

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

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

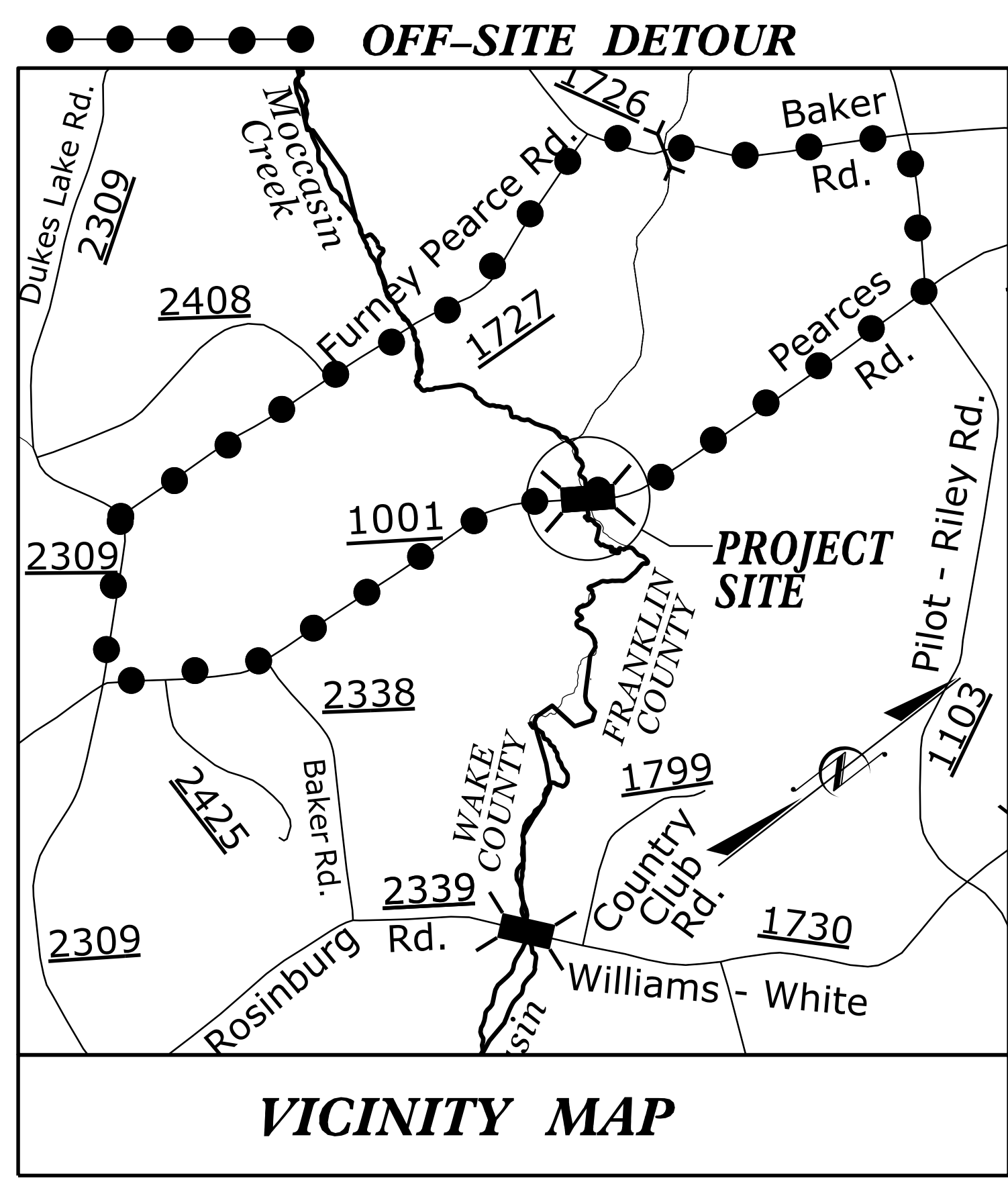
**This file or an individual page
shall not be considered a certified document.**

09/28/19

TIP PROJECT: B-5140

CONTRACT: C204097

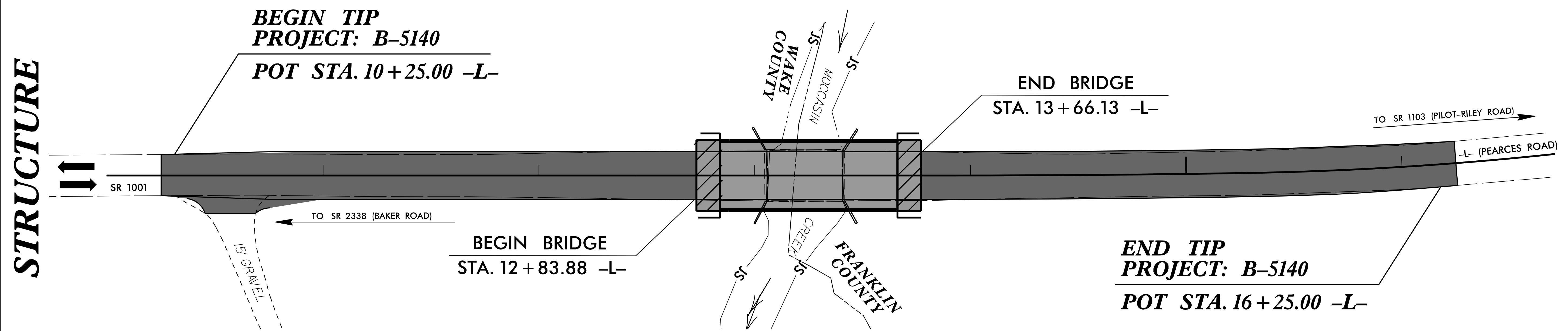
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5140		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
42301.1.1	BRSTP-1001(45)	PE	
42301.2.2		RW & UTILITY	
42301.3.2		CONSTRUCTION	



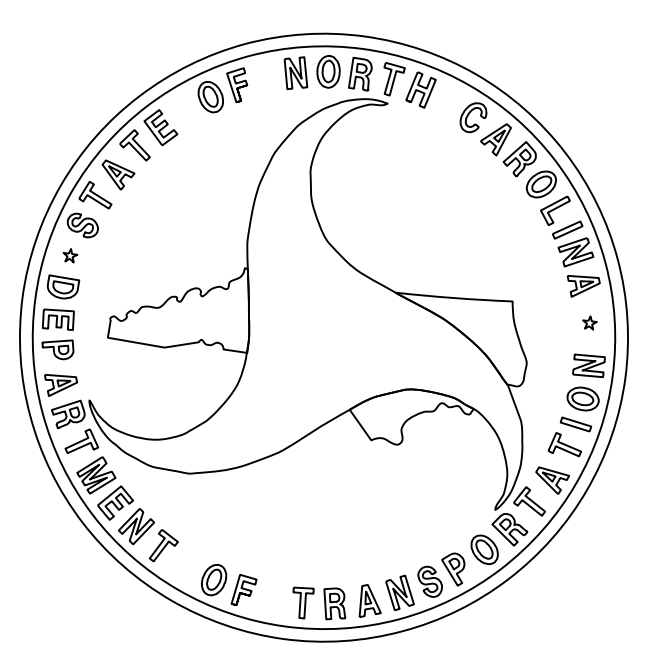
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
WAKE COUNTY

LOCATION: BRIDGE No. 195 OVER MOCCASIN CREEK
ON SR 1001 (PEARCES ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE



** DESIGN EXCEPTION REQUIRED FOR VERTICAL ALIGNMENT



DESIGN DATA

ADT 2018	=	3,535
ADT 2038	=	5,612
K	=	11 %
D	=	65 %
T	=	4 % *
** V	=	60 MPH
* (TTST = 1% DUAL = 3%)		
FUNC CLASS =		
MINOR COLLECTOR		
SUB-REGIONAL TIER		

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT: B-5140	=	0.098 MILES
LENGTH OF STRUCTURE TIP PROJECT: B-5140	=	0.016 MILES
TOTAL LENGTH OF TIP PROJECT: B-5140	=	0.114 MILES

PLANS PREPARED BY :

PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

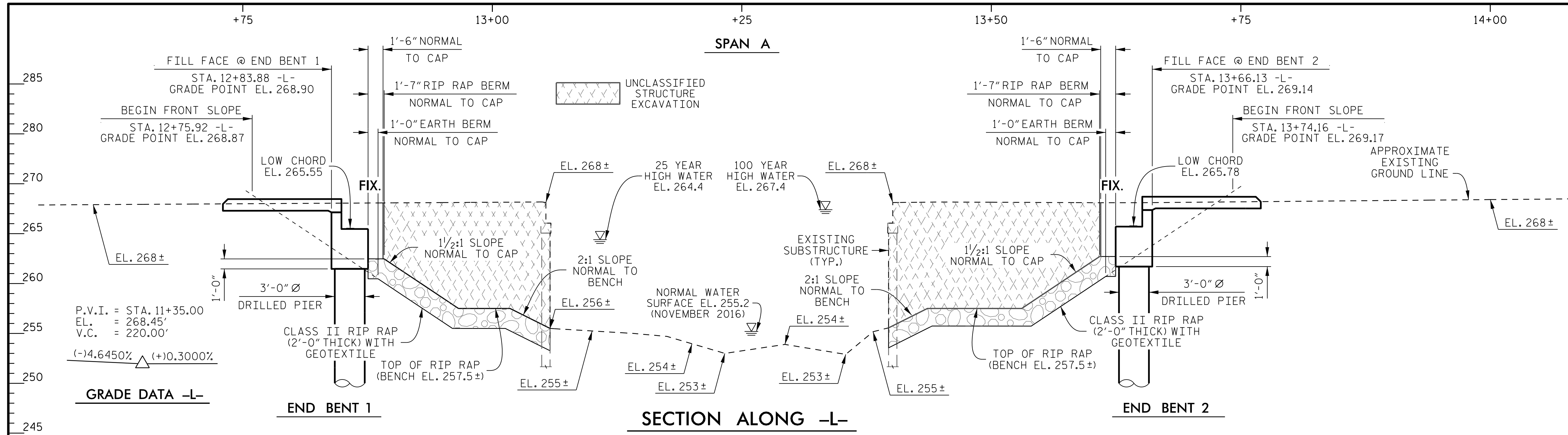
2018 STANDARD SPECIFICATIONS

LETTING DATE:
MAY 15, 2018

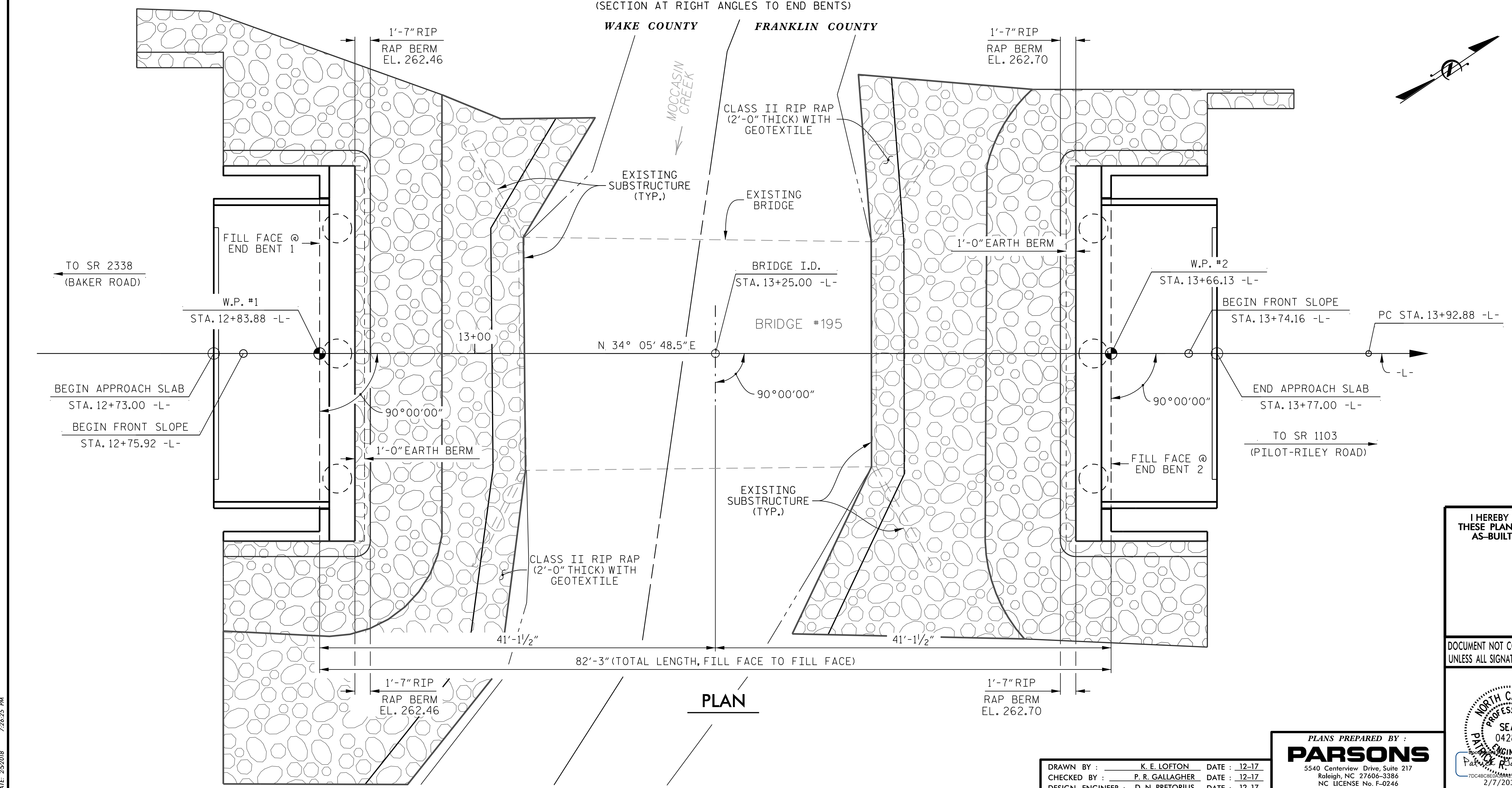
BRIAN K. EASON, P.E.
PROJECT ENGINEER

PATRICK R. GALLAGHER, P.E.
PROJECT DESIGN ENGINEER

NORTH CAROLINA
PROFESSIONAL
SEAL
042890
ENGINEER
PATRICK R. GALLAGHER
2/7/2018



NOTE
FOR NOTES, SEE SHEET 3 OF 3.



HYDRAULIC DATA

DESIGN DISCHARGE	= 1900 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YEARS
DESIGN HIGH WATER ELEVATION	= 264.40 FT.
DRAINAGE AREA	= 8.0 SQ. MI.
BASE DISCHARGE (Q100)	= 3470 CFS
BASE HIGH WATER ELEVATION	= 267.4 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 4660 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 100+ YEARS
OVERTOPPING FLOOD ELEVATION AT STA. 12+31.70 -L-	= 268.8 FT.

PROJECT NO. **B-5140**
WAKE COUNTY
 STATION: **13 + 25.00 -L-**
 SHEET 1 OF 3 REPLACES BRIDGE No. 195

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
BRIDGE OVER MOCCASIN CREEK
ON SR 1001 (PEARCES ROAD)
BETWEEN SR 2338 AND
SR 1103 (FRANKLIN COUNTY)

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROFESSIONAL SEAL
 NORTH CAROLINA
 SEAL
 042890
 P. R. GALLAGHER
 CIVIL ENGINEER
 2/7/2018

PLANS PREPARED BY:
PARSONS
 5540 CenterView Drive, Suite 217
 Raleigh, NC 27606-3386
 NC LICENSE No. F-0246
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY : K. E. LOFTON DATE : 12-17
 CHECKED BY : P. R. GALLAGHER DATE : 12-17
 DESIGN ENGINEER : D. N. PRETORIUS DATE : 12-17

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1-1
1			3			TOTAL SHEETS
2			4			17

FILE: J:\B-5140\Drawings\B-5140-Div-5-910195-smu-gall.dgn
 DATE: 2/20/18 7:26:25 PM

NOTES

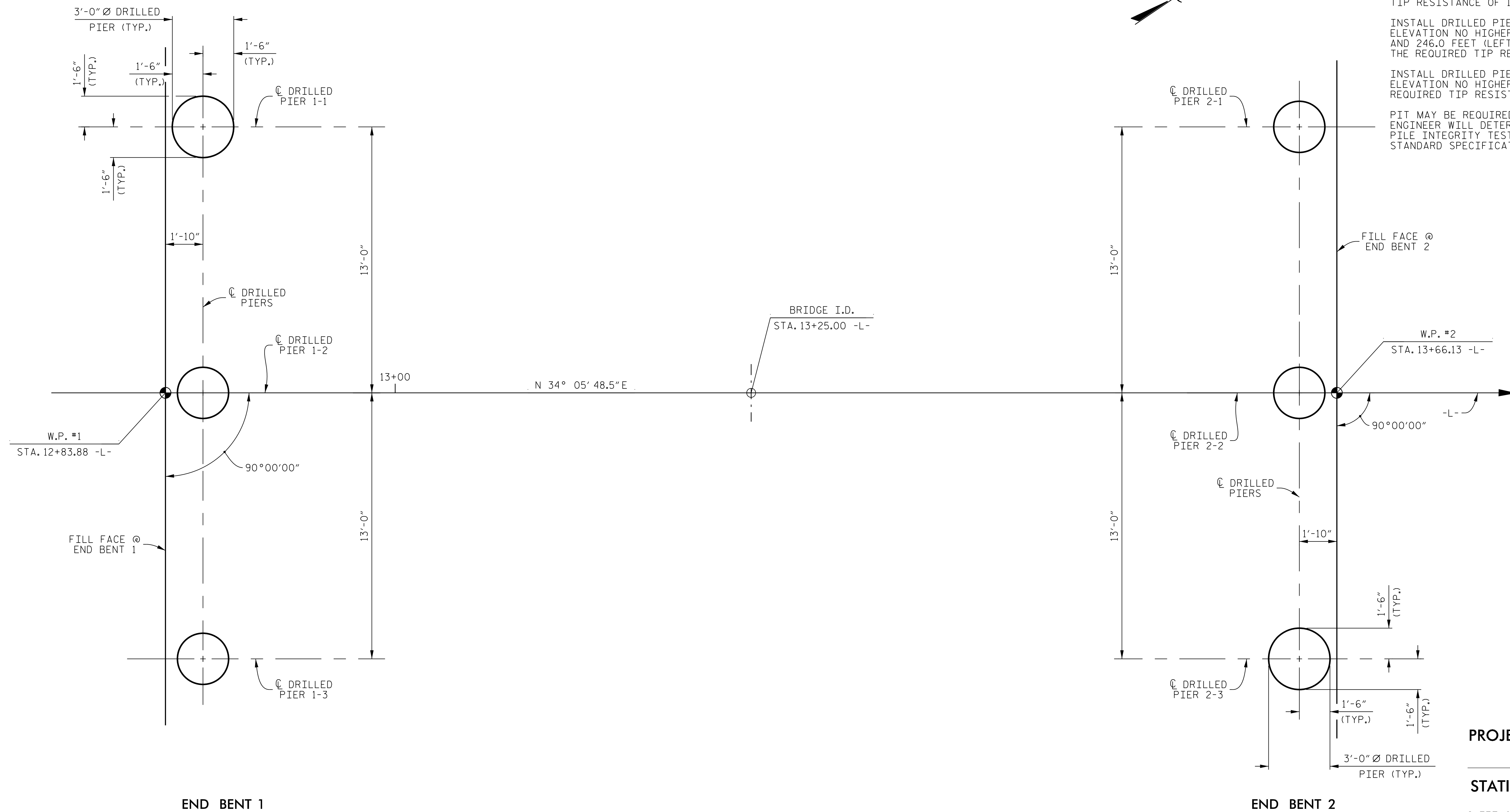
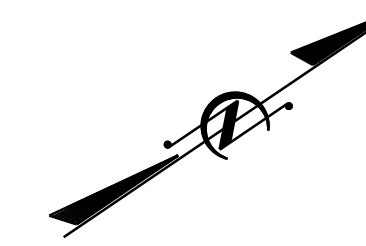
FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATION.

DRILLED PIERS AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 225 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 140 TSF.

INSTALL DRILLED PIERS AT END BENT 1 TO A TIP ELEVATION NO HIGHER THAN 248.0 FEET, 247.0 FEET AND 246.0 FEET (LEFT TO RIGHT, RESPECTIVELY), WITH THE REQUIRED TIP RESISTANCE.

