

09/08/99

TIP PROJECT: B-4834

CONTRACT: C203033

STRUCTURE

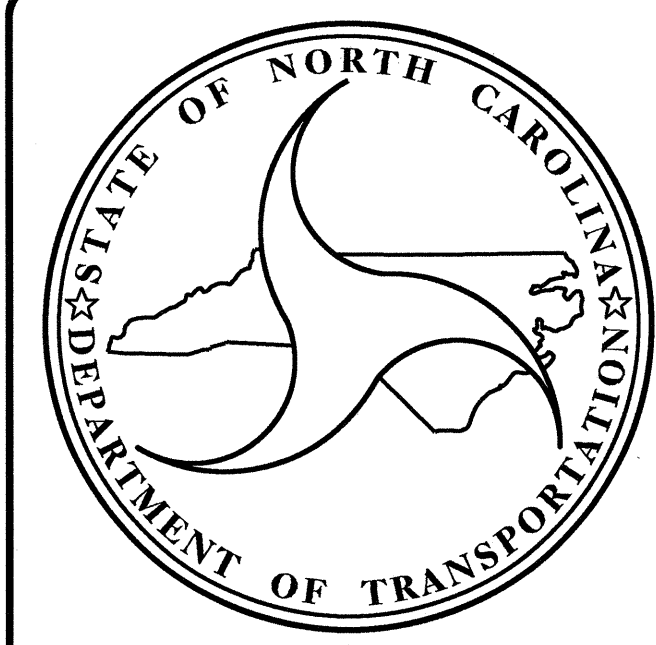
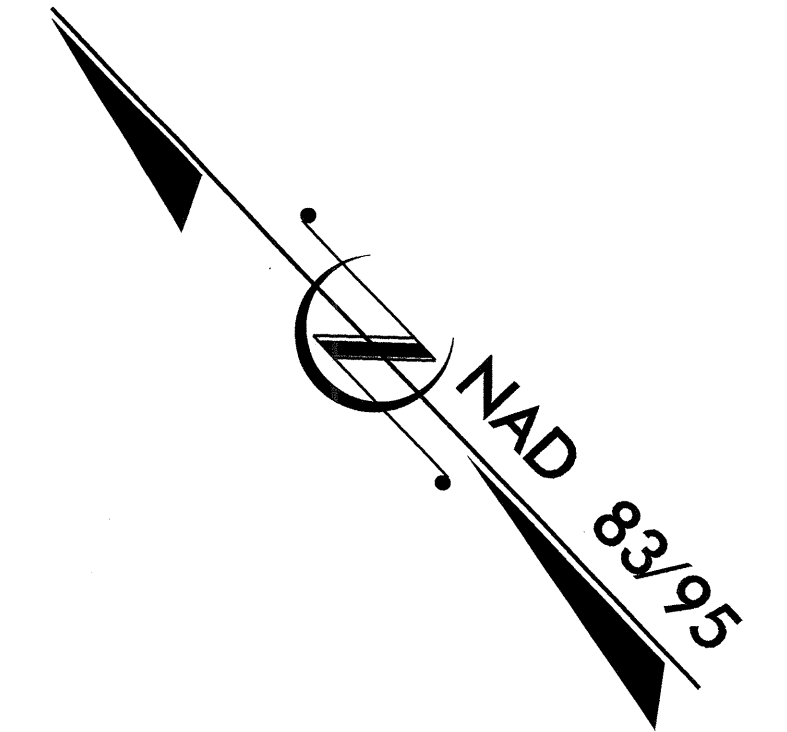
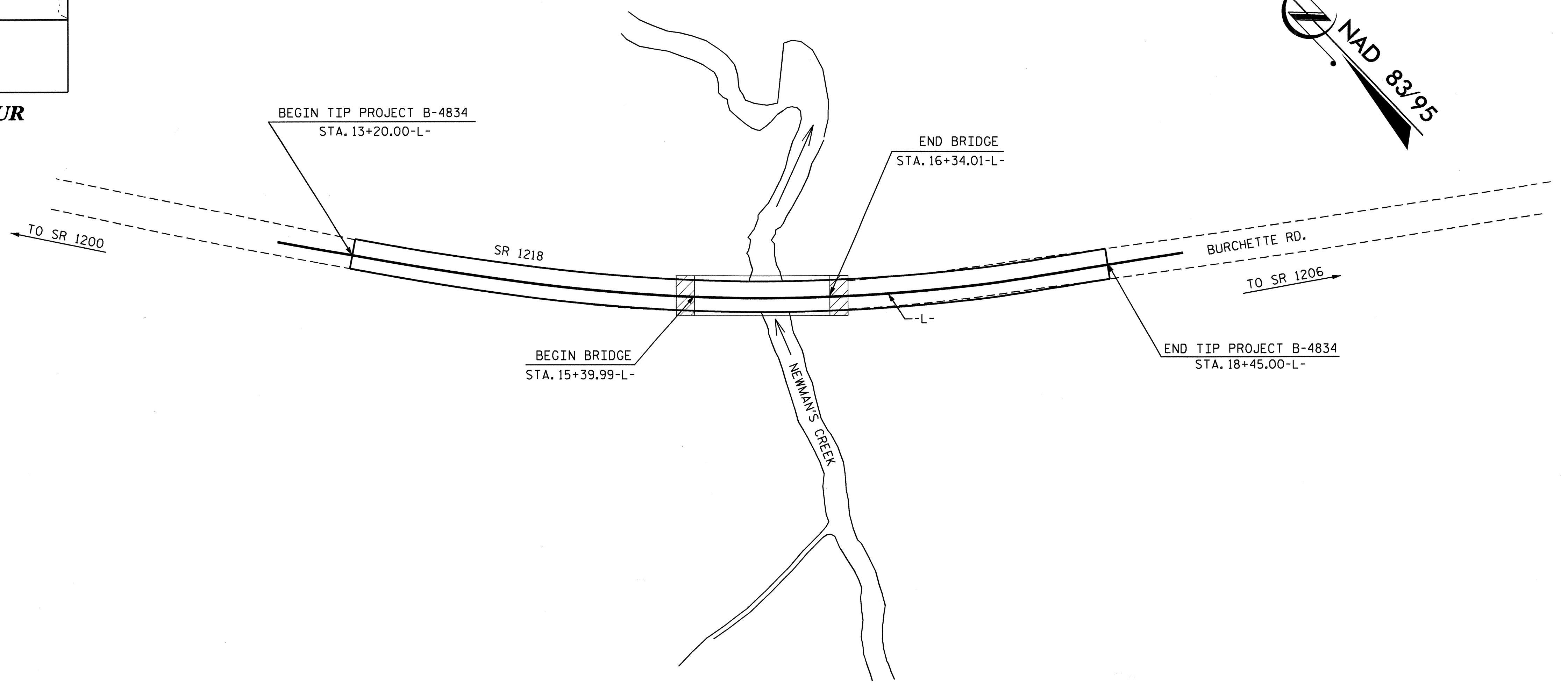
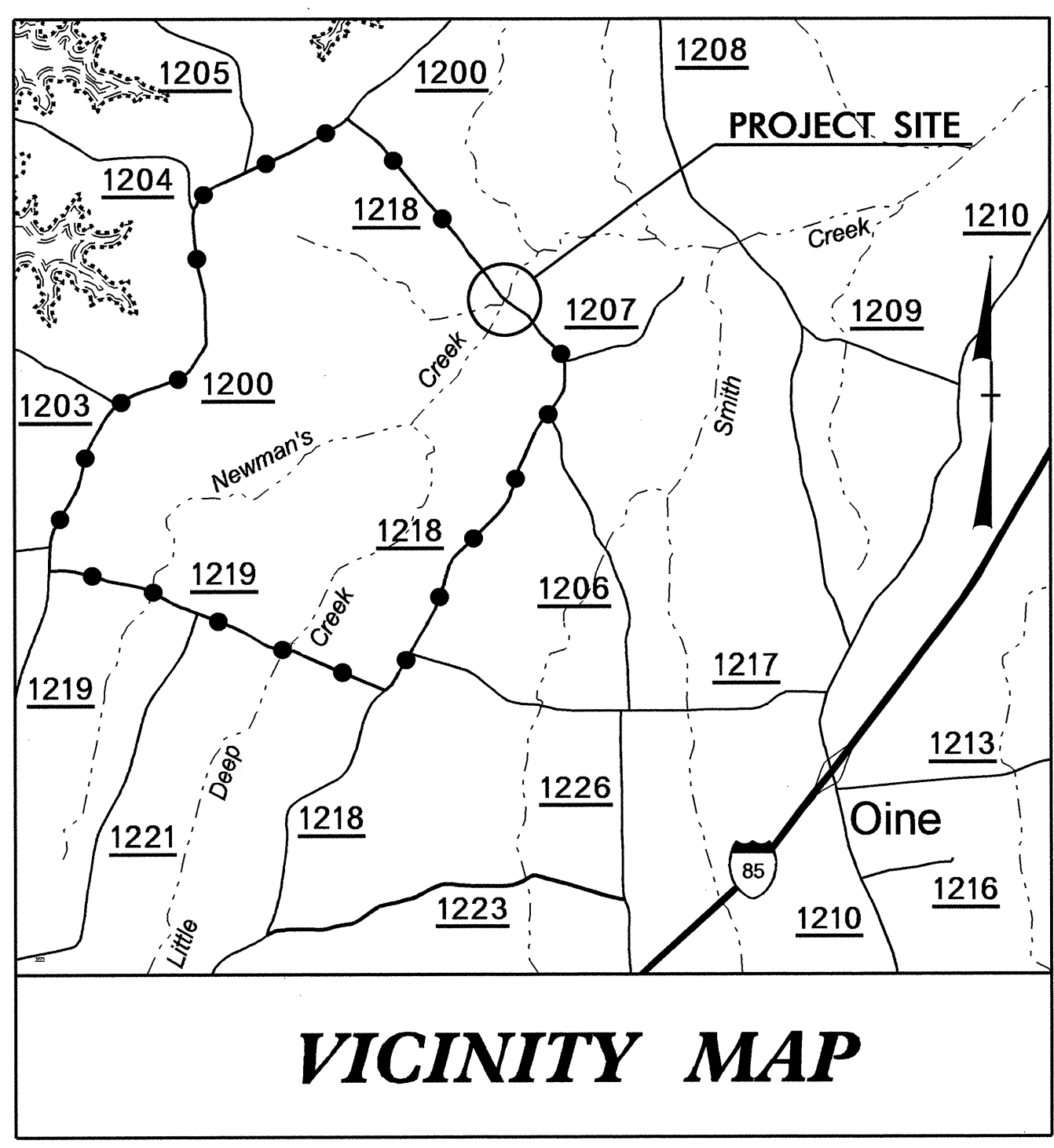
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WARREN COUNTY

LOCATION: BRIDGE NO. 23 OVER NEWMAN'S CREEK ON SR 1218

TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4834		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38604.1.1	BRZ-1218(4)	PE	
38604.2.1	BRZ-1218(4)	ROW, UTIL.	
38604.3.1	BRZ-1218(4)	CONST.	



DESIGN DATA

ADT 2013 = 143
 ADT 2033 = 286
 DHV = 10 %
 D = 60 %
 T = 3 %
 ** V = 30 MPH
 * (TTST 1 % + DUAL 2 %)
 FUNC CLASS = RURAL LOCAL
 SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4834 = 0.081 MI
 LENGTH STRUCTURE TIP PROJECT B-4834 = 0.018 MI
 TOTAL LENGTH TIP PROJECT B-4834 = 0.099 MI

Prepared in the Office of:
DIVISION OF HIGHWAYS
 1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE:
 JANUARY 15, 2013

Q. H. NGUYEN, PE
 PROJECT ENGINEER

B. D. KLAPPENBACH, PE
 PROJECT DESIGN ENGINEER

STRUCTURE MANAGEMENT UNIT
 1000 BIRCH RIDGE DR.
 RALEIGH, N.C. 27610

DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION

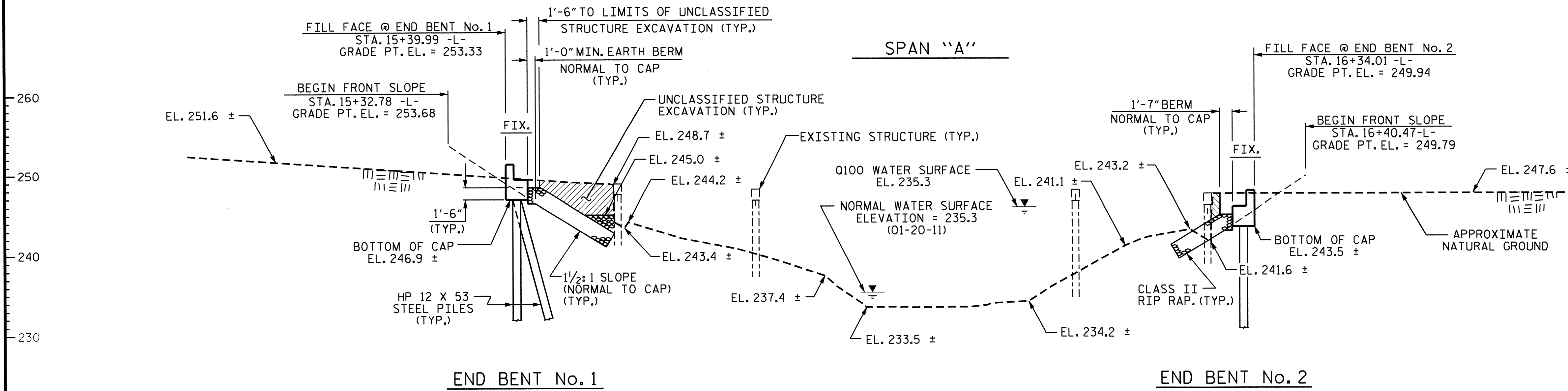
APPROVED ENGINEER DIVISION ADMINISTRATION DATE

09-OCT-2012 15:38
\$\$\$\$\$\$\$\$\$DCN\$\$\$\$\$\$\$\$\$
TEARBOUR

15+00 15+50 16+00 16+50

(-19.8016% (+)2.0988%

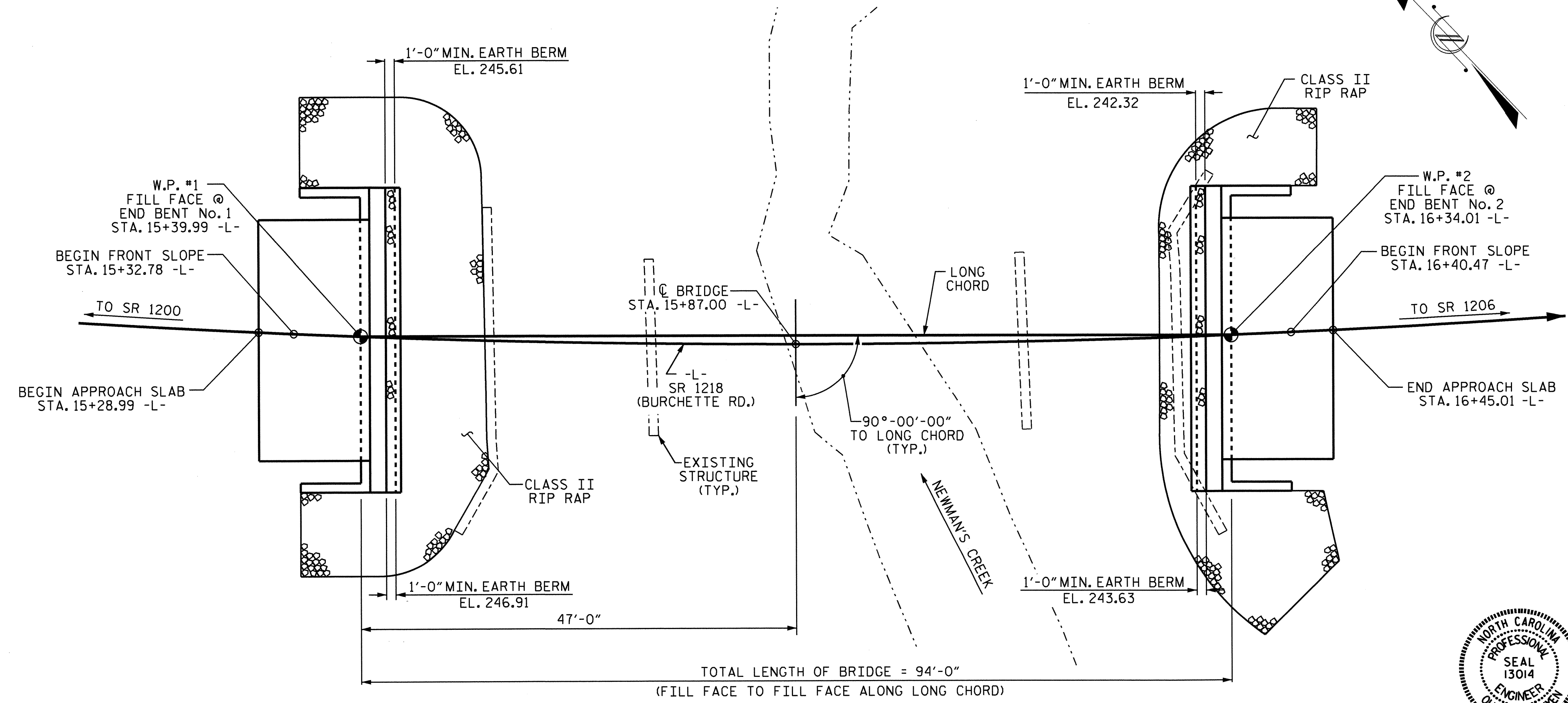
PI= 15+77.00
EL= 244.59'
VC = 480'
GRADE DATA -L-



HORIZONTAL CURVE DATA

PI. STA. 16+02.45-L-
Δ = 15° 59' 42.3" (LT)
D = 4° 46' 28.7"
L = 335.00'
T = 168.60'
R = 1,200.00'

SECTION ALONG -L-



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. B-4834
WARREN COUNTY
STATION: 15+87.00 -L-
SHEET 1 OF 4 REPLACES BRIDGE No. 23

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

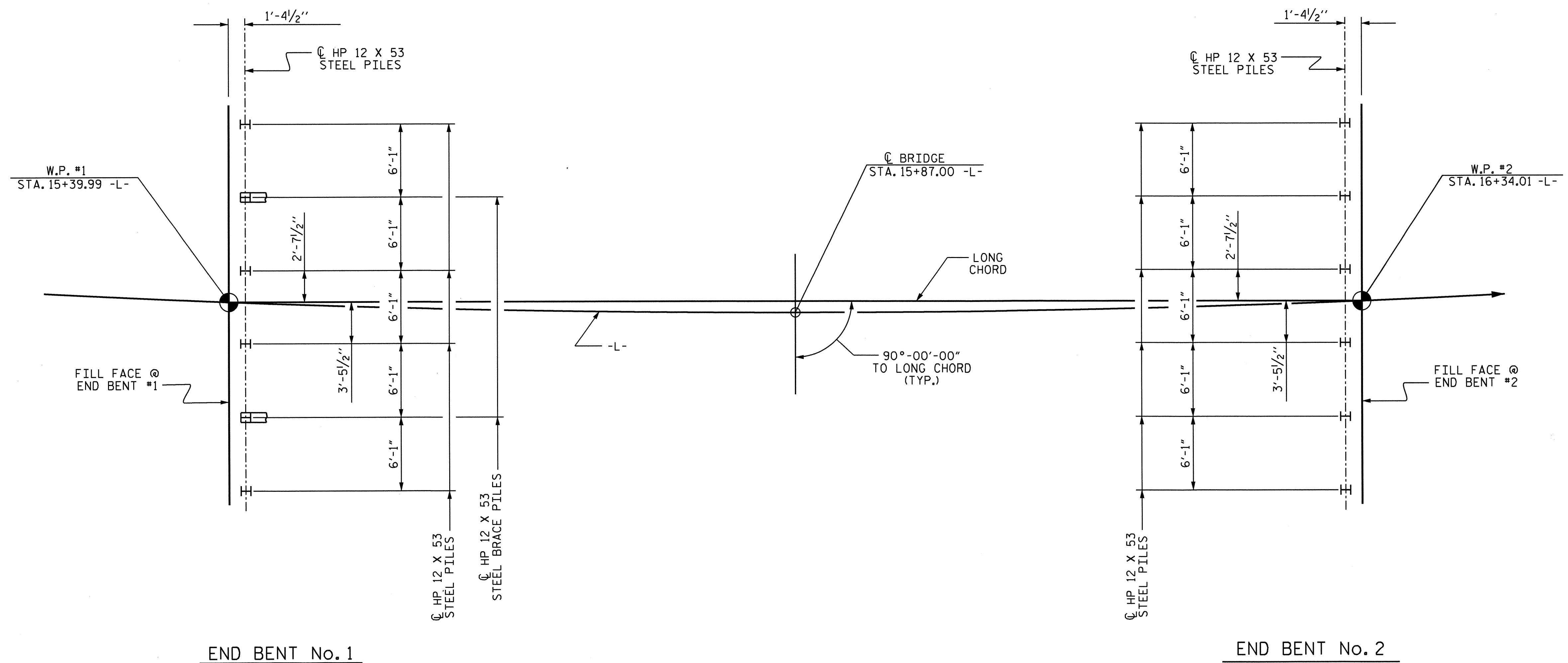
GENERAL DRAWING
BRIDGE ON SR 1218
(BURCHETTE RD.)
OVER NEWMAN'S CREEK
BETWEEN SR 1200 AND SR 1206

Professional Engineer Seal for Quang H. Nguyen, Seal 13014, dated 11-30-12.

Professional Engineer Seal for D. Klappenbach, Seal 15825, dated 11/30/2012.

DRAWN BY: A. V. ROYAL DATE: 05/11
CHECKED BY: D. G. ELY DATE: 05/11

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



FOUNDATION LAYOUT

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGN FOR A FACTORED RESISTANCE OF 96 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE.

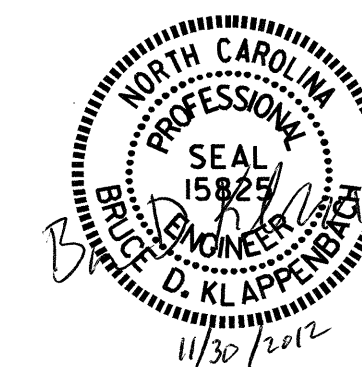
DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT THE BOTTOM OF THE CAP.

BRACE PILES ARE BATTERED 3:12

PROJECT NO. B-4834
WARREN COUNTY
 STATION: 15+87.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 BRIDGE ON SR 1218
 (BURCHETTE RD.)
 OVER NEWMAN'S CREEK
 BETWEEN SR 1200 AND SR 1206

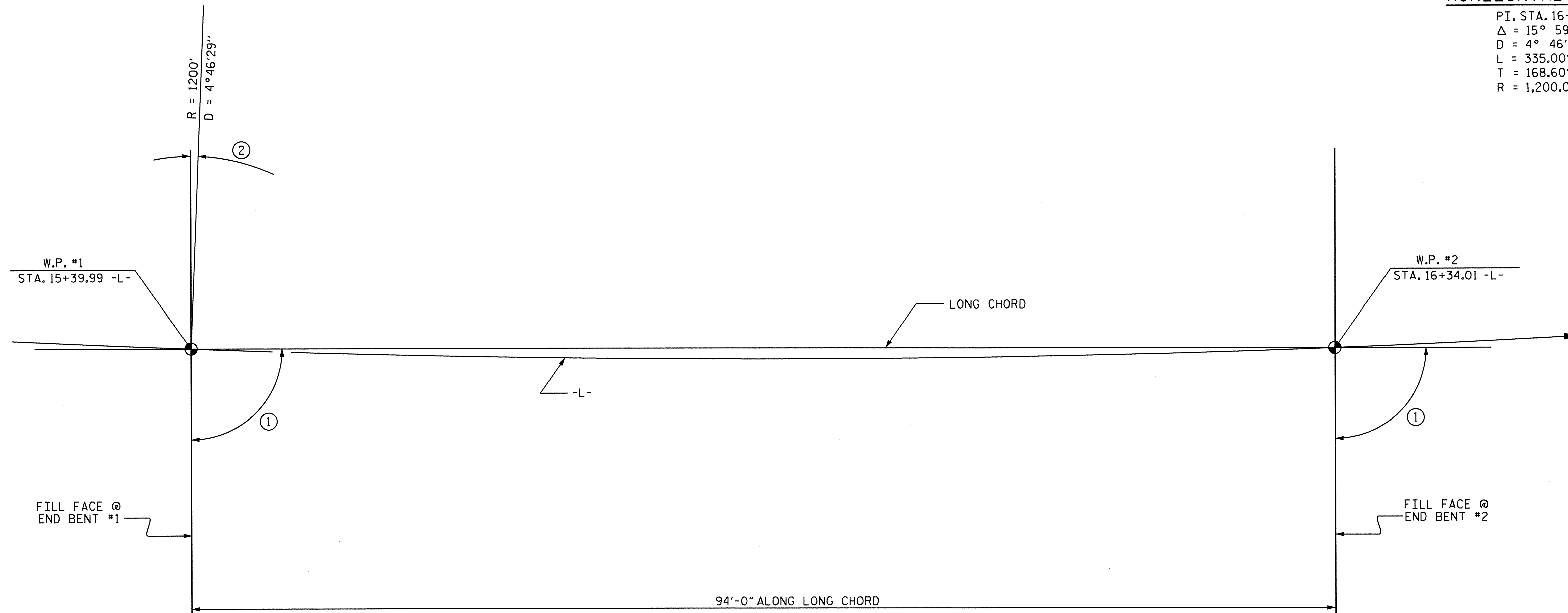


DRAWN BY : D. A. GLADDEN DATE : 07/12
 CHECKED BY : B. D. KLAPPENBACH DATE : 09/12

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

HORIZONTAL CURVE DATA

PI. STA. 16+02.45-L-
 $\Delta = 15^\circ 59' 42.3''$ (LT)
 $D = 4^\circ 46' 28.7''$
 $L = 335.00'$
 $T = 168.60'$
 $R = 1,200.00'$



LONG CHORD LAYOUT

ANGLES

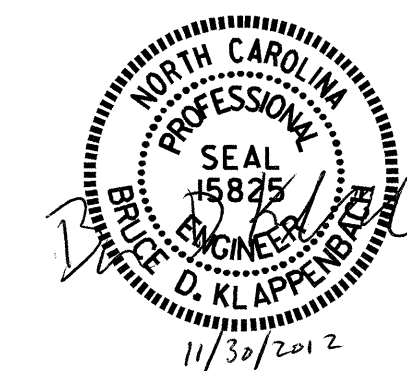
- ① 90°00'00"
- ② 2°14'41"

PROJECT NO. B-4834
WARREN COUNTY
 STATION: 15+87.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

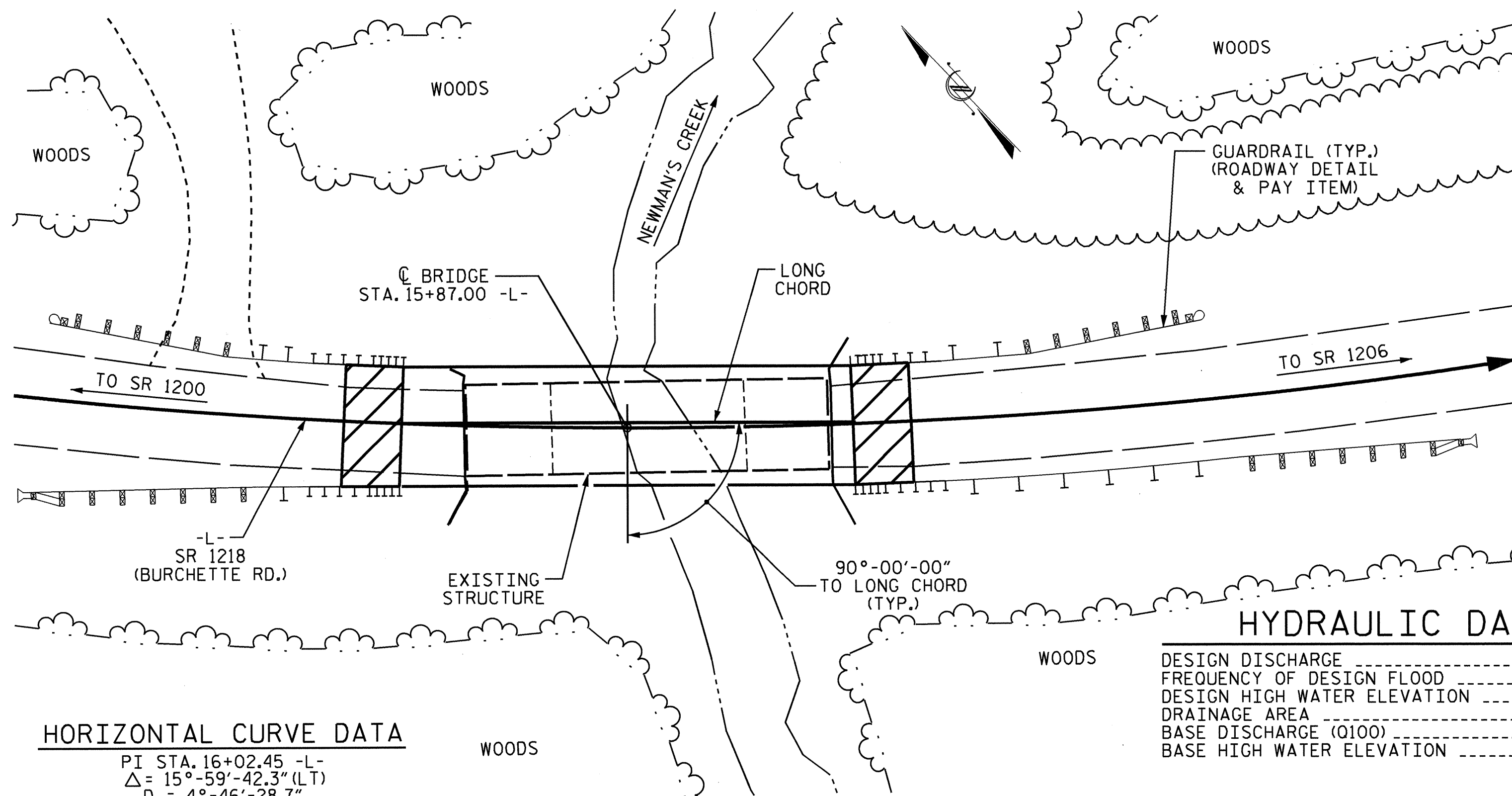
GENERAL DRAWING
 BRIDGE ON SR 1218
 (BURCHETTE RD.)
 OVER NEWMAN'S CREEK
 BETWEEN SR 1200 AND SR 1206



DRAWN BY : D. A. GLADDEN DATE : 07/12
 CHECKED BY : B. D. KLAPPENBACH DATE : 09/12

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

BM #51 RAILROAD SPIKE SET IN 10" ASH TREE; 28.0' RIGHT OF STA. 12+29.00 -BL-, EL. 243.64 NAVD 88



HORIZONTAL CURVE DATA

PI STA. 16+02.45 -L-
 $\Delta = 15^\circ-59'-42.3''$ (LT)
 $D = 4^\circ-46'-28.7''$
 $L = 335.00'$
 $T = 168.60'$
 $R = 1,200.00'$

FOR UTILITY INFORMATION,
 SEE UTILITY PLANS AND
 SPECIAL PROVISIONS.

HYDRAULIC DATA

DESIGN DISCHARGE ----- 2000 CFS
 FREQUENCY OF DESIGN FLOOD ----- 25 YR.
 DESIGN HIGH WATER ELEVATION ----- 244.42
 DRAINAGE AREA ----- 8.42 SQ. MI.
 BASE DISCHARGE (Q100) ----- 2800 CFS
 BASE HIGH WATER ELEVATION ----- 245.95

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE ----- 3700 CFS +
 FREQUENCY OF OVERTOPPING FLOOD --- 500 YR. +
 OVERTOPPING FLOOD ELEVATION ----- 248.74

LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

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

THE EXISTING STRUCTURE CONSISTING OF 3 SPANS, (1 @ 18'- 6", 1 @ 40'- 0", AND 1 @ 18'- 3") TIMBER FLOOR WITH 5" ASPHALT WEARING SURFACE ON I-BEAMS AND TIMBER JOIST, WITH A CLEAR ROADWAY WIDTH OF 19.1 FT. ON TIMBER END BENT CAPS AND TIMBER BENT CAPS ON TIMBER PILES AND LOCATED AT THE PROPOSED SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. FOR REMOVAL OF EXISTING STRUCTURE AT STA. 15+87.00 -L-, SEE SPECIAL PROVISIONS.

