

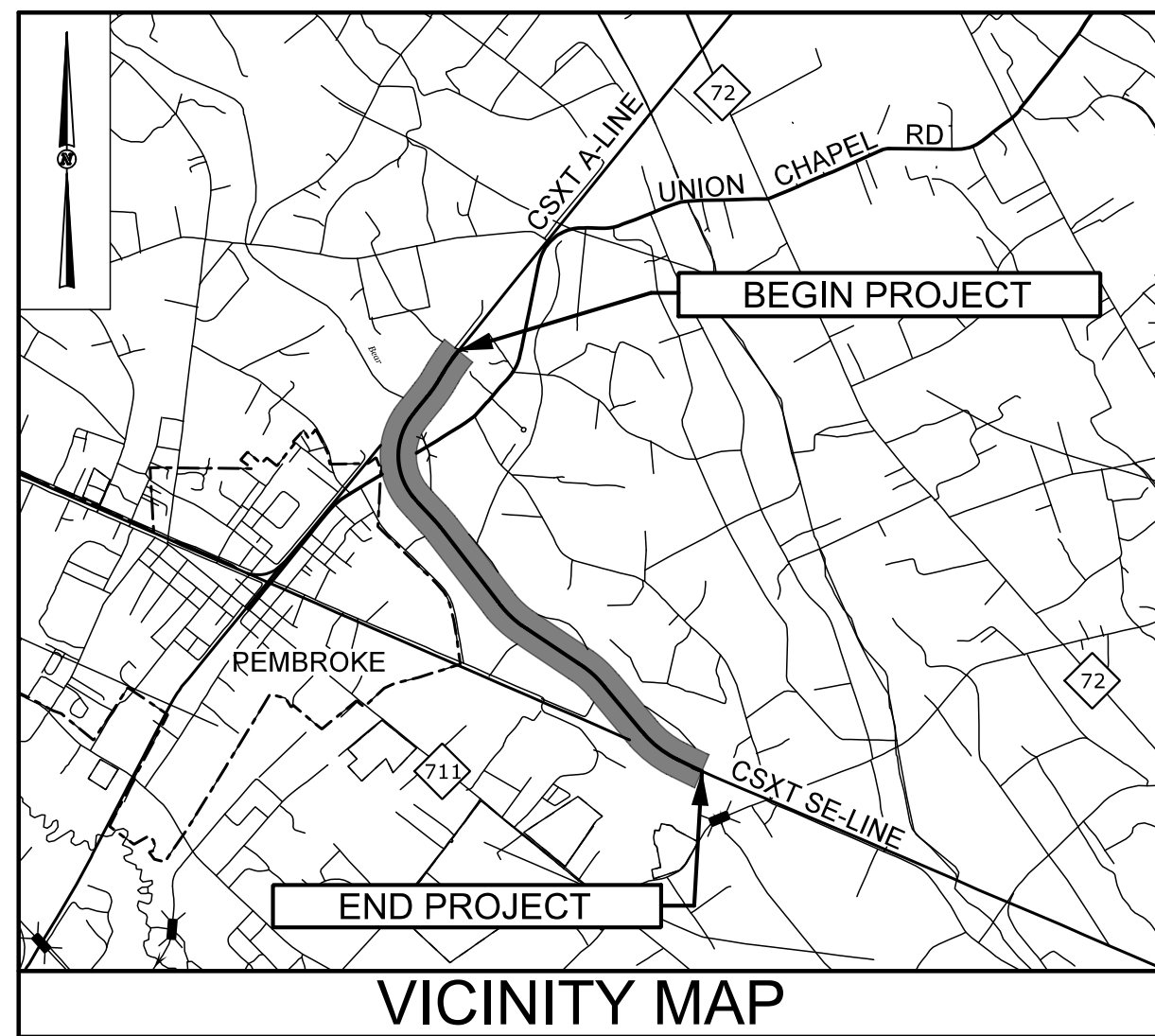
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**TIP PROJECT: P-4900A**

**CONTRACT: C203632**



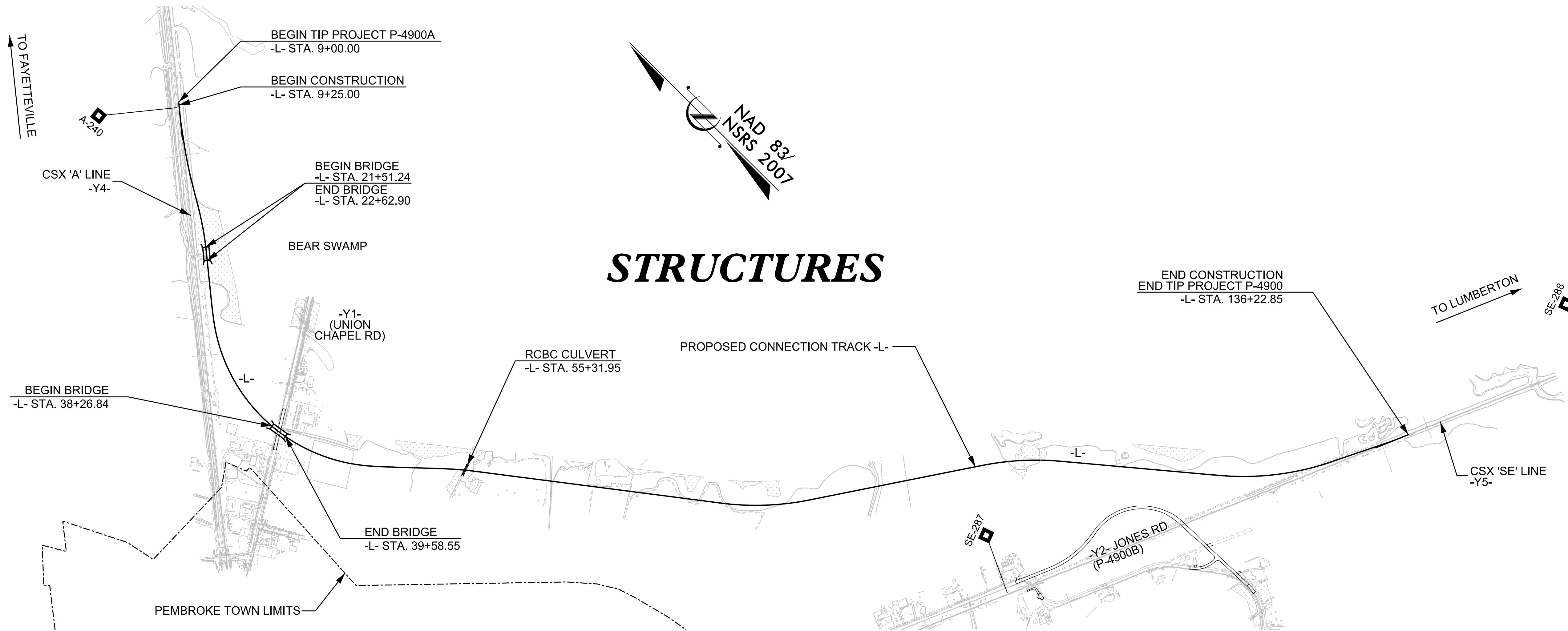
STATE OF NORTH CAROLINA  
NCDOT RAIL DIVISION

**ROBESON COUNTY**

**LOCATION: RAILROAD BYPASS OF PEMBROKE**

**TYPE OF WORK: RAILROAD ROADBED, GRADING, DRAINAGE, STRUCTURES**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-4900A		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
41099.1.S3		P.E. / UTIL P.E. / ROW	
41099.3.52		CONST./UTIL CONST.	



PROJECT LENGTH	
LENGTH OF RAIL TIP PROJECT	2.358 MILES
LENGTH OF STRUCTURES TIP PROJECT	0.047 MILES
TOTAL LENGTH OF RAIL TIP PROJECT	2.405 MILES
NCDOT CONTACT:	BRAD SMYTHE, P.E. NCDOT PROJECT MANAGER

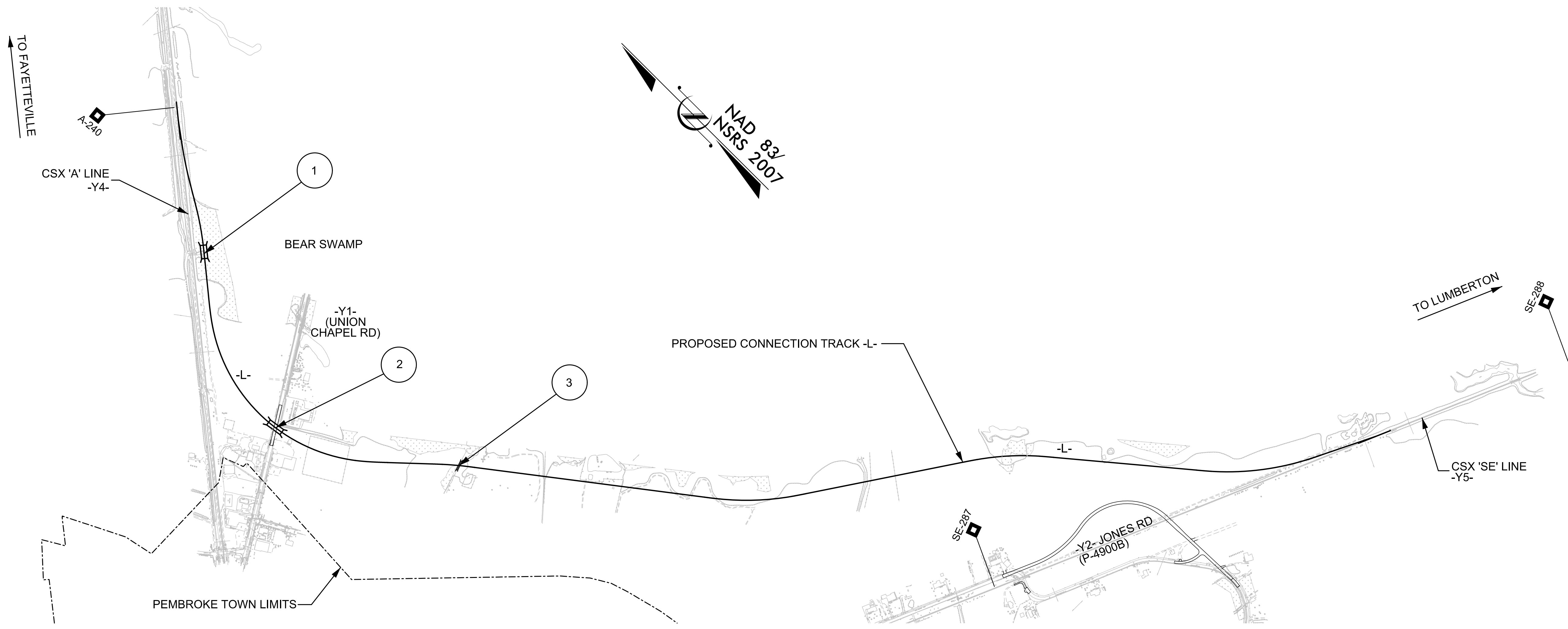
Prepared in the Office of:  
**HNTB**  
HNTB NORTH CAROLINA, P.C.  
343 E. Six Forks Road, Suite 200  
Raleigh, North Carolina 27609  
NC License No: C-1554

2012 STANDARD SPECIFICATIONS	COREY VERNIER, P.E. RAIL PROJECT ENGINEER
RIGHT OF WAY DATE:	DAVID HAWKINS, P.E. STRUCTURE PROJECT ENGINEER
LETTING DATE: AUGUST 18, 2015	BRAD SMYTHE, P.E. NCDOT PROJECT MANAGER

STRUCTURES ENGINEER

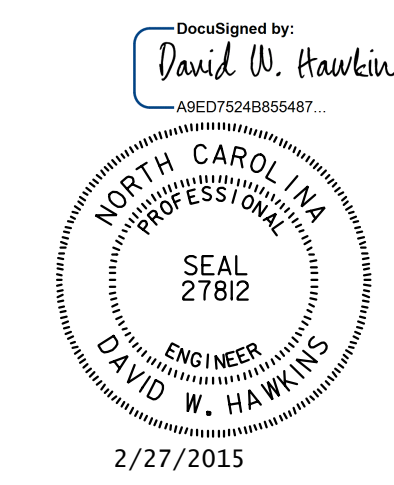
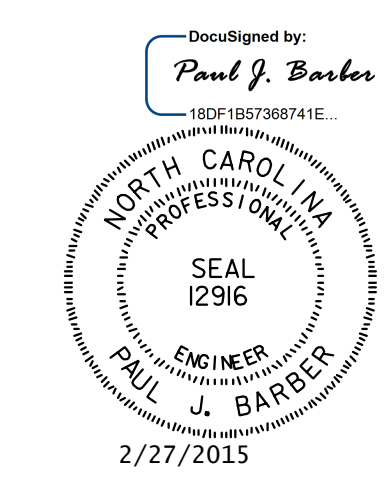
6/22/2015  
SIGNATURE: David W. Hawkins, P.E.

NC DEPARTMENT OF TRANSPORTATION  
**RAIL DIVISION**  
DESIGN AND CONSTRUCTION



INDEX			
STR. NO.	STATION	DESCRIPTION	SHEETS
1	POS 22+07.07 -L-	BRIDGE ON PROPOSED CONNECTING TRACK OVER BEAR SWAMP	S-1 THRU S-19
2	POC 38+93.36 -L-	BRIDGE ON PROPOSED CONNECTING TRACK OVER UNION CHAPEL ROAD	S-20 THRU S-54
3	POC 55+31.95 -L-	DOUBLE 7 FT. x 6 FT. RCBC	C-1 THRU C-6

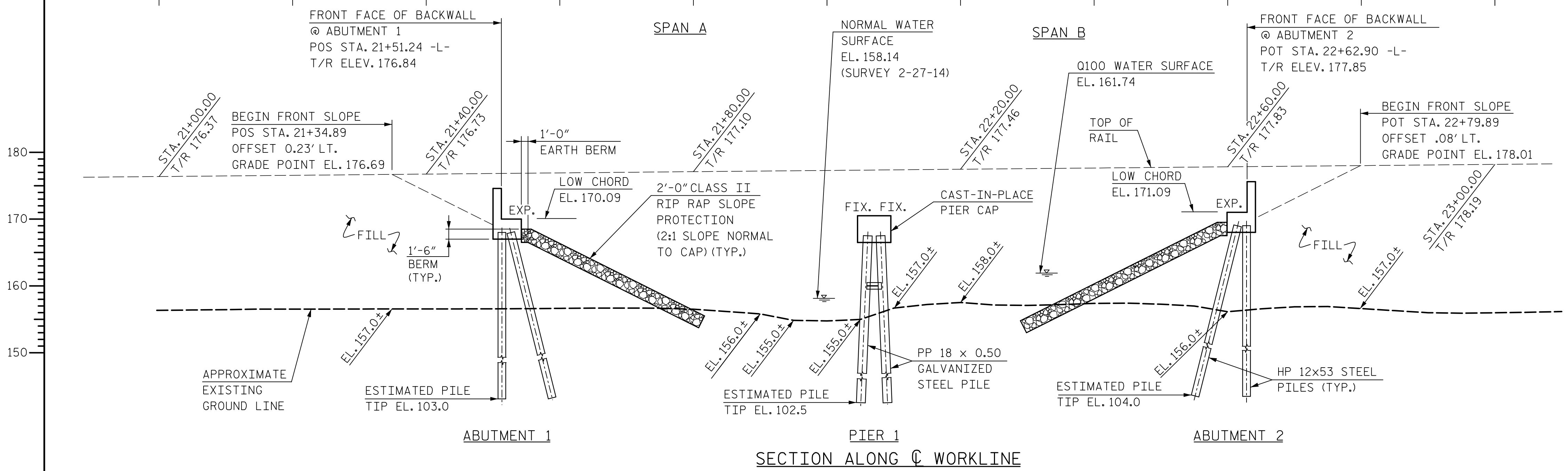
PROJECT NO. P-4900A  
ROBESON COUNTY



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

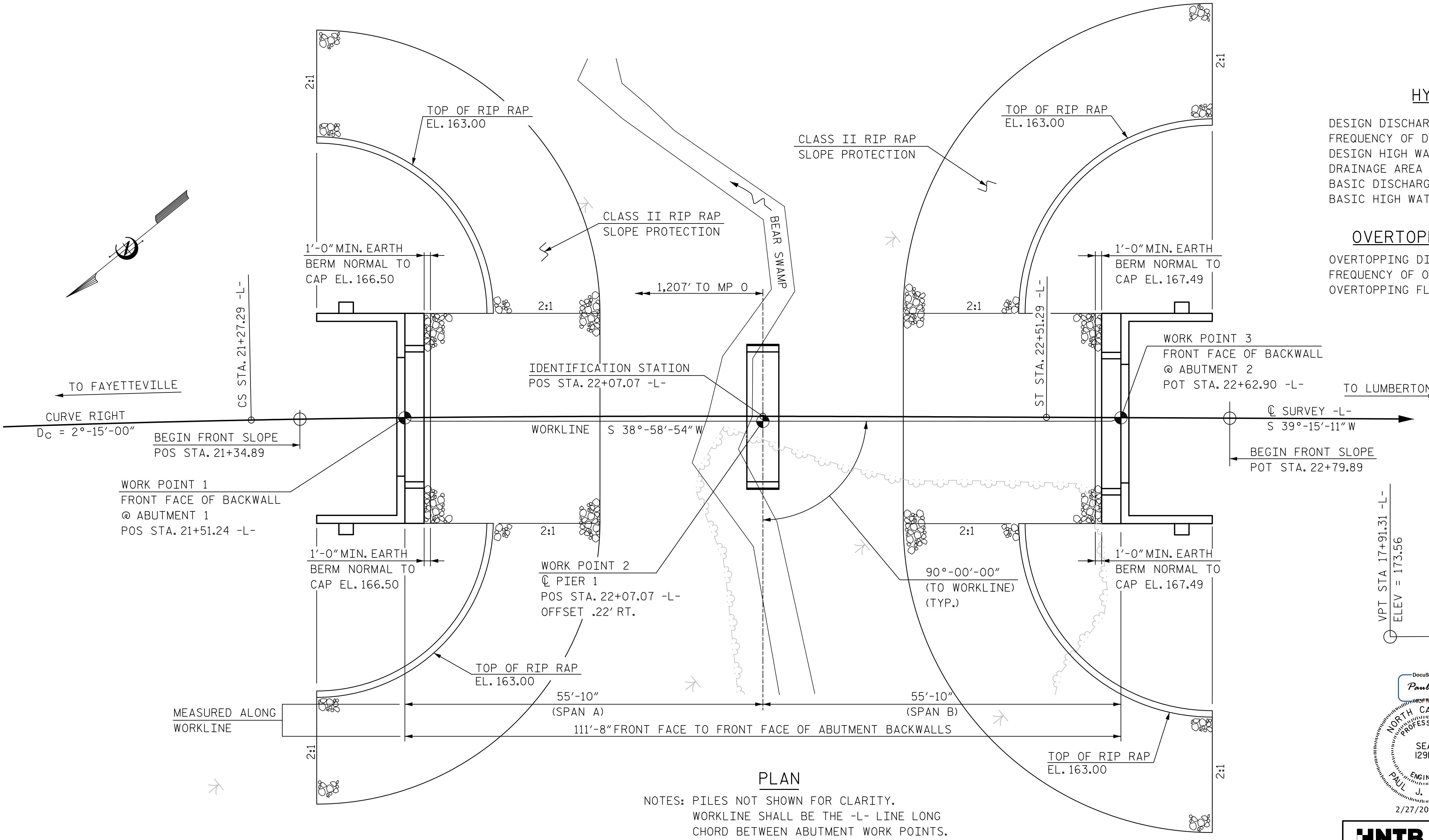
INDEX

<b>HNTB</b> HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO.
DRAWN BY: J. BAYNE	DATE: 9/14	NO. 1	BY: [ ] DATE: [ ]	TOTAL SHEETS
CHECKED BY: D. HAWKINS	DATE: 10/14	NO. 2	BY: [ ] DATE: [ ]	