INSTALL DRILLED PIERS AT END BENT 2 TO A TIP ELEVATION NO HIGHER THAN 250.0 FEET WITH THE REQUIRED TIP RESISTANCE.

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



FOUNDATION LAYOUT

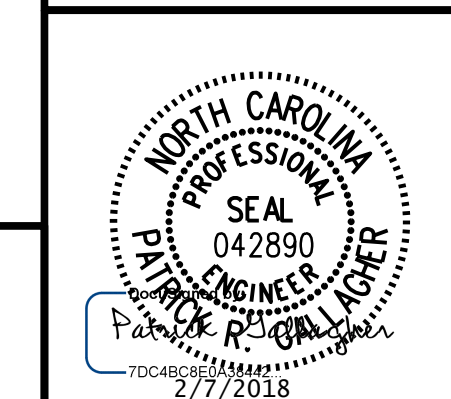
PROJECT NO. B-5140
WAKE COUNTY
 STATION: 13 + 25.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 BRIDGE OVER MOCCASIN CREEK
 ON SR 1001 (PEARCES ROAD)
 BETWEEN SR 2338 AND
 SR 1103 (FRANKLIN COUNTY)

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED



PLANS PREPARED BY :
PARSONS
 5540 CenterView Drive, Suite 217
 Raleigh, NC 27606-3386
 NC LICENSE No. F-0246
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY : K. E. LOFTON DATE : 12-17
 CHECKED BY : P. R. GALLAGHER DATE : 12-17
 DESIGN ENGINEER : D. N. PRETORIUS DATE : 12-17

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1-2
1			3			TOTAL SHEETS
2			4			17

FILE: J:\B-5140\shdwk\p1\final\B-5140_Div_3_910195.dwg, P1.dgn
 DATE: 2/2/2018 7:26:30 PM

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

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.

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		
						LIVE-LOAD FACTORS (γ_{LL})	MOMENT				SHEAR				LIVE-LOAD FACTORS (γ_{LL})	MOMENT								
							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)							
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.155	--	1.750	0.273	1.720	A	EL	39.250	0.502	1.510	A	EL	7.850	0.800	0.273	1.155	A	EL	39.250	--	
	HL-93 (OPERATING)	N/A	--	1.958	--	1.350	0.273	2.230	A	EL	39.250	0.502	1.958	A	EL	7.850	N/A	--	--	--	--	--	--	--
	HS-20 (INVENTORY)	36.000	②	1.533	55.181	1.750	0.273	2.280	A	EL	39.250	0.502	1.910	A	EL	7.850	0.800	0.273	1.533	A	EL	39.250	--	
	HS-20 (OPERATING)	36.000	--	2.473	89.021	1.350	0.273	2.960	A	EL	39.250	0.502	2.473	A	EL	7.850	N/A	--	--	--	--	--	--	--
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.509	47.376	1.400	0.273	6.530	A	EL	39.250	0.502	5.730	A	EL	7.850	0.800	0.273	3.509	A	EL	39.250	--
		SNGARBS2	20.000	--	2.594	51.880	1.400	0.273	4.820	A	EL	39.250	0.502	4.060	A	EL	7.850	0.800	0.273	2.594	A	EL	39.250	--
		SNAGRIS2	22.000	--	2.448	53.850	1.400	0.273	4.550	A	EL	39.250	0.502	3.760	A	EL	7.850	0.800	0.273	2.448	A	EL	39.250	--
		SNCOTTS3	27.250	--	1.746	47.571	1.400	0.273	3.250	A	EL	39.250	0.502	2.860	A	EL	7.850	0.800	0.273	1.746	A	EL	39.250	--
		SNAGGRS4	34.925	--	1.451	50.667	1.400	0.273	2.700	A	EL	39.250	0.502	2.360	A	EL	7.850	0.800	0.273	1.451	A	EL	39.250	--
		SNS5A	35.550	--	1.419	50.453	1.400	0.273	2.640	A	EL	39.250	0.502	2.380	A	EL	7.850	0.800	0.273	1.419	A	EL	39.250	--
		SNS6A	39.950	--	1.299	51.885	1.400	0.273	2.420	A	EL	39.250	0.502	2.170	A	EL	7.850	0.800	0.273	1.299	A	EL	39.250	--
	SNS7B	42.000	--	1.237	51.941	1.400	0.273	2.300	A	EL	39.250	0.502	2.130	A	EL	7.850	0.800	0.273	1.237	A	EL	39.250	--	
	TRUCK TRACTOR SEMI-TRAILER (TTS)	TNAGRIT3	33.000	--	1.583	52.231	1.400	0.273	2.940	A	EL	39.250	0.502	2.590	A	EL	7.850	0.800	0.273	1.583	A	EL	39.250	--
		TNT4A	33.075	--	1.589	52.550	1.400	0.273	2.960	A	EL	39.250	0.502	2.530	A	EL	7.850	0.800	0.273	1.589	A	EL	39.250	--
		TNT6A	41.600	--	1.296	53.907	1.400	0.273	2.410	A	EL	39.250	0.502	2.250	A	EL	7.850	0.800	0.273	1.296	A	EL	39.250	--
		TNT7A	42.000	--	1.301	54.625	1.400	0.273	2.420	A	EL	39.250	0.502	2.210	A	EL	7.850	0.800	0.273	1.301	A	EL	39.250	--
		TNT7B	42.000	--	1.341	56.333	1.400	0.273	2.490	A	EL	39.250	0.502	2.080	A	EL	7.850	0.800	0.273	1.341	A	EL	39.250	--
		TNAGRIT4	43.000	--	1.279	55.001	1.400	0.273	2.380	A	EL	39.250	0.502	2.020	A	EL	7.850	0.800	0.273	1.279	A	EL	39.250	--
TNAGRIT5A		45.000	--	1.207	54.337	1.400	0.273	2.250	A	EL	39.250	0.502	2.000	A	EL	7.850	0.800	0.273	1.207	A	EL	39.250	--	
TNAGRIT5B	45.000	③	1.194	53.739	1.400	0.273	2.220	A	EL	39.250	0.502	1.920	A	EL	7.850	0.800	0.273	1.194	A	EL	39.250	--		

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

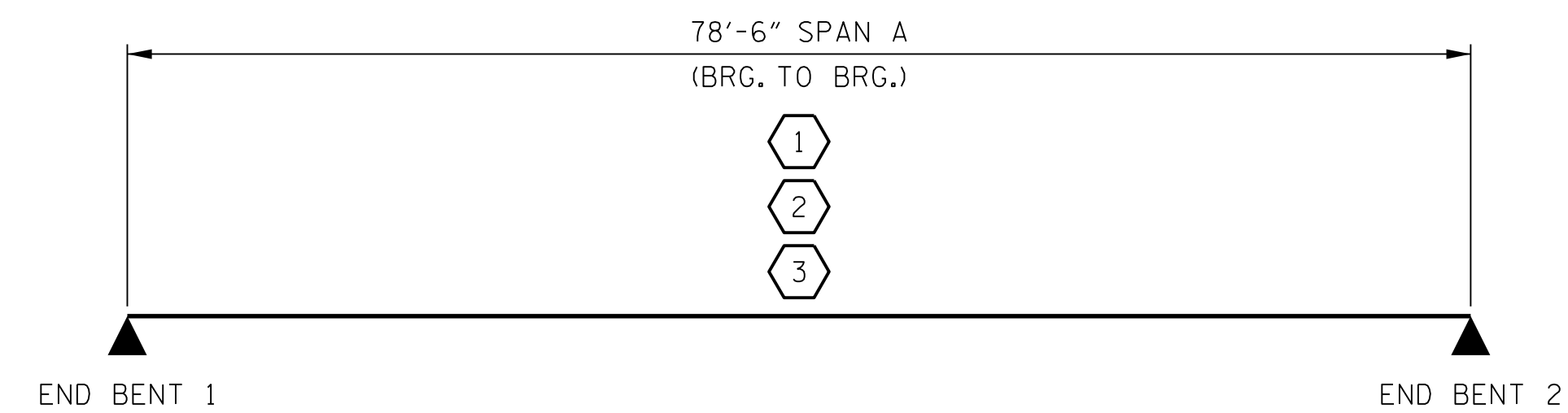
② DESIGN LOAD RATING (HS-20)

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-5140
WAKE COUNTY
 STATION: 13 + 25.00 -L-

FILE: J:\B-5140\Drawings\LRFR\B-5140_DWG_3_91095.dwg, 11/11/11 7:26:41 PM

ASSEMBLED BY : K. E. LOFTON DATE : 12-17
 CHECKED BY : P. R. GALLAGHER DATE : 12-17
 DRAWN BY : TMG 11/11
 CHECKED BY : AAC 11/11

DRAWN BY : K. E. LOFTON DATE : 12-17
 CHECKED BY : P. R. GALLAGHER DATE : 12-17
 DESIGN ENGINEER : D. N. PRETORIUS DATE : 12-17

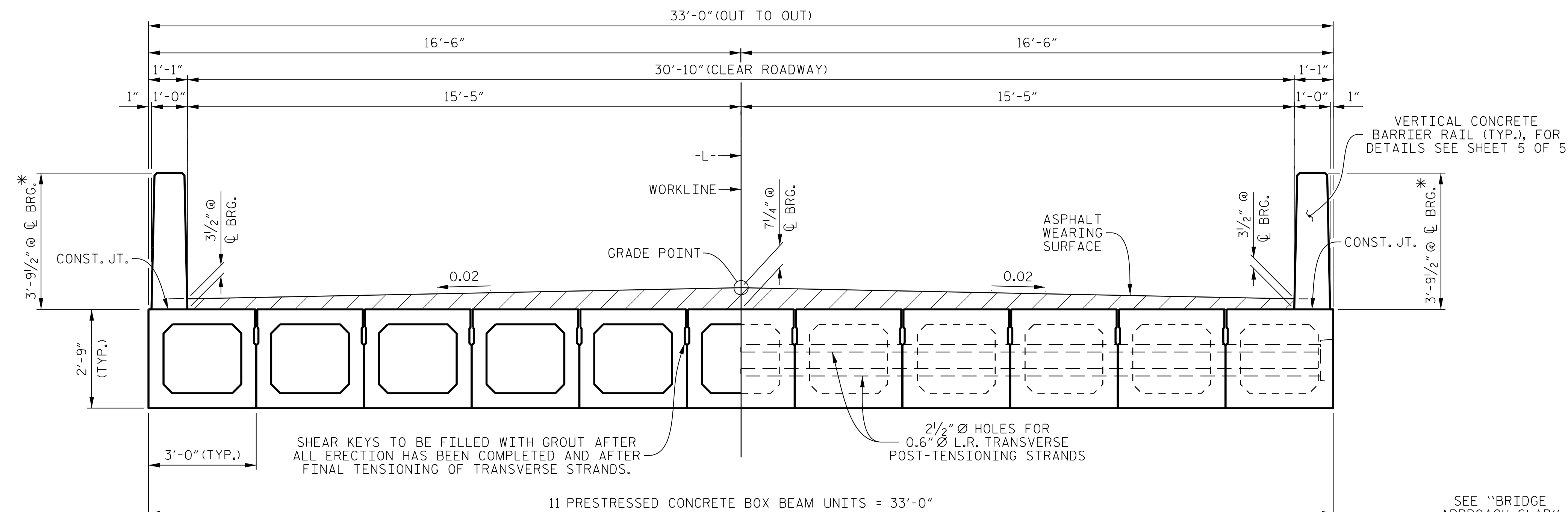
PLANS PREPARED BY :
PARSONS
 5540 CenterView Drive, Suite 217
 Raleigh, NC 27606-3386
 NC LICENSE No. F-0246

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 LRFR SUMMARY FOR
 80' BOX BEAM UNIT
 90° SKEW
 (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	
1			3			S1-4
2			4			
TOTAL SHEETS						17

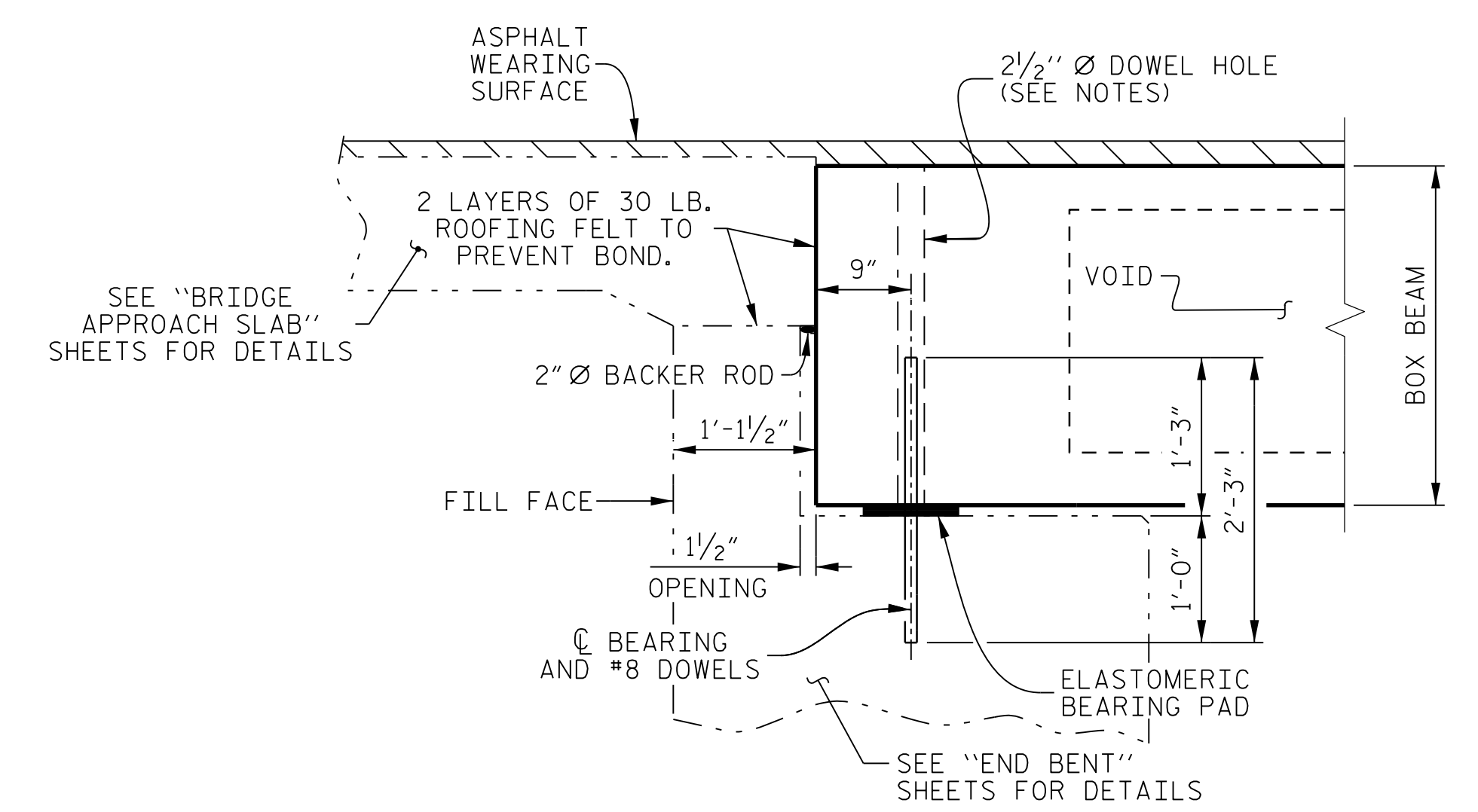


HALF SECTION THROUGH VOIDS **HALF SECTION AT INTERMEDIATE DIAPHRAGMS**

TYPICAL SECTION

* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL, SHEET 5 OF 5.

VERTICAL CONCRETE BARRIER RAIL (TYP.), FOR DETAILS SEE SHEET 5 OF 5



SECTION AT END BENT

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.

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

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 BACKER RODS 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 6000 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.

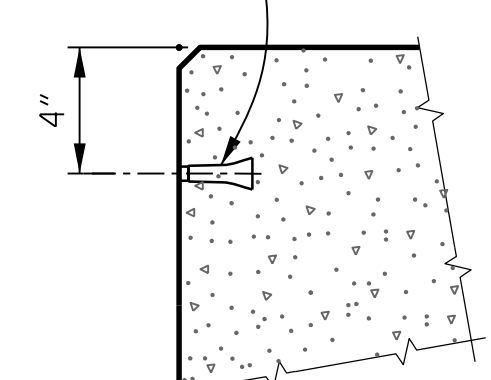
THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

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

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

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

PERMITTED THREADED INSERT CAST IN OUTSIDE FACE OF CORED SLAB UNITS 1 AND 11, RECESSED 3/8" SIZE TO BE DETERMINED BY CONTRACTOR.



THREADED INSERT DETAIL

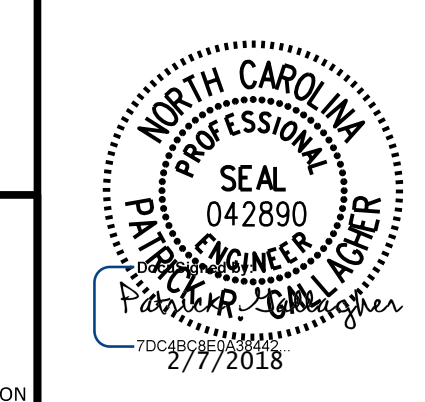
PROJECT NO. **B-5140**
WAKE COUNTY
 STATION: **13 + 25.00 -L-**

SHEET 1 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
3'-0" x 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT
90° SKEW

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1-5
1			3			TOTAL SHEETS
2			4			17

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

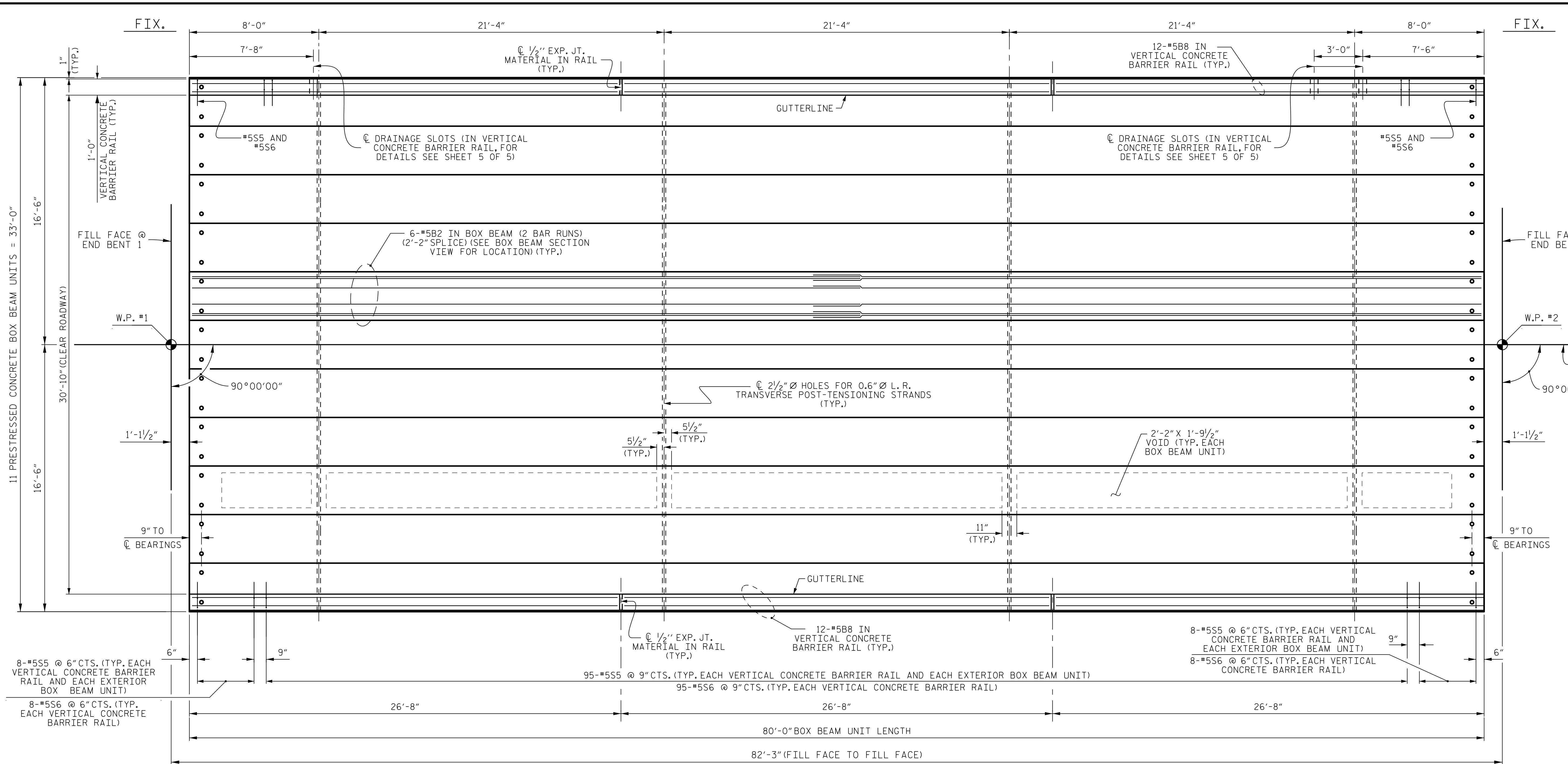


PLANS PREPARED BY:
PARSONS
 5540 CenterView Drive, Suite 217
 Raleigh, NC 27606-3386
 NC LICENSE No. F-0246
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

