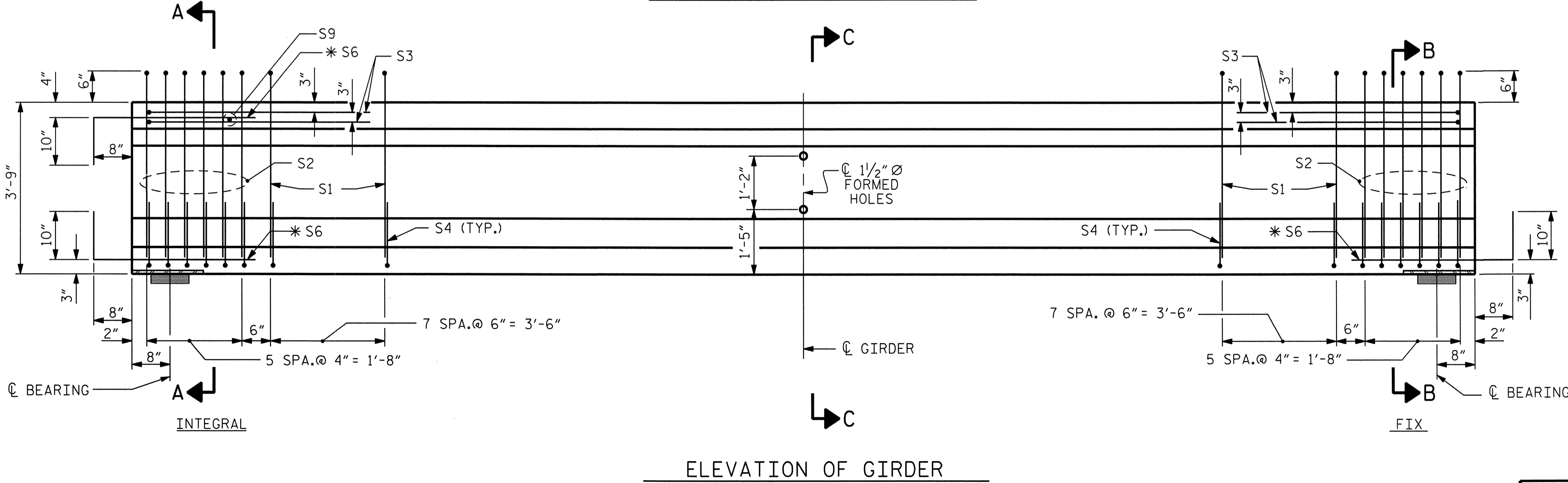
- DEBONDING LEGEND:**
- = FULLY BONDED STRANDS
 - ◆ = STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
 - = STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER



PLAN OF GIRDER



PARTIAL ELEVATION



ELEVATION OF GIRDER
(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

0.6" Ø L. R. GRADE 270 STRANDS

AREA (SQ. INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

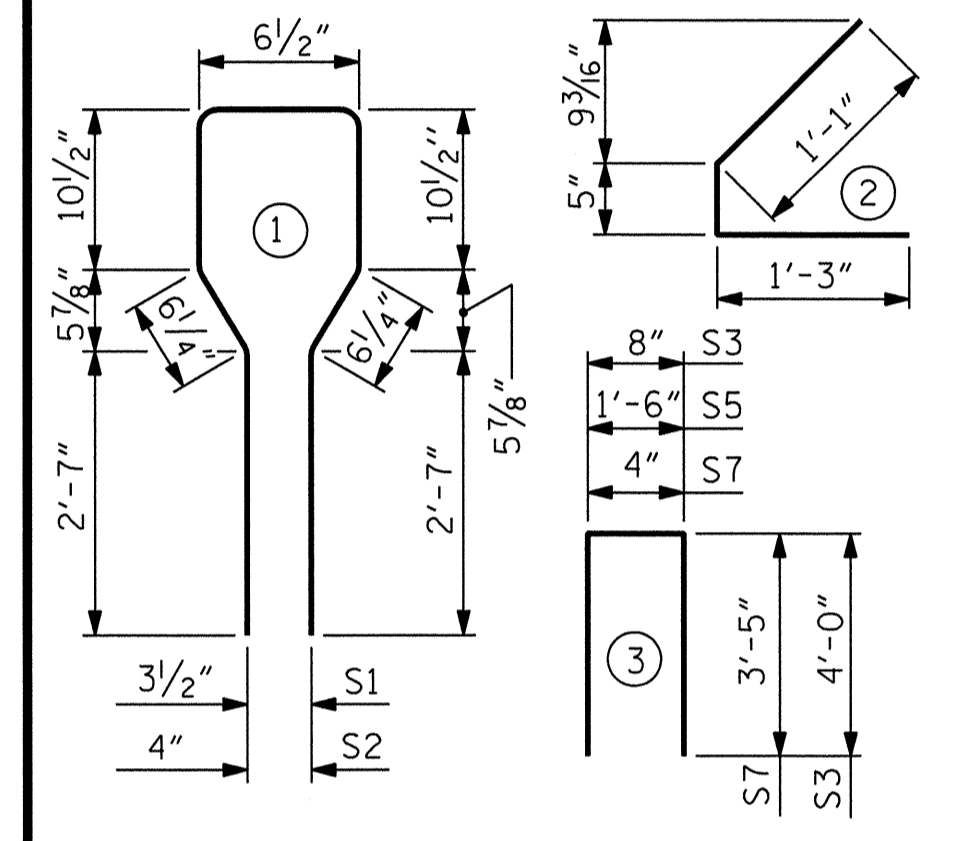
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	83	#4	1	8'-6"	471
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	56	#4	2	2'-9"	103
*S6	12	#5	STR.	3'-8"	46
S7	2	#5	3	7'-2"	15
S8	5	#4	STR.	7'-0"	23
S9	1	#3	STR.	1'-0"	1

* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

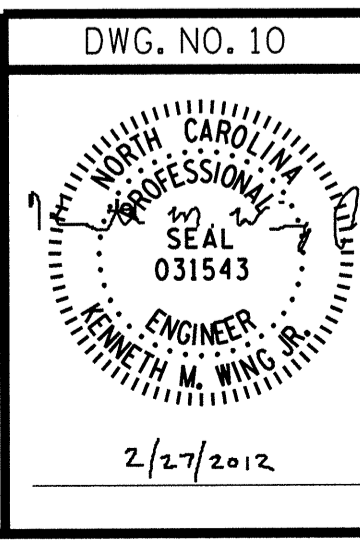
SPAN A	REINFORCING STEEL	8000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
SPAN A	835	11.3	28

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
8	78'-7 1/2"	629'-0"

PROJECT NO. U-5132
ONSLOW COUNTY
STATION: STA. 31+48.82 -L- P.O.C.

SHEET 1 OF 3
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
AASHTO TYPE III
PRESTRESSED CONCRETE
GIRDER CONTINUOUS FOR
LIVE LOAD SPAN A

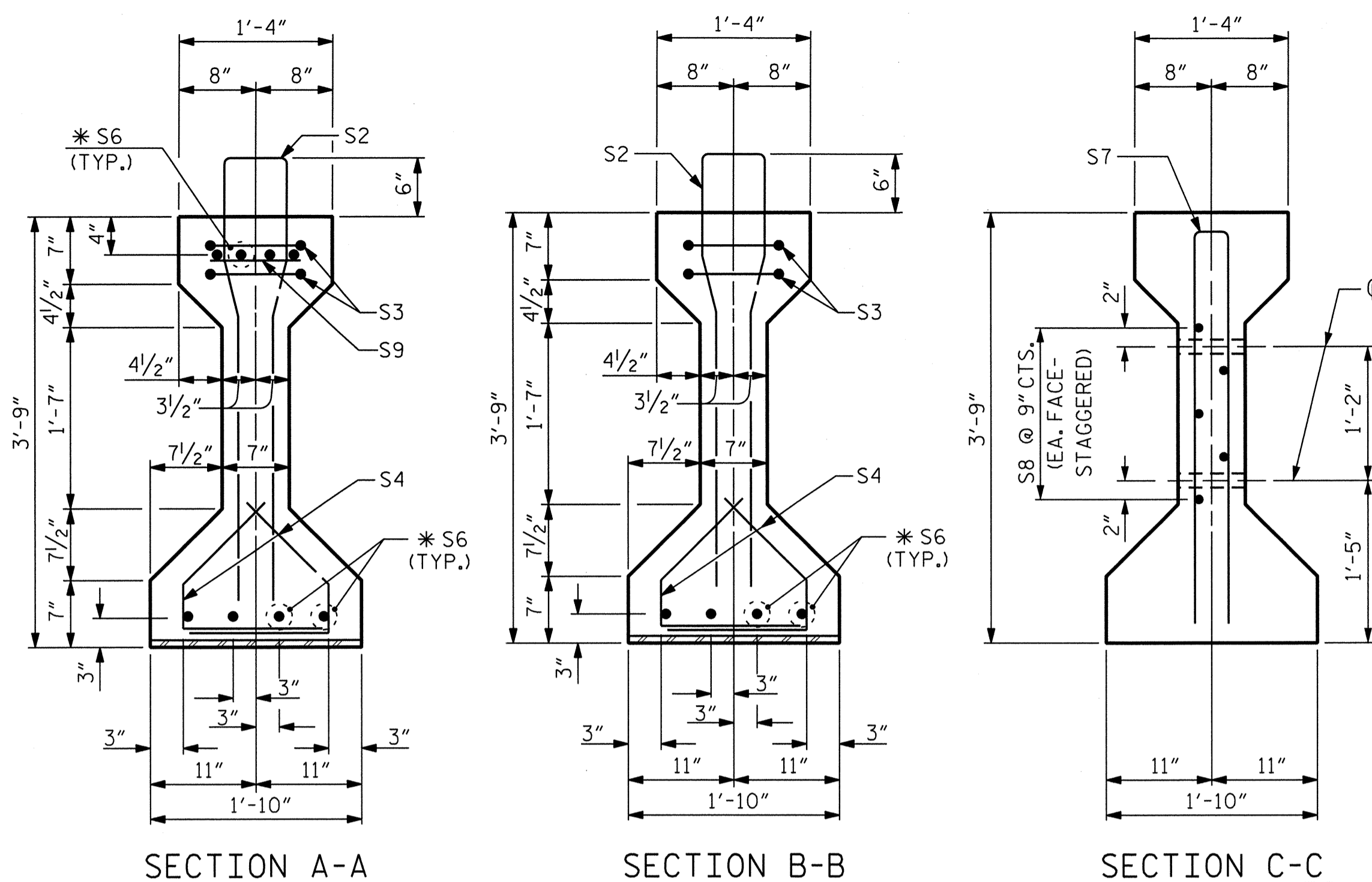


RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NUMBER: F-0112

REVISIONS						SHEET NO. S-10
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

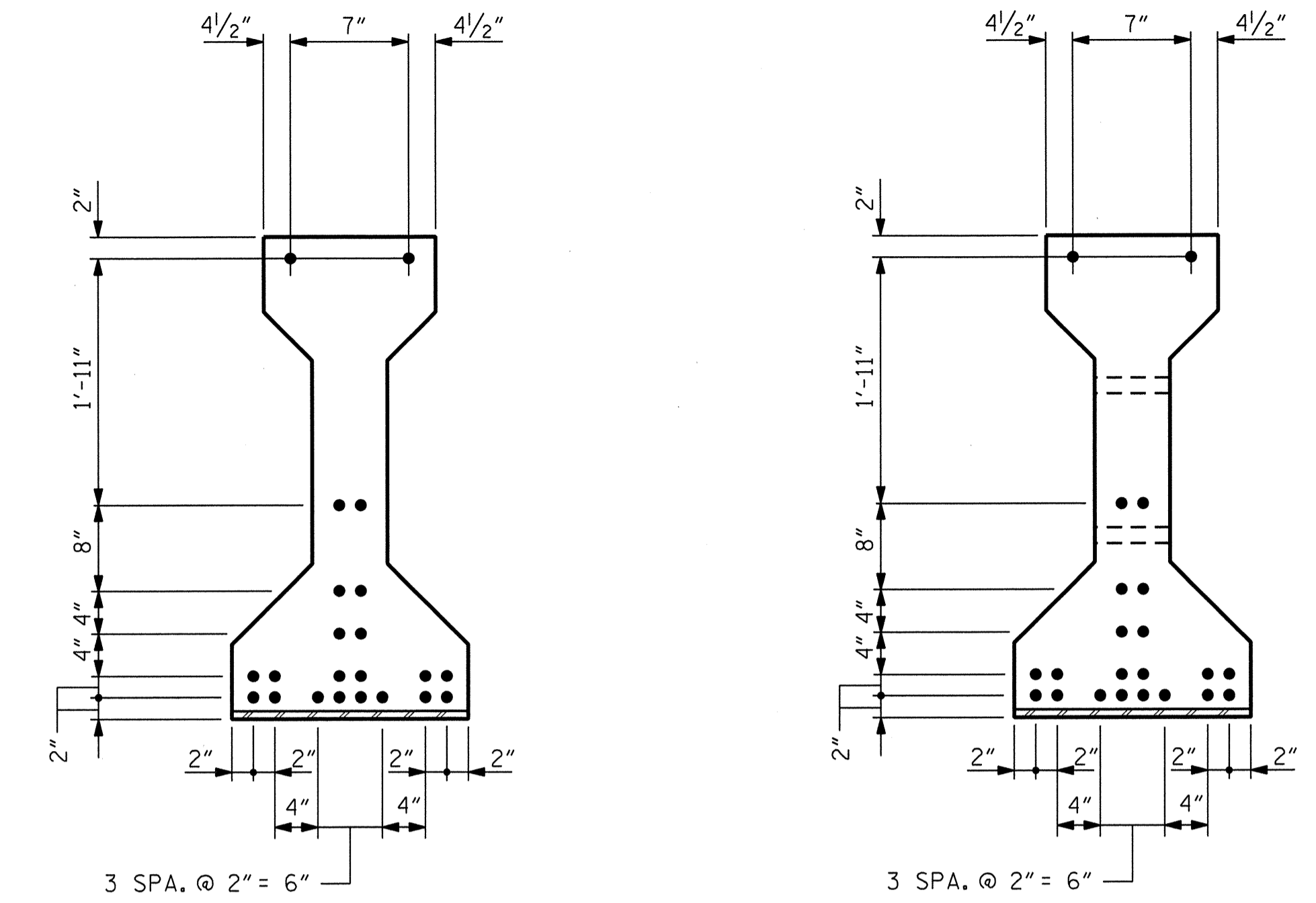
2/27/2012 m:\projects\2009\09012-camp\jeune\U5132.nc24\structures\nc24\final\U5132_sd_gla.dgn

DRAWN BY: ELR 8/91	REV. 7/17/98 RWW/LES
CHECKED BY: GRP 8/91	REV. 10/17/00R RWW/LES
	REV. 5/1/06R TLA/OM
DRAWN BY: C.J. PIPER	DATE: NOV. 11
CHECKED BY: K.M. WING	DATE: NOV. 11



* FOR LOCATION OF S6 BARS, SEE DETAIL "A", SHEET 3 OF 3.

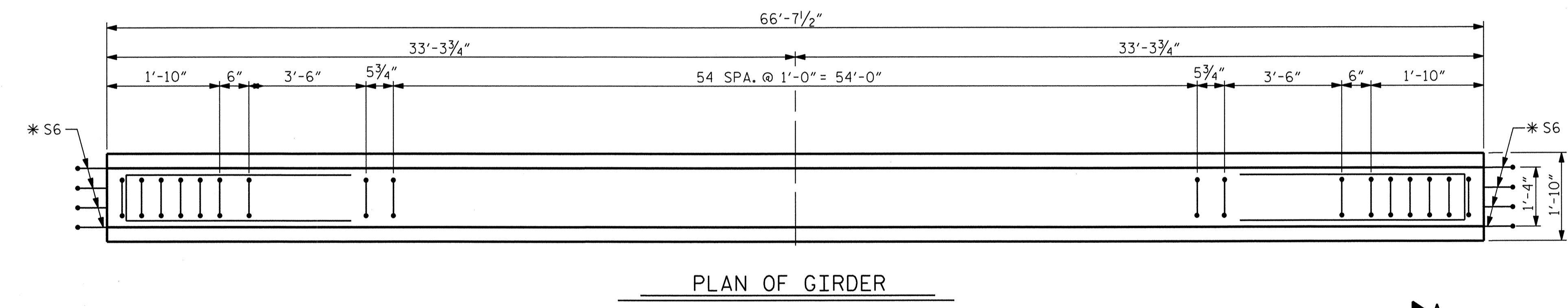
(S1 BARS NOT SHOWN)



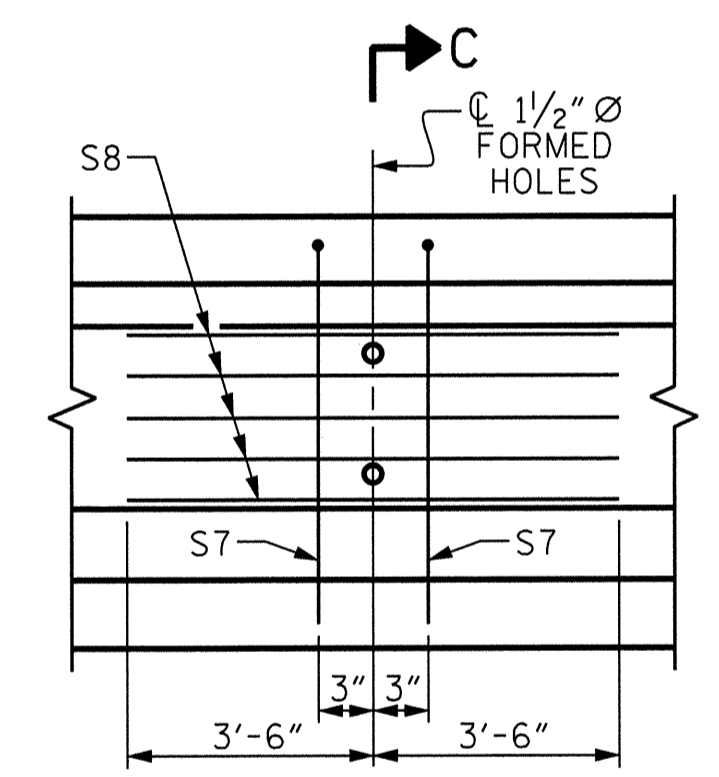
AT END OF GIRDER

AT C OF GIRDER

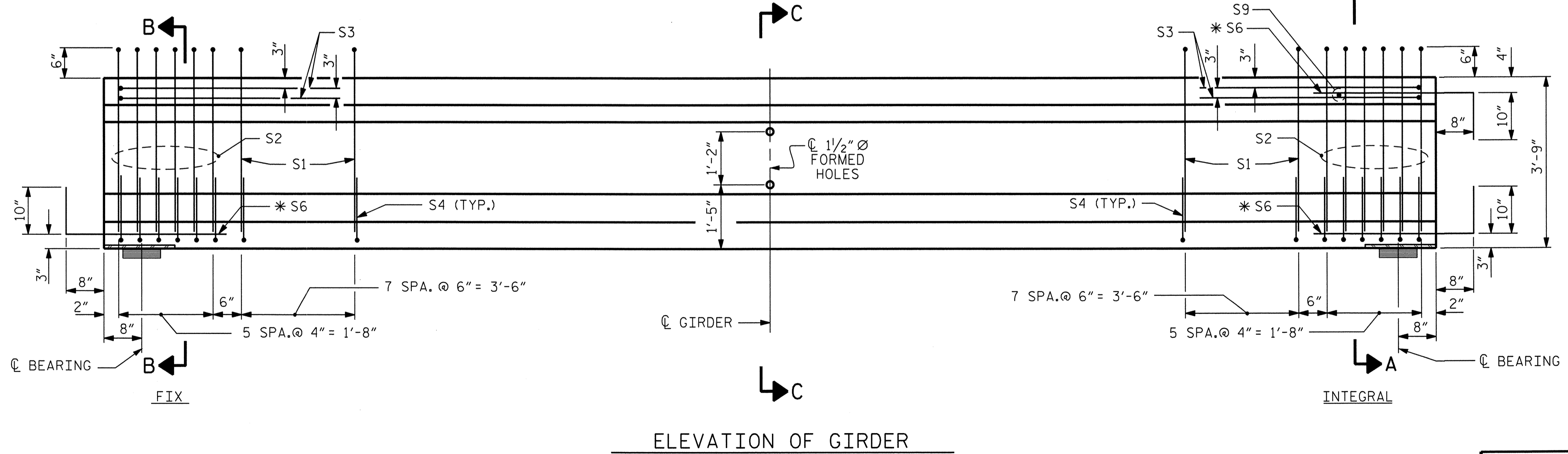
0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



PARTIAL ELEVATION



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

0.6" Ø L. R. GRADE 270 STRANDS

AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

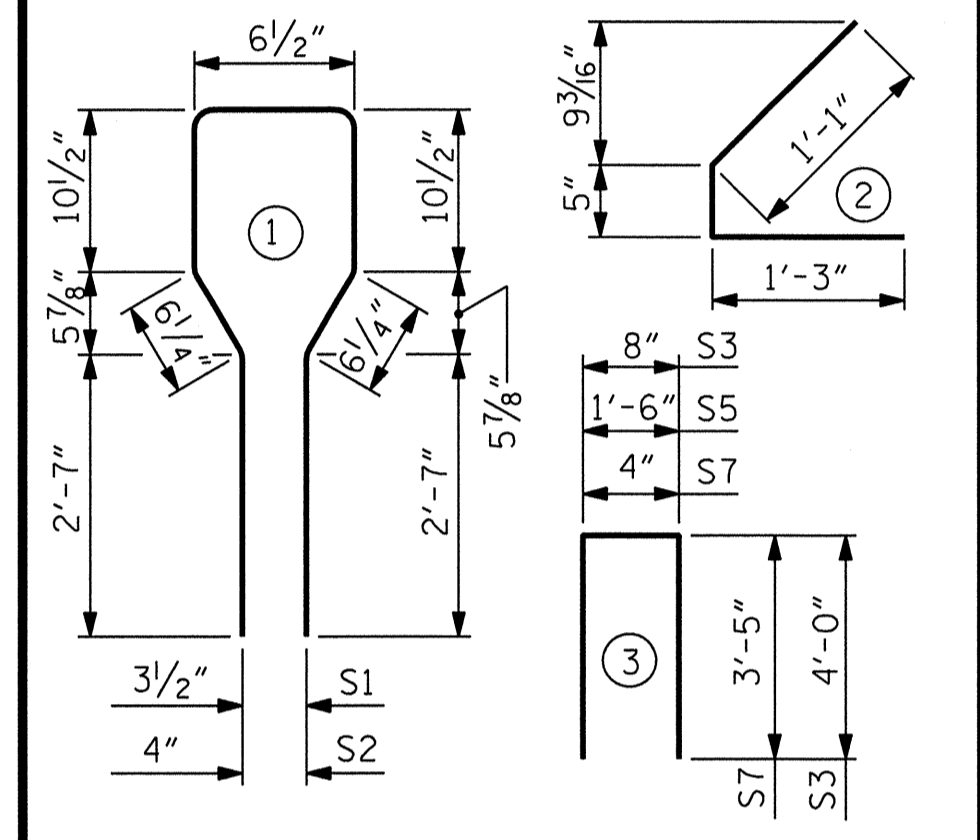
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	71	#4	1	8'-6"	403
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	56	#4	2	2'-9"	103
*S6	12	#5	STR.	3'-8"	46
S7	2	#5	3	7'-2"	15
S8	5	#4	STR.	7'-0"	23
S9	1	#3	STR.	1'-0"	1

* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

SPAN B	REINFORCING STEEL	6500 PSI CONCRETE	0.6" Ø L. R. STRANDS
	L.B.	C.Y.	No.
SPAN B	767	9.6	22

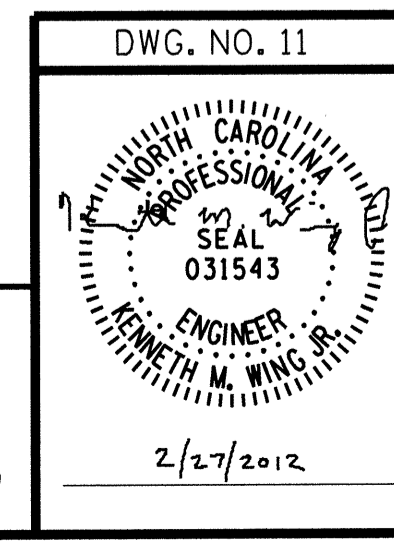
GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
8	66'-7 1/2"	533'-0"

PROJECT NO. U-5132
 ONSLOW COUNTY
 STATION: STA. 31+48.82 -L- P.O.C.

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 AASHTO TYPE III
 PRESTRESSED CONCRETE
 GIRDER CONTINUOUS FOR
 LIVE LOAD SPAN B



RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

REVISIONS						SHEET NO. S-11
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

2/27/2012 m:\projects\2009\09012.campjeune\5132.nc24\structures\nc24\dgn\final\U5132.sd.glb.dgn
 Drawn by: C.J. PIPER DATE: NOV. 11
 Checked by: K.M. WING DATE: NOV. 11

DRAWN BY : ELR 8/91	REV. 7/17/98 RWW/LES
CHECKED BY : GRP 8/91	REV. 10/17/00R RWW/LES
	REV. 5/1/06R TLA/GM
DRAWN BY : C.J. PIPER	DATE : NOV. 11
CHECKED BY : K.M. WING	DATE : NOV. 11

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 SHALL BE GRADE 60.

EMBEDDED PLATE "B-1" SHALL BE METALIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

FOR METALIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

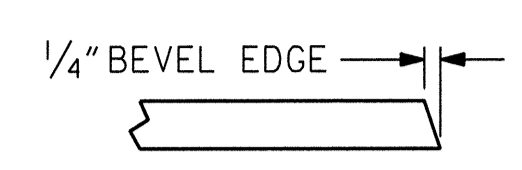
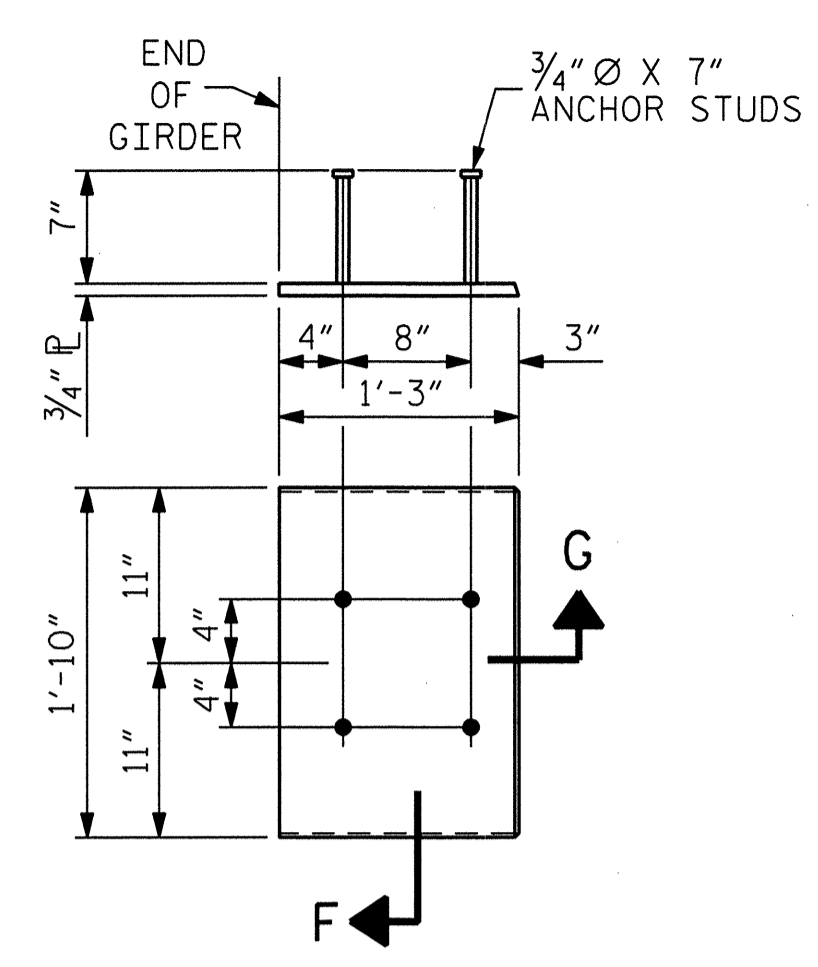
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

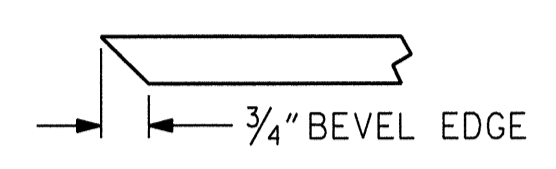
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6000 PSI FOR SPAN A AND 5200 PSI FOR SPAN B.

DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".



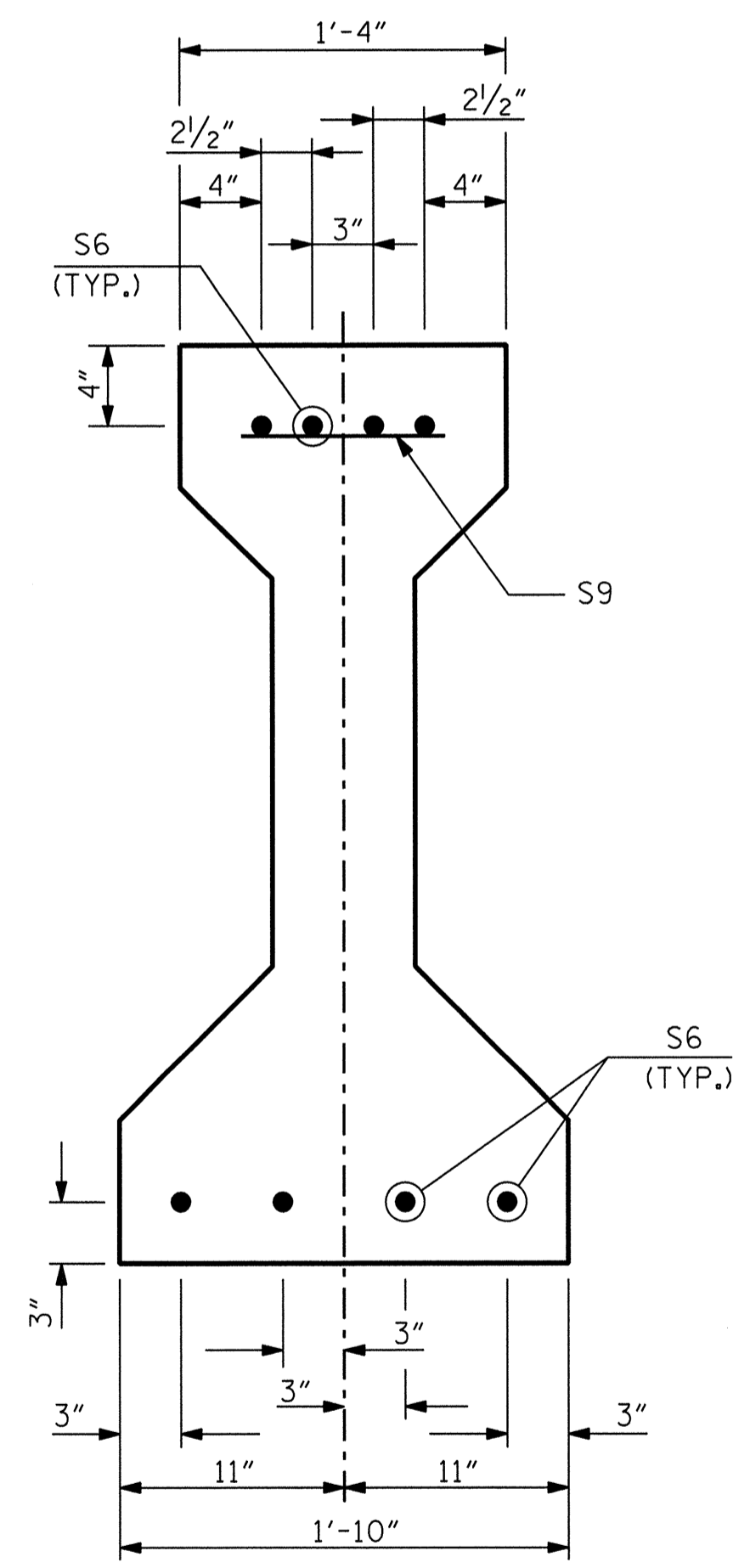
SECTION "G"



SECTION "F"

(SEE NOTES)

EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE III GIRDER
(2 REQ'D PER GIRDER)



DETAIL "A"

PROJECT NO. U-5132
ONSLOW COUNTY
 STATION: STA. 31+48.82 -L- P.O.C.

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**STANDARD
 PRESTRESSED
 CONCRETE GIRDER
 CONTINUOUS FOR LIVE
 LOAD DETAILS**

DWG. NO. 12

 2/27/2012

RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			26

porr\ish 2/27/2012 m:\projects\2009\09012.camp\jeune\U5132.nc24\structures\nc24\dgn\final\U5132.sd.g2.dgn

DRAWN BY : C.J. PIPER DATE : NOV. 11
 CHECKED BY : K.M. WING DATE : NOV. 11

STRUCTURAL STEEL NOTES

ALL INTERMEDIATE DIAPHRAGM STEEL AND CONNECTOR PLATES SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.

TENSION ON THE ASTM A325 BOLTS THROUGH THE CHANNEL MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

THE PLATES, BENT PLATES, CHANNELS, AND ANGLES SHALL BE METALIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALIZATION), SEE SPECIAL PROVISIONS.

FOR METALIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, WASHERS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

USE AN ASTM F436 HARDENED WASHER WITH STANDARD AND SLOTTED HOLES UNDER EACH BOLT HEAD AND NUT.