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 25 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

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

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.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR REMOVAL OF EXISTING STRUCTURE AT STATION 15+87.00 -L-.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

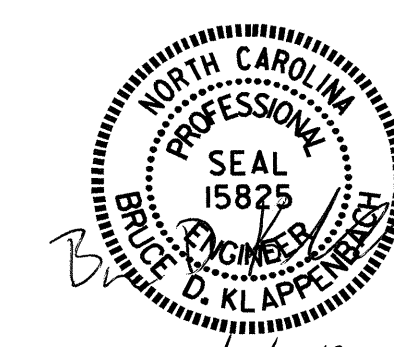
TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	HP 12 X 53 STEEL PILES		VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'- 0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'- 0" X 3'- 3" PRESTRESSED CONCRETE BOX BEAMS	
	LUMP SUM	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE				LUMP SUM				183.50				9	825.75
END BENT NO.1			15.3		2391	6	105		63	70			
END BENT NO.2			15.3		2386	6	90		57	63			
TOTAL	LUMP SUM	LUMP SUM	30.6	LUMP SUM	4777	12	195	183.50	120	133	LUMP SUM	9	825.75

PROJECT NO. B-4834
 WARREN COUNTY
 STATION: 15+87.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 BRIDGE ON SR 1218
 (BURCHETTE RD.)
 OVER NEWMAN'S CREEK
 BETWEEN SR 1200 AND SR 1206



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

DRAWN BY : D. A. GLADDEN DATE : 05/11
 CHECKED BY : B. D. KLAPPENBACH DATE : 09/12

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

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ _{DC}	γ _{OW}
	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								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.057	--	1.75	0.272	1.27	A	EL	45.125	0.495	1.18	A	EL	4.513	0.80	0.272	1.06	A	EL	45.125		
	HL-93(0pr)	N/A	--	1.53	--	1.35	0.272	1.64	A	EL	45.125	0.495	1.53	A	EL	4.513	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.443	51.963	1.75	0.272	1.73	A	EL	45.125	0.495	1.56	A	EL	4.513	0.80	0.272	1.44	A	EL	45.125		
	HS-20(0pr)	36.000	--	2.022	72.78	1.35	0.272	2.24	A	EL	45.125	0.495	2.02	A	EL	4.513	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13,500	--	3.38	45.628	1.4	0.272	5.06	A	EL	45.125	0.495	4.78	A	EL	4.513	0.80	0.272	3.38	A	EL	45.125	
		SNGARBS2	20,000	--	2.466	49.318	1.4	0.272	3.69	A	EL	45.125	0.495	3.35	A	EL	4.513	0.80	0.272	2.47	A	EL	45.125	
		SNAGRIS2	22,000	--	2.314	50.903	1.4	0.272	3.46	A	EL	45.125	0.495	3.1	A	EL	4.513	0.80	0.272	2.31	A	EL	45.125	
		SNCOTTS3	27,250	--	1.68	45.79	1.4	0.272	2.51	A	EL	45.125	0.495	2.38	A	EL	4.513	0.80	0.272	1.68	A	EL	45.125	
		SNAGGRS4	34,925	--	1.384	48.333	1.4	0.272	2.07	A	EL	45.125	0.495	1.94	A	EL	4.513	0.80	0.272	1.38	A	EL	45.125	
		SNS5A	35,550	--	1.355	48.159	1.4	0.272	2.03	A	EL	45.125	0.495	1.95	A	EL	4.513	0.80	0.272	1.35	A	EL	45.125	
		SNS6A	39,950	--	1.235	49.322	1.4	0.272	1.85	A	EL	45.125	0.495	1.77	A	EL	4.513	0.80	0.272	1.23	A	EL	45.125	
	TTST	TNAGRIT3	33,000	--	1.503	49.602	1.4	0.272	2.25	A	EL	45.125	0.495	2.12	A	EL	4.513	0.80	0.272	1.50	A	EL	45.125	
		TNT4A	33,075	--	1.507	49.859	1.4	0.272	2.26	A	EL	45.125	0.495	2.08	A	EL	4.513	0.80	0.272	1.51	A	EL	45.125	
		TNT6A	41,600	--	1.225	50.948	1.4	0.272	1.83	A	EL	45.125	0.495	1.81	A	EL	4.513	0.80	0.272	1.22	A	EL	45.125	
		TNT7A	42,000	--	1.227	51.52	1.4	0.272	1.84	A	EL	45.125	0.495	1.78	A	EL	4.513	0.80	0.272	1.23	A	EL	45.125	
		TNT7B	42,000	--	1.259	52.874	1.4	0.272	1.88	A	EL	45.125	0.495	1.7	A	EL	4.513	0.80	0.272	1.26	A	EL	45.125	
		TNAGRIT4	43,000	--	1.205	51.819	1.4	0.272	1.8	A	EL	45.125	0.495	1.64	A	EL	4.513	0.80	0.272	1.21	A	EL	45.125	
		TNAGT5A	45,000	--	1.14	51.291	1.4	0.272	1.71	A	EL	45.125	0.495	1.62	A	EL	4.513	0.80	0.272	1.14	A	EL	45.125	
TNAGT5B	45,000	3	1.129	50.814	1.4	0.272	1.69	A	EL	45.125	0.495	1.57	A	EL	4.513	0.80	0.272	1.13	A	EL	45.125			

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

- 1.
- 2.
- 3.
- 4.

CONTROLLING LOAD RATING

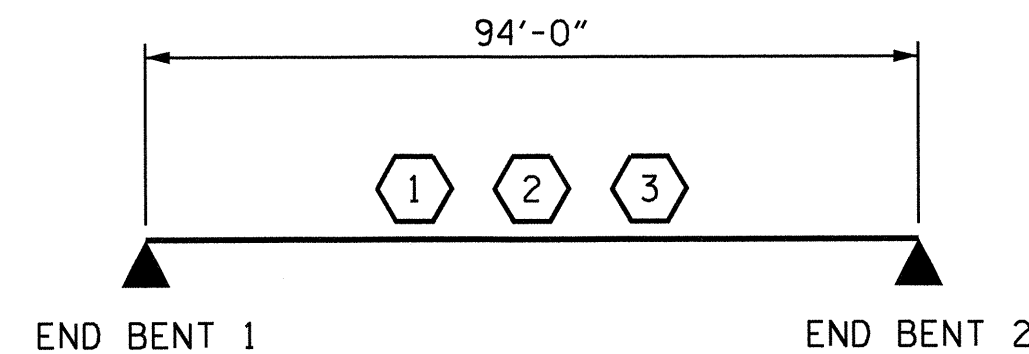
1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE

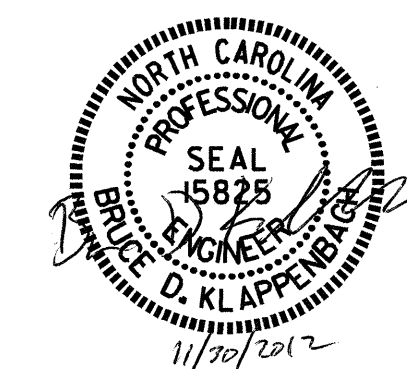
GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. B-4834
WARREN COUNTY
STATION: 15+87.00 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR
PRESTRESSED
CONCRETE GIRDERS
(NON-INTERSTATE TRAFFIC)

ASSEMBLED BY : M. K. TOM	DATE : 5/11/11
CHECKED BY : T. L. CLELLAND	DATE : 2/2012
DRAWN BY : MAA 1/08	REV. 11/12/OBR MAA/GM
CHECKED BY : GM/DI 2/08	

REVISIONS						SHEET NO. S-5
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 20
2			4			

NOTES

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

ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

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

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE 2" Ø BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER, SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4700 PSI.

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

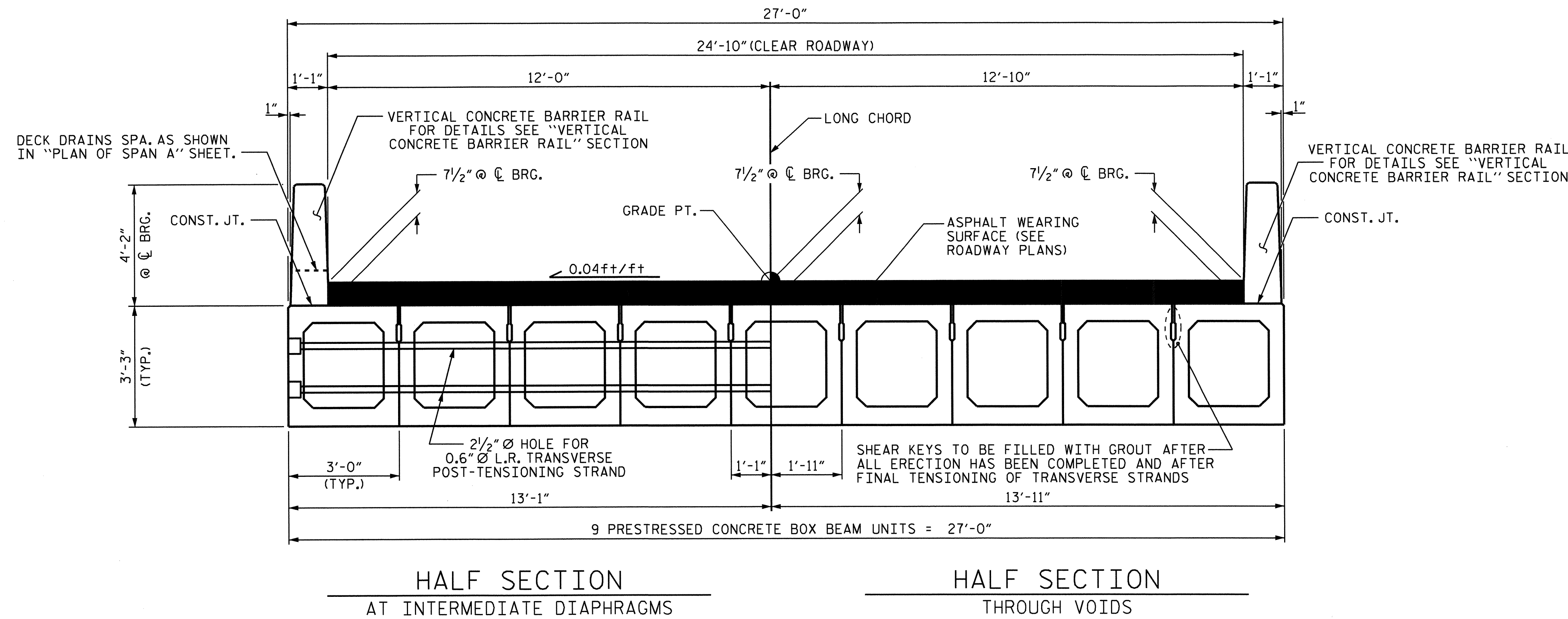
PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.

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. A VERTICAL CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

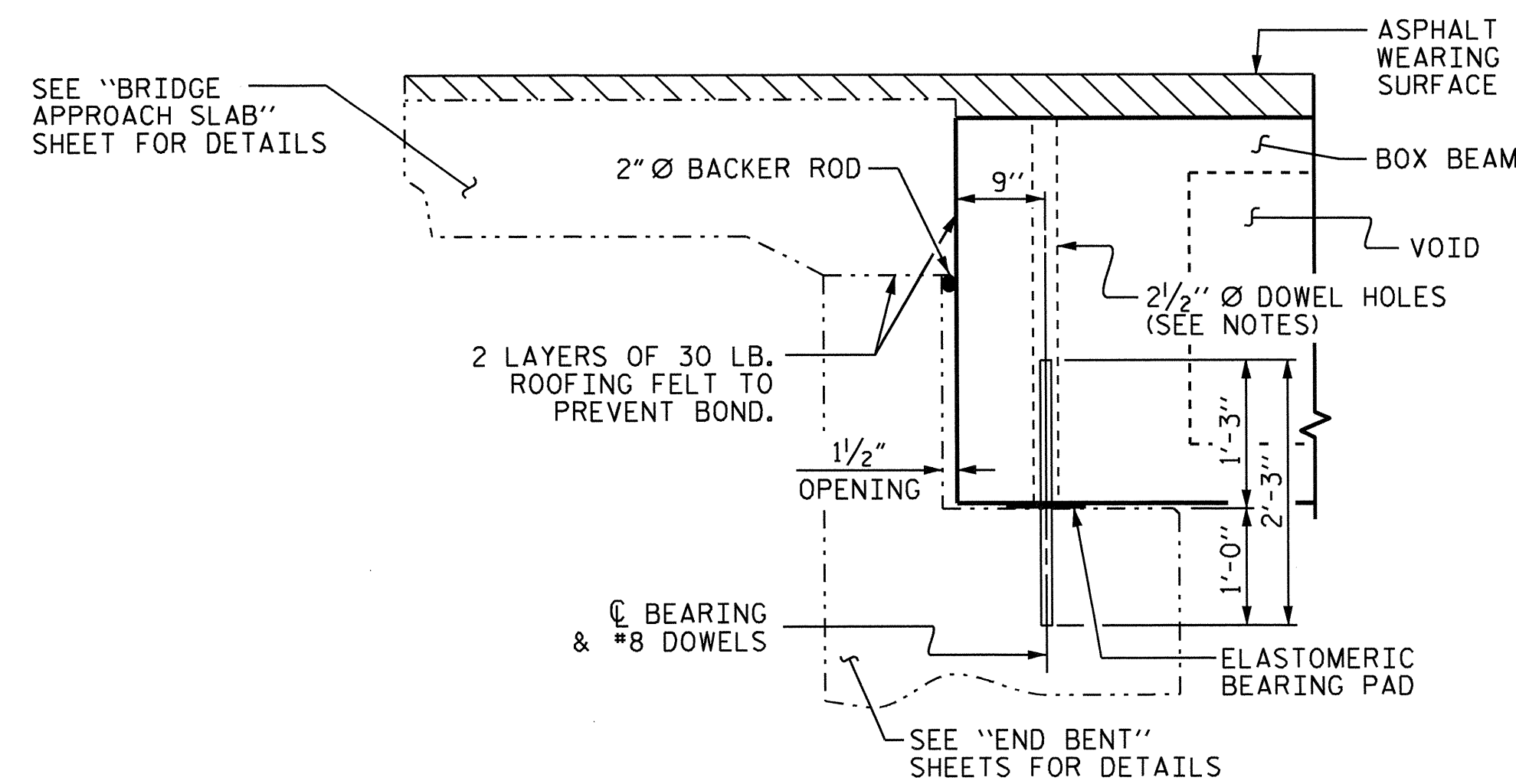
THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.



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

FIXED END

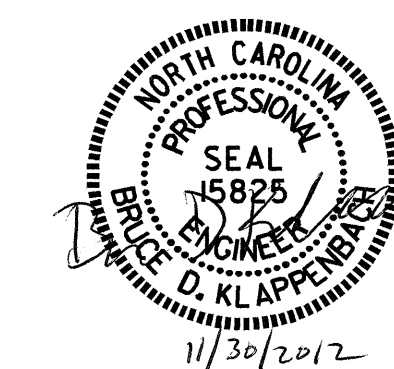


SECTION AT END BENT

PROJECT NO. B-4834
WARREN COUNTY
 STATION: 15+87.00 -L-

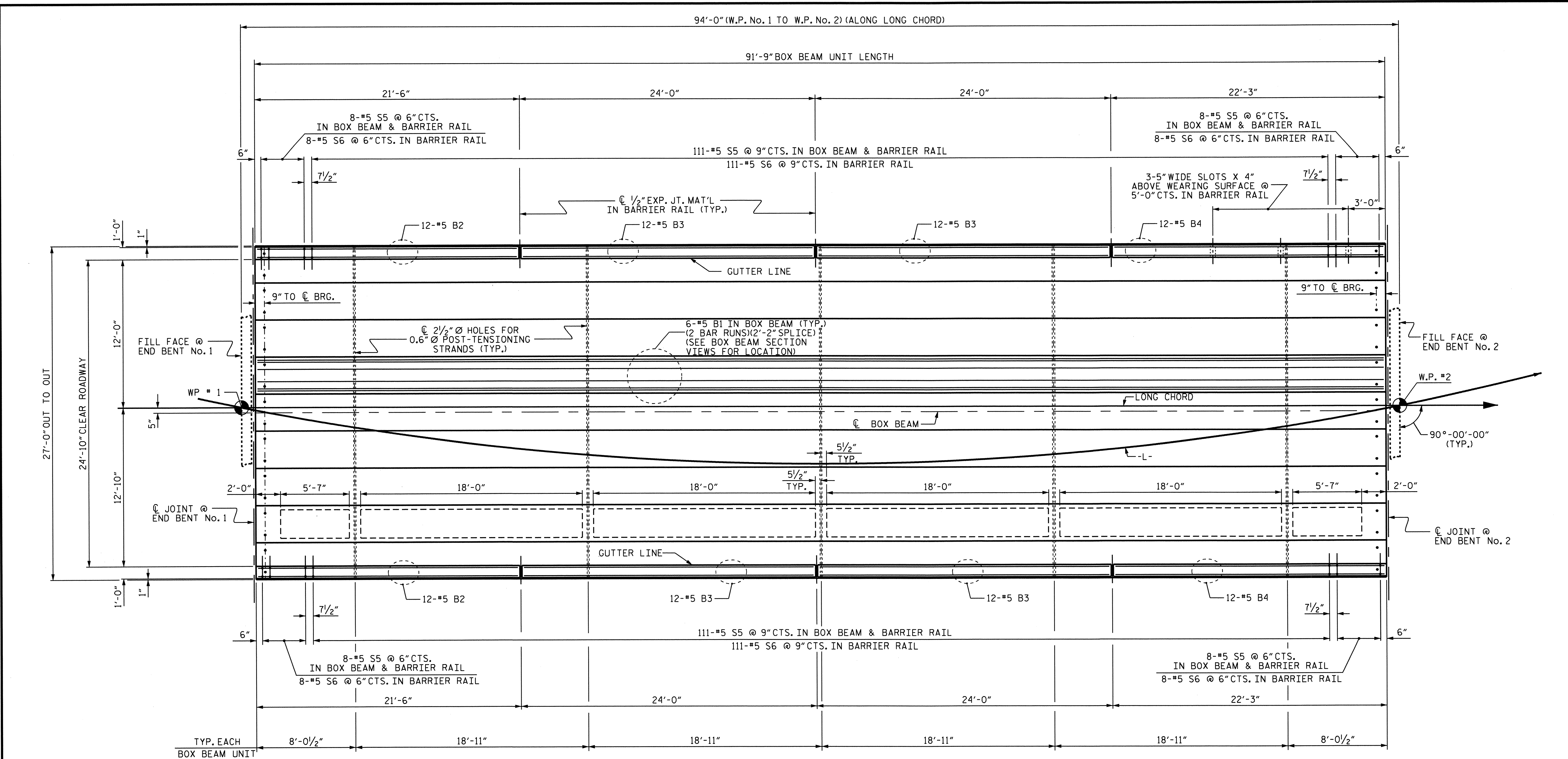
SHEET 1 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3'-0" X 3'-3"
 PRESTRESSED CONCRETE
 BOX BEAM UNIT



ASSEMBLED BY : A. V. ROYAL	DATE : 05/11
CHECKED BY : M. K. TOM	DATE : 05/11
DRAWN BY : TLA 5/05	ADDED 7/11/05R
CHECKED BY : GM 6/05	REV. 5/11/06 TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			20



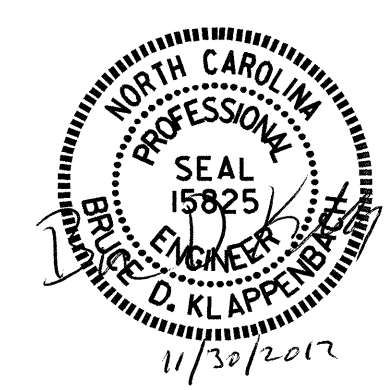
PLAN OF SPAN "A"

PROJECT NO. B-4834
 WARREN COUNTY
 STATION: 15+87.00 -L-

SHEET 2 OF 6

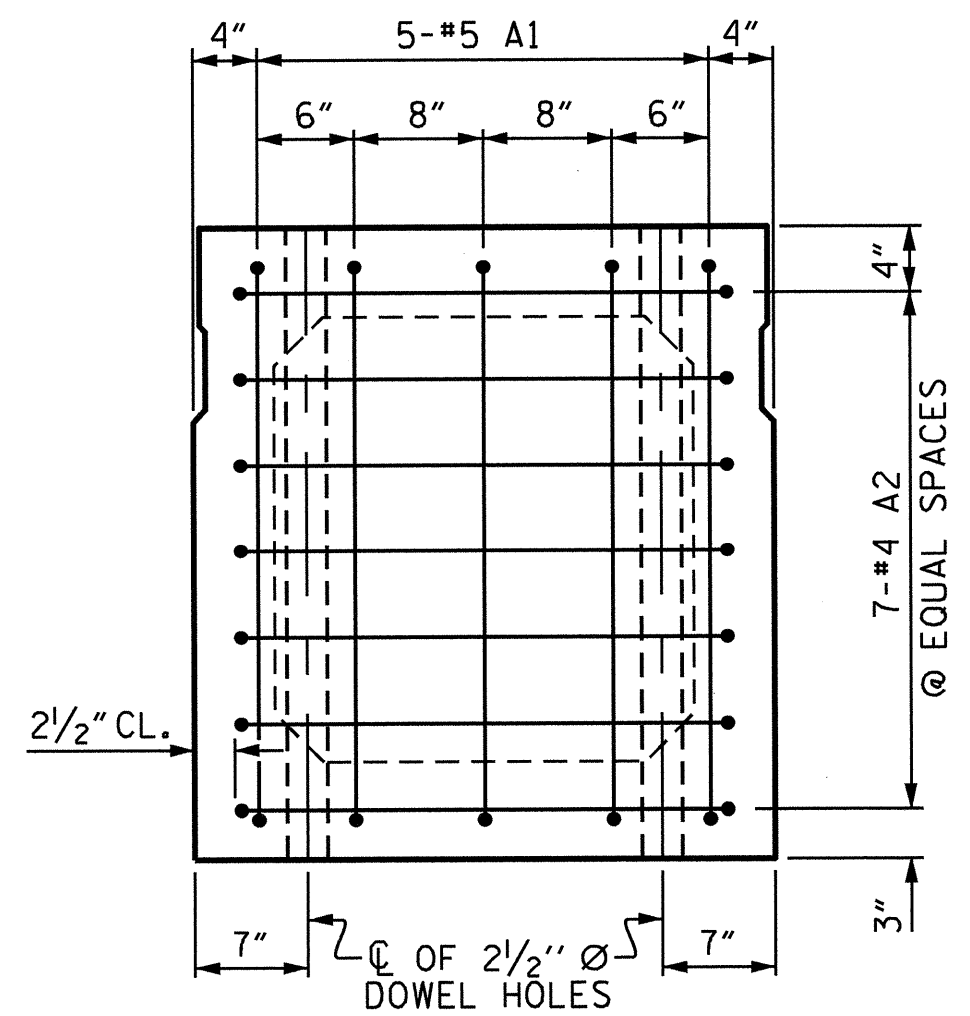
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF SPAN "A"



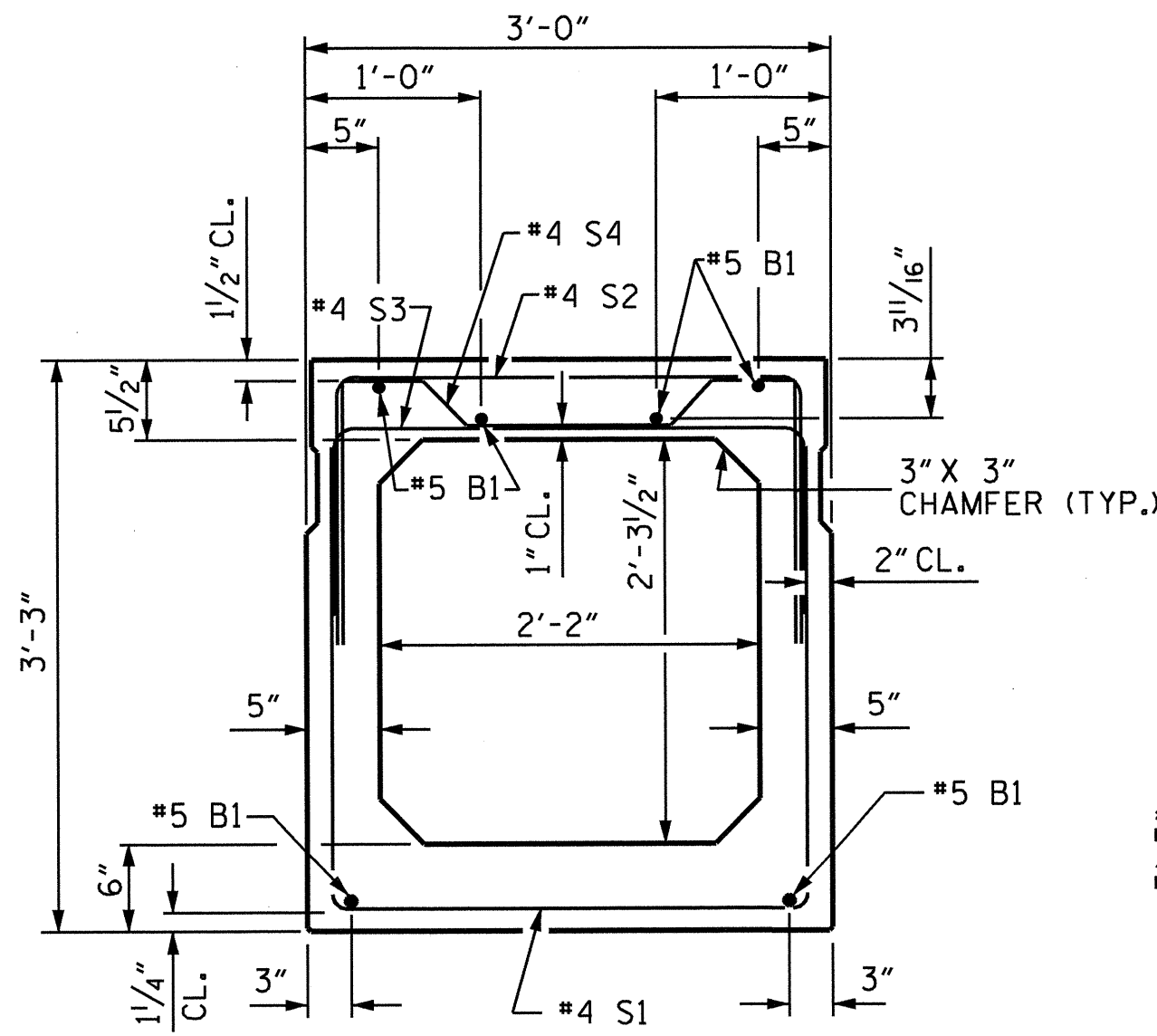
DRAWN BY: A. V. ROYAL DATE: 05/11
 CHECKED BY: M. K. TOM DATE: 05/11

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7	
1			3			TOTAL SHEETS	
2			4			20	



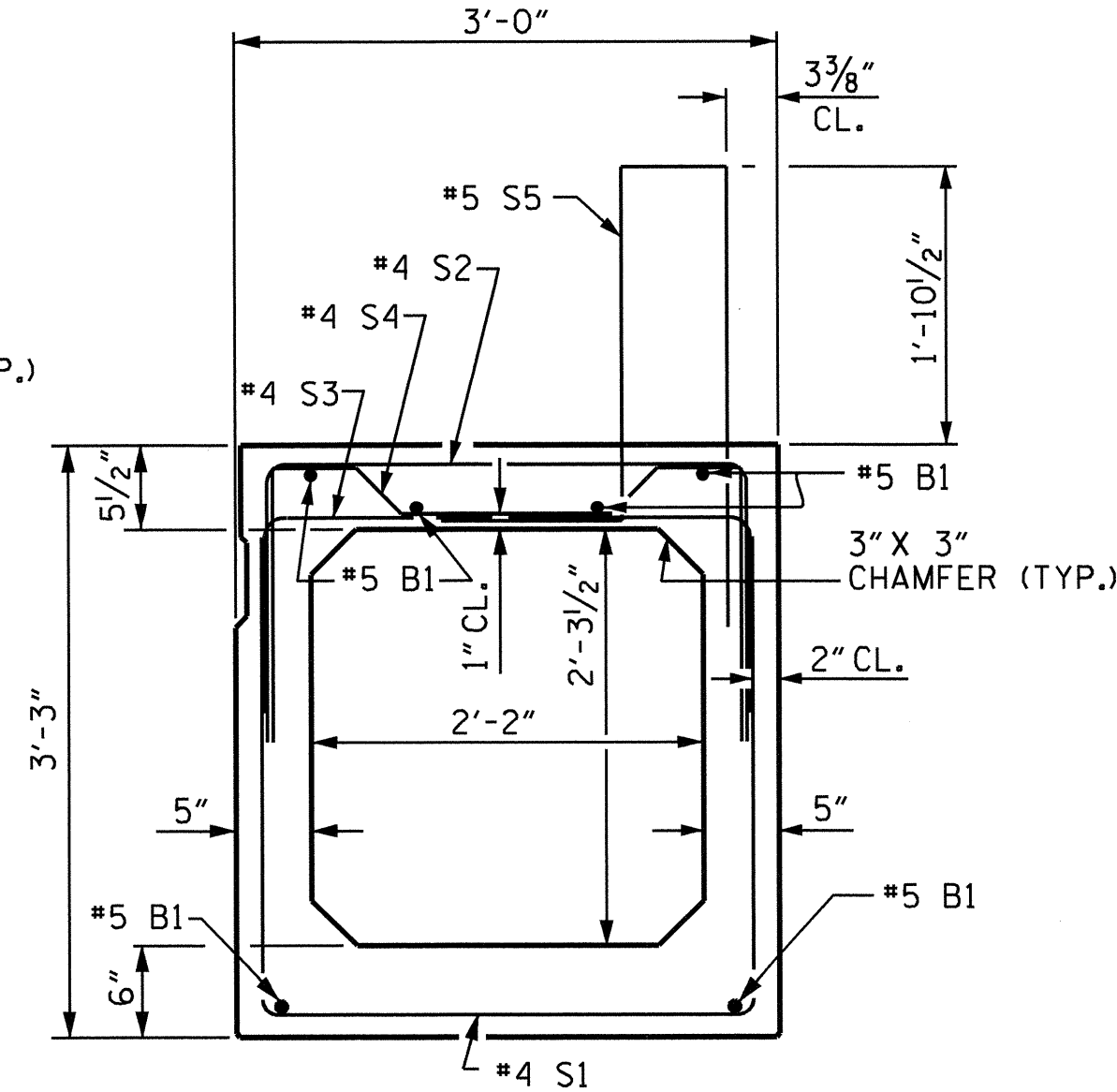
END ELEVATION

SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES. (INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. STRAND LAYOUT NOT SHOWN.)



INTERIOR BOX BEAM SECTION

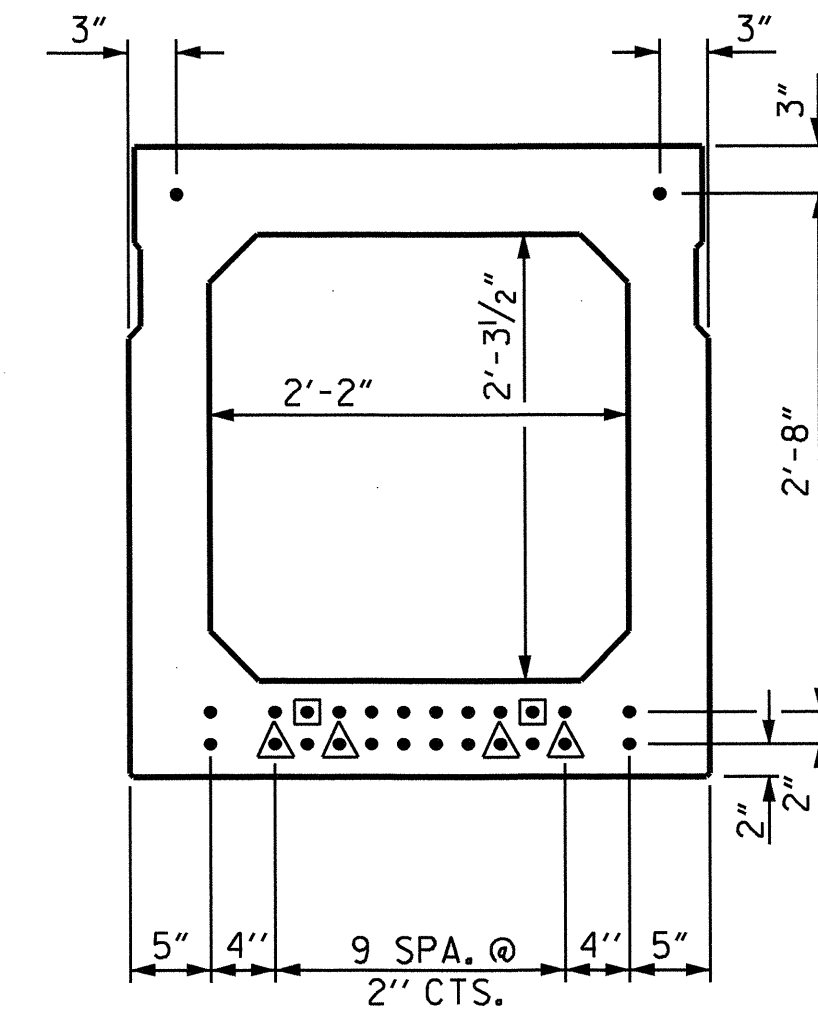
(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION

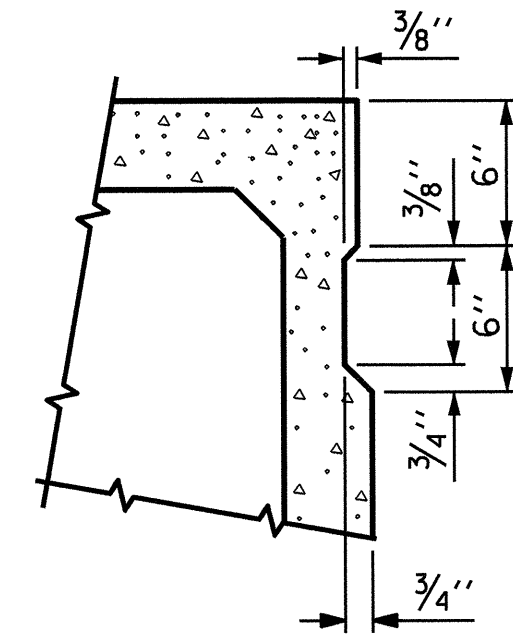
(26 STRANDS REQUIRED)

(INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION)

DEBONDING LEGEND

- FULLY BONDED STRANDS
- ◻ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◻ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

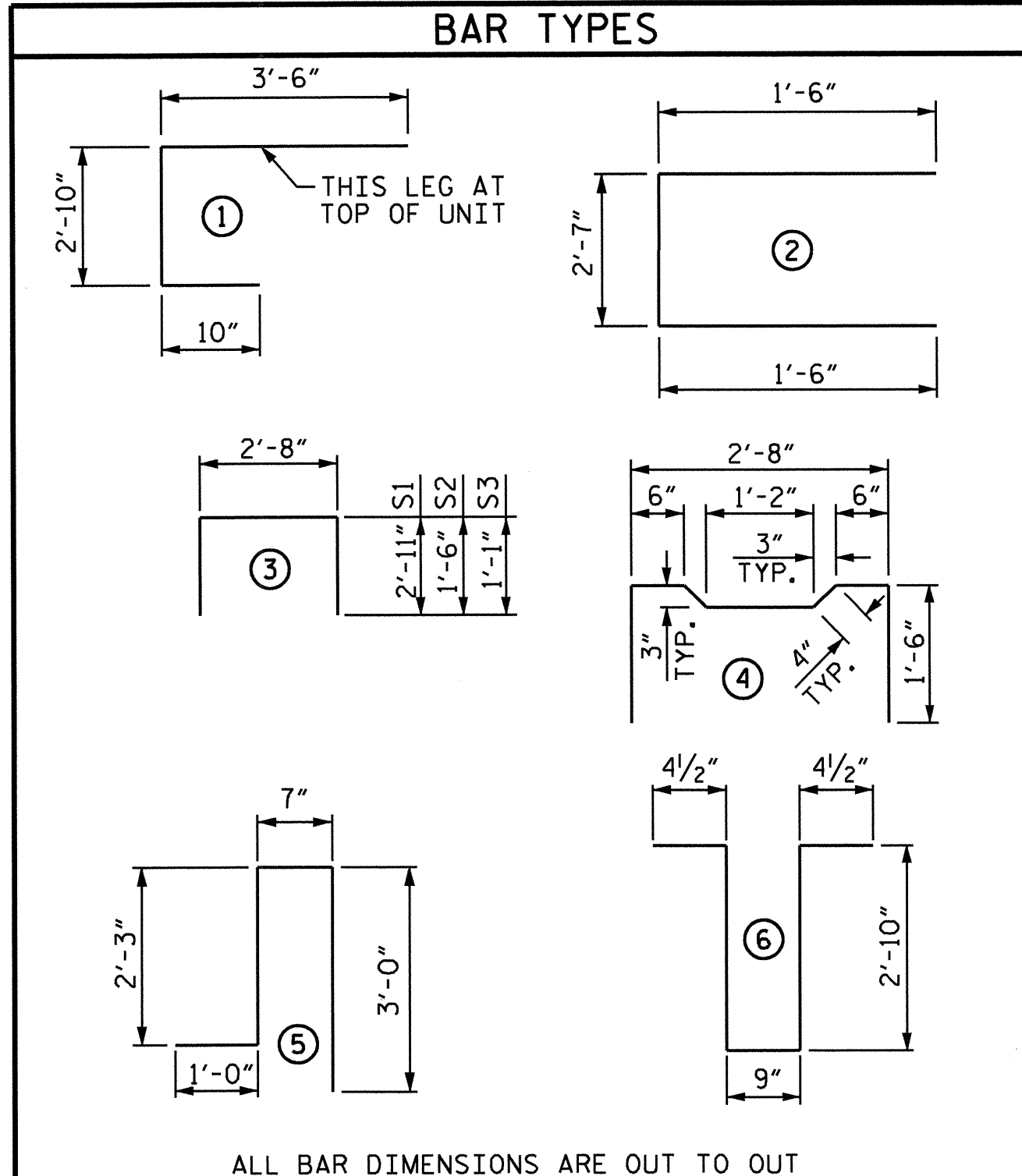
BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.



SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.

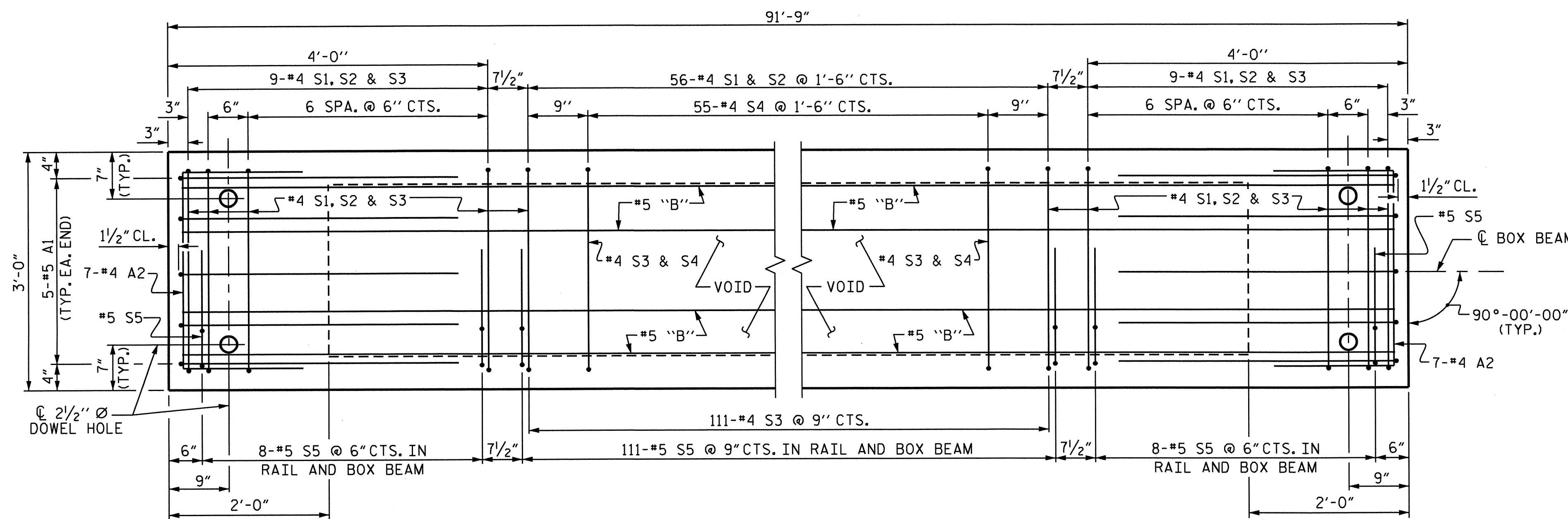
GRADE 270 STRANDS	
	0.6" Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

BAR NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
			LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	7'-2"	75	7'-2"	75
A2	44	#4	5'-7"	164	5'-7"	164
B1	12	#5	46'-10"	586	46'-10"	586
K1	15	#4	7'-2"	72	7'-2"	72
K2	10	#4	2'-7"	17	2'-7"	17
S1	74	#4	8'-6"	420	8'-6"	420
S2	74	#4	5'-8"	280	5'-8"	280
S3	129	#4	4'-10"	416	4'-10"	416
S4	55	#4	5'-10"	214	5'-10"	214
*S5	127	#5	6'-10"	905	--	--
REINFORCING STEEL				2244 LBS.		2244 LBS.
* EPOXY COATED REINF. STEEL				905 LBS.		
6000 P.S.I. CONCRETE				18.1 CU. YDS.		17.9 CU. YDS.
0.6" Ø L.R. STRANDS				No. = 26		No. = 26

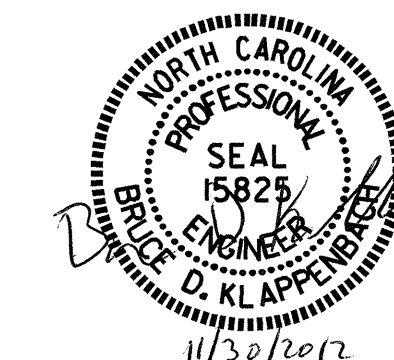


PLAN OF BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. FOR LOCATION OF DIAPHRAGMS, SEE PLAN OF SPANS. FOR REINFORCING STEEL IN DIAPHRAGMS, SEE DIAPHRAGM DETAILS.

ASSEMBLED BY :	A. V. ROYAL	DATE :	05/11
CHECKED BY :	M. K. TOM	DATE :	05/11
DRAWN BY :	TLA 5/05	ADDED :	7/11/05
CHECKED BY :	GM 6/05	REV. :	10/11 TLA/GM

30-NOV-2012 08:48
RA Structures\Plans\Drafting\SUPERSTRUCTURE\B4834.SD.BX.dgn
dklappenbach



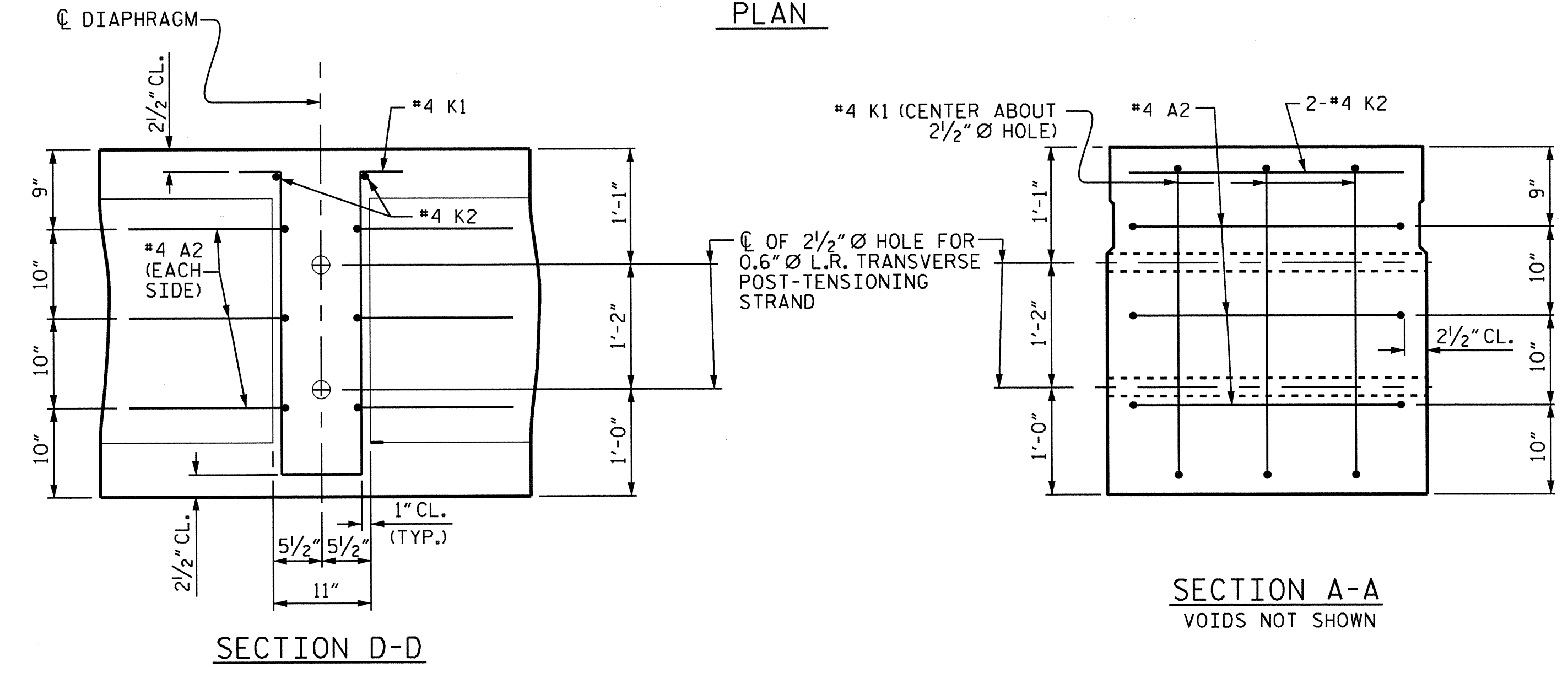
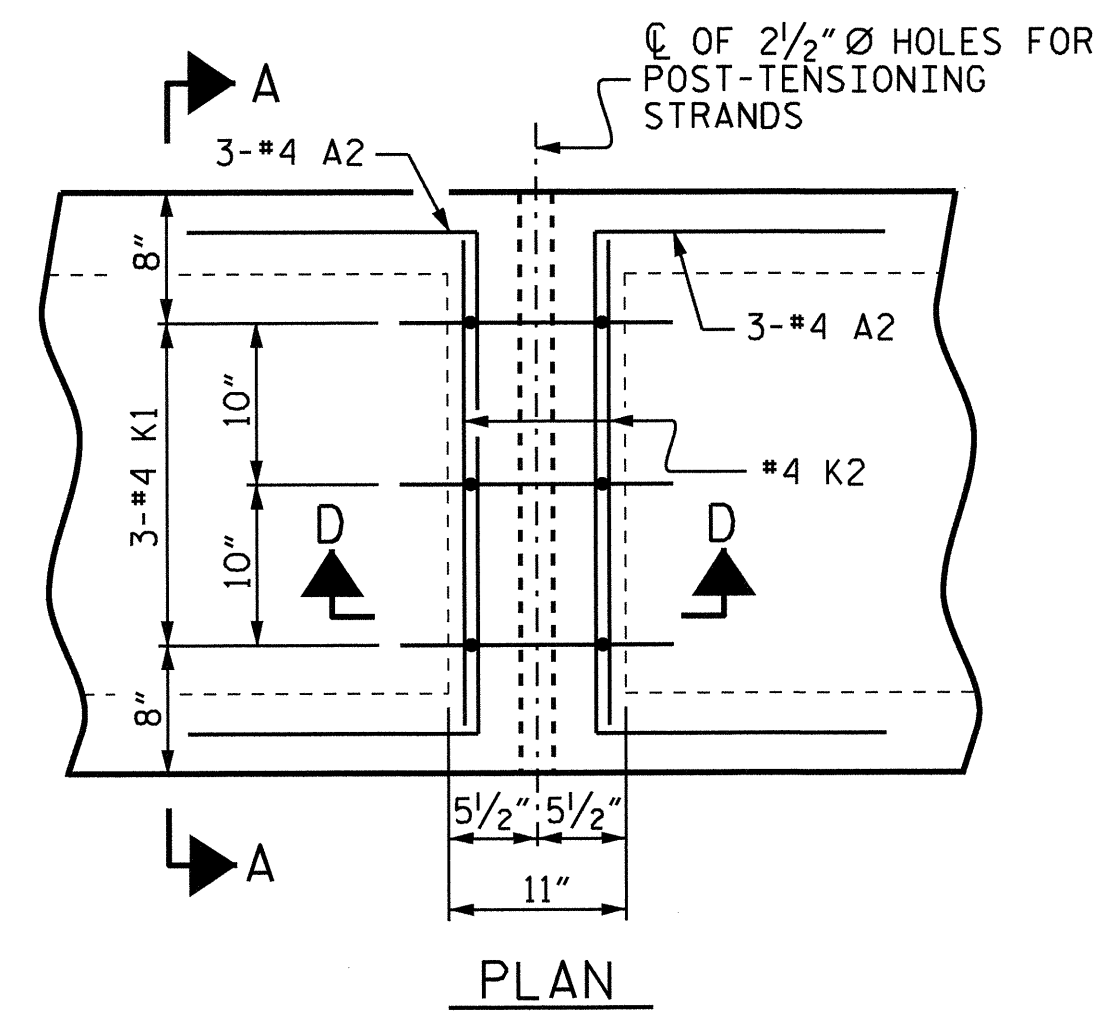
PROJECT NO. B-4834
WARREN COUNTY
STATION: 15+87.00 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
3'-0" X 3'-3"
PRESTRESSED CONCRETE
BOX BEAM UNIT
SPAN "A"

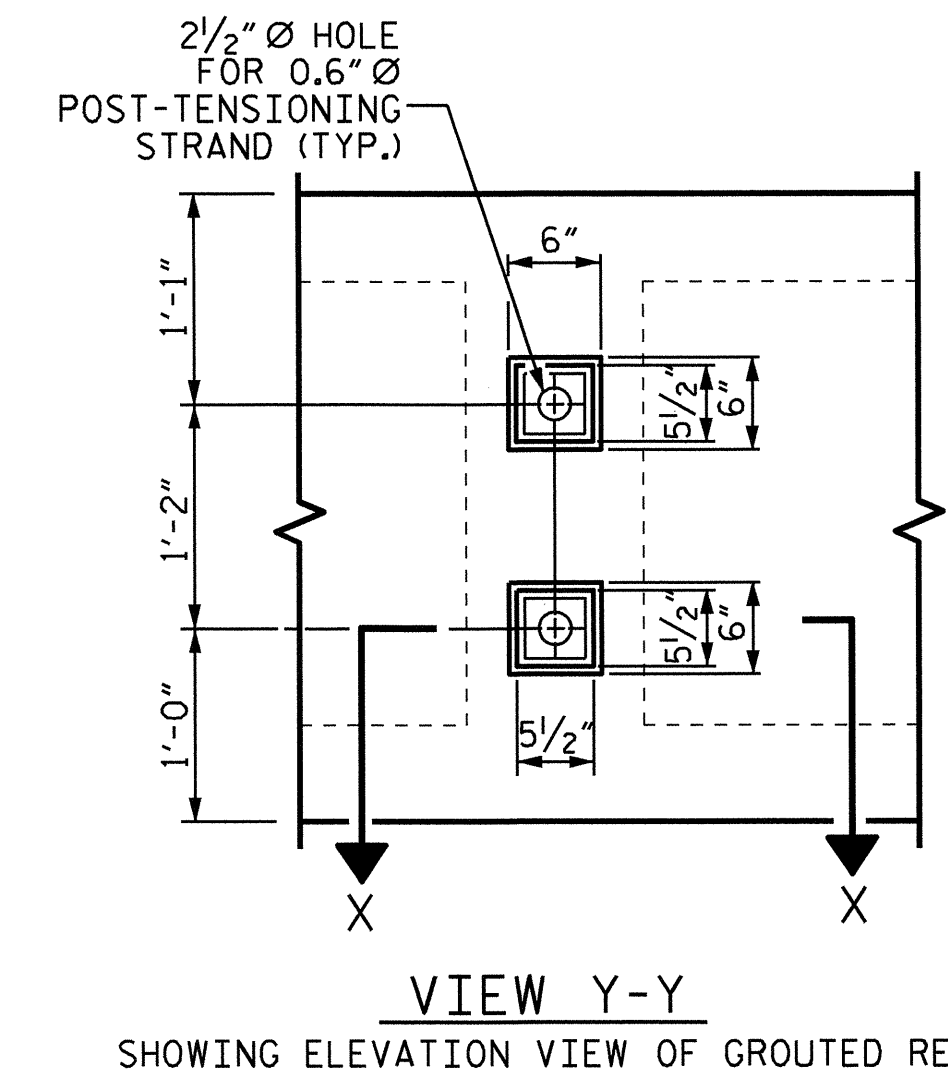
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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 20
2			4			

(SHT 1C) STD. NO. PCBB6

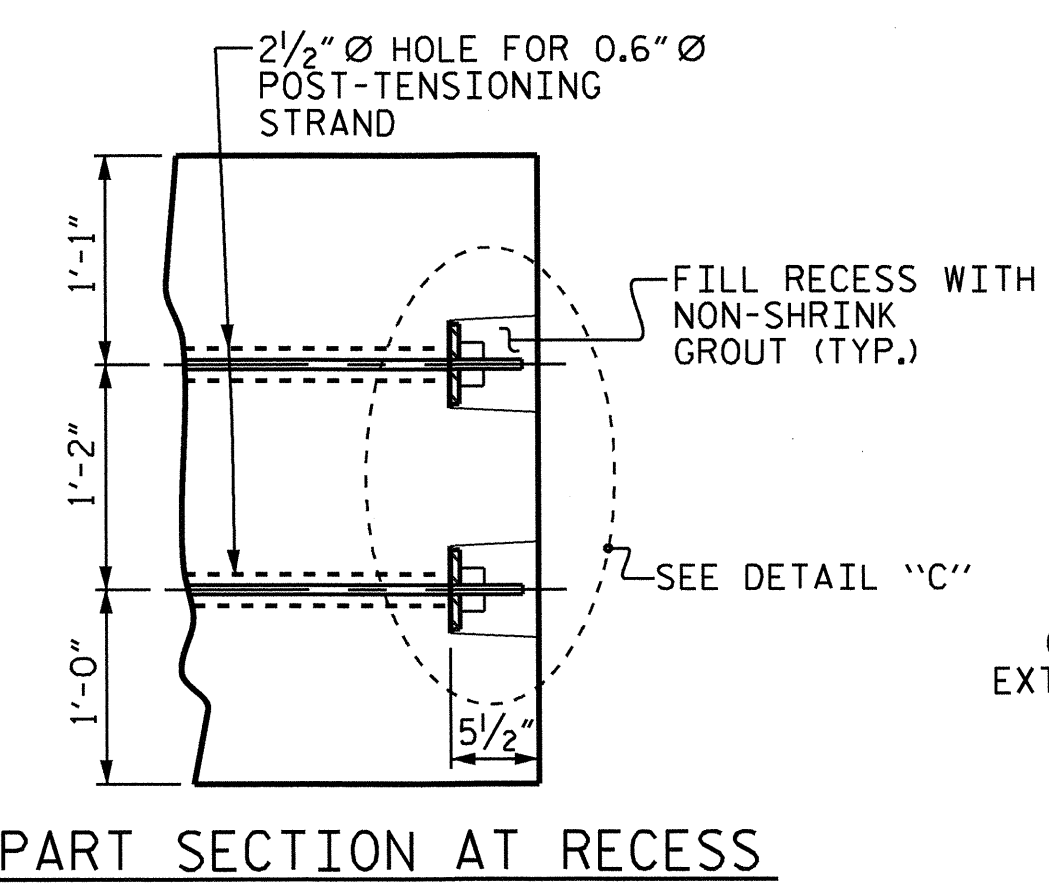
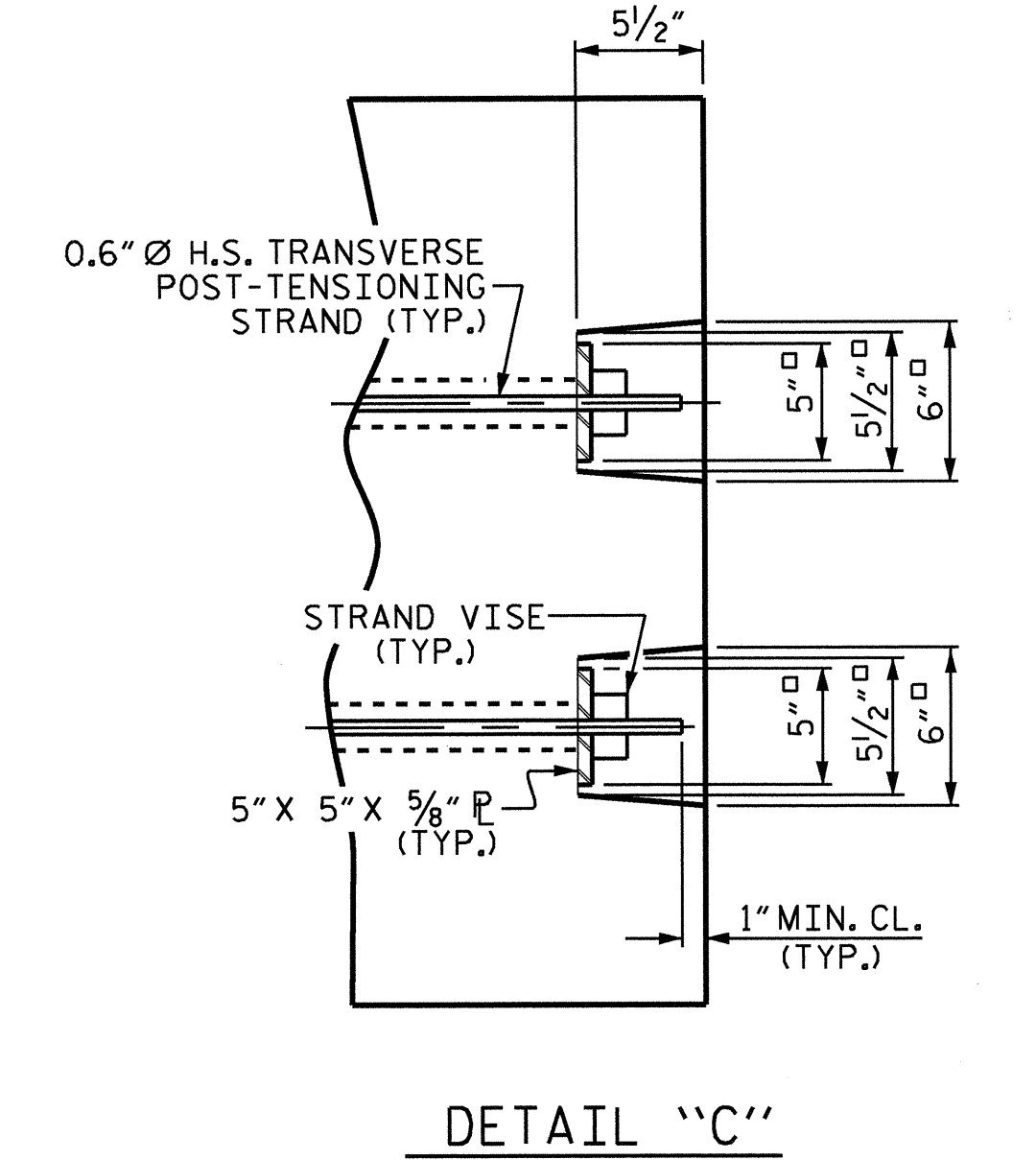


DOUBLE DIAPHRAGM DETAILS

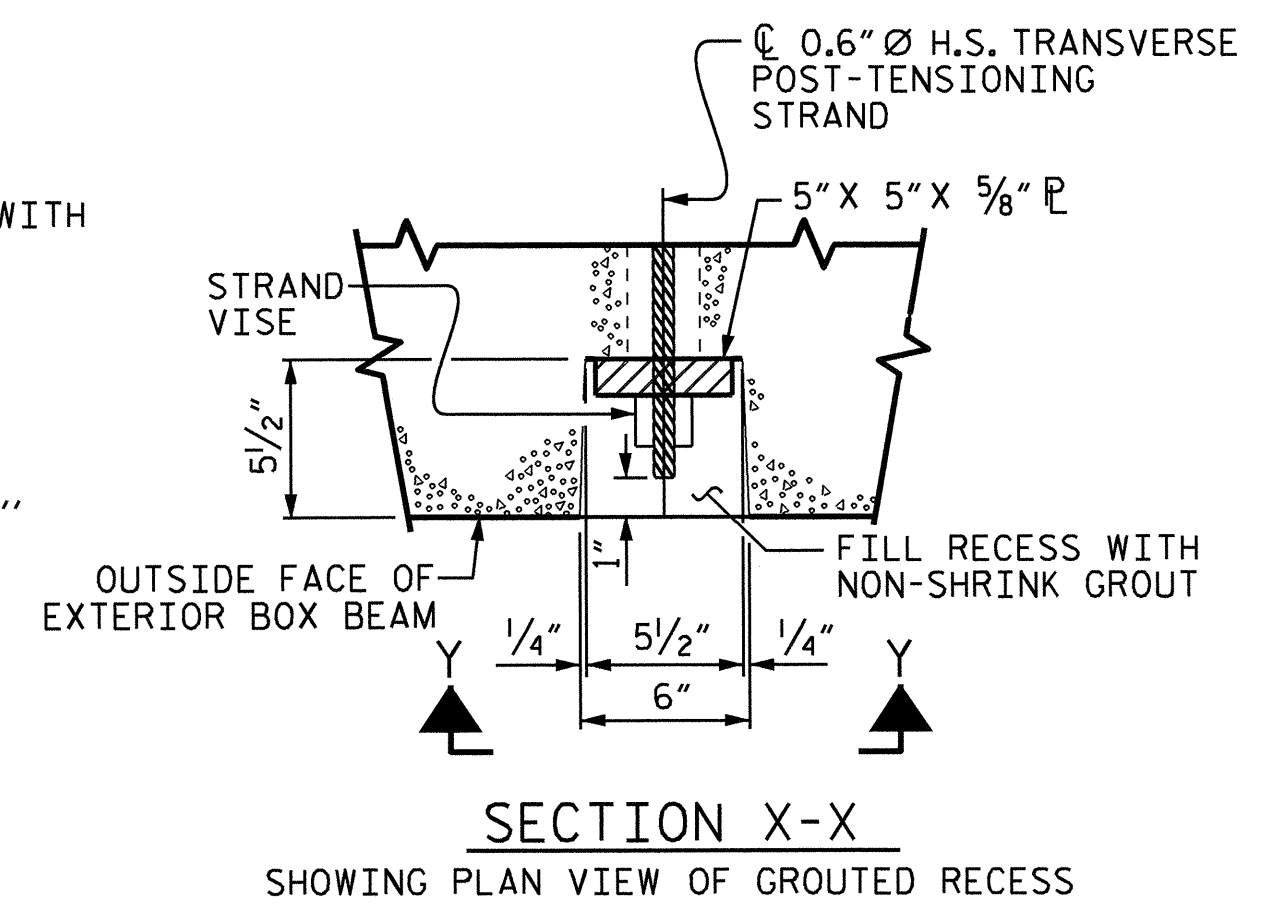
#4 "S" BARS NOT SHOWN. #4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2 1/2" Ø HOLE.



VIEW Y-Y
SHOWING ELEVATION VIEW OF GROUDED RECESS

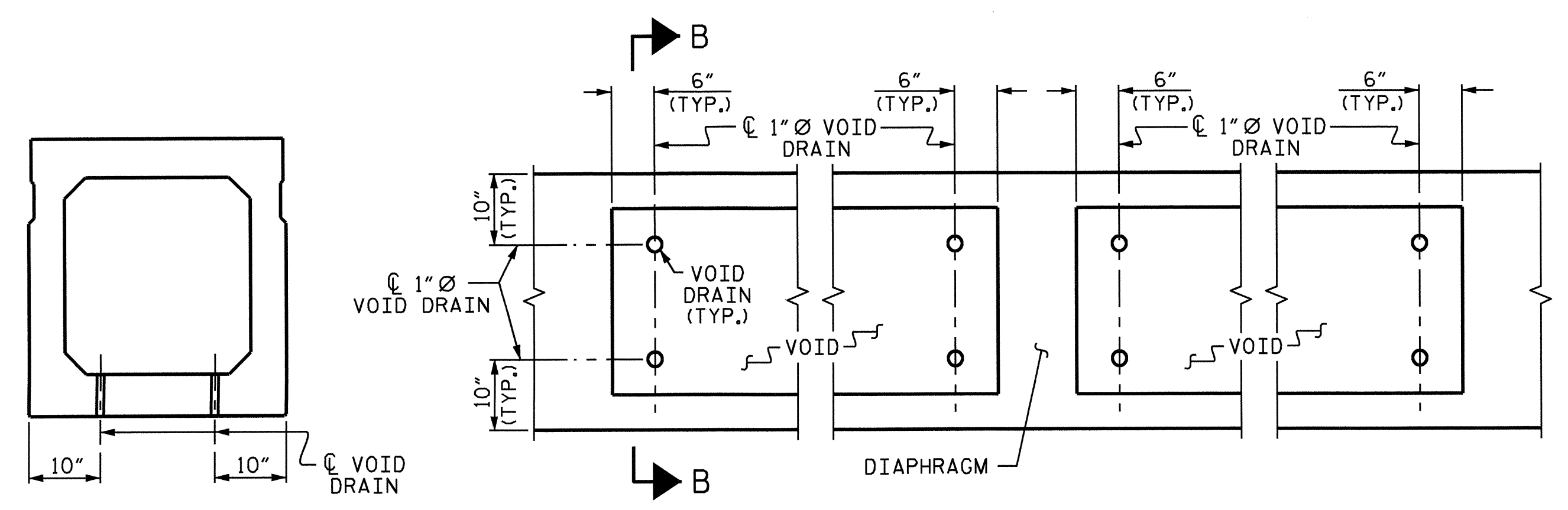


PART SECTION AT RECESS



SECTION X-X
SHOWING PLAN VIEW OF GROUDED RECESS

GROUDED RECESS DETAIL AT END OF POST-TENSIONED STRANDS OF EXTERIOR BOX BEAM



VOID DRAIN DETAILS

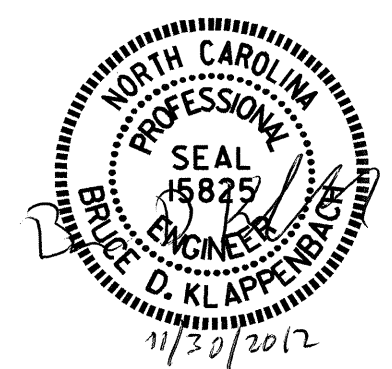
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 3'-3"
	0.6" Ø L.R. STRAND
	SPAN "A"
CAMBER (BEAM ALONE IN PLACE) ↑	3 9/16"
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD ** ↓	1"
FINAL CAMBER ↑	2 9/16"

** INCLUDES FUTURE WEARING SURFACE

PROJECT NO. B-4834
WARREN COUNTY
 STATION: 15+87.00 -L-
 SHEET 4 OF 6

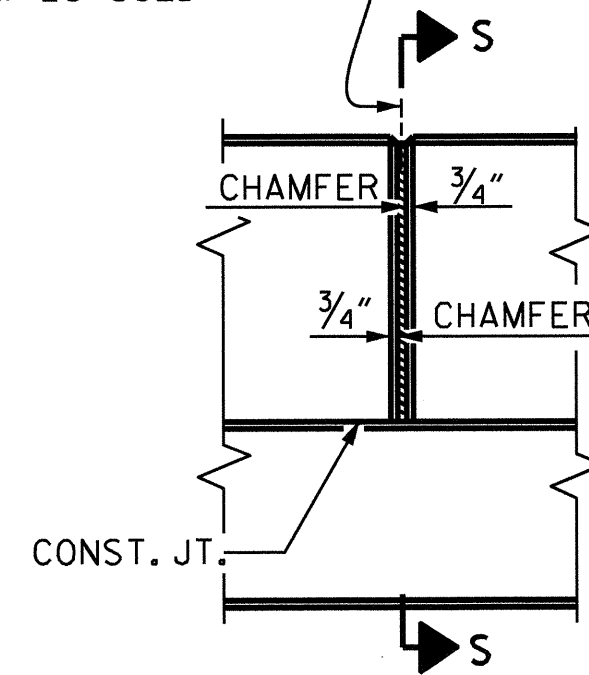
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3'-0" X 3'-3"
 PRESTRESSED CONCRETE
 BOX BEAM UNIT



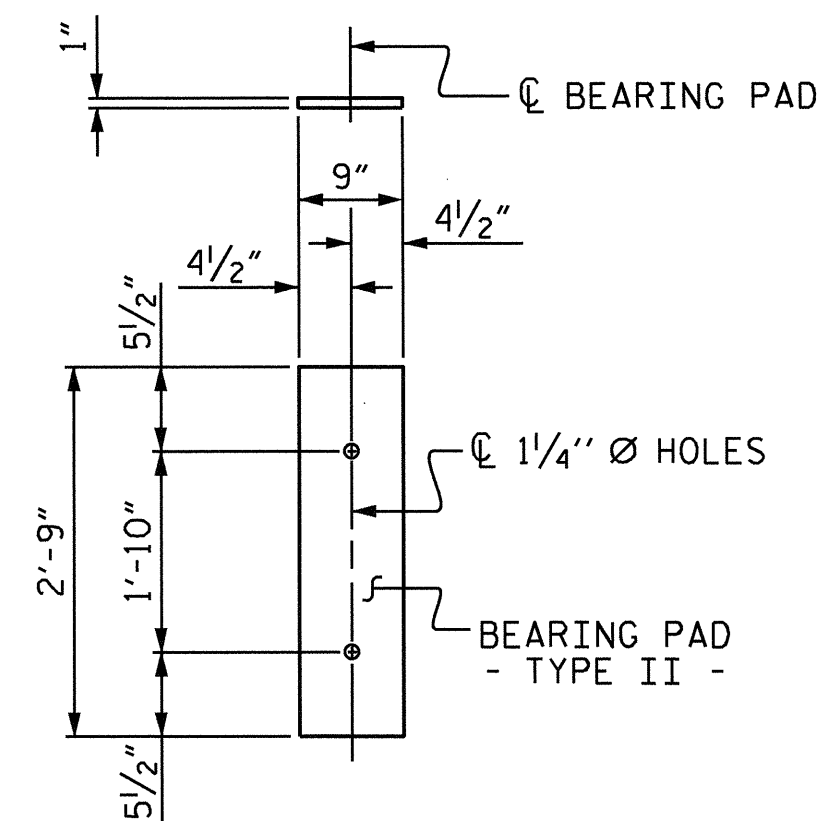
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			20