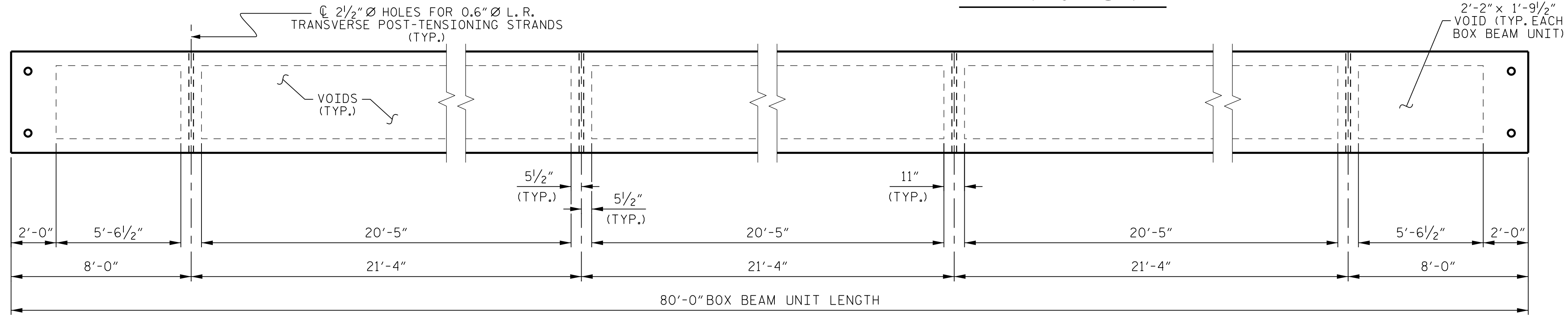
DRAWN BY: **K. E. LOFTON** DATE: **12-17**
 CHECKED BY: **P. R. GALLAGHER** DATE: **12-17**
 DESIGN ENGINEER: **D. N. PRETORIUS** DATE: **12-17**

ASSEMBLED BY: **K. E. LOFTON** DATE: **12-17**
 CHECKED BY: **P. R. GALLAGHER** DATE: **12-17**
 DRAWN BY: **DGE** 8/11
 CHECKED BY: **TMG** 11/11
 REV. 9/14 MAA/TMG

FILE: J:\B-5140\Drawings\Struct\B-5140_Div_5_91095_smu_bbl.dgn
 DATE: 2/20/18 7:26:50 PM



PLAN OF UNIT



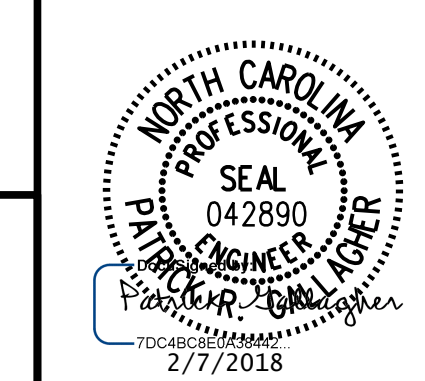
DIAPHRAGM AND VOID LAYOUT

PROJECT NO. **B-5140**
WAKE COUNTY
 STATION: **13 + 25.00 -L-**

SHEET 2 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**3'-0" x 2'-9" PRESTRESSED
 CONCRETE BOX BEAM UNIT
 PLAN OF 80'-0" UNIT
 30'-10" CLEAR ROADWAY
 90° SKEW**

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

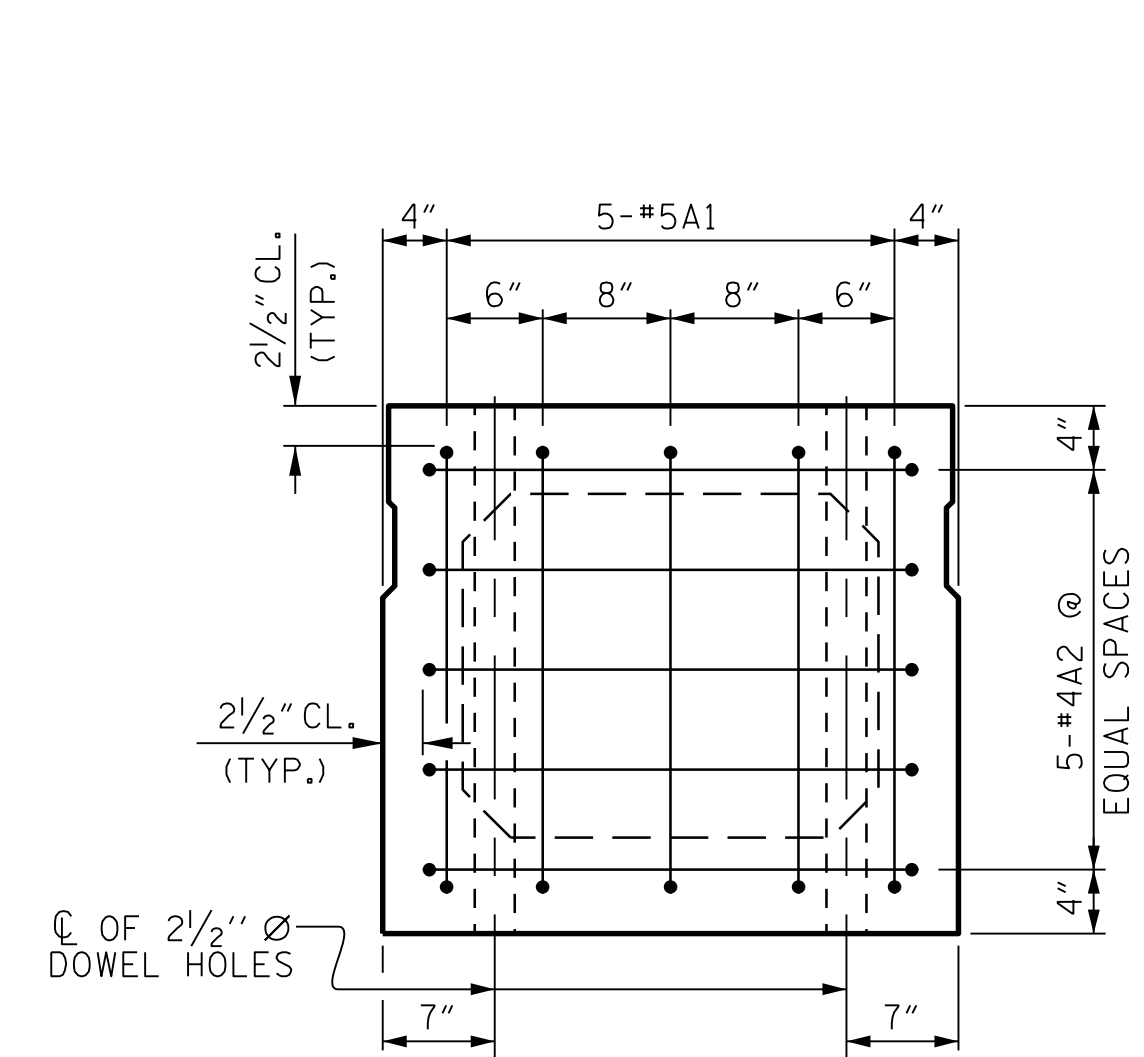


REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S1-6
1			3			TOTAL SHEETS
2			4			17

ASSEMBLED BY : K. E. LOFTON DATE : 12-17
 CHECKED BY : P. R. GALLAGHER DATE : 12-17
 DRAWN BY : DGE 8/11 REV. 8/14 MAA/TMG
 CHECKED BY : TMG 11/11

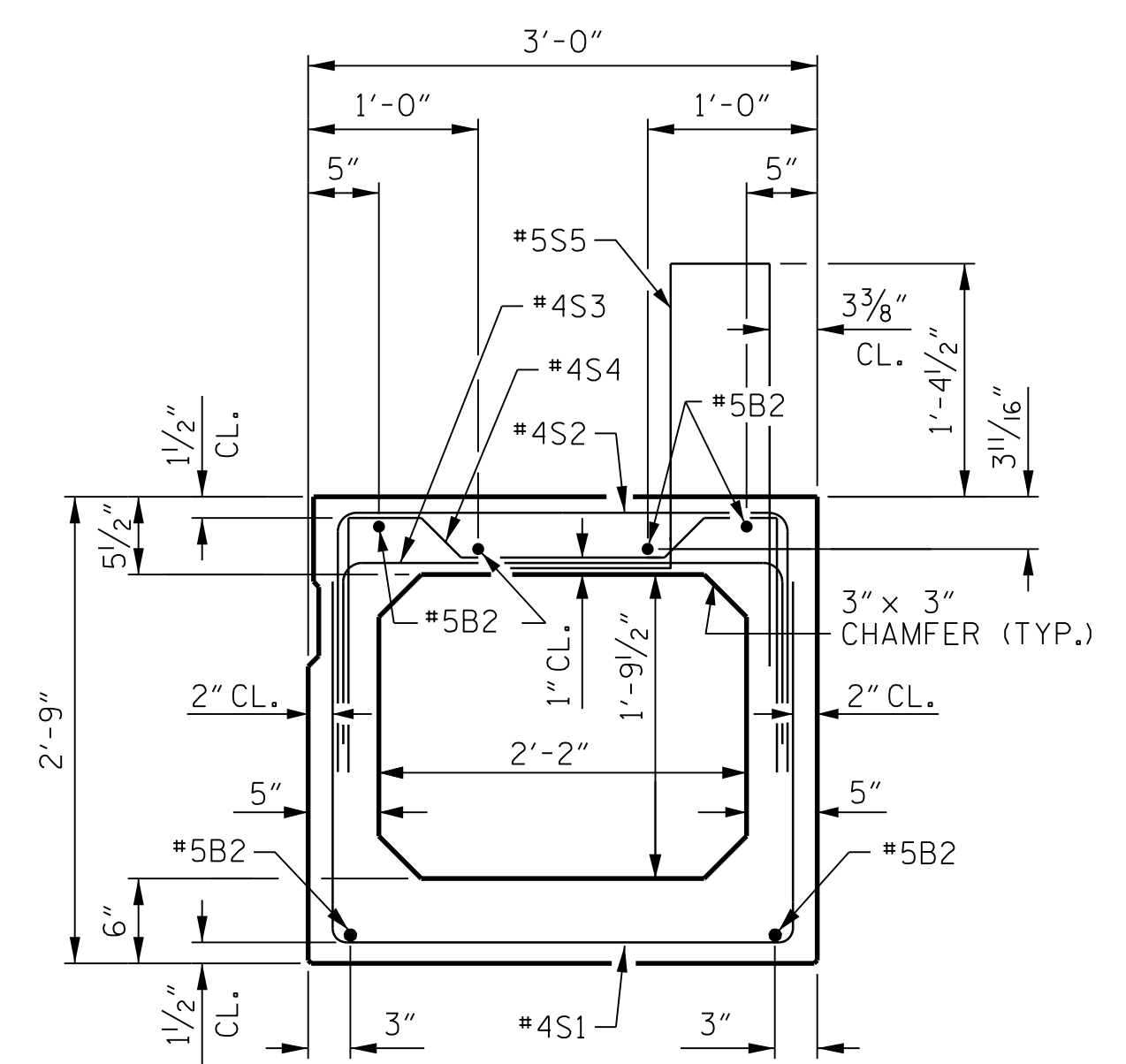
DRAWN BY : K. E. LOFTON DATE : 12-17
 CHECKED BY : P. R. GALLAGHER DATE : 12-17
 DESIGN ENGINEER : D. N. PRETORIUS DATE : 12-17

PLANS PREPARED BY :
PARSONS
 5540 CenterView Drive, Suite 217
 Raleigh, NC 27606-3386
 NC LICENSE No. F-0246



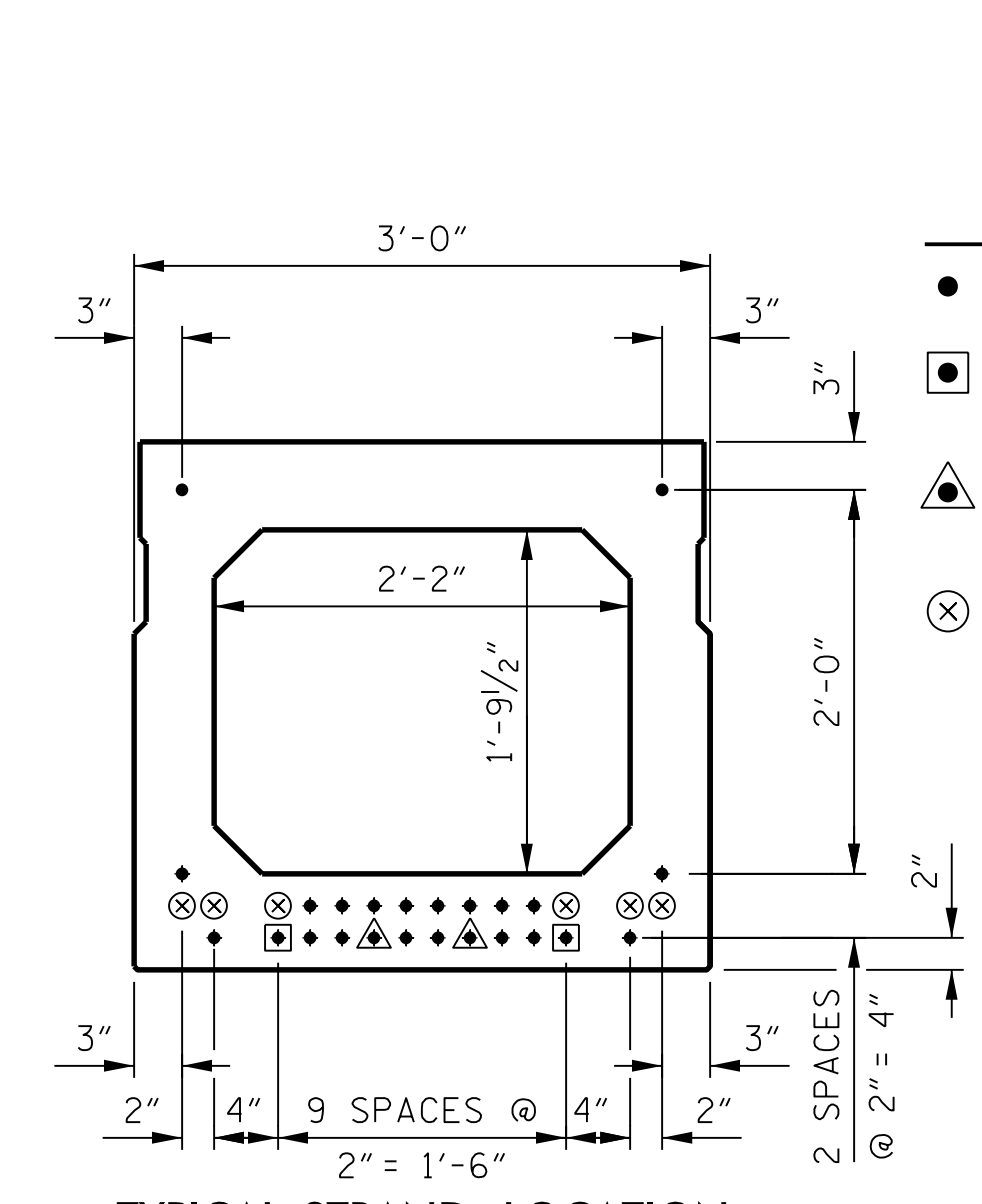
END ELEVATION

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



EXTERIOR SLAB SECTION

(STRAND LAYOUT NOT SHOWN)

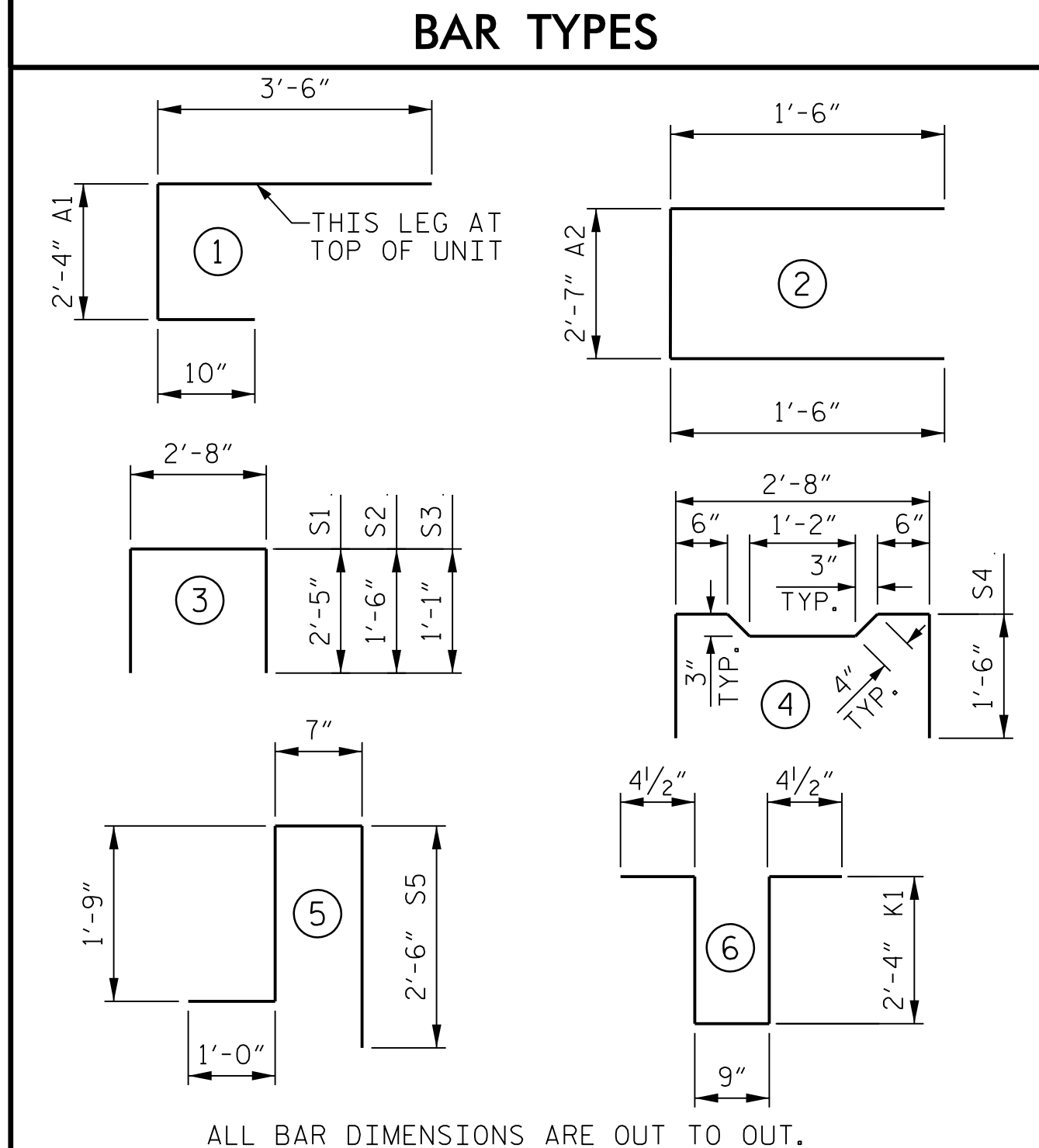


TYPICAL STRAND LOCATION

24 - 0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

- FULLY BONDED STRANDS
 - STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
 - ▲ STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
 - ⊗ OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED, IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE BOX BEAM UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST.
- 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.