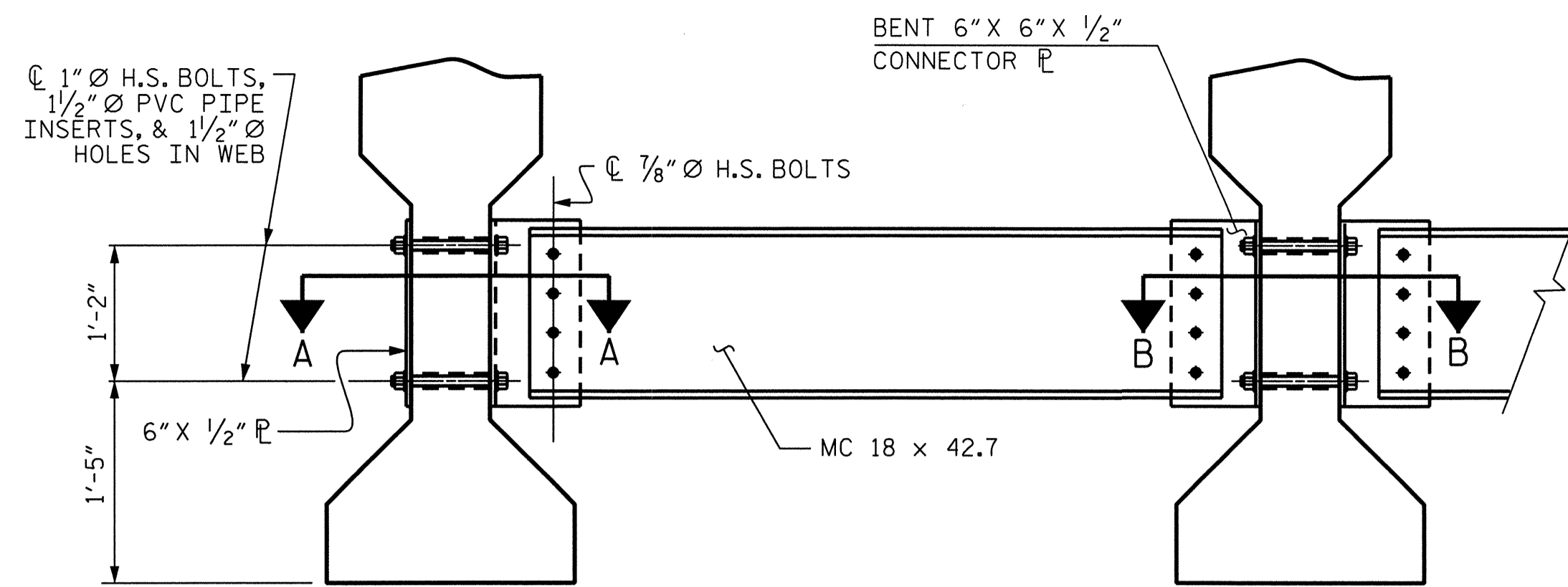
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

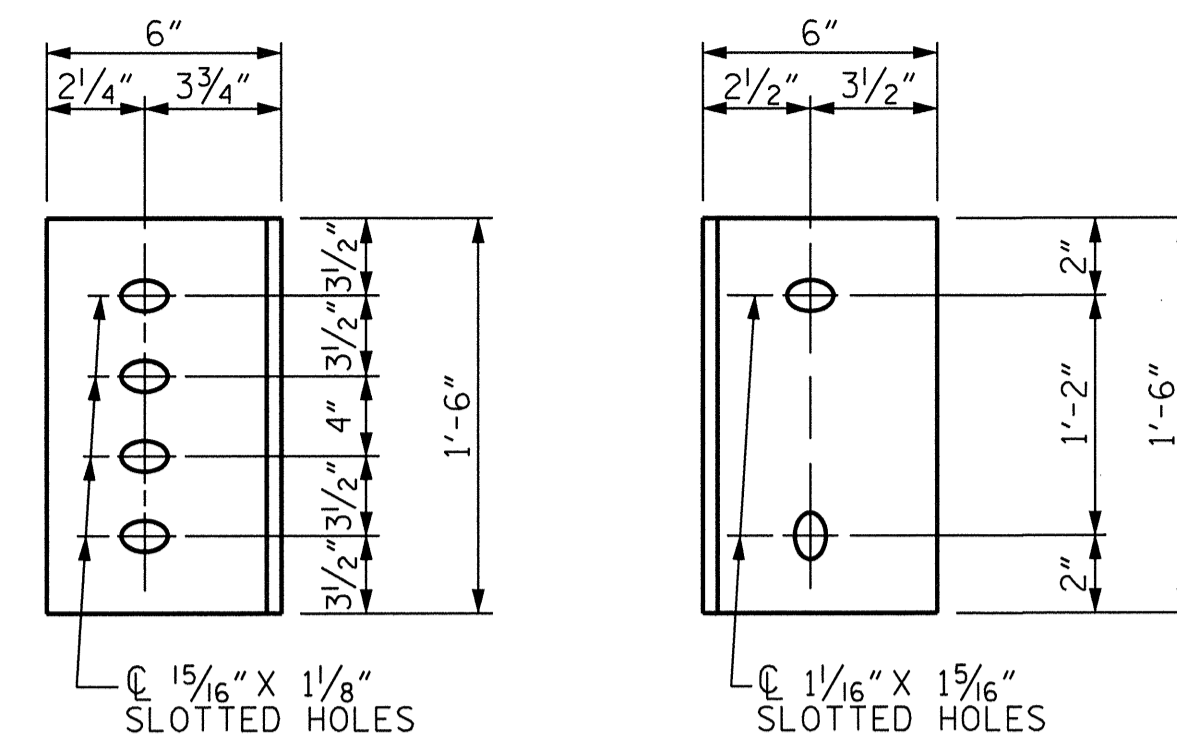
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



EXTERIOR GIRDER **INTERIOR GIRDER**
PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE **WEB FACE**
BENT CONNECTOR PLATE DETAILS

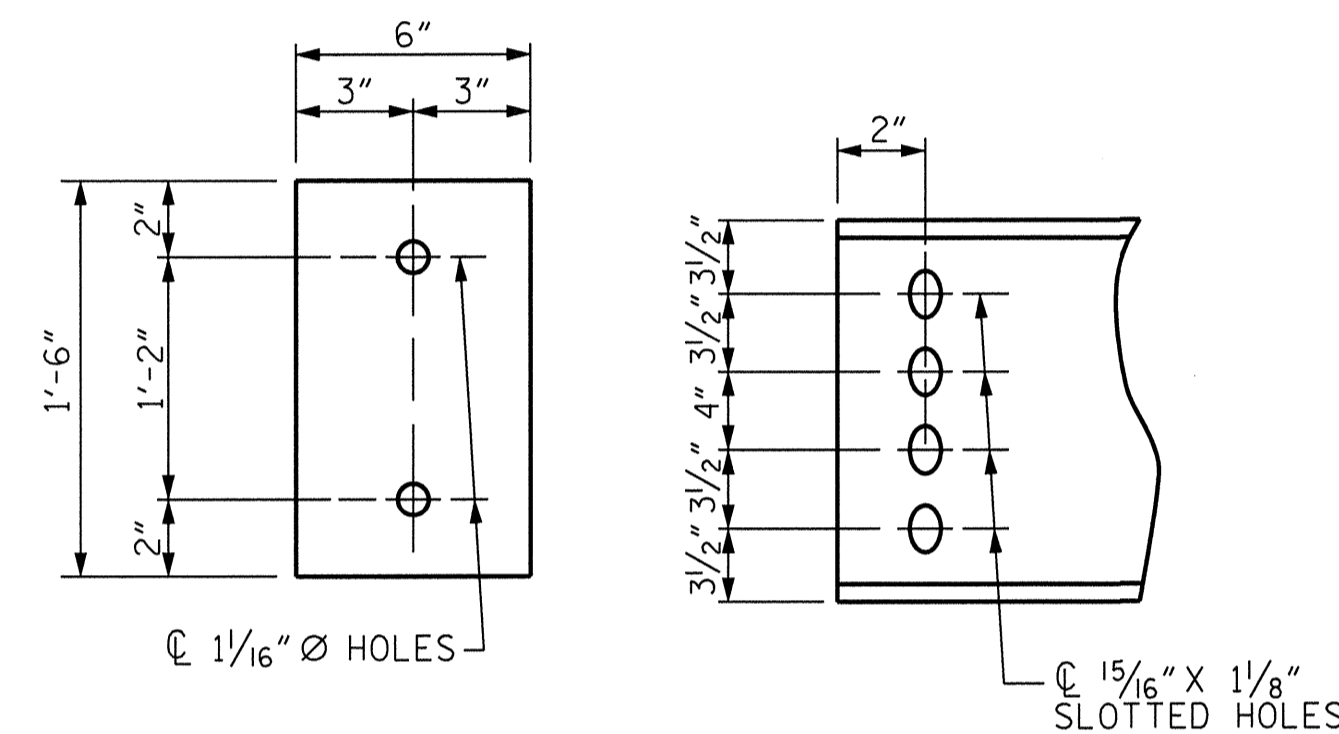
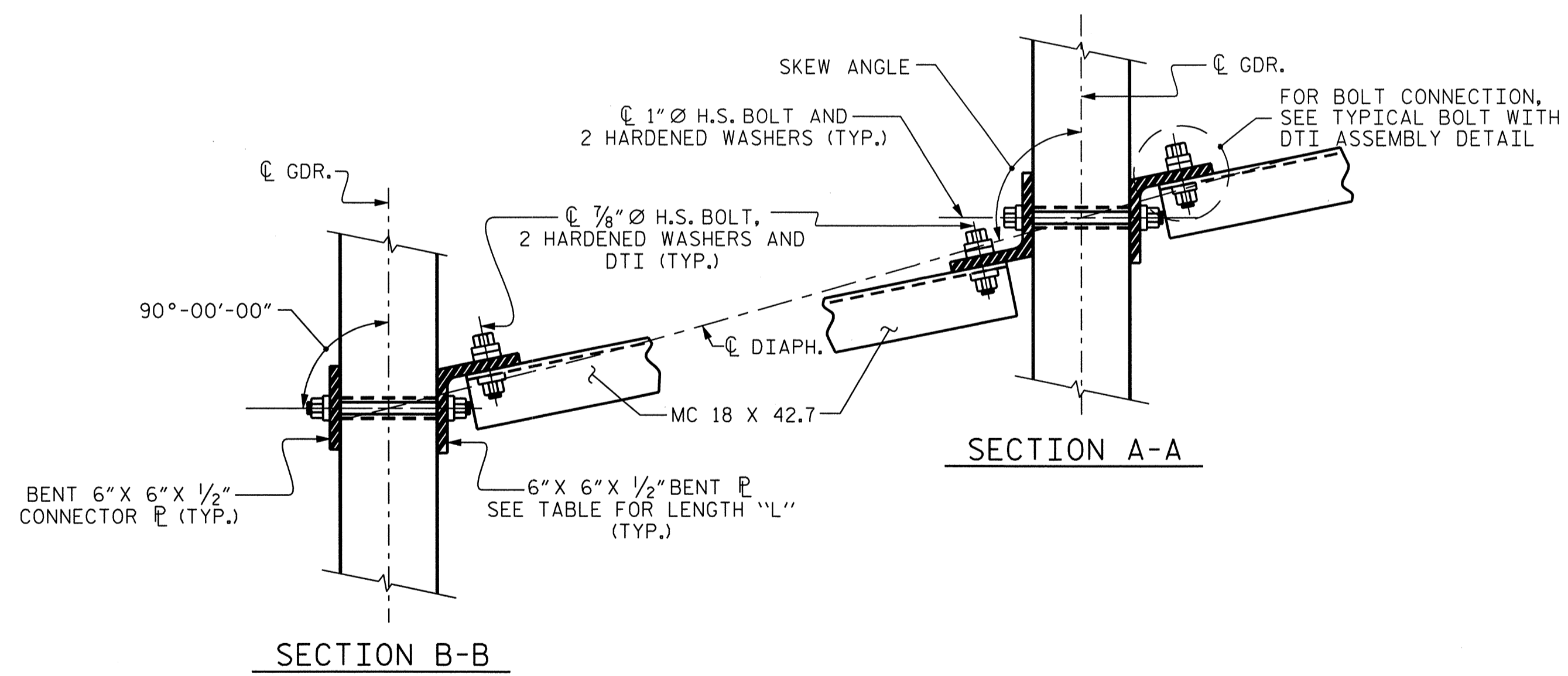
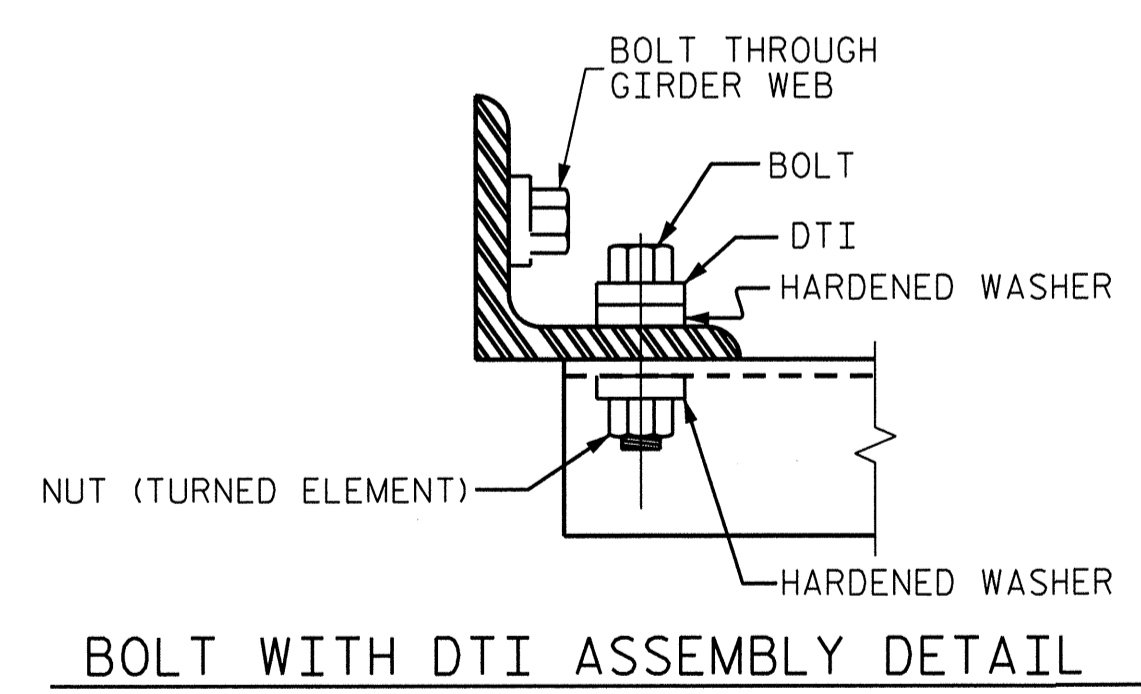


PLATE DETAILS **CHANNEL END**



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. U-5132
ONSLOW COUNTY
STATION: STA. 31+48.82 -L- P.O.C.

D:\projects\2009\09012 - complete\jeune\5132.nc24\structures\nc24\dgn\Final\U5132.sd.tsc.dgn

DRAWN BY : TLA	6/05	ADDED	10/21/05
CHECKED BY : VC	6/05	REV.	5/1/06R
		KMM/GM	
DRAWN BY : C.J. PIPER	DATE : NOV. 11		
CHECKED BY : K.M. WING	DATE : NOV. 11		

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NUMBER: F-0112

DWG. NO. 13
STATE OF NORTH CAROLINA
PROFESSIONAL SEAL
ENGINEER
KENNETH M. WING
2/27/2012

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD INTERMEDIATE STEEL DIAPHRAGM FOR TYPE III PRESTRESSED CONCRETE GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			26

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

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

PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

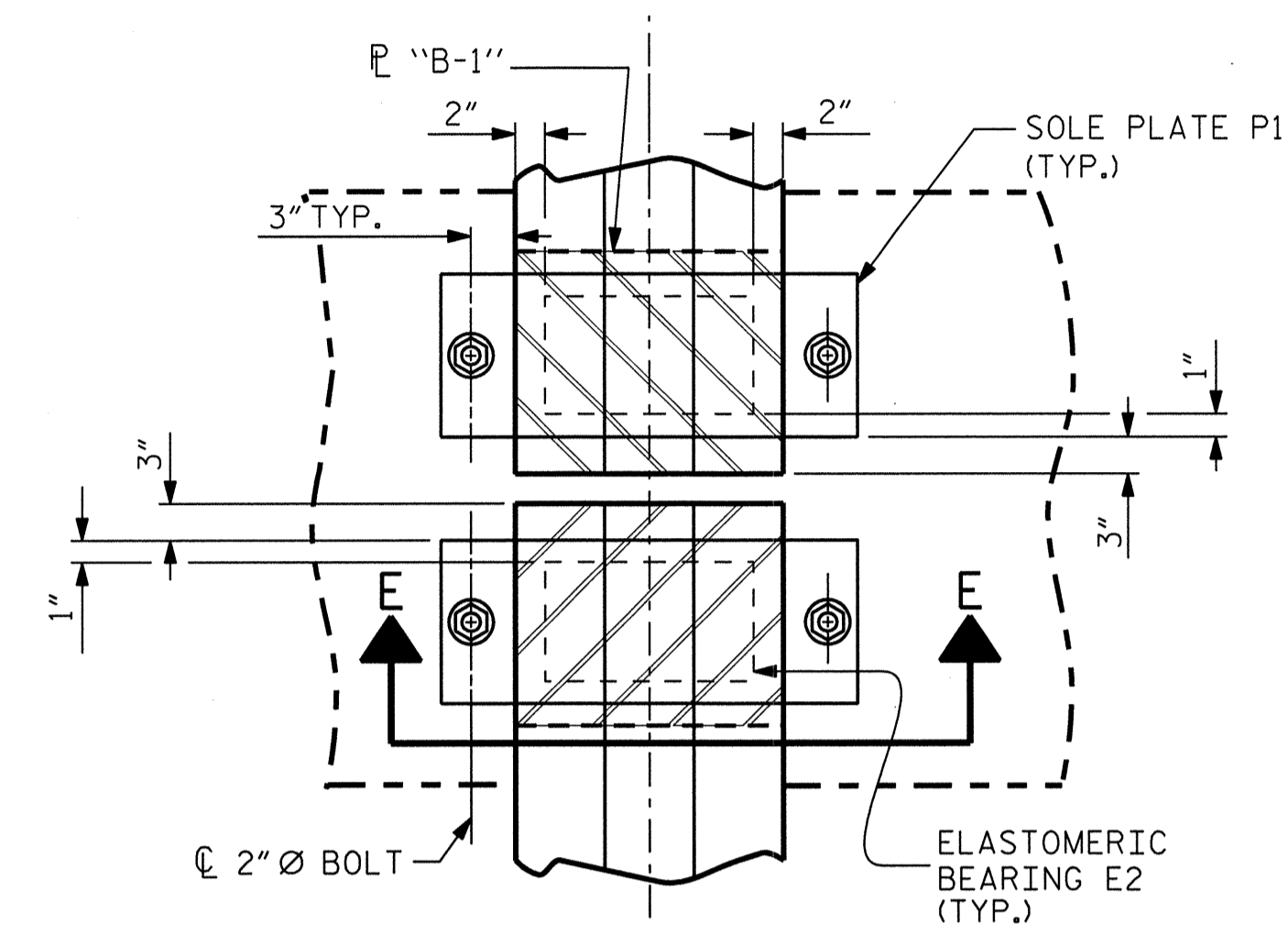
WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

SOLE PLATE P1, BOLTS, NUTS, AND WASHERS SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

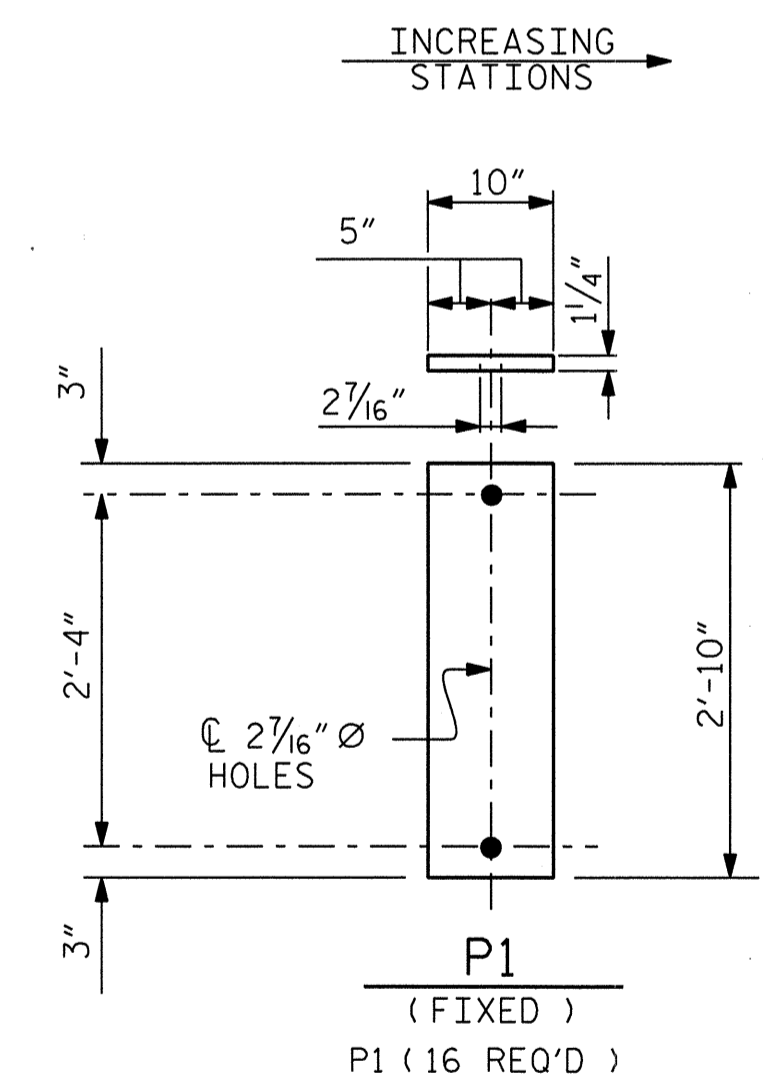
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

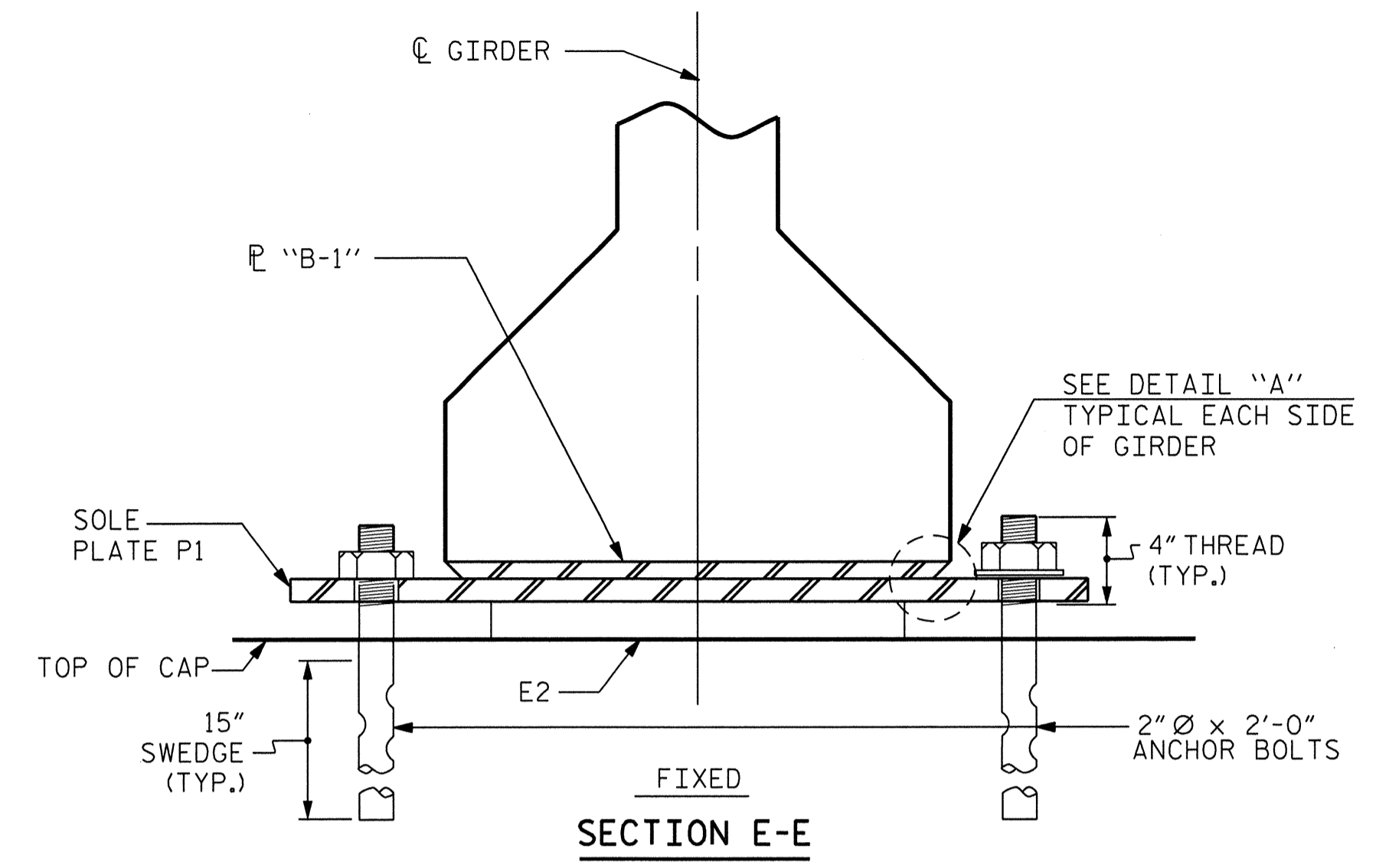
ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.



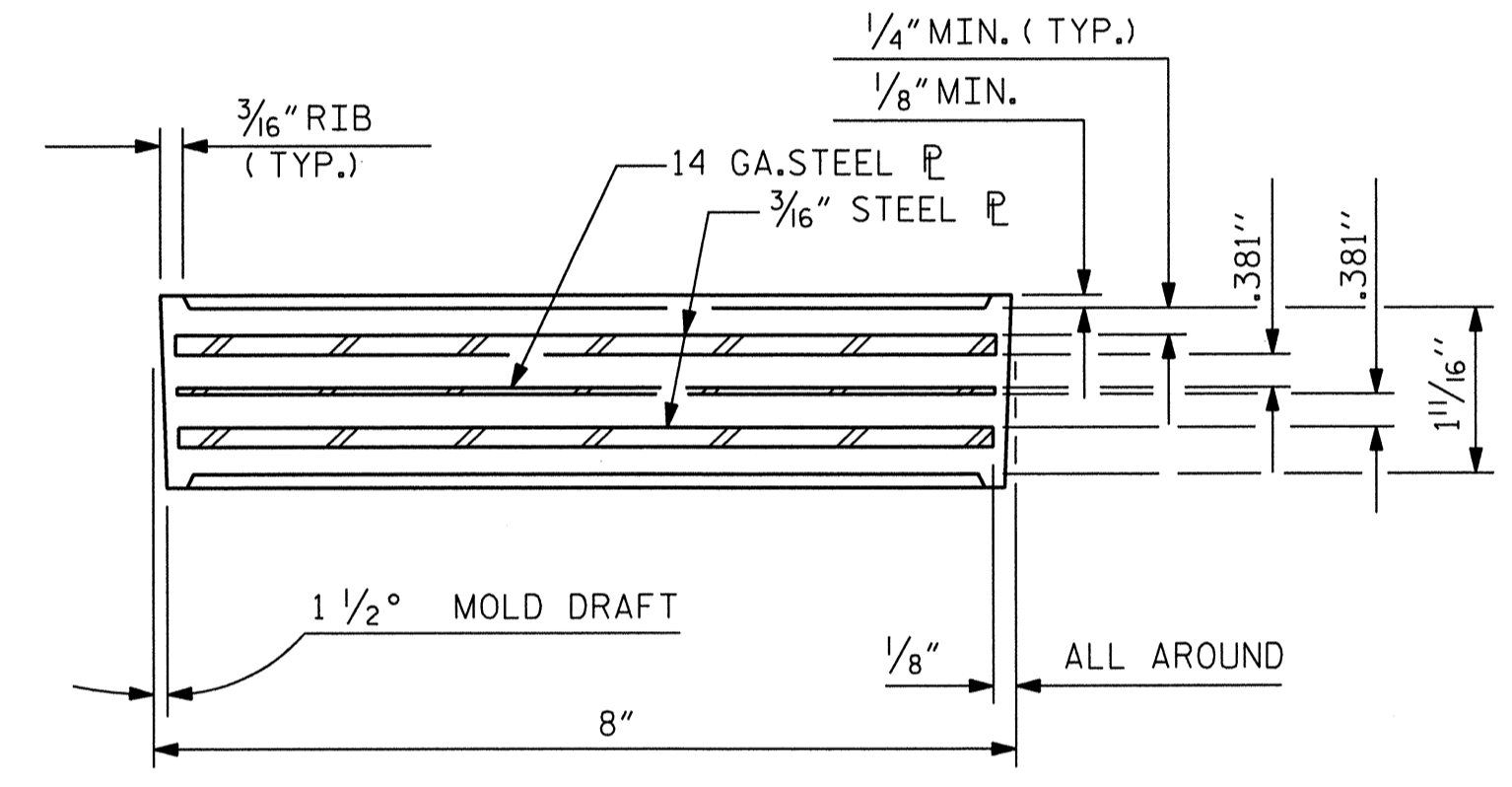
TYPICAL PLAN AT BENT 1
(TOP FLANGE NOT SHOWN)



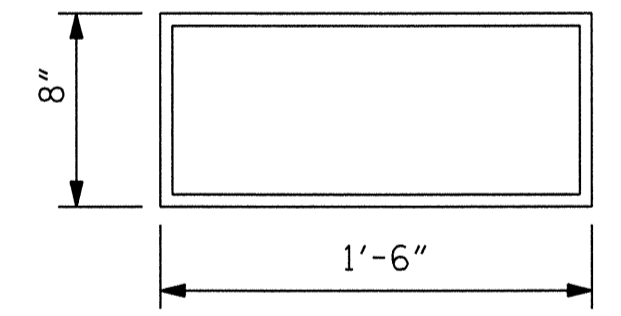
SOLE PLATE DETAILS



SECTION E-E

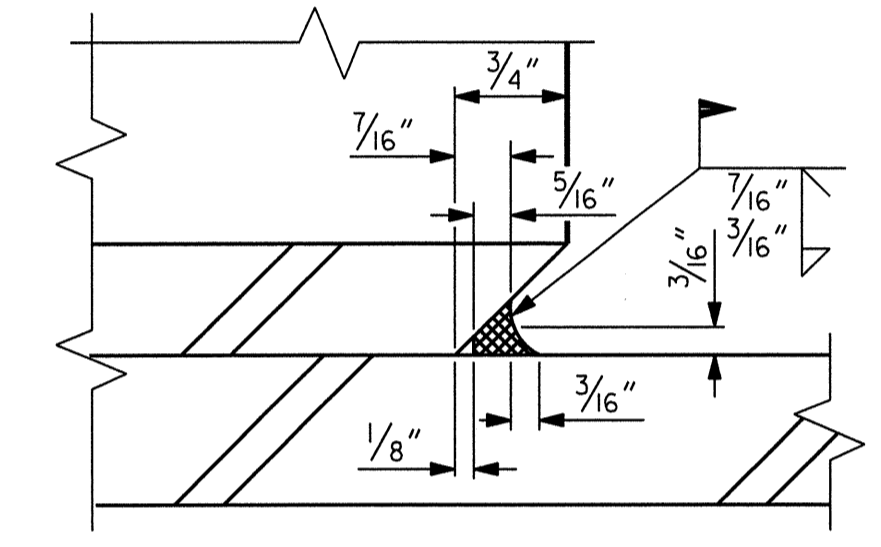


TYPICAL SECTION OF ELASTOMERIC BEARINGS

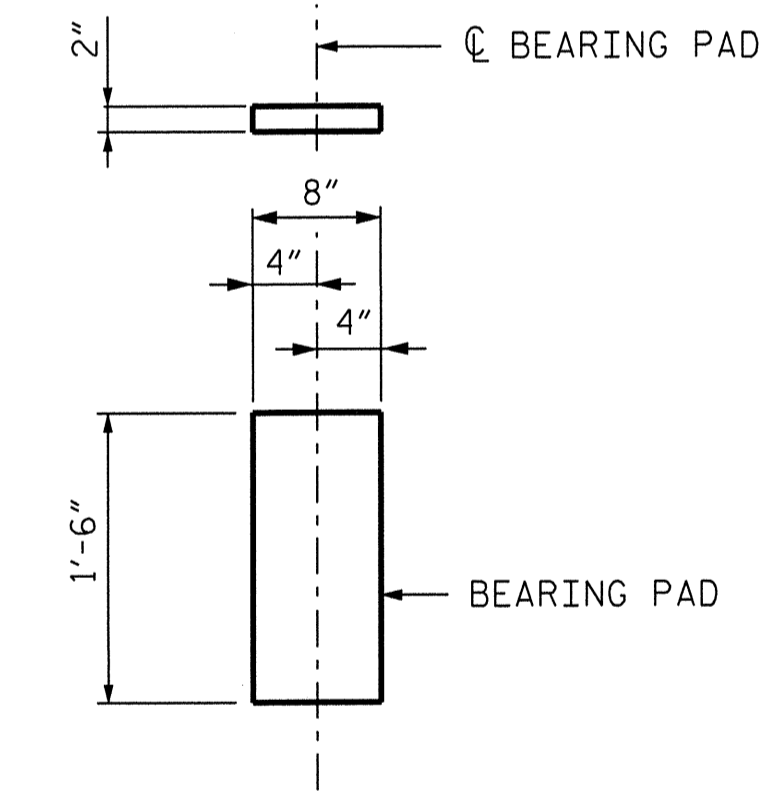


E2 (16 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING
TYPE III

— LOAD RATINGS —	
TYPE III	MAX.D.L.+L.L. 160 K



DETAIL "A"



EI (16 REQ'D)
PLAIN ELASTOMERIC BEARING DETAILS
(TYPICAL BEARING AT INTEGRAL END BENTS)

PROJECT NO. U-5132
ONSLOW COUNTY
STATION: STA. 31+48.82 -L- P.O.C.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
**SUPERSTRUCTURE
ELASTOMERIC BEARING
DETAILS**

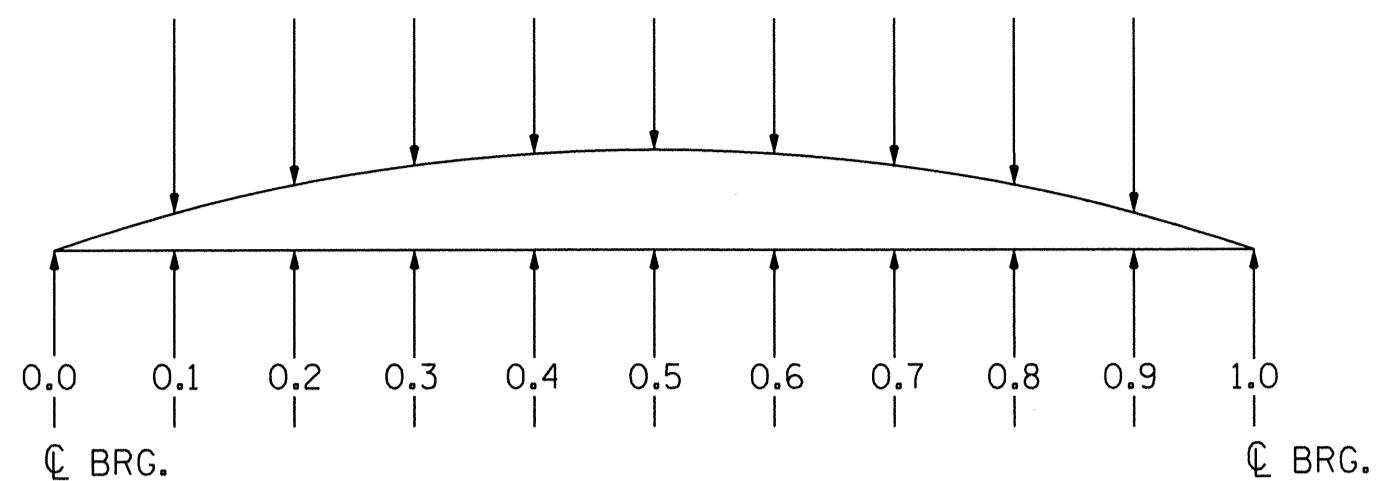
DWG. NO. 14
Professional Engineer Seal for Kenneth M. Wing, No. 031543, State of North Carolina.
2/27/2012

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NUMBER: F-0112

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			26

D:\projects\2009\09012_camplejeune\5132.nc24\structures\nc24\dgn\final\U5132_sd_eb.dgn

2/27/2012
DRAWN BY: C.J. PIPER DATE: NOV. 11
CHECKED BY: K.M. WING DATE: NOV. 11



SCHMATIC CAMBER ORDINATES @ GIRDER TENTHS POINTS

DEFLECTIONS ARE IN FEET (DECIMAL FORM) AT TENTH POINTS BETWEEN BEARINGS, REQUIRED CAMBER VALUES ARE IN INCHES (FRACTIONAL FORM).

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD

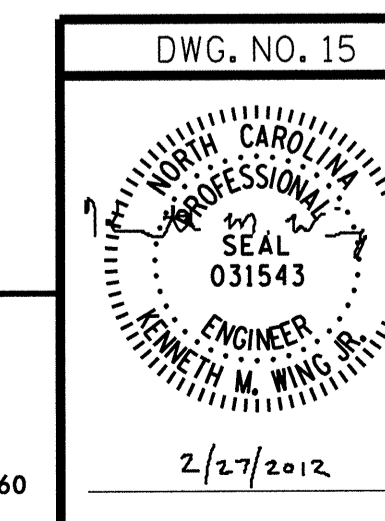
DEAD LOAD DEFLECTION AND CAMBER TABLE FOR GIRDERS - SPAN "A"																							
0.6 Ø LOW RELAXATION	GIRDERS AG1 & AG8											GIRDERS AG2 THROUGH AG7											
TENTH POINTS	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.112	0.196	0.254	0.287	0.297	0.287	0.254	0.196	0.112	0.000	0.000	0.112	0.196	0.254	0.287	0.297	0.287	0.254	0.196	0.112	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. *	↓	0.000	0.034	0.068	0.095	0.112	0.118	0.112	0.095	0.068	0.034	0.000	0.000	0.039	0.078	0.108	0.127	0.134	0.127	0.108	0.078	0.039	0.000
FINAL CAMBER	↑	0"	15/16"	19/16"	17/8"	21/8"	21/8"	17/8"	19/16"	15/16"	0"	0"	7/8"	17/16"	13/4"	115/16"	115/16"	115/16"	13/4"	17/16"	7/8"	0"	

DEAD LOAD DEFLECTION AND CAMBER TABLE FOR GIRDERS - SPAN "B"																							
0.6 Ø LOW RELAXATION	GIRDERS BG1 & BG8											GIRDERS BG2 THROUGH BG7											
TENTH POINTS	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.069	0.120	0.154	0.174	0.180	0.174	0.154	0.120	0.069	0.000	0.000	0.069	0.120	0.154	0.174	0.180	0.174	0.154	0.120	0.069	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. *	↓	0.000	0.020	0.039	0.054	0.064	0.067	0.064	0.054	0.039	0.020	0.000	0.000	0.022	0.044	0.062	0.073	0.077	0.073	0.062	0.044	0.022	0.000
FINAL CAMBER	↑	0"	9/16"	1"	13/16"	15/16"	13/8"	15/16"	13/16"	1"	9/16"	0"	0"	9/16"	7/8"	11/8"	13/16"	11/4"	13/16"	11/8"	7/8"	9/16"	0"

PROJECT NO. U-5132
ONSLOW COUNTY
 STATION: STA. 31+48.82 -L- P.O.C.