**NOTES:**  
 FOR GENERAL NOTES, SEE SHEET 3 OF 3.

- INDEX OF DRAWINGS**
- GENERAL DRAWING: GENERAL PLAN AND ELEVATION (SHEET 1 OF 3)
  - GENERAL DRAWING: FOUNDATION LAYOUT AND FOUNDATION NOTES (SHEET 2 OF 3)
  - GENERAL DRAWING: LOCATION SKETCH, TOTAL BILL OF MATERIAL, AND GENERAL NOTES (SHEET 3 OF 3)
  - SUPERSTRUCTURE: TYPICAL SECTION
  - SUPERSTRUCTURE: PLAN OF SPANS A AND B
  - SUPERSTRUCTURE: 4'-0" x 4'-6" BOX BEAM PLAN AND ELEVATION
  - SUPERSTRUCTURE: 4'-0" x 4'-6" BOX BEAM DETAILS
  - SUPERSTRUCTURE: DIAPHRAGM DETAILS
  - SUPERSTRUCTURE: BOX BEAM SUMMARY AND HANDRAIL DETAILS
  - SUBSTRUCTURE: ABUTMENT 1 (SHEET 1 OF 3)
  - SUBSTRUCTURE: ABUTMENT 1 (SHEET 2 OF 3)
  - SUBSTRUCTURE: ABUTMENT 1 (SHEET 3 OF 3)
  - SUBSTRUCTURE: PIER 1 (SHEET 1 OF 2)
  - SUBSTRUCTURE: PIER 1 (SHEET 2 OF 2)
  - SUBSTRUCTURE: ABUTMENT 2 (SHEET 1 OF 3)
  - SUBSTRUCTURE: ABUTMENT 2 (SHEET 2 OF 3)
  - SUBSTRUCTURE: ABUTMENT 2 (SHEET 3 OF 3)
  - STANDARD: 18" STEEL PIPE PILE
  - STANDARD: RIP RAP DETAILS



**HYDRAULIC DATA**

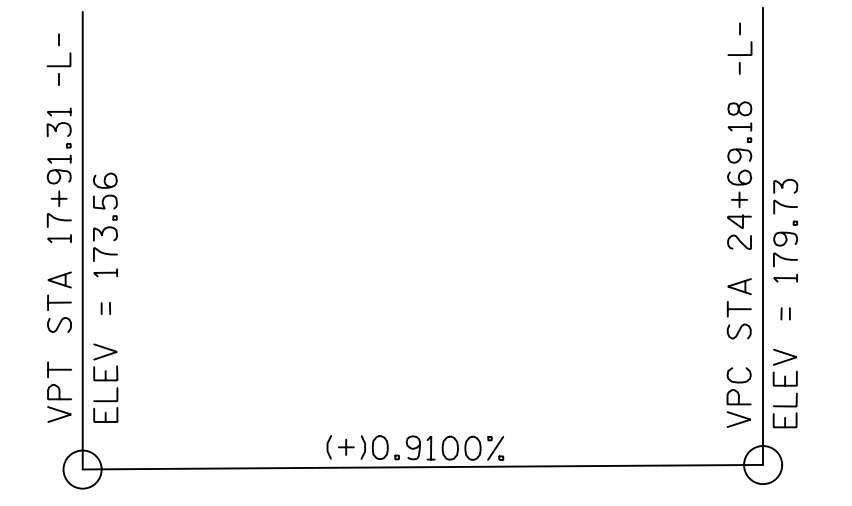
DESIGN DISCHARGE = 1020 CFS  
 FREQUENCY OF DESIGN FLOOD = 100 YR.  
 DESIGN HIGH WATER ELEV. = 161.74  
 DRAINAGE AREA = 10.5 SQ. MI.  
 BASIC DISCHARGE (Q100) = 1020 CFS  
 BASIC HIGH WATER ELEV. = 161.74

**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE = N/A  
 FREQUENCY OF OVERTOPPING FLOOD = >500+ YR.  
 OVERTOPPING FLOOD ELEV. = 171.74

**CURVE DATA -L- (102)**

PIs STA. = 21+68.63 -L-  
 $\Delta$  = 1°-23'-41.7" (RT)  
 Ls = 124.00'  
 LT = 82.67'  
 ST = 41.34'



I HEREBY CERTIFY THESE PLANS ARE AS-BUILT PLANS

PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POS 22+07.07 -L-  
 MILE POST: 0.23  
 SHEET 1 OF 3 BRIDGE NO. \_\_\_\_\_

**GRADE DATA -L-**

DocuSign by: Paul J. Barber  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 12916  
 PAUL J. BARBER  
 2/27/2015

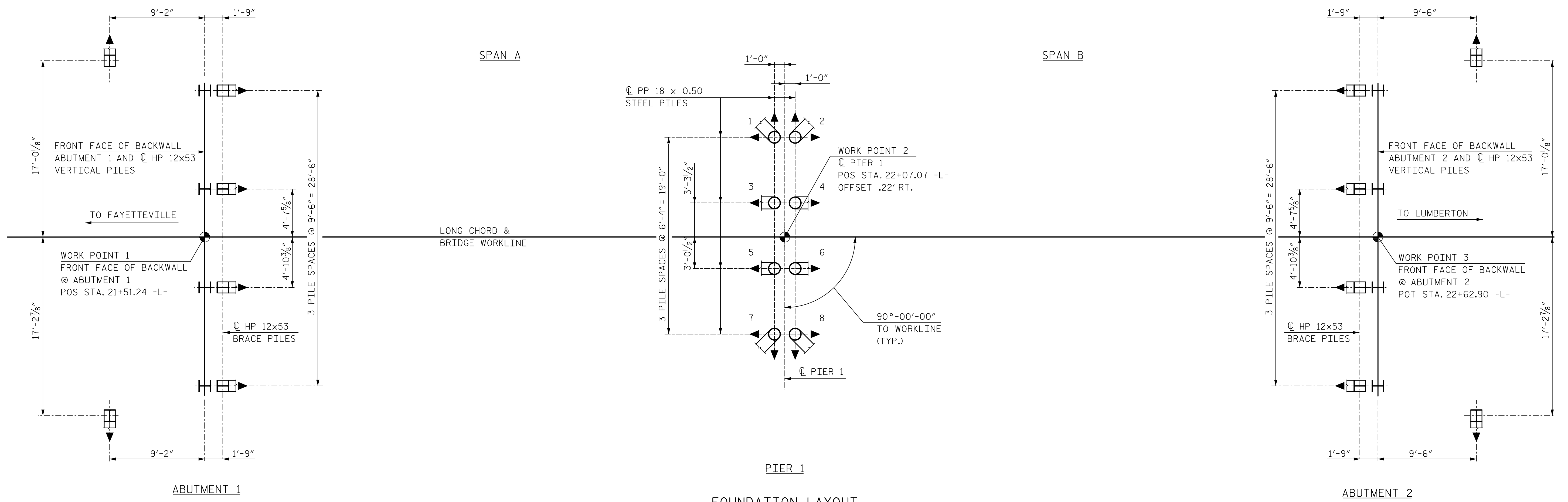
DocuSign by: David W. Hawkins  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 27812  
 DAVID W. HAWKINS  
 2/27/2015

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 License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY M. WRIGHT DATE 7/14  
 CHECKED BY D. HAWKINS DATE 10/14 DWG. NO. 1

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

SHEET NO. **S-1**  
 TOTAL SHEETS **54**



**FOUNDATION NOTES**

FOR PILES, SEE SPECIAL PROVISIONS.

THE ALLOWABLE BEARING CAPACITY FOR PILES AT ABUTMENT NO.1 AND ABUTMENT NO. 2 IS 75 TONS PER PILE.

DRIVE PILES AT ABUTMENT NO.1 AND ABUTMENT NO.2 TO A REQUIRED BEARING CAPACITY OF 150 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.

THE ALLOWABLE BEARING CAPACITY FOR PILES AT PIER NO.1 IS 115 TONS PER PILE.

DRIVE PILES AT PIER NO.1 TO A REQUIRED BEARING CAPACITY OF 240 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO PLUS ANY ADDITIONAL CAPACITY TO ACCOUNT FOR DOWDRAG OR NEGATIVE SKIN FRICTION AND SCOUR.

INSTALL PILES AT PIER NO.1 TO A TIP ELEVATION NO HIGHER THAN 112.0 FT.

PIPE PILE PLATES ARE REQUIRED FOR PIPE PILES AT PIER NO.1. USE PIPE PILE PLATES WITH A DIAMETER EQUAL TO THE PIPE PILE DIAMETER.

STEEL PILE POINTS ARE REQUIRED FOR STEEL PILES AT ABUTMENT NO.1 AND ABUTMENT NO. 2.

TESTING THE FIRST PRODUCTION PILE AT ABUTMENT NO.1 AND ABUTMENT NO.2 WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED. FOR PDA TESTING, SEE SPECIAL PROVISIONS.

TESTING THE FIRST PRODUCTION PILE AT PIER NO.1 WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED. FOR PDA TESTING, SEE SPECIAL PROVISIONS.

THE SCOUR CRITICAL ELEVATION FOR PIER NO.1 IS ELEVATION 141 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DO NOT DRIVE PILES AT ABUTMENT NO.1 UNTIL AFTER OBSERVING A 3 MONTH WAITING PERIOD BEGINNING WHEN SURCHARGE HAS BEEN PLACED AS SHOWN IN RAIL PLANS FOR A MINIMUM DISTANCE OF 300 FT FROM ABUTMENT NO.1. SEE RAIL PLANS AND SURCHARGE SPECIAL PROVISIONS FOR SURCHARGE DETAILS.

DO NOT DRIVE PILES AT ABUTMENT NO.2 UNTIL AFTER OBSERVING A 3 MONTH WAITING PERIOD BEGINNING WHEN SURCHARGE HAS BEEN PLACED AS SHOWN IN RAIL PLANS FOR A MINIMUM DISTANCE OF 300 FT FROM ABUTMENT NO.2. SEE RAIL PLANS AND SURCHARGE SPECIAL PROVISIONS FOR SURCHARGE DETAILS.

**NOTES:**

ABUTMENTS AND PIERS ARE PARALLEL.

ALL DIMENSIONS ARE PARALLEL OR NORMAL TO  $\odot$  PIER 1 AND FRONT FACES OF ABUTMENT BACKWALLS.

INDICATES HP 12x53 PILE BATTER IN DIRECTION SHOWN.

BRACE PILES @ ABUTMENTS ARE TO BE BATTERED @ 3:12.

INDICATES PP 18x0.50 PILE BATTER IN DIRECTION SHOWN.

BRACE PILES 1, 2, 7 & 8 AT PIER ARE TO BE BATTERED @ 1/2:12 LONGITUDINALLY AND 1/2:12 TRANSVERSELY.

BRACE PILES 3, 4, 5 & 6 AT PIER ARE TO BE BATTERED @ 1/2:12 LONGITUDINALLY.

ALL PILE DIMENSIONS ARE TO CENTERS OF PILES AT BOTTOM OF ABUTMENTS OR BOTTOM OF PIER 1.

FOR FOUNDATION ELEVATIONS AND DETAILS, SEE PIER AND ABUTMENT DETAILS.

PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POS 22+07.07 -L-  
 MILE POST: 0.23

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
**FOUNDATION LAYOUT**

DocuSigned by:  
*Paul J. Barber*  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 12916  
 PAUL J. BARBER  
 2/27/2015

DocuSigned by:  
*David W. Hawkins*  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 27812  
 DAVID W. HAWKINS  
 2/27/2015

<b>HNTB</b> HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO.
DRAWN BY: J. BAYNE	DATE: 8/14	NO. 3	BY:	S-2
CHECKED BY: D. RAGAN	DATE: 1/15	NO. 4	DATE:	TOTAL SHEETS
DWG. NO. 2				54

**GENERAL NOTES**

ASSUMED LIVE LOAD = AREMA E80 W/FULL DIESEL IMPACT OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT EDITION OF AREMA'S MANUAL FOR RAILWAY ENGINEERING, "VOL. 2 STRUCTURES" AND CSX TRANSPORTATION'S "UNDERGRADE BRIDGE CRITERIA INCLUDING BALLAST DECK" AND THE STRUCTURE SPECIAL PROVISIONS.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH SEISMIC PERFORMANCE CATEGORY A REQUIREMENTS OF THE AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES", AND CHAPTER NINE "SEISMIC DESIGN FOR RAILWAY STRUCTURES" OF THE CURRENT EDITION OF AREMA'S MANUAL FOR RAILWAY ENGINEERING, "VOL. 2 STRUCTURES".

WELDING SHALL BE IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY (AWS) BRIDGE WELDING CODE D1.5 AS AMENDED AND COMPLEMENTED BY THE AREMA MANUAL.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

REINFORCING STEEL SHALL BE DEFORMED BILLET STEEL CONFORMING TO ASTM DESIGNATION A615, GRADE 60. ALL DIMENSIONS RELATING TO BAR SPACING ARE TO BAR CENTERS UNLESS NOTED. FABRICATION TO BE IN ACCORDANCE WITH THE "MANUAL OF STANDARD PRACTICE", A.C.I. 315-80.

WATERPROOFING: ALL CONSTRUCTION JOINTS AND ANY VISIBLE SHRINKAGE CRACKS WHICH WILL BE COVERED BY FILL SHALL BE WATERPROOFED WITH A COLD LIQUID APPLIED ELASTOMERIC MEMBRANE. FOR WATERPROOFING, SEE SPECIAL PROVISIONS.

WATERPROOFING IS REQUIRED AT THE FOLLOWING LOCATIONS:

1. ALONG FULL LENGTH OF HORIZONTAL CONSTRUCTION JOINT AT TOP OF CAP WITH BACKWALL AT EACH ABUTMENT (FILL FACE OF BACKWALL AND WINGWALLS ONLY).
2. AT ANY CONCRETE SHRINKAGE CRACKS WHICH WILL BE COVERED BY FILL.

WATERPROOFING FOR LOCATIONS 1 AND 2 ABOVE SHALL BE 24" WIDE AND SHALL BE CENTERED OVER JOINTS OR CRACKS.

DAMP-PROOFING SHALL BE APPLIED TO THE FOLLOWING SURFACES REGARDLESS OF WHETHER OR NOT THE PLAN DETAILS SO INDICATE:

1. ON FILL FACE OF FOOTING AND BACKWALL AT EACH ABUTMENT.
2. ON FILL FACE OF ABUTMENT WINGWALLS FROM BOTTOM OF WINGWALL TO TOP OF BACKWALL ELEVATION AT EACH ABUTMENT.

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 SPICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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

FOR REINFORCING, CONCRETE AND DAMPPROOFING, SEE "CAST-IN-PLACE CONCRETE" SPECIAL PROVISIONS.

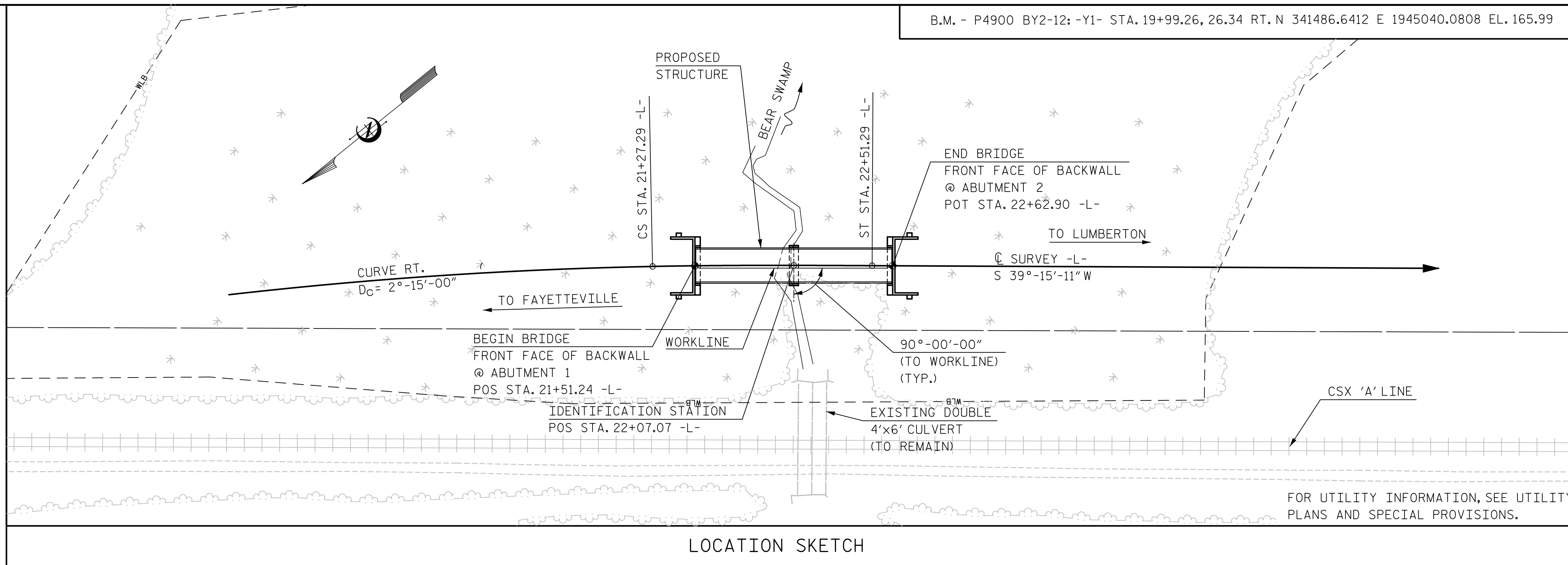
THE SCOUR CRITICAL ELEVATION FOR PIER NO. 1 IS ELEVATION 145.5 FEET. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

FOR INTERIOR PIER NO. 1, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE PIER 1 SHEET(S) FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

ONLY ITEMS IN THE PROPOSAL AS PAY ITEMS WILL BE PAID FOR. COMPENSATION FOR ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, AND INCIDENTALS FOR THE ENTIRE CONTRACT SHALL BE INCLUDED IN THE PRICE BID FOR PAY ITEMS.

CONTROL OF WORK: ALL WORK INVOLVED IN THE CONSTRUCTION OF THE RAILROAD STRUCTURE SHALL BE PERFORMED TO THE SATISFACTION OF THE ENGINEER AND/OR CSX TRANSPORTATION. ALL METHODS OF HANDLING WORK AFFECTING THE SAFETY OF RAIL OPERATIONS MUST BE APPROVED BY THE RAILWAY ENGINEER BEFORE PROCEEDING WITH THAT PORTION OF THE WORK. RAIL TRAFFIC SHALL, AT ALL TIMES, BE MAINTAINED AND PROTECTED. THE CONTRACTOR SHALL NOT AT ANY TIME DELAY OR INTERFERE WITH RAIL OPERATIONS.

ALL CONSTRUCTION JOINTS SHOWN ON THESE PLANS SHALL BE REQUIRED UNLESS SHOWN AS OPTIONAL. CONSTRUCTION JOINTS SHALL NOT BE PERMITTED EXCEPT AS SHOWN ON THESE PLANS, OR WHERE WRITTEN APPROVAL HAS BEEN OBTAINED.



LOCATION SKETCH

**TOTAL BILL OF MATERIAL**

	PDA TESTING	CAST-IN-PLACE CONCRETE (4,000 PSI)	REINFORCING STEEL	HP 12 x 53 STEEL PILES		PP 18 x 0.50 GALVANIZED STEEL PILES		STEEL PILE POINTS	PIPE PILE PLATES	PILE REDRIVES	CONCRETE BALLAST CURB	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	4'-0" x 4'-6" PRESTRESSED CONCRETE BOX BEAMS		STEEL HANDRAIL
				NO.	L.F.	NO.	L.F.								EACH	EACH	
SUPERSTRUCTURE	---	---	---	---	---	---	---	---	---	---	222.6	---	---	LUMP SUM	10	556.5	222.8
ABUTMENT 1	---	36.8	5,713	10	650	---	---	10	---	10	---	281	312	---	---	---	38.2
PIER 1	---	16.5	4,784	---	---	8	520	---	8	8	---	---	---	---	---	---	---
ABUTMENT 2	---	37.4	5,739	10	650	---	---	10	---	10	---	342	379	---	---	---	39.2
<b>TOTAL</b>	<b>3</b>	<b>90.7</b>	<b>16,236</b>	<b>20</b>	<b>1,300</b>	<b>8</b>	<b>520</b>	<b>20</b>	<b>8</b>	<b>28</b>	<b>222.6</b>	<b>623</b>	<b>691</b>	<b>LUMP SUM</b>	<b>10</b>	<b>556.5</b>	<b>300.2</b>

FOR STEEL HANDRAIL, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR BACKFILL BEHIND ABUTMENTS AND OTHER BACKFILL AROUND THE STRUCTURE, SEE SPECIAL PROVISION "BACKFILLING AROUND STRUCTURES".