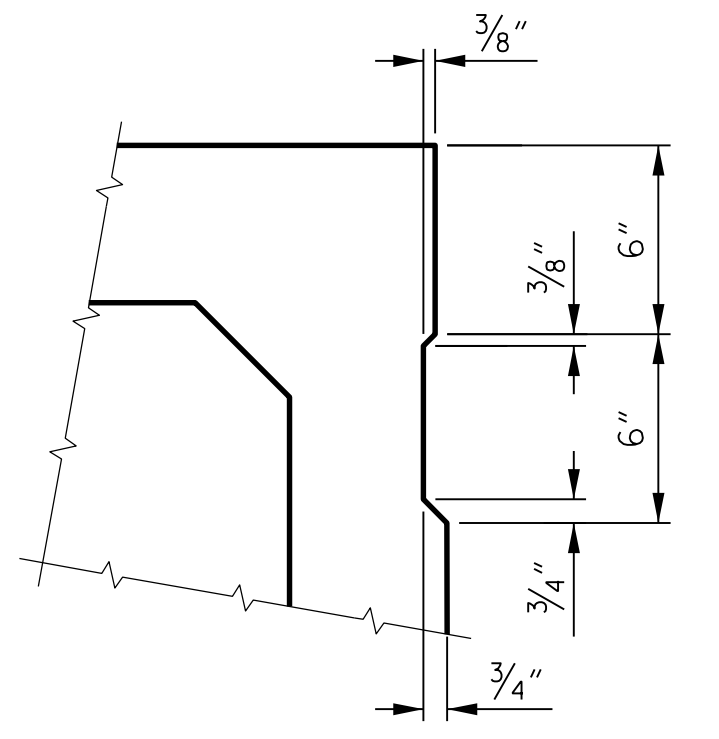


ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

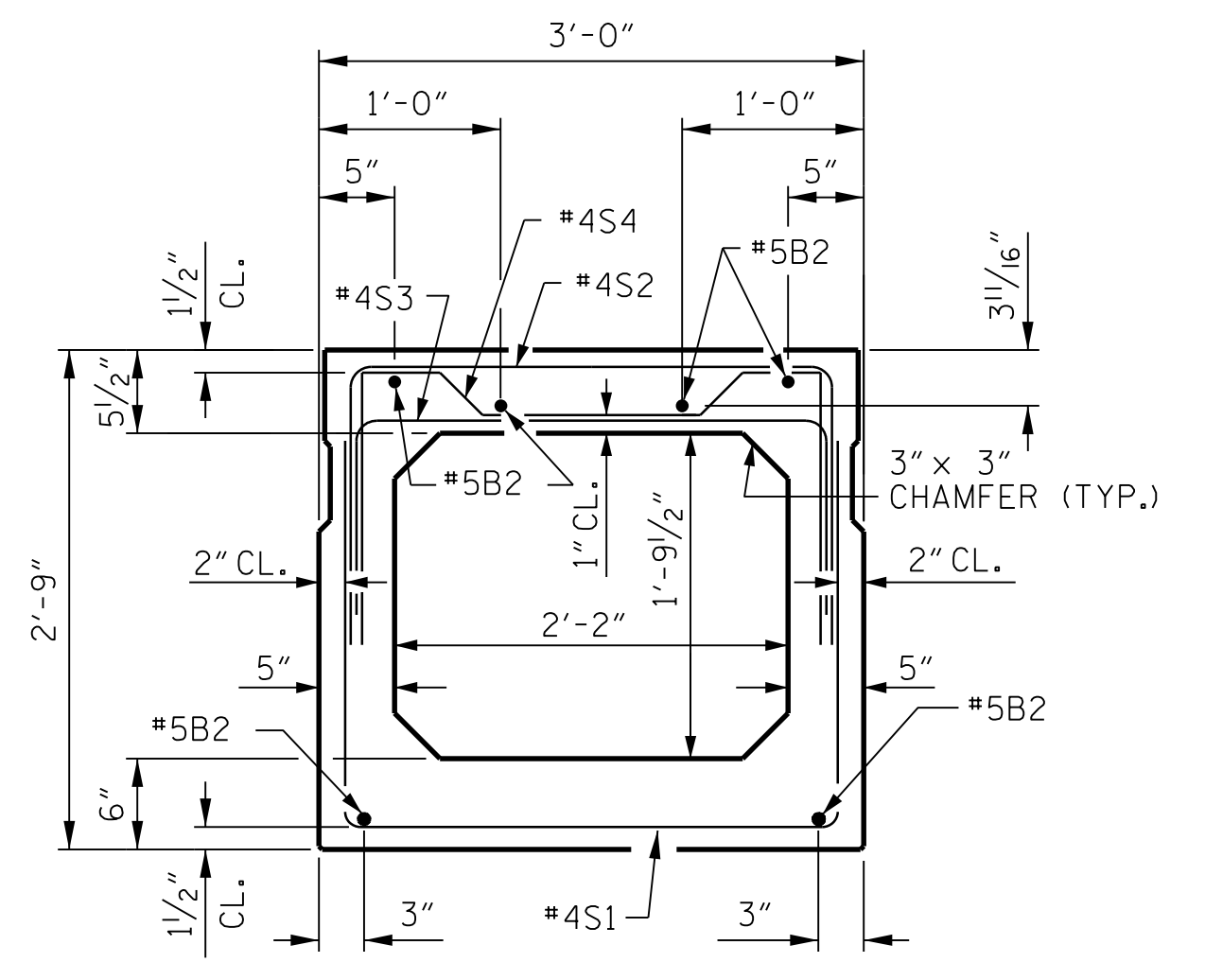
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
				LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	6'- 8"	70	6'- 8"	70
A2	34	#4	2	5'- 7"	127	5'- 7"	127
B2	12	#5	STR	40'-11"	512	40'-11"	512
K1	12	#4	6	6'- 2"	49	6'- 2"	49
K2	8	#4	STR	2'- 7"	14	2'- 7"	14
S1	66	#4	3	7'- 6"	331	7'- 6"	331
S2	66	#4	3	5'- 8"	250	5'- 8"	250
S3	113	#4	3	4'- 10"	365	4'- 10"	365
S4	47	#4	4	5'- 10"	183	5'- 10"	183
*S5	111	#5	5	5'- 10"	675	--	--
REINFORCING STEEL				1,901 LBS.		1,901 LBS.	
*EPOXY COATED REINFORCING STEEL				675 LBS.		--	
8000 P.S.I. CONCRETE				14.2 CU. YDS.		14.1 CU. YDS.	
0.6" Ø L.R. STRANDS				No. = 24		No. = 24	

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



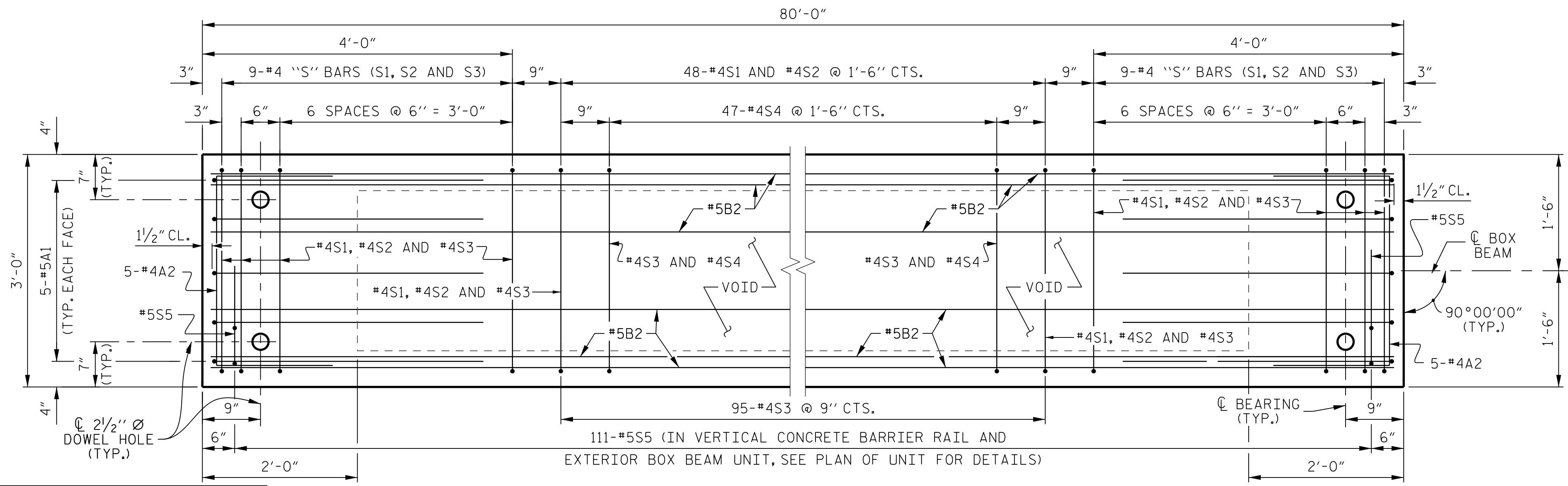
SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF CORED SLAB UNITS 1 AND 11.



INTERIOR SLAB SECTION

(STRAND LAYOUT NOT SHOWN)



PLAN OF BOX BEAM

(STRAND LAYOUT NOT SHOWN)

NOTES

- EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5S5 BARS.
- FOR LOCATION OF DIAPHRAGMS, SEE "PLAN OF UNIT", SHEET 2 OF 5.
- FOR THREADED INSERTS, SEE "THREADED INSERT DETAIL", SHEET 1 OF 5.
- FOR REINFORCING STEEL IN DIAPHRAGMS, SEE "DOUBLE DIAPHRAGM DETAILS", SHEET 4 OF 5.

PROJECT NO. **B-5140**

WAKE COUNTY

STATION: **13 + 25.00 -L-**

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0" x 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT
90° SKEW

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

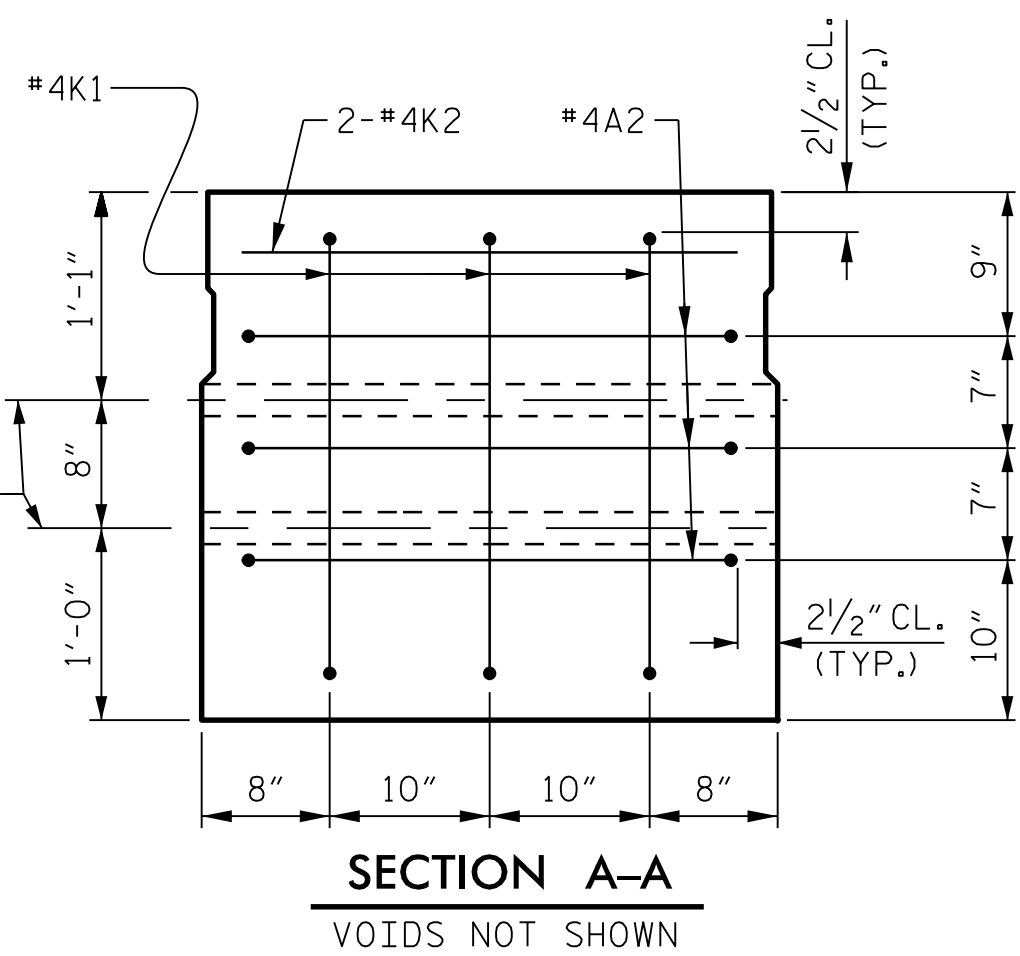
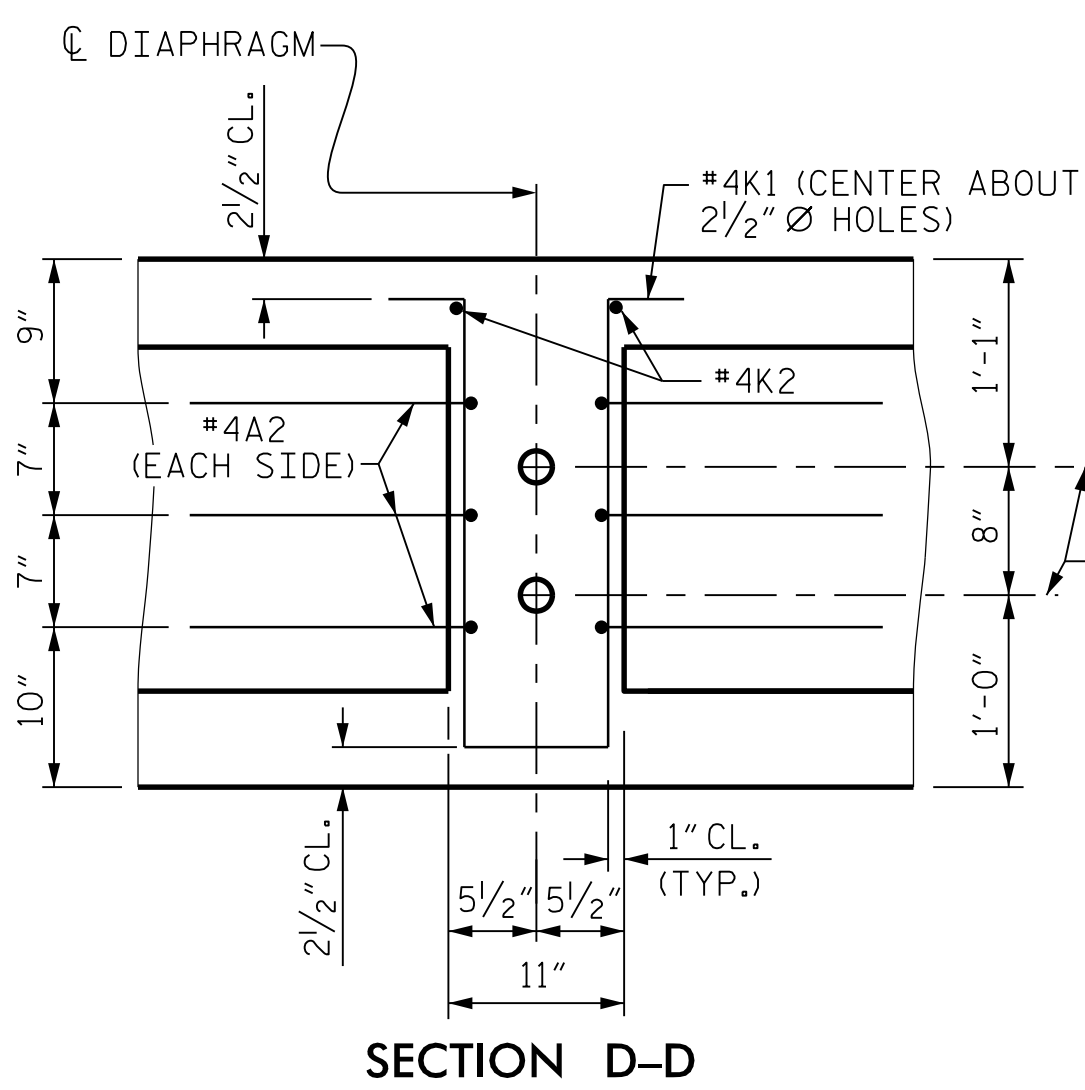
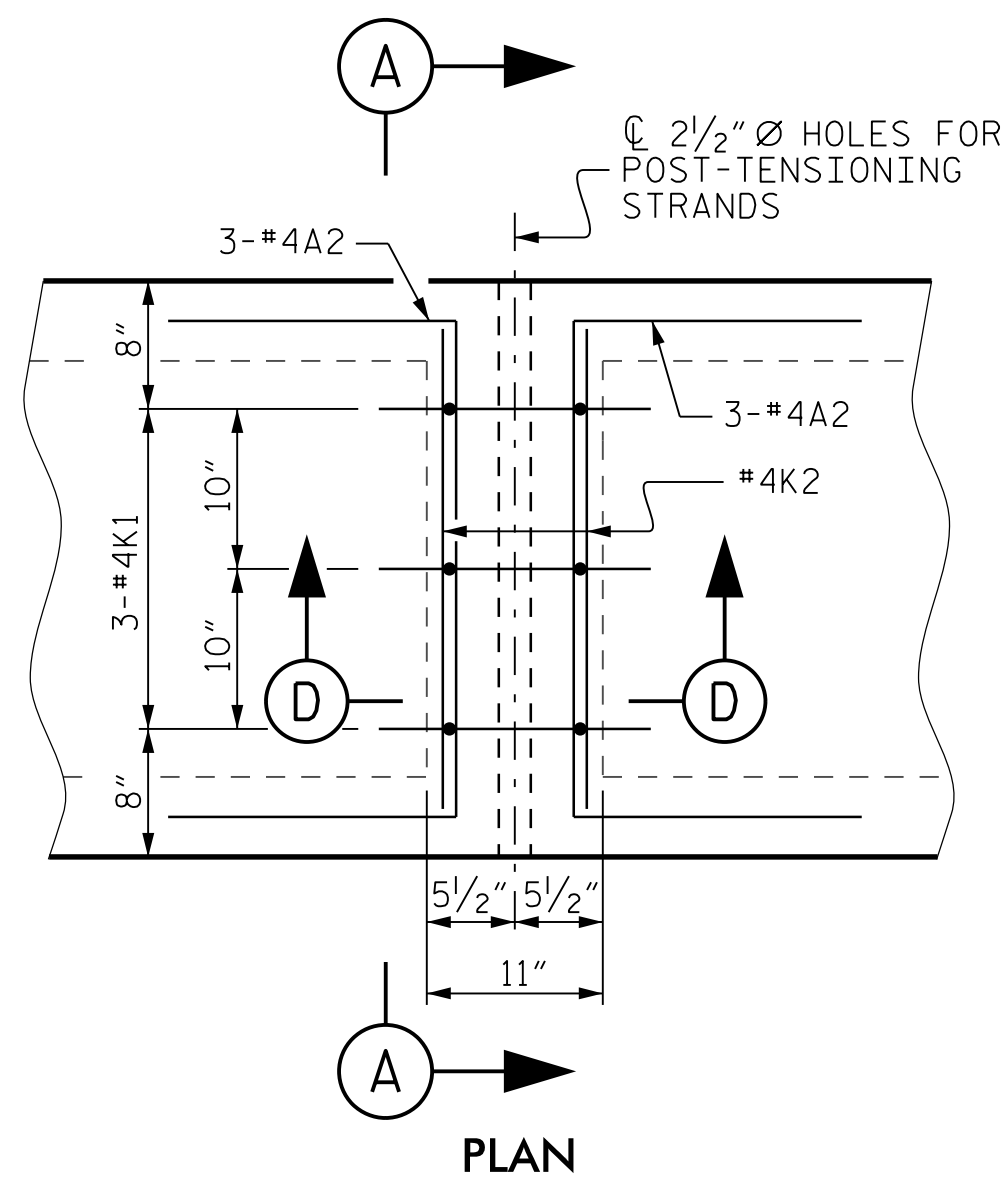


PLANS PREPARED BY:
PARSONS
5540 Centerview Drive, Suite 217
Raleigh, NC 27606-3386
NC LICENSE No. F-0246

DRAWN BY : K. E. LOFTON DATE : 12-17
CHECKED BY : P. R. GALLAGHER DATE : 12-17
DESIGN ENGINEER : D. N. PRETORIUS DATE : 12-17