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 GIRDER CAMBER DETAILS**

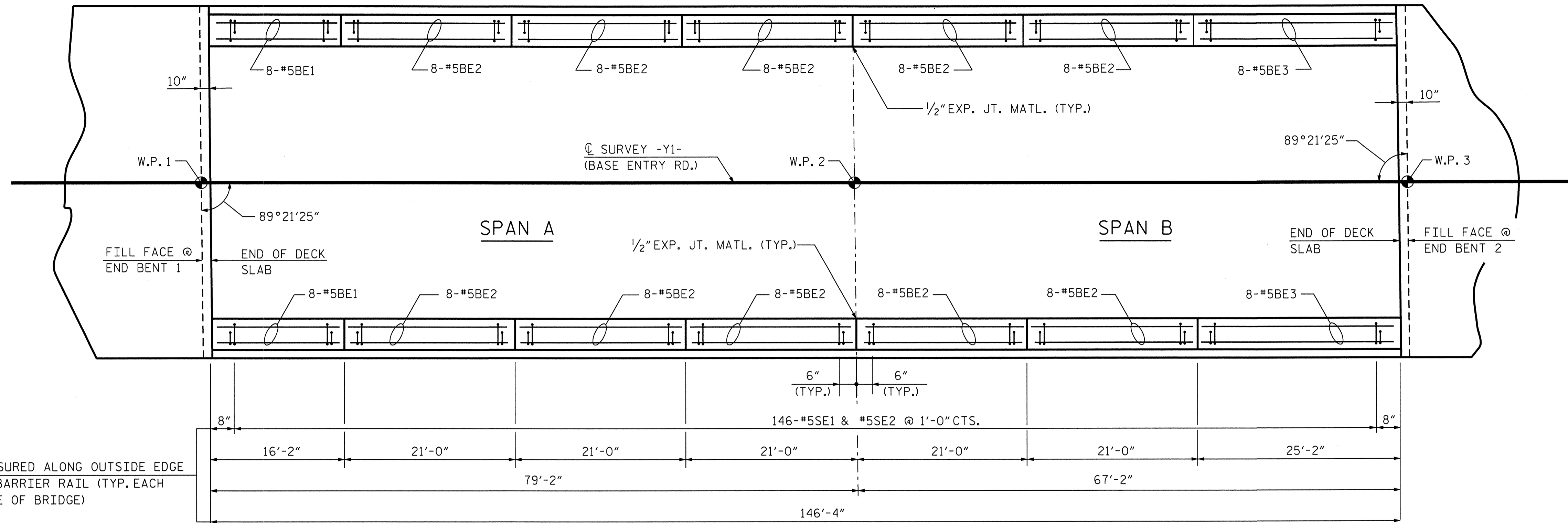


RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			26

2/27/2012 m:\projects\2009\09012.camp\jeune\U5132.nc24\structures\nc24\dgn\Final\U5132.sd.dgn
 parrish

DRAWN BY : C.J. PIPER DATE : NOV. 11
 CHECKED BY : K.M. WING DATE : NOV. 11



PLAN

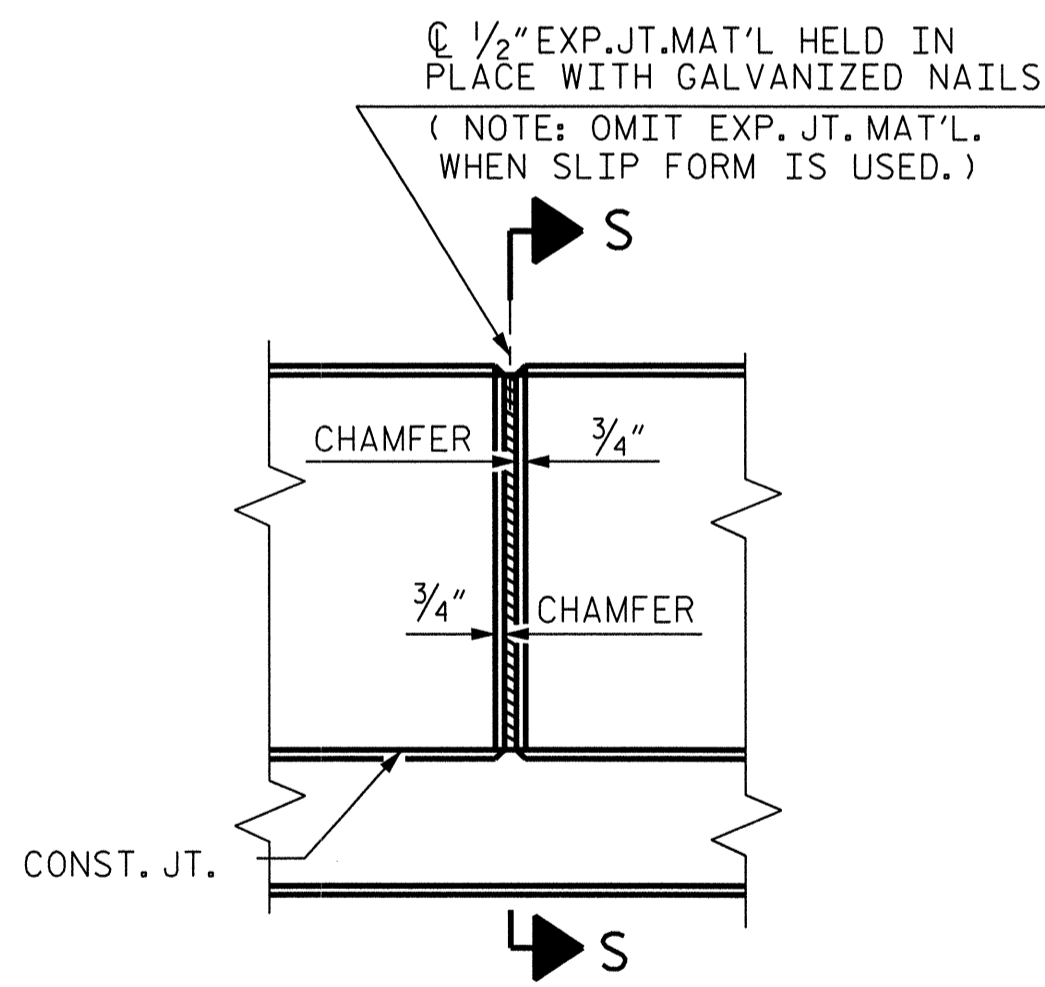
BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

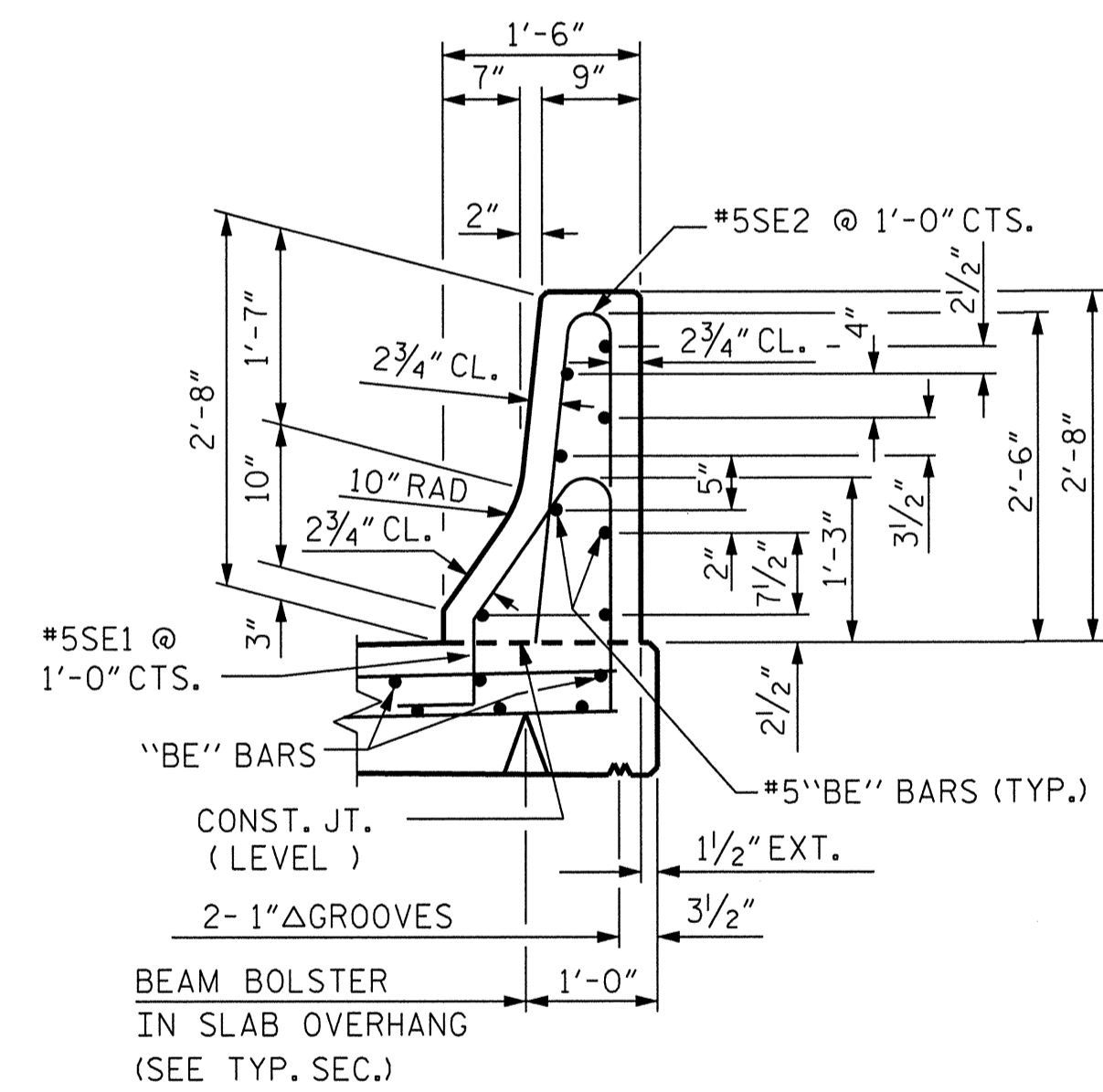
BILL OF MATERIAL
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
BE1	16	#5	STR.	15'-9"	263
BE2	80	#5	STR.	20'-7"	1718
BE3	16	#5	STR.	24'-9"	413
SE1	292	#5	1	4'-8"	1421
SE2	292	#5	2	5'-2"	496
EPOXY COATED REINFORCING STEEL				4,311	LBS.
CLASS AA CONCRETE				29.3	CU. YDS.
CONCRETE BARRIER RAIL				292.67	LIN. FT.

MEASURED ALONG OUTSIDE EDGE OF BARRIER RAIL (TYP. EACH SIDE OF BRIDGE)



ELEVATION AT EXPANSION JOINTS



SECTION THRU RAIL

NOTES:

BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

VERTICAL 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. THE CONTRACTION JOINTS 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.

PROJECT NO. U-5132
ONSLOW COUNTY
 STATION: STA. 31+48.82 -L- P.O.C.

BARRIER RAIL DETAILS

DRAWN BY : ARB 5/87	REV. 10/17/00	RWW/LES
CHECKED BY : SJD 9/87	REV. 5/7/03R	RWW/JTE
	REV. 5/1/06R	TLA/GM
DRAWN BY : C.J. PIPER	DATE : NOV. 11	
CHECKED BY : K.M. WING	DATE : NOV. 11	

RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

DWG. NO. 16

2/27/2012

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**STANDARD
 CONCRETE
 BARRIER RAIL**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			26

2/27/2012 m:\projects\2009\09012-complejeune\5132.nc24\structures\nc24\dgn\Final\5132.sd_cbr.dgn

NOTES

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

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.)

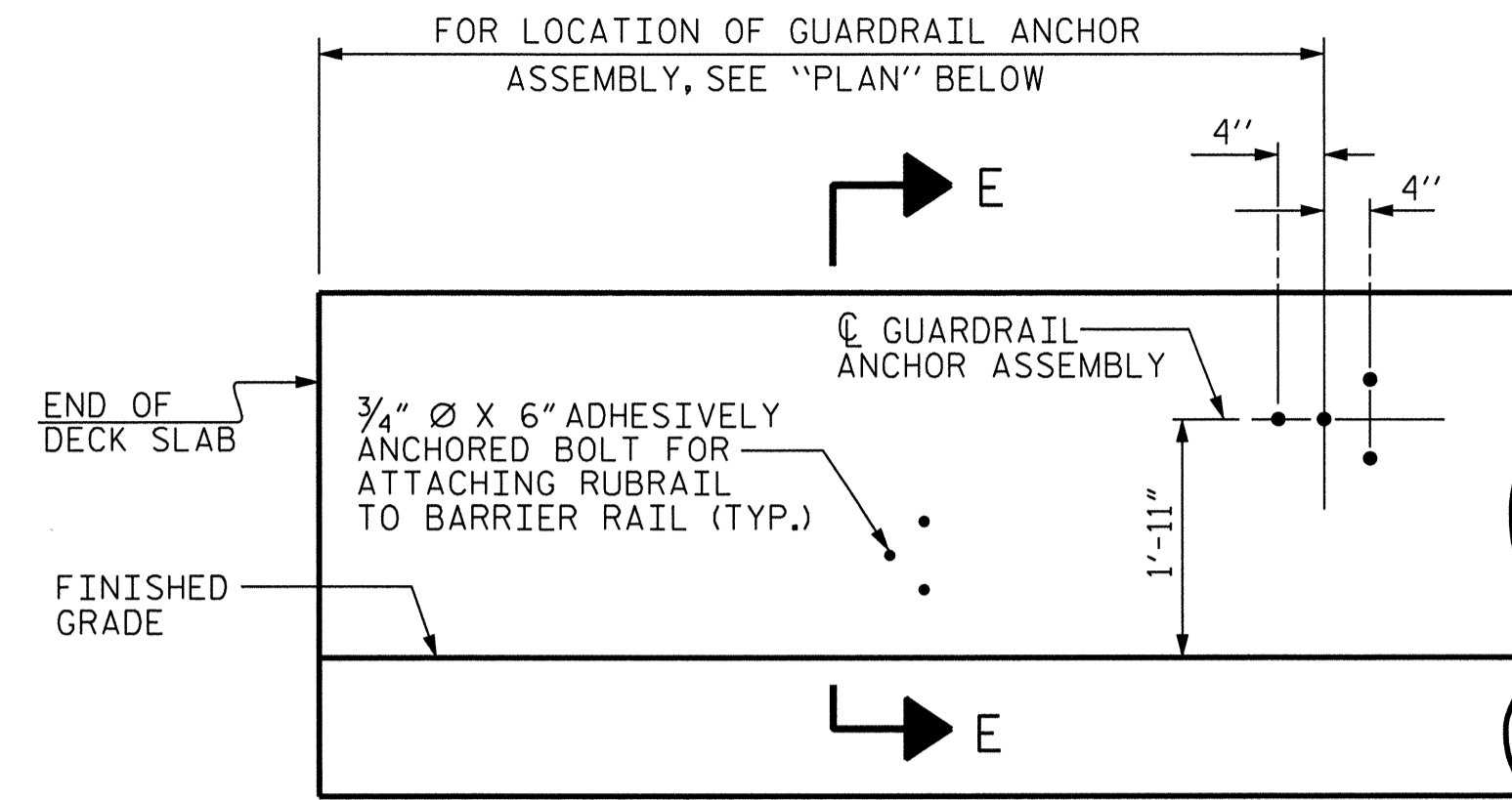
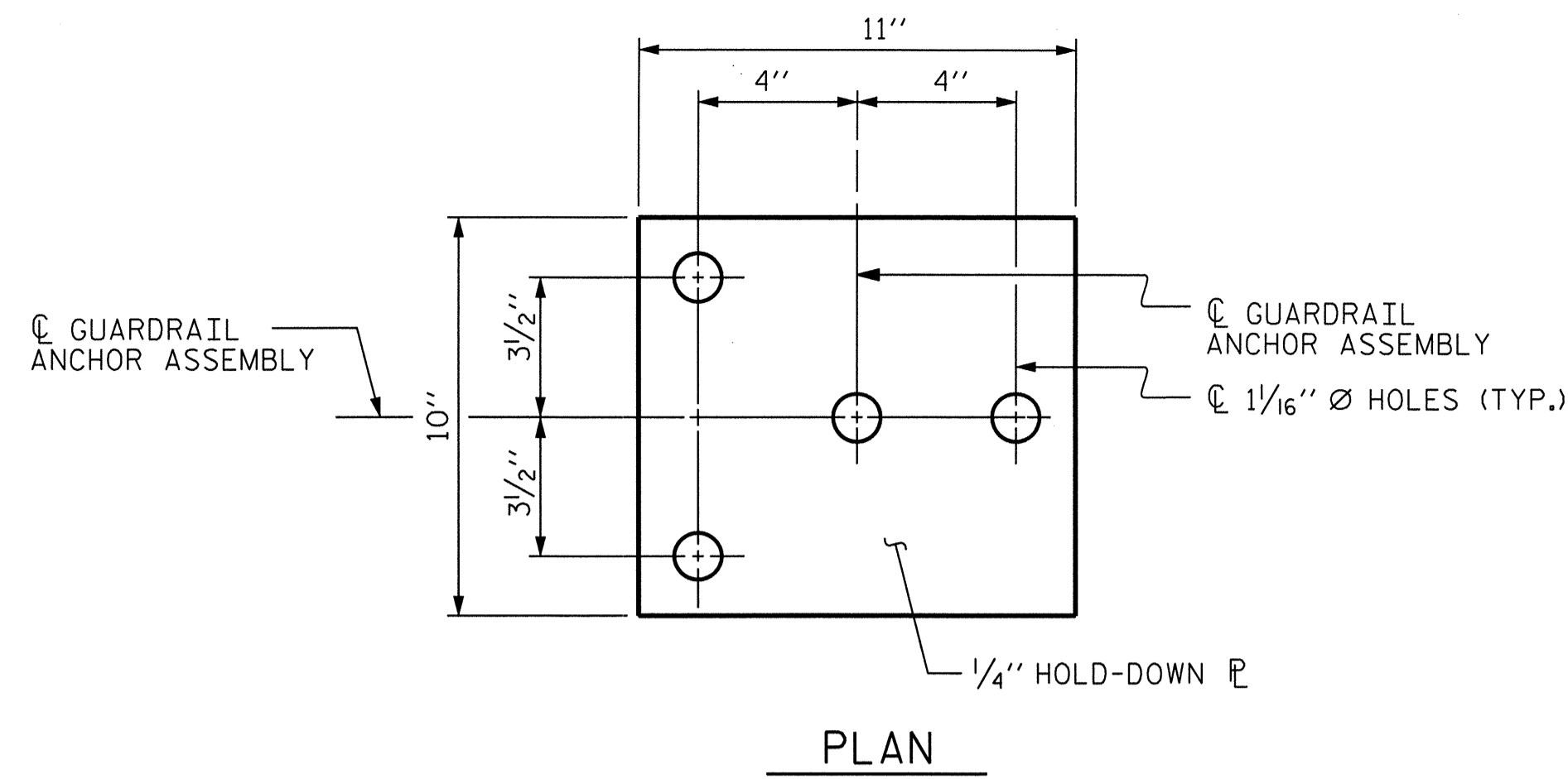
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

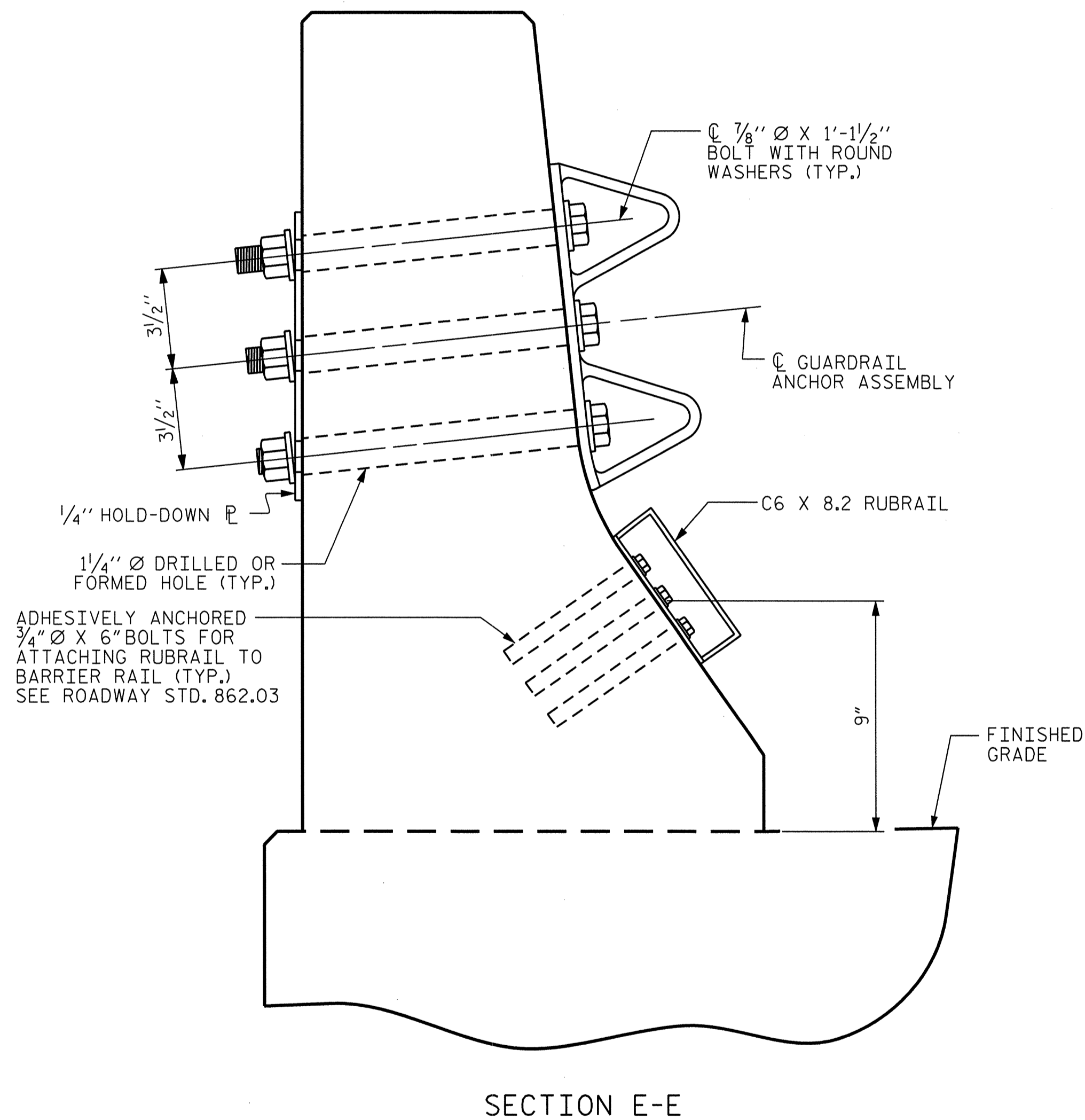
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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.

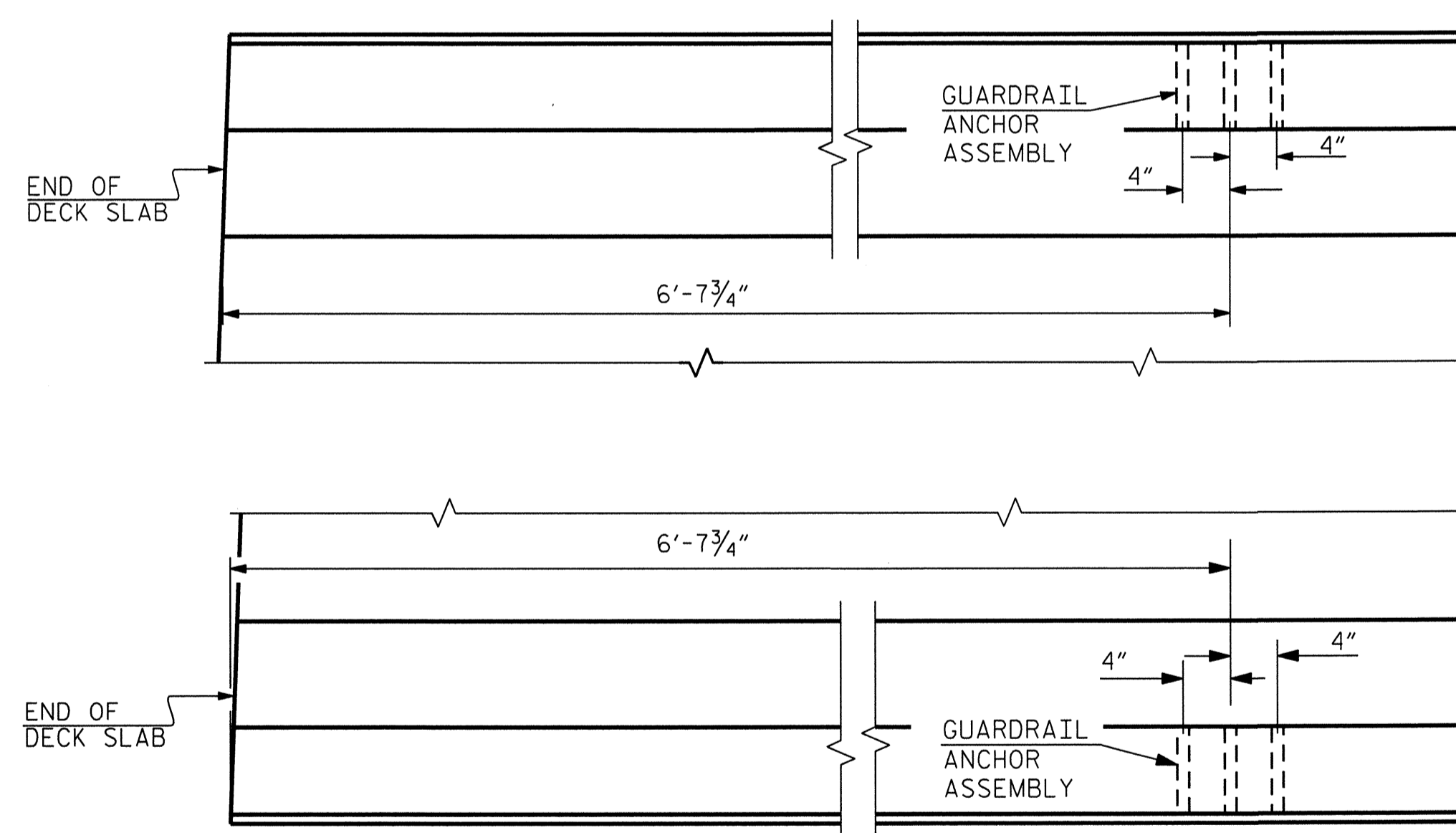
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



ELEVATION
FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03

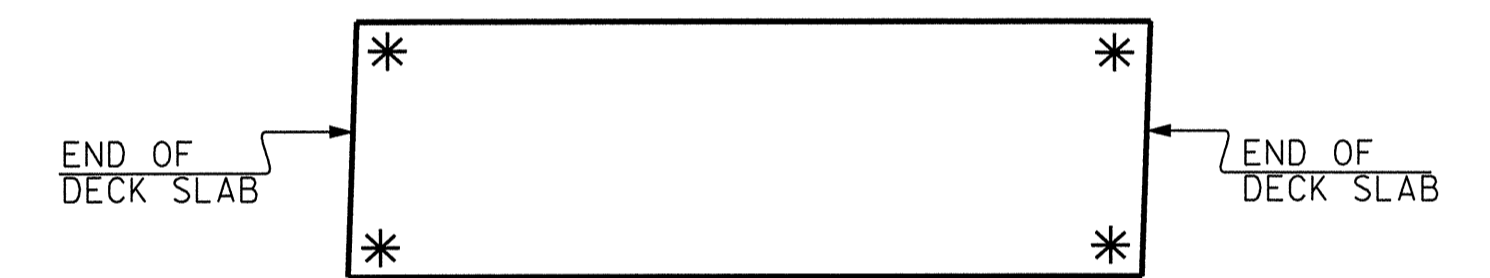


SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN
LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.



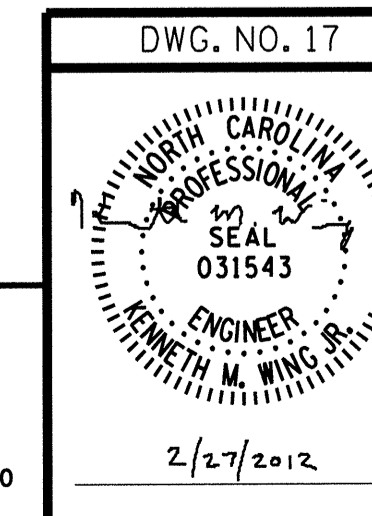
SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. U-5132
ONslow COUNTY
 STATION: STA. 31+48.82 -L- P.O.C.

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 GUARDRAIL ANCHORAGE
 FOR BARRIER RAIL



RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			26

2/27/2012 2:27:12 pm \\projects\2009\09012.ccm\jeune\5132.nc24\structures\nc24\dgn\final\5132.sd_gra.dgn

DRAWN BY : TLA 5/06	ADDED 5/1/06R KMM/GM
CHECKED BY : GM 5/06	REV. 10/1/11 MAA/GM
DRAWN BY : C.J. PIPER	DATE : NOV. 11
CHECKED BY : K.M. WING	DATE : NOV. 11

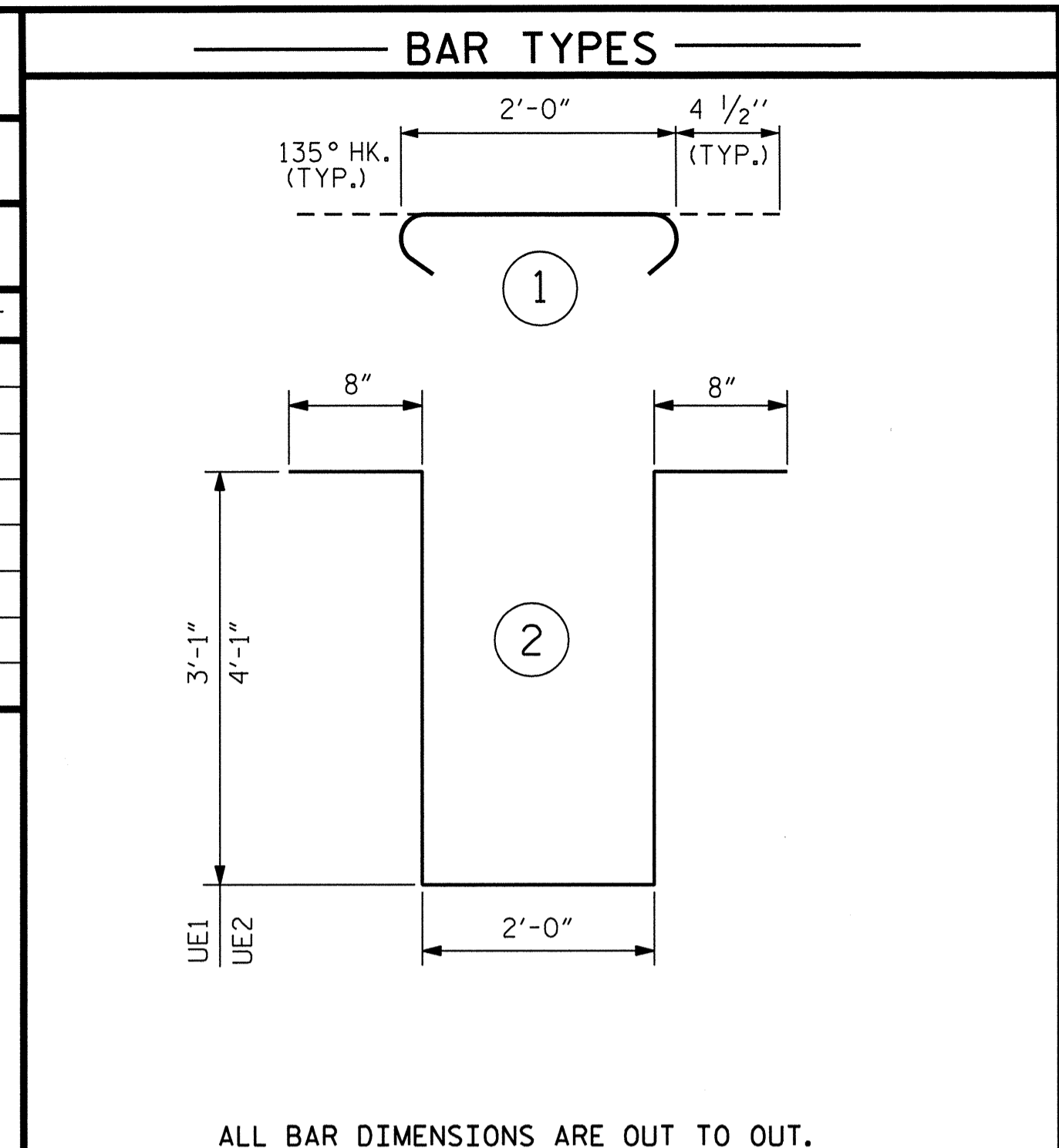
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

REINFORCING BAR SCHEDULE

SPANS A AND B

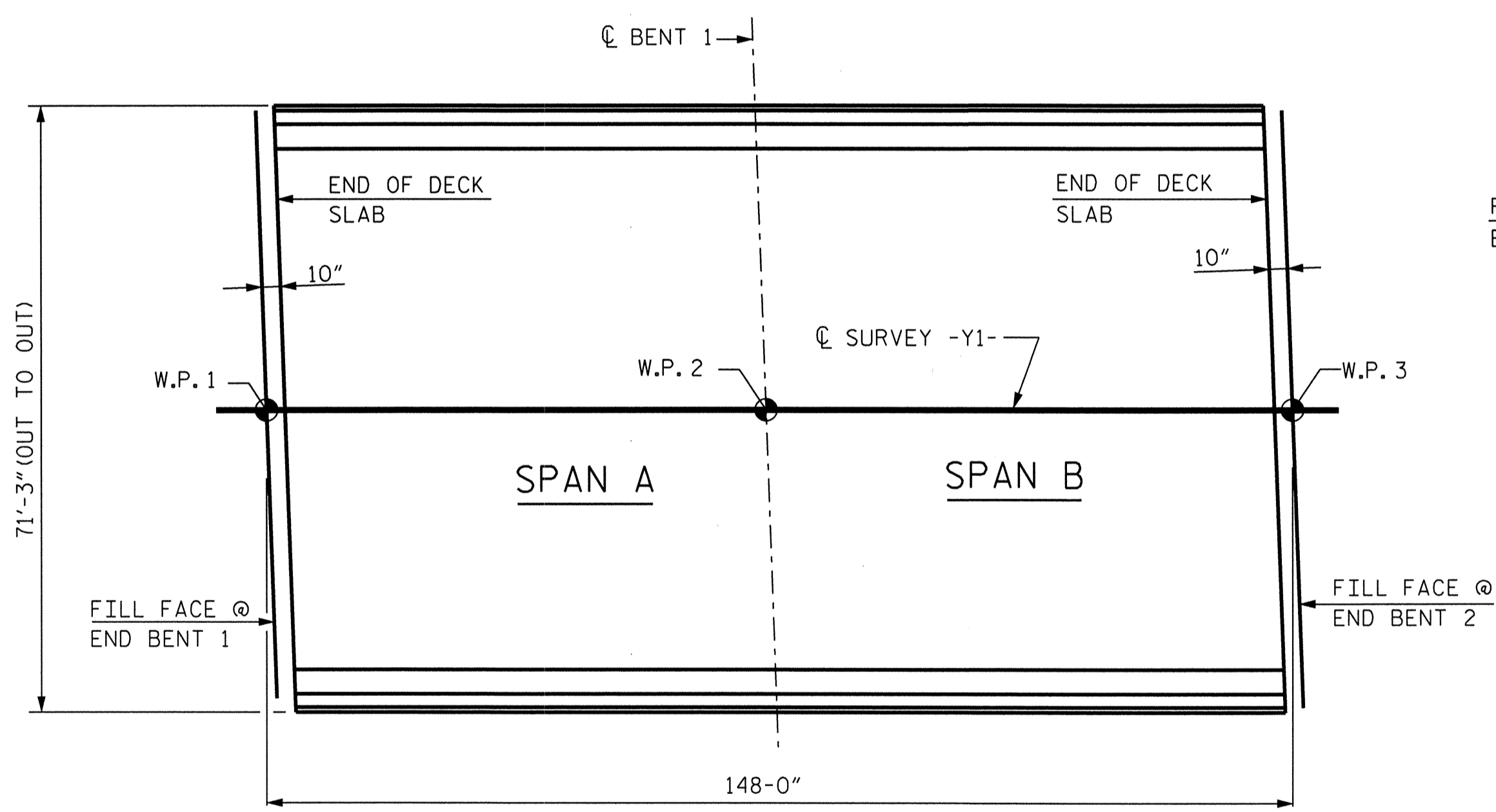
EPOXY COATED						NON-EPOXY COATED					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
AE1	586	#5	STR.	36'-9"	22,462	A1	293	#5	STR.	41'-3"	12,606
BE1	282	#6	STR.	16'-0"	6,777	A2	293	#5	STR.	31'-11"	9,754
BE2	146	#4	STR.	20'-0"	1,951	B1	276	#5	STR.	50'-2"	14,442
BE3	73	#6	STR.	54'-0"	5,921	K1	14	#4	STR.	7'-8"	72
BE4	68	#6	STR.	22'-0"	2,247	K2	28	#4	STR.	8'-5"	157
BE5	73	#4	STR.	30'-0"	1,463	K3	12	#4	STR.	23'-1"	185
UE1	14	#4	2	9'-6"	89	K4	14	#4	STR.	7'-2"	67
UE2	42	#4	2	11'-6"	323	S1	154	#4	1	2'-9"	283



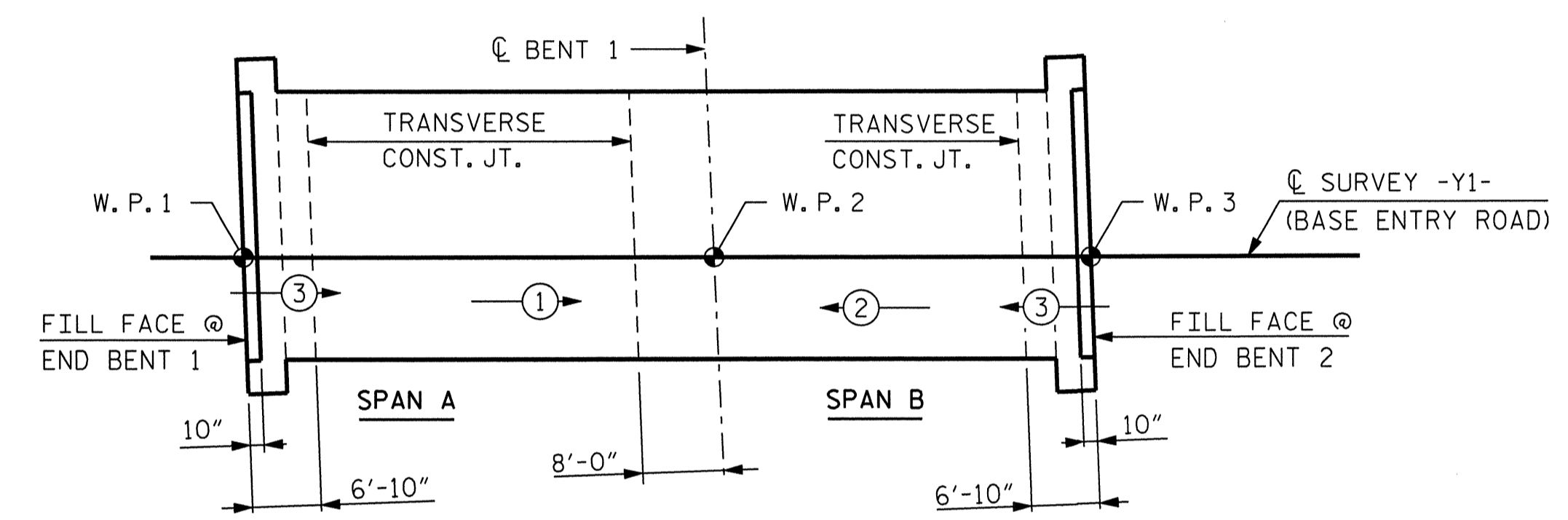
—SUPERSTRUCTURE BILL OF MATERIAL—

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
SPANS A AND B		37,566	41,233
POUR 1	138.2		
POUR 2	168.3		
POUR 3	78.5		
TOTALS**	385.0	37,566	41,233

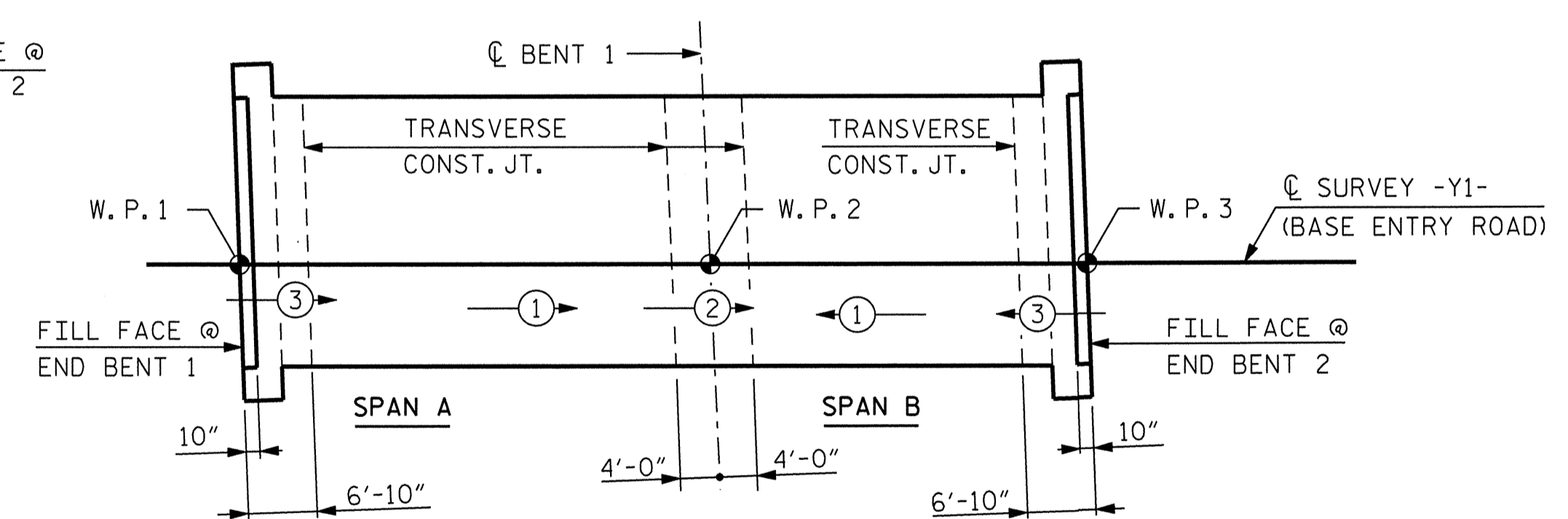
**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED.