ASSEMBLED BY : A. V. ROYAL DATE : 05/11
 CHECKED BY : M. K. TOM DATE : 05/11
 DRAWN BY : TLA 5/05 ADDED 10/1/11
 CHECKED BY : GM 6/05

1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS.
(NOTE: OMIT EXP. JT. MAT'L WHEN SLIP FORM IS USED)



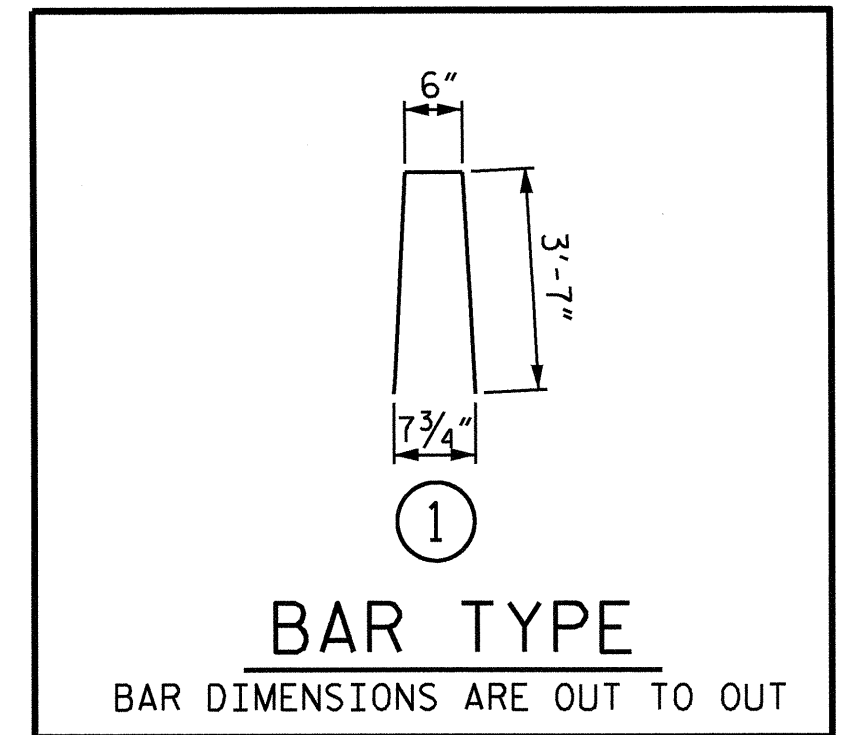
ELEVATION AT EXPANSION JOINTS



FIXED END
(TYPE II - 18 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



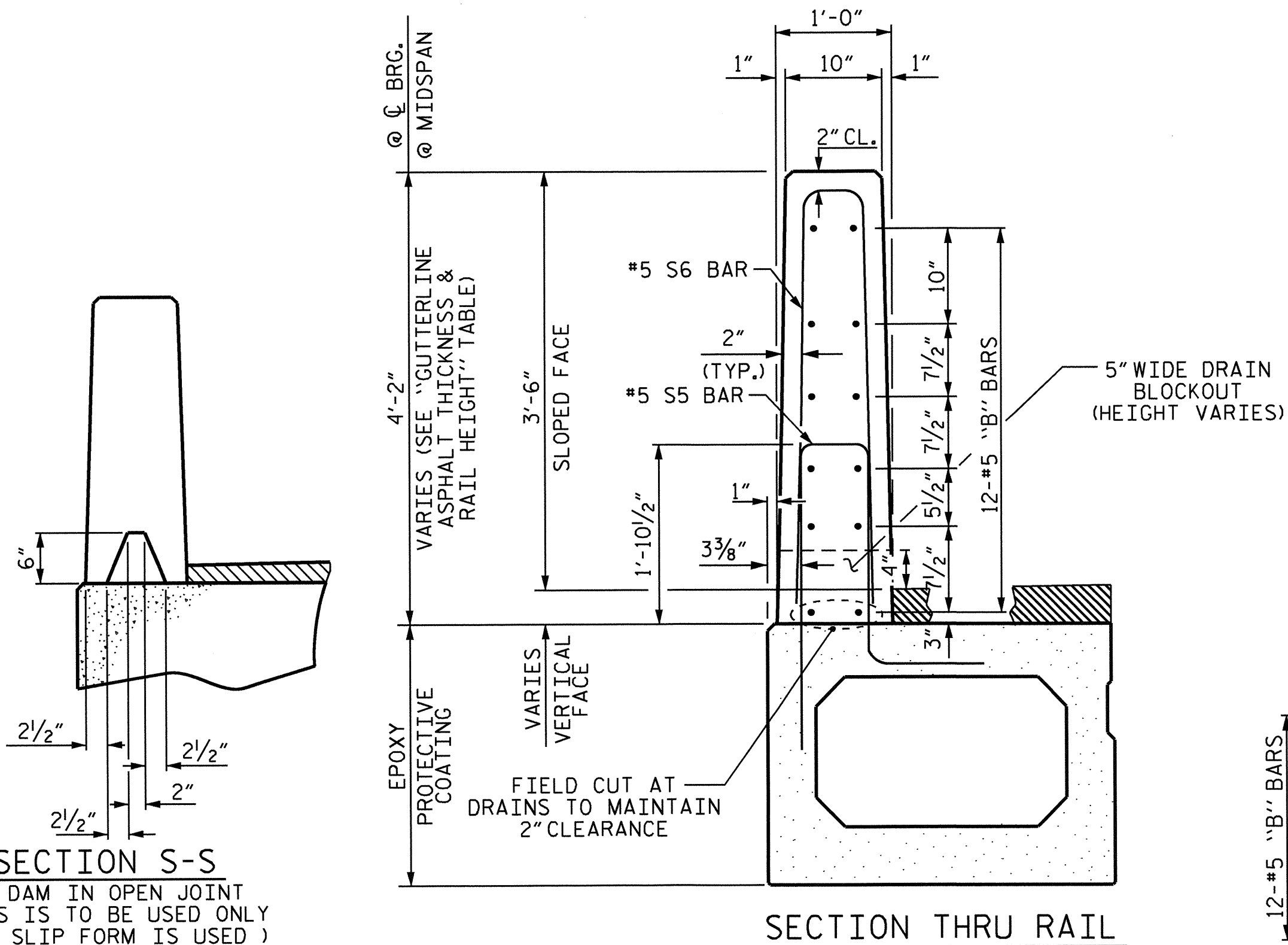
GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
91'-9" UNITS	Δ 1 7/8"	3'-11 1/2"

Δ THICKNESS AT MID-SPAN REFLECTS THE EFFECTS OF THE VERTICAL CURVE.

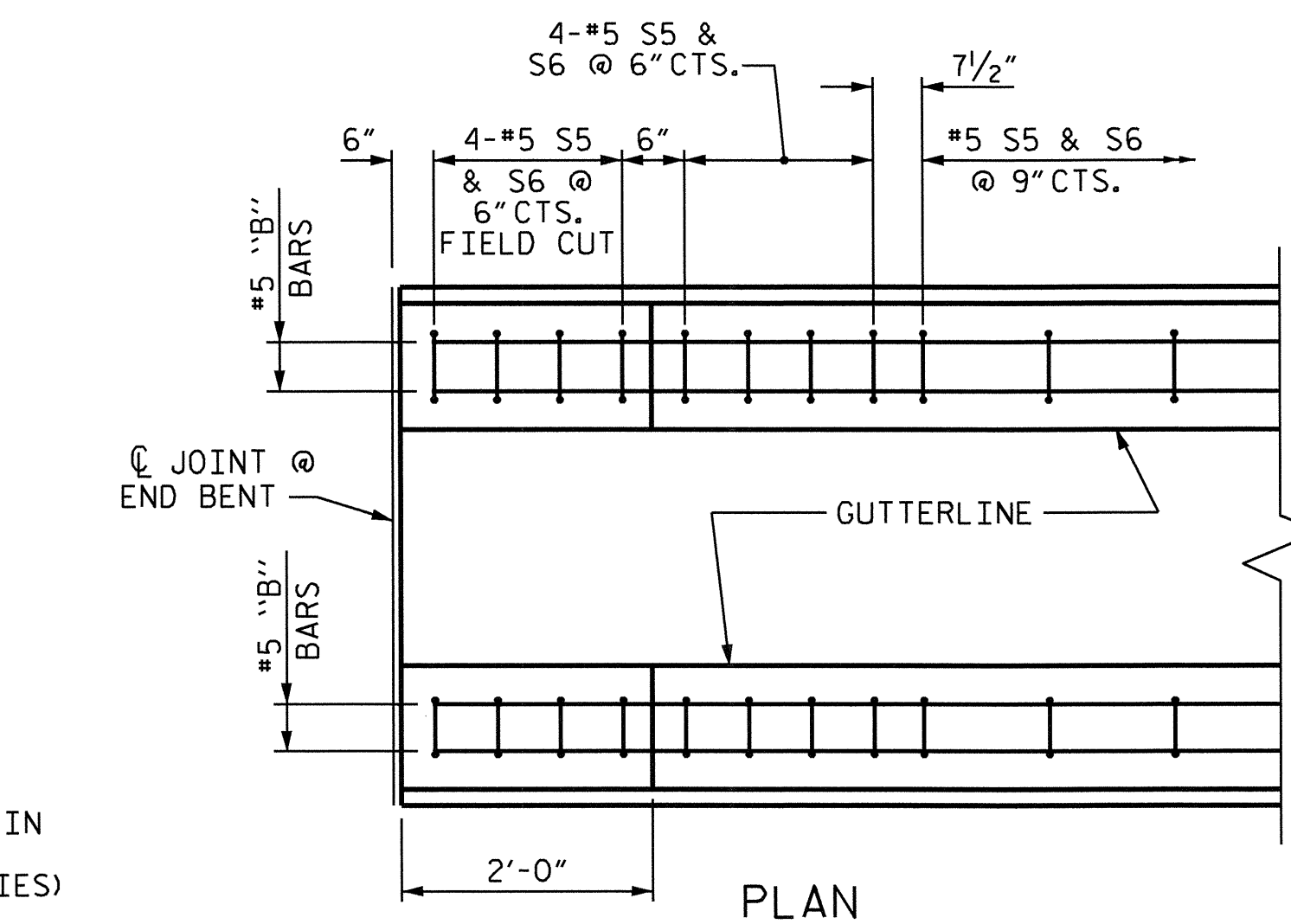
VERTICAL CURVE ORDINATE = 3/16"

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL					
BAR	BARS PER SPAN	SIZE	TYPE	LENGTH	WEIGHT
SPAN "A"					
* B2	24	#5	STR	21'-1"	528
* B3	48	#5	STR	23'-7"	1181
* B4	24	#5	STR	21'-10"	547
* S6	254	#5	1	7'-8"	1722
* EPOXY COATED REINFORCING STEEL					3977 LBS.
CLASS AA CONCRETE					26.0 CU. YDS.
TOTAL LIN. FT. OF VERTICAL CONCRETE BARRIER RAIL					183.50'

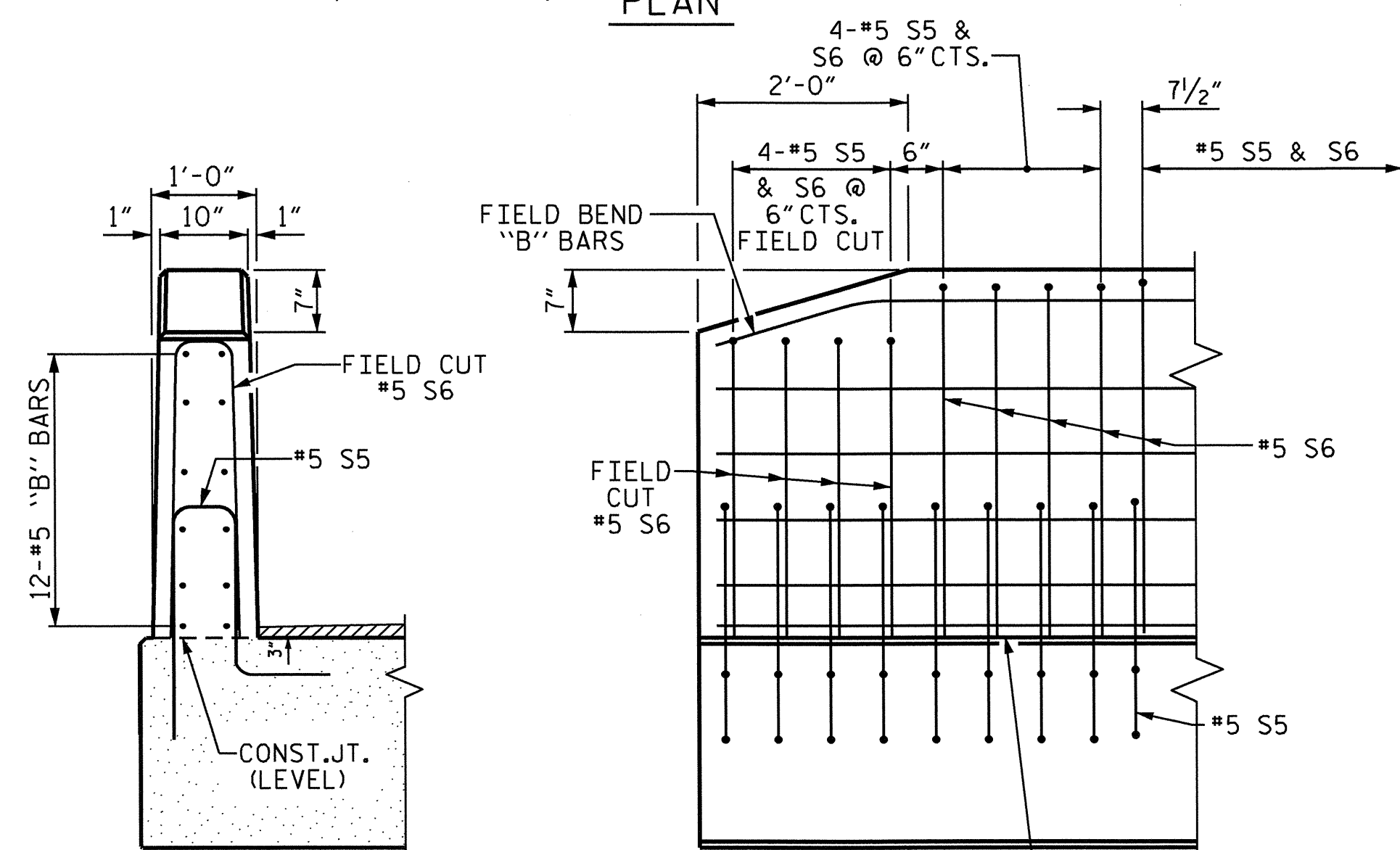
BOX BEAM UNITS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
SPAN A			
EXTERIOR B.B.	2	91'-9"	183'-6"
INTERIOR B.B.	7	91'-9"	642'-3"
TOTAL	9		825.75'



SECTION THRU RAIL



PLAN



END VIEW

SIDE VIEW

END OF VERTICAL CONCRETE BARRIER RAIL DETAILS

(SLOPED END - FIELD MODIFICATION)

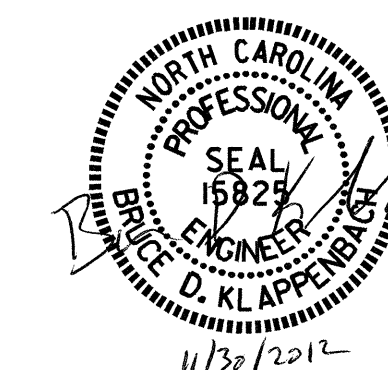
SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

VERTICAL CONCRETE BARRIER RAIL DETAILS

PROJECT NO. B-4834
WARREN COUNTY
STATION: 15+87.00 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
3'-0" X 3'-3"
PRESTRESSED CONCRETE
BOX BEAM UNIT



ASSEMBLED BY: T.L. CLELLAND DATE: 2/2012
CHECKED BY: B. KLAPPENBACH DATE: 7/2012

DRAWN BY: DGE II/II
CHECKED BY: TMG II/II

27-NOV-2012 12:01
Q:\S\Structures\Plans\Drafting\SUPERSTRUCTURE\B4834.SD.BX.dgn
tbarbour

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1			3			TOTAL SHEETS 20
2			4			

STD. NO. 39PCBB8.90S

NOTES

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

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

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

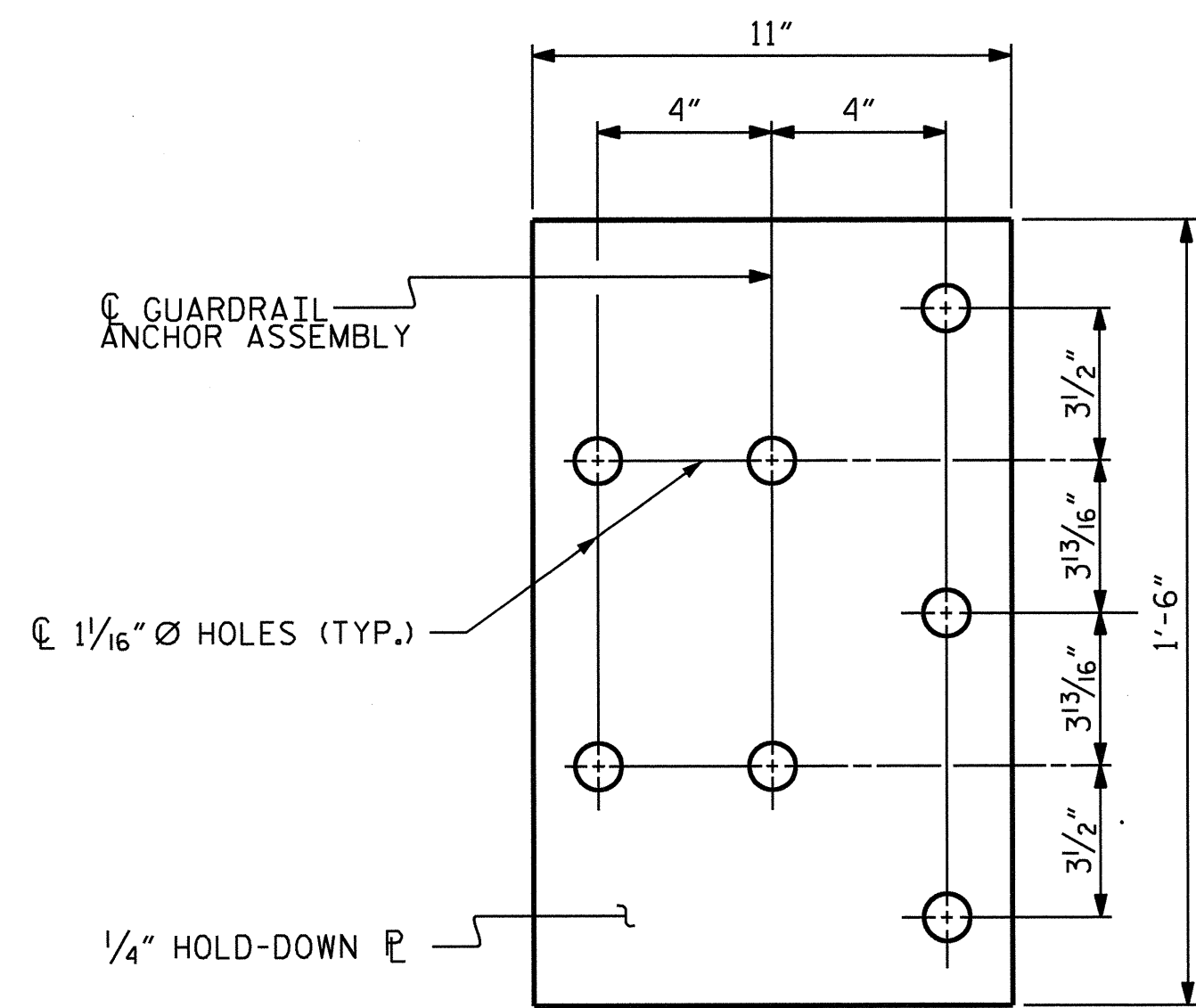
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

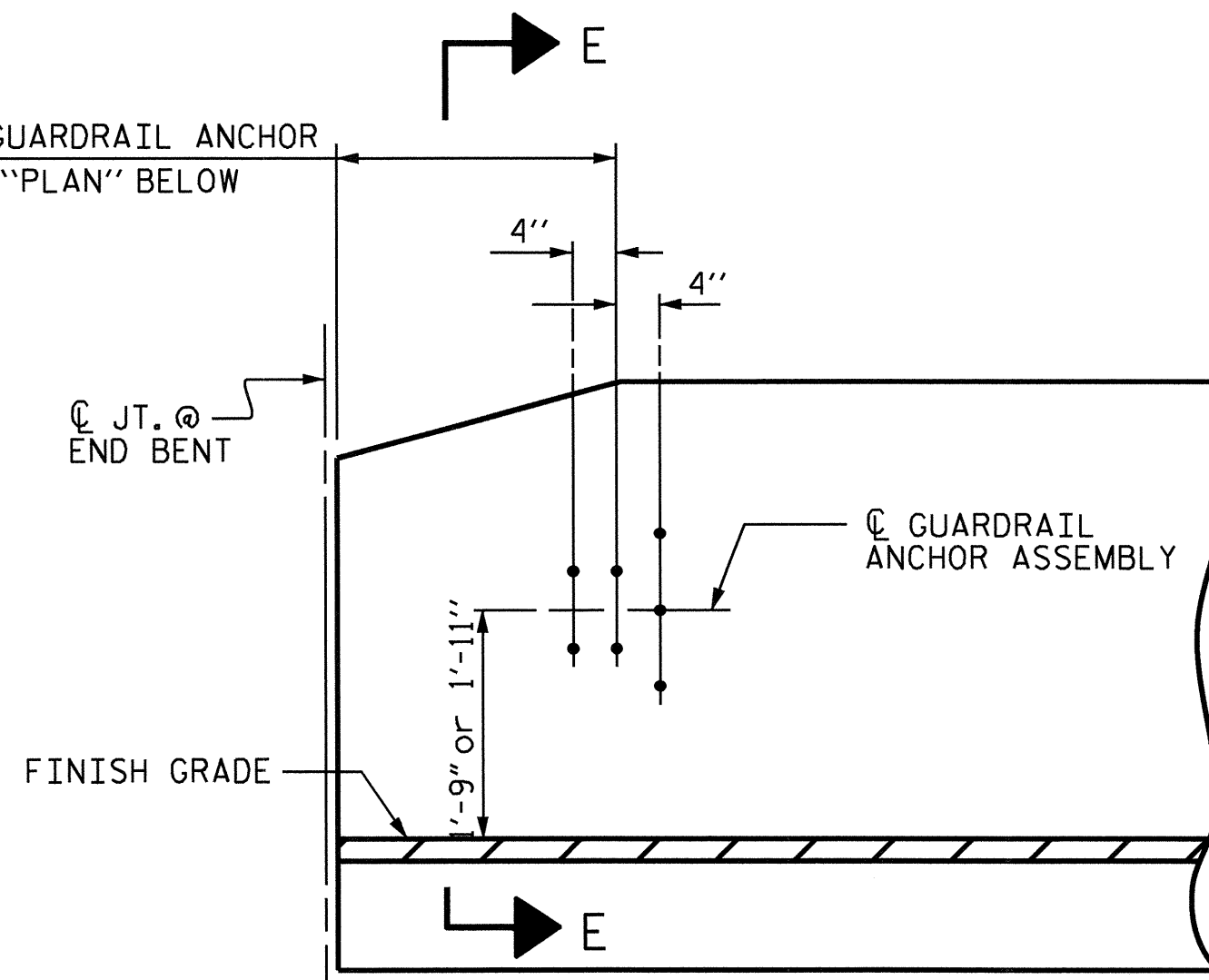
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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

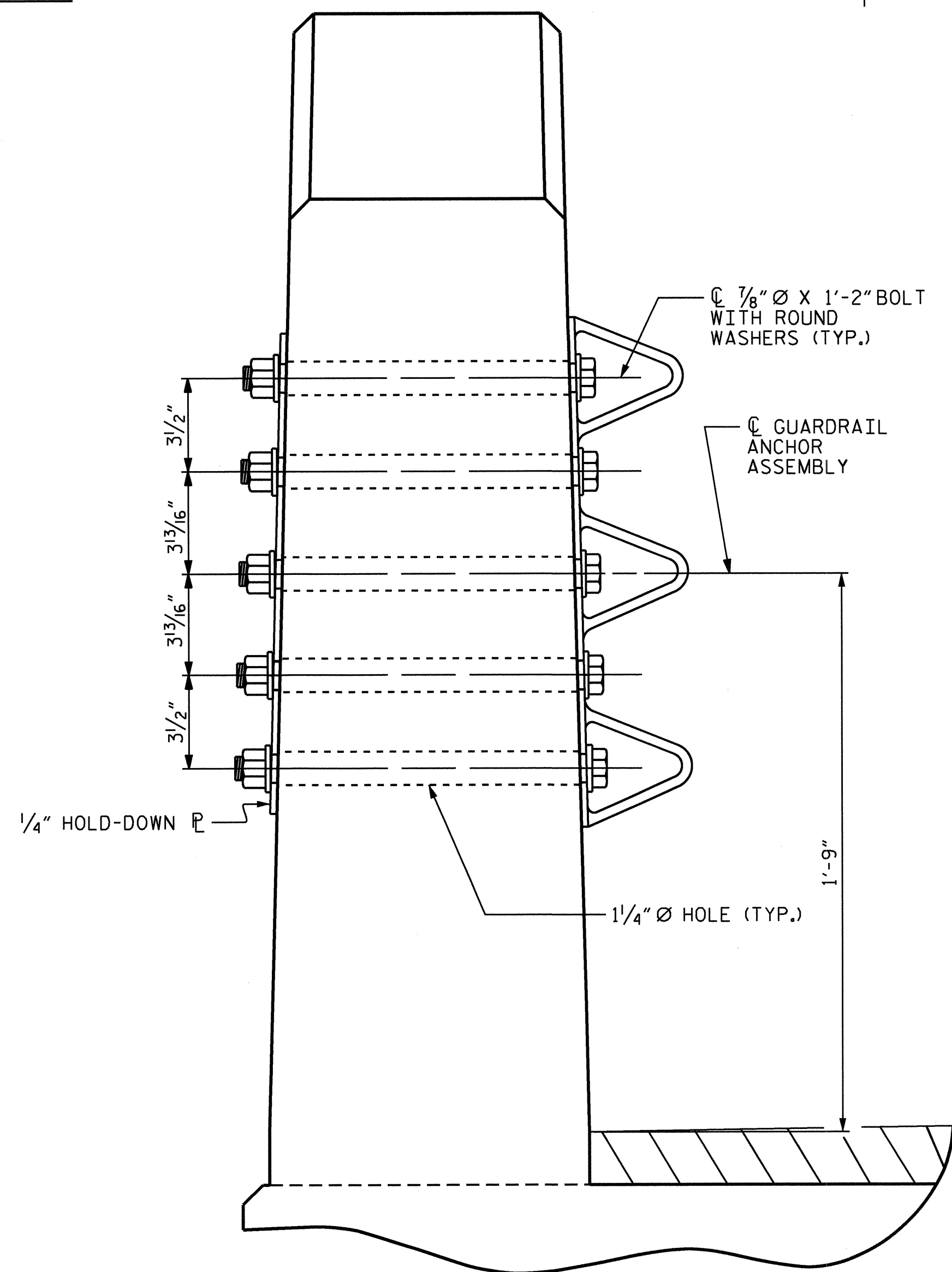


PLAN

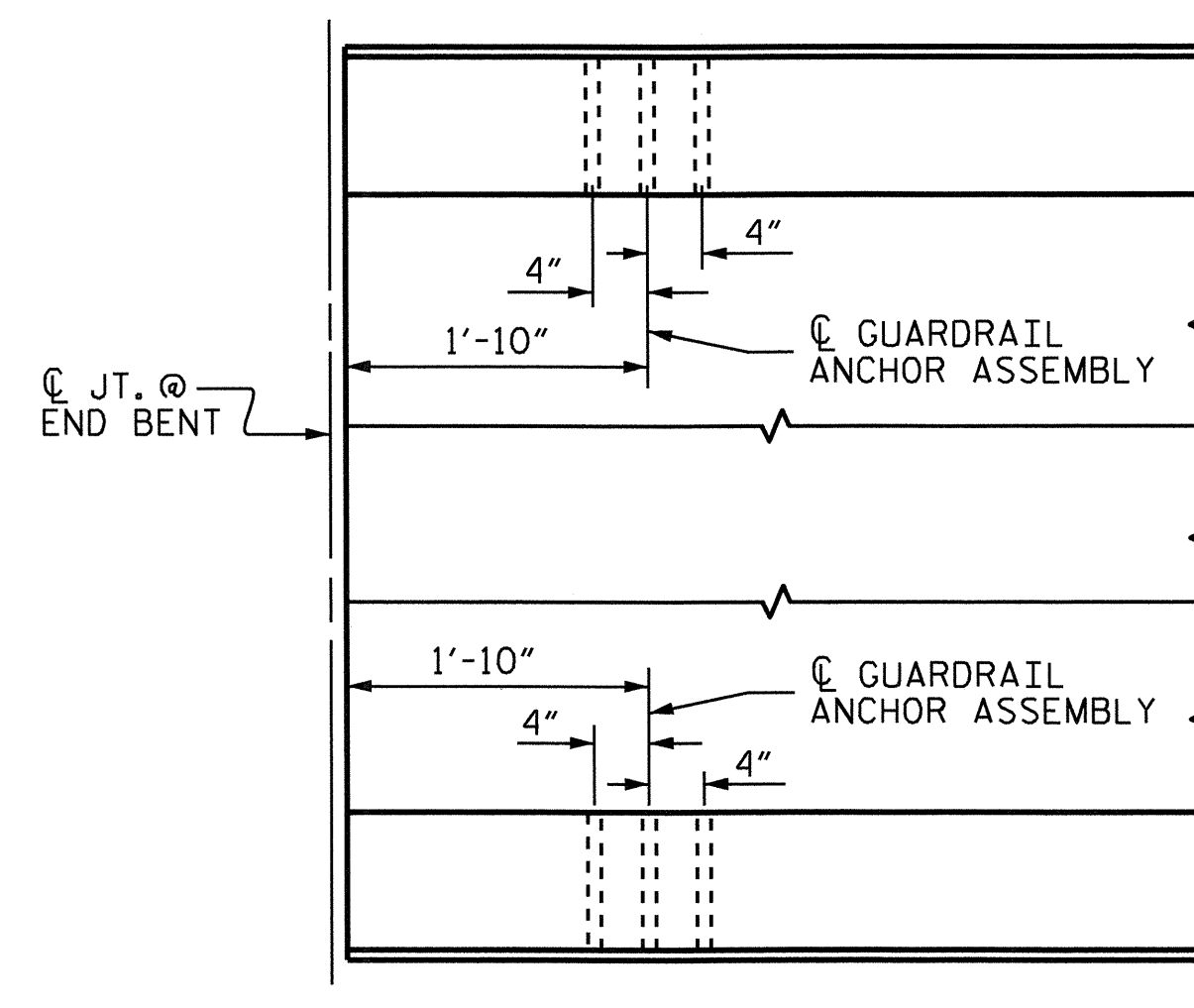
FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW



ELEVATION



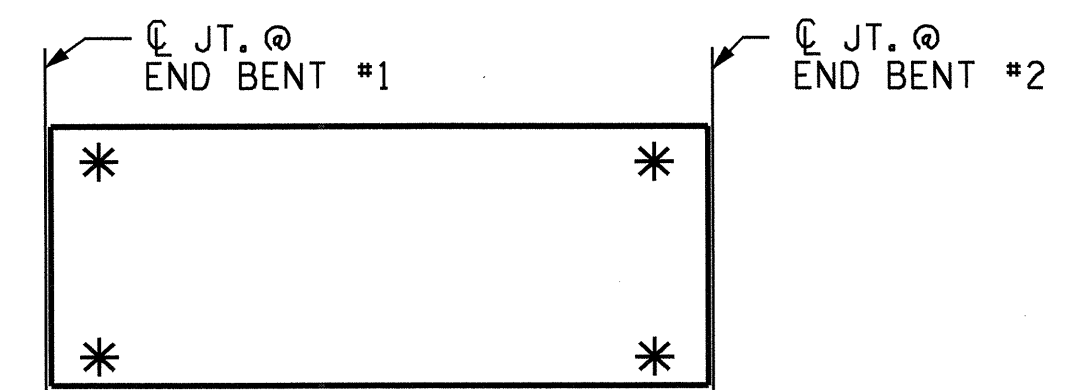
SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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



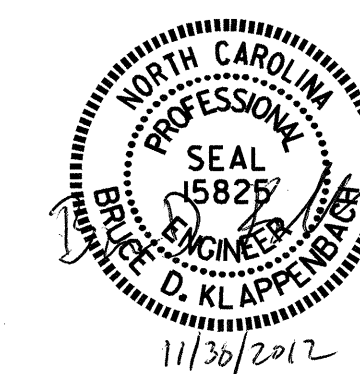
SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4834
WARREN COUNTY
STATION: 15+87.00 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD GUARDRAIL ANCHORAGE FOR VERTICAL CONCRETE BARRIER RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-11					TOTAL SHEETS 20