FOR WATERSTOPS, SEE SPECIAL PROVISIONS.

FOR RAILROAD TRACKWORK, SEE RAILROAD TRACKWORK PLANS.

FOR CONCRETE BALLAST CURB, SEE SPECIAL PROVISIONS.

FOR WATERPROOFING, SEE SPECIAL PROVISIONS.

METAL DRAINS BEHIND ABUTMENTS SHALL BE AS SHOWN ON THE PLANS OR IN THE SPECIAL PROVISIONS. DETAILS OF THE DRAINAGE SYSTEM SHALL BE SUBMITTED FOR REVIEW.

FOR FOUNDATION NOTES, SEE "FOUNDATION LAYOUT" SHEET.

FOR 4'-0" x 4'-6" PRESTRESSED CONCRETE BOX BEAM, SEE SPECIAL PROVISIONS.

ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES", JANUARY 2012, NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (HEREIN CALLED STANDARD SPECIFICATIONS, EXCEPT AS NOTED HEREIN, ELSEWHERE ON THE PLANS, OR IN THE SPECIAL PROVISIONS.

THIS BRIDGE SHALL BE CONSTRUCTED USING TOP-DOWN CONSTRUCTION METHODS. THE USE OF A TEMPORARY CAUSWAY OR WORK BRIDGE IS NOT PERMITTED.

**TOTAL BILL OF MATERIAL**

	STRUCTURE DRAINAGE SYSTEM AT STATION 22+07.07 -L-	DAMP-PROOFING	WATERPROOFING
SUPERSTRUCTURE	LUMP SUM	---	---
ABUTMENT 1	---	46.6	12.3
PIER 1	---	---	---
ABUTMENT 2	---	47.6	12.5
<b>TOTAL</b>	<b>LUMP SUM</b>	<b>94.2</b>	<b>24.8</b>

PROJECT NO. P-4900A

ROBESON COUNTY

STATION: POS 22+07.07 -L-

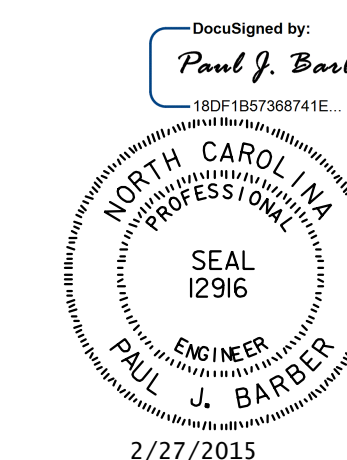
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SHEET 3 OF 3

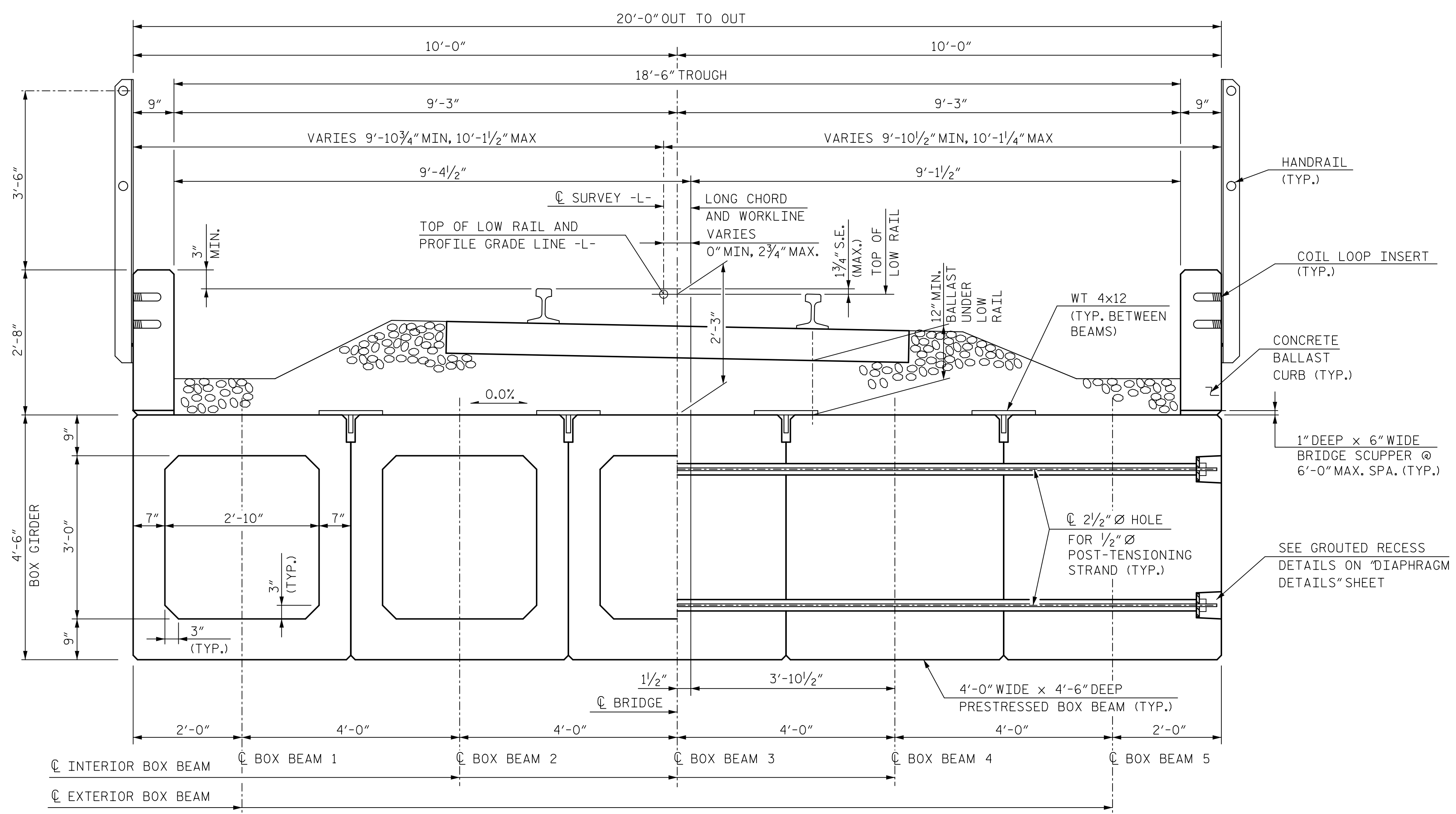
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**GENERAL DRAWING**

LOCATION SKETCH,  
TOTAL BILL OF MATERIAL  
AND GENERAL NOTES



<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO.	
DRAWN BY	M. WRIGHT	DATE	7/14	NO.	3	BY:	
CHECKED BY	D. RAGAN	DATE	1/15	NO.	4	DATE:	
DWG. NO. 3						TOTAL SHEETS	
						54	



**NOTES:**  
 ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO ASTM SPECIFICATION A416 (AASHTO M203) EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. INITIAL PRESTRESSING FORCE IS 31.0 KIPS PER 1/2" Ø STRAND.

ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL CONFORM TO CURRENT ASTM SPECIFICATION A615, GRADE 60.

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 1/2" Ø DOWEL HOLES AT EXPANSION ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH JOINT SEALER MATERIAL TO 1/2" ABOVE THE TOP OF DOWELS AND THEN FILLED WITH GROUT.

THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE SL LOW MODULUS SILICONE SEALANT. 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 5,000 PSI.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS AND COATED WITH ASPHALT MASTIC.

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

CURB CONCRETE SHALL BE CAST-IN-PLACE CONCRETE (5,000 PSI).

CURBS ARE NOT TO BE CAST ON THE GIRDERS UNTIL AFTER RELEASE OF PRESTRESSING FORCE.

FOR HANDRAIL DETAILS, SEE "BOX BEAM SUMMARY AND HANDRAIL DETAILS" SHEET.

WT MEMBERS AND BRACE PLATE SHALL BE ASTM A36 STEEL AND SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE WT MEMBER AND BRACE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

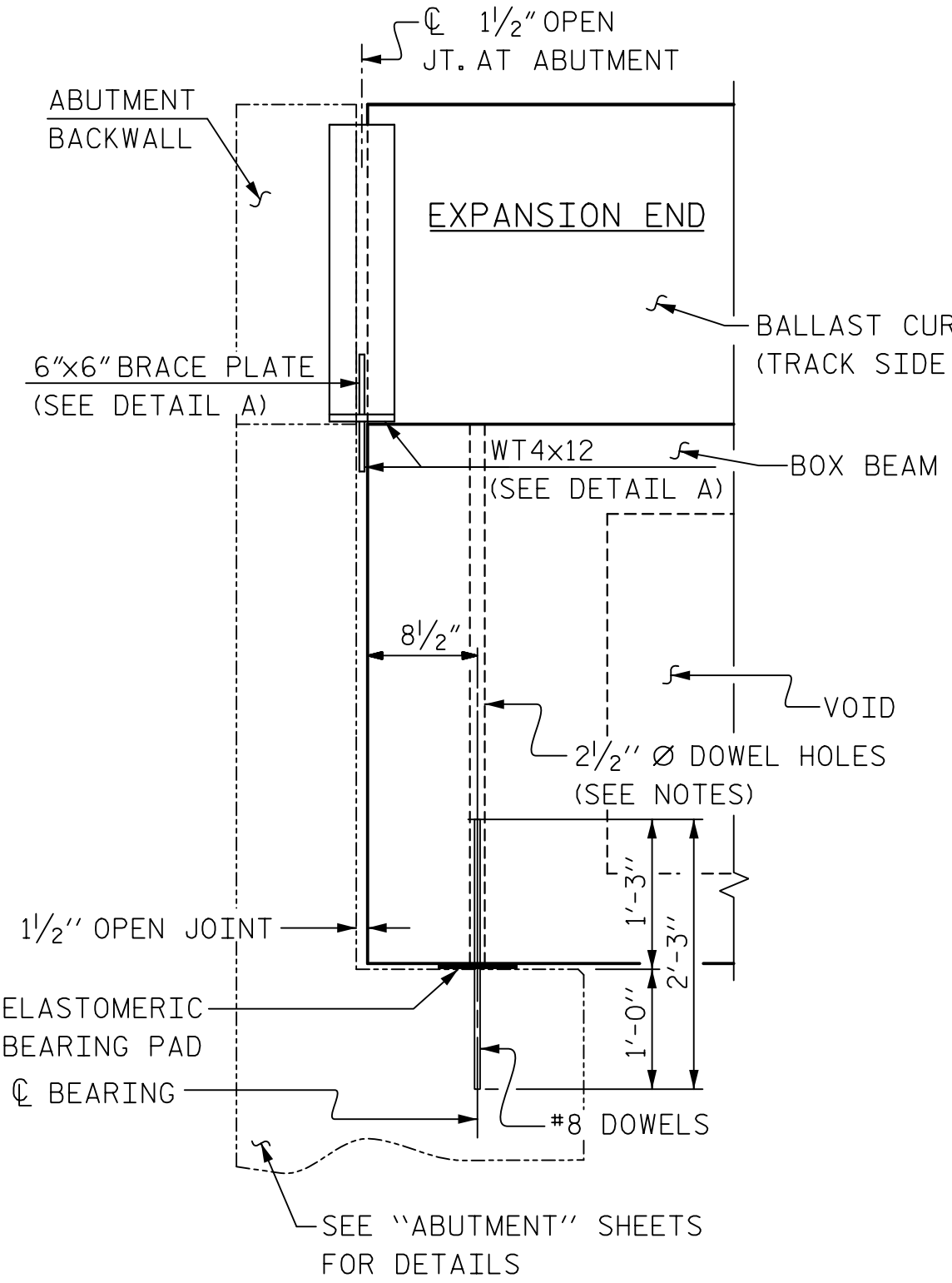
ALL CONCRETE IN PRECAST BOXES SHALL BE PER SECTION 1078 OF THE NCDOT STANDARD SPECIFICATIONS. CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 7,000 PSI.

THE COST OF THE DIAPHRAGM POST-TENSIONING, JOINT SEALER, GROUT, BACKER ROD, ASPHALT MASTIC, AND WT 4x12 WITH BRACE PLATES SHALL BE INCLUDED IN THE PRICE OF THE 4'-0" x 4'-6" PRESTRESSED BOX GIRDER.

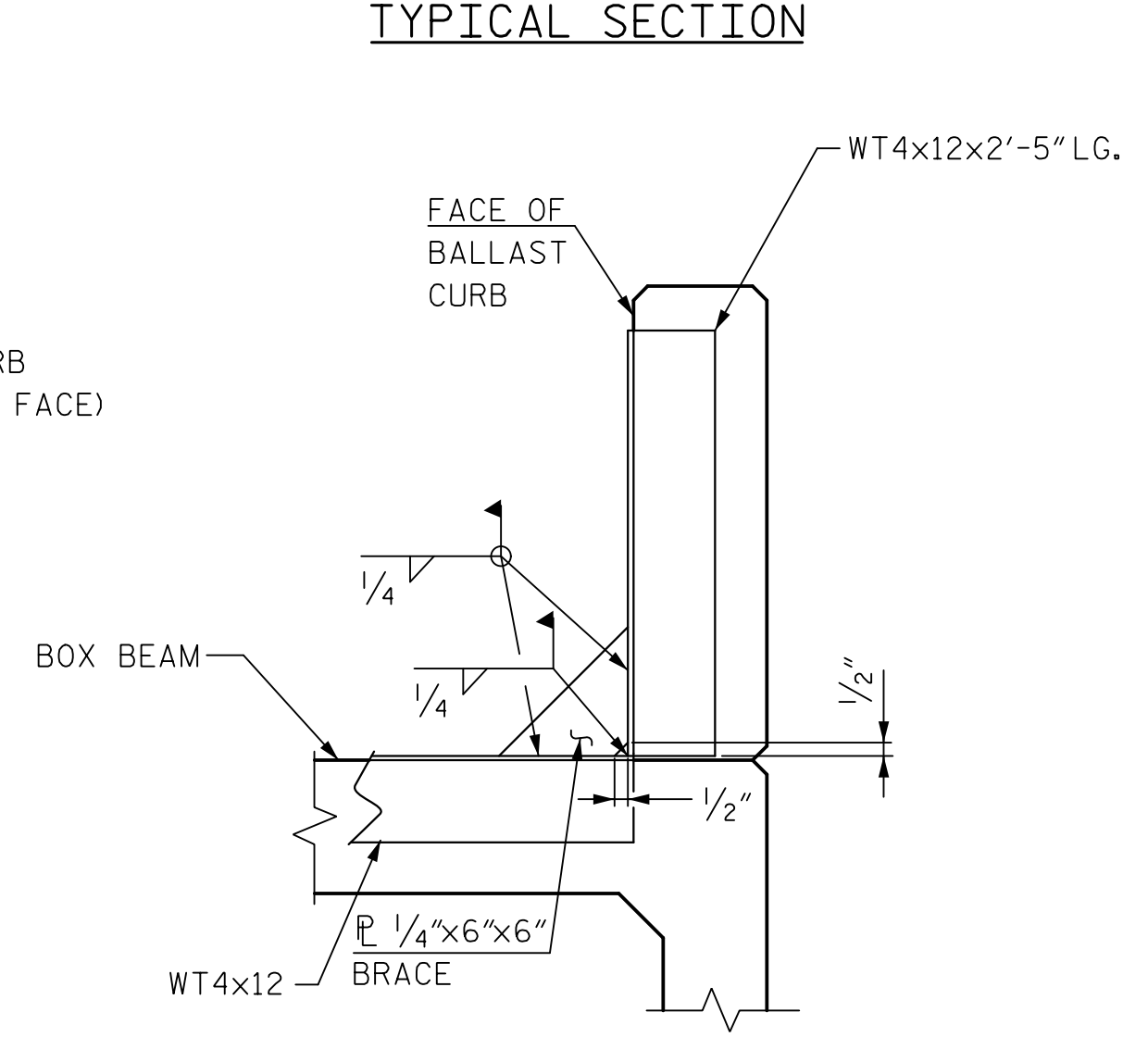
HALF SECTION AT VOID

HALF SECTION AT DIAPHRAGM

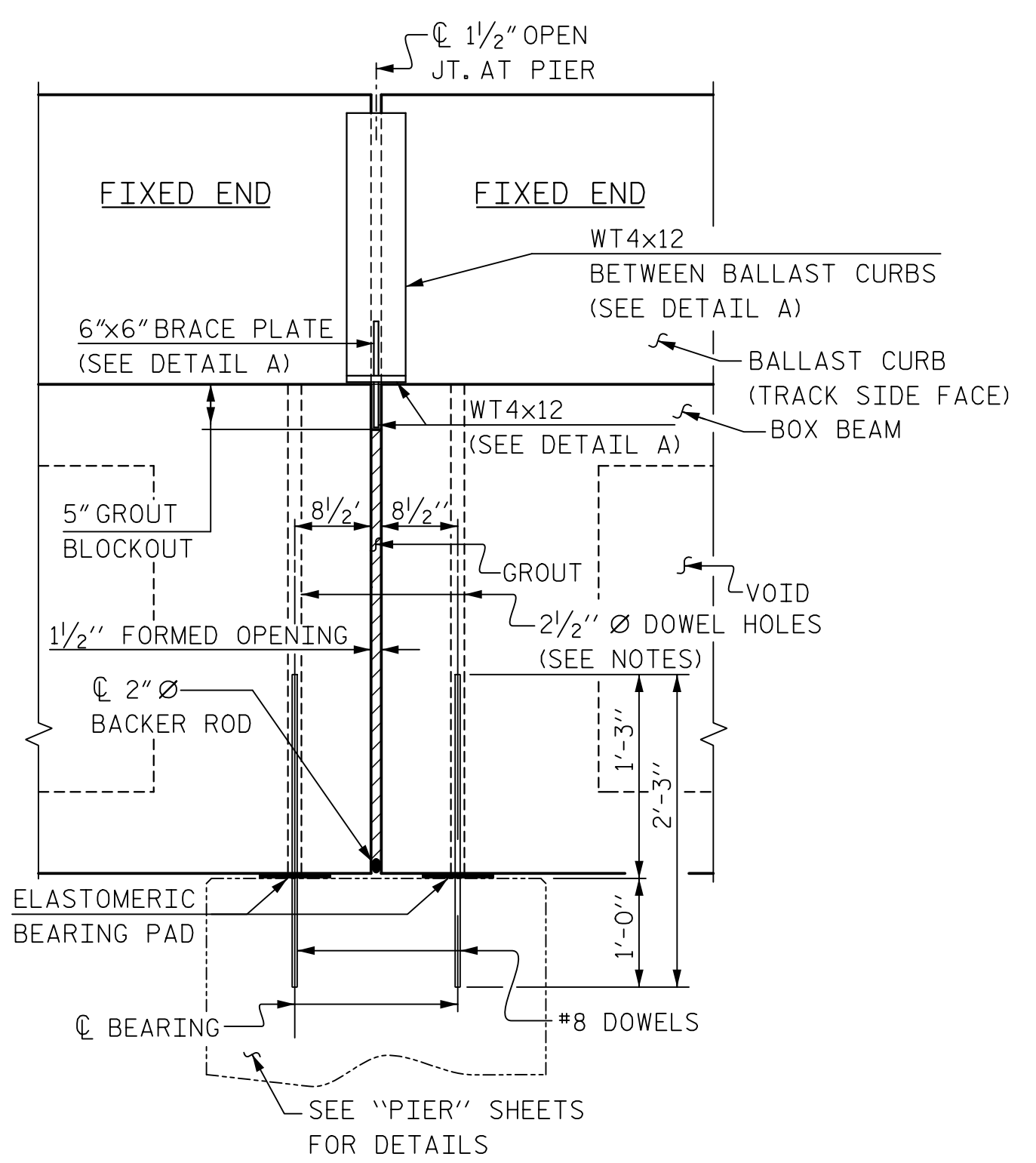
TYPICAL SECTION



SECTION AT ABUTMENT

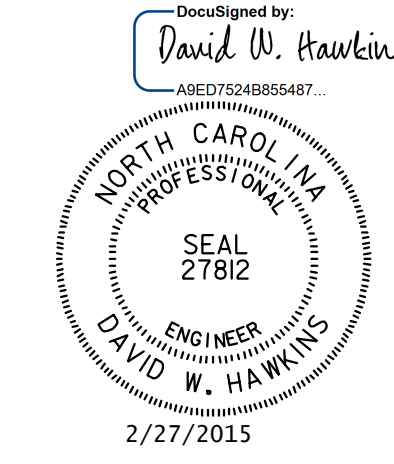
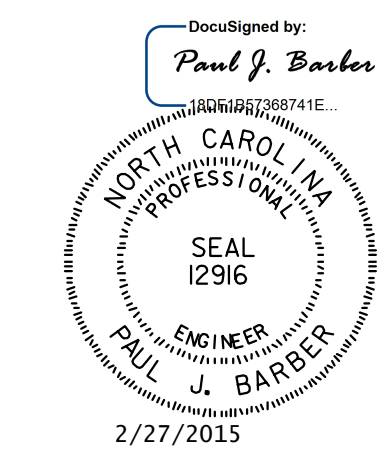