LAYOUT FOR COMPUTING AREA OF
REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 10,545)



SLAB POURING SEQUENCE



OPTIONAL SLAB POURING SEQUENCE

POUR 2 CANNOT BE STARTED UNTIL BOTH ADJACENT POUR 1'S REACH A MINIMUM OF 3000 PSI.

GROOVING BRIDGE FLOORS

APPROACH SLABS	2,804 SO.FT.
BRIDGE DECK	8,468 SO.FT.
TOTAL	11,272 SO.FT.

PROJECT NO. U-5132
ONSLOW COUNTY
 STATION: STA. 31+48.82 -L- P.O.C.

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 BILL OF MATERIAL

DWG. NO. 18

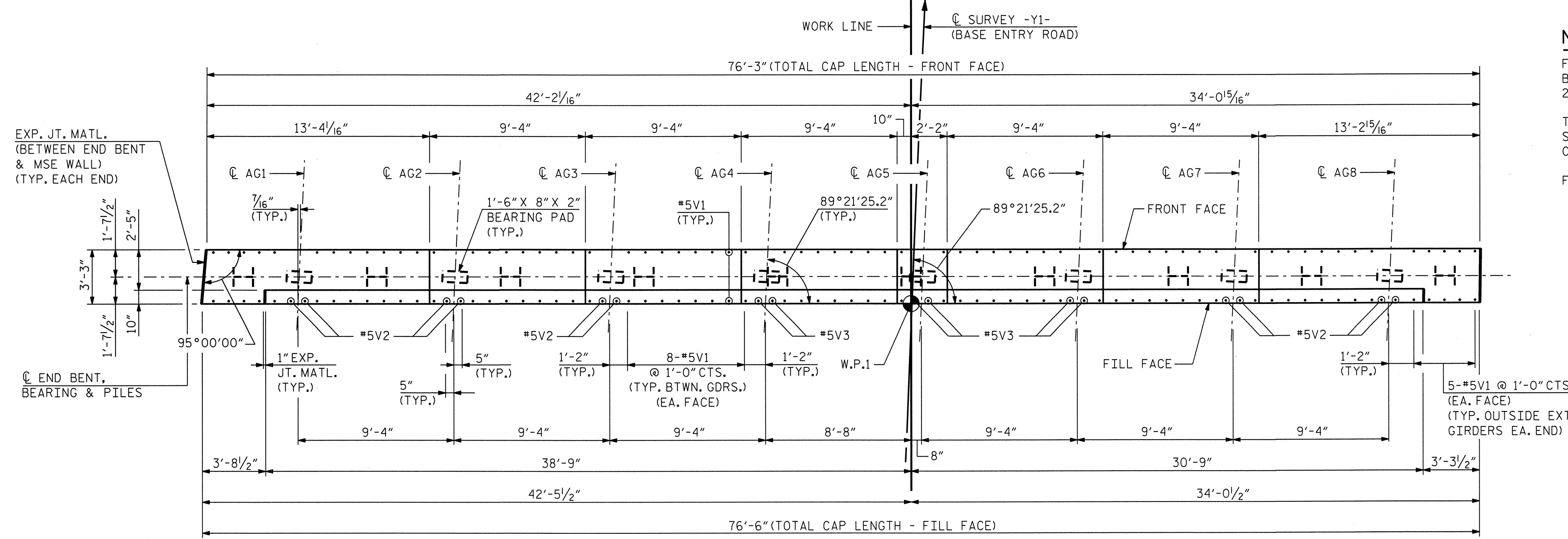
2/27/2012

RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

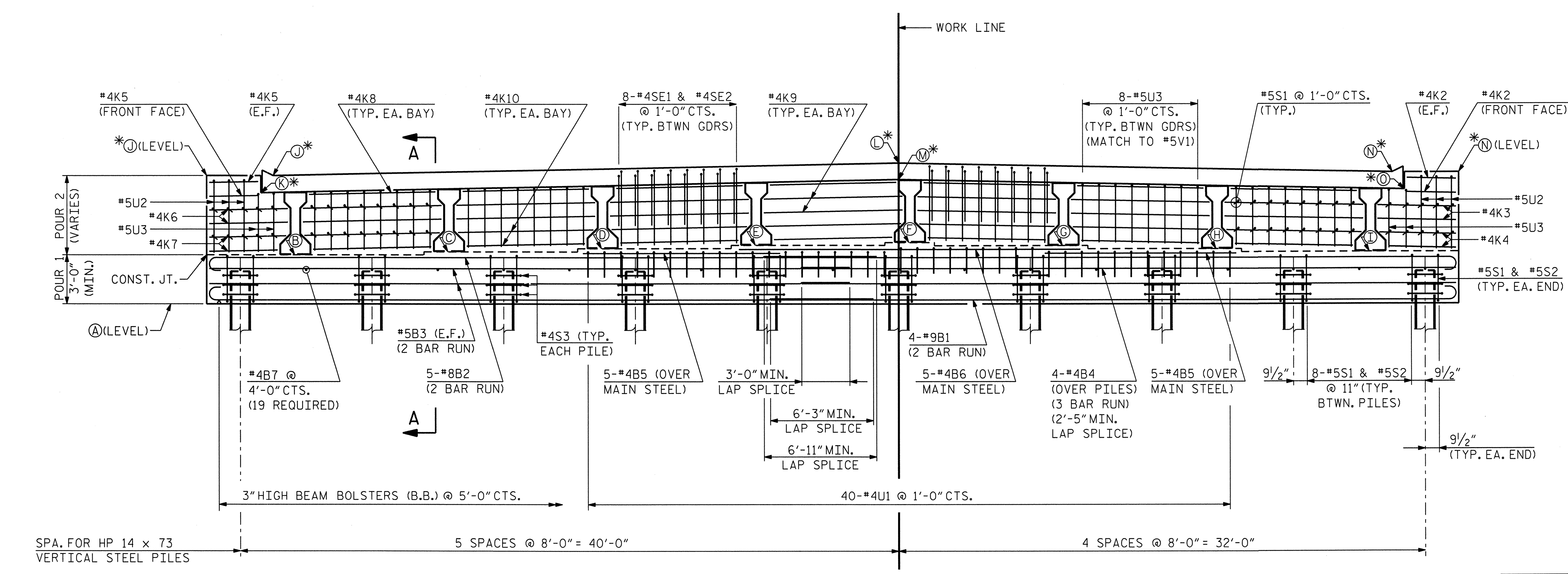
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-18
1			3			TOTAL SHEETS
2			4			26

D:\projects\2009\09012.complejeune\U5132.nc24\structures\nc24\dgn\final\U5132.sd_b.m.dgn

DRAWN BY: JMB 5/87	REV. 6/1/94	EEM/GRP
CHECKED BY: SJD 9/87	REV. 8/16/99	RWW/LES
	REV. 5/1/06	TLA/GM
DRAWN BY: C.J. PIPER	DATE: NOV. 11	
CHECKED BY: K.M. WING	DATE: NOV. 11	



PLAN



ELEVATION

FOR DESCRIPTION AND LOCATION OF REINFORCING STEEL IN SUPERSTRUCTURE SLAB, SEE "TYPICAL SECTION" SHEET.

#5V1 NOT SHOWN IN ELEVATION FOR CLARITY. SEE PLAN VIEW FOR PLACEMENT AND DIMENSIONING.

NOTES:

FOR SECTION A-A AND PILE SPLICE DETAILS, SEE "END BENT 1 DETAILS AND BILL OF MATERIAL" SHEET, SHEET 2 OF 2.

THE MSE RETAINING WALLS ARE NOT SHOWN. FOR DETAILS, SEE "MSE RETAINING WALL FOR BRIDGE ON BASE ENTRY RD. OVER NC 24" SHEETS.

FOR MSE RETAINING WALLS, SEE SPECIAL PROVISIONS.

ELEVATION TABLE	
A	39.397
B	42.397
C	42.587
D	42.776
E	42.965
F	43.127
G	42.943
H	42.759
I	42.574
J*	47.187
K*	46.005
L*	47.957
M*	46.790
N*	47.365
O*	46.183

* AT FILL FACE

PROJECT NO. U-5132
 ONSLOW COUNTY
 STATION: STA. 31+48.82 -L- P.O.C.

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 1

DWG. NO. 19

2/27/2012

RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

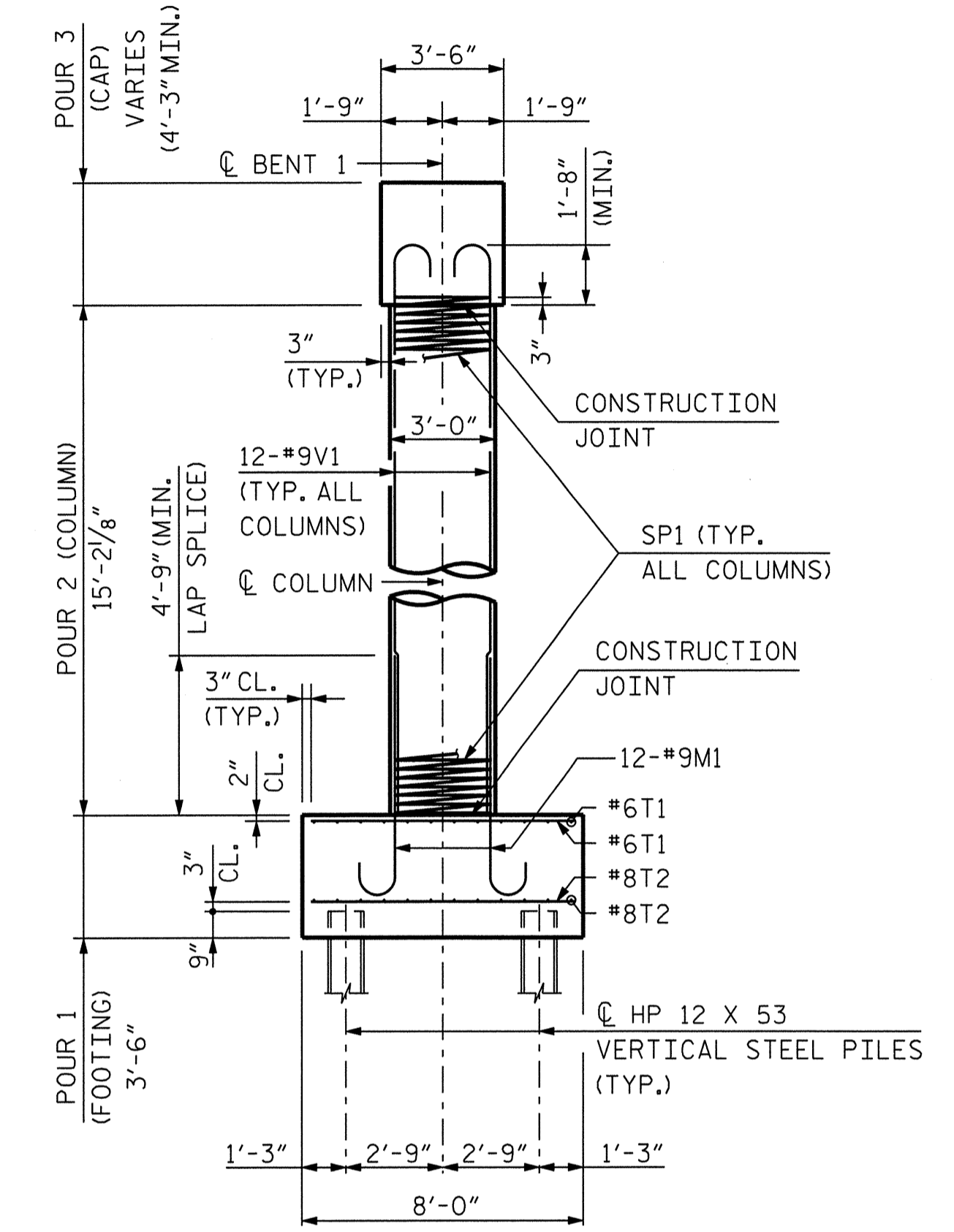
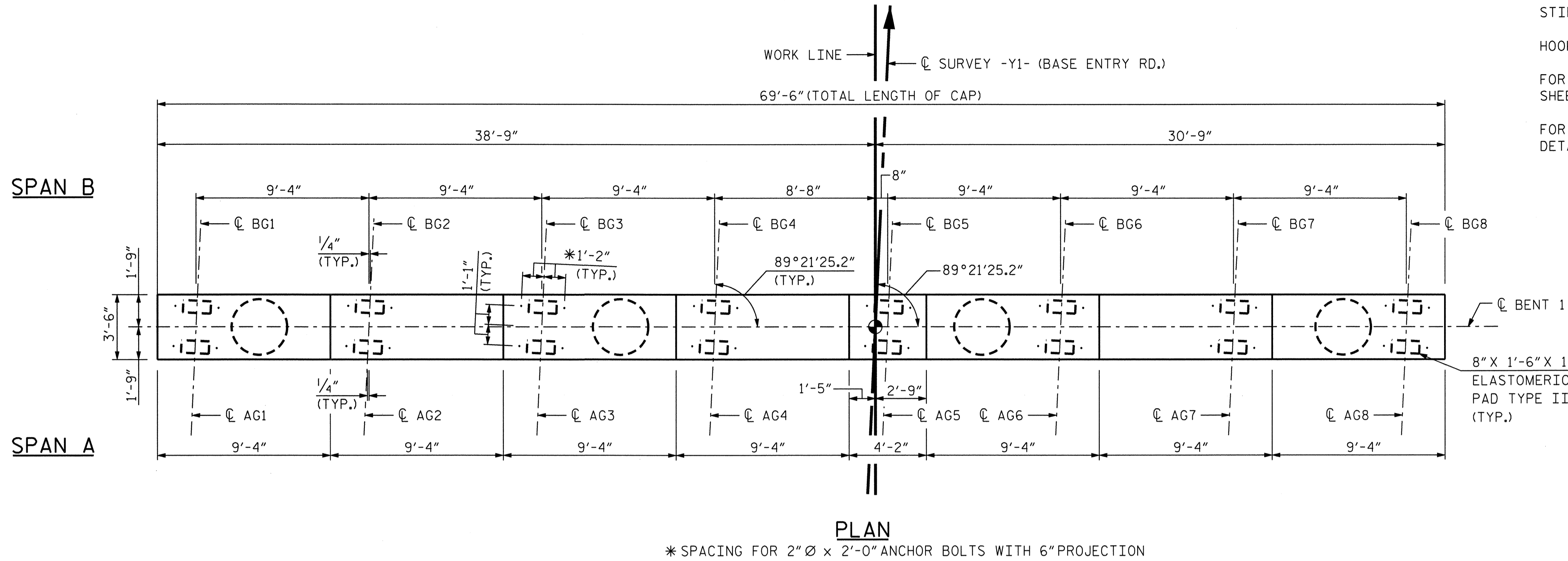
REVISIONS						SHEET NO. S-19
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

2/27/2012 m:\projects\2009\09012\complete\jeune\U5132_nc24\structures\nc24\dgn\final\U5132_sd.eb1.dgn

DRAWN BY: C.J. PIPER DATE: NOV. 11
 CHECKED BY: K.M. WING DATE: NOV. 11

NOTES:

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 FOR PILE SPlice DETAILS, SEE "END BENT 1 DETAILS AND BILL OF MATERIAL" SHEET, SHEET 2 OF 2.
 FOR SECTION A-A THROUGH CAP, SECTION B-B THROUGH BEARING AND END OF CAP DETAIL, SEE "BENT 1 DETAILS AND BILL OF MATERIAL" SHEET, SHEET 2 OF 2.



ELEVATION TABLE	
A	43.426
B	43.613
C	43.800
D	43.987
E	44.148
F	43.961
G	43.775
H	43.589
I	39.176
J	24.000

PROJECT NO. U-5132
 ONSLOW COUNTY
 STATION: STA. 31+48.82 -L- P.O.C.

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE BENT 1

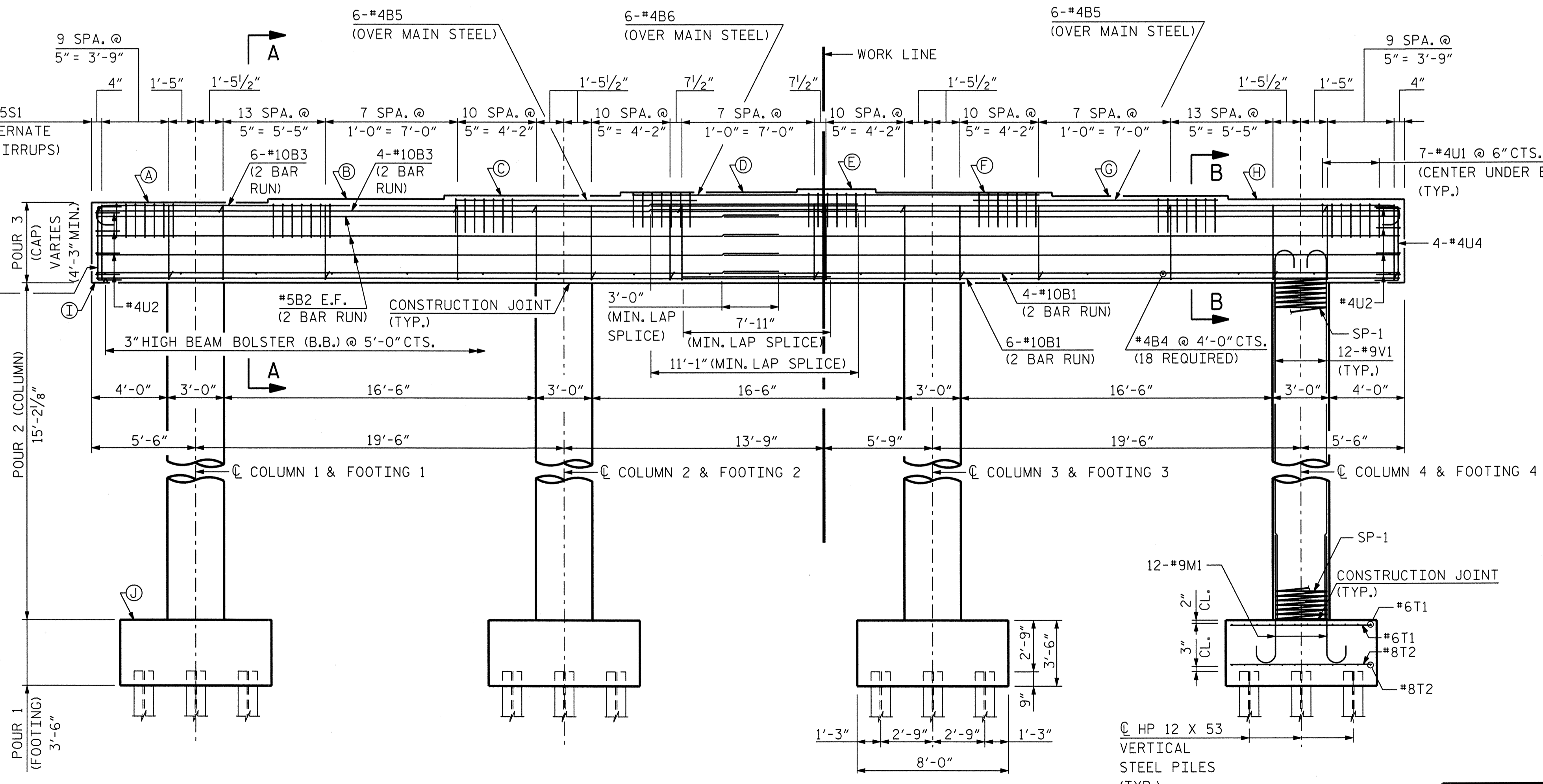
REVISIONS						SHEET NO. S-21 TOTAL SHEETS 26
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DWG. NO. 21

2/27/2012

Professional Engineer Seal
 KENNETH M. WING
 031543

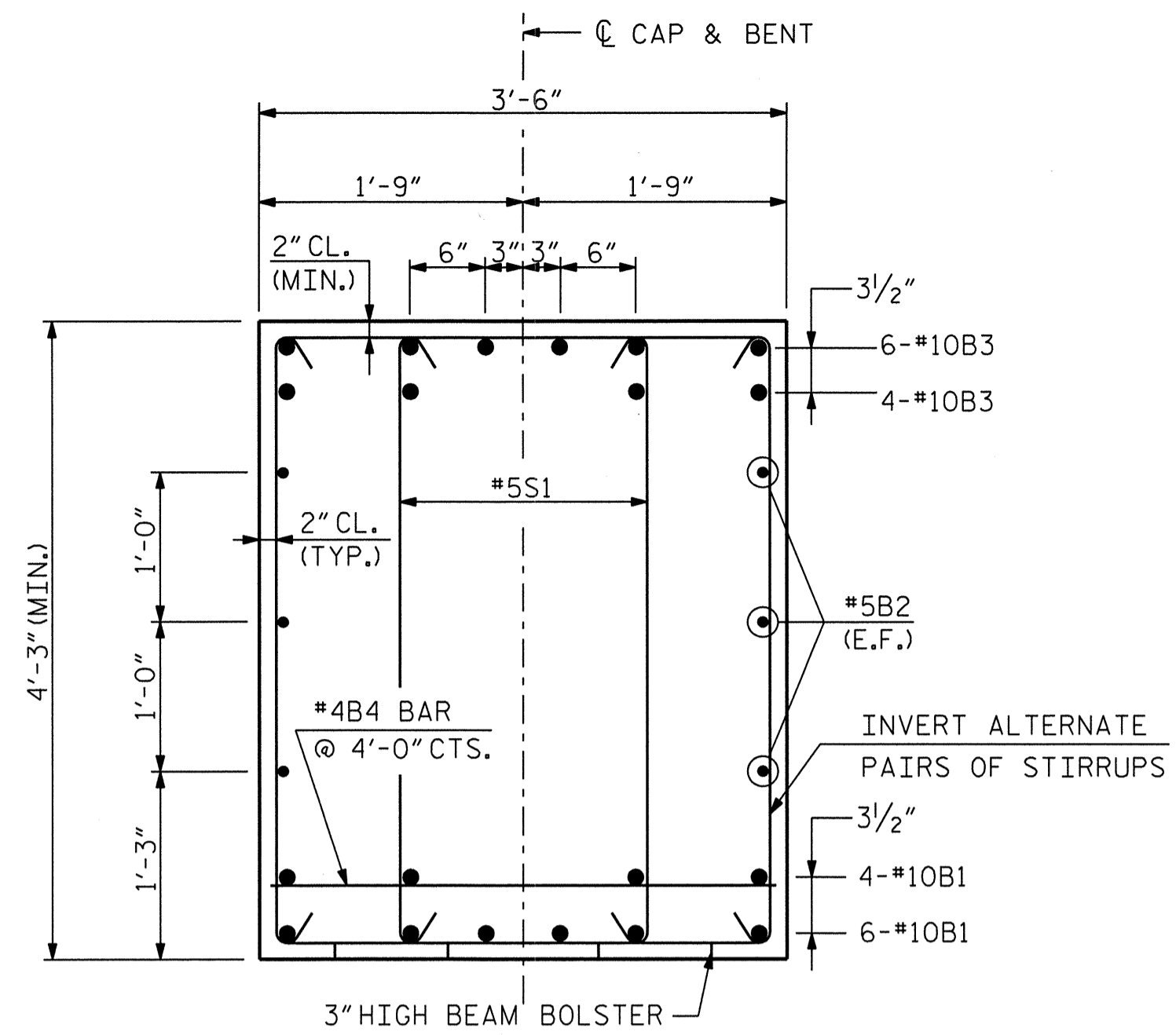
RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112



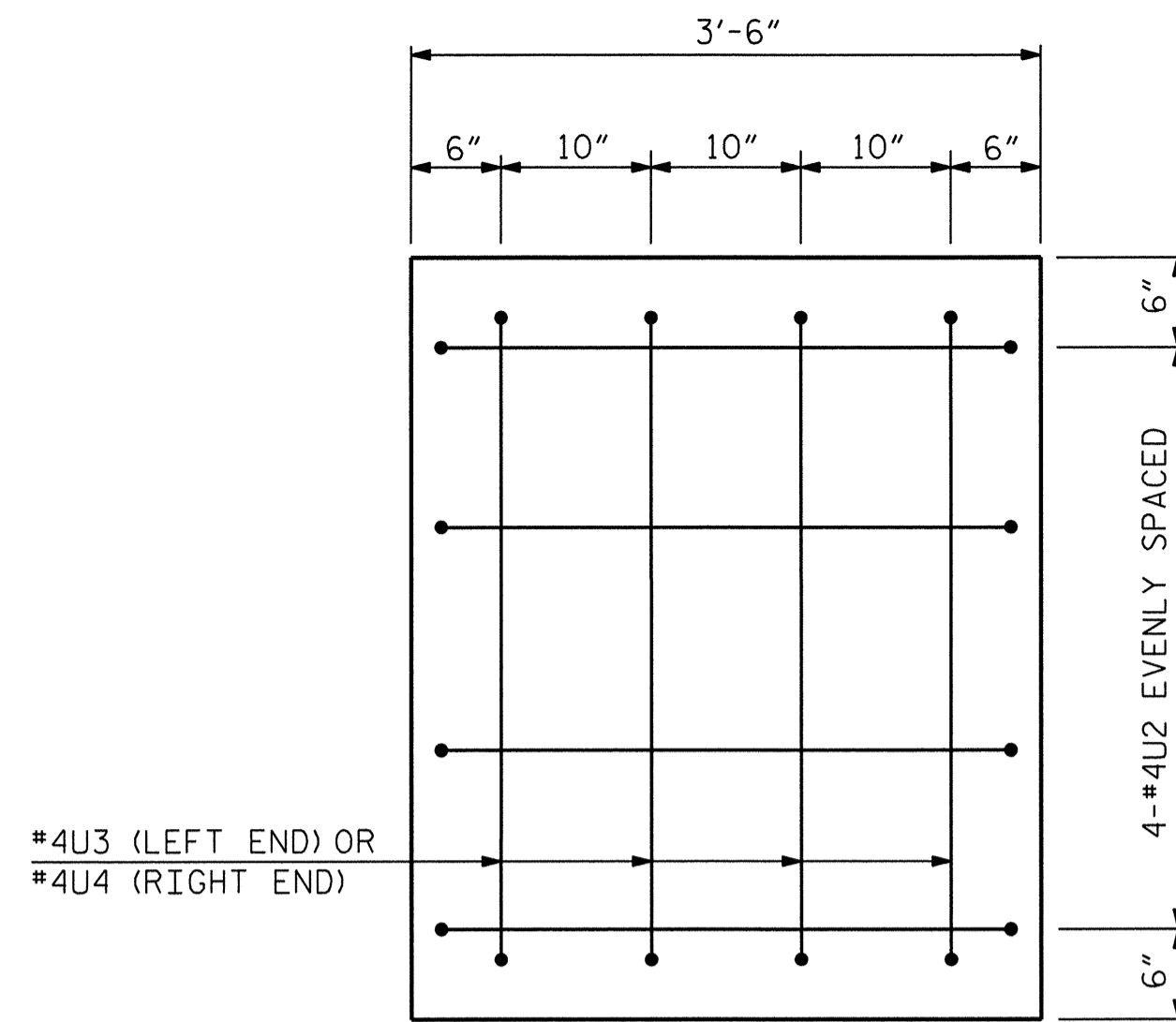
2/27/2012 m:\projects\2009\09012.cample\jeune\5132.nc24\structures\nc24\dgn\Final\U5132.sd.bl.dgn

DRAWN BY: C.J. PIPER DATE: NOV. 11
 CHECKED BY: K.M. WING DATE: NOV. 11

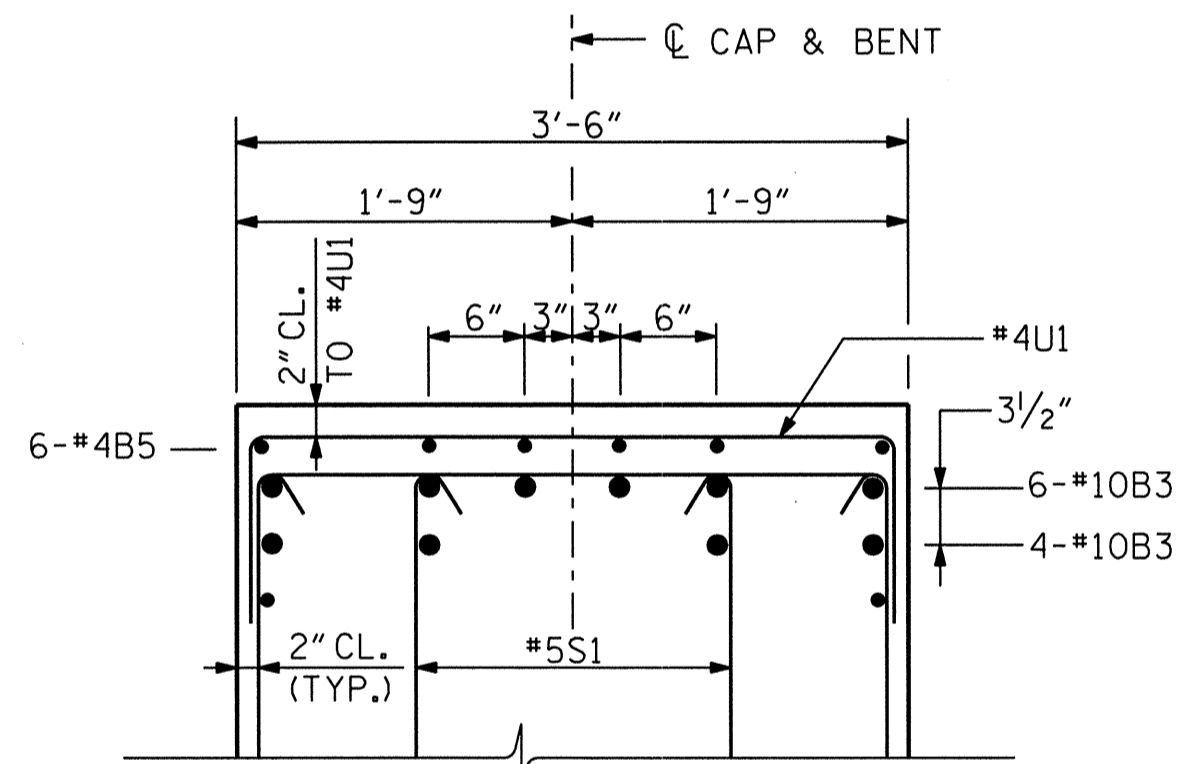
pdr\ish 2/27/2012 m:\projects\2009\09012_camplejeune\5132.nc24\structures\nc24\dgn\5132_sd_b2.dgn



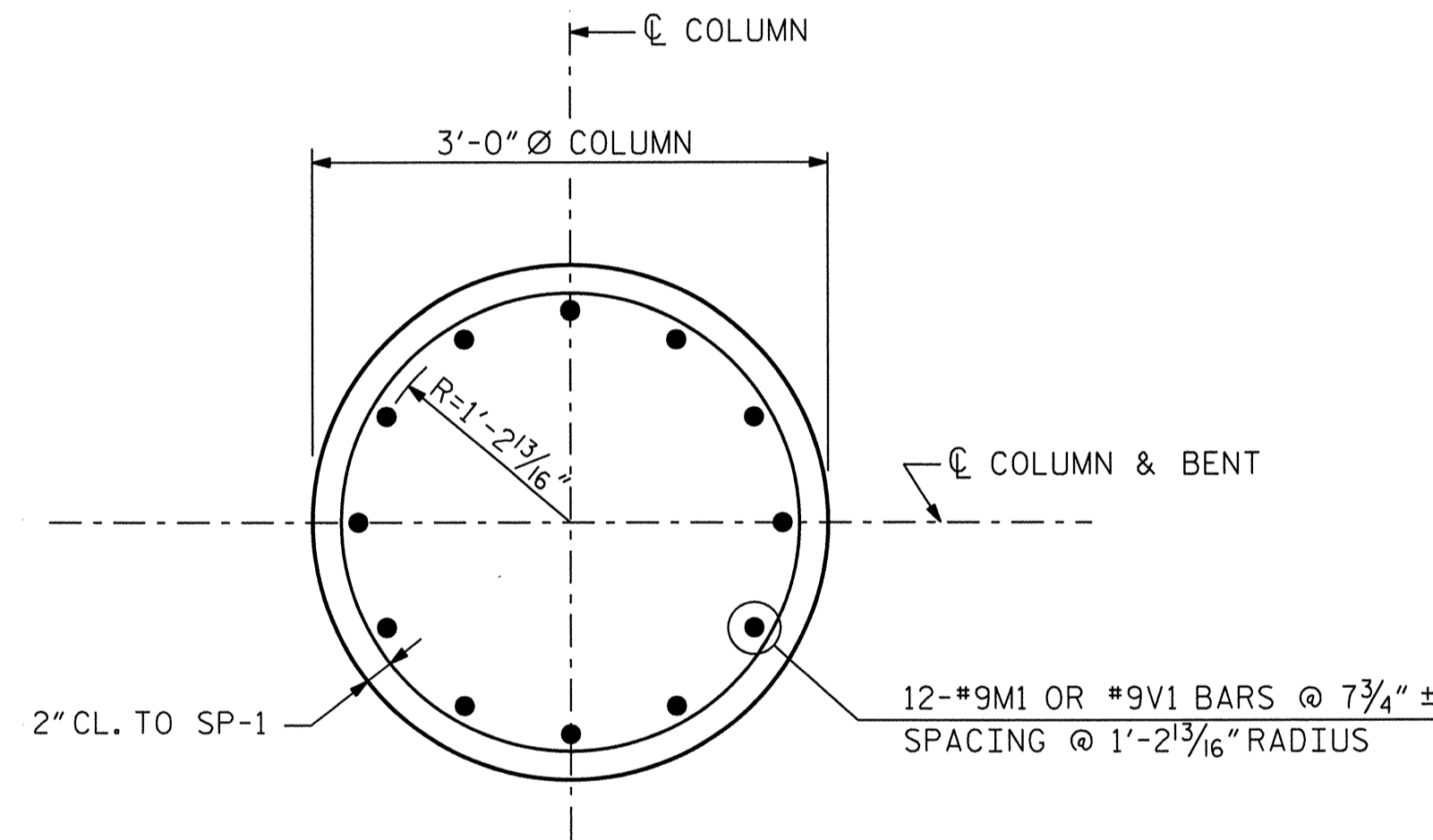
SECTION A-A THROUGH CAP



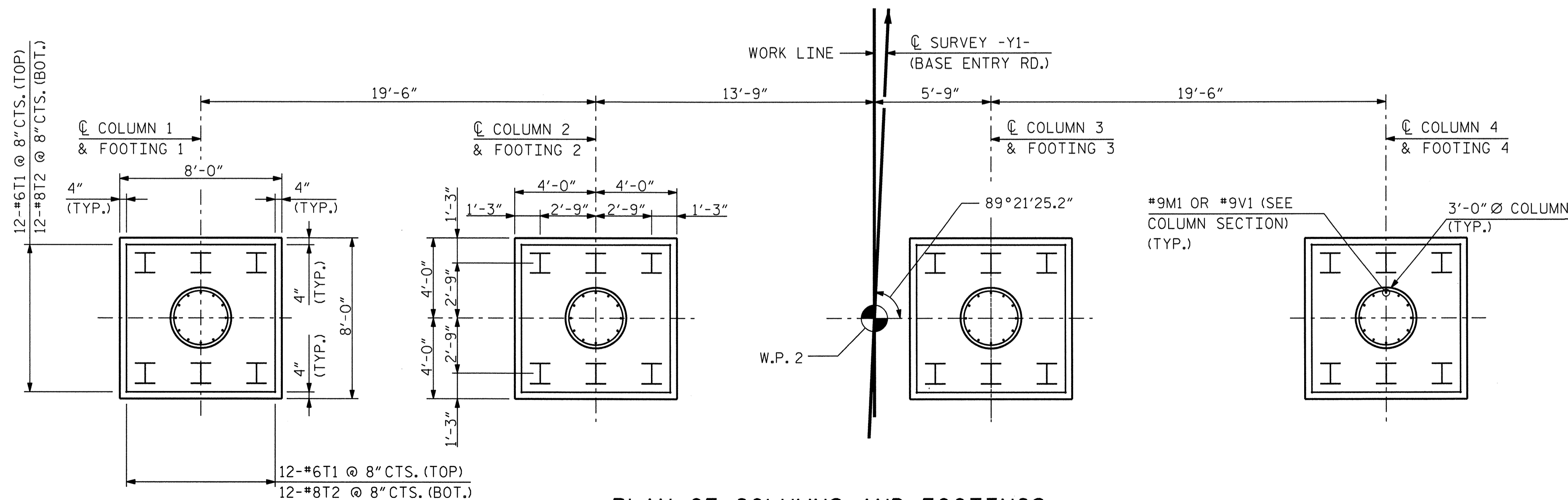
END OF CAP DETAIL



SECTION B-B THROUGH BEARING



COLUMN SECTION



PLAN OF COLUMNS AND FOOTINGS

(DATA SHOWN TYPICAL FOR EACH COLUMN AND FOOTING)

DRAWN BY: C.J. PIPER DATE: NOV. 11
 CHECKED BY: K.M. WING DATE: NOV. 11

BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	20	#10	STR.	38'-7"	3320
B2	12	#5	STR.	36'-1"	452
B3	20	#10	STR.	41'-7"	3579
B4	18	#4	STR.	3'-2"	38
B5	12	#4	STR.	11'-9"	94
B6	6	#4	STR.	22'-6"	90
M1	48	#9	1	8'-6"	1387
S1	224	#5	2	11'-2"	2609
T1	96	#6	STR.	7'-6"	1081
T2	96	#8	STR.	7'-6"	1922
U1	56	#4	3	6'-2"	231
U2	8	#4	3	6'-0"	32
U3	4	#4	3	6'-9"	18
U4	4	#4	3	6'-10"	18
V1	48	#9	1	18'-2"	2965
REINFORCING STEEL					17,836 LBS.
SP-1	4	*	4	536'-3"	1433
SPIRAL COLUMN REINFORCING STEEL					1,433 LBS.
CLASS "A" CONCRETE					
POUR 1 (FOOTINGS)					33.2 C.Y.
POUR 2 (COLUMNS)					15.9 C.Y.
POUR 3 (CAP)					41.3 C.Y.
TOTAL					90.4 C.Y.
HP 12 X 53 STEEL PILES					
NO. 24					1,560 LIN. FT.
FOUNDATION EXCAVATION					LUMP SUM

NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. U-5132
ONSLOW COUNTY
 STATION: STA. 31+48.82 -L- P.O.C.