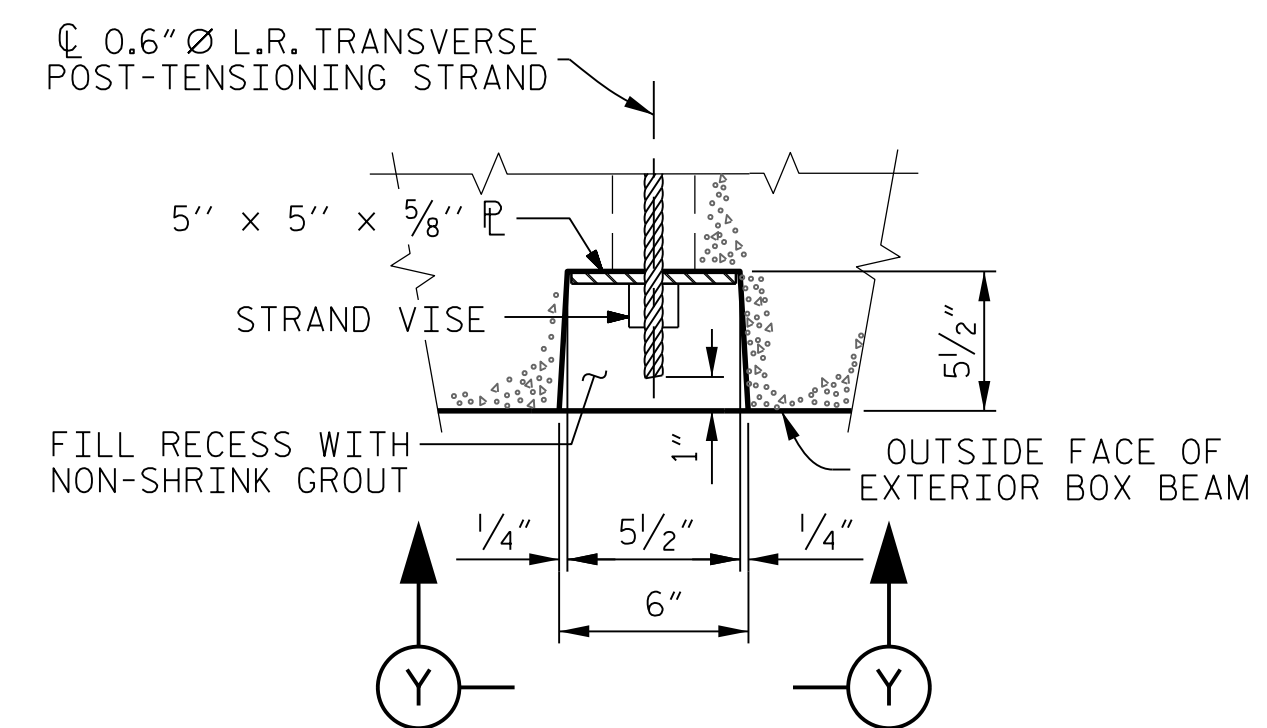
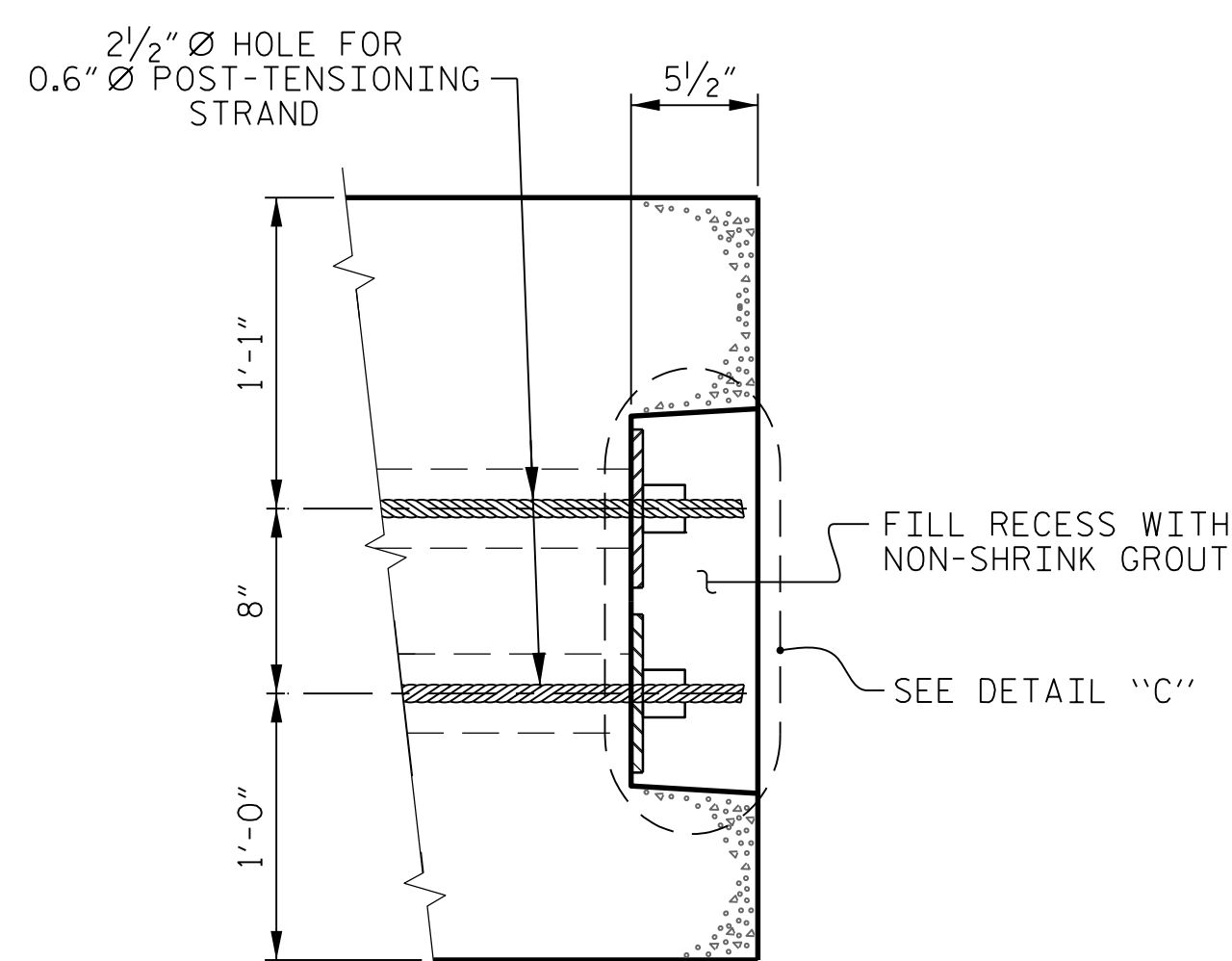
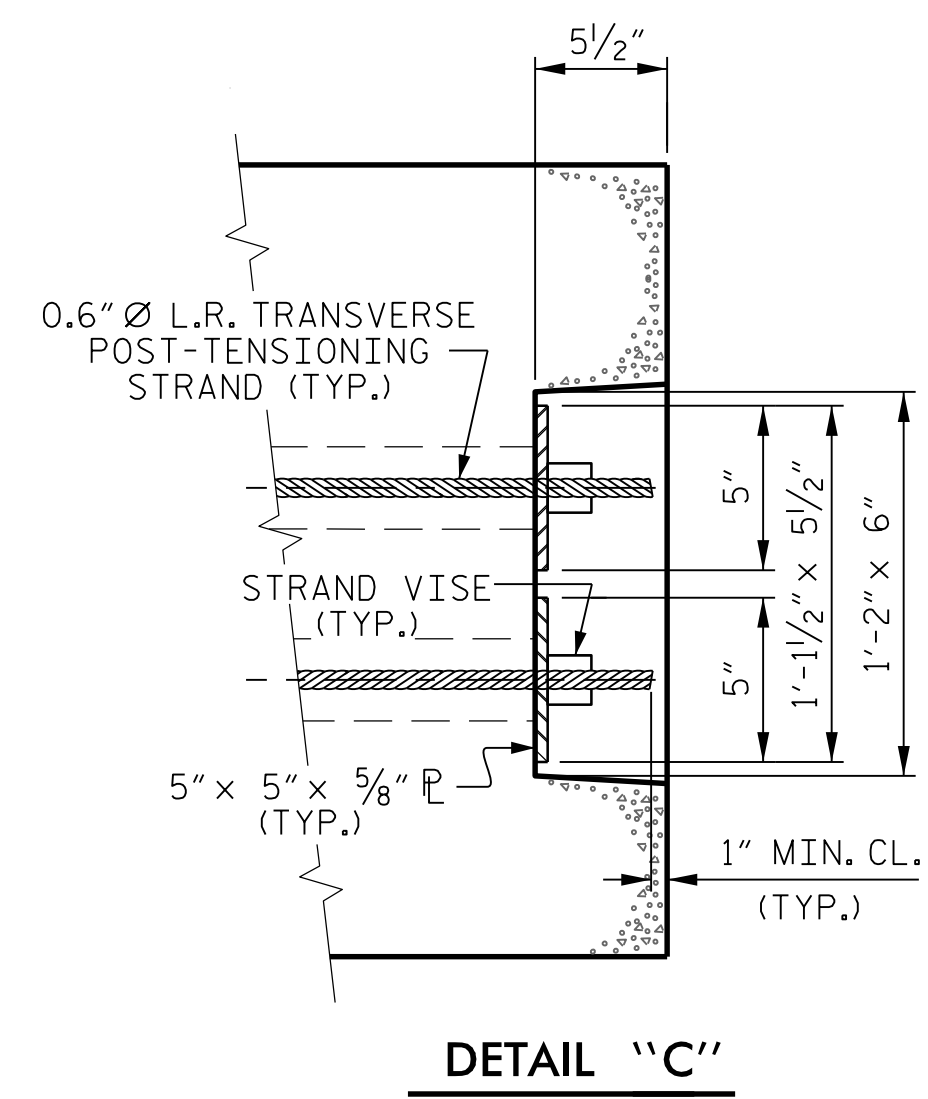
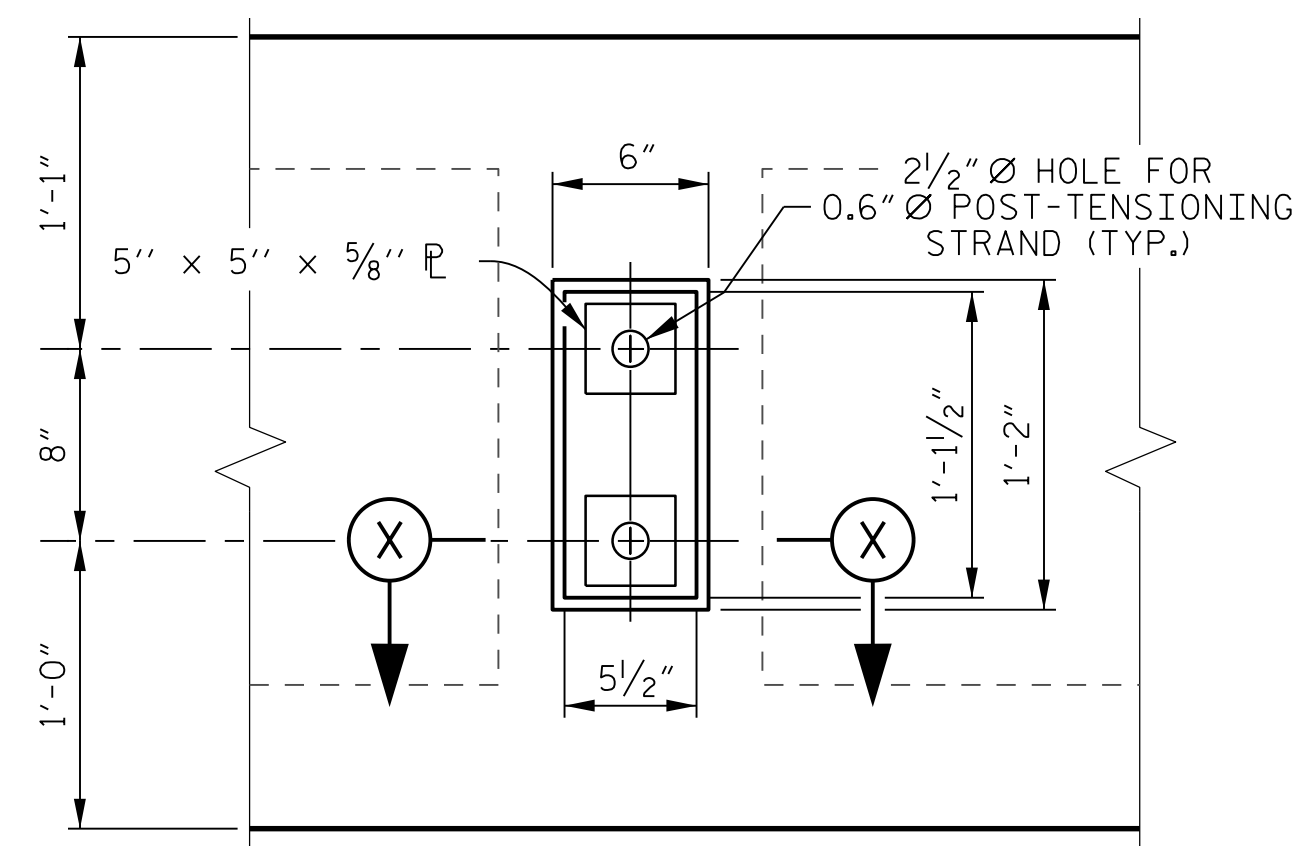
ASSEMBLED BY : K. E. LOFTON DATE : 12-17
CHECKED BY : P. R. GALLAGHER DATE : 12-17
DRAWN BY : DGE 10/11 REV. 9/14 MAA/TMG
CHECKED BY : TMG 11/11

REVISIONS						SHEET No. S1-7
No.	BY:	DATE:	No.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			17

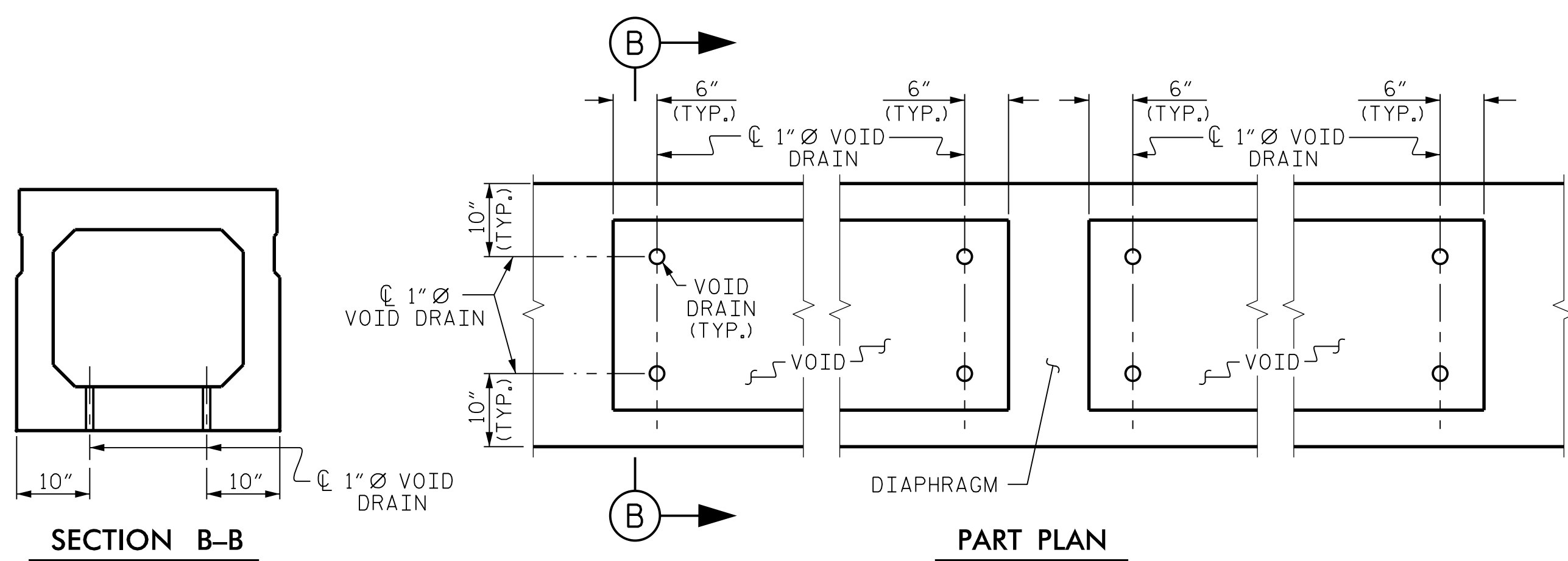


DOUBLE DIAPHRAGM DETAILS

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



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



VOID DRAIN DETAILS

(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID DRAIN)

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 2'-9"
SPAN A	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1 3/4" ↑
** DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD	1/2" ↓
FINAL CAMBER	1 1/4" ↑

** INCLUDES FUTURE WEARING SURFACE

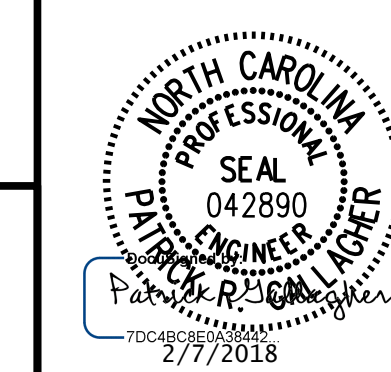
PROJECT NO. **B-5140**
WAKE COUNTY
 STATION: **13 + 25.00 -L-**

SHEET 4 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
3'-0" x 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT
90° SKEW

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED



PLANS PREPARED BY:
PARSONS
 5540 CenterView Drive, Suite 217
 Raleigh, NC 27606-3386
 NC LICENSE No. F-0246

DRAWN BY: K. E. LOFTON DATE: 12-17
 CHECKED BY: P. R. GALLAGHER DATE: 12-17
 DESIGN ENGINEER: D. N. PRETORIUS DATE: 12-17

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	17
1			3			TOTAL SHEETS
2			4			17

STD. No. 33PCBB5_90S

ASSEMBLED BY: K. E. LOFTON DATE: 12-17
 CHECKED BY: P. R. GALLAGHER DATE: 12-17
 DRAWN BY: DGE 10/11 REV. 8/14 MAA/TMG
 CHECKED BY: TMG 11/11

GUTTERLINE ASPHALT WEARING SURFACE THICKNESS AND RAIL HEIGHT AT MID-SPAN

	ASPHALT WEARING SURFACE THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
LEFT	2 1/4"	3'-8 1/4"
RIGHT	2 1/4"	3'-8 1/4"

NOTE: FOR ASPHALT WEARING SURFACE THICKNESS AND RAIL HEIGHT AT END BENTS, SEE TYPICAL SECTION, SHEET 1 OF 5.