DETAIL A



SECTION AT PIER

PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POS 22+07.07 -L-  
 MILE POST: 0.23



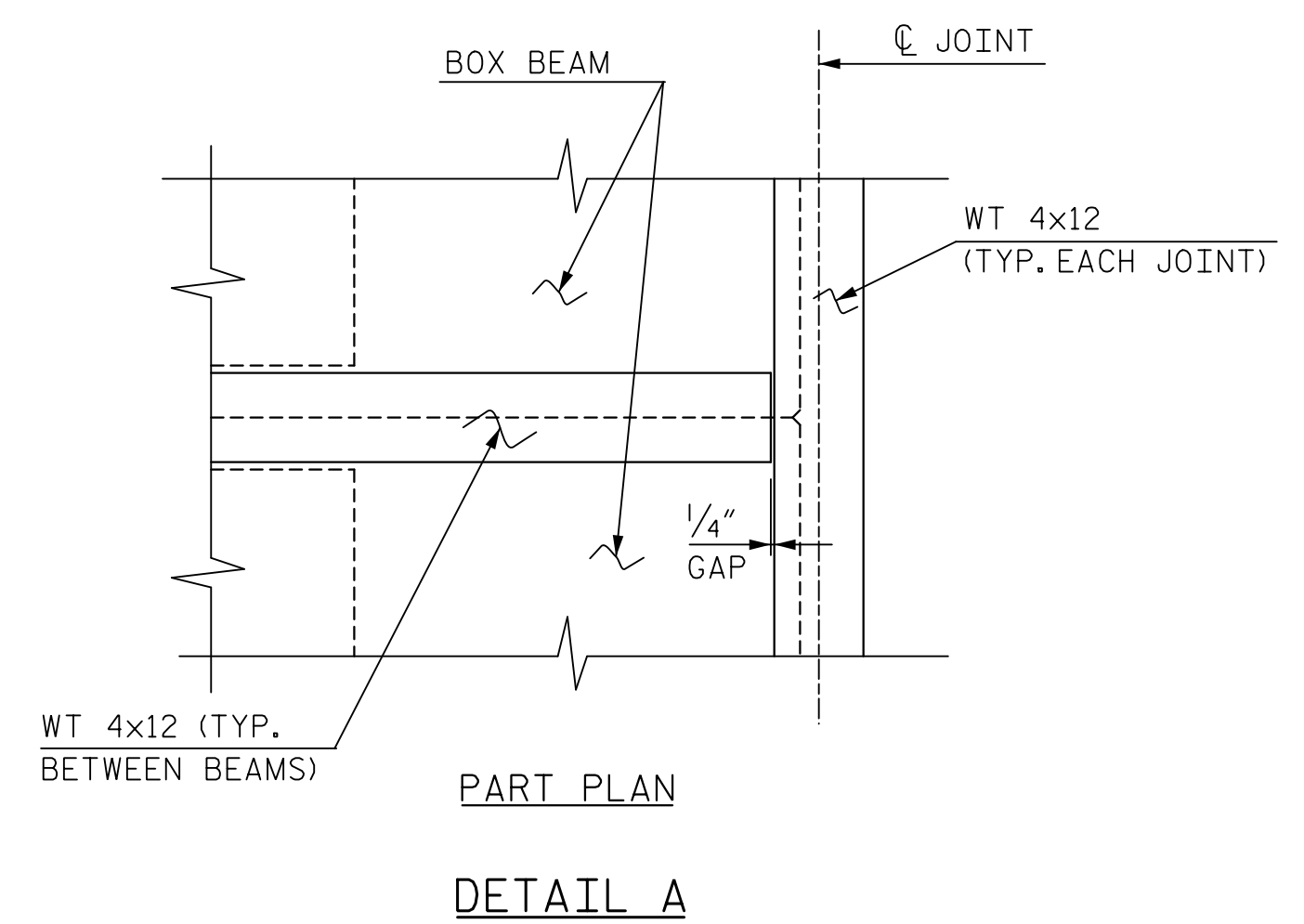
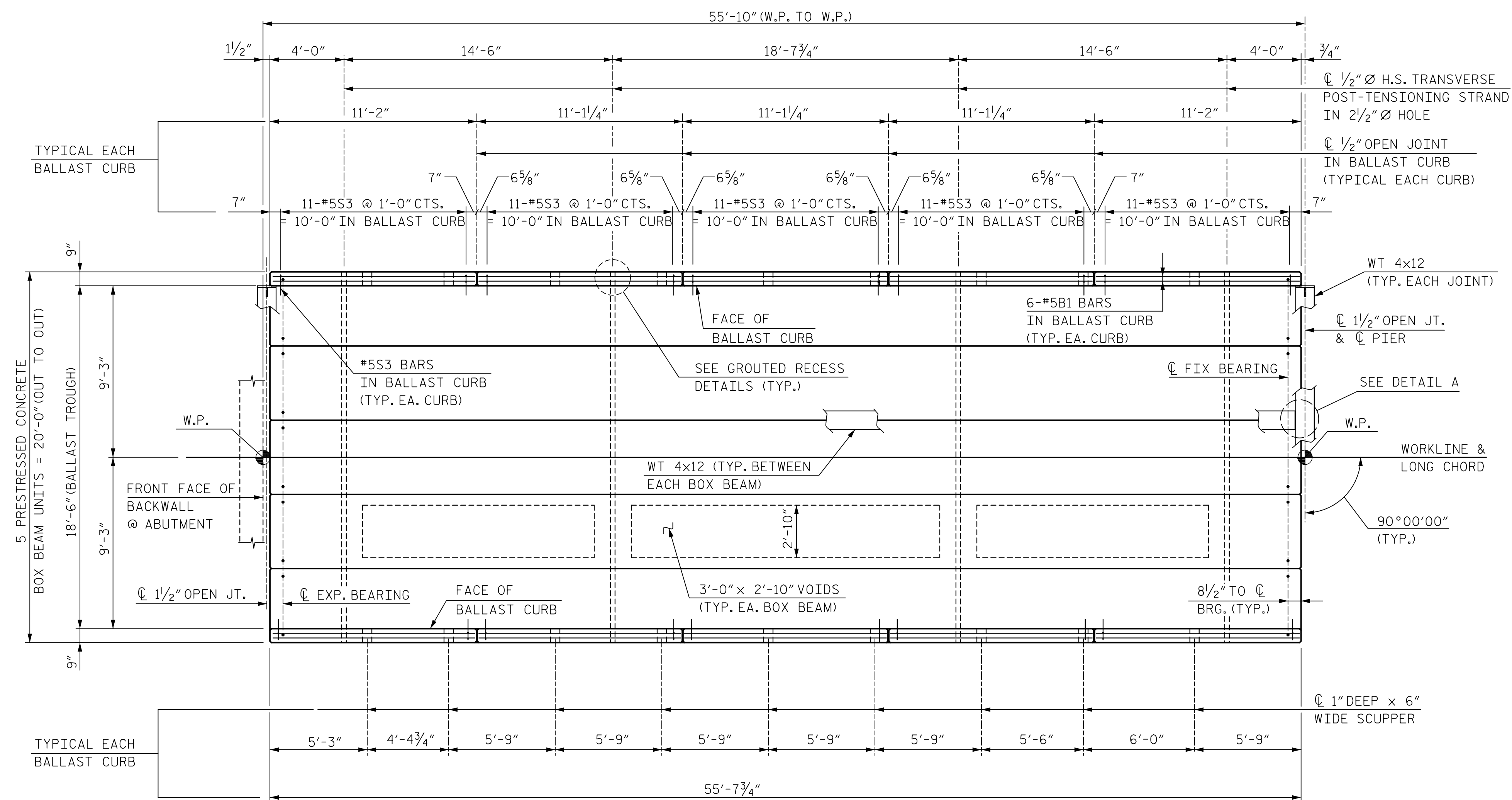
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION

<b>HNTB</b> HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO.
DRAWN BY: J. BAYNE	DATE: 8/14	NO. 3	BY:	5-4
CHECKED BY: P. BARBER	DATE: 9/14	NO. 4	DATE:	TOTAL SHEETS
DWG. NO. 4				54

**NOTES:**  
 FOR GROUDED RECESS DETAILS, SEE "DIAPHRAGM DETAILS" SHEET.

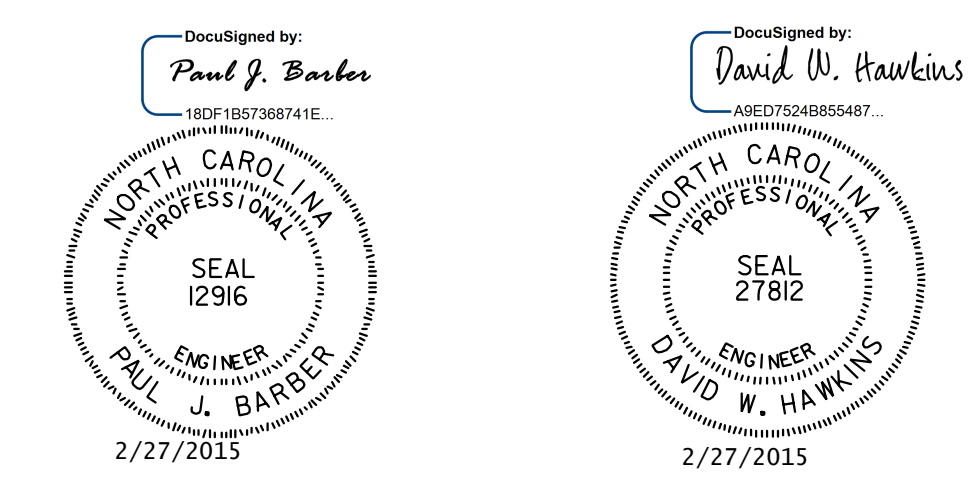
FOR BALLAST CURB AND HANDRAIL DETAILS, SEE "BOX BEAM SUMMARY AND HANDRAIL DETAILS" SHEET.

SCUPPER LOCATIONS MAY BE ADJUSTED SLIGHTLY IN FIELD TO AVOID "S3" BARS FROM BOX BEAM. CARE SHALL BE TAKEN TO RELOCATE ANY SCUPPERS AWAY FROM DIAPHRAGM GROUDED RECESSES AND OPEN JOINTS IN BALLAST CURB.



TYPICAL PLAN OF END SPAN  
 (SPAN A SHOWN, SPAN B OPPOSITE HAND)

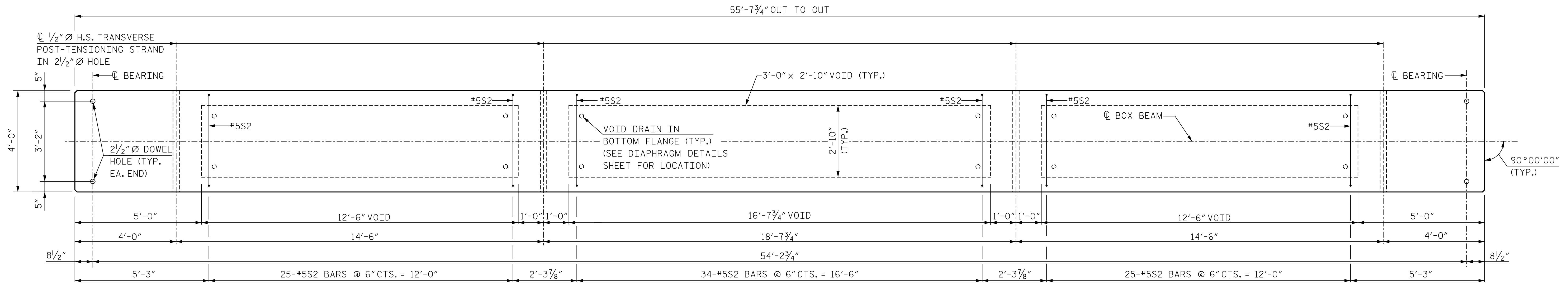
PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POS 22+07.07 -L-  
 MILE POST: 0.23



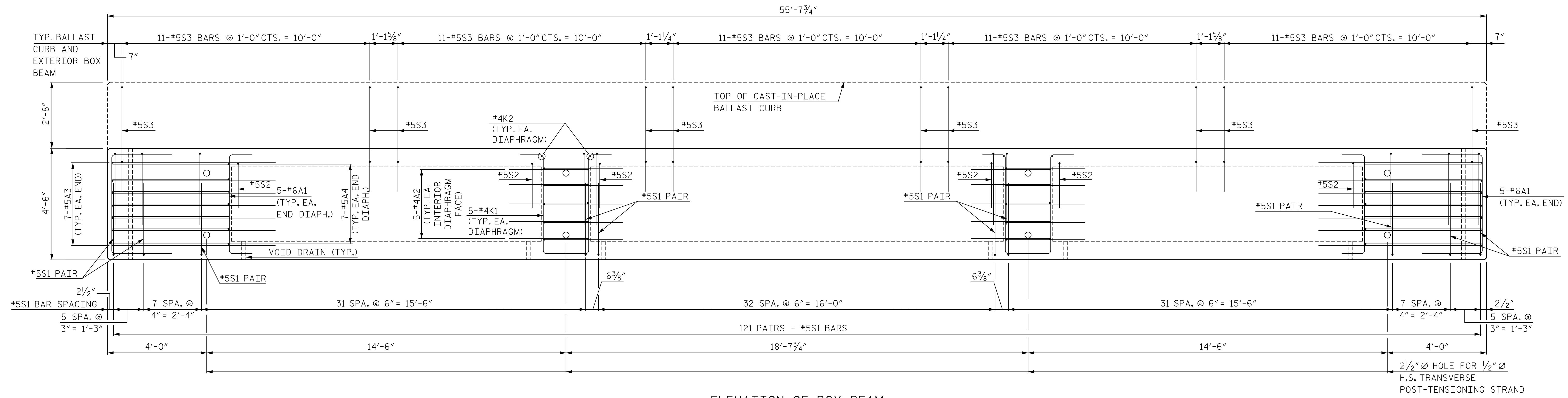
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPANS A AND B

<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO.	
DRAWN BY	J. BAYNE	DATE	8/14	NO.	BY:	DATE:	S-5
CHECKED BY	P. BARBER	DATE	9/14	1			
				NO.	BY:	DATE:	TOTAL SHEETS
				2	3		54





PLAN OF BOX BEAM



ELEVATION OF BOX BEAM

(EXTERIOR SECTION SHOWN, INTERIOR SECTION SIMILAR EXCEPT OMIT BALLAST CURB)

**DESIGN LOADS**

LIVE LOAD	= E80
LL DISTRIBUTION	= 44.4%
IMPACT	= 30.6%
DEAD LOAD/BOX	= 2.7 KLF

**GIRDER PROPERTIES**

AREA	= 1,386 IN <sup>2</sup>
SECTION MODULUS	= 18,625 IN <sup>3</sup>
NO. OF STRANDS	= 66
ECC. AT C.L. SPAN (FROM BOT.)	= 12.74 IN
ULTIMATE MOMENT PROVIDED	= 7,313 F+K

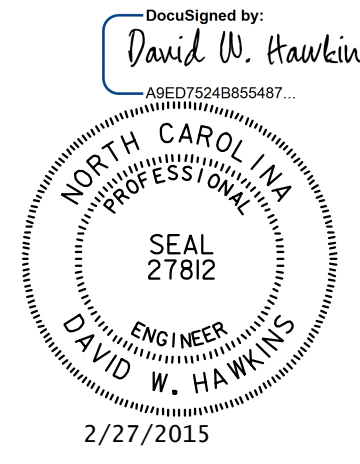
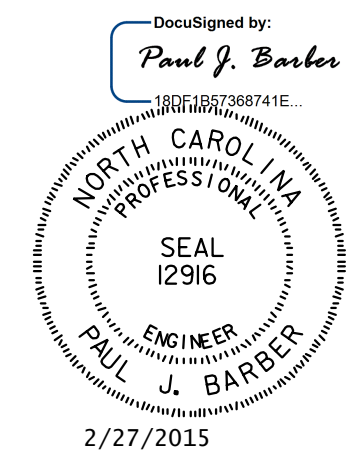
**NOTES:**

FOR DIAPHRAGM GEOMETRY AND REINFORCING DETAILS, SEE "DIAPHRAGM DETAILS" SHEET.

FOR GROUTED RECESS DETAILS FOR EXTERIOR BOX BEAM, SEE "DIAPHRAGM DETAILS" SHEET.