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1 DETAILS
AND BILL OF MATERIAL

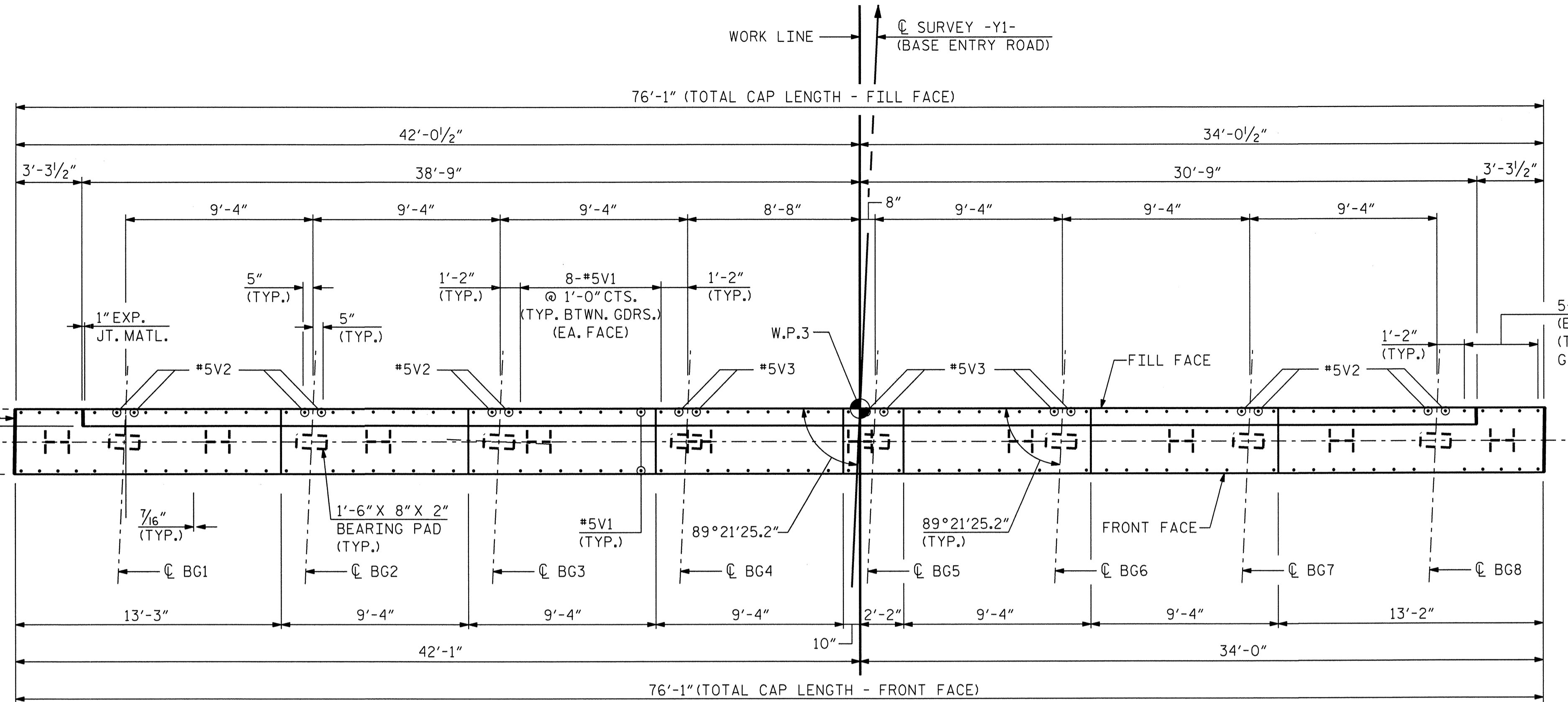
RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

DWG. NO. 22
 NORTH CAROLINA PROFESSIONAL SEAL
 031543
 ENGINEER
 WENETH M. WING JR.
 2/27/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			26

EXP. JT. MATL.
(BETWEEN END BENT
& MSE WALL)
(TYP. EACH END)

EXP. JT. MATL.
(TYP. EACH END)



PLAN

NOTES:

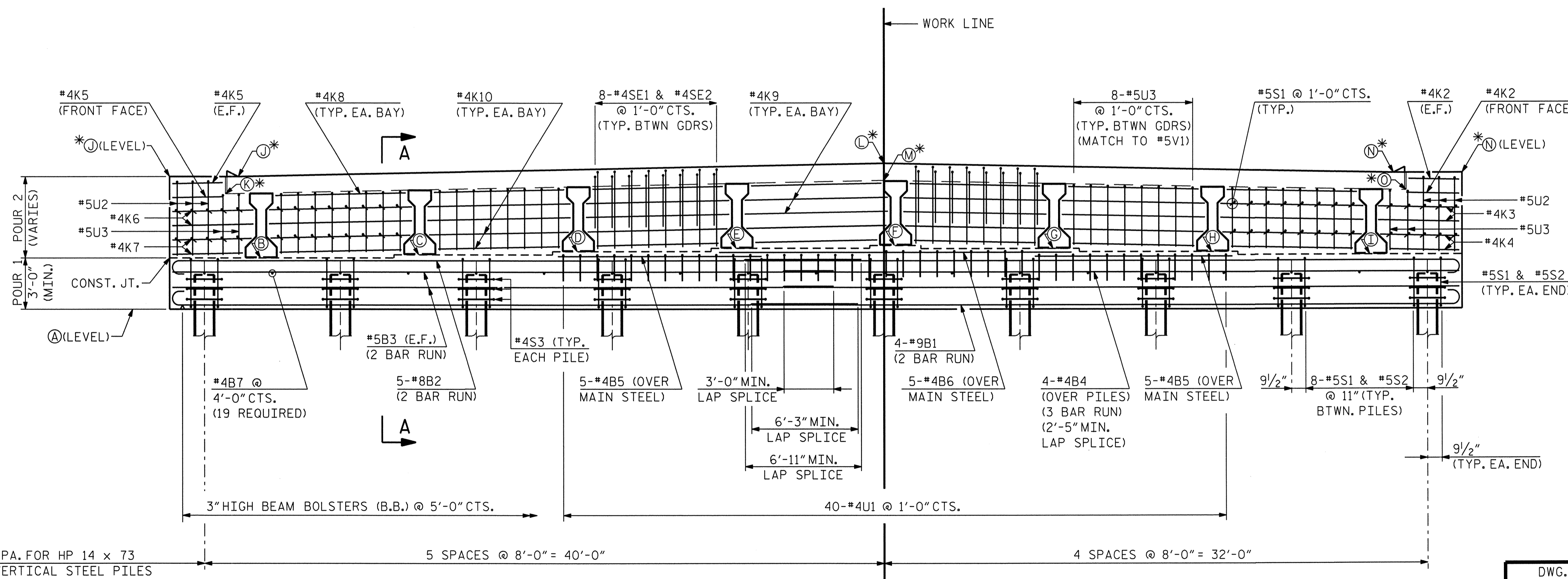
FOR SECTION A-A AND PILE SPLICE DETAILS, SEE "END BENT 2 DETAILS AND BILL OF MATERIAL" SHEET, SHEET 2 OF 2.

THE MSE RETAINING WALLS ARE NOT SHOWN. FOR DETAILS, SEE "MSE RETAINING WALL FOR BRIDGE ON BASE ENTRY RD. OVER NC 24" SHEETS.

FOR MSE RETAINING WALLS, SEE SPECIAL PROVISIONS.

ELEVATION TABLE	
A	40.254
B	43.254
C	43.439
D	43.625
E	43.811
F	43.970
G	43.782
H	43.594
I	43.407
J*	48.065
K*	46.884
L*	48.821
M*	47.654
N*	48.218
O*	47.036

* AT FILL FACE



ELEVATION

FOR DESCRIPTION AND LOCATION OF REINFORCING STEEL IN SUPERSTRUCTURE SLAB, SEE "TYPICAL SECTION" SHEET.

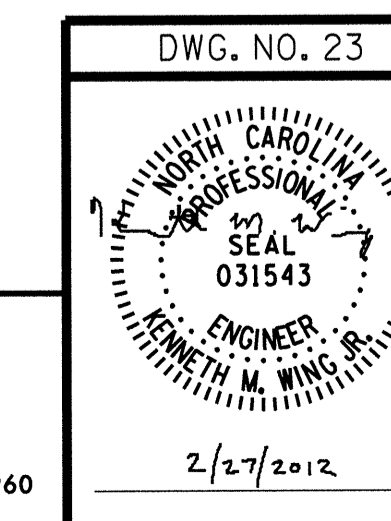
#5V1 NOT SHOWN IN ELEVATION FOR CLARITY. SEE PLAN VIEW FOR PLACEMENT AND DIMENSIONING.

PROJECT NO. U-5132
 ONSLOW COUNTY
 STATION: STA. 31+48.82 -L- P.O.C.

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 2



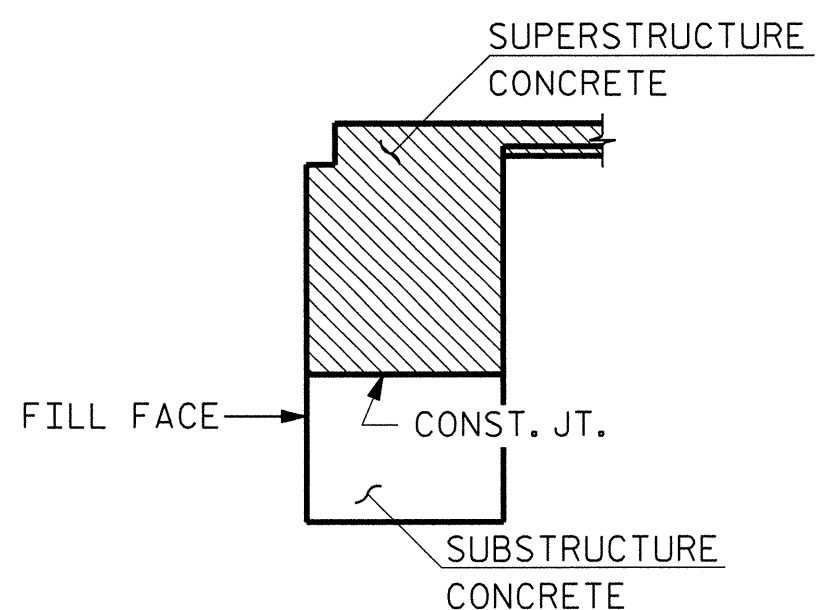
RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			26

2/27/2012 10:00:00 AM C:\projects\2009\09012.complejeune\U5132.nc24\structures\nc24\dgn\final\U5132.sd_eb2.dgn

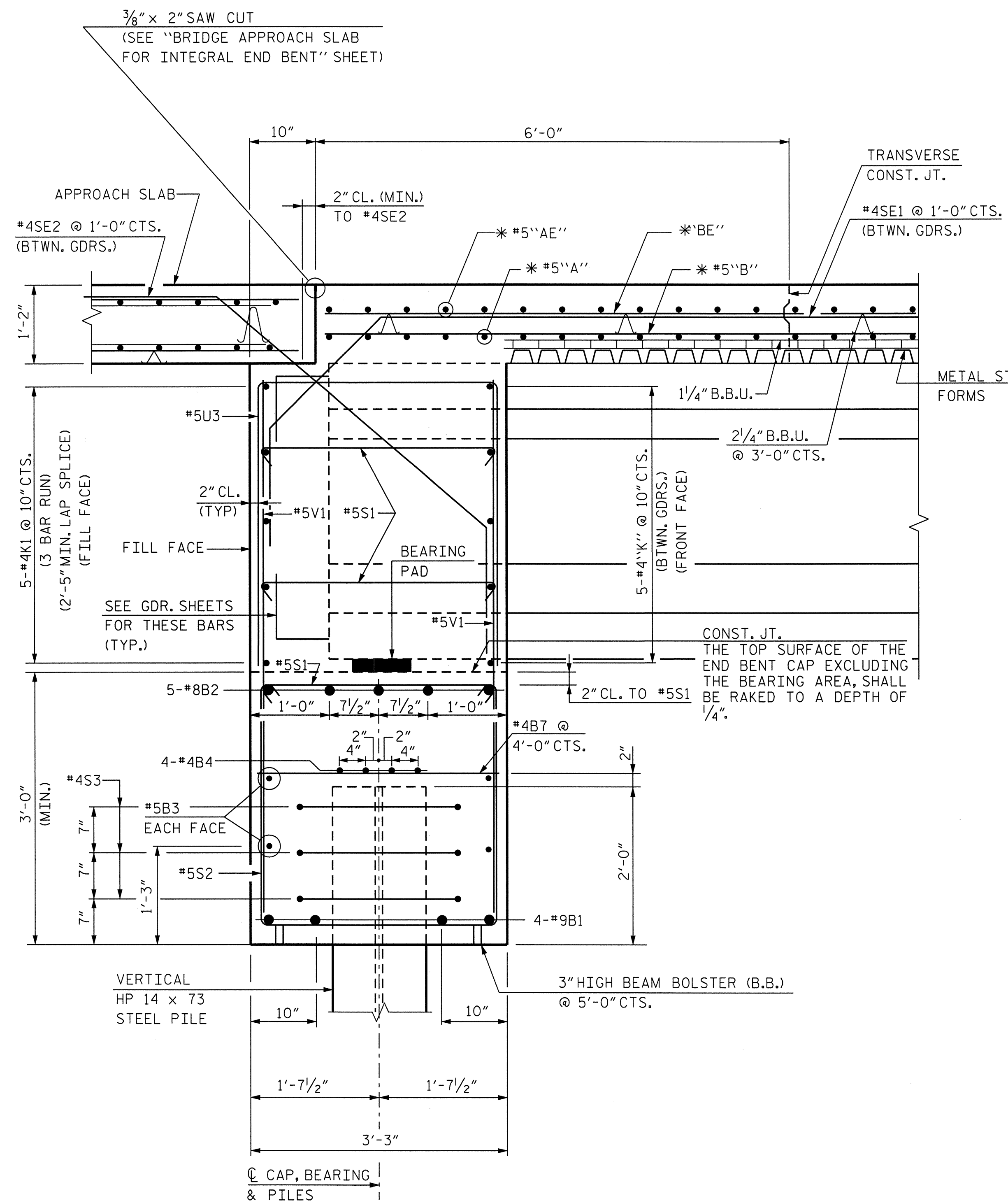
DRAWN BY: C.J. PIPER DATE: NOV. 11
 CHECKED BY: K.M. WING DATE: NOV. 11

* BARS ARE PLACED ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

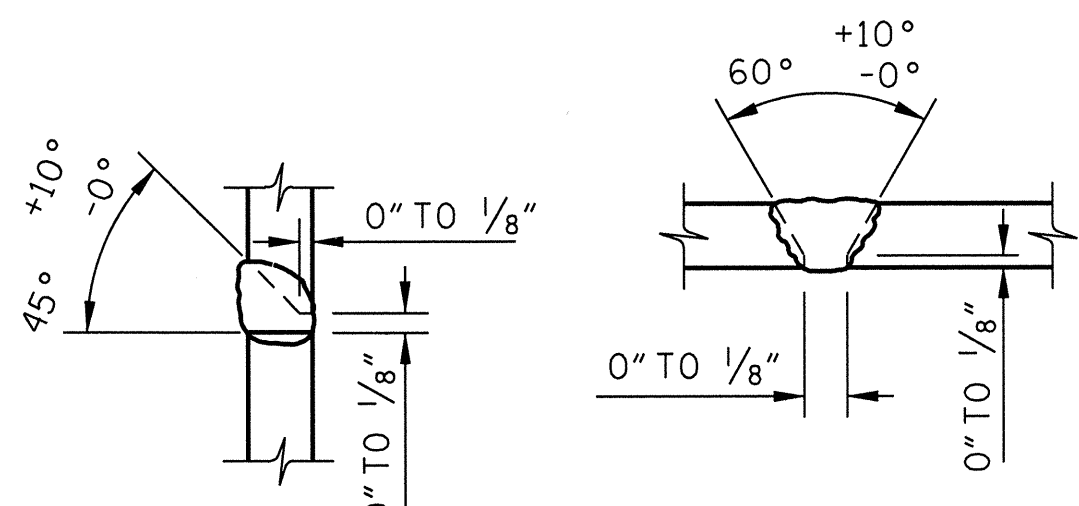


CONCRETE QUANTITY DETAIL

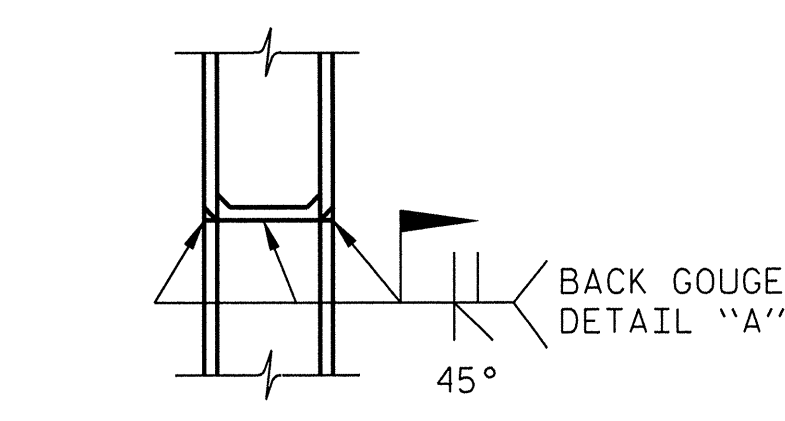
NOTE: CONCRETE QUANTITIES OF INTEGRAL END BENT CAP ABOVE CONSTRUCTION JOINT ARE INCLUDED IN SUPERSTRUCTURE QUANTITIES. REINFORCING STEEL IN THESE AREAS IS INCLUDED IN THE END BENT QUANTITIES.



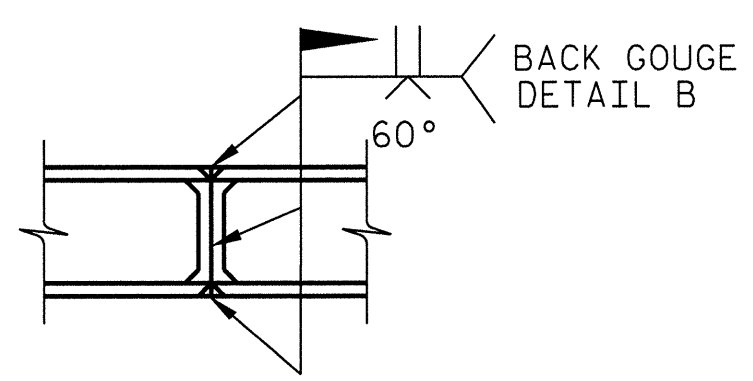
SECTION A-A
(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)



DETAIL "A" DETAIL "B"



* PILE VERTICAL

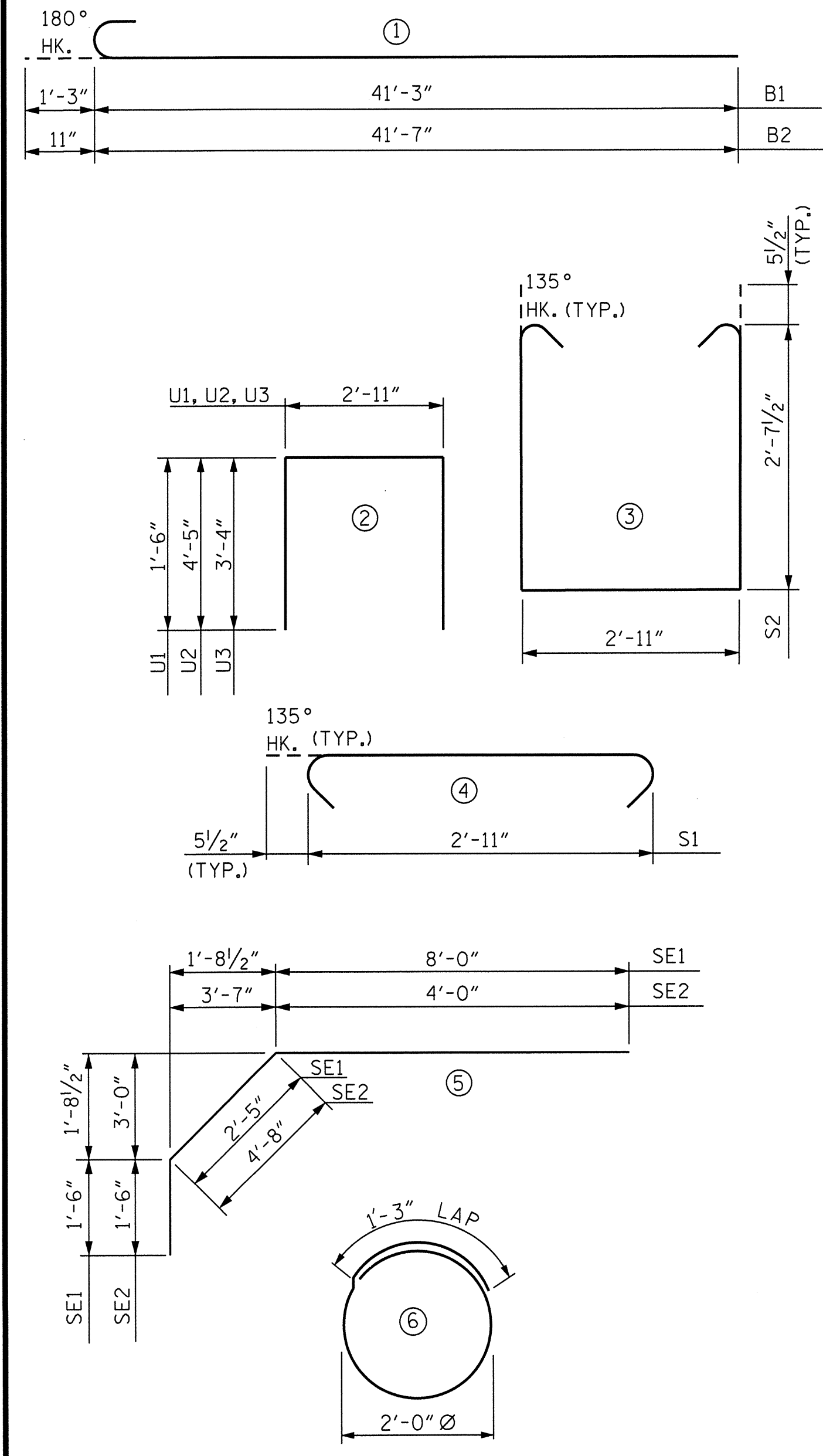


* PILE HORIZONTAL OR VERTICAL

PILE SPLICE DETAILS

* POSITION OF PILE DURING WELDING.

BAR TYPES



NOTES:
ALL BAR DIMENSIONS ARE OUT TO OUT.
QUANTITIES SHOWN ARE FOR ONE END BENT.

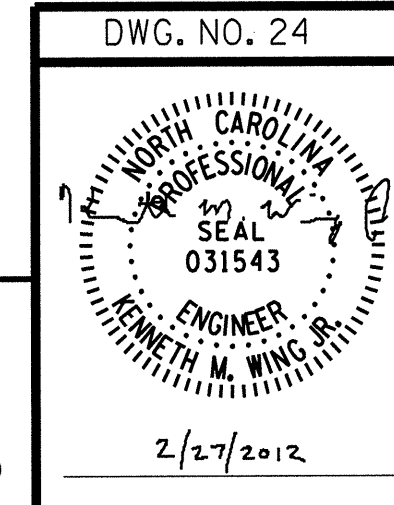
BILL OF MATERIAL

END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	42'-6"	1156
B2	10	#8	1	42'-6"	1135
B3	8	#5	STR.	39'-7"	330
B4	12	#4	STR.	27'-0"	216
B5	10	#4	STR.	13'-0"	87
B6	5	#4	STR.	21'-0"	70
B7	19	#4	STR.	2'-11"	37
K1	15	#4	STR.	27'-0"	271
K2	3	#4	STR.	2'-11"	6
K3	2	#4	STR.	4'-8"	6
K4	2	#4	STR.	4'-0"	5
K5	3	#4	STR.	2'-11"	6
K6	2	#4	STR.	4'-8"	6
K7	2	#4	STR.	4'-0"	5
K8	7	#4	STR.	7'-8"	36
K9	14	#4	STR.	8'-5"	79
K10	14	#4	STR.	7'-2"	67
S1	206	#5	4	3'-10"	824
S2	74	#5	3	9'-1"	701
S3	30	#4	6	7'-5"	149
SE1	56	#4	5	11'-11"	446
SE2	56	#4	5	10'-2"	380
U1	40	#4	2	5'-11"	158
U2	6	#5	2	11'-9"	74
U3	60	#5	2	9'-7"	600
V1	132	#5	STR.	6'-3"	861
V2	10	#5	STR.	6'-4"	66
V3	6	#5	STR.	6'-10"	43
EPOXY COATED REINFORCING STEEL					826 LBS.
REINFORCING STEEL					6,994 LBS.
CLASS "A" CONCRETE POUR 1 (CAP)					30.8 C.Y.
HP 14 x 73 STEEL PILES					
NO.					10
LIN. FEET					700
E = EPOXY COATED STEEL					

PROJECT NO. U-5132
ONSLow COUNTY
STATION: STA. 31+48.82 -L- P.O.C.

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 2
DETAILS AND
BILL OF MATERIAL



RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NUMBER: F-0112

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			26

2/27/2012 m:\projects\2009\09012_camplejeune\U5132.nc24\structures\nc24\dgn\final\U5132_sd_eb2d.dgn

DRAWN BY: C.J. PIPER DATE: NOV. 11
CHECKED BY: K.M. WING DATE: NOV. 11

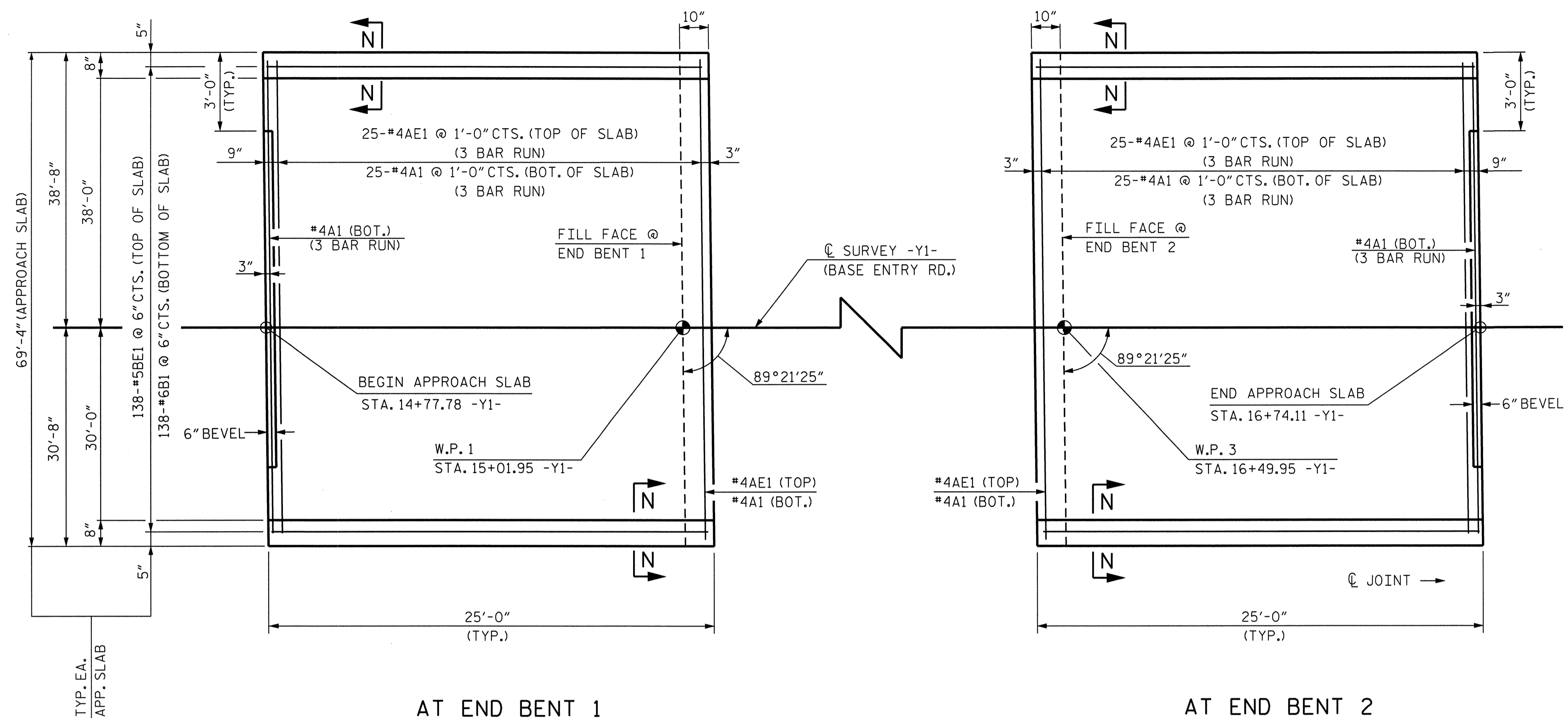
NOTES

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

FOR REINFORCED BRIDGE APPROACH FILL FABRIC WALL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

AREA BETWEEN THE MSE RETAINING WALL 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.

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWS 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.

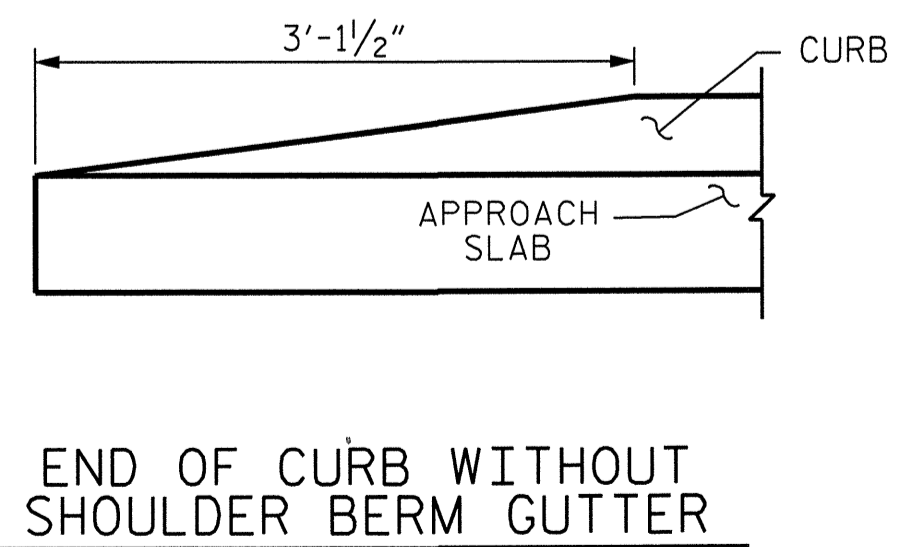
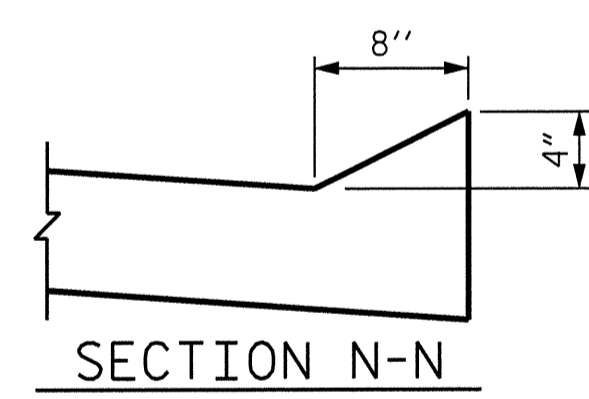
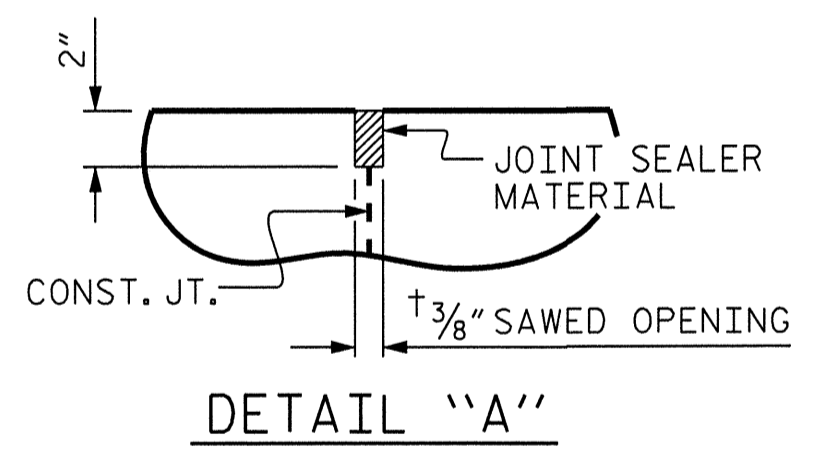
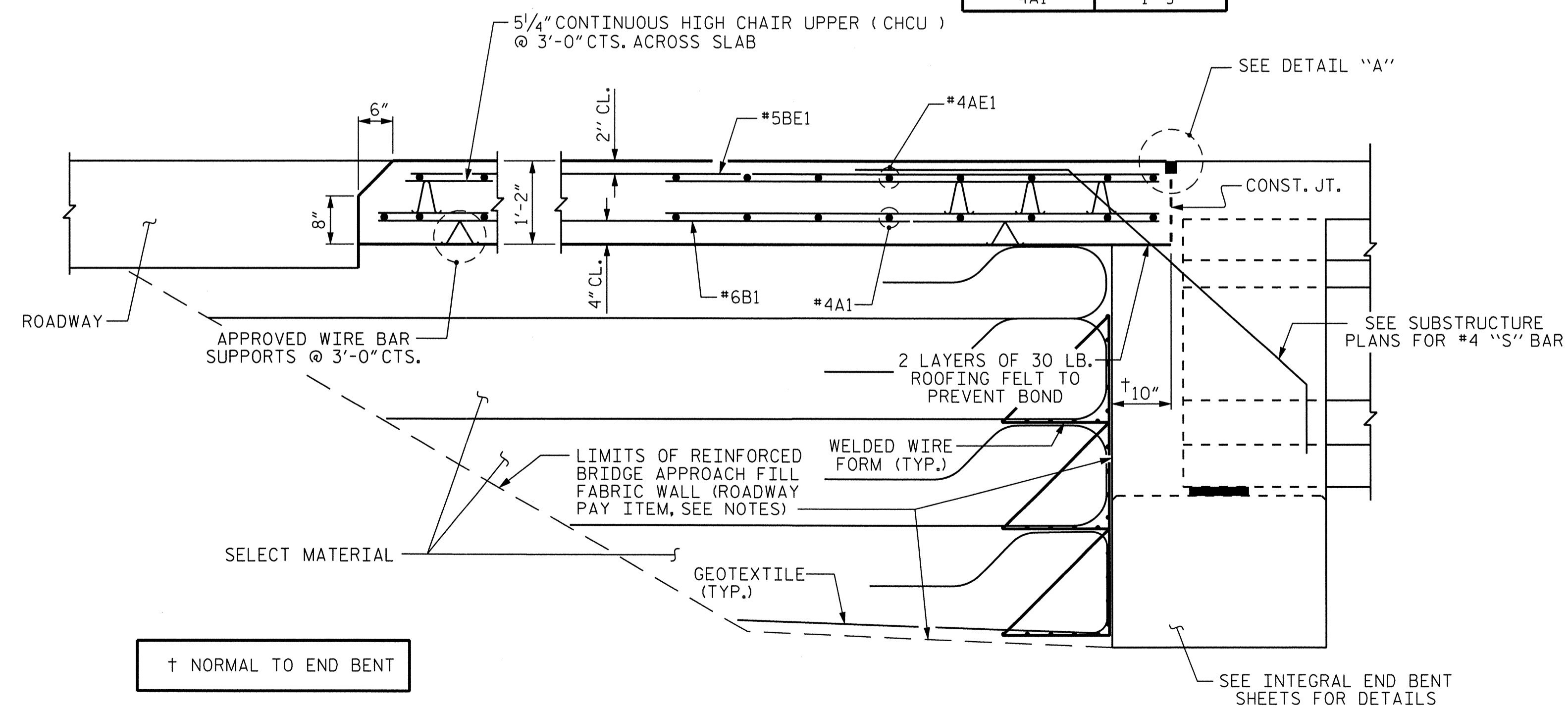


AT END BENT 1

AT END BENT 2

PLAN OF APPROACH SLABS

MINIMUM SPLICE LENGTH	
#4AE1	2'-0"
#4A1	1'-9"



PROJECT NO. U-5132
ONSLOW COUNTY
 STATION: STA. 31+48.82 -L- P.O.C.