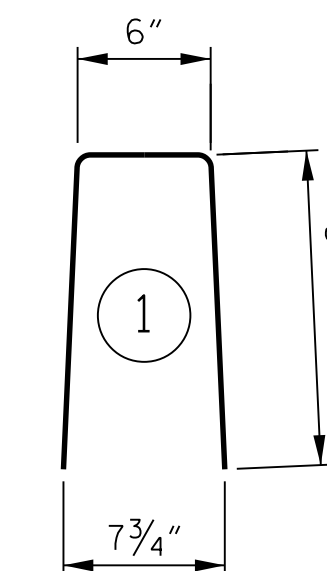
BOX BEAMS REQUIRED

SPAN A	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR BOX BEAM	2	80'-0"	160'-0"
INTERIOR BOX BEAM	9	80'-0"	720'-0"
TOTAL	11		880'-0"

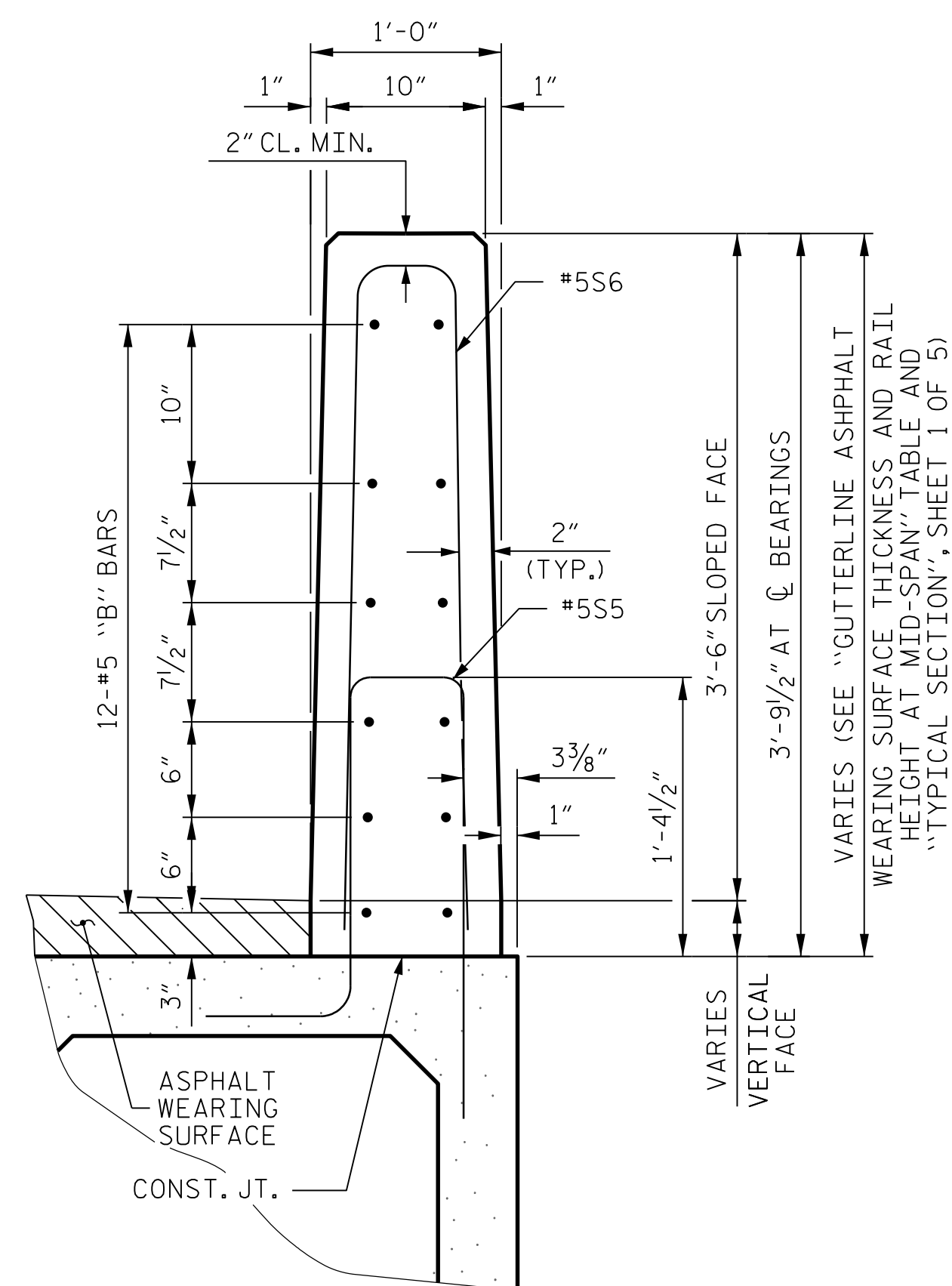
BILL OF MATERIAL FOR ONE VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER ONE EXTERIOR UNIT	TOTAL No.	SIZE	TYPE	LENGTH	WEIGHT
80'-0" UNIT						
* B8	36	36	#5	STR	26'-3"	986
* S6	111	111	#5	1	7'-2"	830
* EPOXY COATED REINFORCING STEEL (PER EXTERIOR UNIT)						1,816 LBS.
CLASS AA CONCRETE (PER EXTERIOR UNIT)						10.3 CU. YDS.
VERTICAL CONCRETE BARRIER RAIL (PER EXTERIOR UNIT)						80.0 LIN. FT.

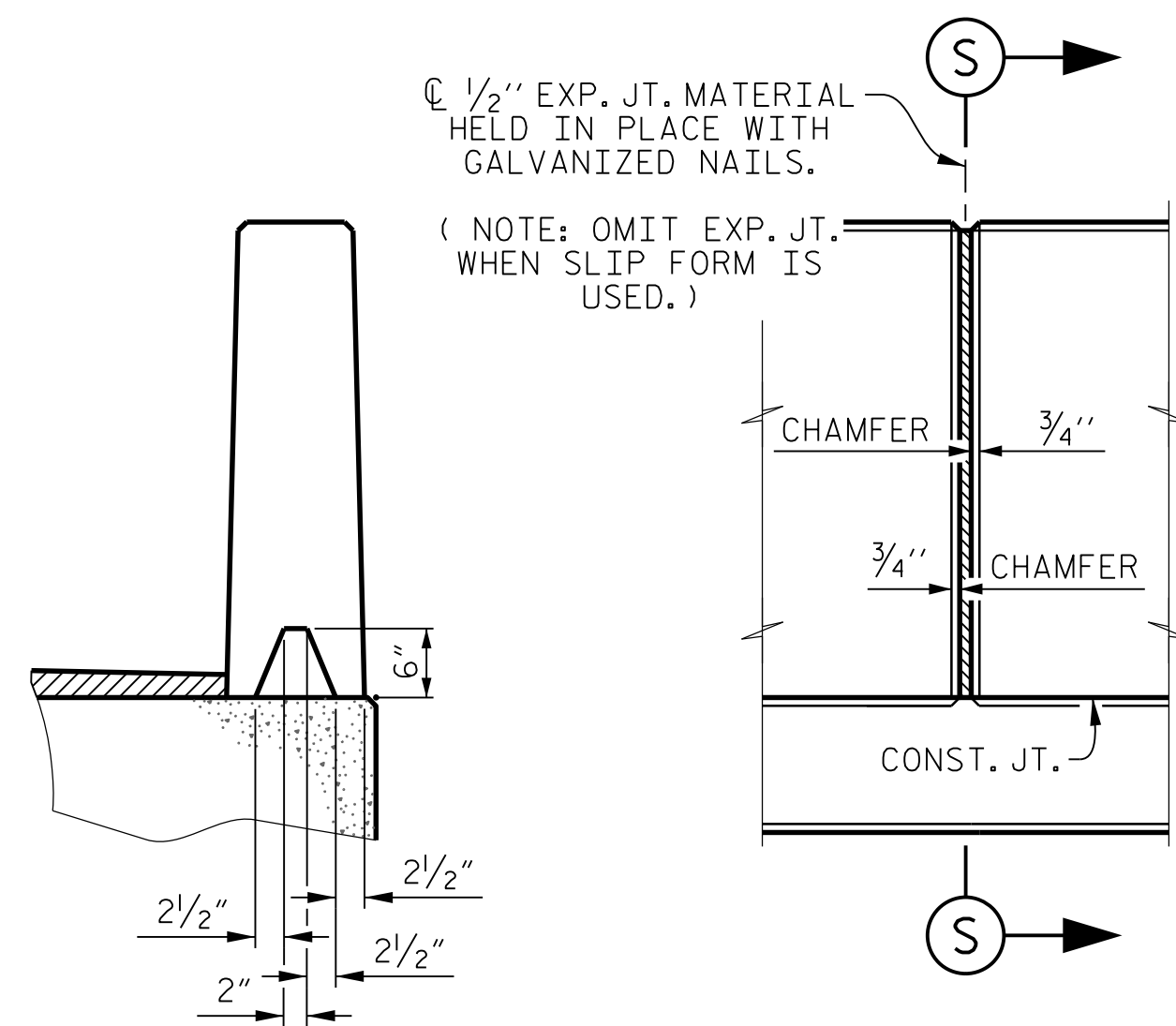
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



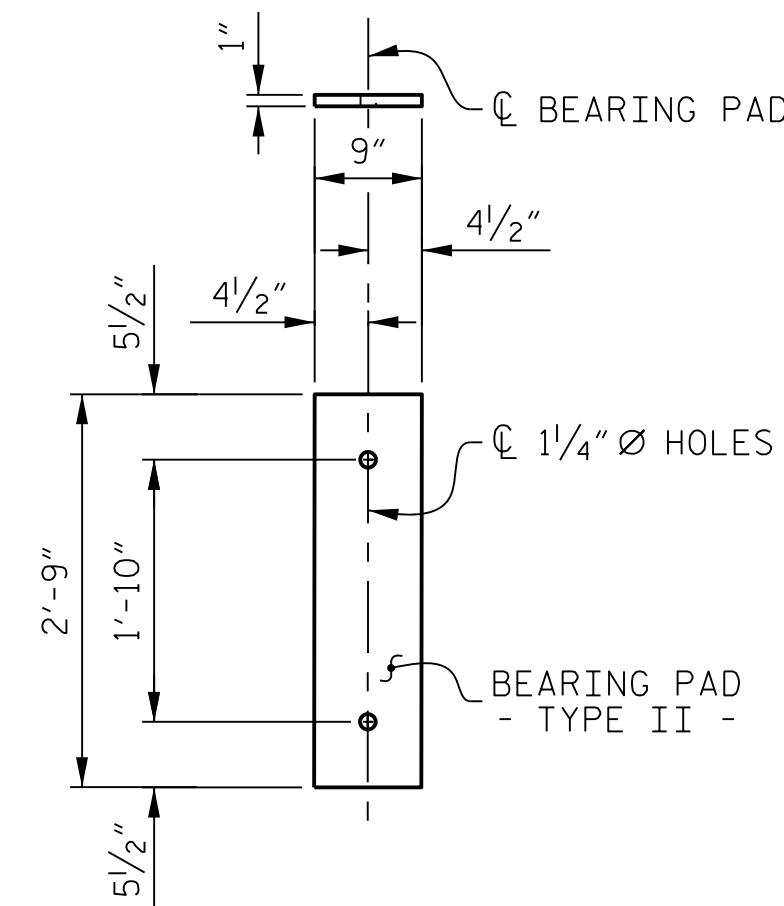
VERTICAL CONCRETE BARRIER RAIL SECTION



SECTION S-S ELEVATION AT EXPANSION JOINTS

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

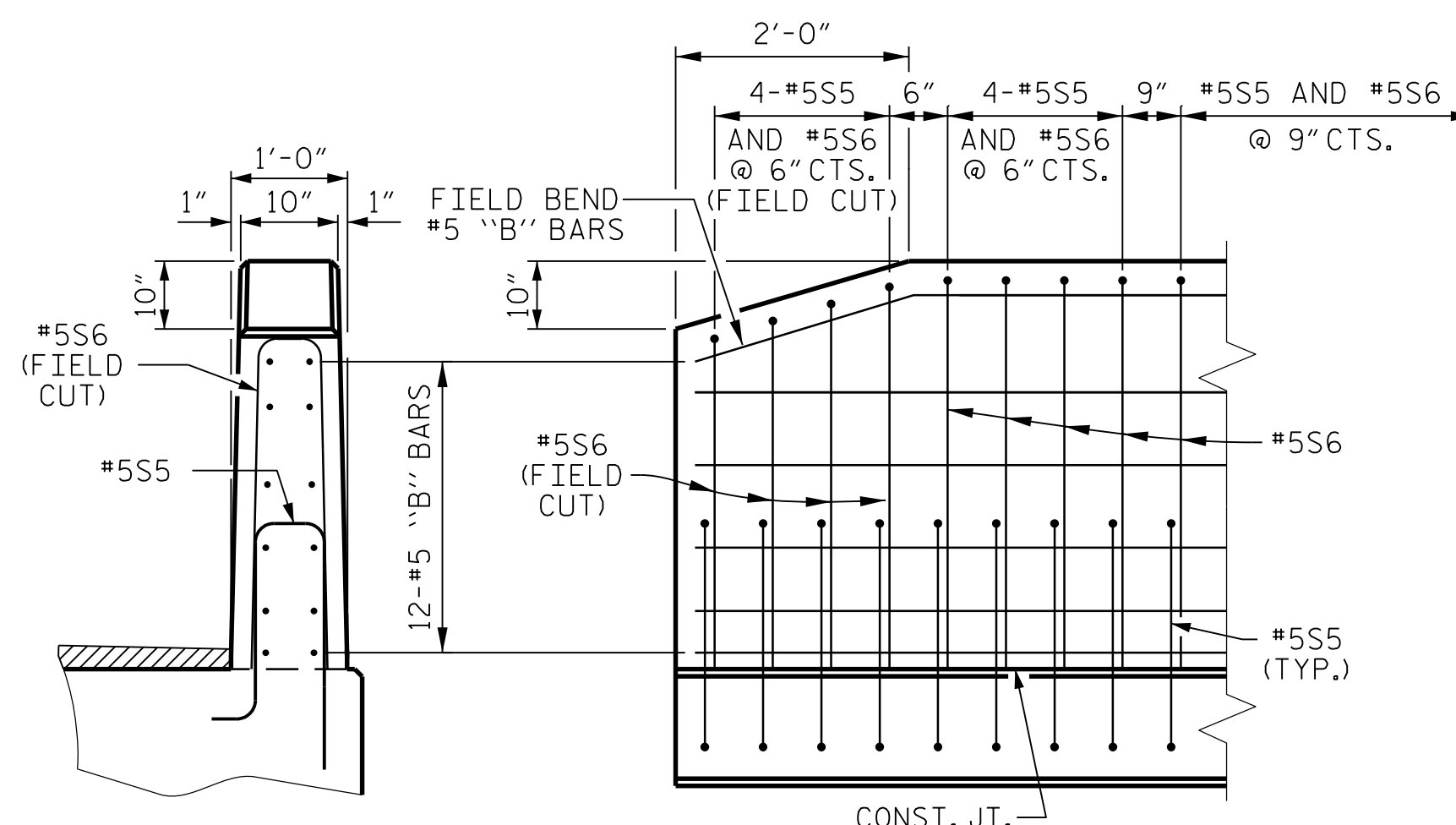
VERTICAL CONCRETE BARRIER RAIL DETAILS



FIXED END (TYPE II - 22 REQUIRED)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



END VIEW ELEVATION VIEW

END OF RAIL DETAILS

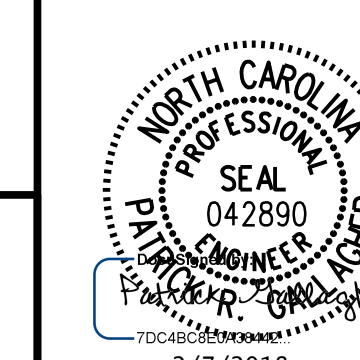
PROJECT NO. B-5140
 WAKE COUNTY
 STATION: 13 + 25.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 3'-0" x 2'-9"
 PRESTRESSED CONCRETE
 BOX BEAM UNIT
 90° SKEW

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED



PLANS PREPARED BY:
PARSONS
 5540 CenterView Drive, Suite 217
 Raleigh, NC 27606-3386
 NC LICENSE No. F-0246

DRAWN BY: K. E. LOFTON DATE: 12-17
 CHECKED BY: P. R. GALLAGHER DATE: 12-17
 DESIGN ENGINEER: D. N. PRETORIUS DATE: 12-17

ASSEMBLED BY: K. E. LOFTON DATE: 12-17
 CHECKED BY: P. R. GALLAGHER DATE: 12-17
 DRAWN BY: DGE 10/11 REV. 4/15 MAA/TMG
 CHECKED BY: TMG 11/11

REVISIONS				SHEET No.	
No.	BY:	DATE:	No.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					17

STD. No. 33PCBB8-90S

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.

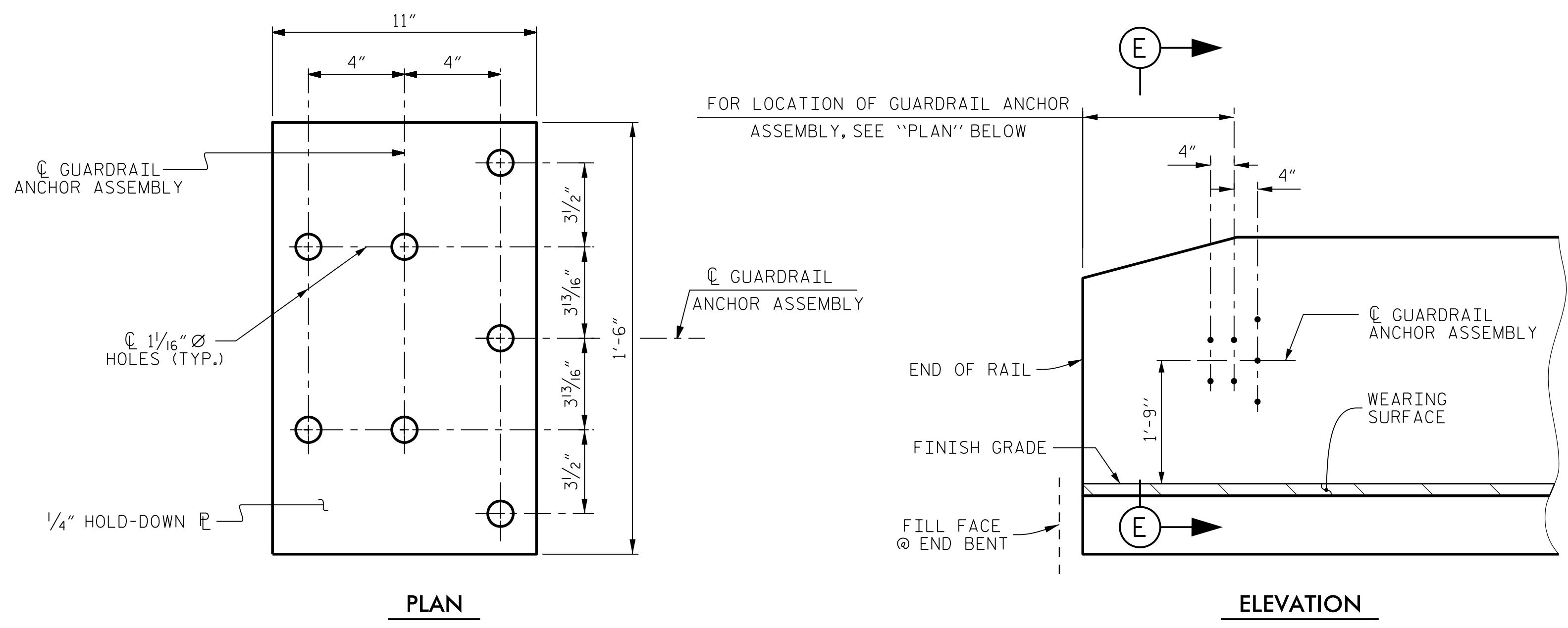
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

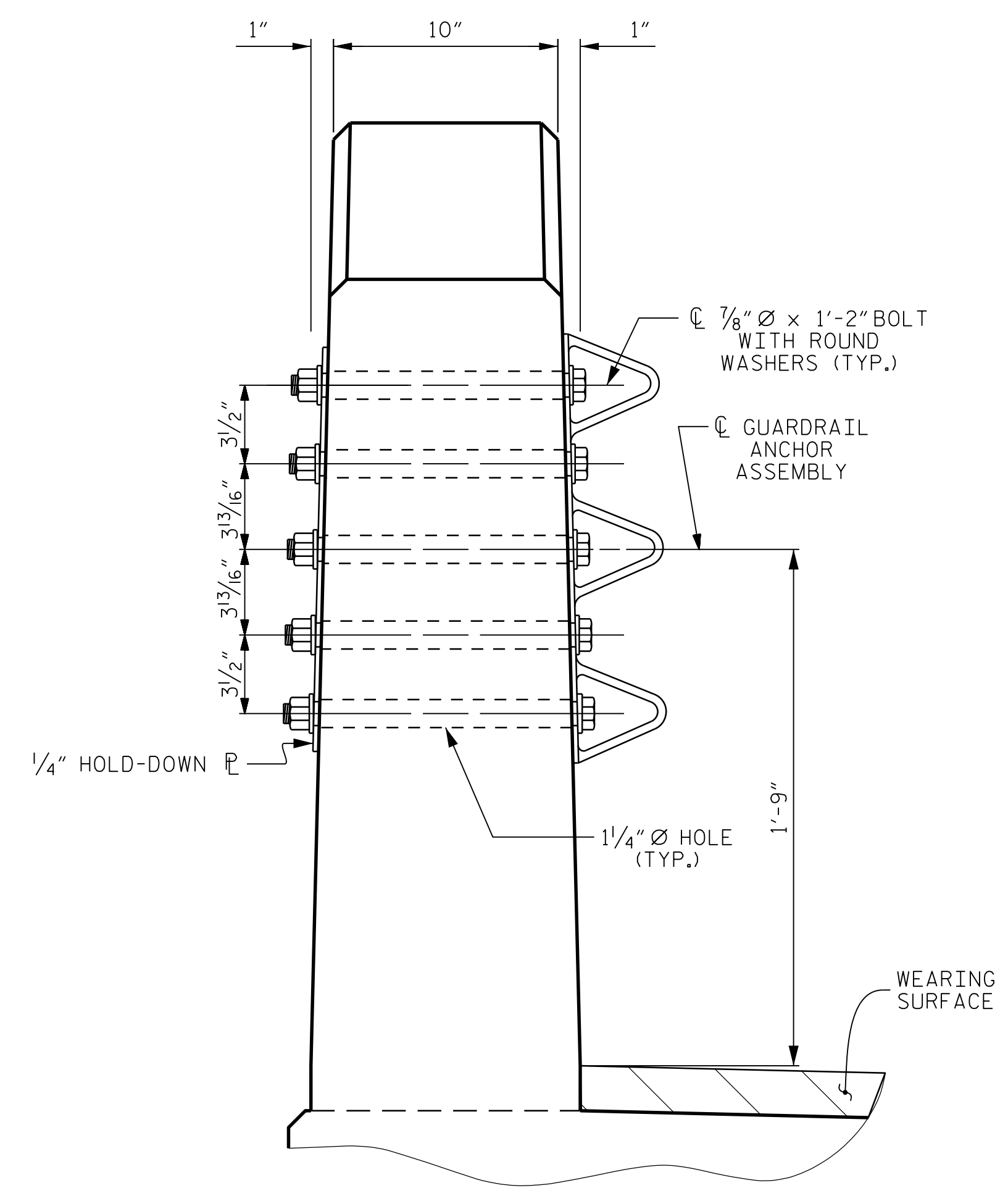
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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.