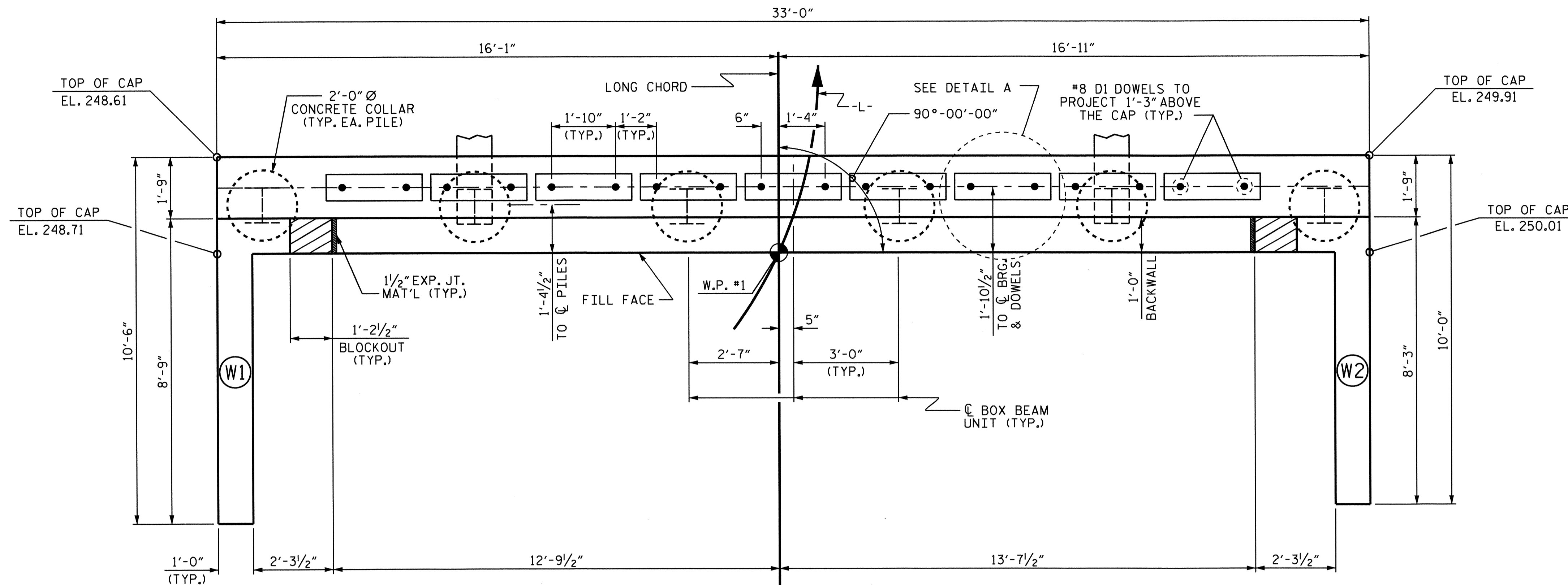
ASSEMBLED BY : T.L. CLELLAND DATE : 2/2012
CHECKED BY : B. KLAPPENBACH DATE : 7/2012
DRAWN BY : MAA 5/10
CHECKED BY : GM 5/10
ADDED 5/6/10
REV. 10/1/11
REV. 12/5/11
MAA/GM
MAA/GM

NOTES:

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

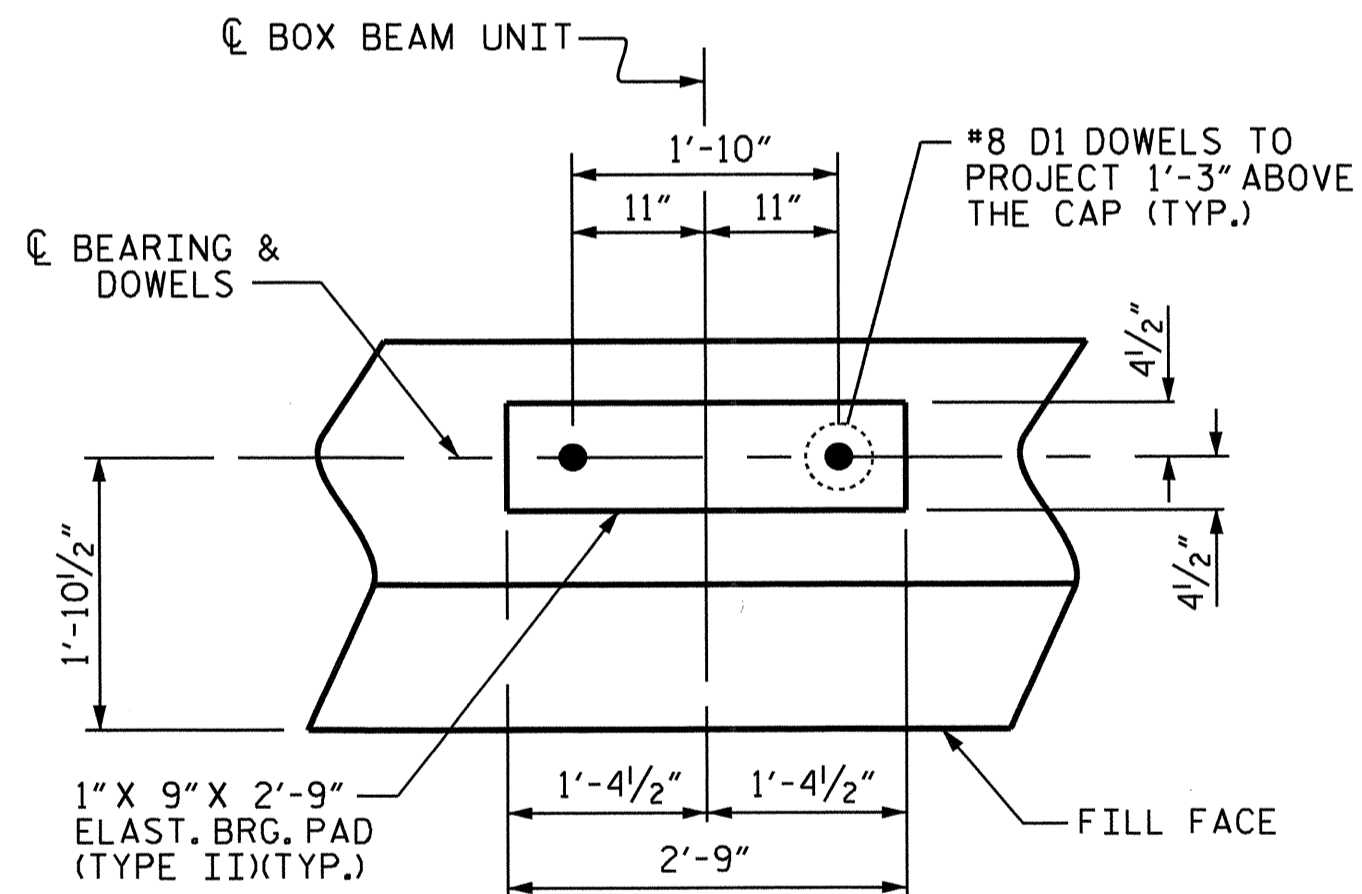
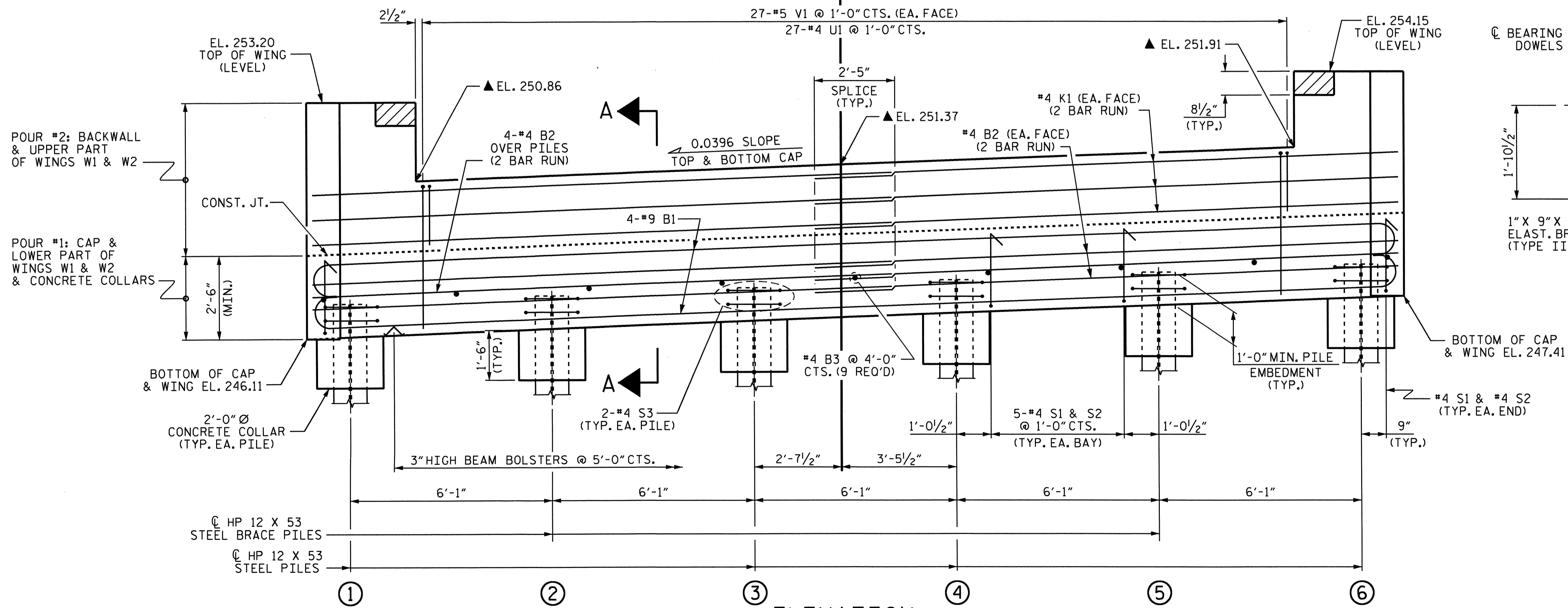
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPlice DETAILS, SEE SHEET 3 OF 3.



TOP OF PILE ELEVATIONS	
①	247.16
②	247.40
③	247.64
④	247.88
⑤	248.12
⑥	248.36

▲ THIS ELEVATION TAKEN ON FILL FACE OF BACKWALL.



DETAIL "A"

(TYP. EA. BEARING)

PROJECT NO. B-4834

WARREN COUNTY

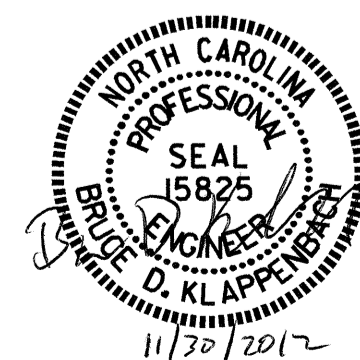
STATION: 15+87.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

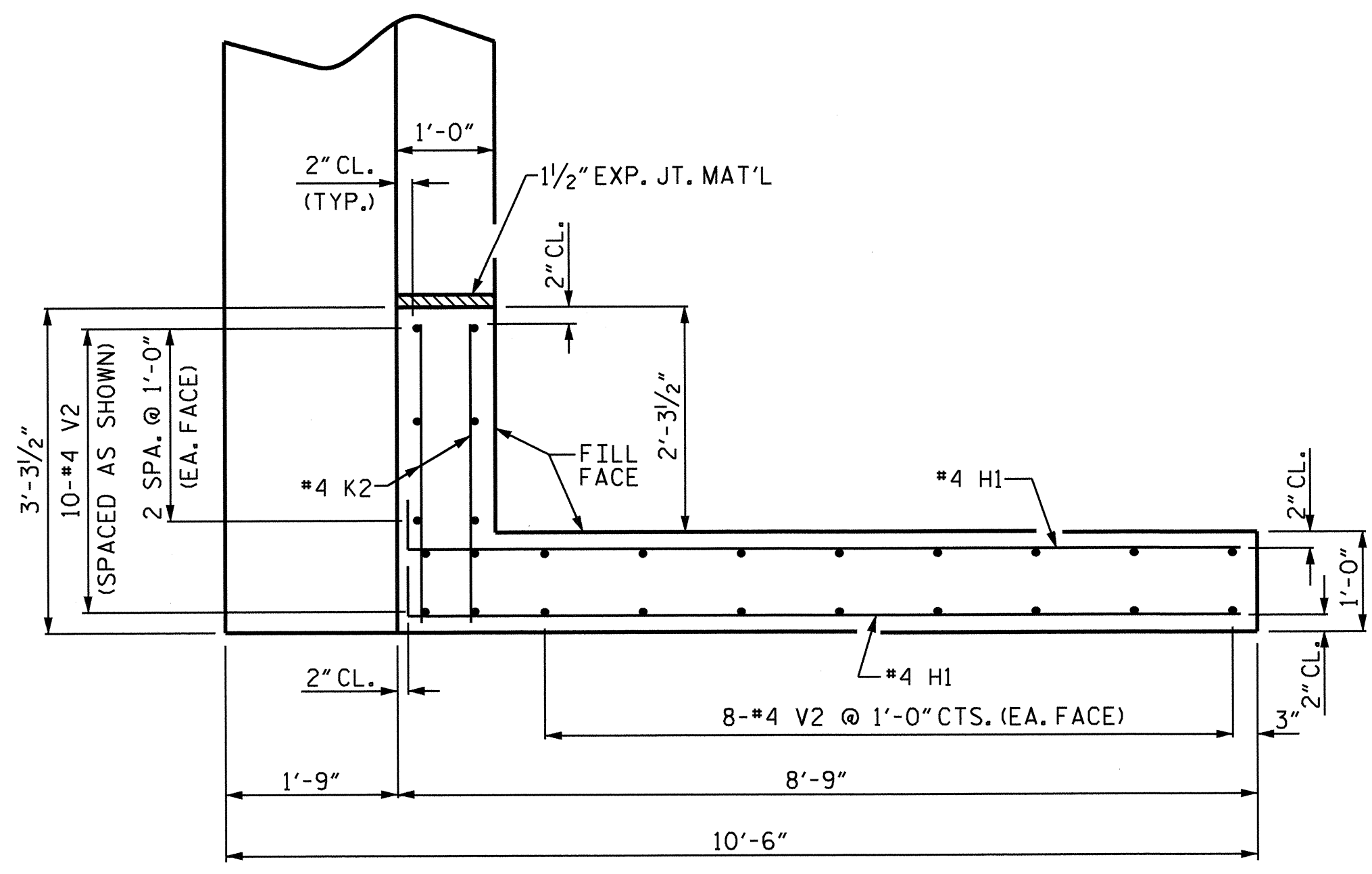
SUBSTRUCTURE

END BENT No. 1

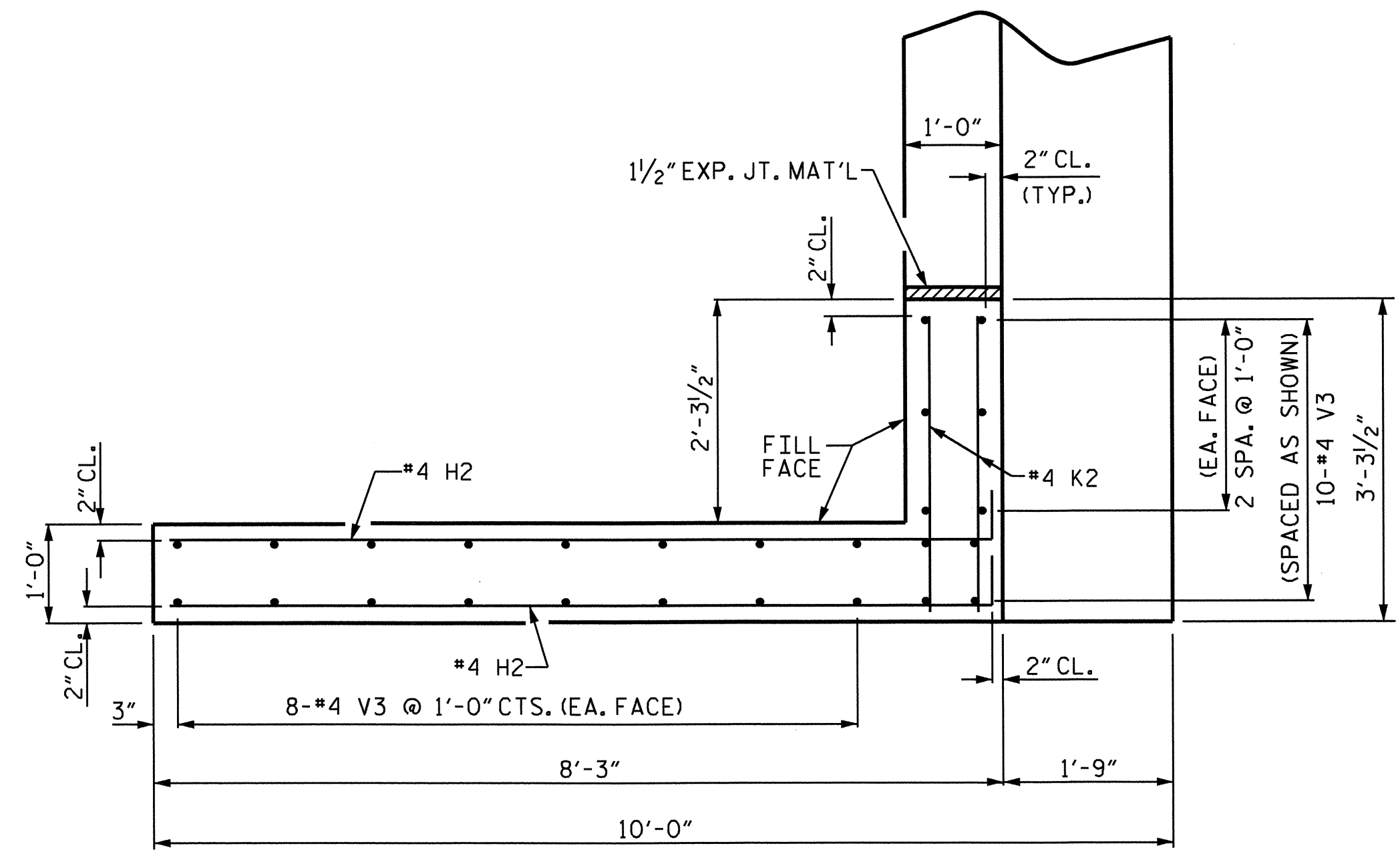


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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 20
2			4			

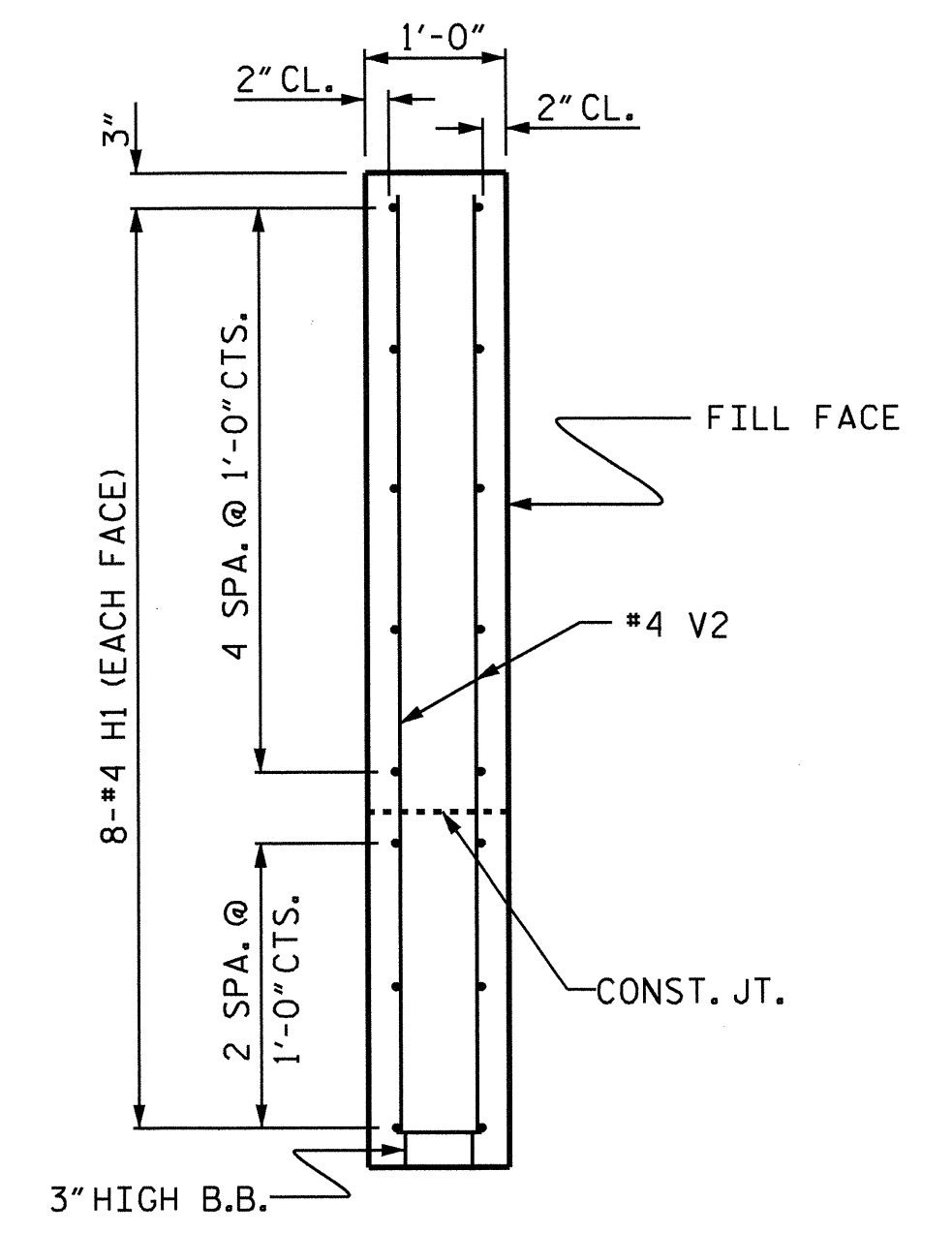
DRAWN BY: T.L. CLELLAND DATE: 2/2012
CHECKED BY: B. KLAPPENBACH DATE: 7/2012



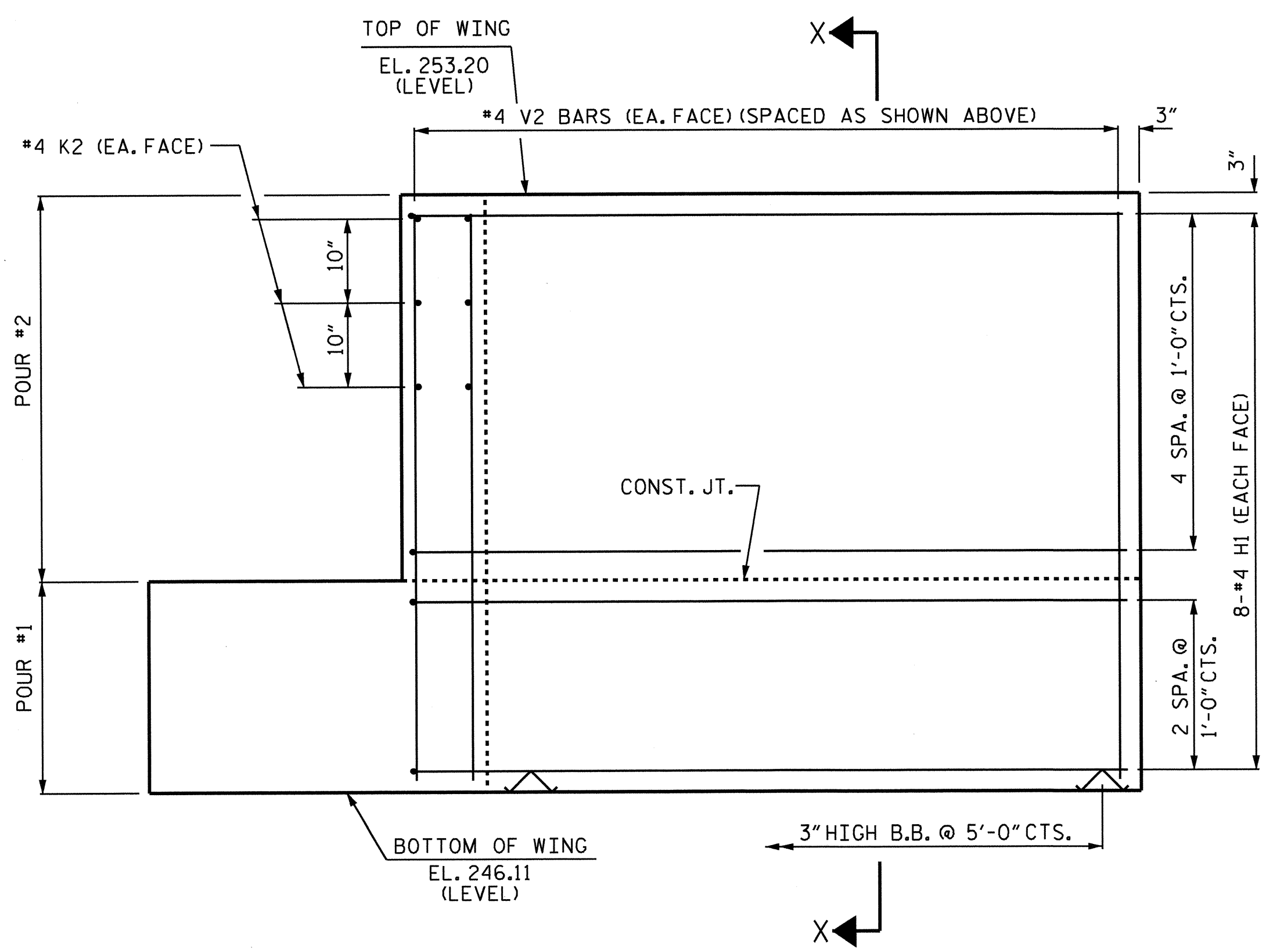
PLAN OF WING (W1)



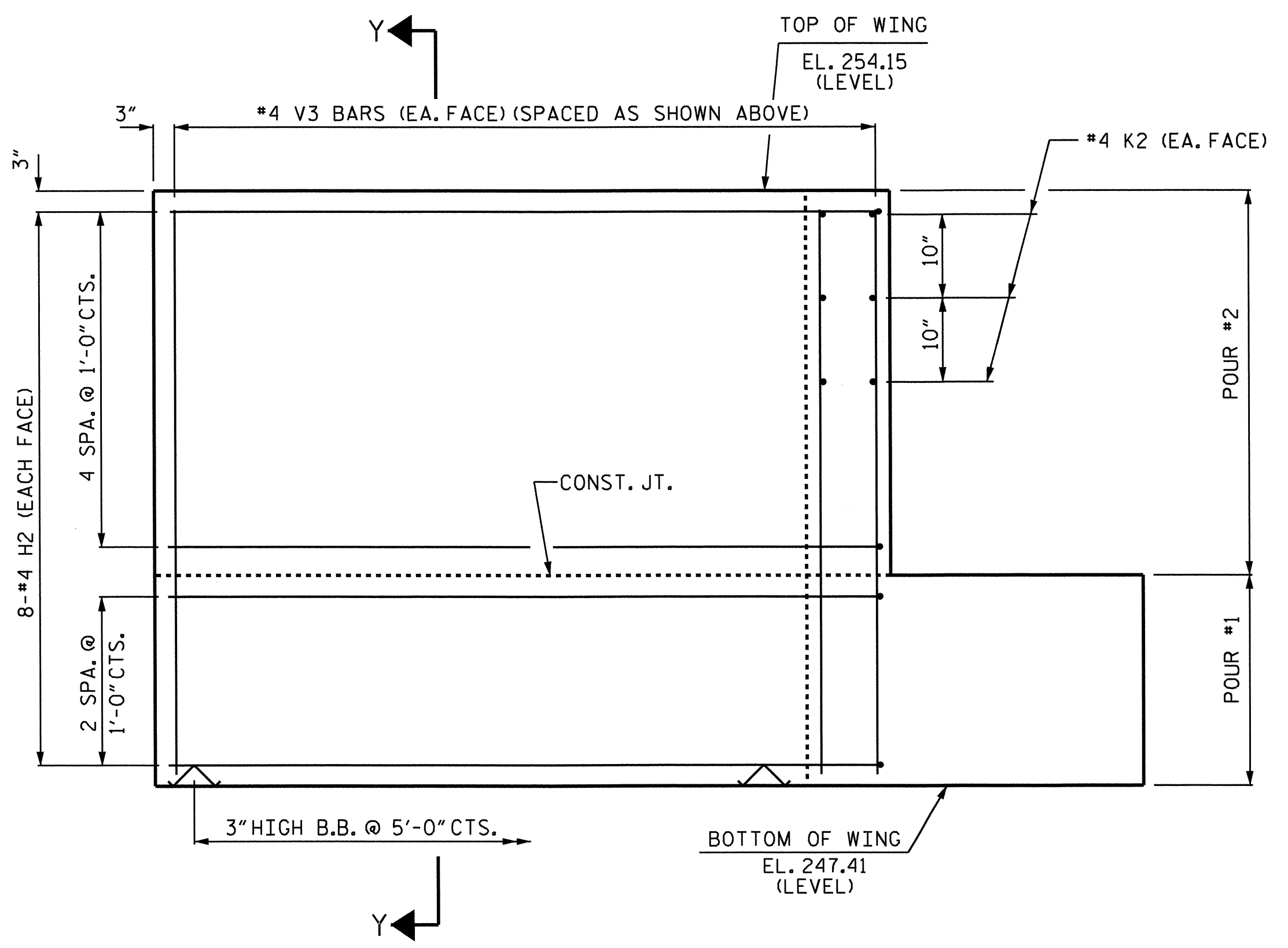
PLAN OF WING (W2)



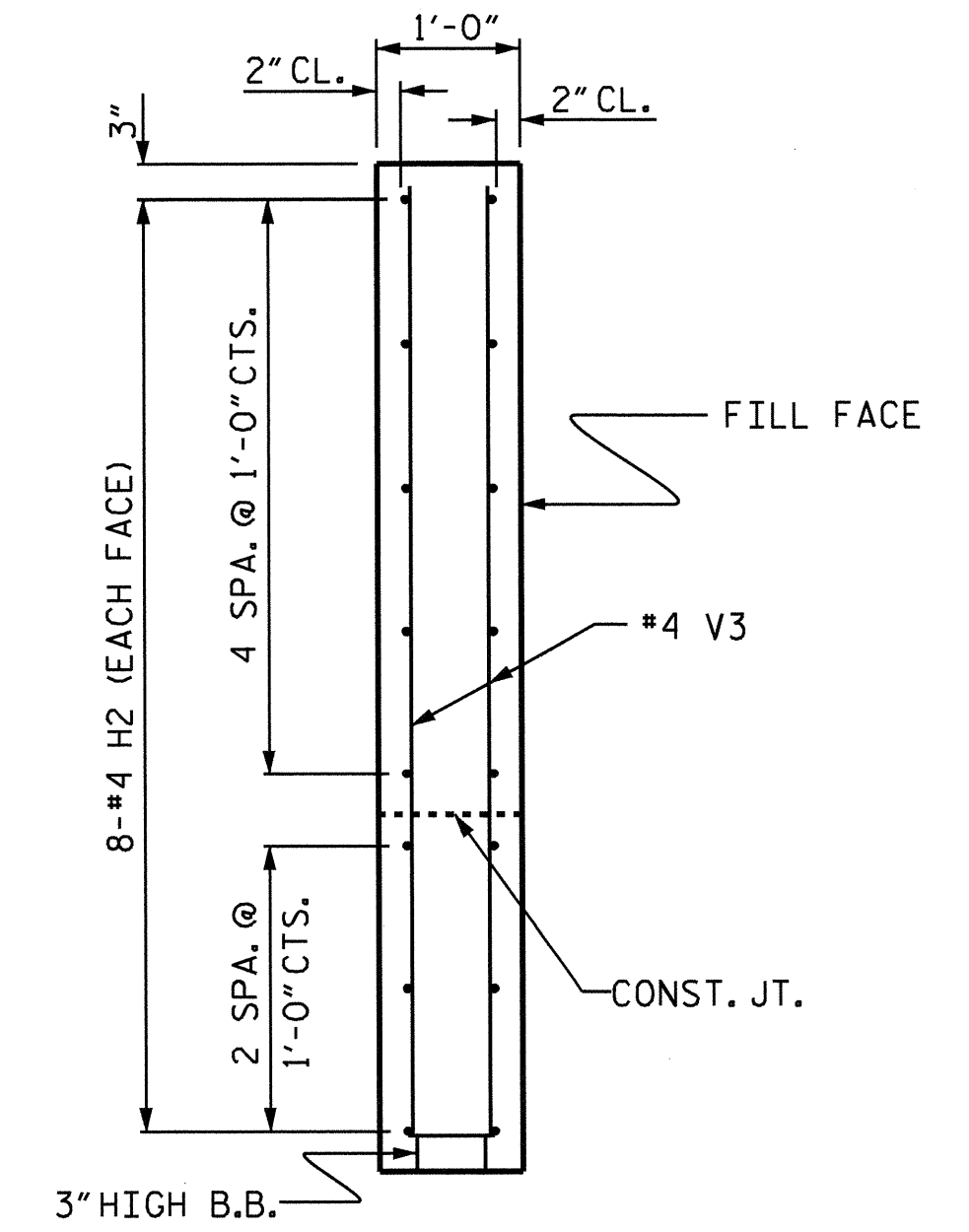
SECTION X-X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

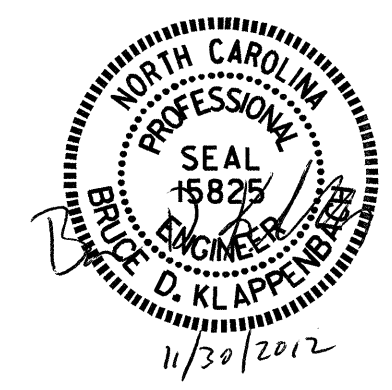


SECTION Y-Y

PROJECT NO. B-4834
 WARREN COUNTY
 STATION: 15+87.00 -L-

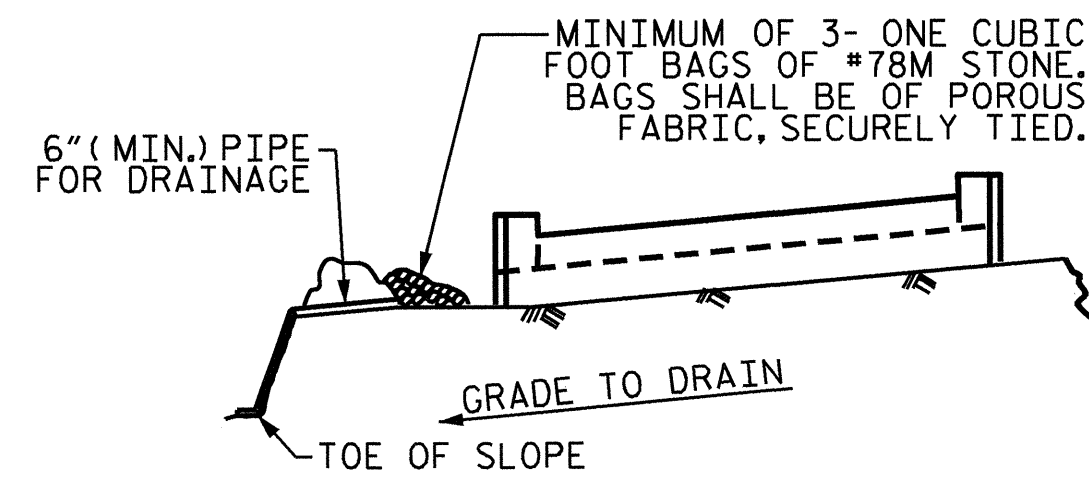
SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 1