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
STANDARD
BRIDGE APPROACH SLAB
FOR INTEGRAL END BENT

DWG. NO. 25

2/27/2012

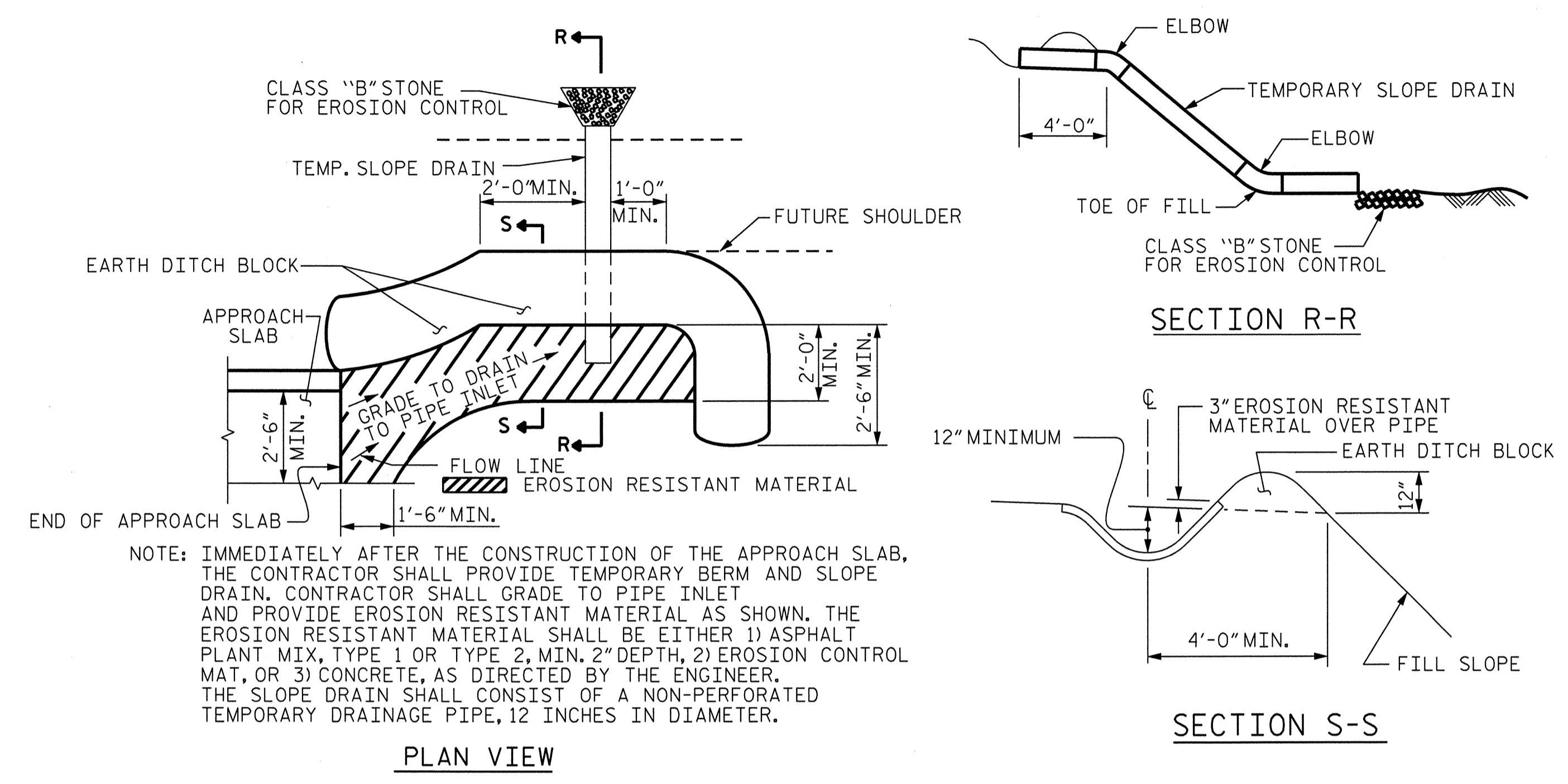
RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			26

2/27/2012 m:\projects\2009\09012.complejeune\5132.nc24\structures\nc24\dgn\final\U5132_sd.op1.dgn
 2/27/2012

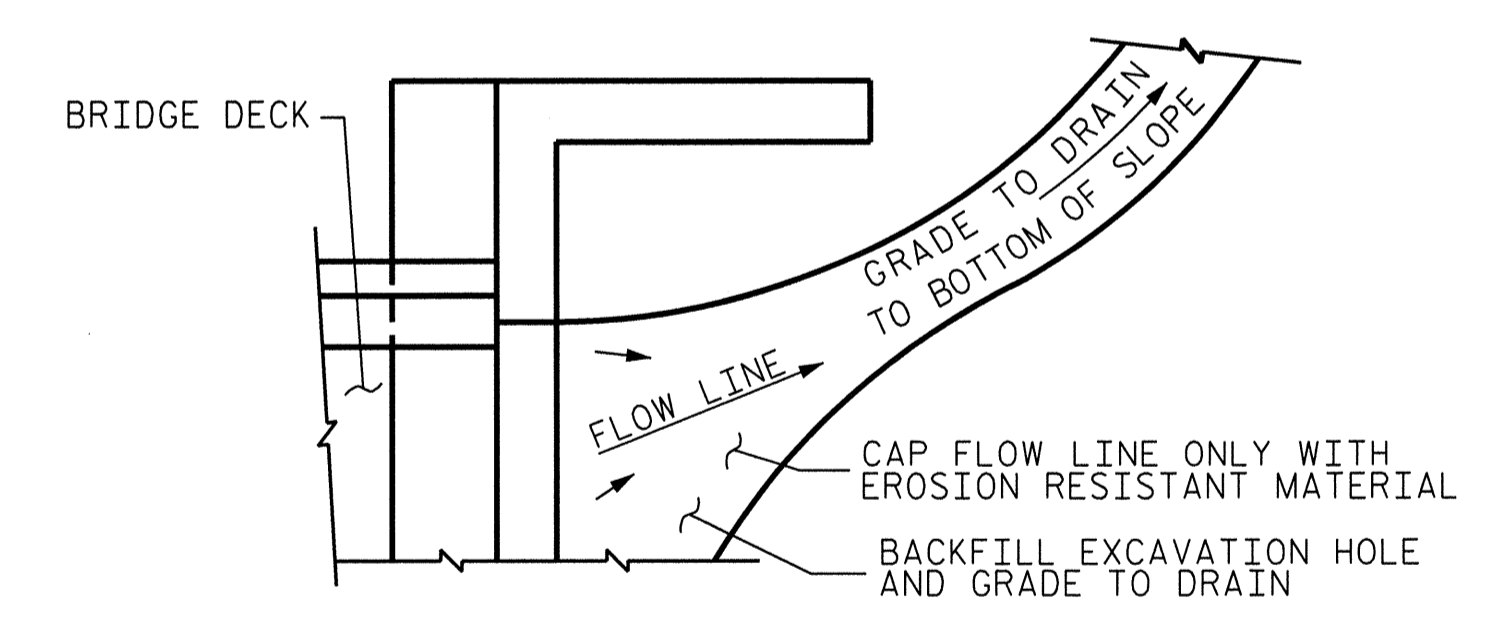
DRAWN BY : TLA	10/05	ADDED 5/1/06RR	KMM/GM
CHECKED BY : GM	5/06	REV. 10/1/11	MAA/GM
DRAWN BY : C.J. PIPER	DATE : NOV. 11		
CHECKED BY : K.M. WING	DATE : NOV. 11		

BILL OF MATERIAL					
FOR ONE APPROACH SLAB (2 REQ'D)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
AE1	75	#4	STR.	24'-4"	1219
A1	78	#4	STR.	24'-2"	1259
BE1	138	#5	STR.	24'-1"	3467
B1	138	#6	STR.	24'-7"	5096
REINFORCING STEEL					6,335 LBS.
EPOXY COATED REINFORCING STEEL					4,686 LBS.
CLASS AA CONCRETE					75.1 C. Y.



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.

TEMPORARY BERM AND SLOPE DRAIN DETAILS



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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. U-5132
ONslow COUNTY
 STATION: STA. 31+48.82 -L- P.O.C.

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 BRIDGE APPROACH
 SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			26

DWG. NO. 26

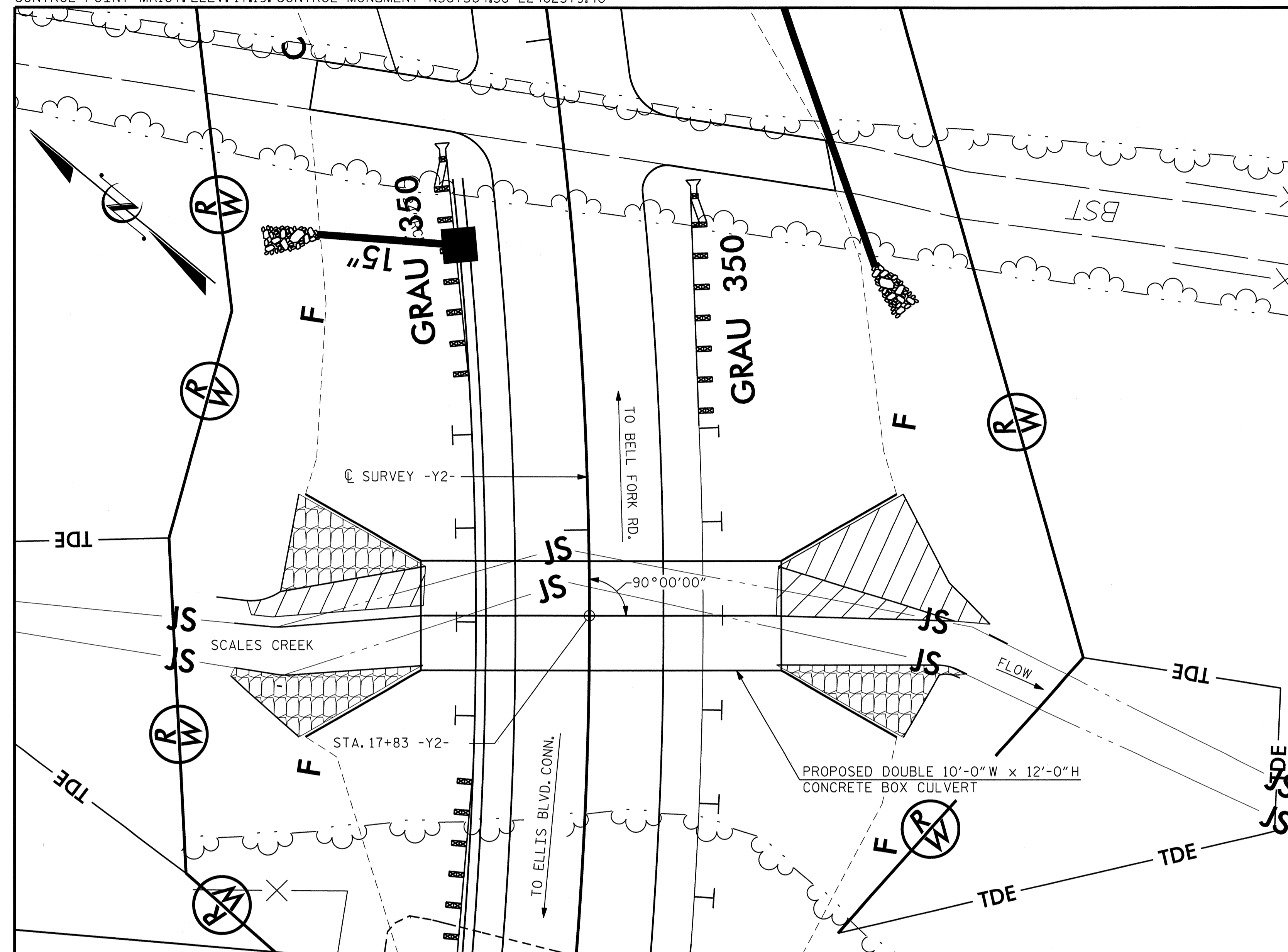
PROFESSIONAL ENGINEER
 SEAL
 031543
 W. M. WING, JR.

2/27/2012

RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

2/27/2012 m:\projects\2009\09012.cample\jeune\U5132.nc24\structures\nc24\dgn\Final\U5132.sd_cp2.dgn

DRAWN BY :	FCJ	11/88	REV. 10/17/00	RWW/LJS
CHECKED BY :	ARB	11/88	REV. 5/7/03	RWW/JTE
			REV. 5/1/06R	MAA/KMM
DRAWN BY :	C.J. PIPER	DATE :	NOV. 11	
CHECKED BY :	K.M. WING	DATE :	NOV. 11	

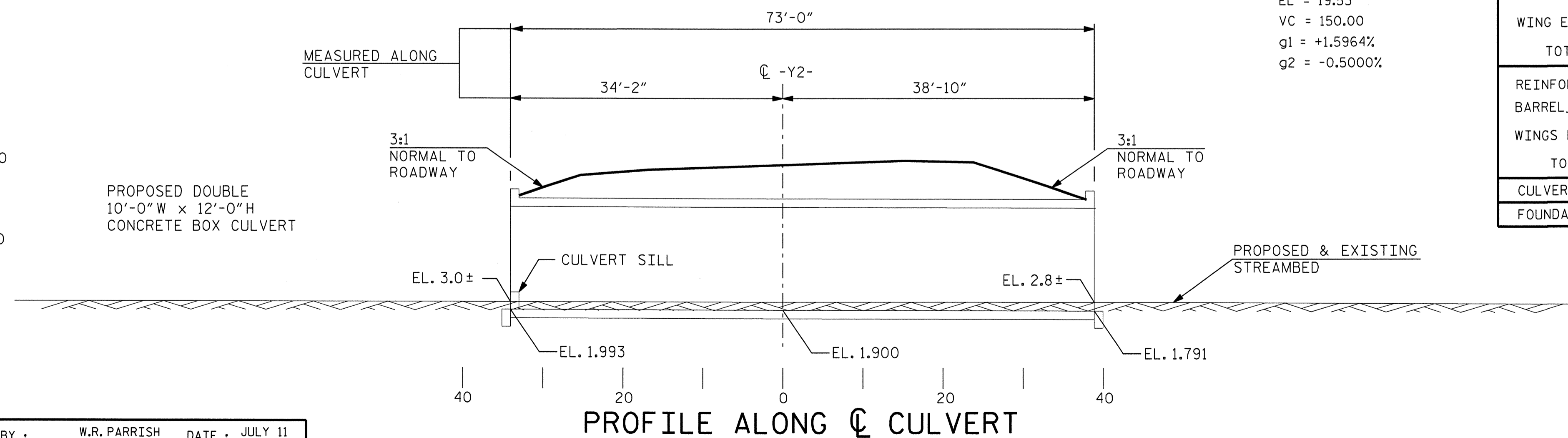


LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS
 GRADE POINT ELEVATION @ STA. 17+82.61 = 18.967
 BED ELEVATION @ STA. 17+82.61 = 2.900
 ROADWAY SLOPES = 3:1

-Y2- PROFILE DATA

VP1 = 16+70.00
 EL = 19.53
 VC = 150.00
 g1 = +1.5964%
 g2 = -0.5000%



PROFILE ALONG CULVERT

NOTES:

- ASSUMED LIVE LOAD -----HL-93 OR ALTERNATE LOADING.
- DESIGN FILL-----6.00 FT.
- FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.
- 3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:
 1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICALS.
 2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.
- THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.

STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION, EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS, EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

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 EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

AT THE CONTRACTOR'S OPTION HE MAY SUBMIT, TO THE ENGINEER FOR APPROVAL, DESIGN AND DETAIL DRAWINGS FOR A PRECAST REINFORCED CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE CULVERT SHOWN ON THE PLANS. THE DESIGN SHALL PROVIDE THE SAME SIZE AND NUMBER OF BARRELS AS USED ON THE CAST-IN-PLACE DESIGN. FOR OPTIONAL PRECAST REINFORCED CONCRETE BOX CULVERT, SEE SPECIAL PROVISIONS.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WINGS COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

FOR "FALSEWORK AND FORMWORK", "CRANE SAFETY", "GROUT FOR STRUCTURES", AND "SUBMITTAL OF WORKING DRAWINGS", SEE SPECIAL PROVISIONS.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE-----3,630 C.F.S.
 FREQUENCY OF OVERTOPPING FLOOD-----500 YR. +
 OVERTOPPING FLOOD ELEVATION-----18.8

HYDRAULIC DATA

DESIGN DISCHARGE-----900 C.F.S.
 FREQUENCY OF DESIGN FLOOD-----25 YR.
 DESIGN HIGH WATER ELEVATION-----15.7
 DRAINAGE AREA-----0.85 SQ. MI.
 BASIC DISCHARGE (Q100)-----1,200 C.F.S.
 BASIC HIGH WATER ELEVATION-----16.5

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE	
BARREL @	2,588 CY/FT 189.6 C.Y.
WING ETC.	87.6 C.Y.
TOTAL	277.2 C.Y.
REINFORCING STEEL	
BARREL	44,475 LBS.
WINGS ETC.	6,942 LBS.
TOTAL	51,417 LBS.
CULVERT EXCAVATION	LUMP SUM
FOUNDATION CONDITIONING MATERIAL	115 TONS

PROJECT NO. U-5132

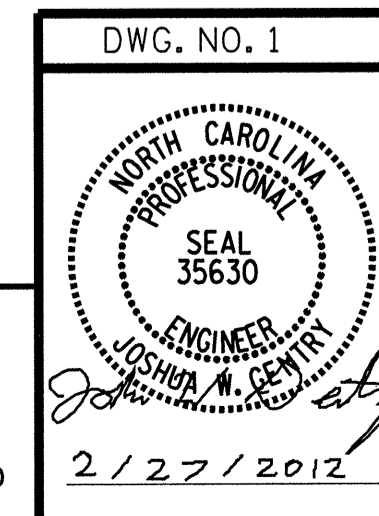
ONSLow COUNTY

STATION: STA. 17+83 -Y2-

SHEET 1 OF 5 BRIDGE NO. 309

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

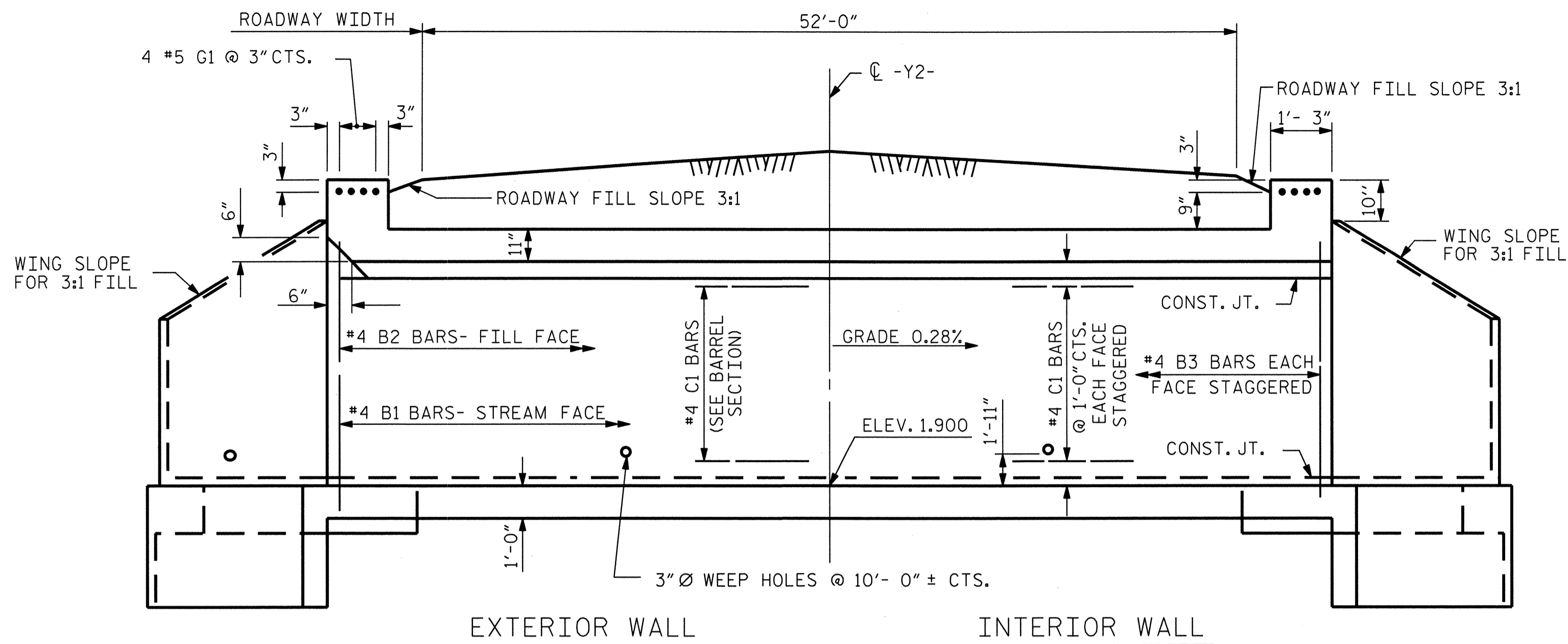
GENERAL DRAWING
 DOUBLE 10 FT. W x 12 FT. H
 CONCRETE BOX CULVERT
 90° SKEW



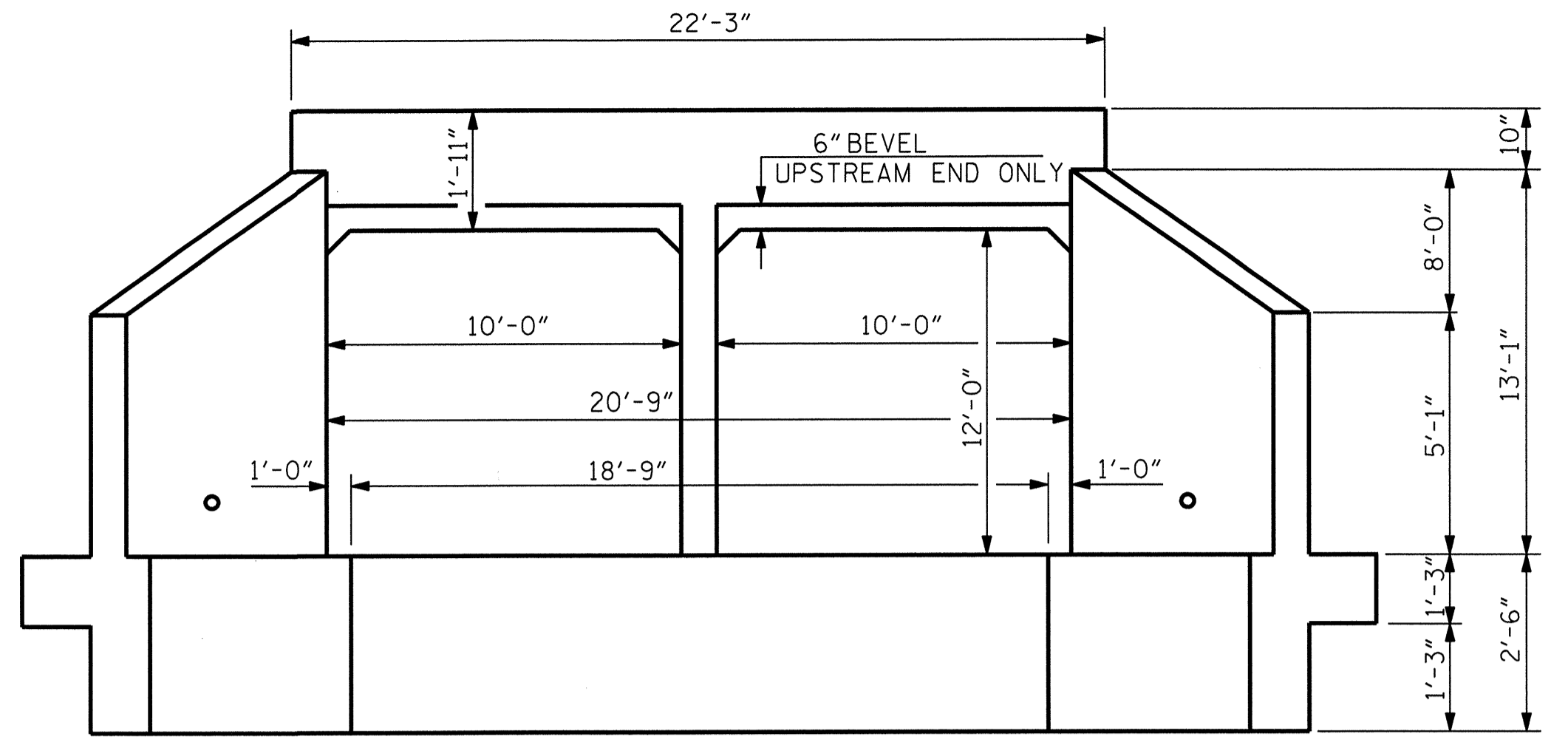
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-1
1			3			TOTAL SHEETS
2			4			5

2/27/2012 m:\projects\2009\09012_camplejeune\5132.nc24\structures\culvert at y2\cb12.dgn

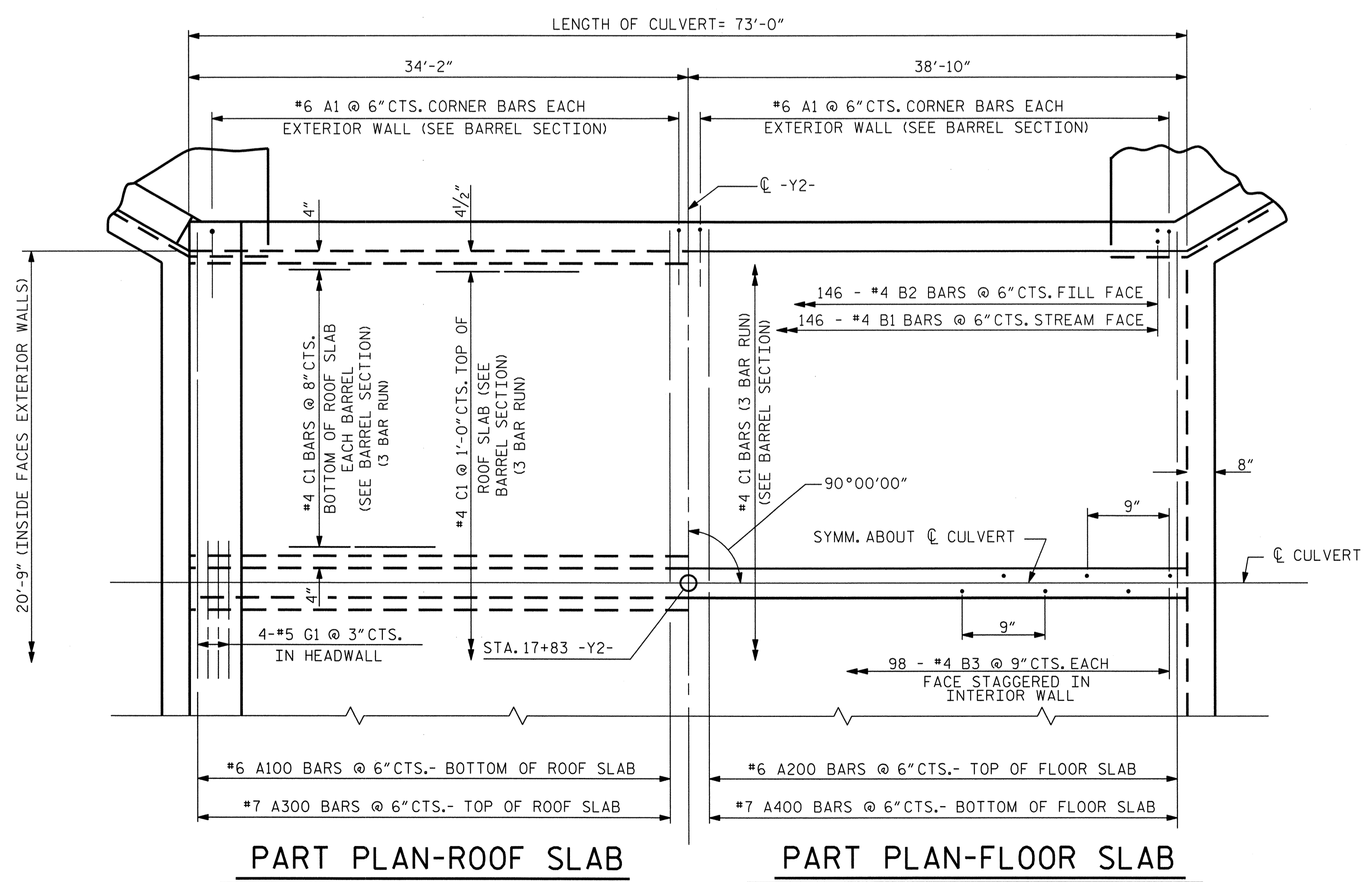
DRAWN BY: W.R. PARRISH DATE: JULY 11
 CHECKED BY: J.W. GENTRY DATE: JULY 11



CULVERT SECTION NORMAL TO ROADWAY

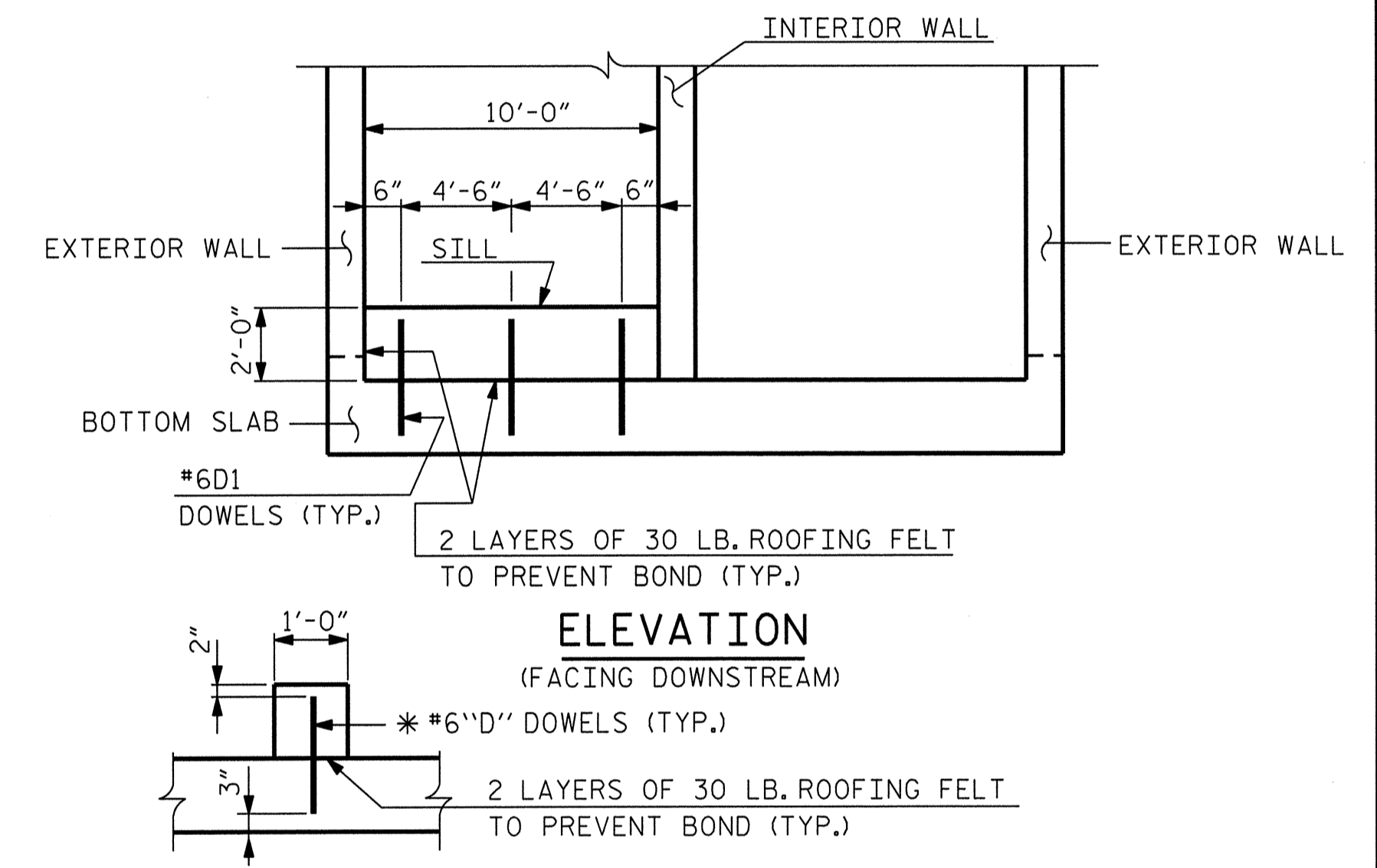


END ELEVATION



PART PLAN-ROOF SLAB

PART PLAN-FLOOR SLAB



CULVERT SILL DETAILS

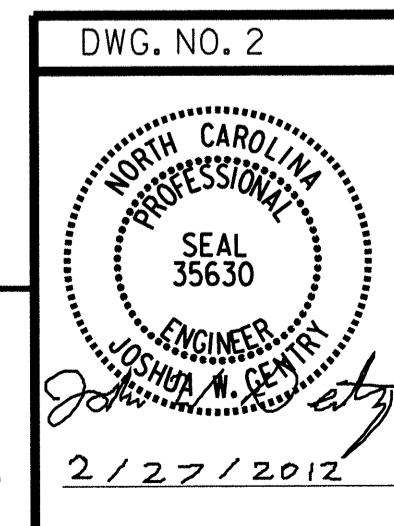
SECTION THROUGH SILL
 *DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED

PROJECT NO. U-5132
ONSLow COUNTY
 STATION: STA. 17+83 -Y2-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**BARREL STANDARD
 DOUBLE 10 FT. W x 12 FT. H
 CONCRETE BOX CULVERT
 90° SKEW**



RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

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

2/27/2012 m:\projects\2009\09012_camplejeune\5132_nc24\structures\culvert at y2\cbi2A.dgn

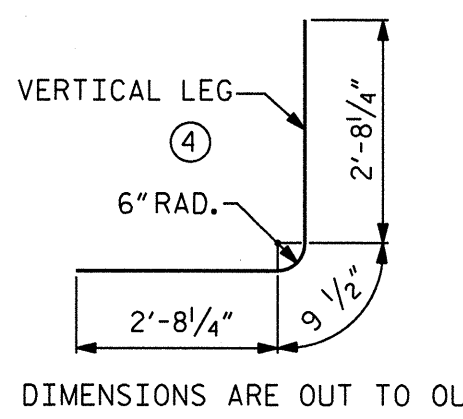
DRAWN BY: W.R. PARRISH DATE: JULY 11
 CHECKED BY: J.W. GENTRY DATE: JULY 11

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	584	#6	4	6'-2"	5409
A100	146	#6	STR.	21'-11"	4806
A200	146	#6	STR.	21'-11"	4806
A300	146	#7	STR.	21'-11"	6540
A400	146	#7	STR.	21'-11"	6540
B1	292	#4	STR.	13'-5"	2617
B2	292	#4	STR.	11'-2"	2178
B3	196	#4	STR.	13'-5"	1757
C1	567	#4	STR.	25'-5"	9627
D1	3	#6	STR.	2'-7"	12
G1	8	#5	STR.	21'-11"	183

REINFORCING STEEL 44,475 LBS.

BAR TYPE



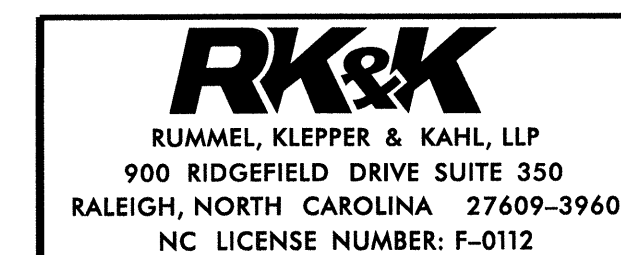
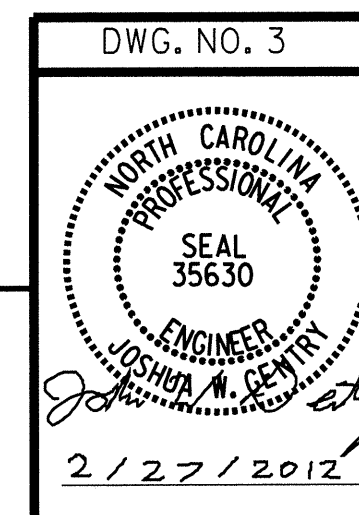
SPLICE LENGTHS

BAR	SIZE	SPLICE LENGTHS
A100	#6	2'-9"
A200	#6	2'-9"
A300	#7	3'-9"
A400	#7	3'-9"
B1	#4	1'-9"
B3	#4	1'-9"
C1	#4	1'-9"

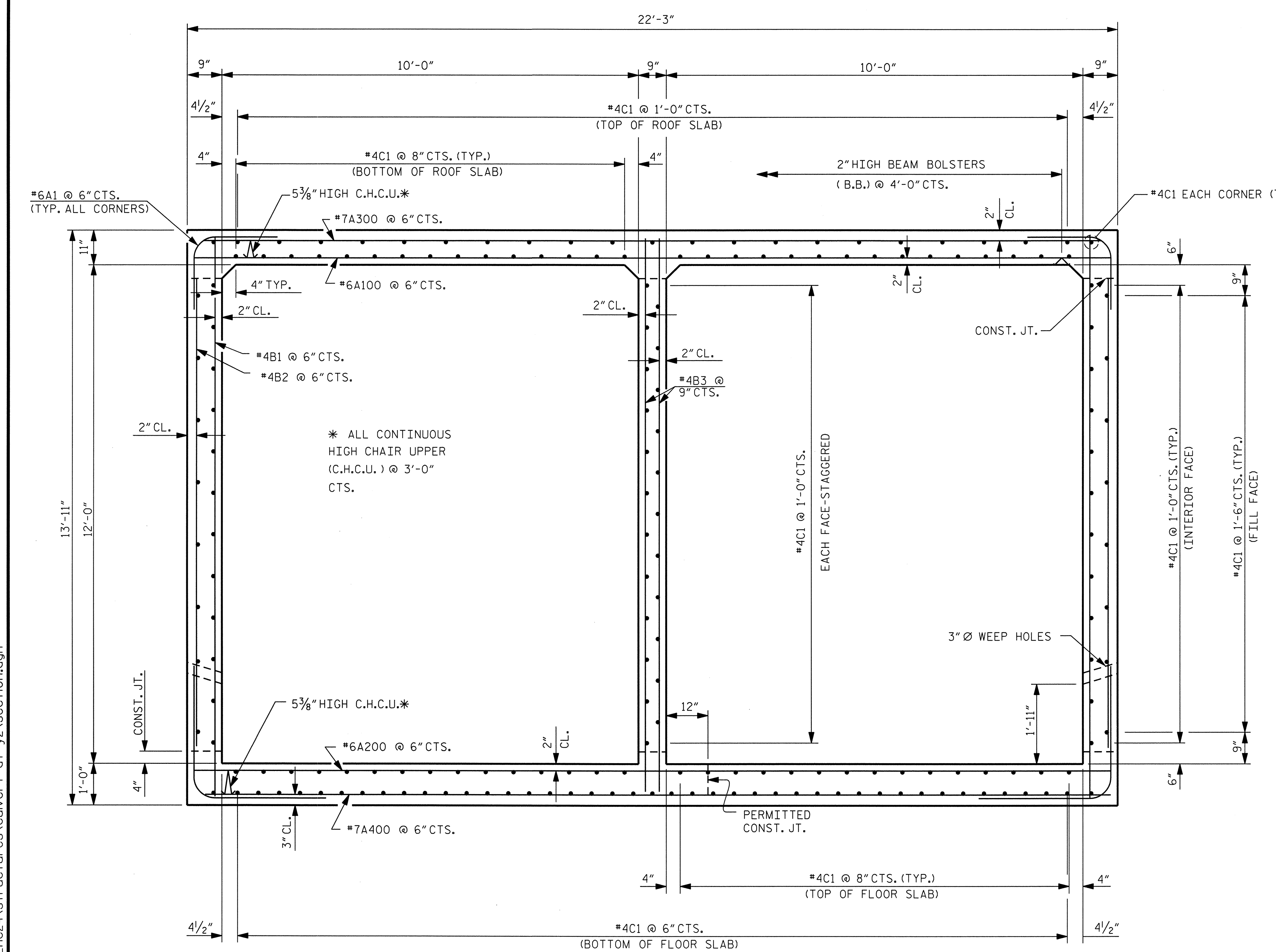
PROJECT NO. U-5132
 ONSLOW COUNTY
 STATION: STA. 17+83 -Y2-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 TYPICAL SECTION
 DOUBLE
 10 FT. W X 12 FT. H
 CONCRETE BOX CULVERT



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

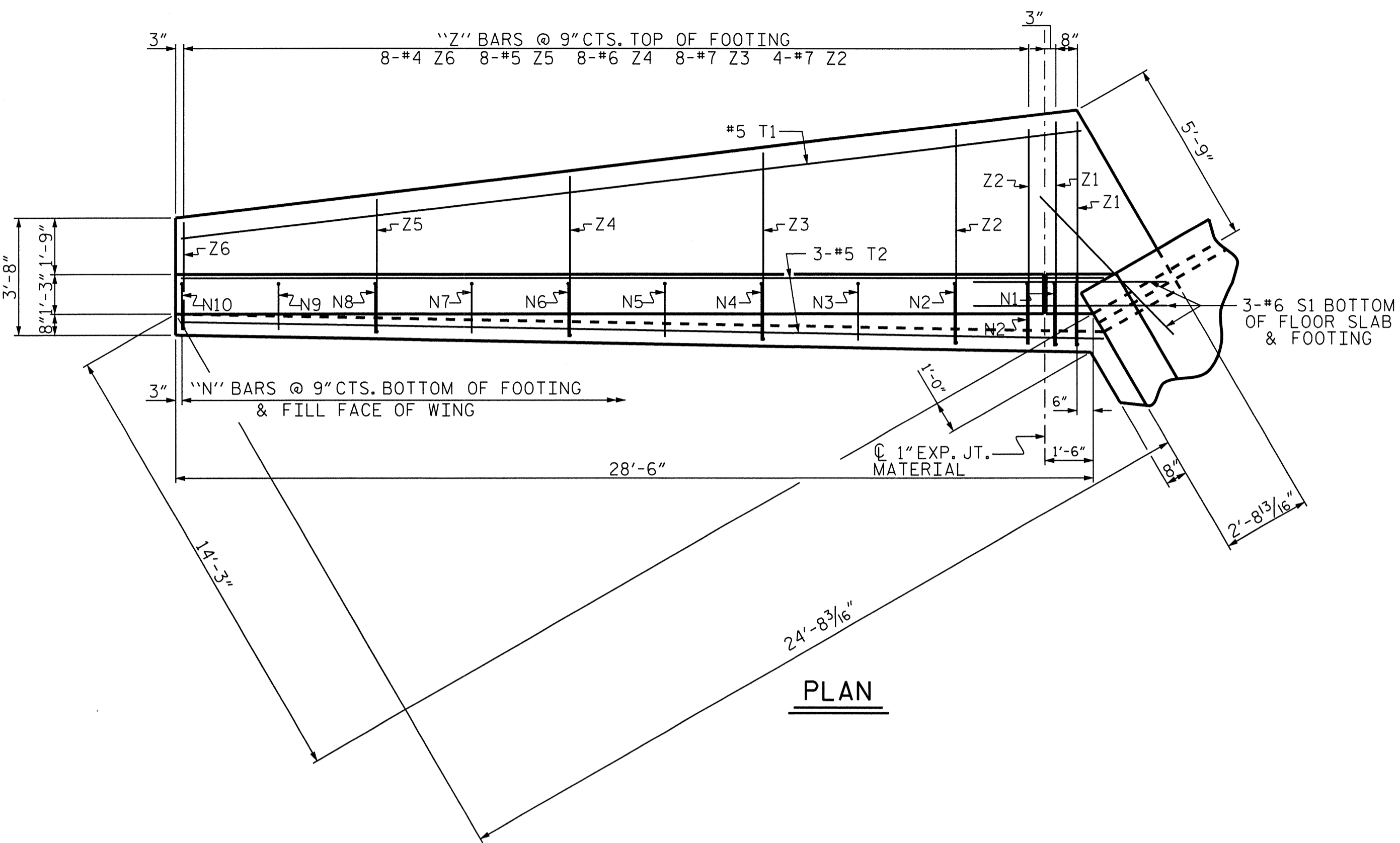


RIGHT ANGLE SECTION OF BARREL
 THERE ARE 189 "C" BARS IN SECTION OF BARREL.