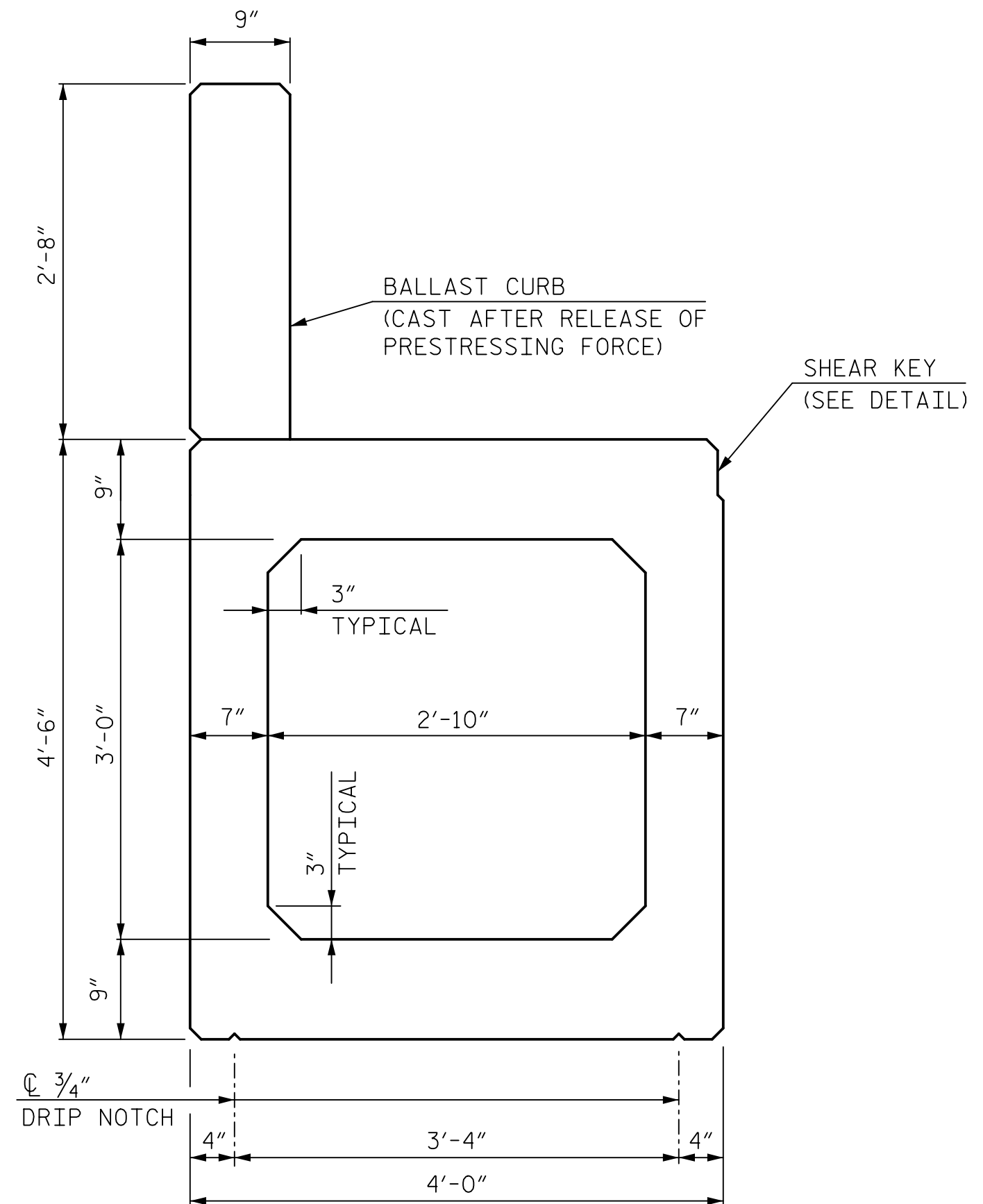
FOR BOX BEAM BILL OF MATERIAL AND REINFORCING SCHEDULE, SEE "4'-0\"/>

PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POS 22+07.07 -L-  
 MILE POST: 0.23

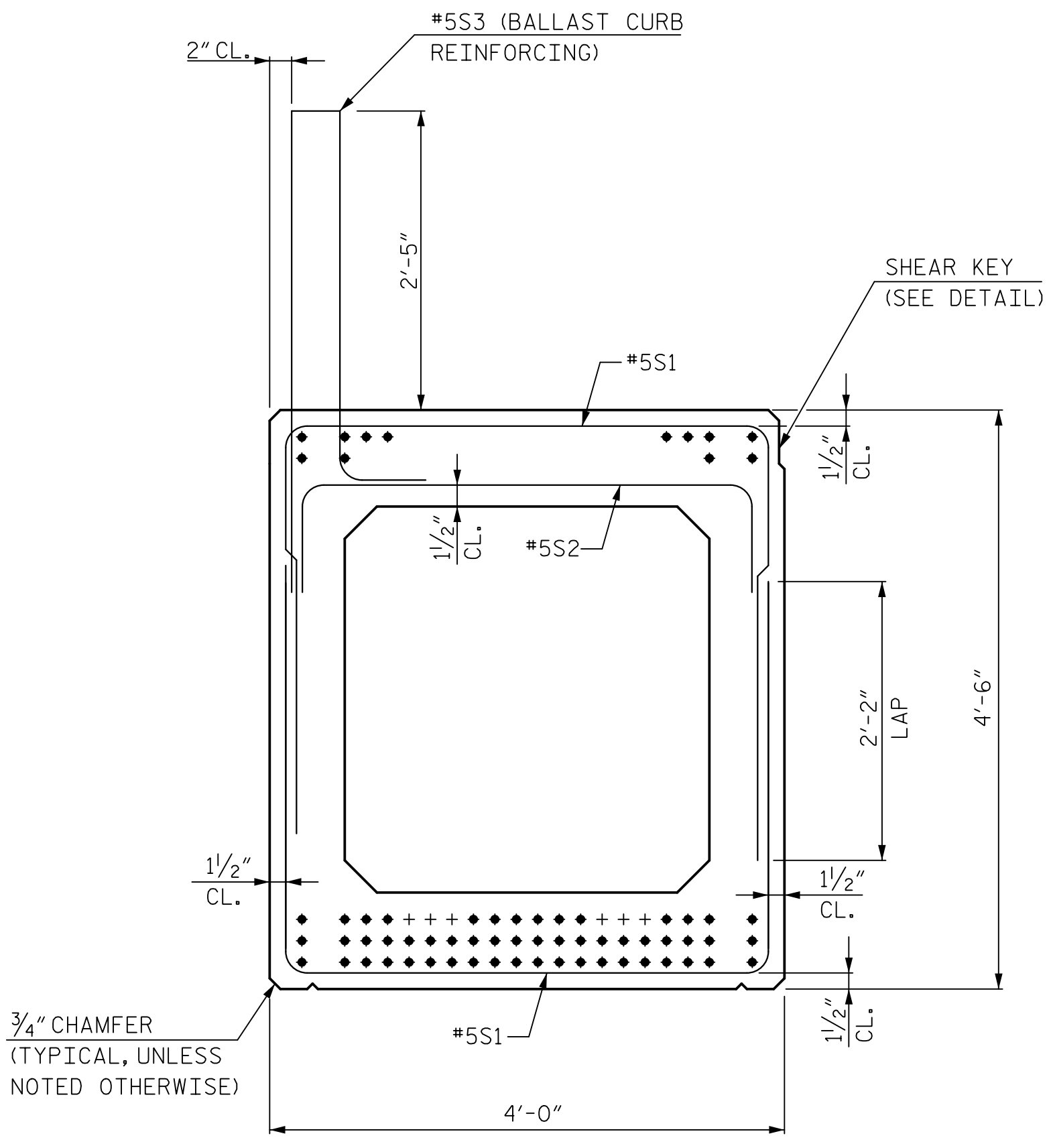


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUPERSTRUCTURE**  
 4'-0" x 4'-6" BOX BEAM  
 PLAN AND ELEVATION

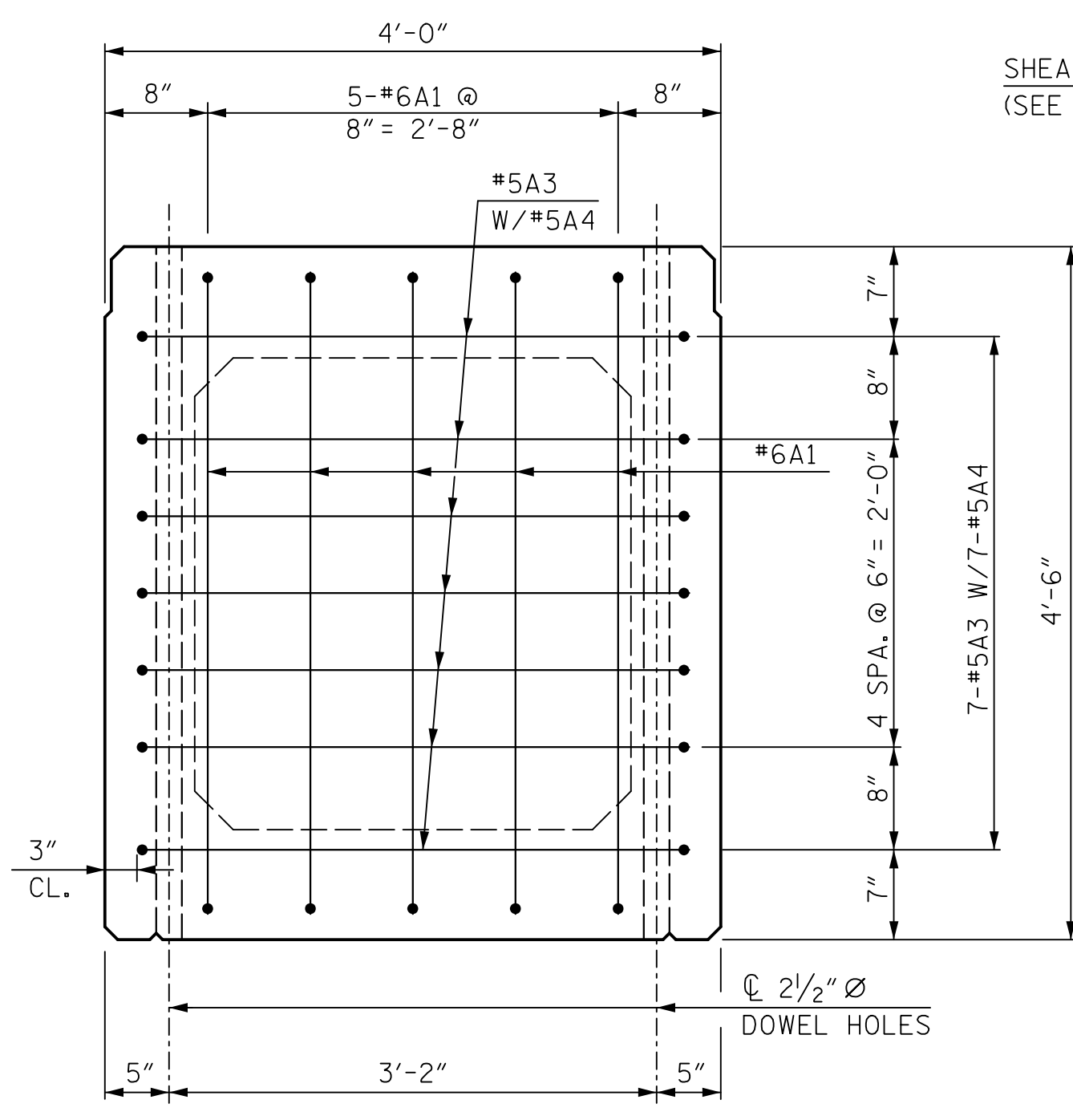
<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO.
DRAWN BY	J. BAYNE	DATE	8/14	NO.	BY:	DATE:
CHECKED BY	P. BARBER	DATE	9/14	1		
DWG. NO. 6				2		
						TOTAL SHEETS
						54



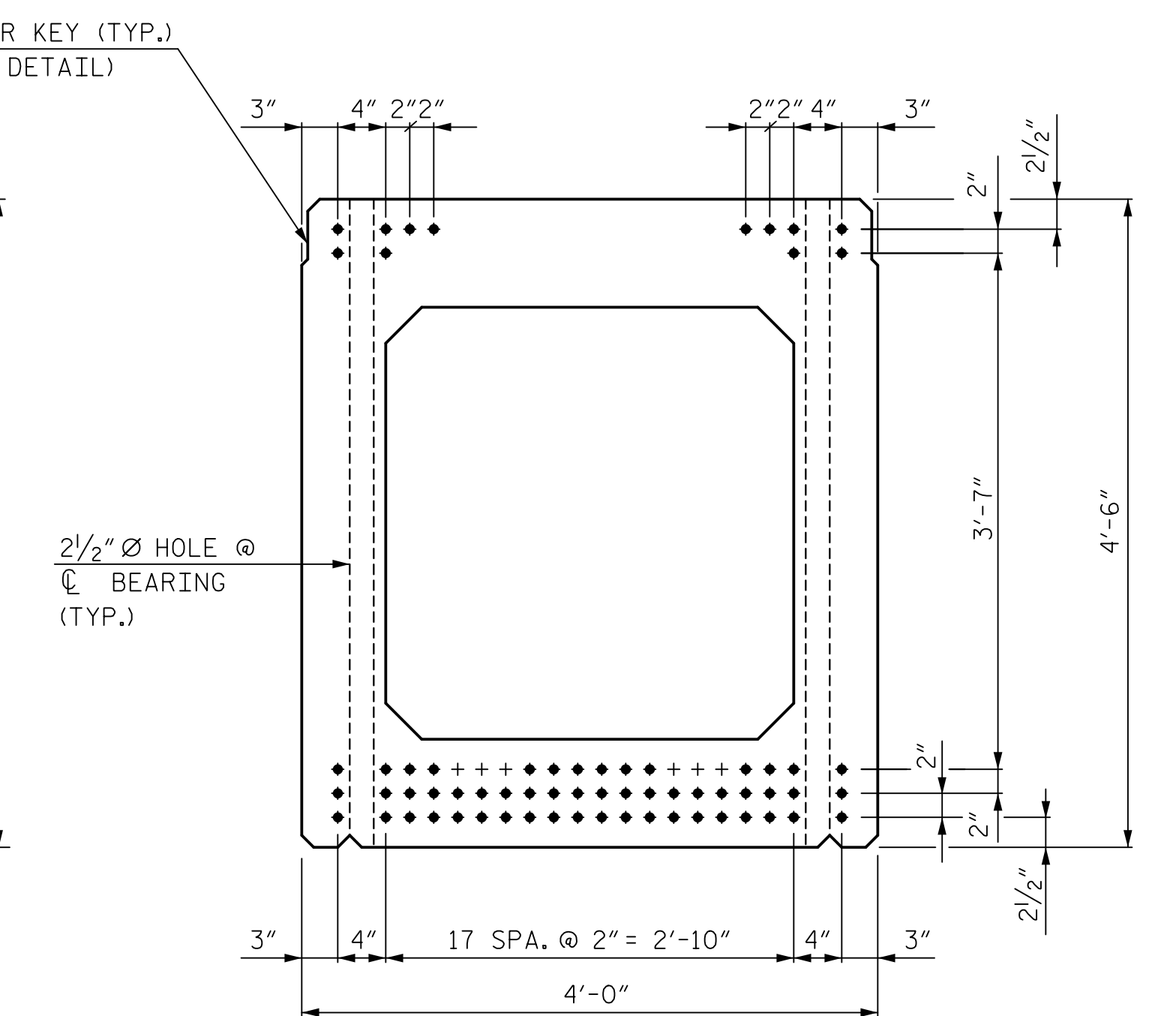
**TYPICAL BEAM SECTION**  
 (EXTERIOR BEAM SECTION SHOWN, INTERIOR BEAM SECTION SIMILAR EXCEPT SHEAR KEY LOCATION AND OMIT BALLAST CURB)



**TYPICAL BOX BEAM REINFORCING PATTERN**  
 (EXTERIOR BEAM SECTION SHOWN, INTERIOR BEAM SECTION SIMILAR EXCEPT SHEAR KEY LOCATION AND OMIT BALLAST CURB REINFORCING)

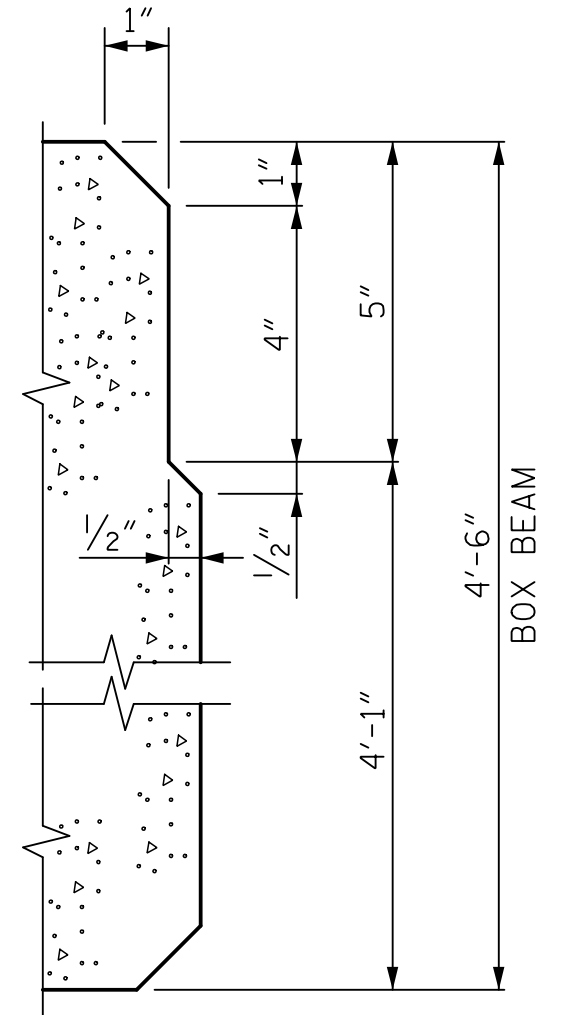


**END ELEVATION**  
 SHOWING PLACEMENT OF "A" BARS AND LOCATION OF DOWEL HOLES AT BEARINGS. (INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION AND BALLAST CURB REINFORCING). STRAND LAYOUT NOT SHOWN.



**TYPICAL STRAND LOCATION**  
 (1/2" Ø LOW RELAXATION STRAND LAYOUT) (66 STRANDS REQUIRED)  
 (INTERIOR BOX BEAM SECTION SHOWN - EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION AND BALLAST CURB REINFORCING).

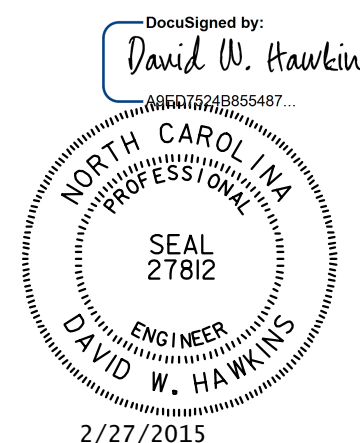
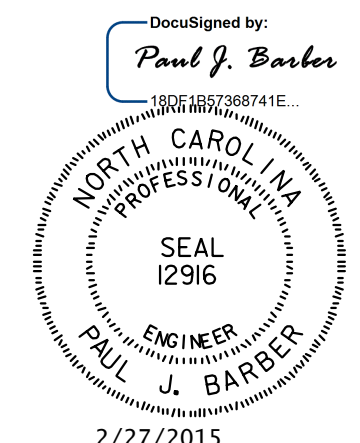
BAR TYPES				BILL OF MATERIAL FOR ONE BOX BEAM SECTION			
BAR	SIZE	TYPE	LENGTH	EXTERIOR UNIT		INTERIOR UNIT	
				NO.	WEIGHT	NO.	WEIGHT
A1	4'-0"			20	180	20	180
A2	3'-6"			20	131	20	131
A3 & A4	3'-6"			14	243	14	243
A4	5		12'-10"	14	187	14	187
S1	3'-9"						
S2	3'-9"						
K1	4	2	11'-4"	10	76	10	76
K2	4	STR.	3'-8"	4	10	4	10
S1	5	1	10'-3"	242	2,587	242	2,587
S2	5	1	5'-5"	84	475	84	475
S3	5	3	7'-11"	55	454		
REINFORCING STEEL				LBS. 4,343		LBS. 3,889	
7,000 P.S.I. CONCRETE				CU. YDS. 24.2		CU. YDS. 24.2	
1/2" Ø L.R. STRANDS				No. 66		No. 66	



**PART ELEVATION SHEAR KEY DETAIL**  
 NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.

NOTE: ALL STRANDS ARE BONDED FULL LENGTH.