DRAWN BY: T.L.CLELLAND DATE: 2/2012
 CHECKED BY: B. KLAPPENBACH DATE: 7/2012

REVISIONS						SHEET NO. S-13
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 20
2			4			

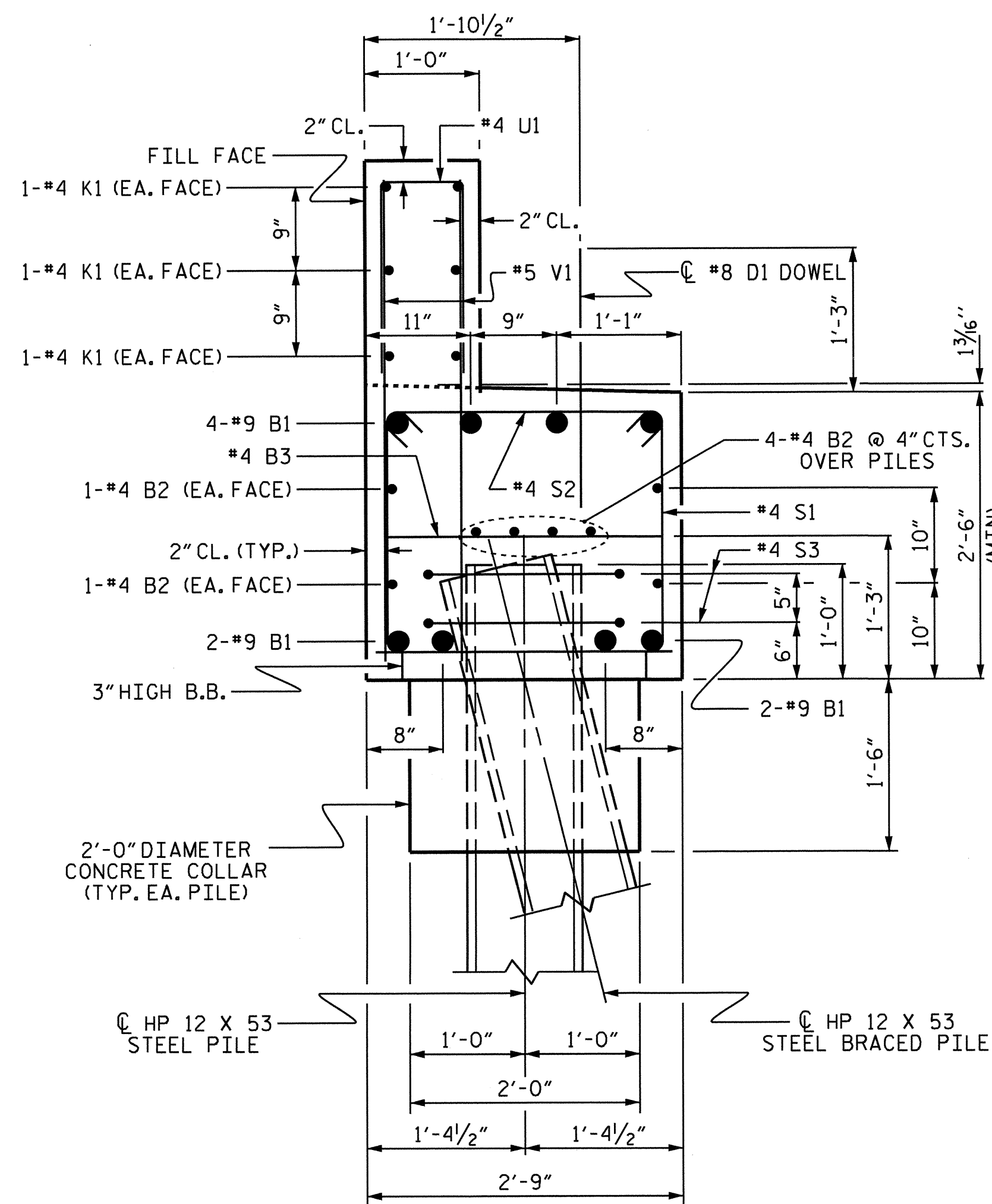


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

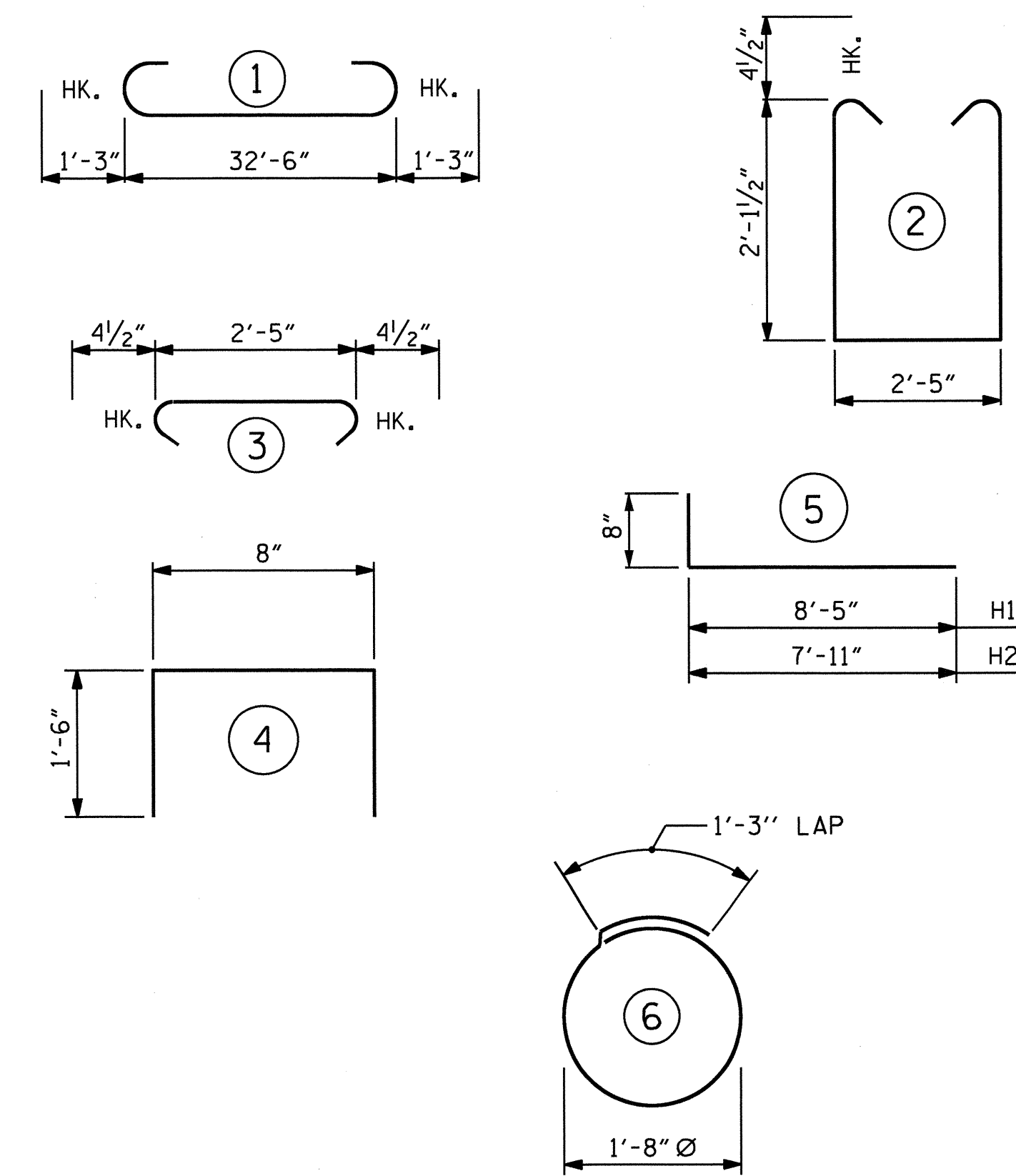
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



SECTION A-A

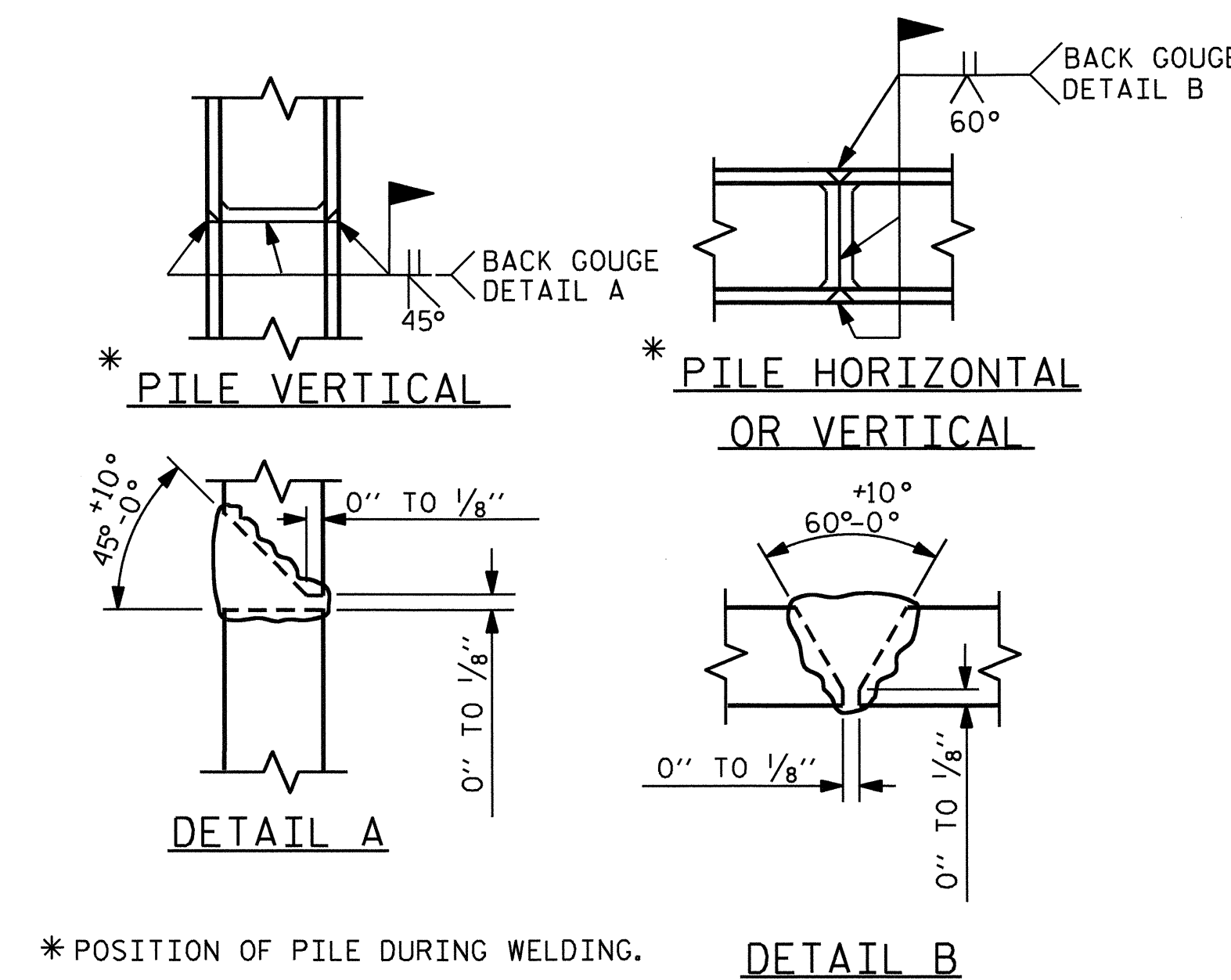
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

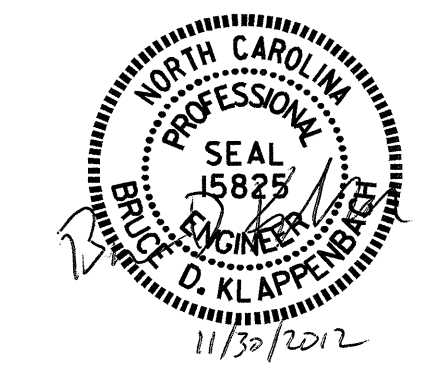
END BENT No. 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	35'-0"	952
B2	16	#4	STR	17'-7"	188
B3	9	#4	STR	2'-5"	15
D1	18	#8	STR	2'-3"	108
H1	16	#4	5	9'-1"	97
H2	16	#4	5	8'-7"	92
K1	12	#4	STR	17'-7"	141
K2	12	#4	STR	2'-11"	23
S1	27	#4	2	7'-5"	134
S2	27	#4	3	3'-2"	57
S3	12	#4	6	6'-6"	52
U1	27	#4	4	3'-8"	66
V1	54	#5	STR	4'-3"	239
V2	26	#4	STR	6'-9"	117
V3	26	#4	STR	6'-4"	110
REINFORCING STEEL					2391 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1 CAP & LOWER WINGS & CONC. COLLARS					11.0 C.Y.
POUR #2 UPPER WINGS & BACKWALL					4.3 C.Y.
TOTAL CLASS A CONCRETE					15.3 C.Y.
HP 12 X 53 STEEL PILES					
NO: 6					LIN. FT. = 105



PILE SPLICE DETAILS

PROJECT NO. B-4834
WARREN COUNTY
 STATION: 15+87.00 -L-

SHEET 3 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 1

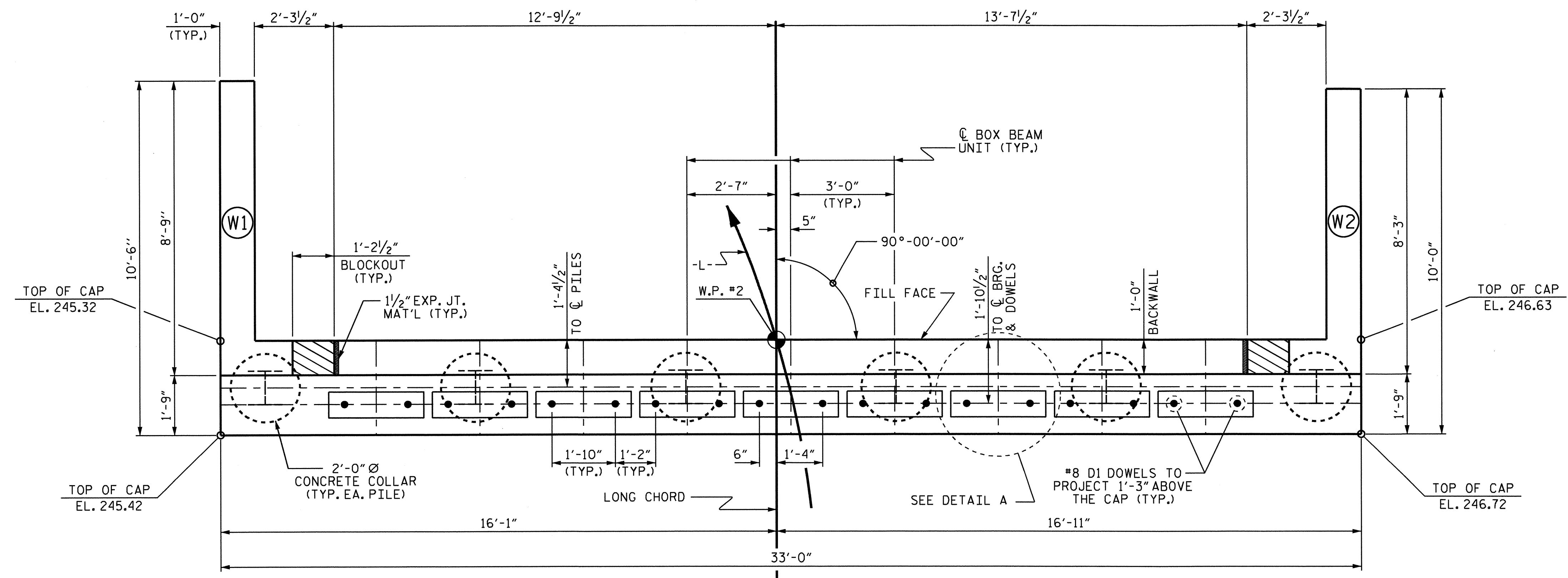


DRAWN BY: T.L.CLELLAND DATE: 2/2012
 CHECKED BY: B. KLAPPENBACH DATE: 7/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			20

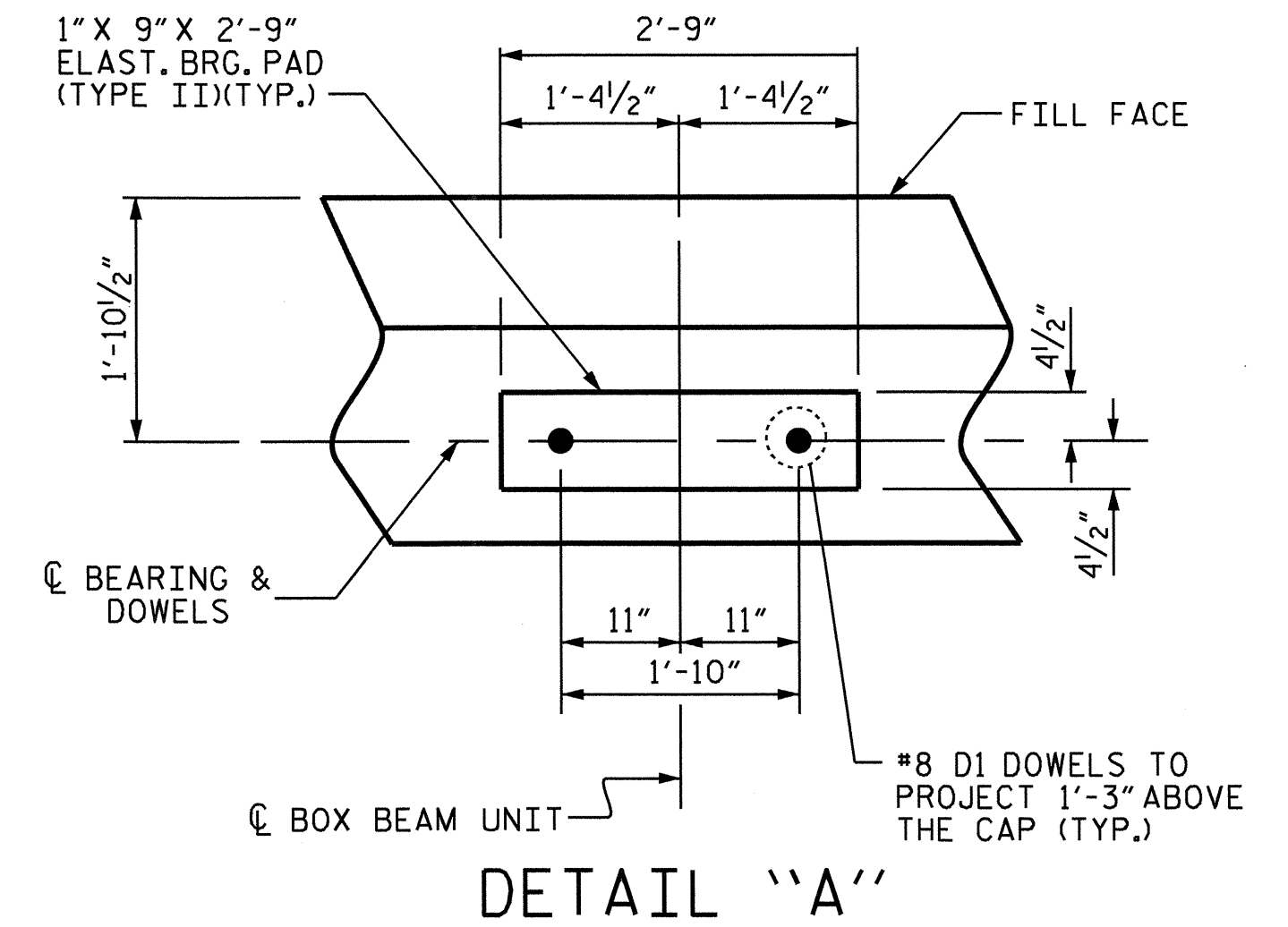
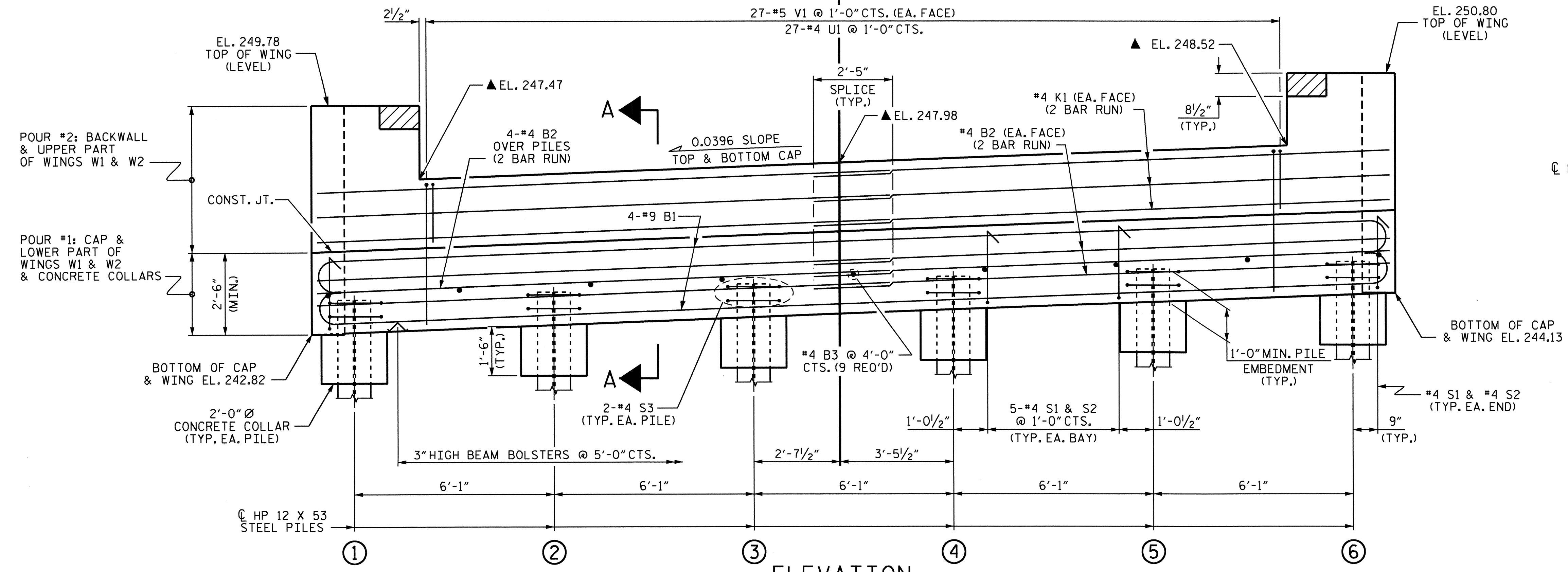
NOTES:

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
 THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
 FOR PILE SPlice DETAILS, SEE SHEET 3 OF 3.



TOP OF PILE ELEVATIONS	
①	243.87
②	244.11
③	244.35
④	244.59
⑤	244.83
⑥	245.08

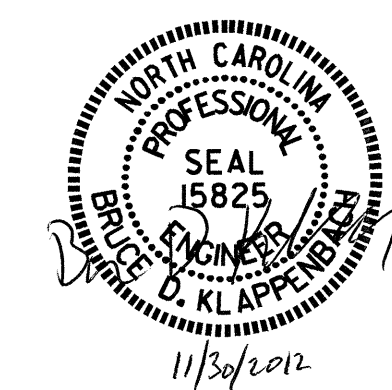
▲ THIS ELEVATION TAKEN ON FILL FACE OF BACKWALL.



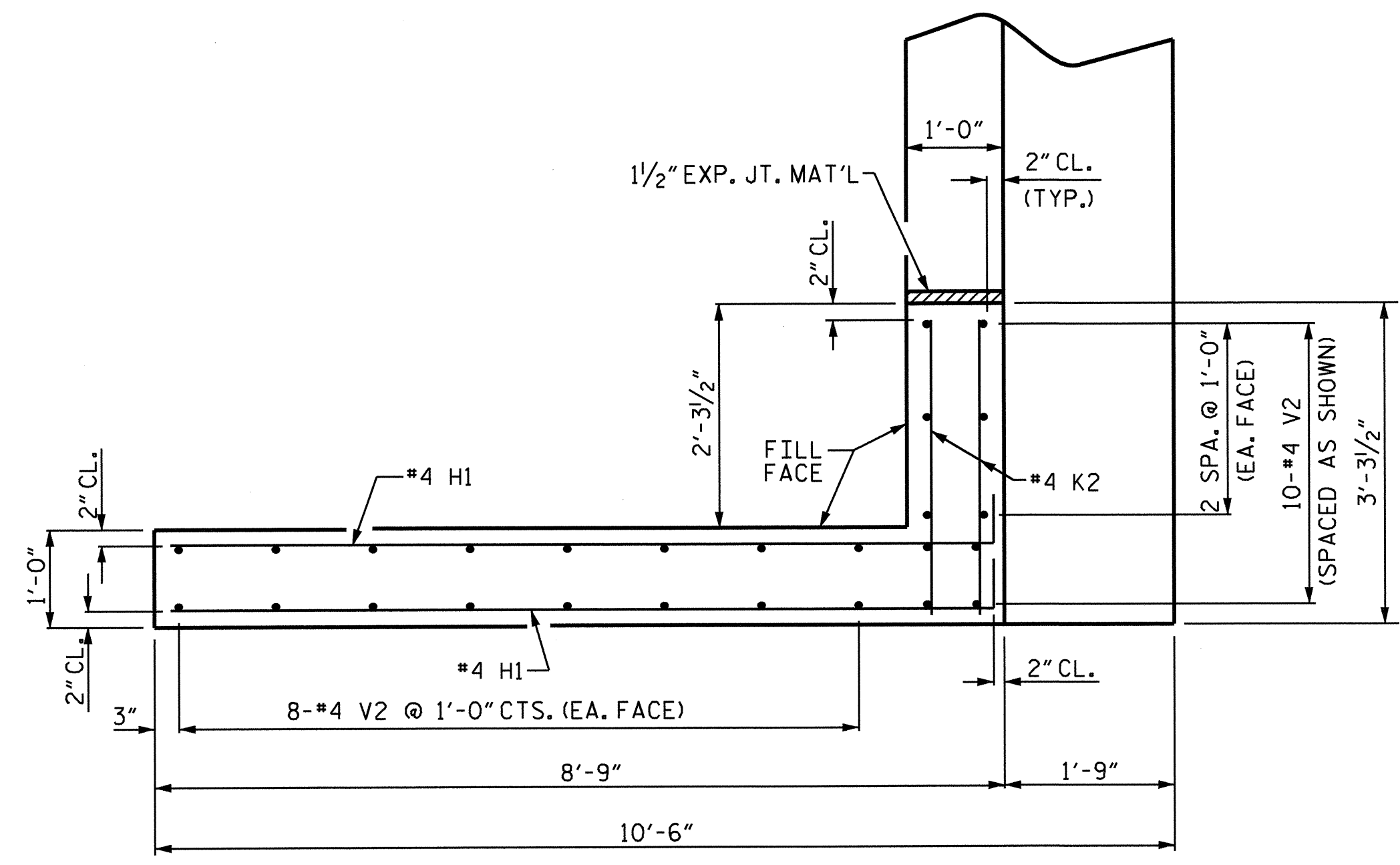
PROJECT NO. B-4834
 WARREN COUNTY
 STATION: 15+87.00 -L-
 SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 2

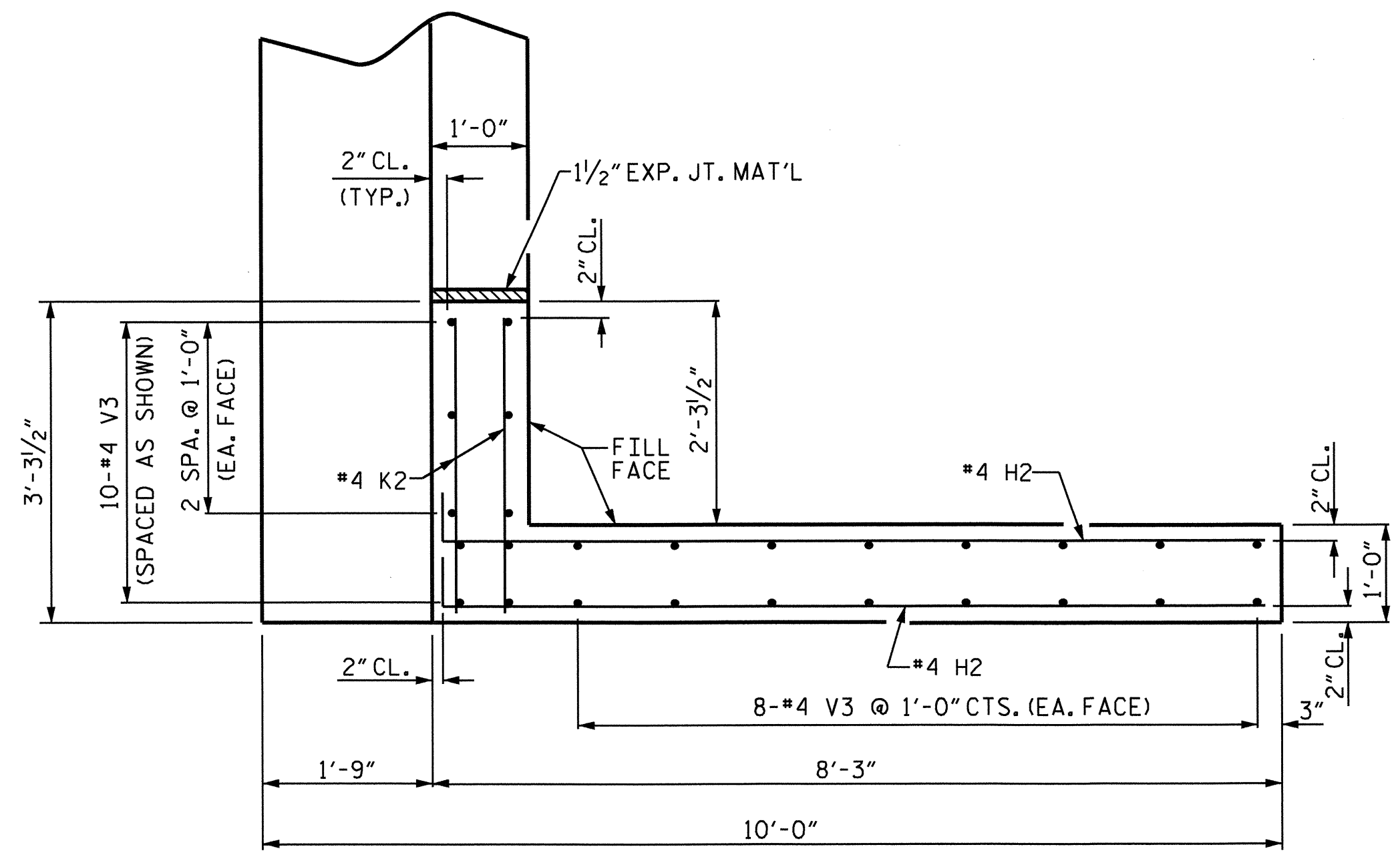
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15	
1			3			TOTAL SHEETS 20	
2			4				



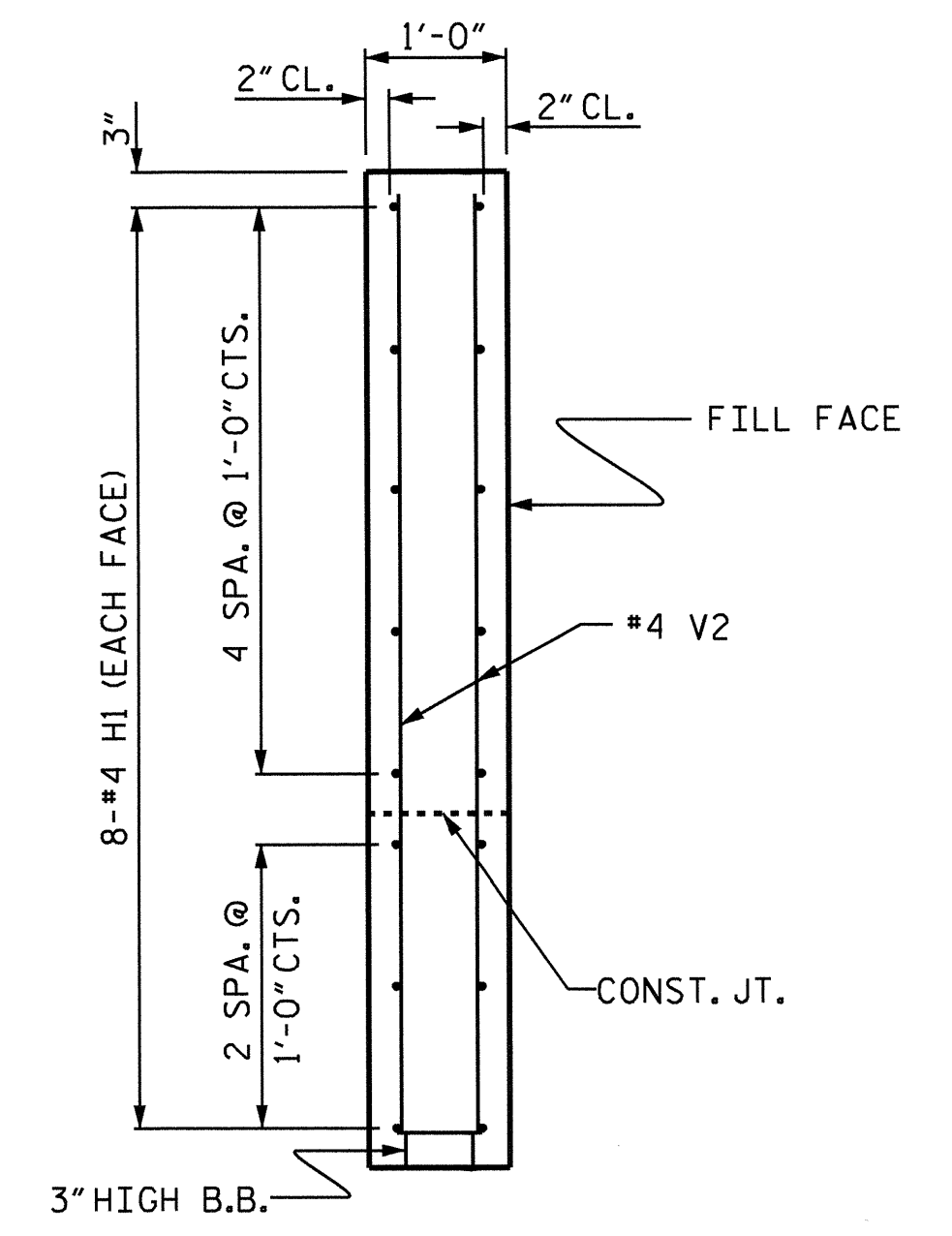
DRAWN BY: T.L. CLELLAND DATE: 2/2012
 CHECKED BY: B. KLAPPENBACH DATE: 7/2012