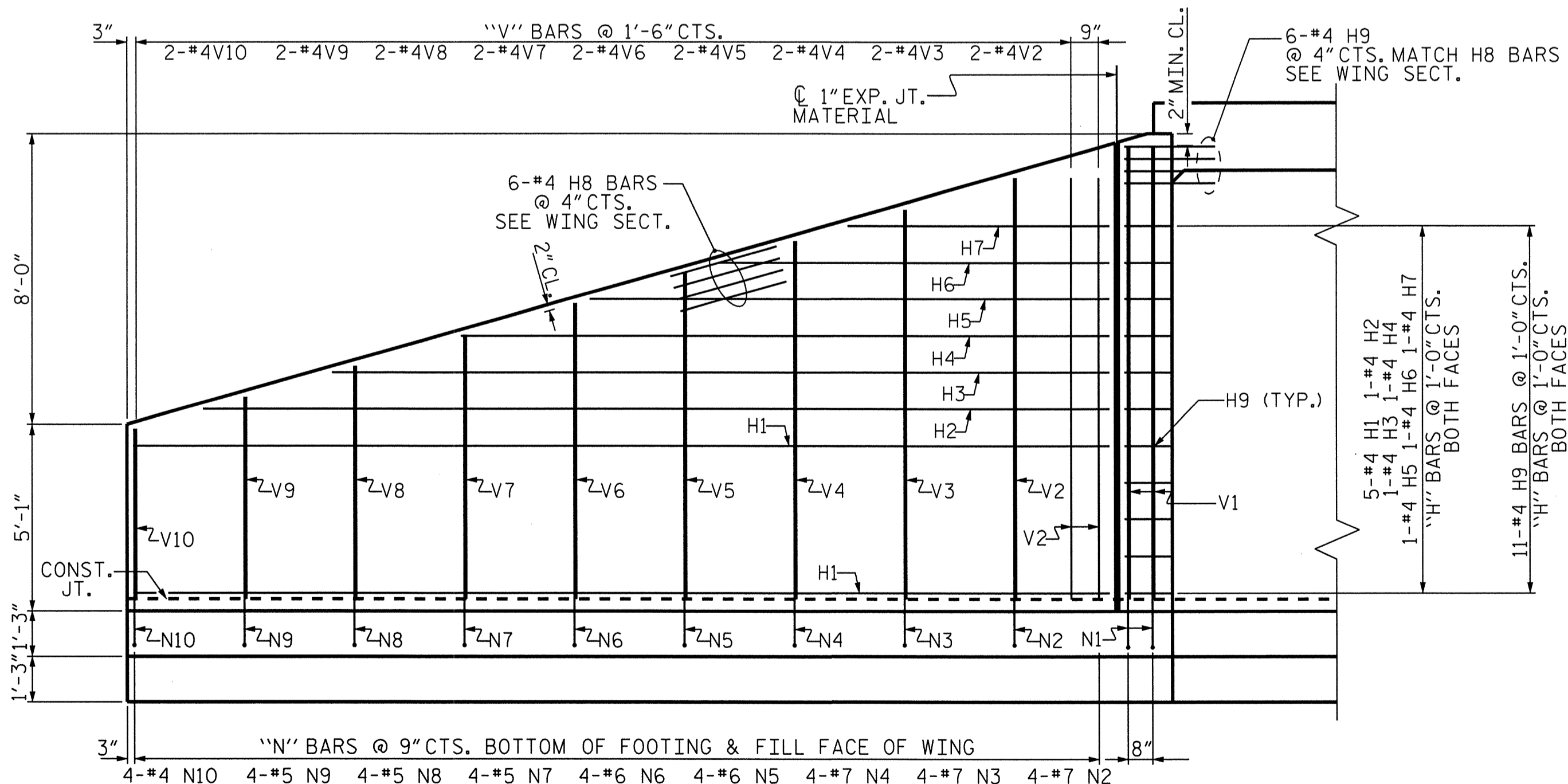
2/27/2012 m:\projects\2009\09012_complete\jeune\U5132.nc24\structures\culvert at y2\section.dgn

DRAWN BY: W.R. PARRISH DATE: JULY 11
 CHECKED BY: J.W. GENTRY DATE: JULY 11

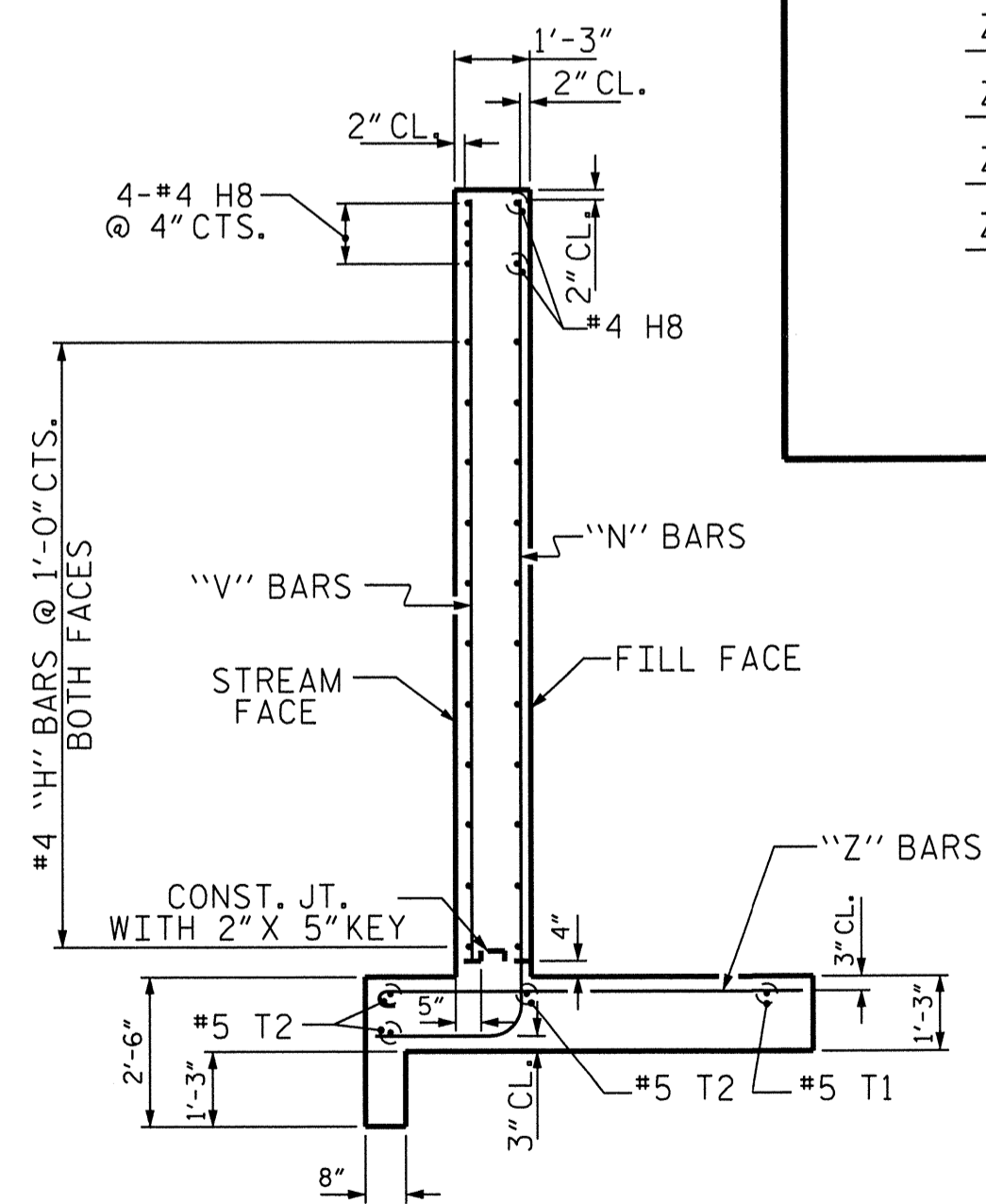
2/27/2012
 m:\projects\2009\09012.cml\jeune\5132.nc24\structures\culvert at y2\cwg9011.dgn



PLAN



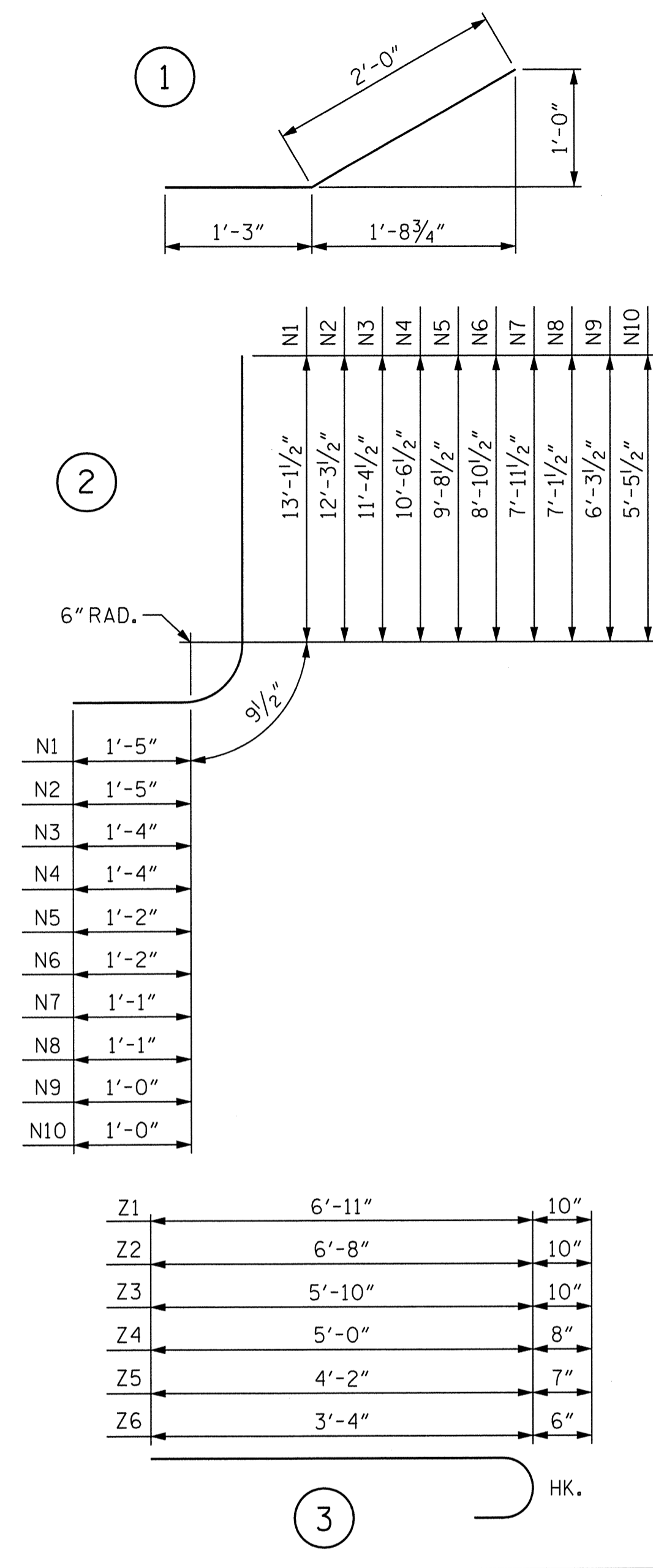
ELEVATION



TYPICAL WING SECTION

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	40	#4	STR	26'-7"	710
H2	8	#4	STR	24'-8"	132
H3	8	#4	STR	21'-2"	113
H4	8	#4	STR	17'-8"	94
H5	8	#4	STR	14'-2"	76
H6	8	#4	STR	10'-7"	57
H7	8	#4	STR	7'-1"	38
H8	24	#4	STR	27'-8"	444
H9	112	#4	1	3'-3"	243
N1	8	#7	2	15'-4"	251
N2	16	#7	2	14'-6"	474
N3	16	#7	2	13'-6"	442
N4	16	#7	2	12'-8"	414
N5	16	#6	2	11'-8"	280
N6	16	#6	2	10'-10"	260
N7	16	#5	2	9'-10"	164
N8	16	#5	2	9'-0"	150
N9	16	#5	2	8'-1"	135
N10	16	#4	2	7'-3"	77
S1	12	#6	STR	6'-0"	108
T1	4	#5	STR	28'-2"	118
T2	12	#5	STR	28'-8"	359
V1	8	#4	STR	12'-4"	66
V2	12	#4	STR	11'-5"	92
V3	8	#4	STR	10'-7"	57
V4	8	#4	STR	9'-9"	52
V5	8	#4	STR	8'-10"	47
V6	8	#4	STR	8'-0"	43
V7	8	#4	STR	7'-2"	38
V8	8	#4	STR	6'-4"	34
V9	8	#4	STR	5'-5"	29
V10	8	#4	STR	4'-7"	24
Z1	8	#7	3	7'-9"	127
Z2	16	#7	3	7'-6"	245
Z3	32	#7	3	6'-8"	436
Z4	32	#6	3	5'-8"	272
Z5	32	#5	3	4'-9"	159
Z6	32	#4	3	3'-10"	82

REINFORCING STEEL FOR 4 WINGS		6,942 LBS
CLASS A CONCRETE		
4 WINGS		82.8 CY
2 HEADWALLS		2.1 CY
2 END CURTAIN WALLS		2.7 CY
TOTAL		87.6 CY

PROJECT NO. U-5132
 ONSLOW COUNTY
 STATION: STA. 17+83 -Y2-

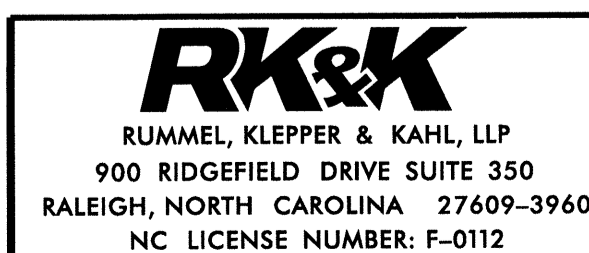
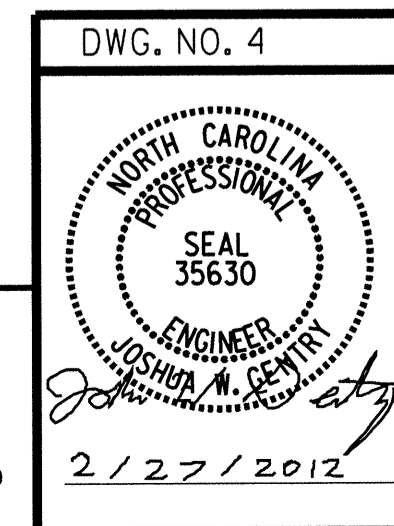
SHEET 4 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

WINGS FOR
 CONCRETE BOX CULVERT

H=12'-0" SLOPE = 3:1
 90° SKEW

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



DRAWN BY: W.R. PARRISH DATE: JULY 11
 CHECKED BY: J.W. GENTRY DATE: JULY 11

**LOAD AND RESISTANCE FACTOR RATING (LRFR)
SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS**

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE								COMMENT NUMBER		
						MOMENT				SHEAR						
						LIVE-LOAD FACTORS (LL)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE		DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	1	1.00	--	1.75	2.87	1	TOP SLAB	5.0	1.00	1	BOTTOM SLAB	9.2		
	HL-93 (OPERATING)	N/A		1.28	--	1.35	3.72	1	TOP SLAB	5.0	1.28	1	BOTTOM SLAB	9.2		
	HS-20 (INVENTORY)	36.000	2	1.21	43.56	1.75	3.28	1	EXT. WALL	6.0	1.21	1	BOTTOM SLAB	9.2		
	HS-20 (OPERATING)	36.000		1.57	56.52	1.35	4.25	1	EXT. WALL	6.0	1.57	1	BOTTOM SLAB	9.2		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		2.32	31.32	1.40	4.13	1	EXT. WALL	6.0	2.32	1	TOP SLAB	0.8		
		SNGARBS2	20.000		2.19	43.80	1.40	4.13	1	EXT. WALL	6.0	2.19	1	TOP SLAB	0.8	
		SNAGRIS2	22.000		2.08	45.76	1.40	4.13	1	EXT. WALL	6.0	2.08	1	BOTTOM SLAB	9.2	
		SNCOTTS3	27.250		1.36	37.06	1.40	3.17	1	EXT. WALL	12.0	1.36	1	TOP SLAB	0.8	
		SNAGGRS4	34.925		1.36	47.50	1.40	3.48	1	EXT. WALL	12.0	1.36	1	BOTTOM SLAB	9.2	
		SNS5A	35.550		1.41	50.13	1.40	3.39	1	EXT. WALL	12.0	1.41	1	BOTTOM SLAB	9.2	
		SNS6A	39.950		1.34	53.53	1.40	3.38	1	EXT. WALL	12.0	1.34	1	BOTTOM SLAB	9.2	
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	SNS7B	42.000		1.27	53.34	1.40	3.38	1	EXT. WALL	12.0	1.27	1	BOTTOM SLAB	9.2	
		TNAGRIT3	33.000		1.60	52.80	1.40	4.13	1	EXT. WALL	6.0	1.60	1	BOTTOM SLAB	9.2	
		TNT4A	33.075		1.59	52.59	1.40	3.58	1	EXT. WALL	12.0	1.59	1	TOP SLAB	0.8	
		TNT6A	41.600		1.40	60.20	1.40	3.44	1	EXT. WALL	12.0	1.40	1	BOTTOM SLAB	9.2	
		TNT7A	42.000		1.37	61.65	1.40	3.52	1	EXT. WALL	12.0	1.37	1	BOTTOM SLAB	9.2	
		TNT7B	42.000		1.43	64.35	1.40	3.43	1	EXT. WALL	12.0	1.43	1	TOP SLAB	0.8	
		TNAGRIT4	43.000		1.38	57.41	1.40	3.58	1	EXT. WALL	12.0	1.38	1	BOTTOM SLAB	9.2	
TNAGT5A	45.000		1.38	57.96	1.40	3.57	1	EXT. WALL	12.0	1.38	1	BOTTOM SLAB	9.2			
TNAGT5B	45.000		3	1.13	47.46	1.40	3.57	1	EXT. WALL	12.0	1.13	1	BOTTOM SLAB	9.2		

LOAD FACTORS: _____

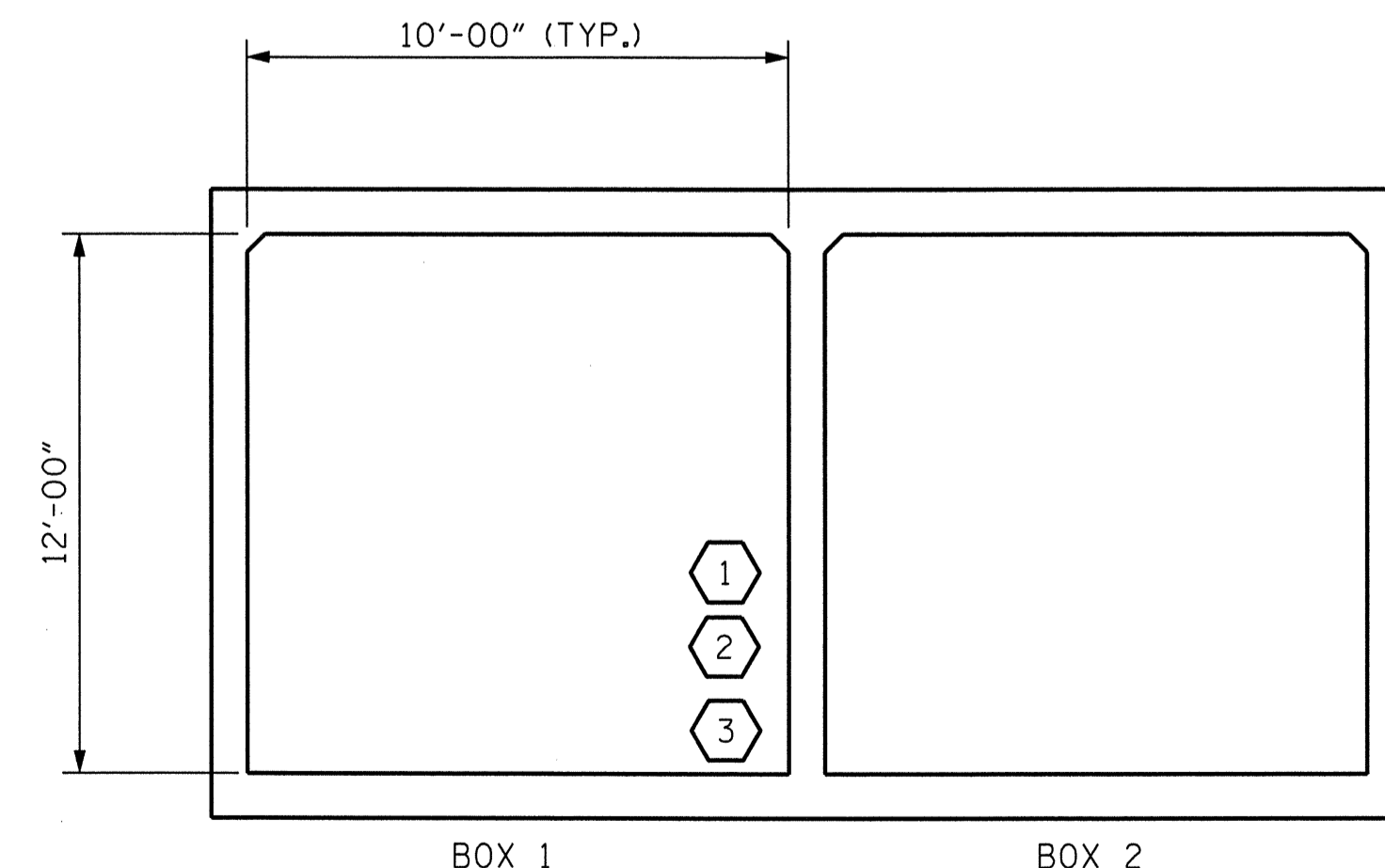
DESIGN LOAD RATING FACTORS

LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	--
WA	1.00	--

NOTE:
RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:
1. VERTICAL ELEMENTS ARE REFERENCED STARTING AT THE BOTTOM.
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	



LRFR SUMMARY
(LOOKING DOWNSTREAM)

PROJECT NO. U-5132
ONSLAW COUNTY
STATION: STA. 17+83 -Y2-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR
REINFORCED CONCRETE
BOX CULVERTS
(NON-INTERSTATE TRAFFIC)

DWG. NO. 5

NORTH CAROLINA
PROFESSIONAL
SEAL
35630
ENGINEER
JOSHUA A. GENTRY

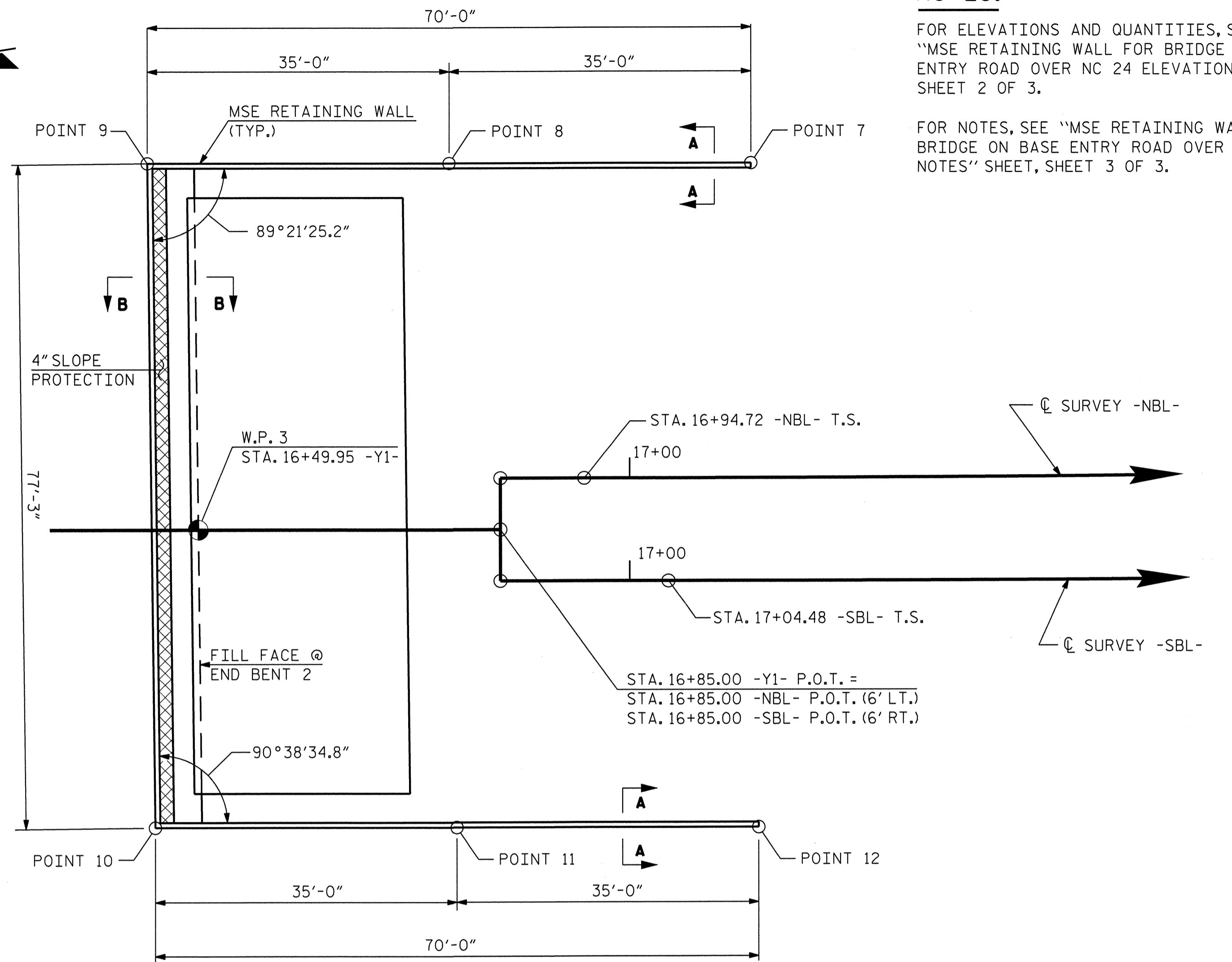
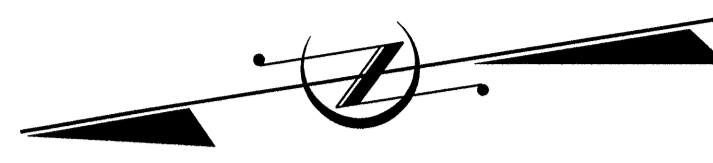
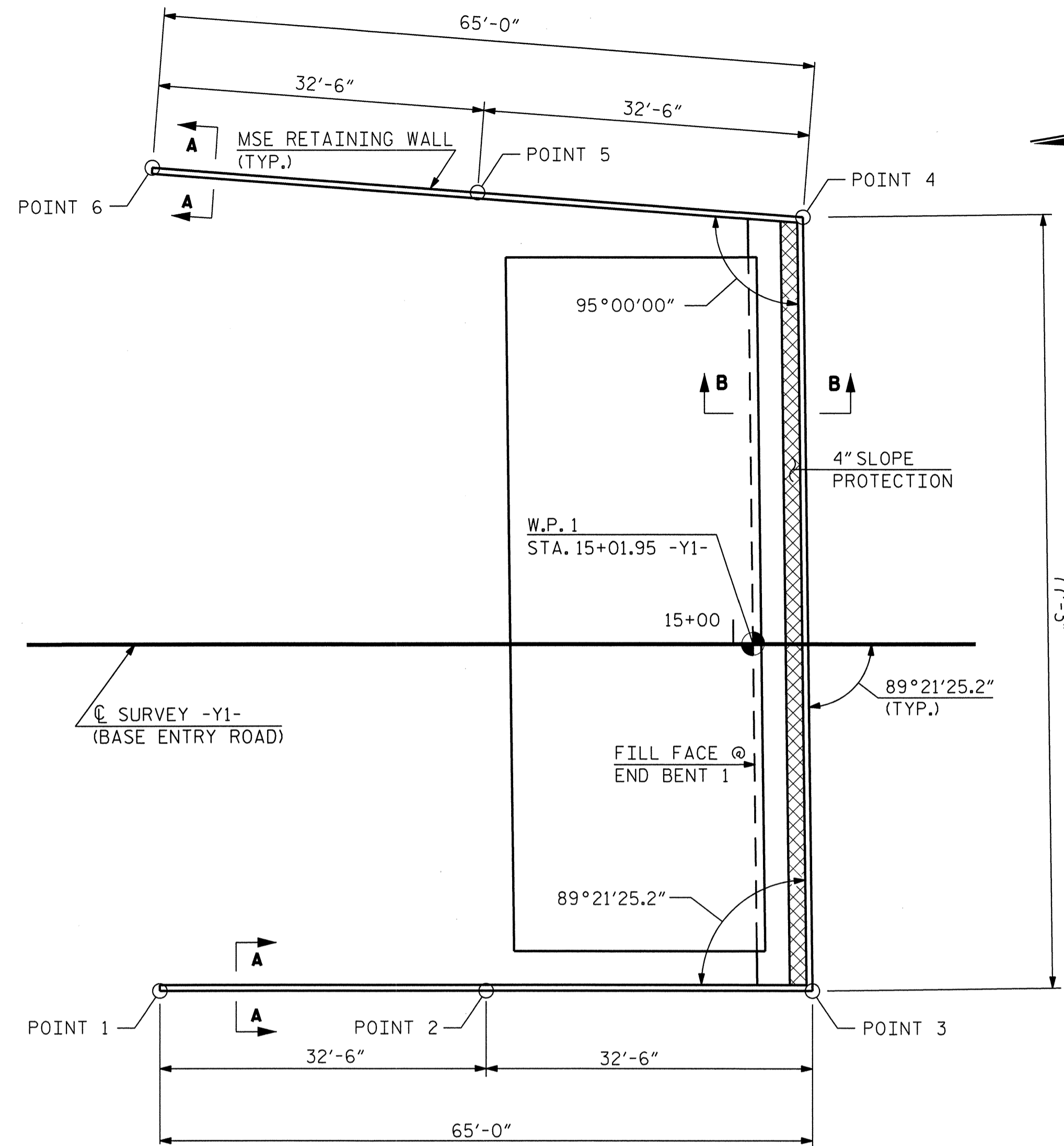
2/27/2012

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NUMBER: F-0112

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

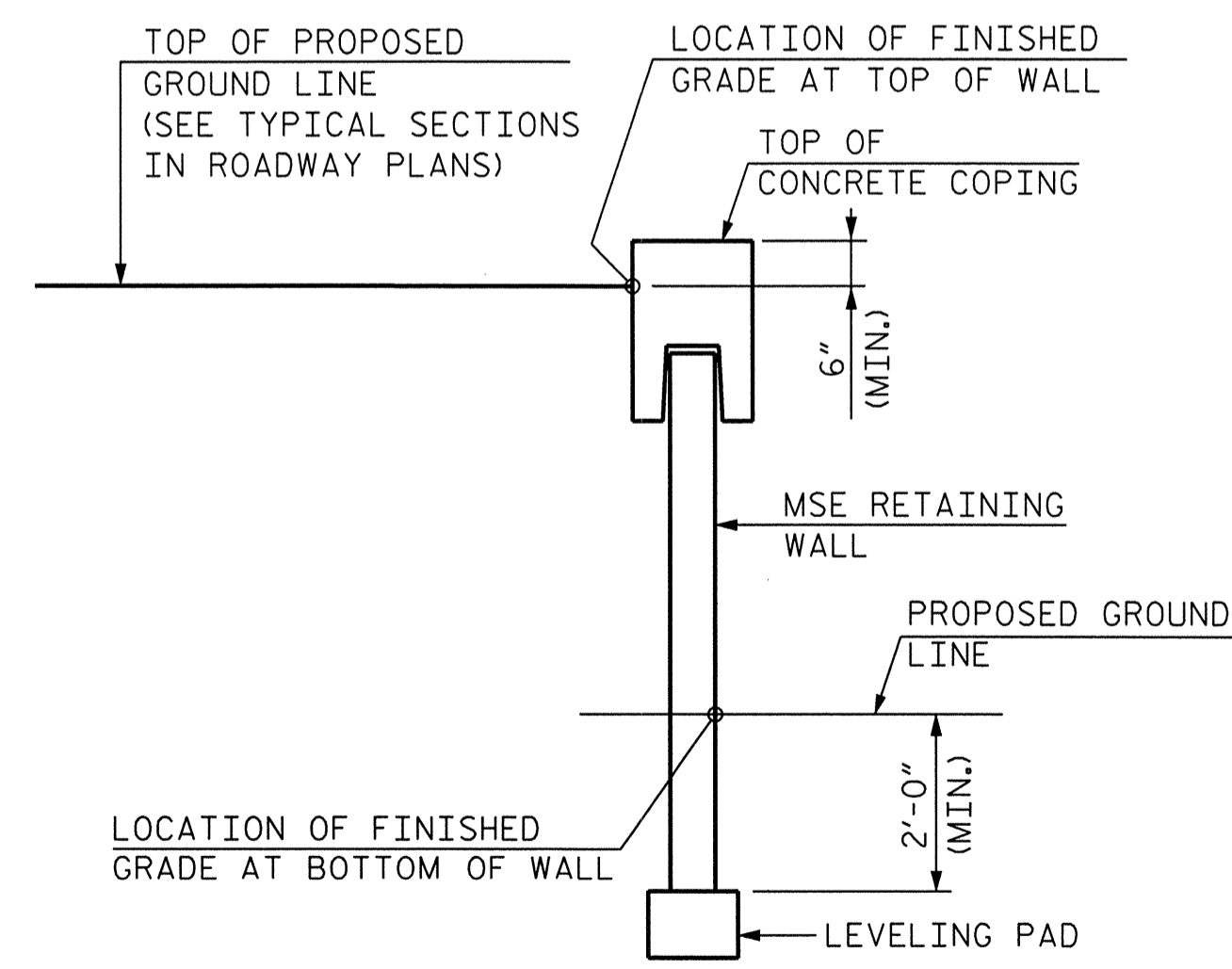
2/27/2012 m:\projects\2009\09012_campjeune\5132_nc24\structures\culvert at y2\LRFR.dgn

DRAWN BY: W.R. PARRISH DATE: SEPT. 11
CHECKED BY: J.W. GENTRY DATE: SEPT. 11

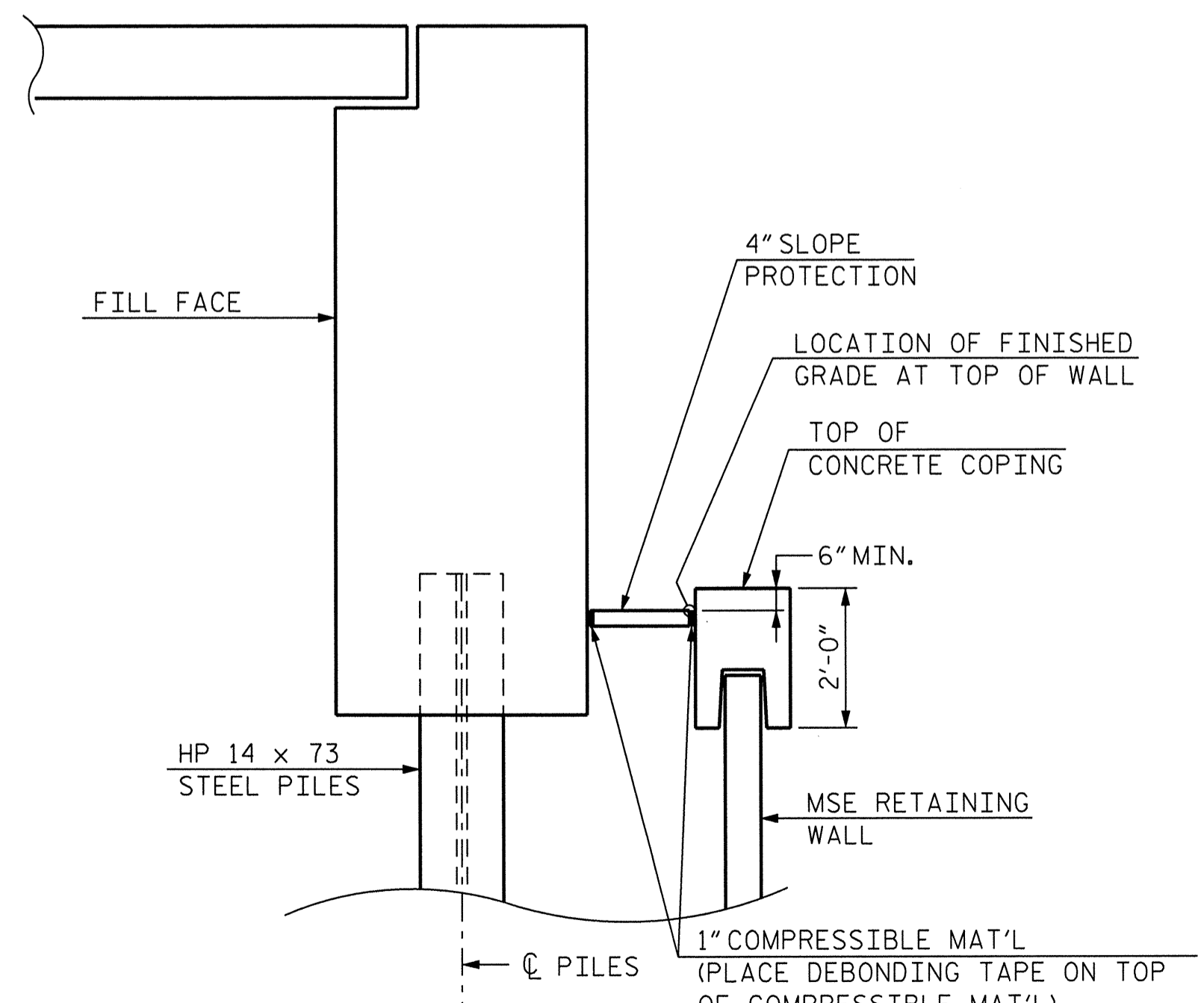


NOTES:
 FOR ELEVATIONS AND QUANTITIES, SEE "MSE RETAINING WALL FOR BRIDGE ON BASE ENTRY ROAD OVER NC 24 ELEVATION" SHEET, SHEET 2 OF 3.
 FOR NOTES, SEE "MSE RETAINING WALL FOR BRIDGE ON BASE ENTRY ROAD OVER NC 24 NOTES" SHEET, SHEET 3 OF 3.