GRADE 270 STRANDS	
AREA ( SQUARE INCHES )	0.153
ULTIMATE STRENGTH (LBS. PER STRAND )	41,300
APPLIED PRESTRESS (LBS. PER STRAND )	30,980

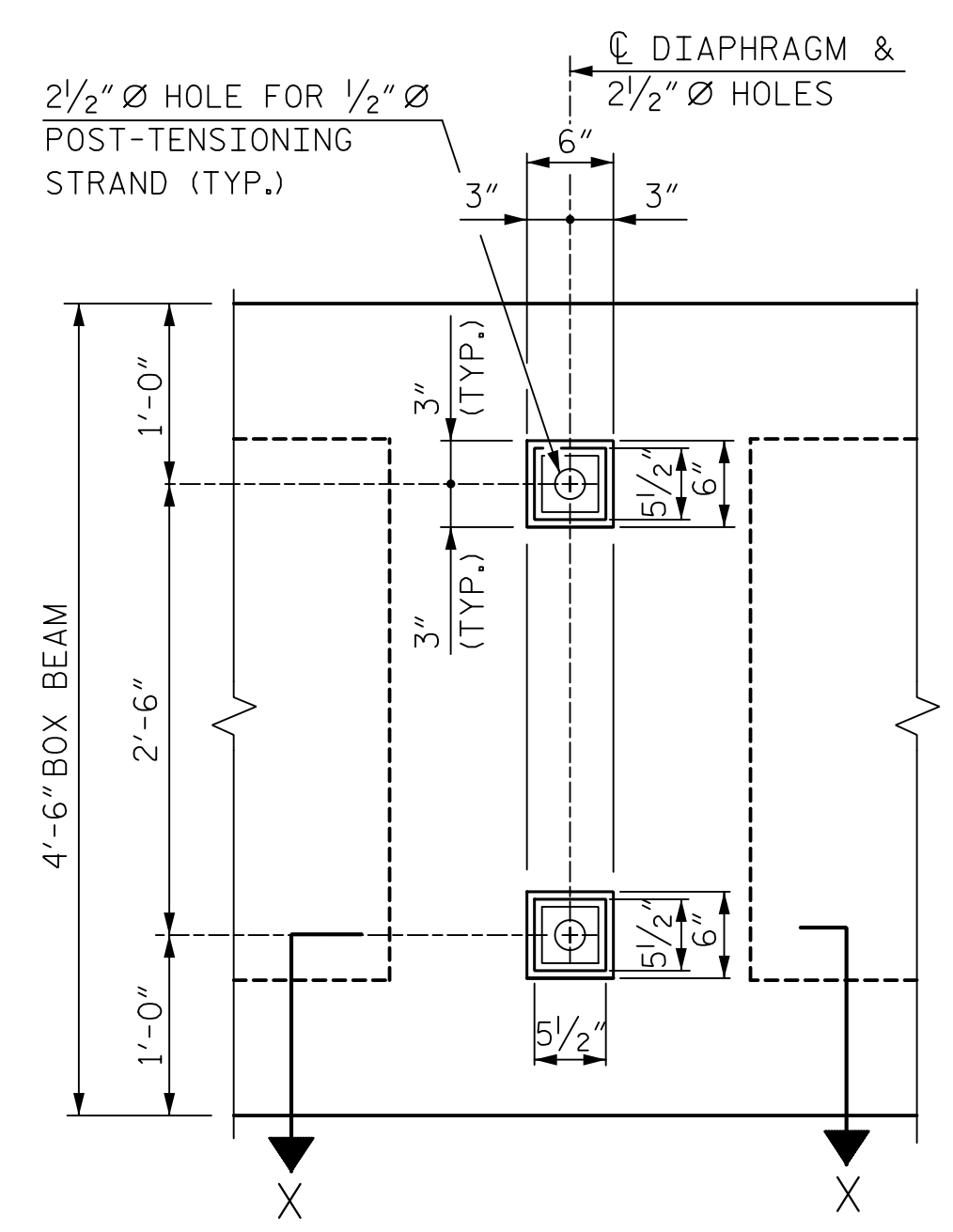


PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POS 22+07.07 -L-  
 MILE POST: 0.23

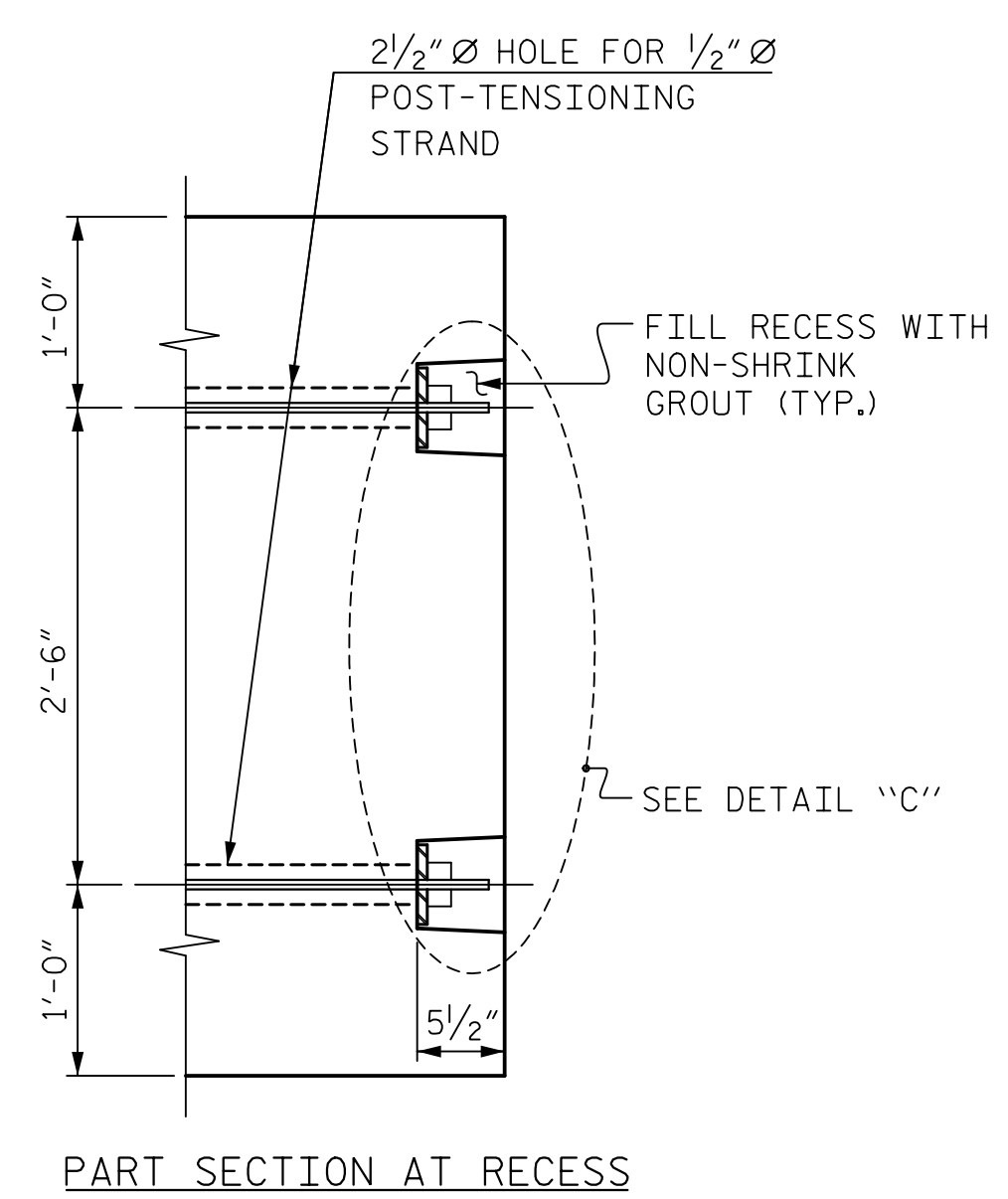
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUPERSTRUCTURE**  
 4'-0" x 4'-6"  
**BOX BEAM DETAILS**

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7	
1			3			TOTAL SHEETS	
2			4			54	

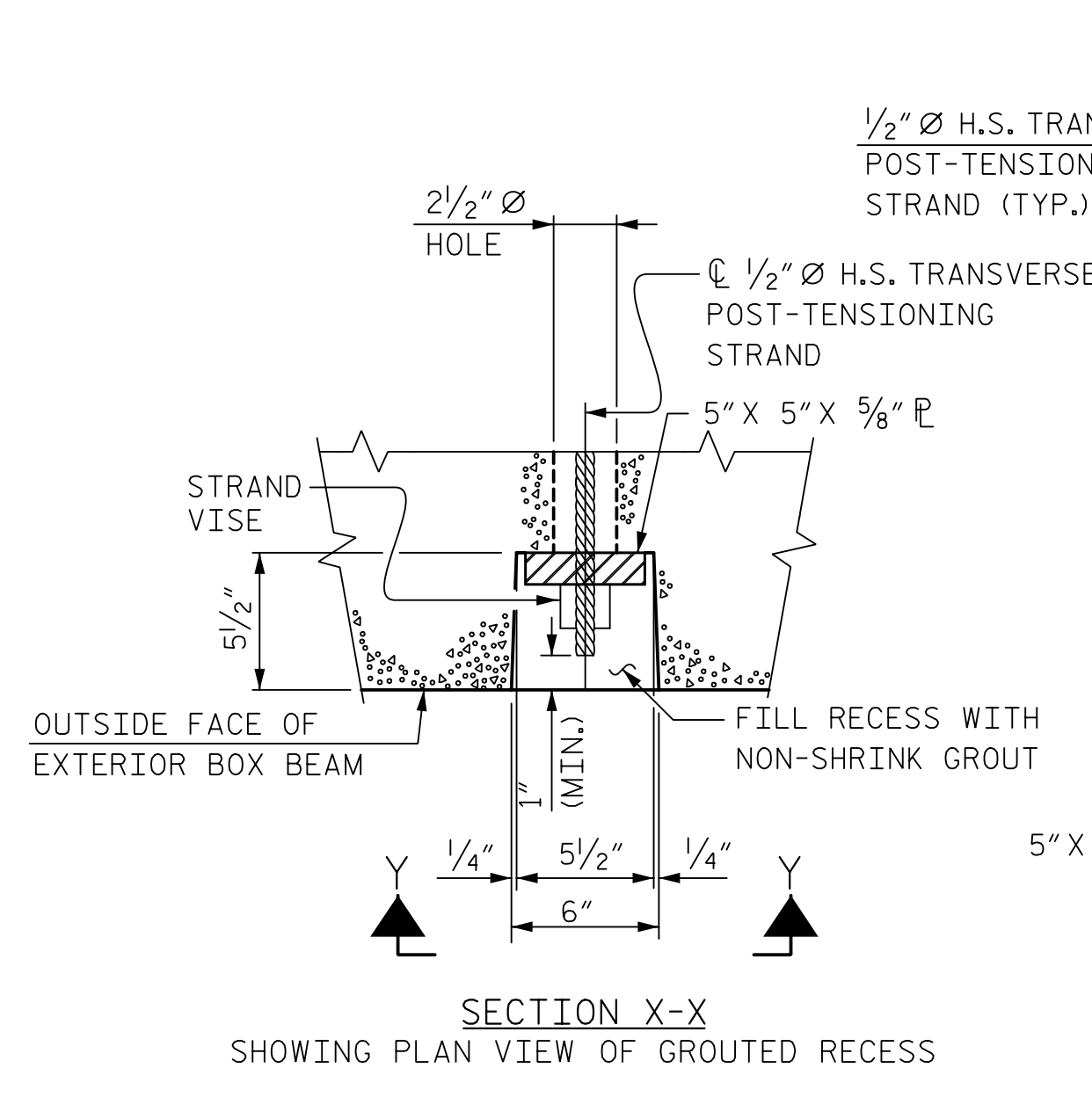
**HNTB** HNTB NORTH CAROLINA, P.C.  
 License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609  
 DRAWN BY M. WRIGHT DATE 8/14  
 CHECKED BY P. BARBER DATE 9/14 DWG. NO. 7



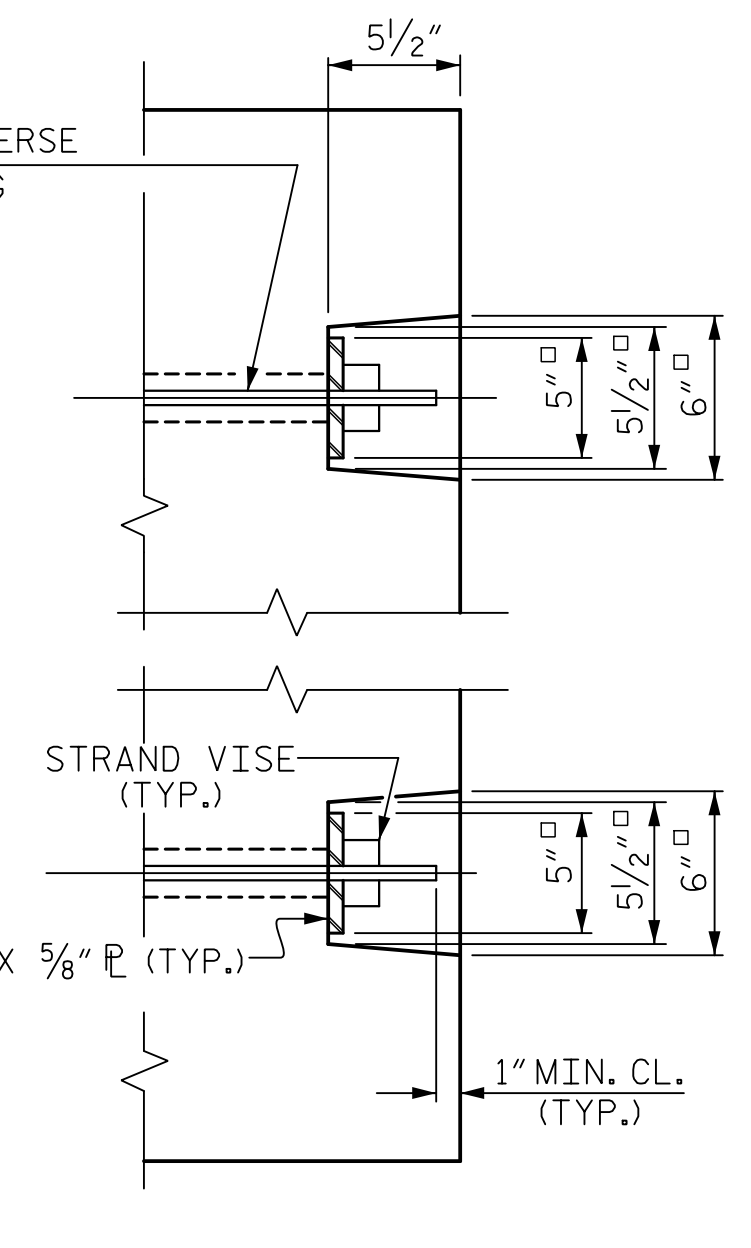
VIEW Y-Y  
SHOWING ELEVATION VIEW OF  
GROUTED RECESS



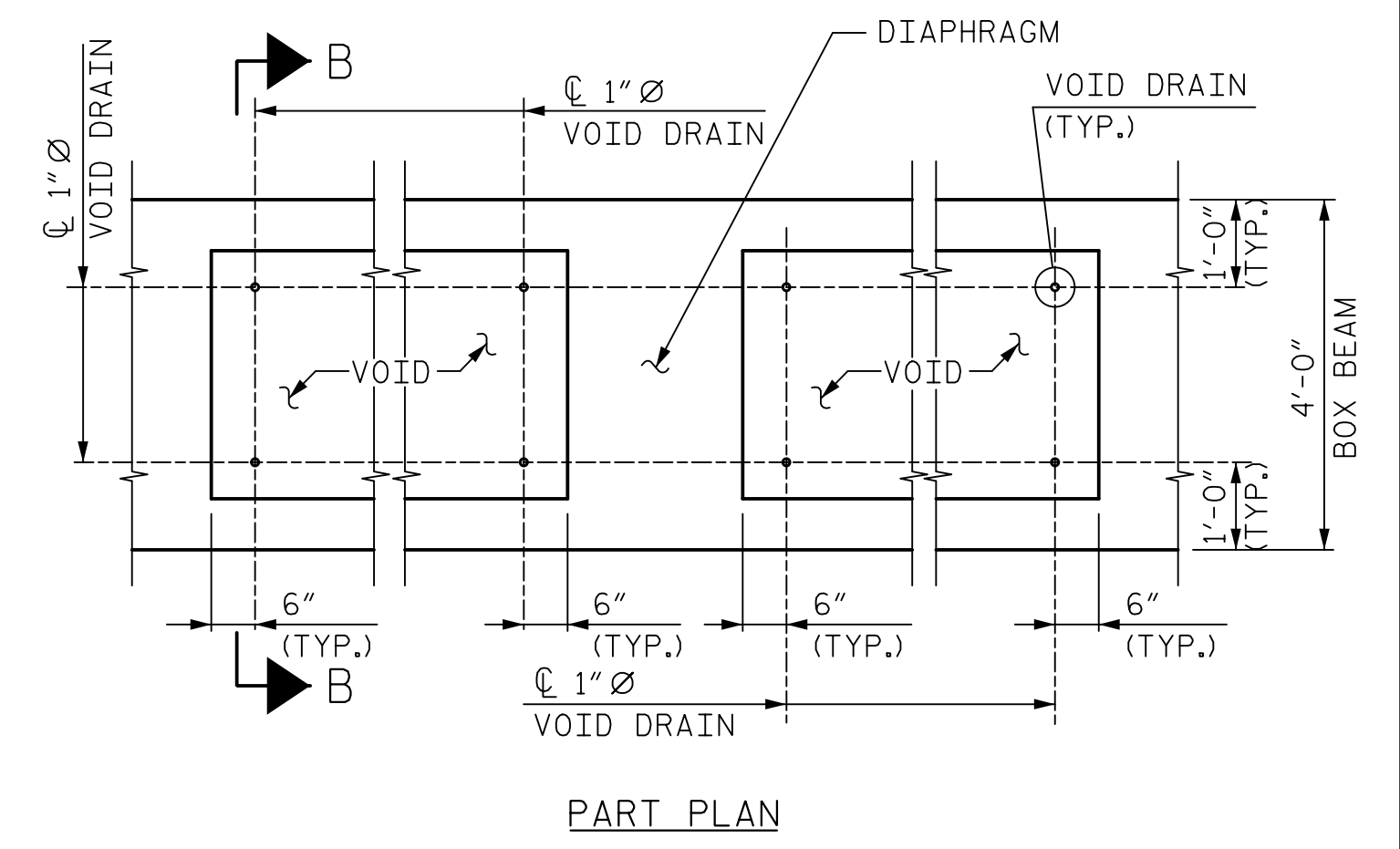
PART SECTION AT RECESS



SECTION X-X  
SHOWING PLAN VIEW OF GROUTED RECESS

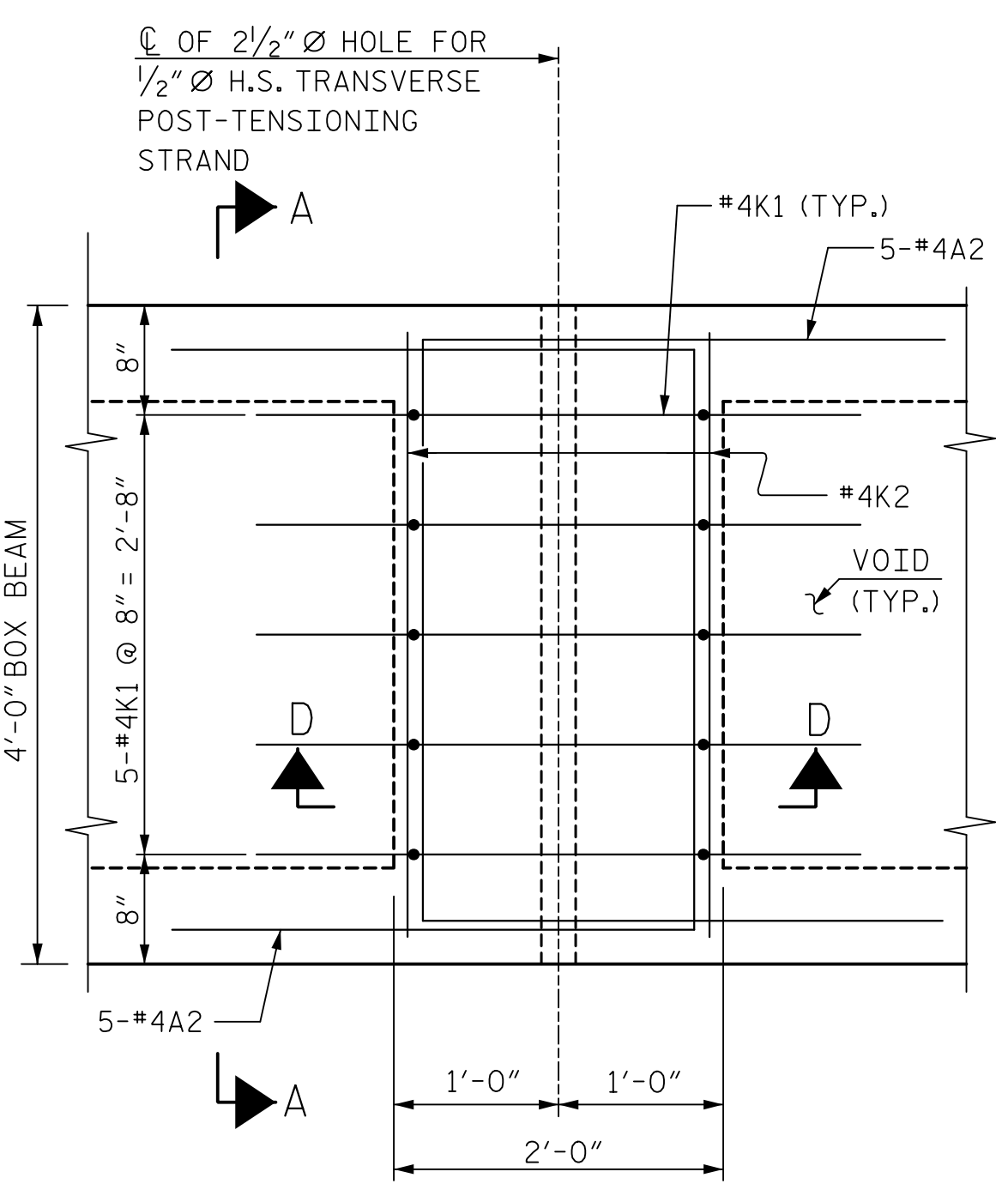


DETAIL "C"