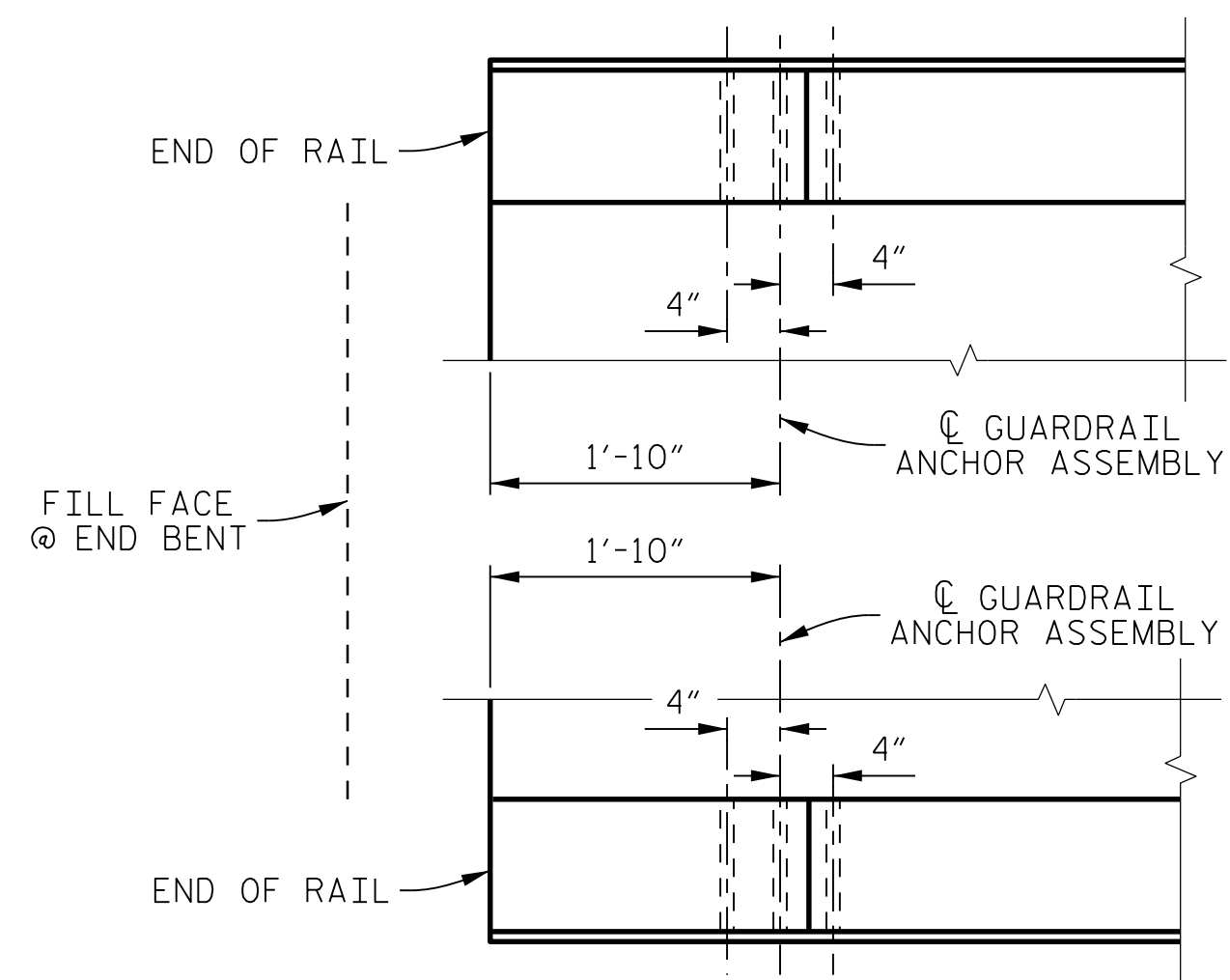


PLAN

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
* LOCATION OF GUARDRAIL ATTACHMENT

PROJECT NO. B-5140
WAKE COUNTY
 STATION: 13 + 25.00 -L-

REPLACES BRIDGE No. 195

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
**GUARDRAIL ANCHORAGE
 DETAILS FOR VERTICAL
 CONCRETE BARRIER RAIL**

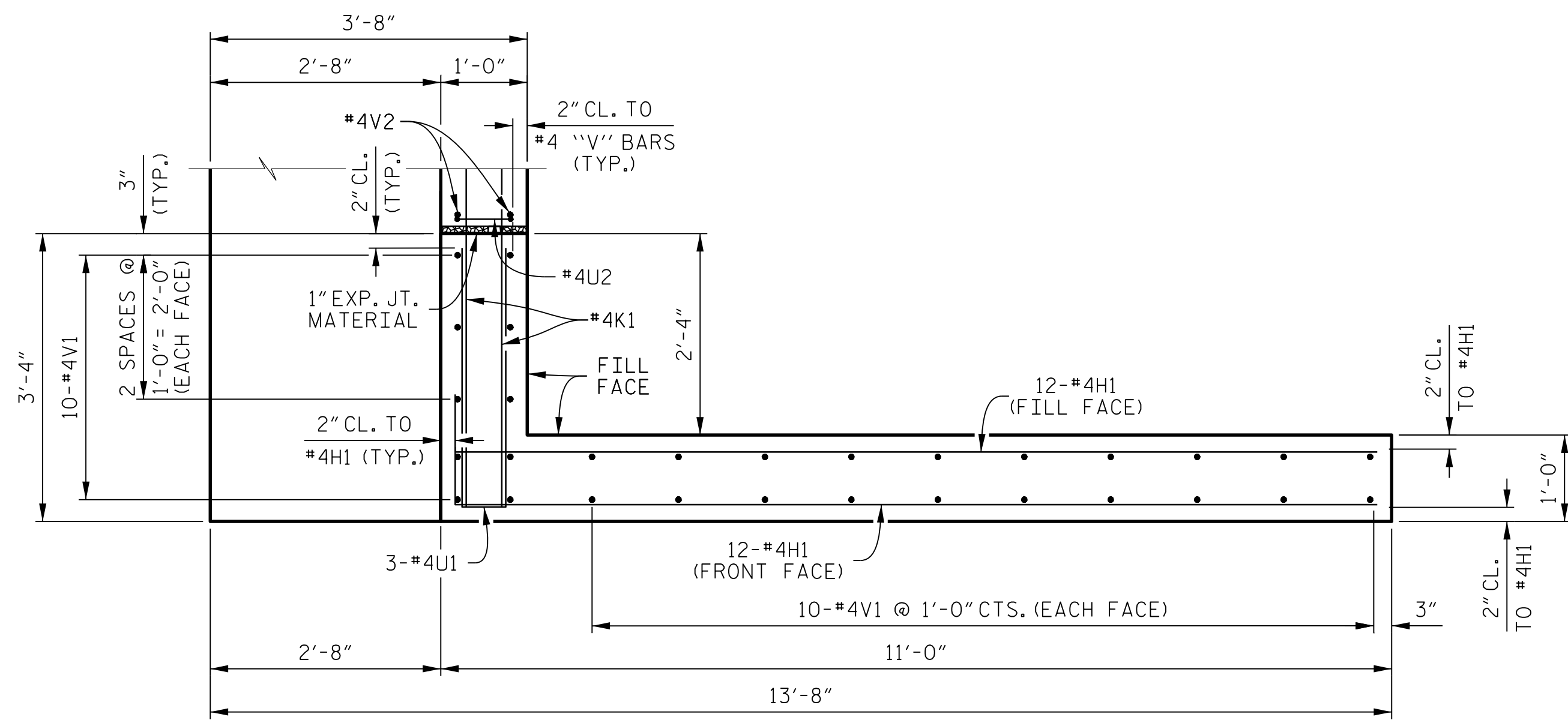
DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
PARSONS
 5540 CenterView Drive, Suite 217
 Raleigh, NC 27606-3386
 NC LICENSE No. F-0246
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

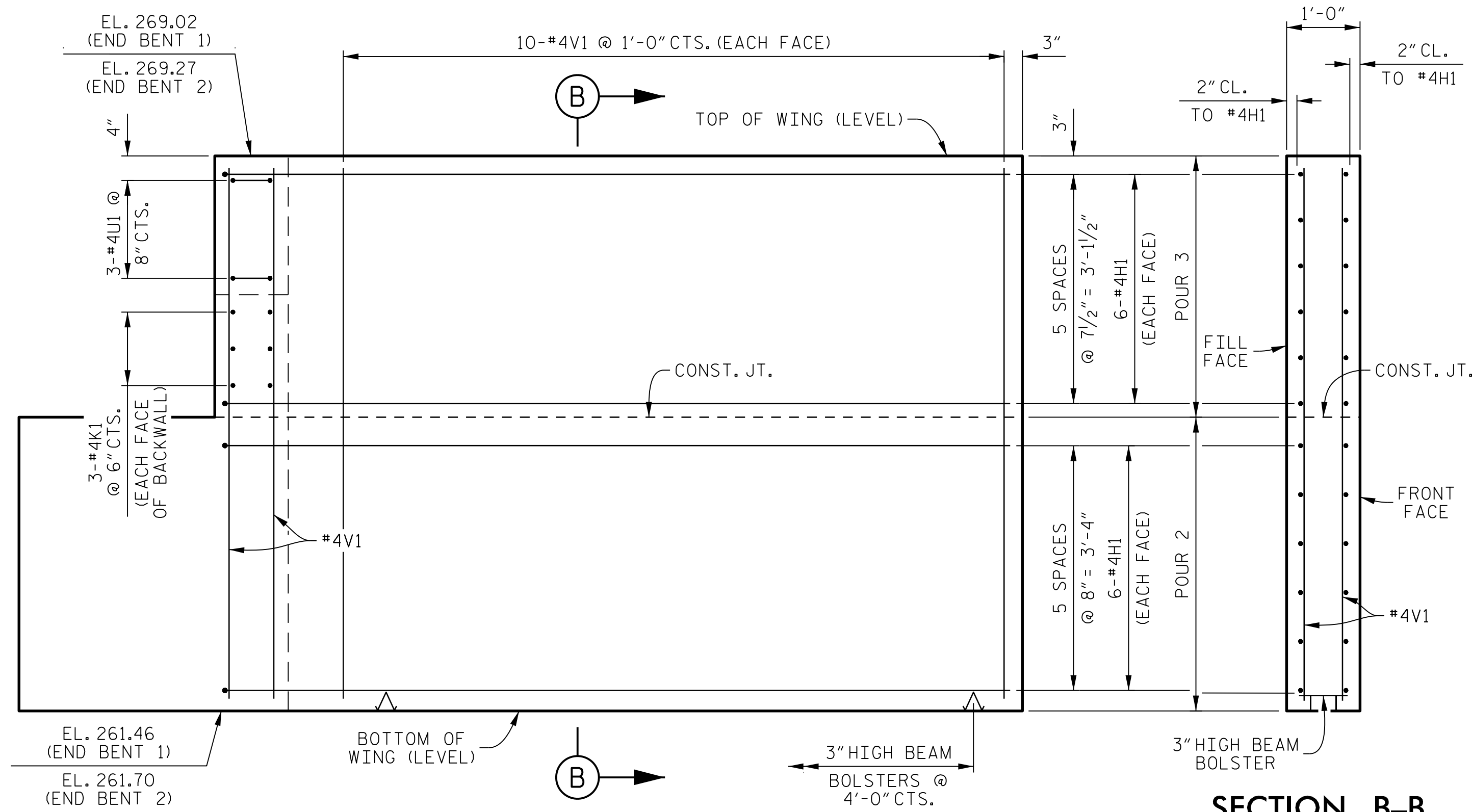
DRAWN BY : K. E. LOFTON DATE : 12-17
 CHECKED BY : P. R. GALLAGHER DATE : 12-17
 DESIGN ENGINEER : D. N. PRETORIUS DATE : 12-17

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	17
1			3			TOTAL SHEETS
2			4			17

FILE: J:\A-5140\Drawings\Detail\B-5140_Div_3_91095_smu.dgn
 DATE: 2/20/18 7:27:07 AM

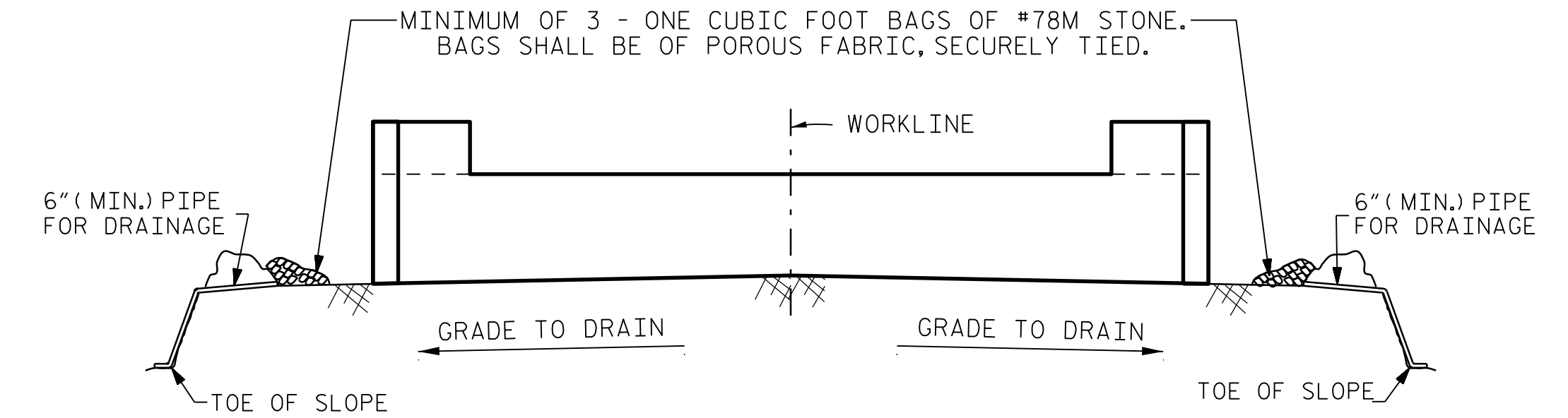


PLAN OF WING (W1)



ELEVATION OF WING (W1)

SECTION B-B



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.

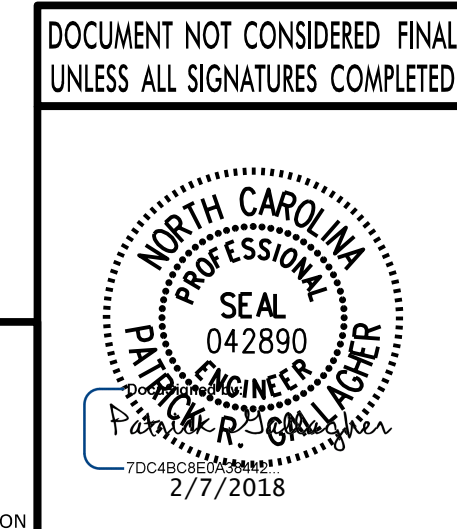
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

TEMPORARY DRAINAGE AT END BENT

PROJECT NO. B-5140
 WAKE COUNTY
 STATION: 13 + 25.00 -L-
 SHEET 3 OF 4

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



PLANS PREPARED BY:
PARSONS
 5540 CenterView Drive, Suite 217
 Raleigh, NC 27606-3386
 NC LICENSE No. F-0246
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY : K. E. LOFTON DATE : 12-17
 CHECKED BY : P. R. GALLAGHER DATE : 12-17
 DESIGN ENGINEER : D. N. PRETORIUS DATE : 12-17

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	TOTAL SHEETS
1			3			17
2			4			

FILE: J:\B-5140\Substructure\Detail\B-5140_Div_3_910195.dwg, 7/22/14 PM
 DATE: 2/20/18