PLAN



SECTION A-A

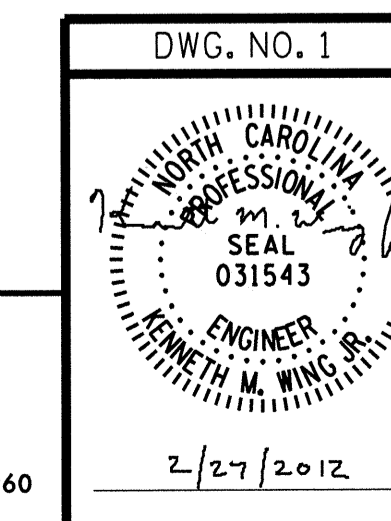


SECTION B-B

PROJECT NO. U-5132
ONSLOW COUNTY
 STATION: STA. 31+48.82 -L- P.O.C.

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**MSE RETAINING WALL FOR
 BRIDGE ON BASE ENTRY RD.
 OVER NC 24
 PLAN**



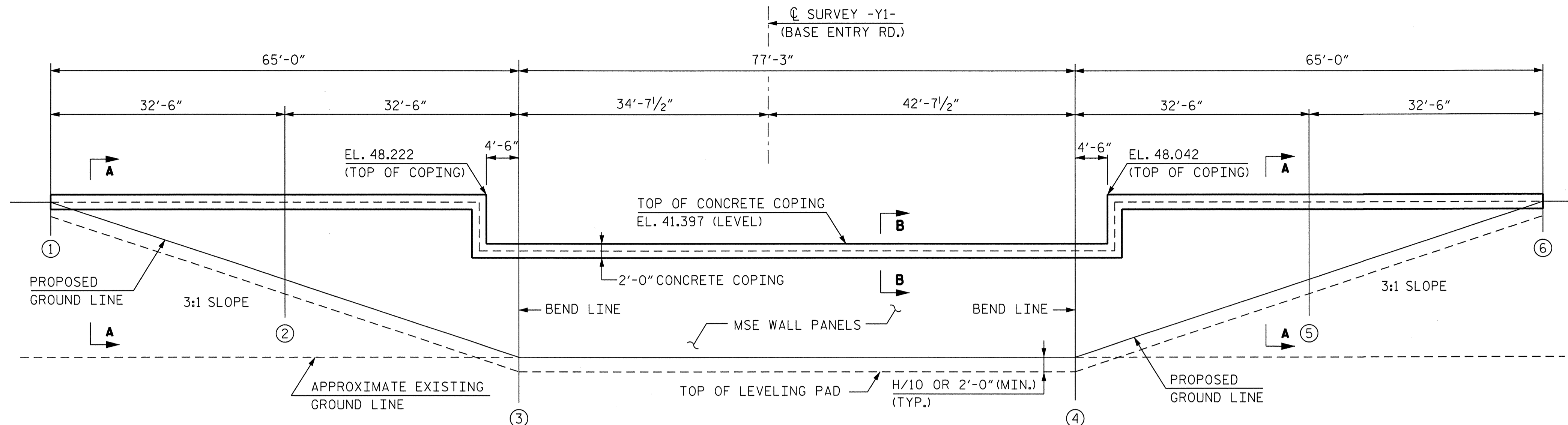
RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

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

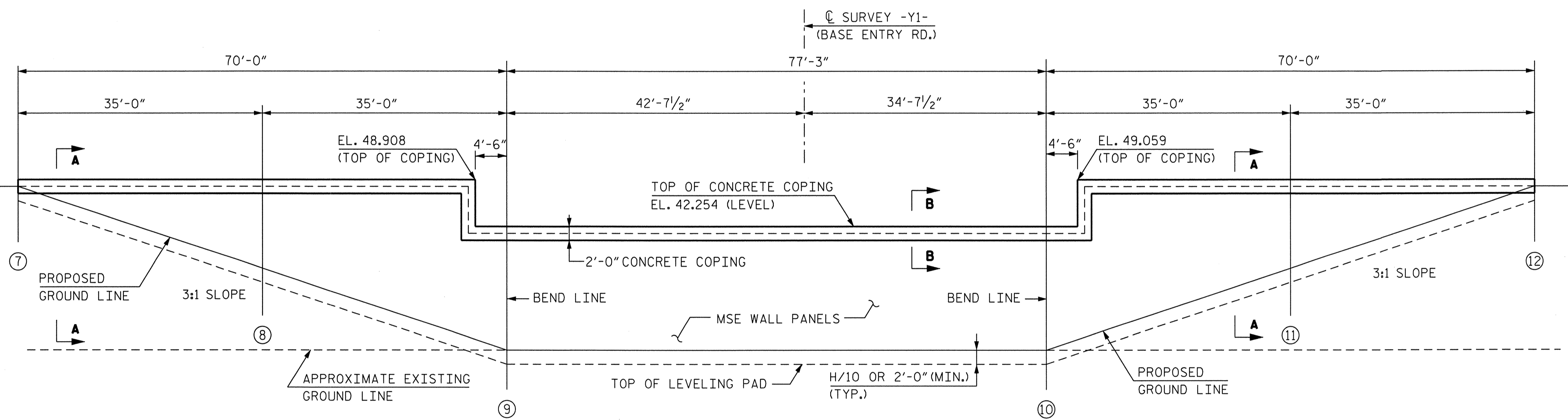
2/27/2012 10:27:27 am \\projects\2009\09012_cample\jeune\5132.nc24\structures\nc24\dgn\Final\U5132_sd_wall.plt.dgn

DRAWN BY: C.J. PIPER DATE: NOV. 11
 CHECKED BY: K.M. WING DATE: NOV. 11

NOTE:
 FOR SECTION A-A AND B-B, SEE "MSE RETAINING WALL FOR BRIDGE ON BASE ENTRY RD. OVER NC 24 PLAN" SHEET, SHEET 1 OF 3.
 FOR NOTES, SEE "MSE RETAINING WALL FOR BRIDGE ON BASE ENTRY ROAD OVER NC 24 NOTES" SHEET, SHEET 3 OF 3.



ELEVATION - END BENT 1
 LOOKING AT EXPOSED FRONT FACE OF MSE RETAINING WALL
 AREA = 2,700 ± SQ. FT.



ELEVATION - END BENT 2
 LOOKING AT EXPOSED FRONT FACE OF MSE RETAINING WALL
 AREA = 2,900 ± SQ. FT.

END BENT 1 WALL OFFSETS AND ELEVATIONS				
POINT	STATION	OFFSET	FINISHED GRADE @ BOT. OF WALL	FINISHED GRADE @ TOP OF WALL
1	14+42.82 -Y1-	34'-7 1/2" RT.	46.8	46.330
2	14+75.33 -Y1-	34'-7 1/2" RT.	36.1	47.078
3	15+07.83 -Y1-	34'-7 1/2" RT.	25.4	40.897
4	15+06.96 -Y1-	42'-7 1/2" LT.	26.0	40.897
5	14+74.56 -Y1-	45'-1 1/8" LT.	36.5	46.883
6	14+42.17 -Y1-	47'-6 3/4" LT.	47.1	46.582

END BENT 2 WALL OFFSETS AND ELEVATIONS				
POINT	STATION	OFFSET	FINISHED GRADE @ BOT. OF WALL	FINISHED GRADE @ TOP OF WALL
7	17+14.10-NBL	36'-7 1/2" LT.	48.4	47.735
8	16+79.05-Y1-	42'-7 1/2" LT.	37.2	48.109
9	16+44.05-Y1-	42'-7 1/2" LT.	26.2	41.754
10	16+44.92-Y1-	34'-7 1/2" RT.	25.6	41.754
11	16+79.92-Y1-	34'-7 1/2" RT.	37.1	48.261
12	17+14.91-SBL	28'-7 1/2" RT.	48.6	48.558

BRIDGE @ STA. 15+81.95 -Y1-	4" SLOPE PROTECTION	* WELDED WIRE FABRIC 60" WIDE APPROX. L.F.
END BENT 1	16	29
END BENT 2	15	27

* QUANTITY IS BASED ON 5' POURS.

PROJECT NO. U-5132
 ONSLOW COUNTY
 STATION: STA. 31+48.82 -L- P.O.C.

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

MSE RETAINING WALL FOR
 BRIDGE ON BASE ENTRY RD.
 OVER NC 24
 ELEVATION

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

DWG. NO. 2

PROFESSIONAL SEAL
 031543
 ENGINEER
 KENNETH M. WING, JR.

2/27/2012

RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

D:\projects\2009\09012.comple\jeune\5132.nc24\structures\nc24\dgn\final\5132_sd_wall.eid.dgn

DRAWN BY: C.J. PIPER DATE: NOV. 11
 CHECKED BY: K.M. WING DATE: NOV. 11

parrish 2/27/2012 m:\projects\2009\09012_camplejeune\U5132.nc24\structures\nc24\dgn\final\U5132_sd_wall.et.dgn

NOTES:

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.

USE AN MSE WALL SYSTEM WITH PRECAST CONCRETE PANELS FOR RETAINING WALLS AT END BENT NO. 1 AND END BENT NO. 2.

CAST-IN-PLACE REINFORCED CONCRETE COPING IS REQUIRED FOR RETAINING WALLS AT END BENT NO. 1 AND END BENT NO. 2.

A DRAIN IS REQUIRED FOR RETAINING WALLS AT END BENT NO. 1 AND END BENT NO. 2.

FOUNDATIONS FOR END BENT NO. 1 LOCATED AT STATION 15+01.95 -Y1- AND END BENT NO. 2 LOCATED AT STATION 16+49.95 -Y1- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALLS. SEE "GENERAL DRAWING FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE, OR REINFORCEMENT FOR RETAINING WALLS AT END BENT NO. 1 AND END BENT NO. 2 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

DESIGN RETAINING WALL AT END BENT NO. 1 AND END BENT NO. 2 FOR THE FOLLOWING:

- A) H = DESIGN HEIGHT + EMBEDMENT
- B) DESIGN LIFE = 100 YEARS
- C) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 5,500 LB/SF.
- D) FOR DISCONTINUOUS (INEXTENSIBLE) REINFORCEMENT MSE WALLS, SOIL REINFORCEMENT LENGTH SHALL BE A MINIMUM OF 15 FEET FOR ABUTMENT WALLS AT END BENT NO. 1 AND END BENT NO. 2 AND SOIL REINFORCEMENT FOR SIDE WALLS SHOULD BE GREATER OF 0.8H OR 8 FEET TO SATISFY EXTERNAL AND GLOBAL STABILITY.

E) FOR CONTINUOUS (GEOGRID OR SHEETS) REINFORCEMENT, MSE WALLS SOIL REINFORCEMENT LENGTH SHALL BE A MINIMUM OF 22 FEET FOR ABUTMENT WALLS AT END BENT NO. 1 AND END BENT NO. 2 AND SOIL REINFORCEMENT FOR SIDE WALLS SHOULD BE GREATER OF 1.0H OR 10 FEET TO SATISFY EXTERNAL AND GLOBAL STABILITY.

F) MINIMUM EMBEDMENT ELEVATION = +22.9 FEET AT END BENT NO. 1 AND +23.1 AT END BENT NO. 2.

G) AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (φ) DEGREES	COHESION (c) PSF
COARSE	110	38	0
FINE	125	34	0

* SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.

H) IN-SITU ASSUMED MATERIAL PROPERTIES:

MATERIAL TYPE	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (φ) DEGREES	COHESION (c) PSF
BACKFILL	120	32	0
FOUNDATION	120	30	0

I) DESIGN RETAINING WALLS AT END BENT NO. 1 AND END BENT NO. 2 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

DRIVE PILES BEFORE CONSTRUCTING MSE WALLS AT END BENT NO. 1 AND END BENT NO. 2.

PLACE 24-INCH CANS AROUND PILES FROM THE TOP OF LEVELING PAD ELEVATION TO BOTTOM OF THE PILE CAP. THE CANS SHOULD BE STRONG ENOUGH TO WITHSTAND THE PRESSURES FROM COMPACTION OPERATIONS ON ADJACENT FILL WITHOUT DISTORTION.

STEEL REINFORCEMENT SHALL NOT TOUCH THE CANS.

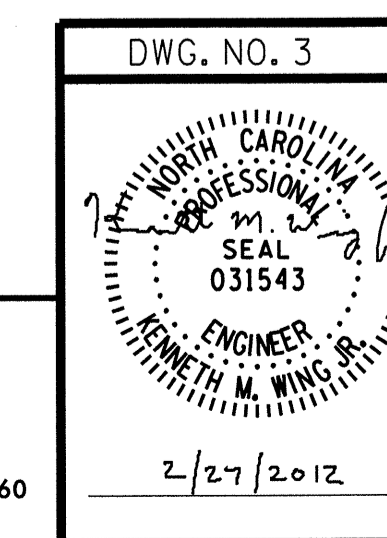
FUTURE OBSTRUCTIONS SUCH AS GUARDRAIL POSTS, PAVEMENT, PIPES, INLETS, OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALLS AT END BENTS 1 AND 2.

AREA BETWEEN THE MSE RETAINING WALL 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.

PROJECT NO. U-5132
ONSLOW COUNTY
 STATION: STA. 31+48.82 -L- P.O.C.

SHEET 3 OF 3

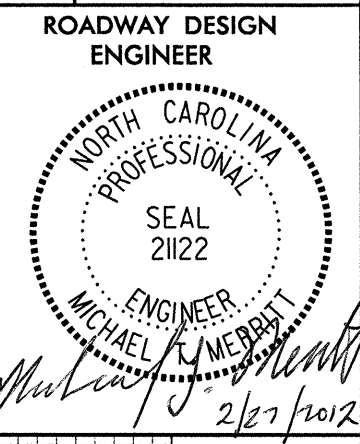
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 MSE RETAINING WALL FOR
 BRIDGE ON BASE ENTRY RD.
 OVER NC 24
 NOTES



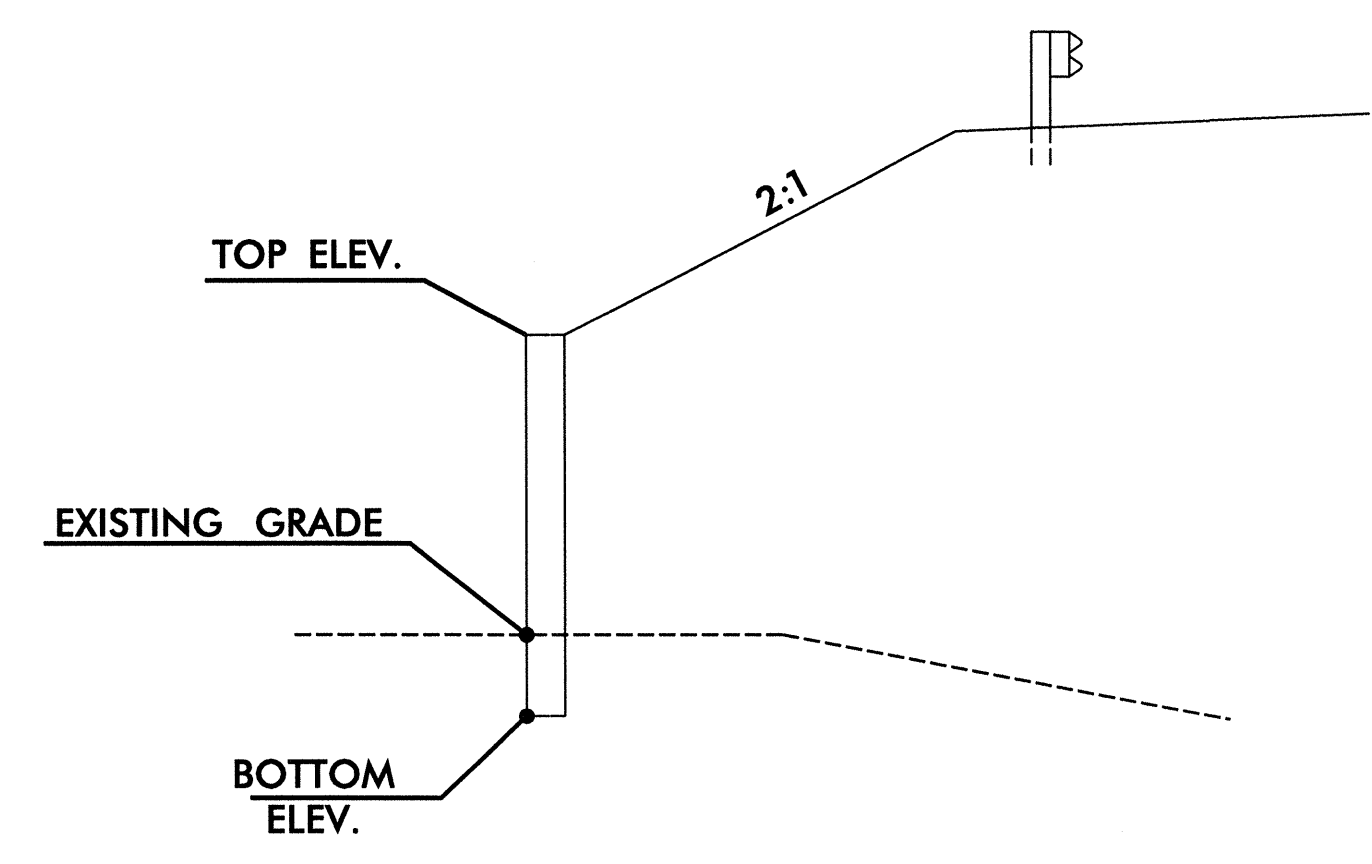
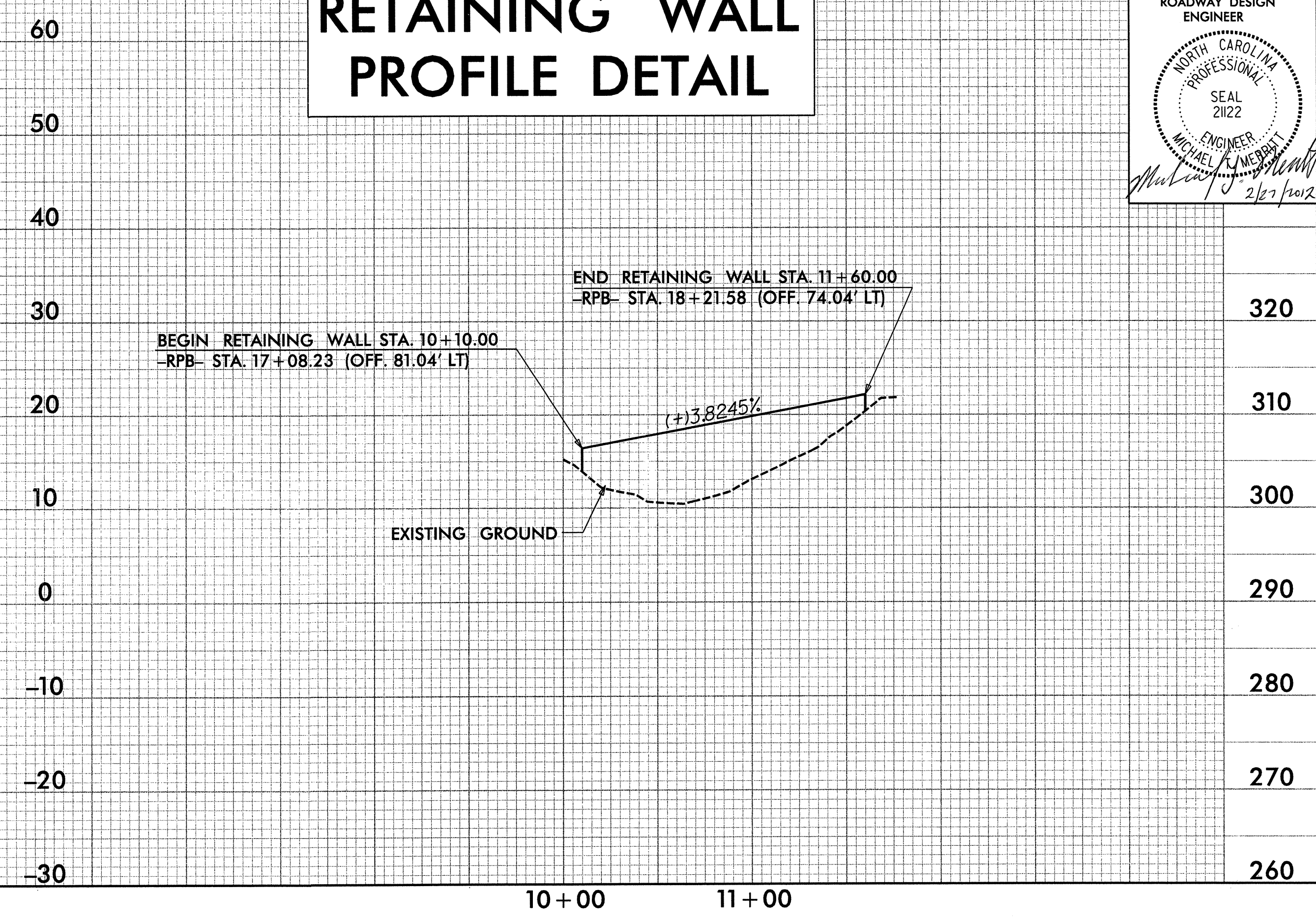
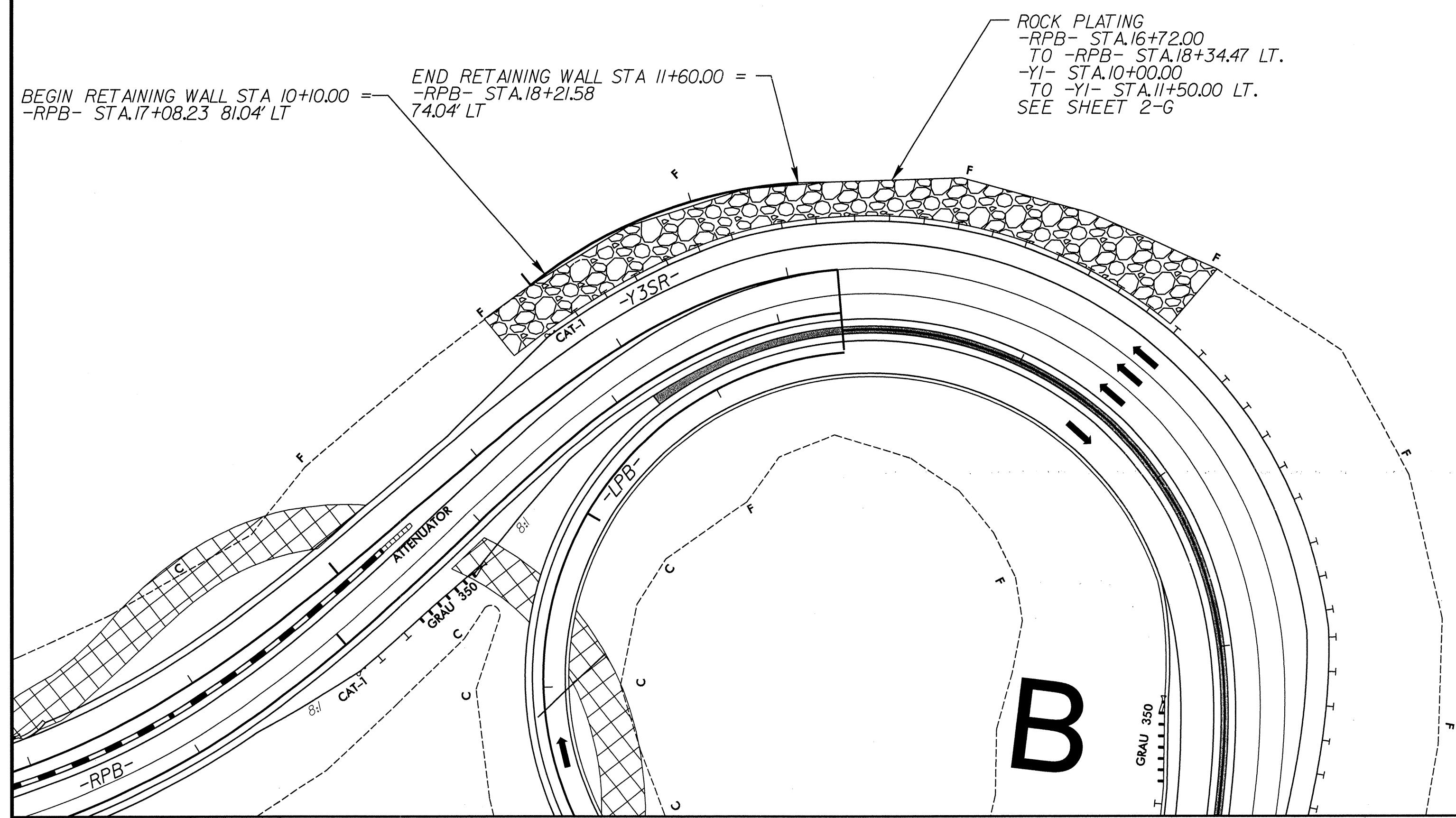
RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NUMBER: F-0112

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

DRAWN BY : C.J. PIPER DATE : NOV. 11
 CHECKED BY : K.M. WING DATE : NOV. 11



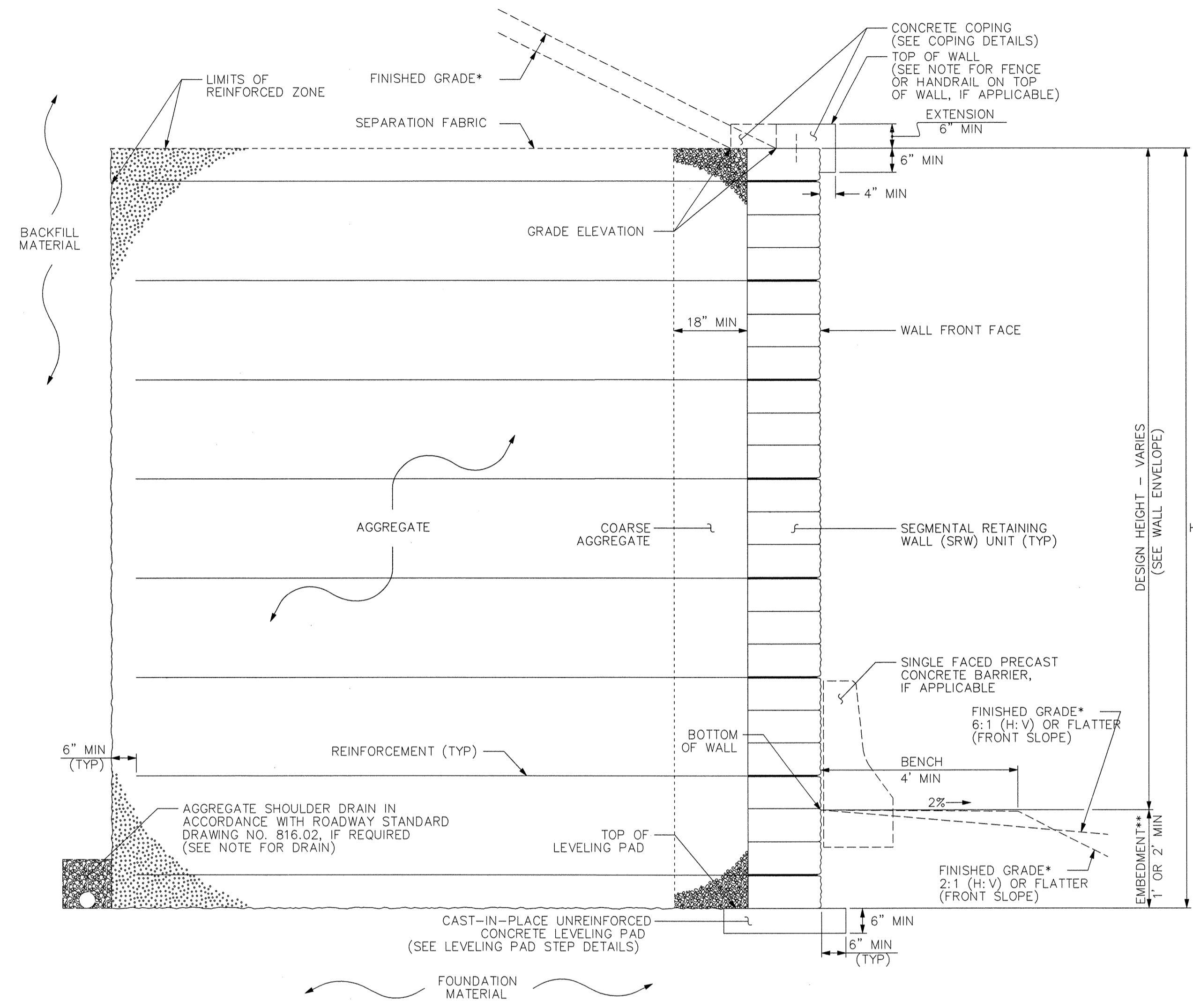
RETAINING WALL PROFILE DETAIL



ELEVATION LOCATIONS
N.T.S.

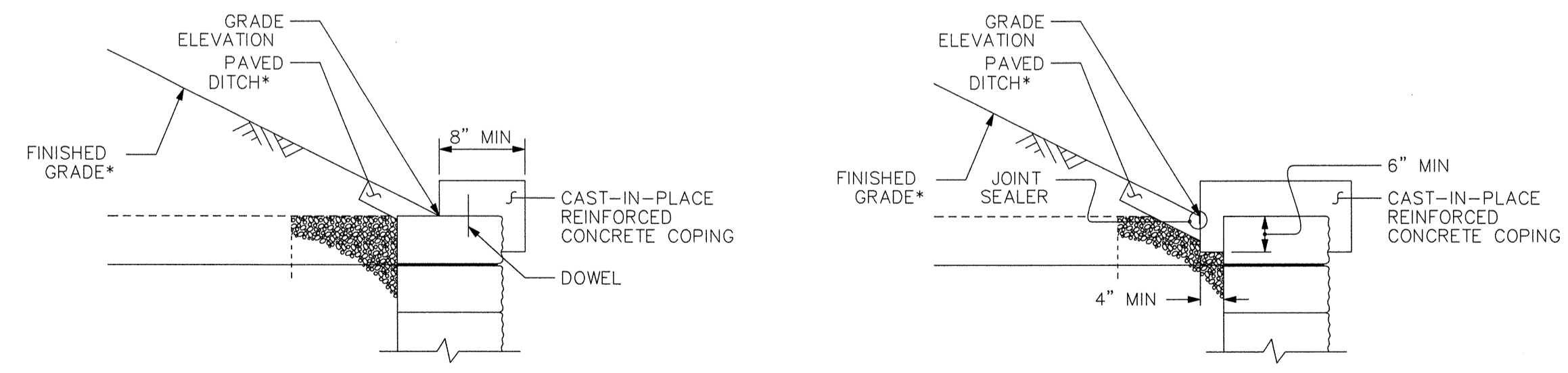
STATION	TOP ELEV.	EXIST ELEV.	BOT. ELEV.
10+10.00	16.40	13.88	11.88
10+50.00	17.93	10.60	8.60
11+00.00	19.84	13.06	11.06
11+50.00	21.76	18.82	16.82
11+60.00	22.14	20.37	18.37

2/27/2012
I:\projects\2009\09012_CompLeJeune\U5132_NC24_Roadway\Proj\U5132_rdy_psh02_walldetail.dgn



MSE WALL WITH SRW UNITS - TYPICAL SECTION

*SEE ROADWAY PLANS FOR FINISHED GRADE AND DITCH DETAILS.
 **SEE MSE RETAINING WALLS PROVISION FOR EMBEDMENT REQUIREMENTS.



COPING DETAILS

AT THE CONTRACTOR'S OPTION, CONNECT COPING TO SRW UNITS WITH DOWELS OR EXTEND COPING DOWN BACK OF SRW UNITS.
 *SEE ROADWAY PLANS FOR FINISHED GRADE AND DITCH DETAILS.

MSE WALL NOTES:

- FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.
- USE AN MSE WALL SYSTEM WITH SEGMENTAL RETAINING WALL UNITS FOR RETAINING WALL BETWEEN -RPB- STATION 17+08.23 AND 18+21.58.
- CAST-IN-PLACE REINFORCED CONCRETE COPING IS REQUIRED FOR RETAINING WALL.
- A DRAIN IS NOT REQUIRED FOR RETAINING WALL.
- BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL BETWEEN -RPB- STATION 17+08.23 AND 18+21.58 SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.
- DESIGN RETAINING WALL FOR WALL HEIGHTS EQUAL TO THE DESIGN HEIGHT (DIFFERENCE BETWEEN GRADE ELEVATION AND BOTTOM OF WALL ELEVATION) PLUS EMBEDMENT (DIFFERENCE BETWEEN BOTTOM OF WALL ELEVATION AND TOP OF LEVELING PAD ELEVATION).
- DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
- DESIGN RETAINING WALL FOR THE FOLLOWING:
 - MINIMUM DESIGN LIFE = 75 YEARS
 - MAXIMUM FACTORED BEARING RESISTANCE = 3000 PSF
 - MINIMUM REINFORCEMENT LENGTH = 14 FT
 - MINIMUM EMBEDMENT DEPTH = 2 FT
 - AGGREGATE PARAMETERS:

STANDARD SIZE NO. (IN ACCORDANCE WITH SECTION 1005 OF THE STANDARD SPECIFICATIONS)	UNITWEIGHT (gamma) PCF	FRICITION ANGLE (PHI) DEGREES	COHESION (C) PSF
1S, 2S, 2MS AND 4S (FINE AGGREGATE)	125	34	0

F. IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNITWEIGHT (gamma) PCF	FRICITION ANGLE (PHI) DEGREES	COHESION (C) PSF
BACKFILL	120	30	0
FOUNDATION	115	31	0

- SEE SHEET 2-KK FOR RETAINING WALL PLAN AND PROFILE DETAIL.

8/17/99
 REVISIONS
 2/27/2012
 M:\Projects\2009\09012_CompLejeune\U5132_NC24_Roadway\Proj\SRW-Mechanically Stabilized Earth-2.dgn

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	-----	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	-----	SEE PLANS
IMPACT ALLOWANCE	-----	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF		
STRUCTURAL STEEL - AASHTO M270 GRADE 36	-	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	-	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	-	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION		
GRADE 60	---	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	-----	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	-----	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR		
UNTREATED - EXTREME FIBER STRESS	-----	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN		
OF TIMBER	-----	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	-----	30 LBS. PER CU. FT.
		(MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2006 "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. FINISHES 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