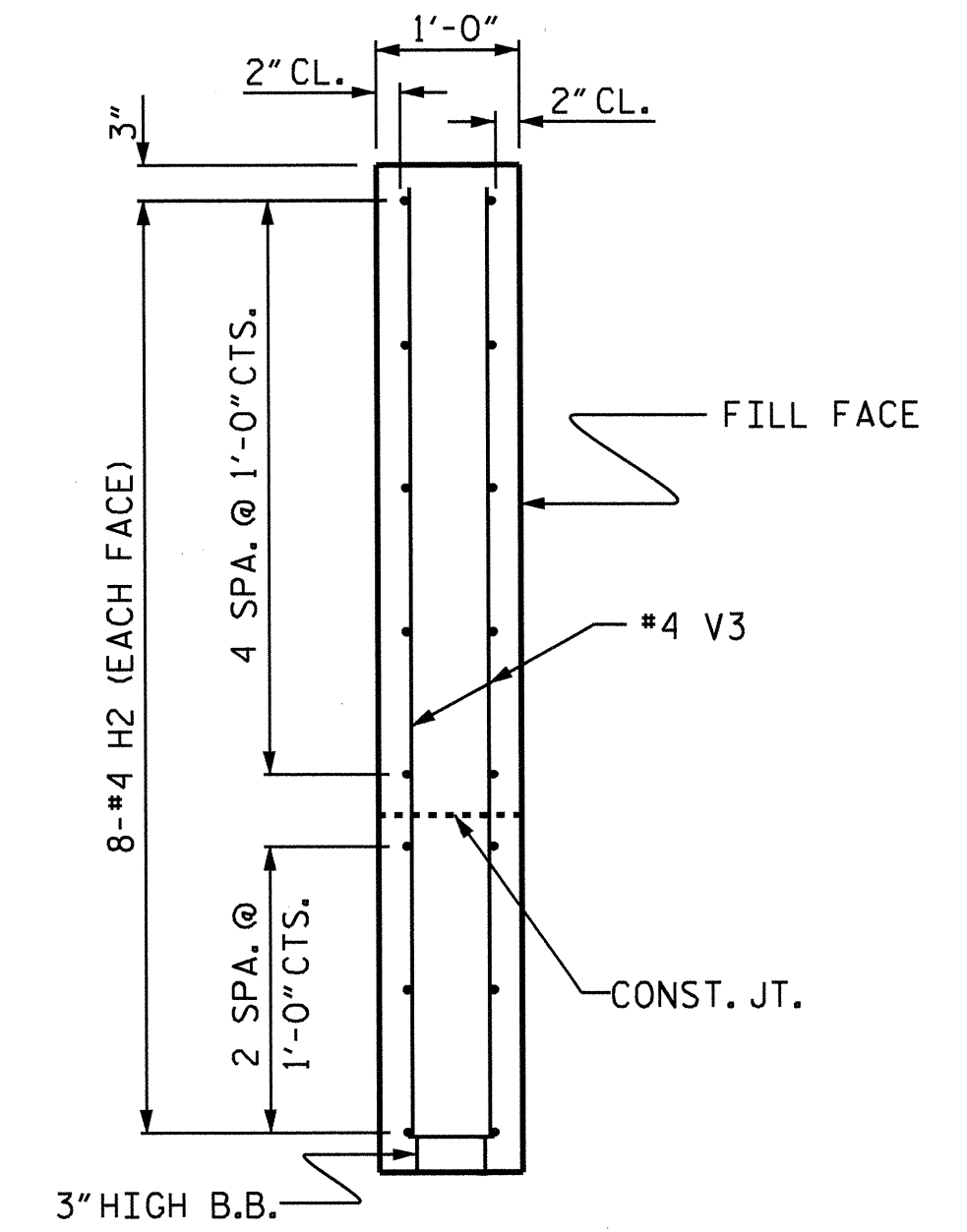
PLAN OF WING (W1)



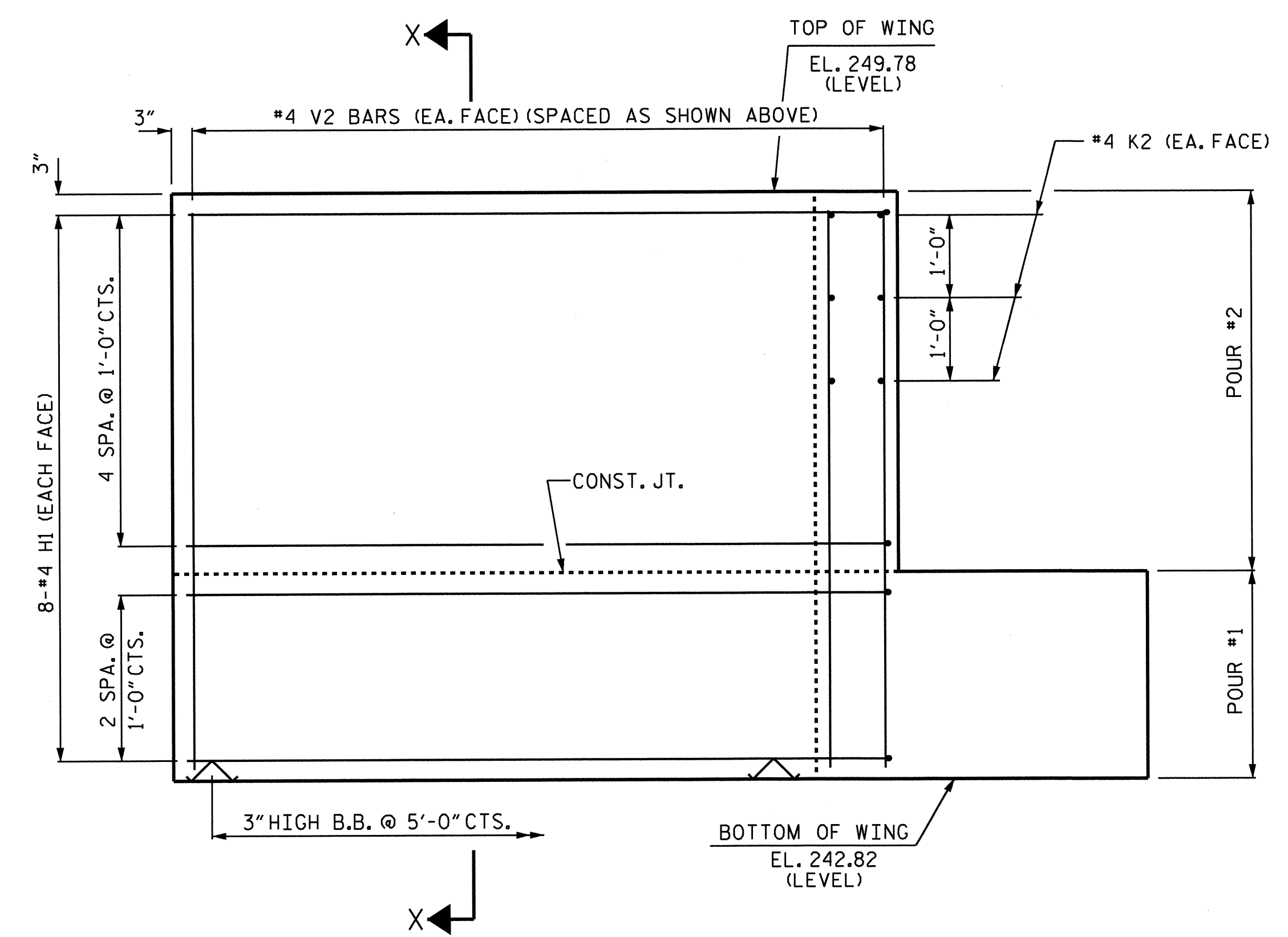
PLAN OF WING (W2)



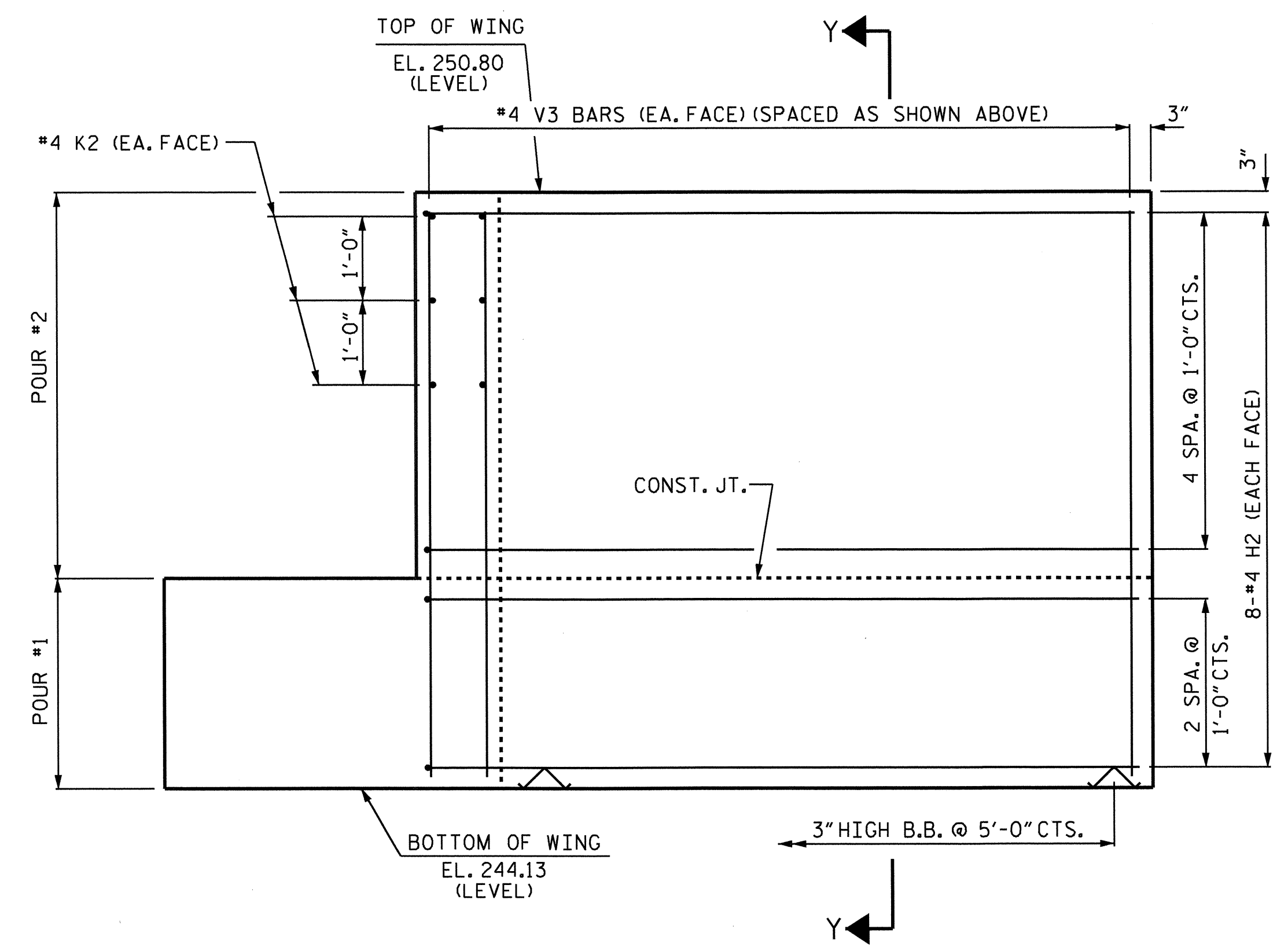
SECTION X-X



SECTION Y-Y



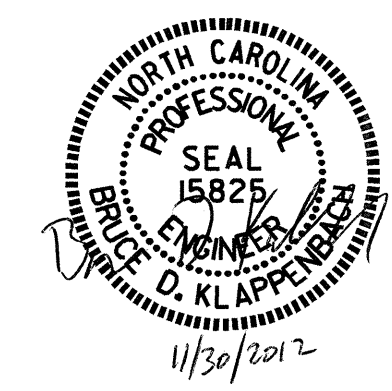
ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

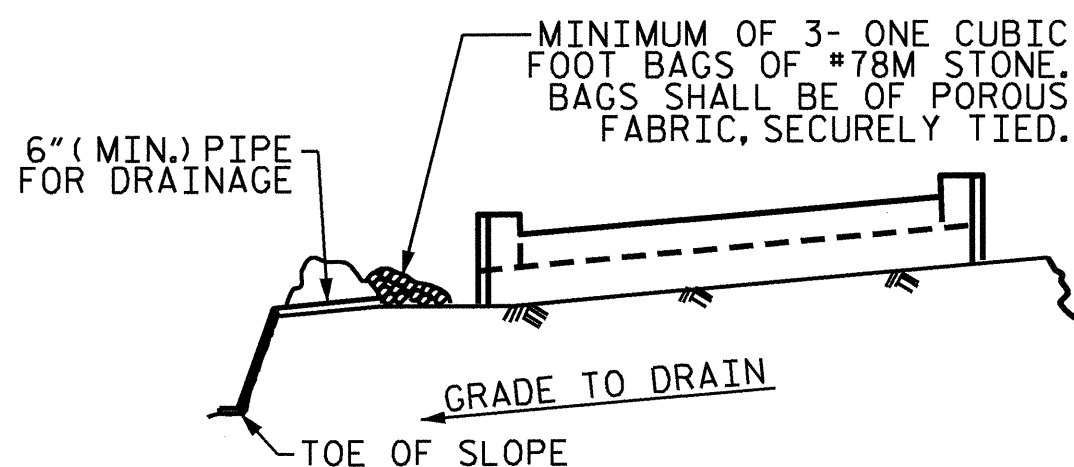
PROJECT NO. B-4834
WARREN COUNTY
 STATION: 15+87.00 -L-

SHEET 2 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 2



DRAWN BY: T.L.CLELLAND DATE: 2/2012
 CHECKED BY: B. KLAPPENBACH DATE: 7/2012

REVISIONS						SHEET NO. S-16
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 20
2			4			

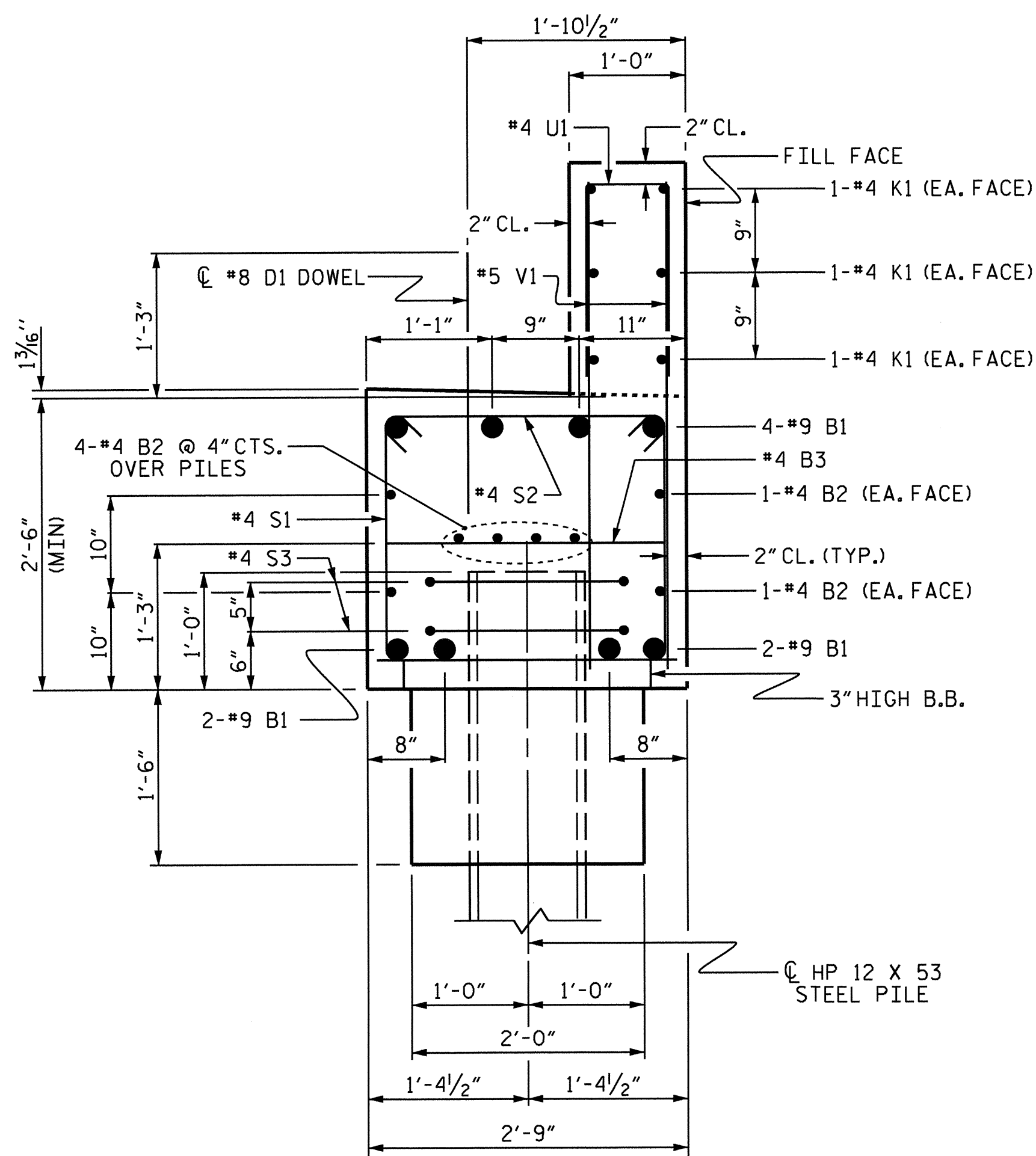


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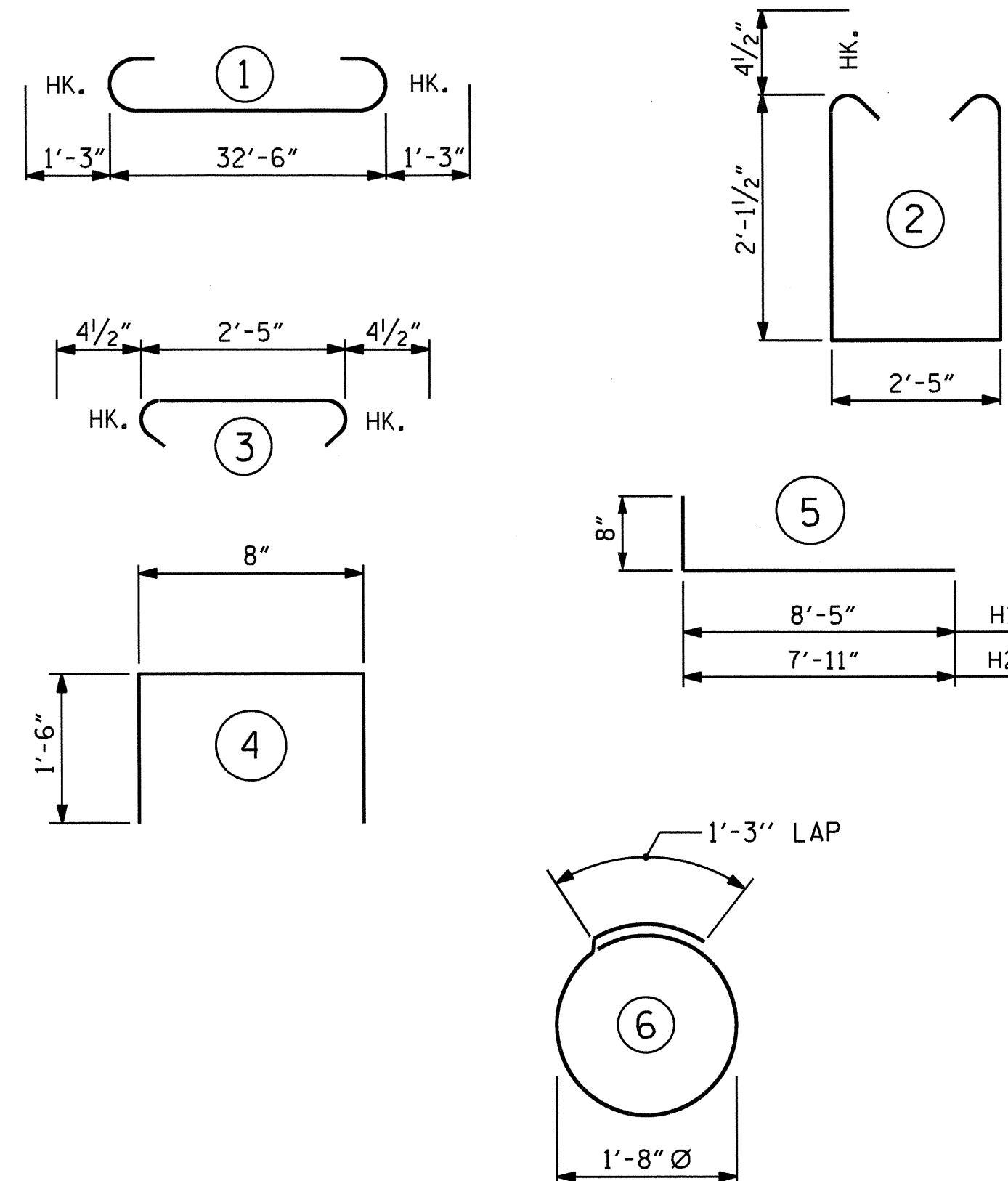
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT No. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	35'-0"	952
B2	16	#4	STR	17'-7"	188
B3	9	#4	STR	2'-5"	15
D1	18	#8	STR	2'-3"	108
H1	16	#4	5	9'-1"	97
H2	16	#4	5	8'-7"	92
K1	12	#4	STR	17'-7"	141
K2	12	#4	STR	2'-11"	23
S1	27	#4	2	7'-5"	134
S2	27	#4	3	3'-2"	57
S3	12	#4	6	6'-6"	52
U1	27	#4	4	3'-8"	66
V1	54	#5	STR	4'-2"	235
V2	26	#4	STR	6'-8"	116
V3	26	#4	STR	6'-4"	110

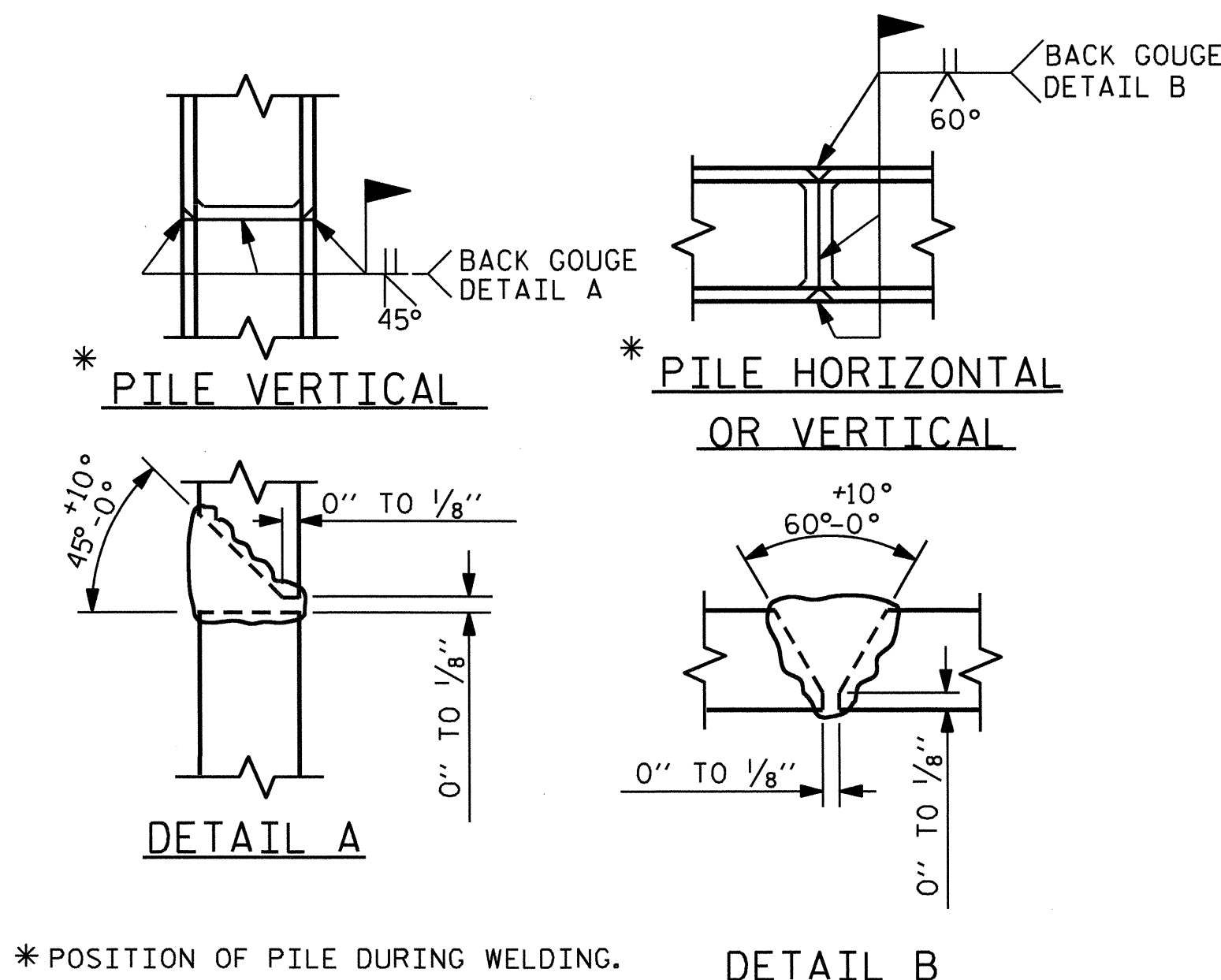
REINFORCING STEEL 2386 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1	CAP & LOWER WINGS & CONC. COLLARS	11.0 C.Y.
POUR #2	UPPER WINGS & BACKWALL	4.3 C.Y.

TOTAL CLASS A CONCRETE 15.3 C.Y.

HP 12 X 53 STEEL PILES
NO: 6 LIN. FT. = 90



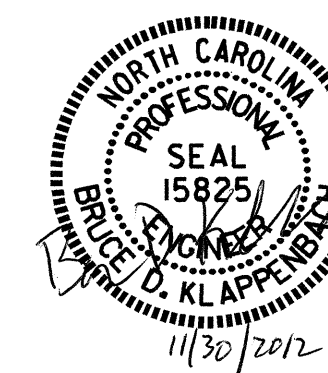
PILE SPLICE DETAILS

PROJECT NO. B-4834
WARREN COUNTY
STATION: 15+87.00 -L-

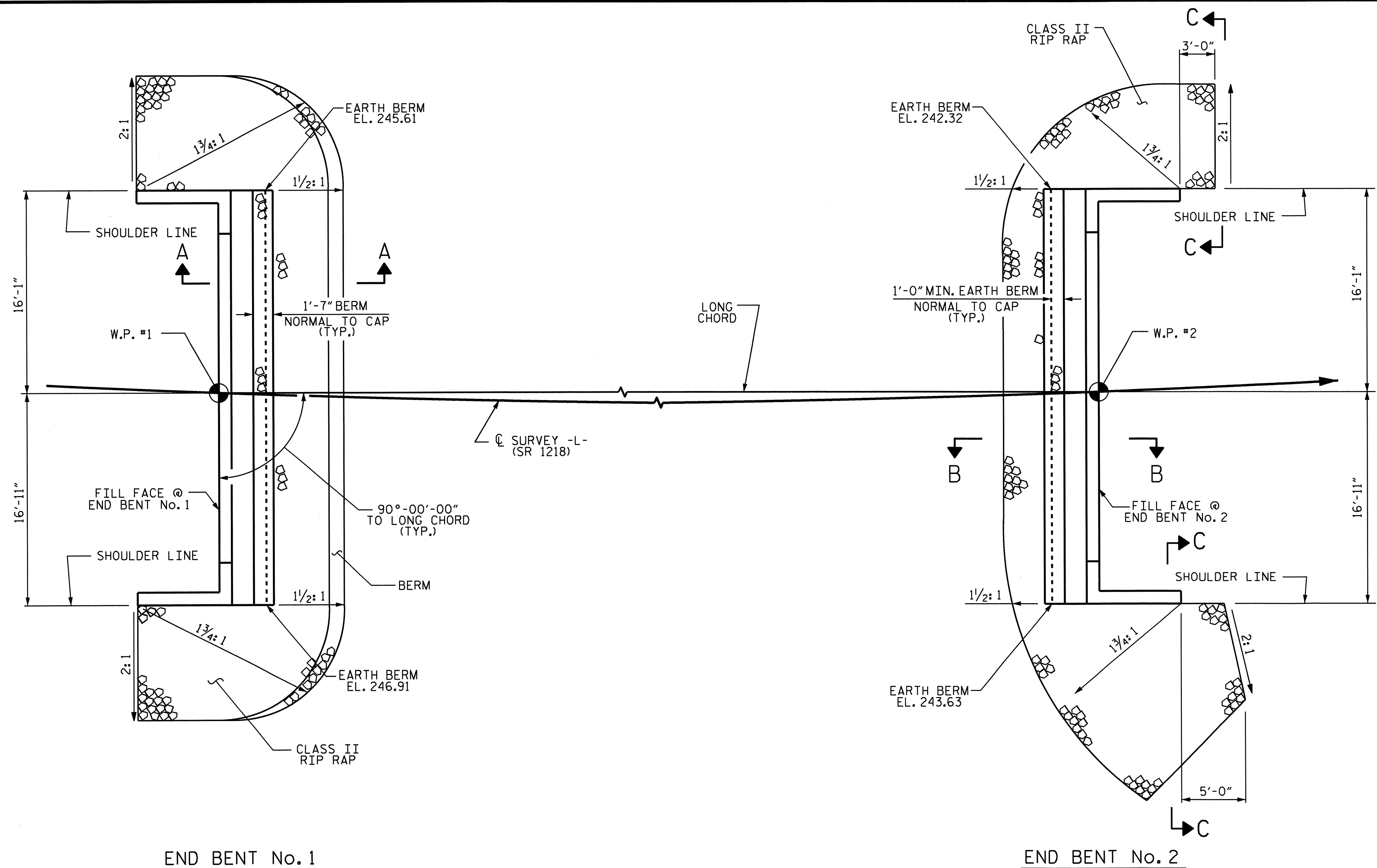
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS 20
2			4			