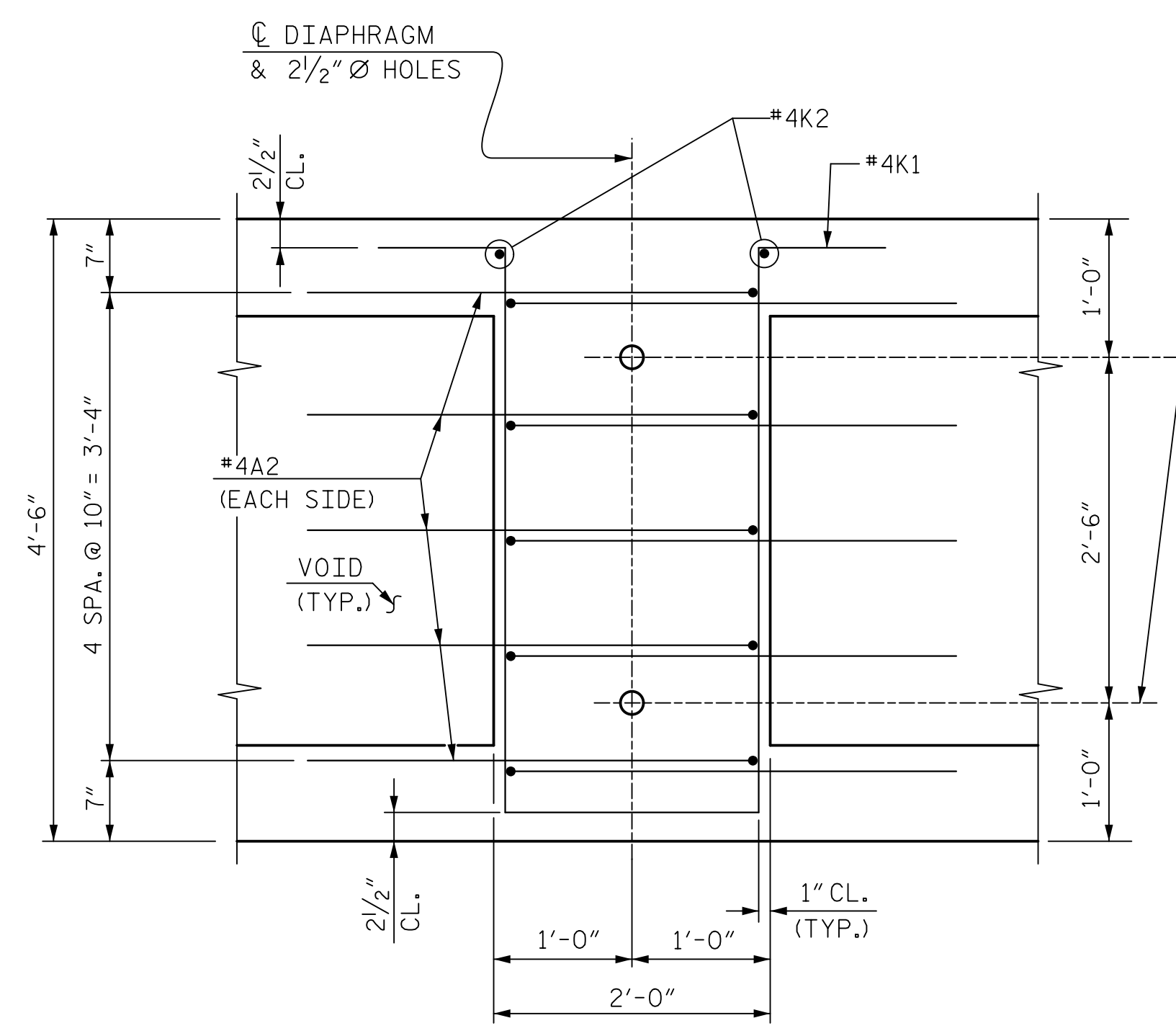


PART PLAN

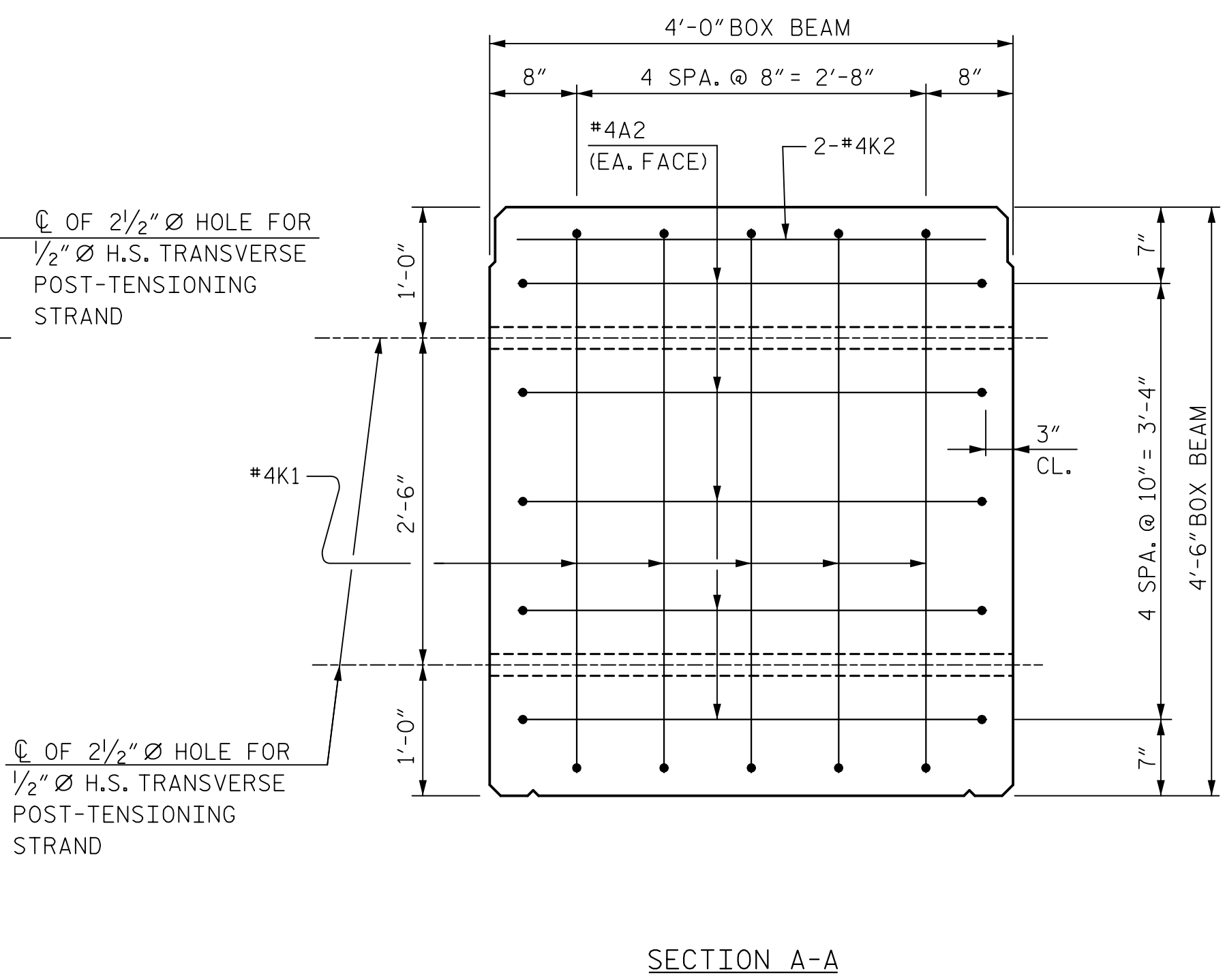
GROUTED RECESS DETAIL AT  
END OF POST-TENSIONED STRANDS  
OF EXTERIOR BOX BEAM



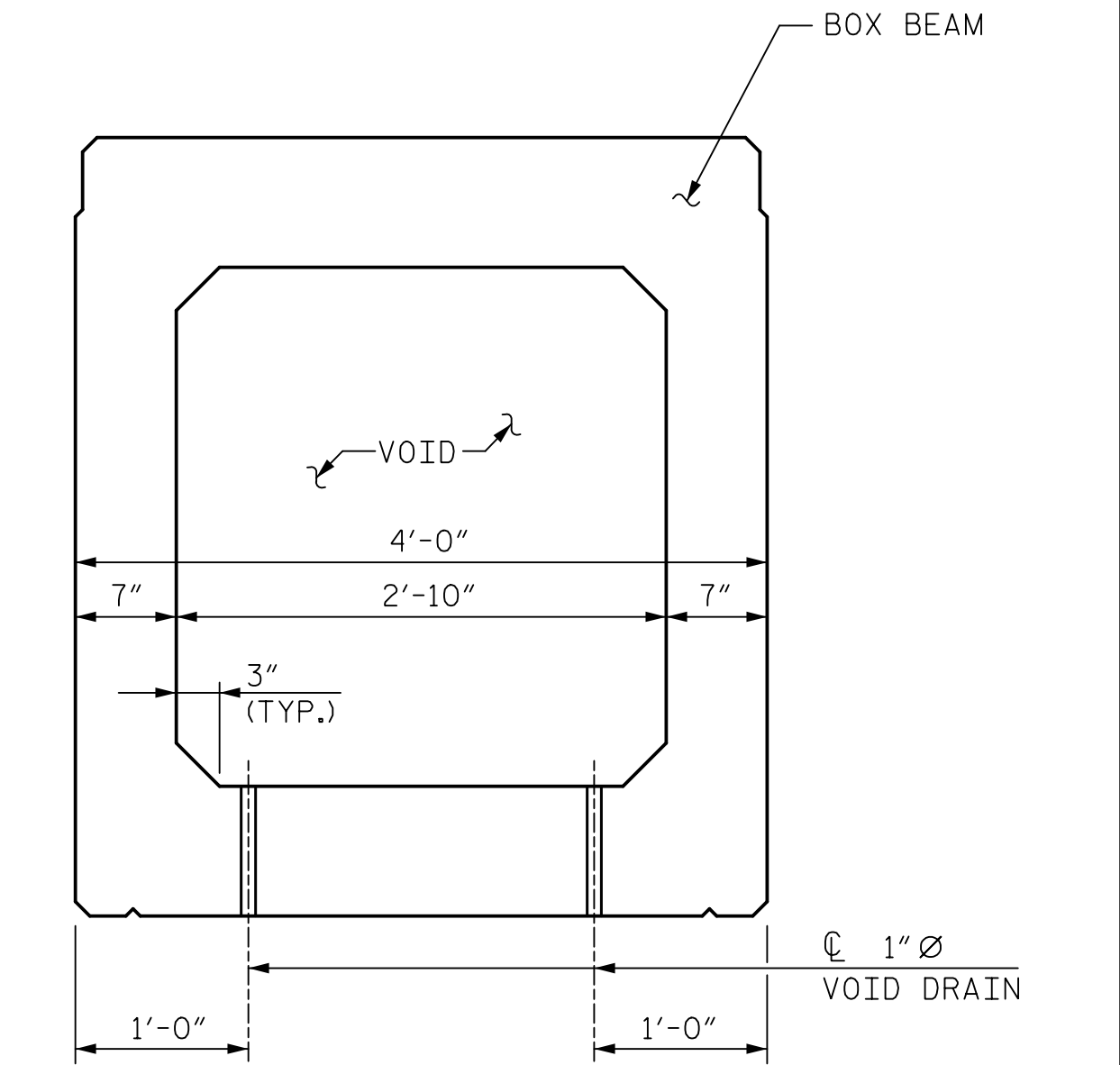
PLAN



SECTION D-D



SECTION A-A  
VOIDS NOT SHOWN



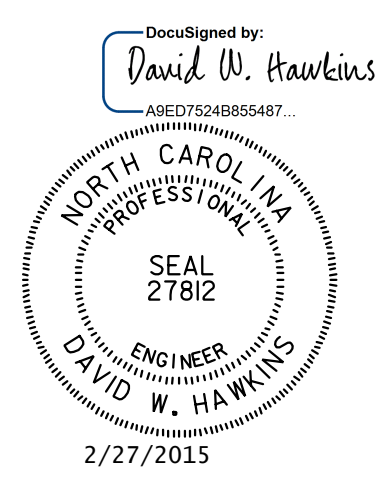
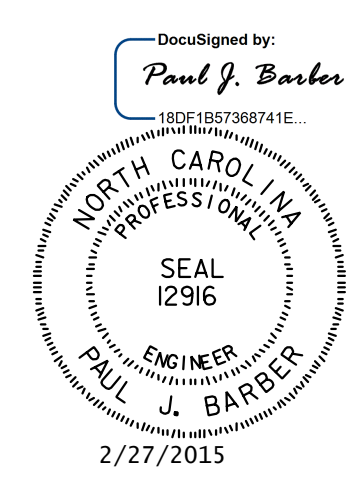
SECTION B-B

VOID DRAIN DETAILS  
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POS 22+07.07 -L-  
 MILE POST: 0.23

DIAPHRAGM DETAILS

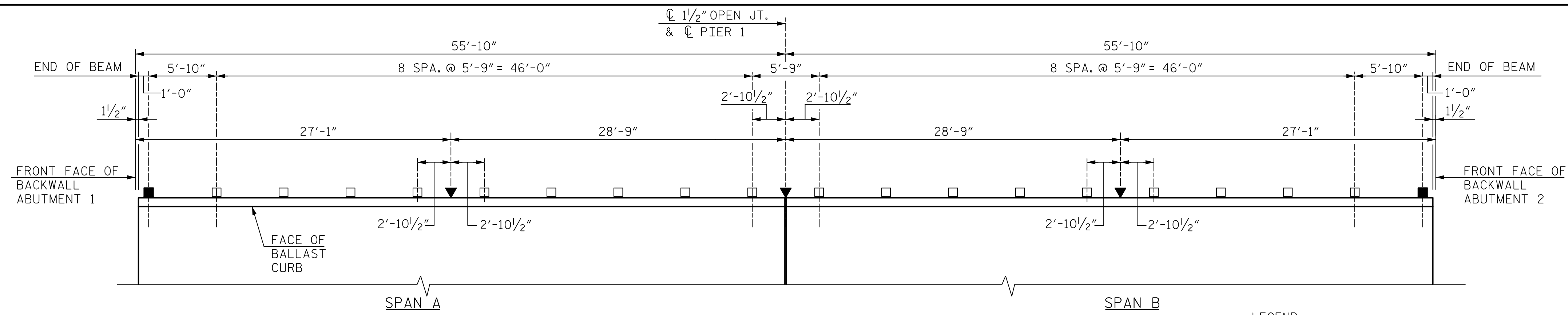
#5 "S" BARS NOT SHOWN. #5 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2 1/2" Ø HOLE.



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DRAWN BY M. WRIGHT DATE 8/14  
 CHECKED BY P. BARBER DATE 9/14 DWG. NO. 8

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			54



**NOTES:**  
 HANDRAIL POST SHALL BE ASTM A36 STEEL.  
 HANDRAIL PIPE SHALL BE ASTM A53 GRADE B STEEL.  
 HANDRAIL ASSEMBLIES SHALL BE SHOP-PAINTED WITH AN INORGANIC ZINC-ACRYLIC SYSTEM IN ACCORDANCE WITH SYSTEM 1 OF ARTICLE 442-7 OF THE STANDARD SPECIFICATIONS. TOP COAT SHALL BE WHITE, FS 17925 FEDERAL STANDARD 575 COLOR.

ALL WELDING SHALL BE IN CONFORMANCE WITH AWS D1.5, BRIDGE WELDING CODE, CURRENT EDITION.  
 JOINTS IN RAILING (SPLICE GAP) SHALL BE LOCATED AS SHOWN IN POST SPACING PLAN.

POSTS SHALL BE SET PERPENDICULAR TO CURB AND RAILS SHALL BE PLACED PARALLEL TO GRADE OF BALLAST CURB.

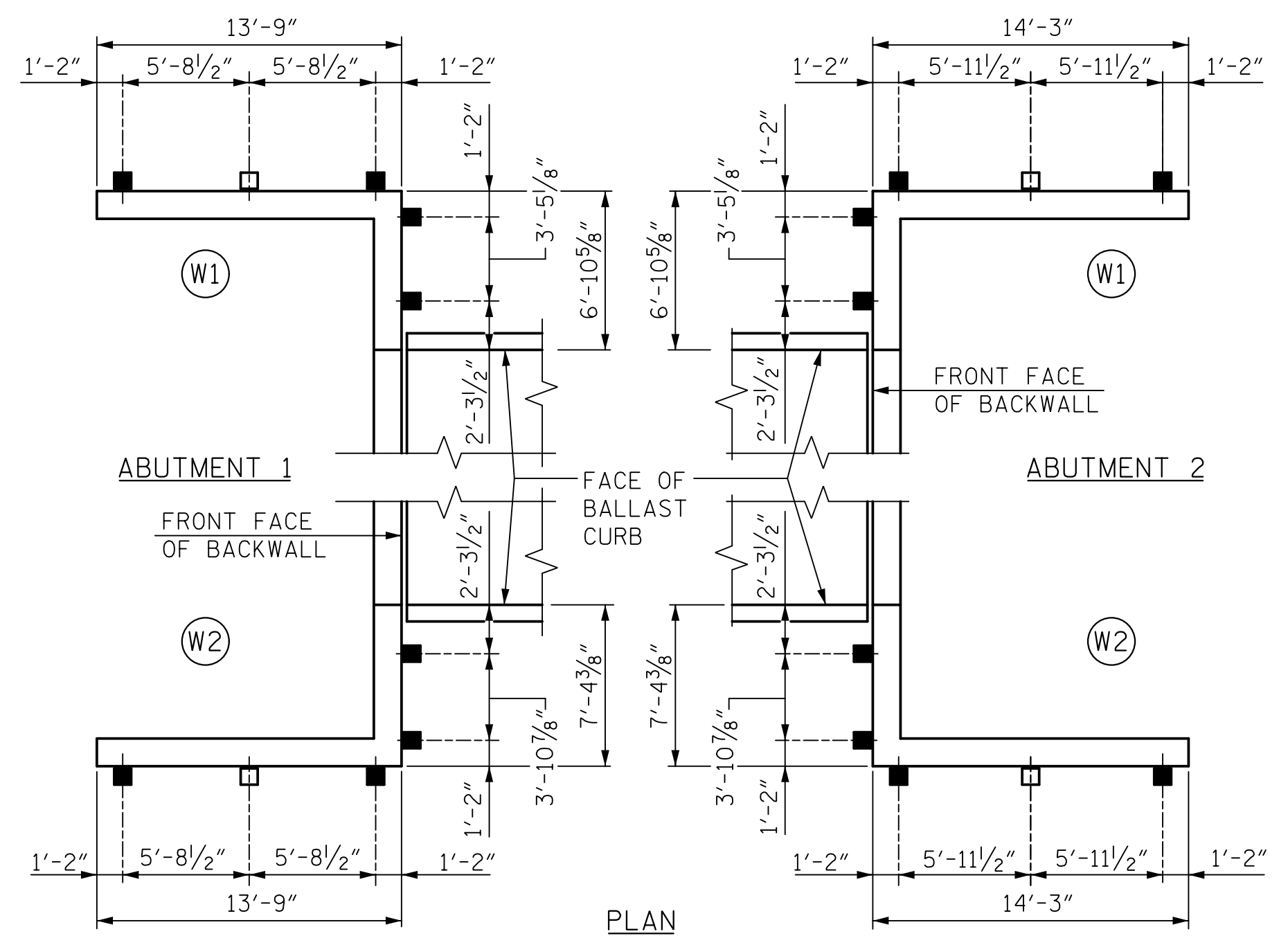
CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTIONS ARE NOT REQUIRED.