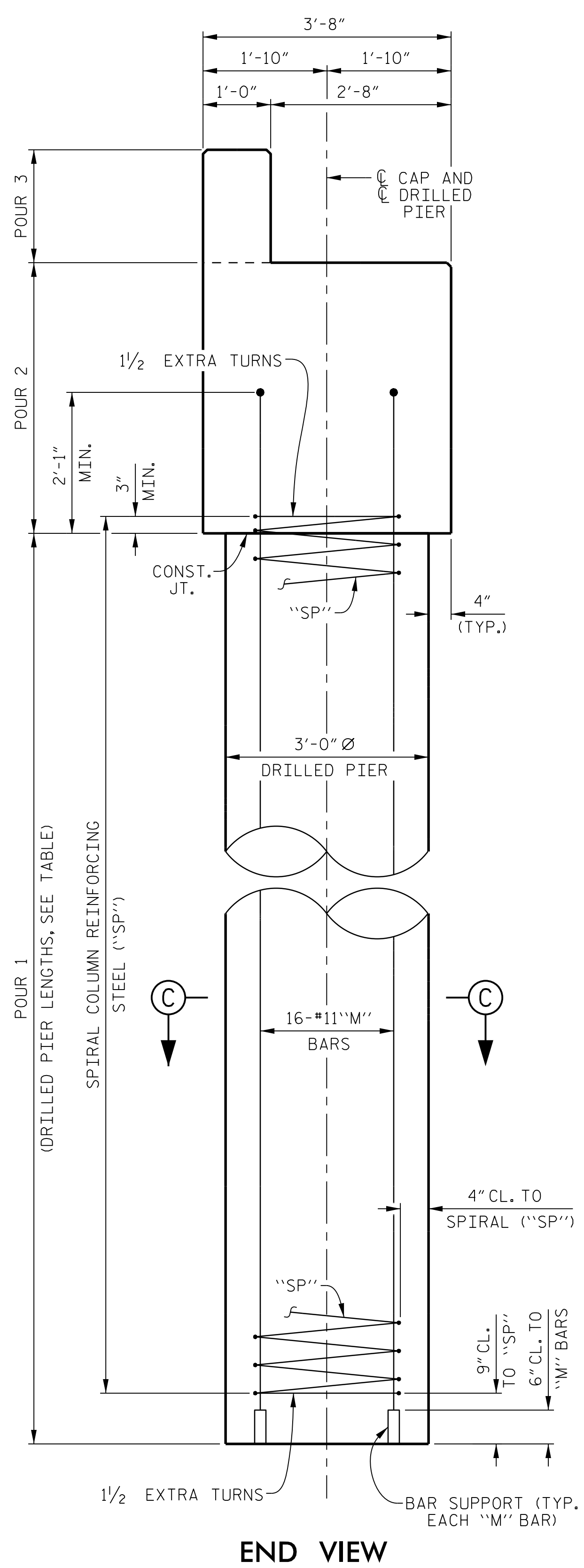
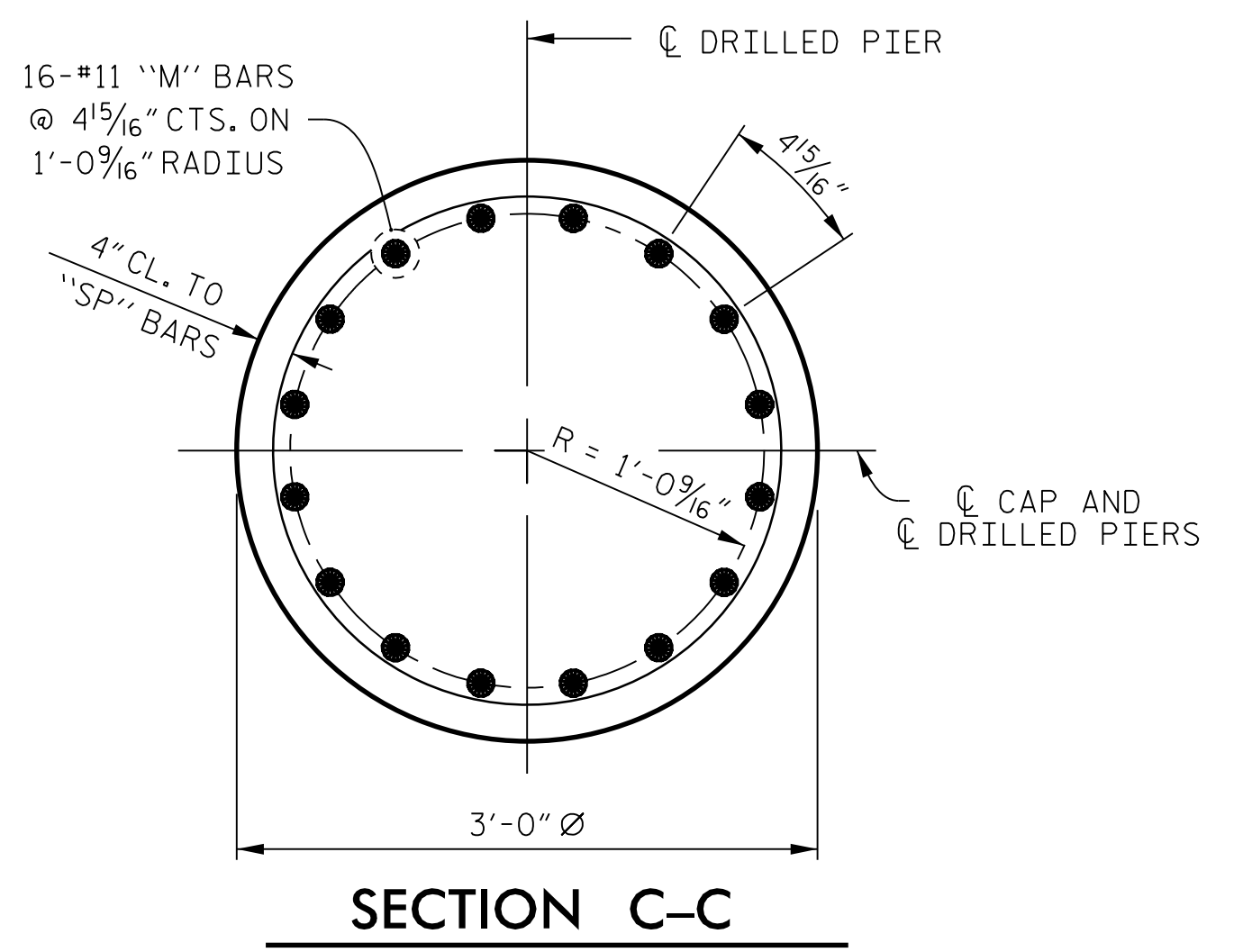


TABLE OF DRILLED PIER REINFORCING				DRILLED PIER LENGTH
LOCATION	DRILLED PIER	SPIRAL	"M" BAR	
END BENT 1	1-1	SP1	M1	13'-5 1/2"
	1-2	SP2	M2	14'-5 1/2"
	1-3	SP3	M3	15'-5 1/2"
END BENT 2	2-1	SP4	M4	11'-8 3/8"
	2-2	SP4	M4	11'-8 3/8"
	2-3	SP4	M4	11'-8 3/8"



END VIEW

BILL OF MATERIAL																													
BAR TYPES					END BENT 1			END BENT 2																					
BAR No.	SIZE	TYPE	LENGTH	WEIGHT	BAR No.	SIZE	TYPE	LENGTH	WEIGHT																				
B1	10	#10	3	41'-6"	1,786	B1	10	#10	3	41'-6"	1,786																		
B2	20	#4	STR	20'-7"	275	B2	20	#4	STR	20'-7"	275																		
D1	22	#8	STR	2'-3"	132	D1	22	#8	STR	2'-3"	132																		
H1	48	#4	6	11'-4"	363	H1	48	#4	6	11'-4"	363																		
K1	12	#4	STR	20'-7"	165	K1	12	#4	STR	20'-7"	165																		
M1	16	#11	1	19'-8"	1,672	M4	48	#11	1	17'-10"	4,548																		
M2	16	#11	1	20'-8"	1,757	U1	6	#4	4	6'-7"	26																		
M3	16	#11	1	21'-8"	1,842	U2	33	#4	4	3'-4"	73																		
U1	6	#4	4	6'-7"	26	S1	48	#4	5	4'-1"	131																		
U2	33	#4	4	3'-4"	73	S2	48	#4	2	11'-4"	363																		
S1	48	#4	5	4'-1"	131	V1	60	#4	STR	7'-3"	291																		
S2	48	#4	2	11'-4"	363	V2	66	#4	STR	5'-0"	220																		
V1	60	#4	STR	7'-3"	291	REINFORCING STEEL		8,373 LBS.																					
V2	66	#4	STR	5'-0"	220	REINFORCING STEEL		9,096 LBS.																					
REINFORCING STEEL					REINFORCING STEEL					819 LBS.																			
SP1	1	***	7	244'-10"	255	SPIRAL COLUMN REINFORCING STEEL					671 LBS.																		
SP2	1	***	7	262'-1"	273	CLASS A CONCRETE					POUR 3 BACKWALL AND UPPER WINGS					5.5 CU. YDS.													
SP3	1	***	7	279'-4"	291	CLASS A CONCRETE					POUR 2 CAP AND LOWER WINGS					24.1 CU. YDS.													
SPIRAL COLUMN REINFORCING STEEL					TOTAL					29.6 CU. YDS.					TOTAL					29.6 CU. YDS.									
DRILLED PIER CONCRETE					POUR 1					9.2 CU. YDS.					DRILLED PIER CONCRETE					POUR 1					9.2 CU. YDS.				
DRILLED PIER CONCRETE					POUR 1					11.4 CU. YDS.					3'-0" Ø DRILLED PIER IN SOIL					16.6 LIN. FT.									
3'-0" Ø DRILLED PIER IN SOIL					23.9 LIN. FT.					3'-0" Ø DRILLED PIER NOT IN SOIL					18.5 LIN. FT.														
3'-0" Ø DRILLED PIER NOT IN SOIL					19.5 LIN. FT.					*** THE SP4 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.																			
*** THE SP1, SP2 AND SP3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.																													

ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. B-5140
 WAKE COUNTY
 STATION: 13 + 25.00 -L-

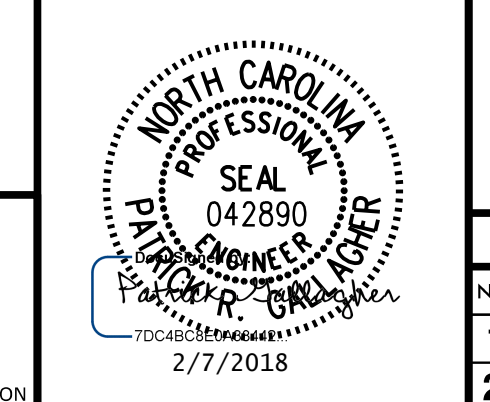
SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

END BENT DETAILS

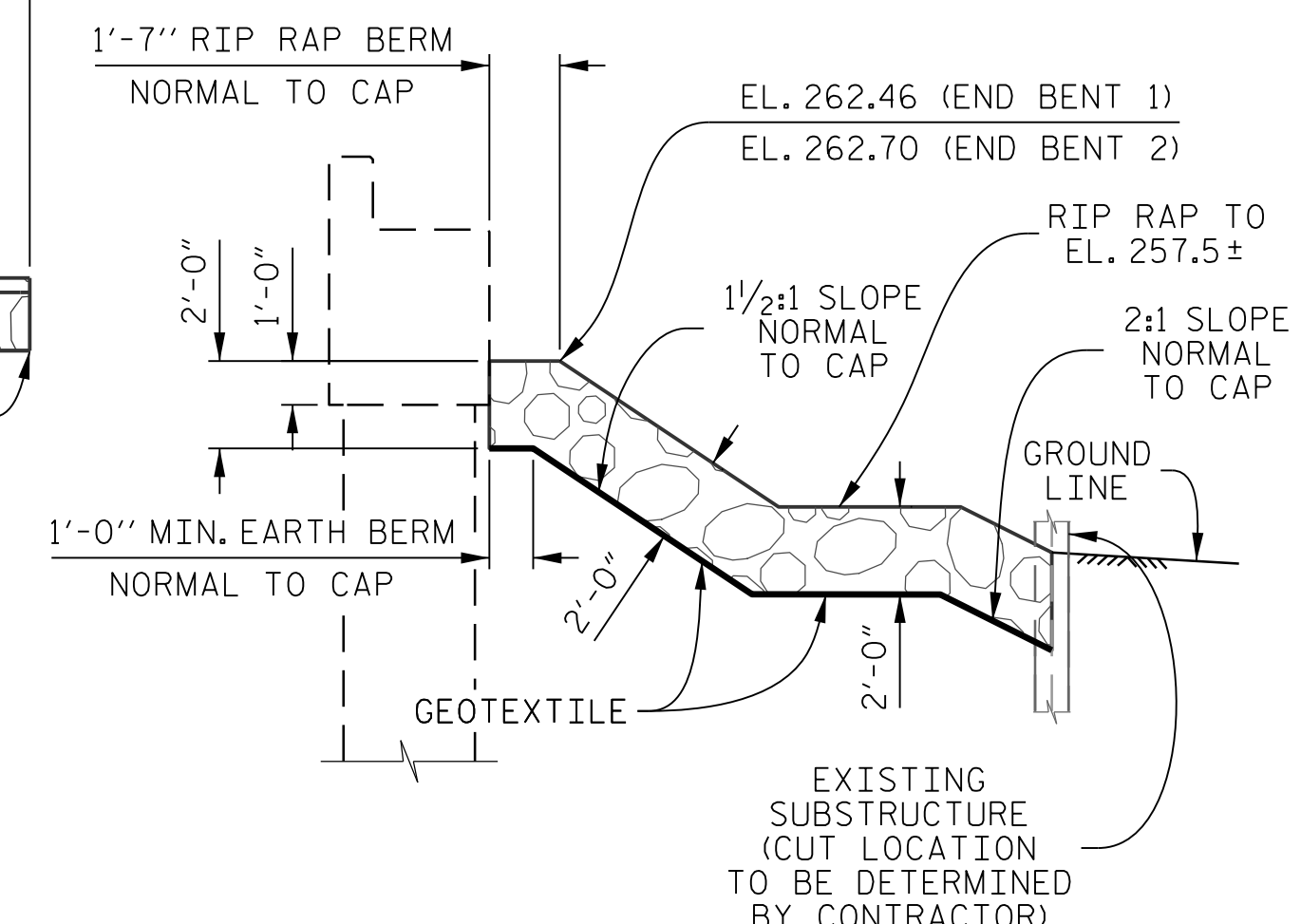
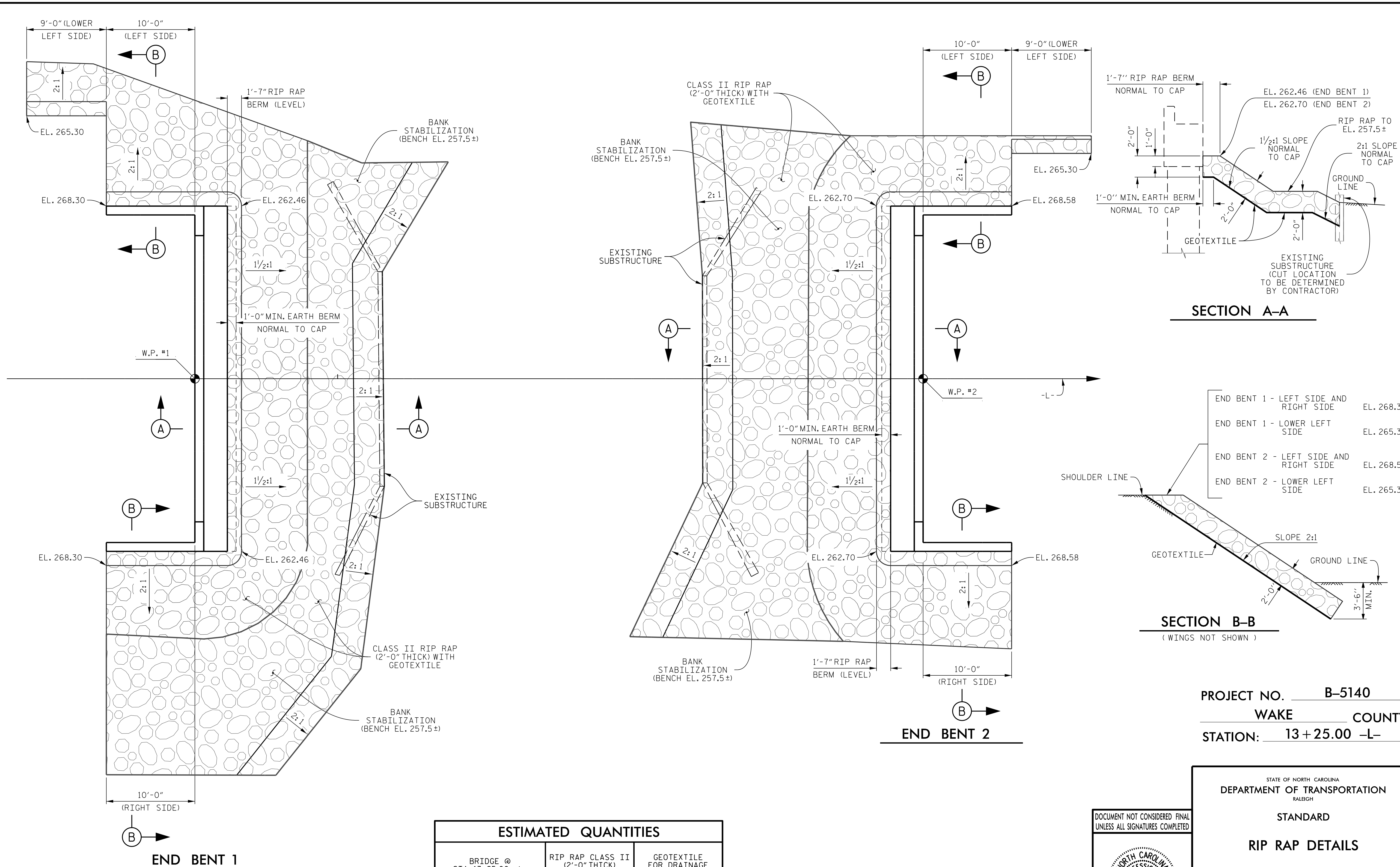
DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED



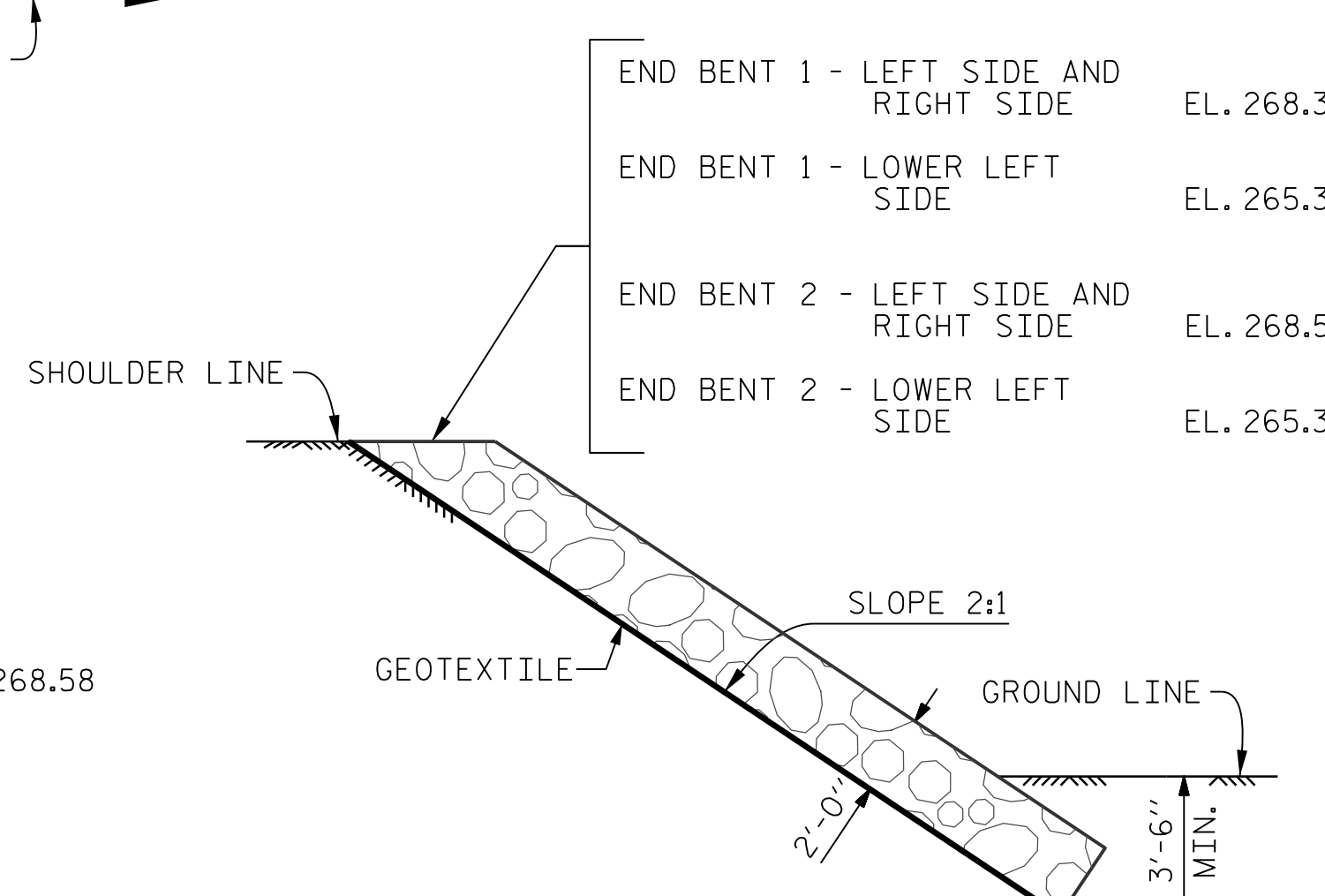
PLANS PREPARED BY:
PARSONS
 5540 CenterView Drive, Suite 217
 Raleigh, NC 27606-3386
 NC LICENSE No. F-0246

DRAWN BY :	K. E. LOFTON	DATE :	12-17
CHECKED BY :	P. R. GALLAGHER	DATE :	12-17
DESIGN ENGINEER :	D. N. PRETORIUS	DATE :	12-17

REVISIONS						SHEET No.	
No.	BY:	DATE:	No.	BY:	DATE:	TOTAL SHEETS	
1			3			17	
2			4				



SECTION A-A



SECTION B-B
(WINGS NOT SHOWN)

ESTIMATED QUANTITIES		
BRIDGE @ STA. 13+25.00 -L-	RIP RAP CLASS II (2'-0" THICK) (TONS)	GEOTEXTILE FOR DRAINAGE (SQUARE YARDS)
END BENT 1	177	197
END BENT 2	158	175

DRAWN BY : K. E. LOFTON DATE : 12-17
 CHECKED BY : P. R. GALLAGHER DATE : 12-17
 DESIGN ENGINEER : D. N. PRETORIUS DATE : 12-17

PLANS PREPARED BY :
PARSONS
 5540 CenterView Drive, Suite 217
 Raleigh, NC 27606-3386
 NC LICENSE No. F-0246
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5140
 WAKE COUNTY
 STATION: 13+25.00 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD RIP RAP DETAILS					
REVISIONS					
No.	BY:	DATE:	No.	BY:	DATE:
1			3		
2			4		

SHEET No.	S1-15
TOTAL SHEETS	17