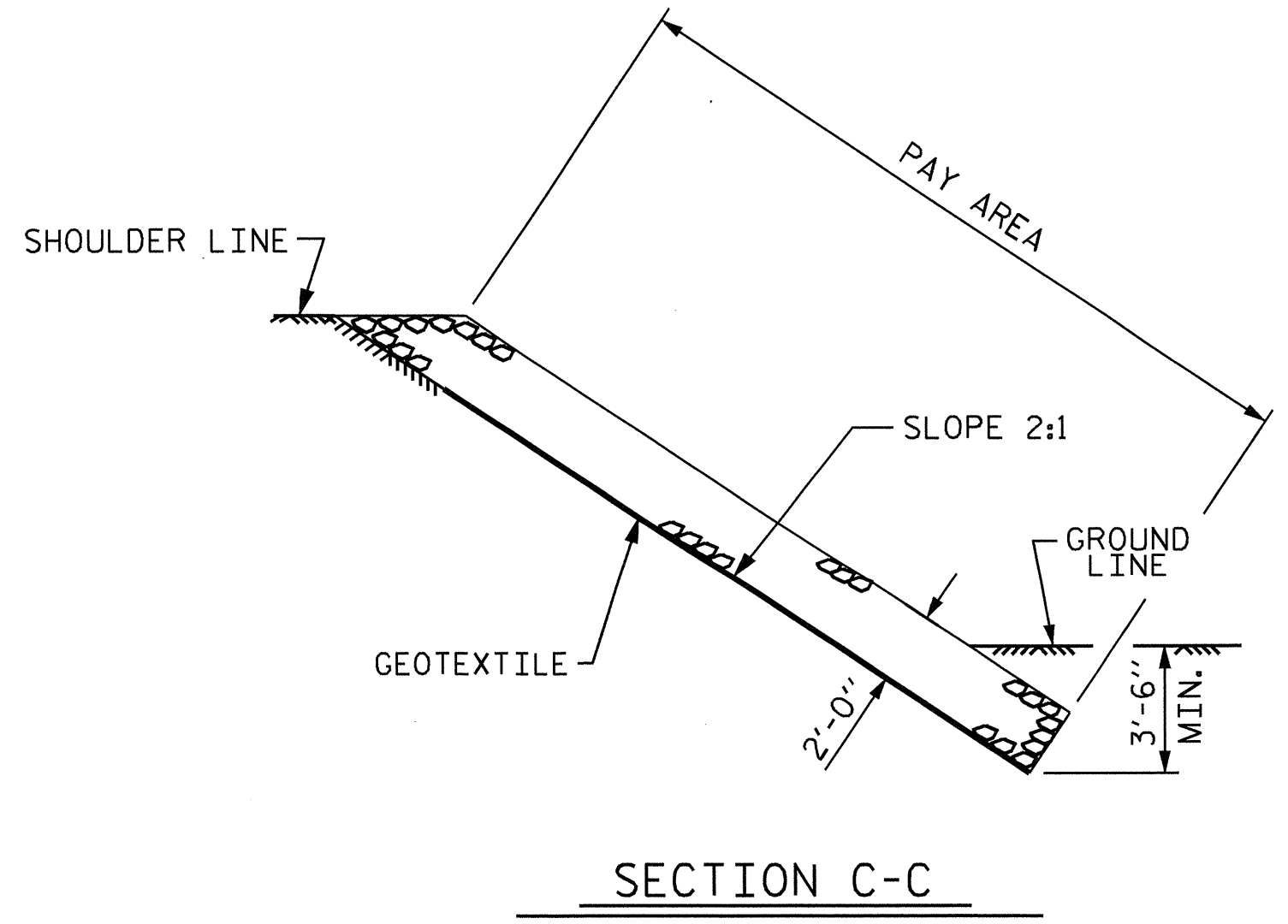
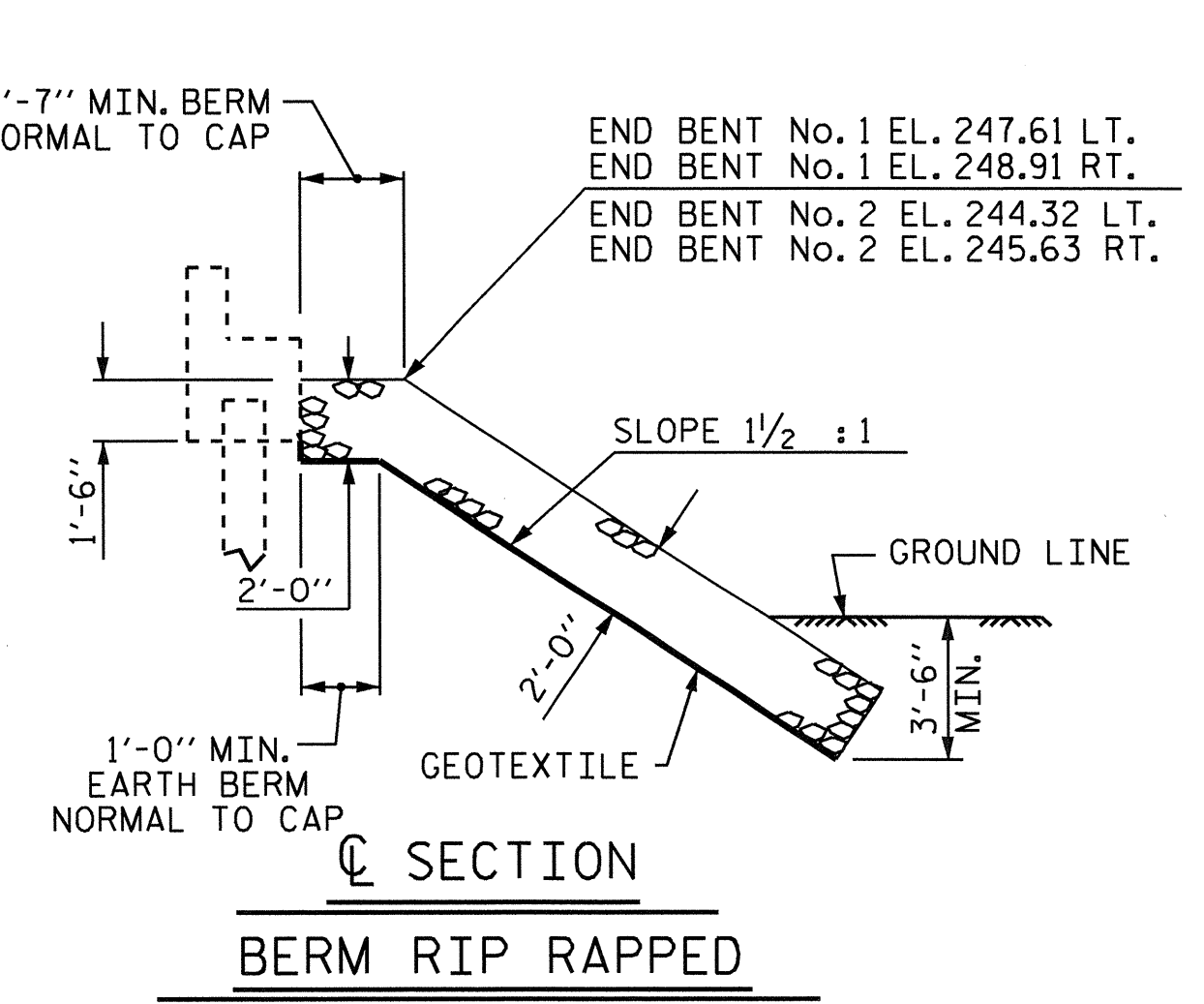
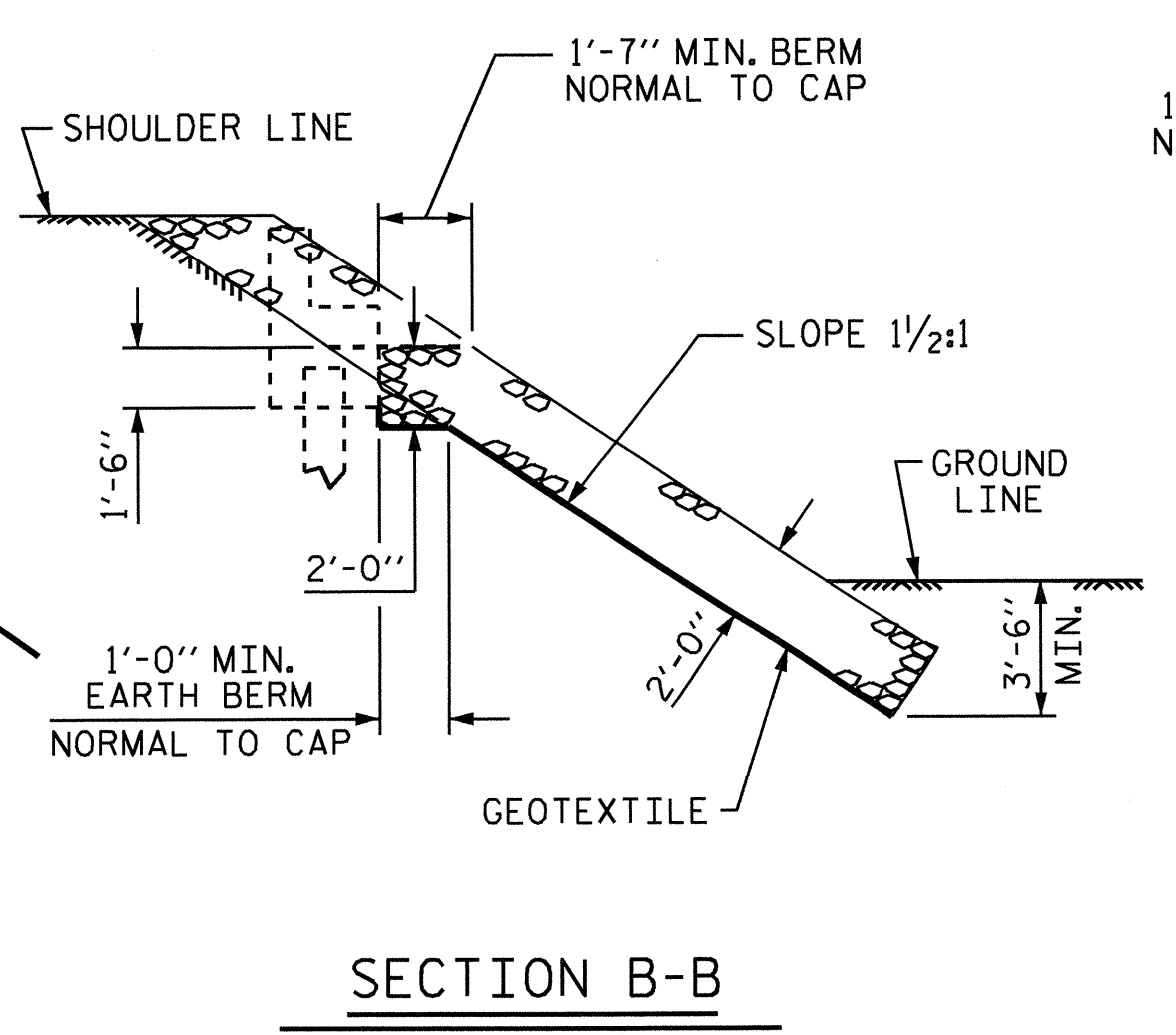
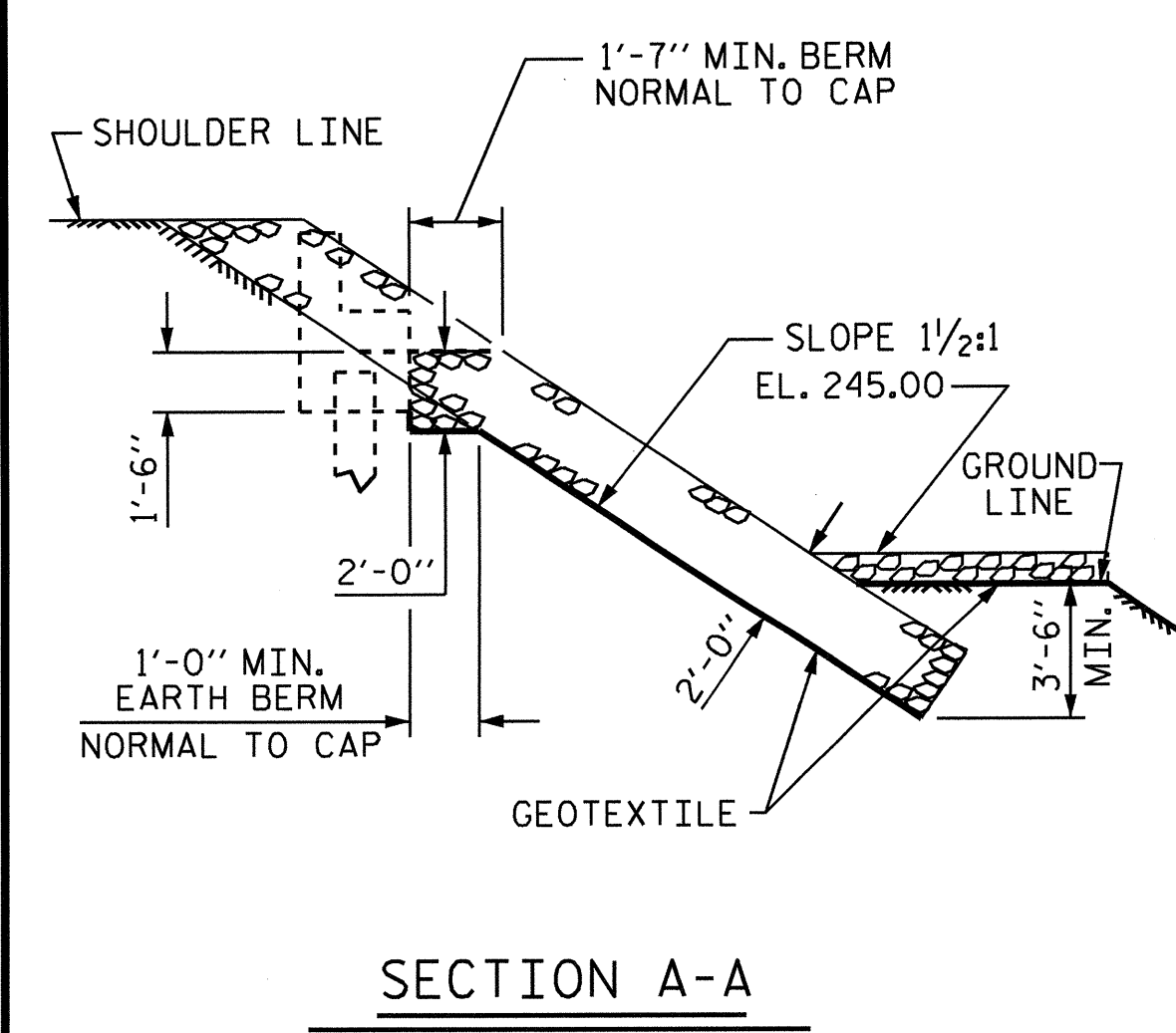


ESTIMATED QUANTITIES		
BRIDGE @ STA. 15+87.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT No. 1	63	70
END BENT No. 2	57	63
TOTAL	120	133

PLAN OF RIP RAP



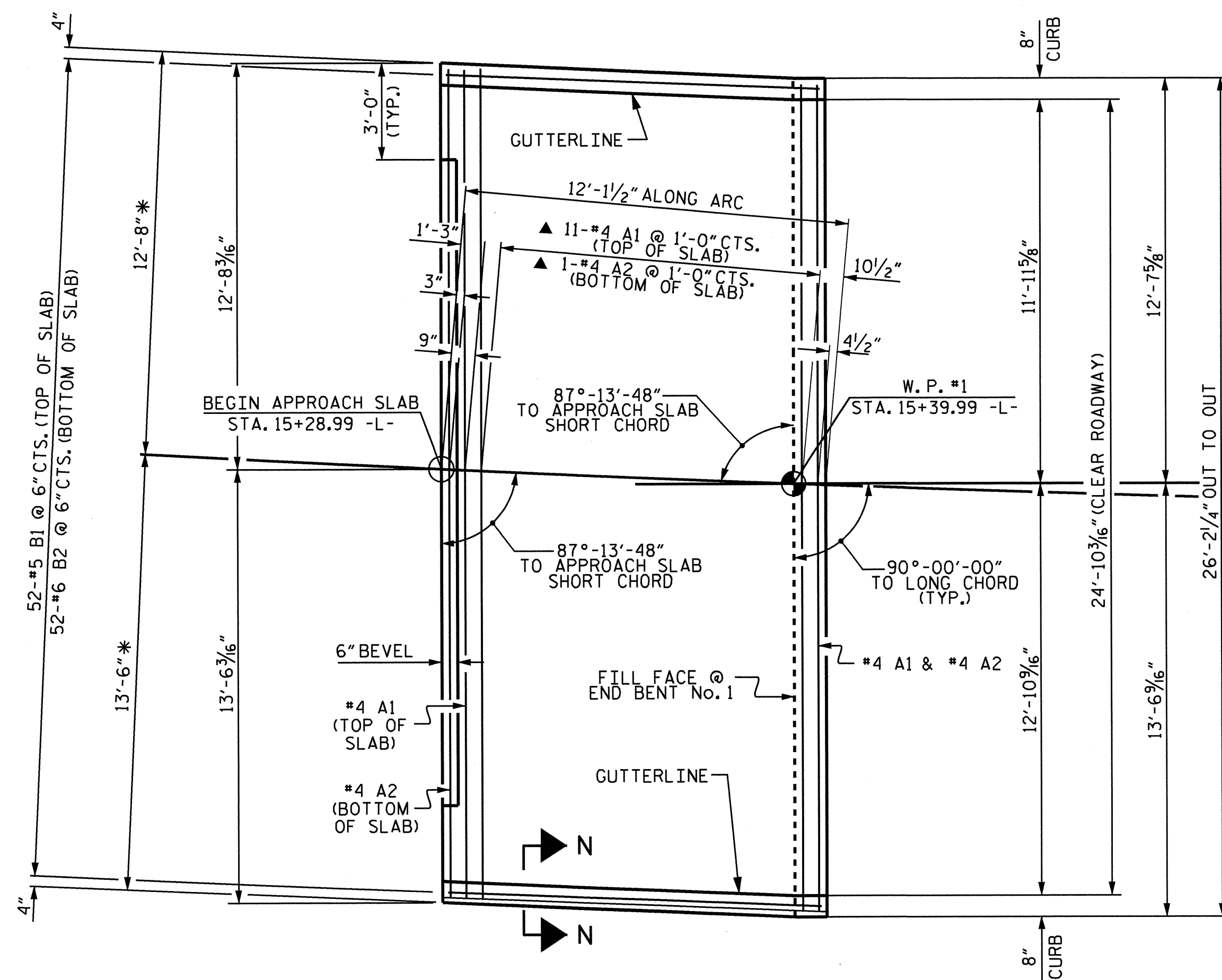
PROJECT NO. B-4834
WARREN COUNTY
 STATION: 15+87.00 -L-



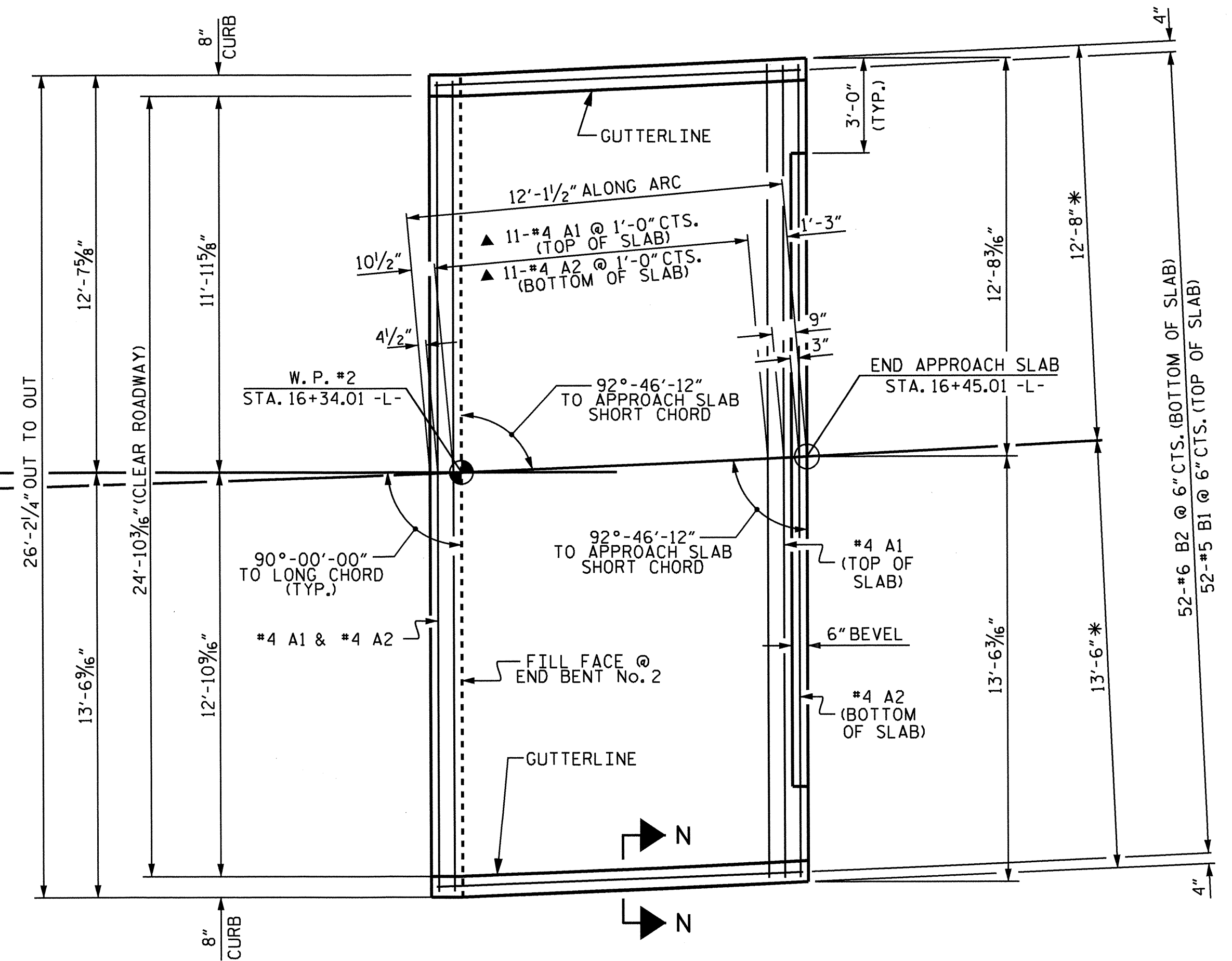
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RIP RAP DETAILS

ASSEMBLED BY : A. V. ROYAL DATE : 03/11
 CHECKED BY : M. K. TOM DATE : 05/11
 DRAWN BY : FCJ 2/88 REV. 8/16/99 RWW/LES
 CHECKED BY : ARB 8/88 REV. 10/17/00 RWW/LES
 REV. 5/1/06R TLA/GM

REVISIONS						SHEET NO. S-18
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 20
2			4			



PLAN @ END BENT No. 1



PLAN @ END BENT No. 2

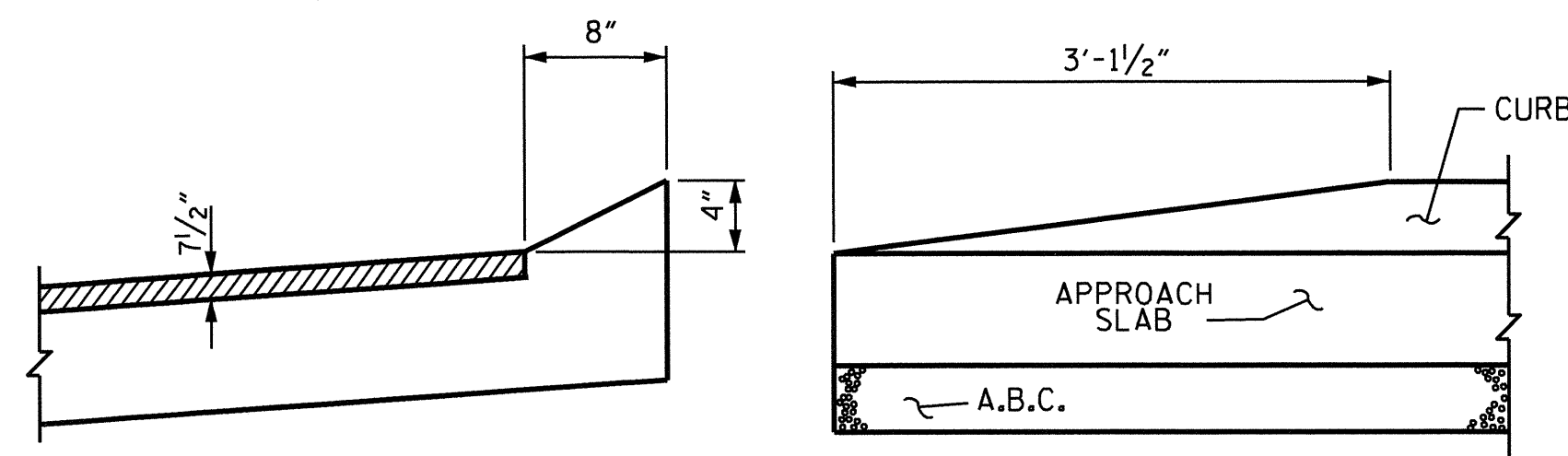
PLAN OF APPROACH SLABS

ARC OFFSETS ARE NEGLIGIBLE, THEREFORE NOT SHOWN.

NOTES:

* MEASURED RADIALLY

▲ "A" BARS ARE PLACED ALONG APPROACH SLAB CHORD AND PLACED PARALLEL TO FILL FACE.



SECTION N-N

END OF CURB WITHOUT SHOULDER BERM GUTTER

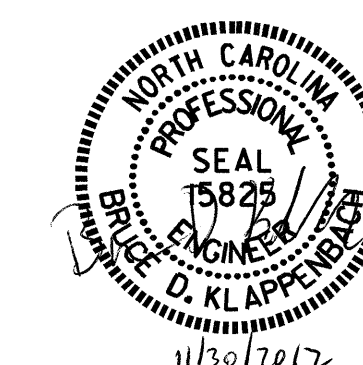
CURB DETAILS

PROJECT NO. B-4834
 WARREN COUNTY
 STATION: 15+87.00 -L-

SHEET 1 OF 2

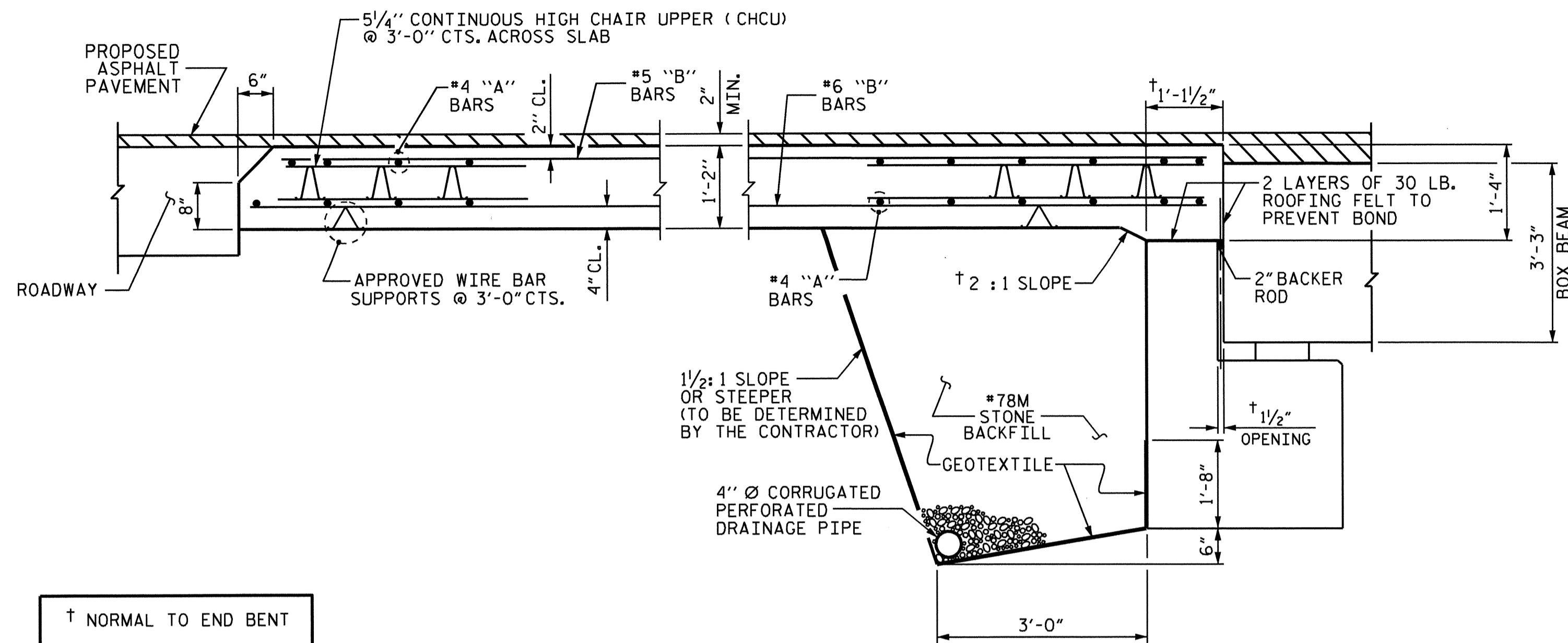
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH SLAB
 FOR PRESTRESSED
 CONCRETE BOX BEAM
 (SUB-REGIONAL TIER)



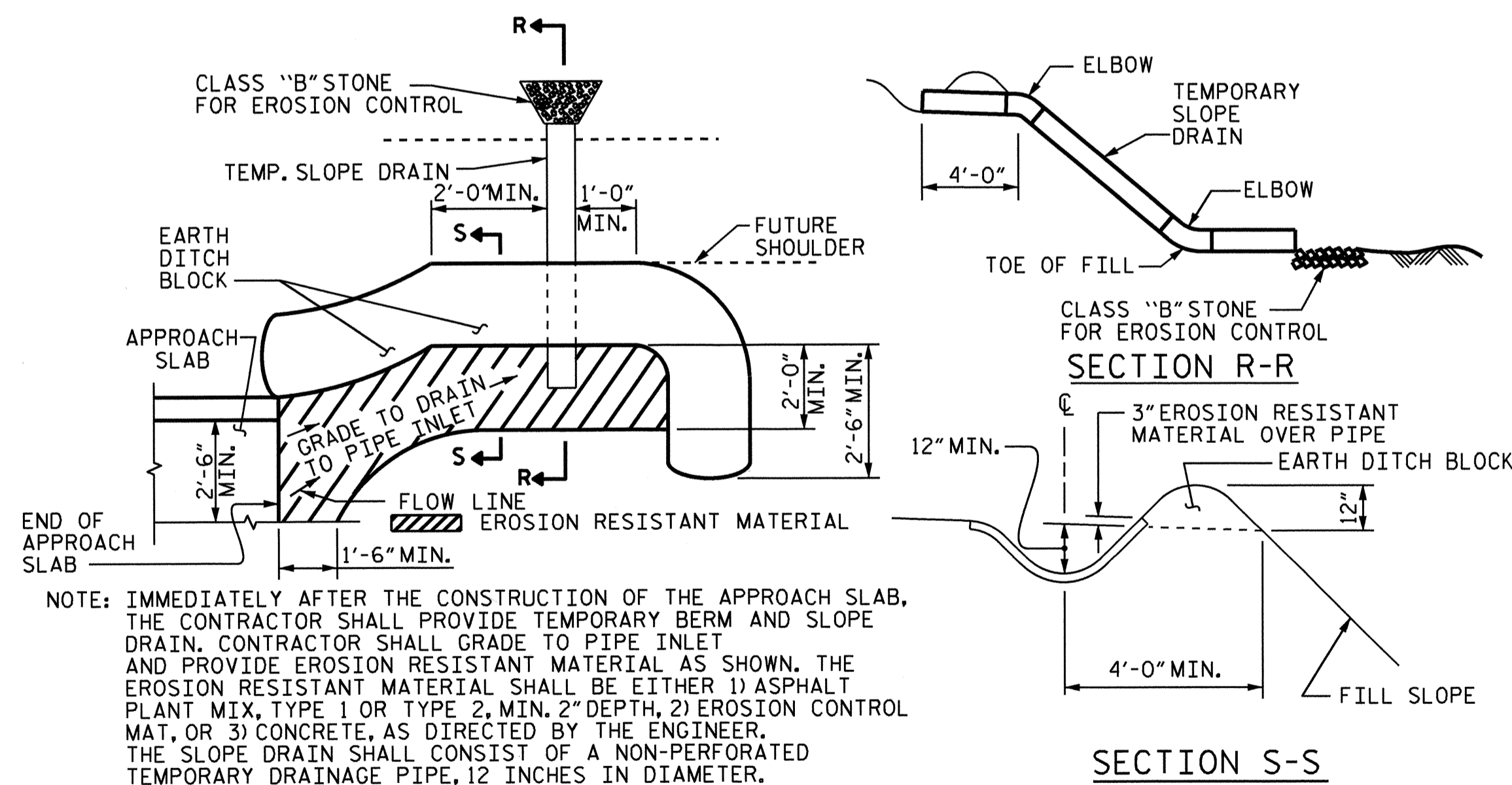
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			20

DRAWN BY: A. V. ROYAL DATE: 05/11
 CHECKED BY: M. K. TOM DATE: 05/11



† NORMAL TO END BENT

SECTION THRU SLAB



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

PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

NOTES

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

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

#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

#78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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

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

APPROACH SLAB GROOVING IS NOT REQUIRED.

BILL OF MATERIAL

APPROACH SLAB AT EB No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	25'-10"	224
A2	13	#4	STR	25'-10"	224
* B1	52	#5	STR	11'-2"	606
B2	52	#6	STR	11'-8"	911

REINFORCING STEEL LBS. 1135

* EPOXY COATED REINFORCING STEEL LBS. 830

CLASS AA CONCRETE C. Y. 13.8

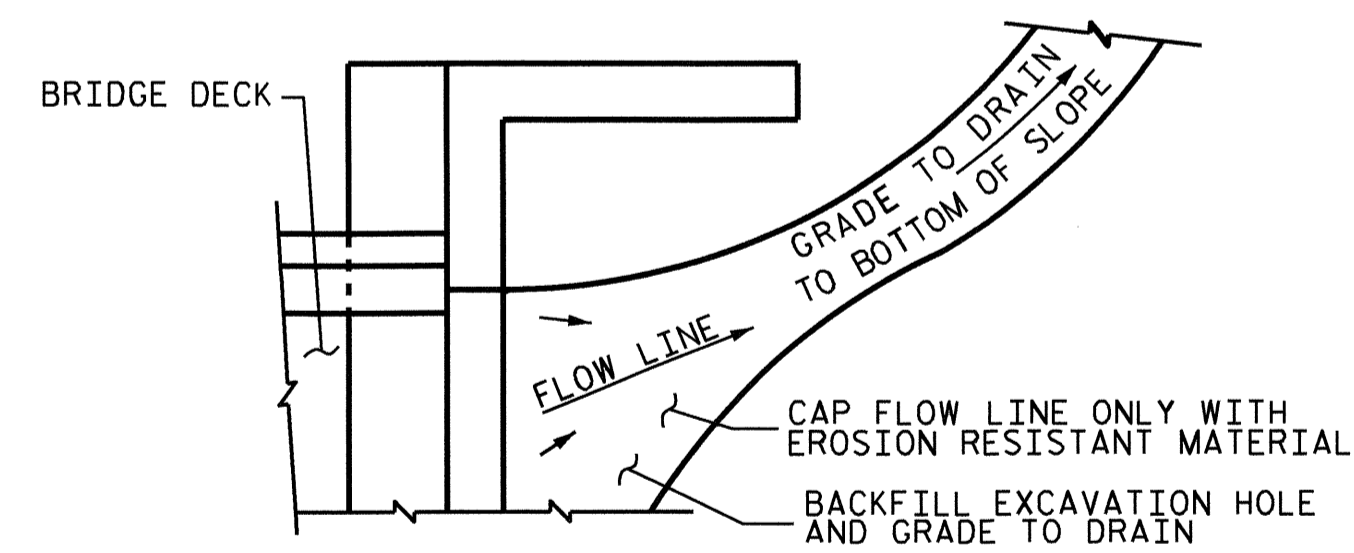
APPROACH SLAB AT EB No. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	25'-10"	224
A2	13	#4	STR	25'-10"	224
* B1	52	#5	STR	11'-2"	606
B2	52	#6	STR	11'-8"	911

REINFORCING STEEL LBS. 1135

* EPOXY COATED REINFORCING STEEL LBS. 830

CLASS AA CONCRETE C. Y. 13.8



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. B-4834

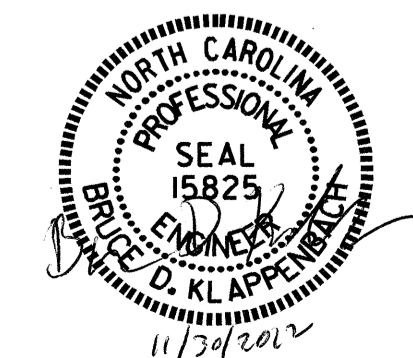
WARREN COUNTY

STATION: 15+87.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB
FOR PRESTRESSED
CONCRETE BOX BEAM
(SUB-REGIONAL TIER)



REVISIONS

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

SHEET NO. S-20

TOTAL SHEETS 20

DRAWN BY: A. V. ROYAL DATE: 05/11
CHECKED BY: M. K. TOM DATE: 05/11

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16" INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS 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.

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