THE CENTERLINE OF ANY SPLICE AND/OR EXPANSION JOINT SHALL BE LOCATED A MINIMUM OF 2'-0" FROM CENTERLINE POST. SPLICE JOINTS IN EACH OF THE TWO RAILS SHALL BE PLACED IN THE SAME LOCATION AND PANEL.

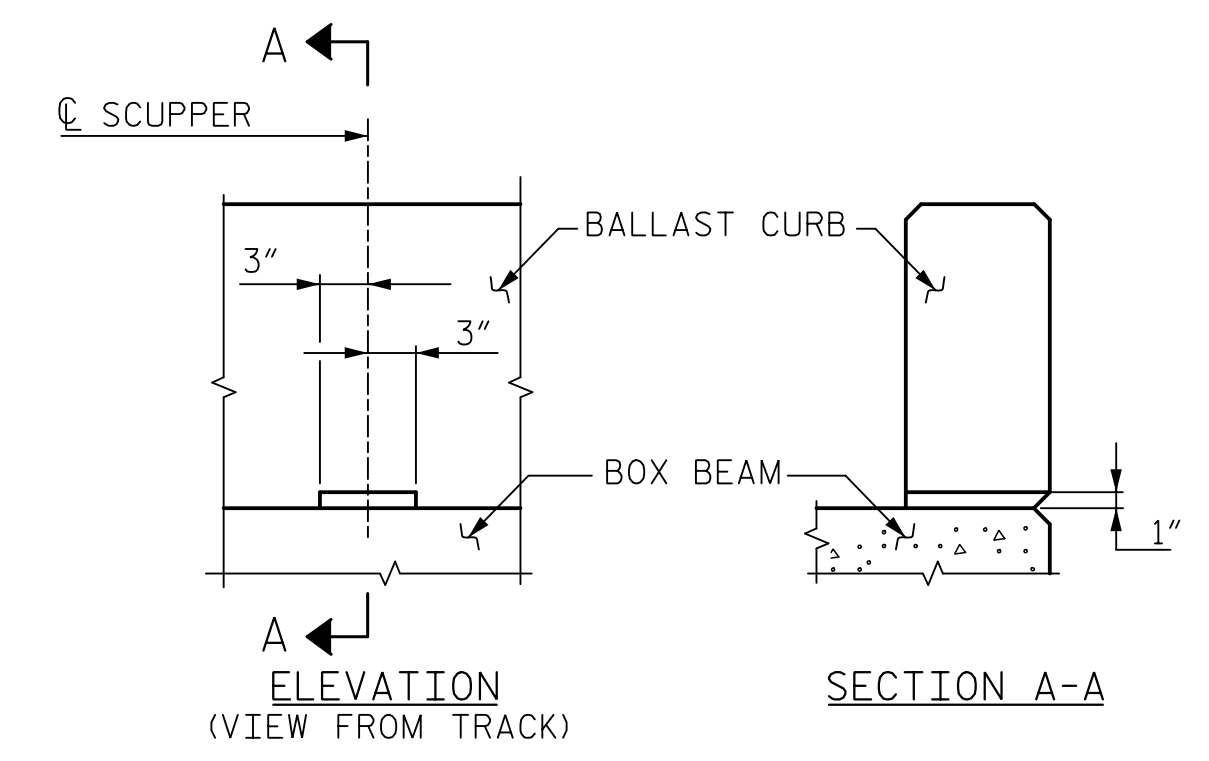
SHOP DRAWINGS FOR RAILINGS AND COIL LOOP INSERTS ARE REQUIRED AND SHALL BE SUBMITTED FOR APPROVAL.

**HANDRAIL POST SPACING - BRIDGE**  
 (LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)

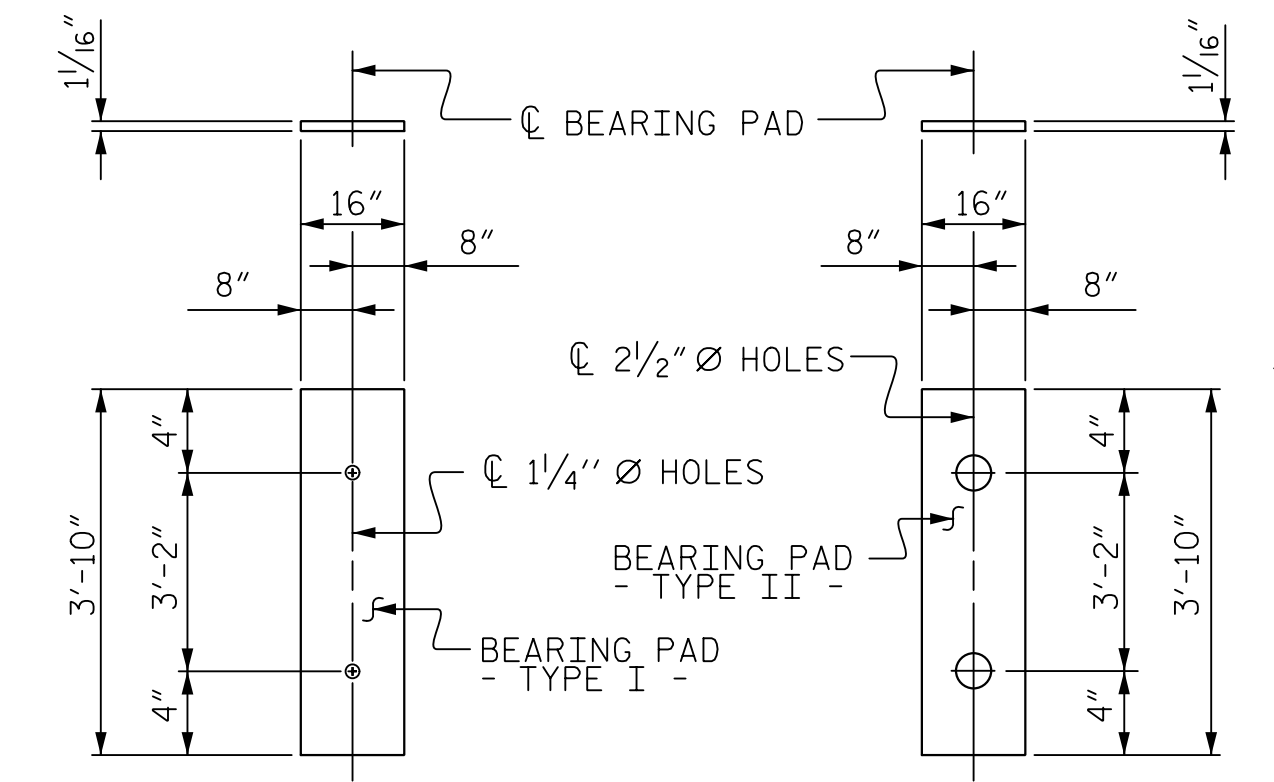
- LEGEND**
- - INTERIOR POST
  - - END POST
  - ▼ - RAIL EXPANSION JOINT



**HANDRAIL POST SPACING - WINGWALLS**

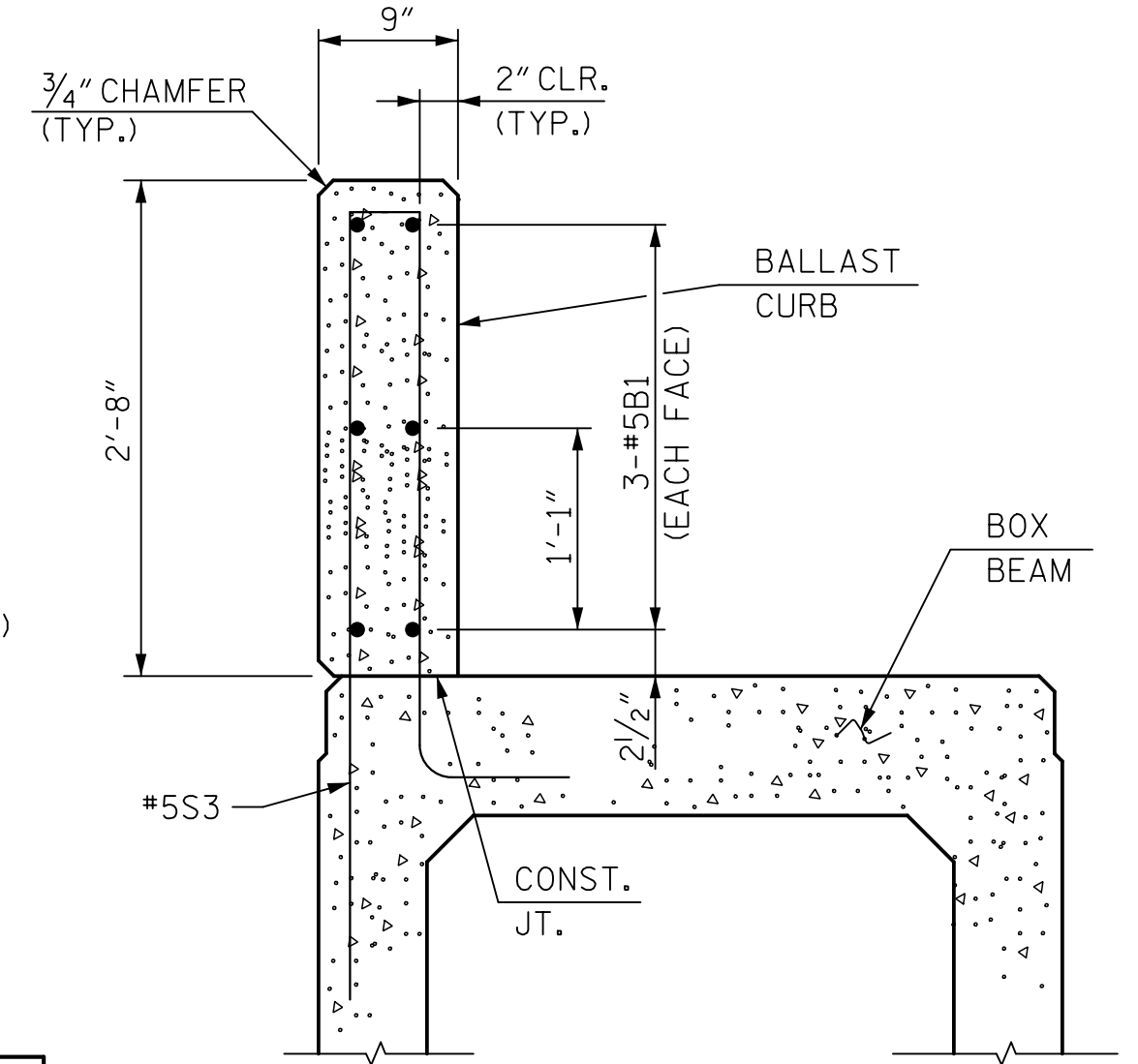


**SCUPPER DETAILS**  
 (REINFORCING STEEL NOT SHOWN FOR CLARITY)



**ELASTOMERIC BEARING DETAILS**

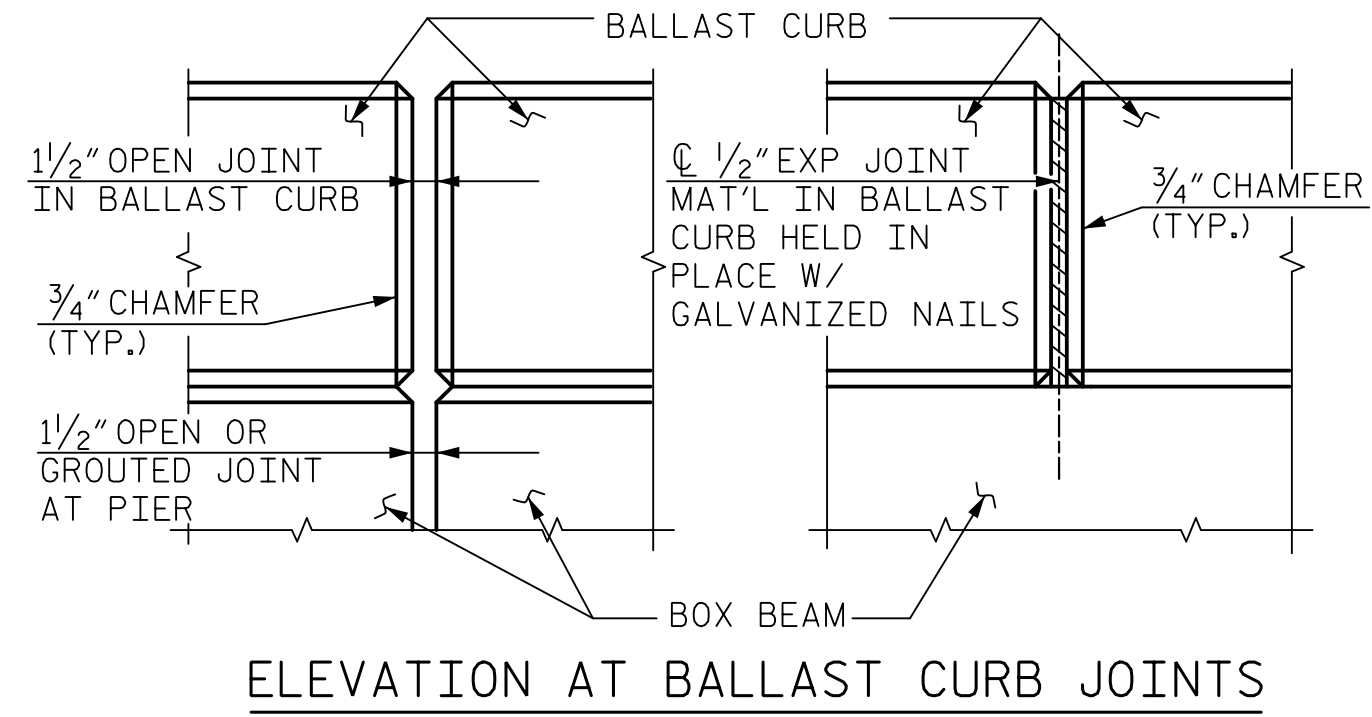
THE ELASTOMER IN THE BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.140 KSI, IN ACCORDANCE WITH AASHTO M251, AND SHALL BE 60 DUROMETER HARDNESS.



**SECTION THRU CURB**  
**BALLAST CURB DETAILS**

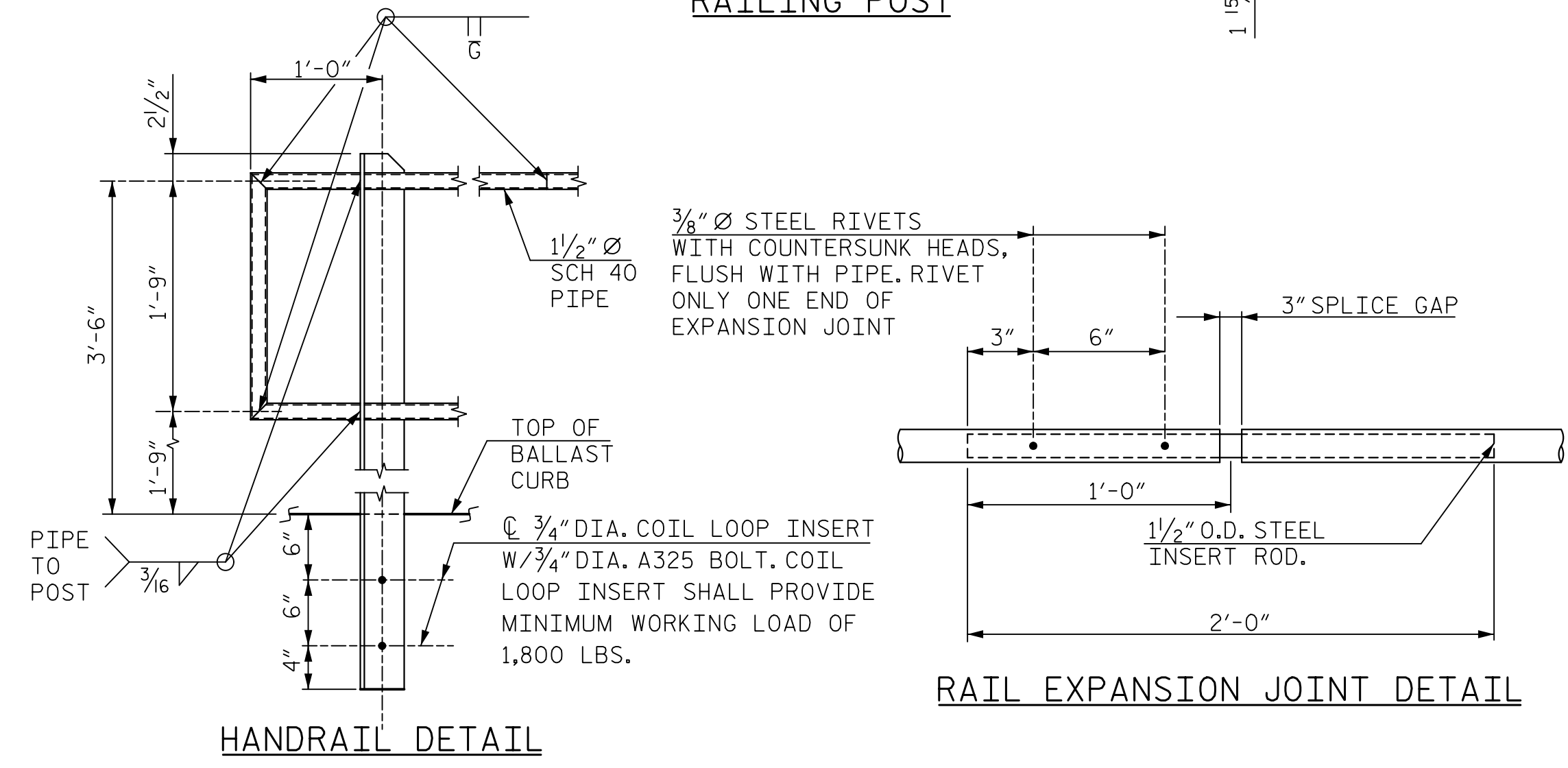
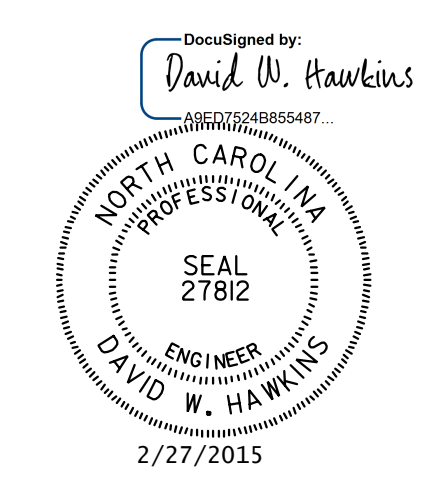
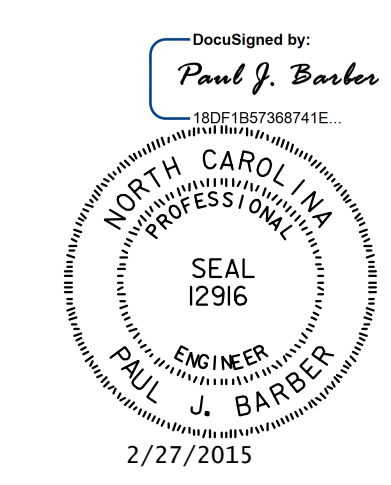
PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POS 22+07.07 -L-  
 MILE POST: 0.23

BOX BEAM UNITS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
SPAN A	5	55'-7 3/4"	278'-2 3/4"
SPAN B	5	55'-7 3/4"	278'-2 3/4"
TOTAL	10		556'-5 1/2"



**ELEVATION AT BALLAST CURB JOINTS**

BILL OF MATERIAL FOR BALLAST CURB						
BAR	BARS PER SPAN	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	60	60	#5	STR	10'-8"	1,335
REINFORCING STEEL						LBS. 1,335
CAST-IN-PLACE CONCRETE (5,000 PSI)						CU.YDS. 16.5
TOTAL LIN. FT. OF CONCRETE BALLAST CURB						LIN. FT. 222.6



**HANDRAIL DETAIL**

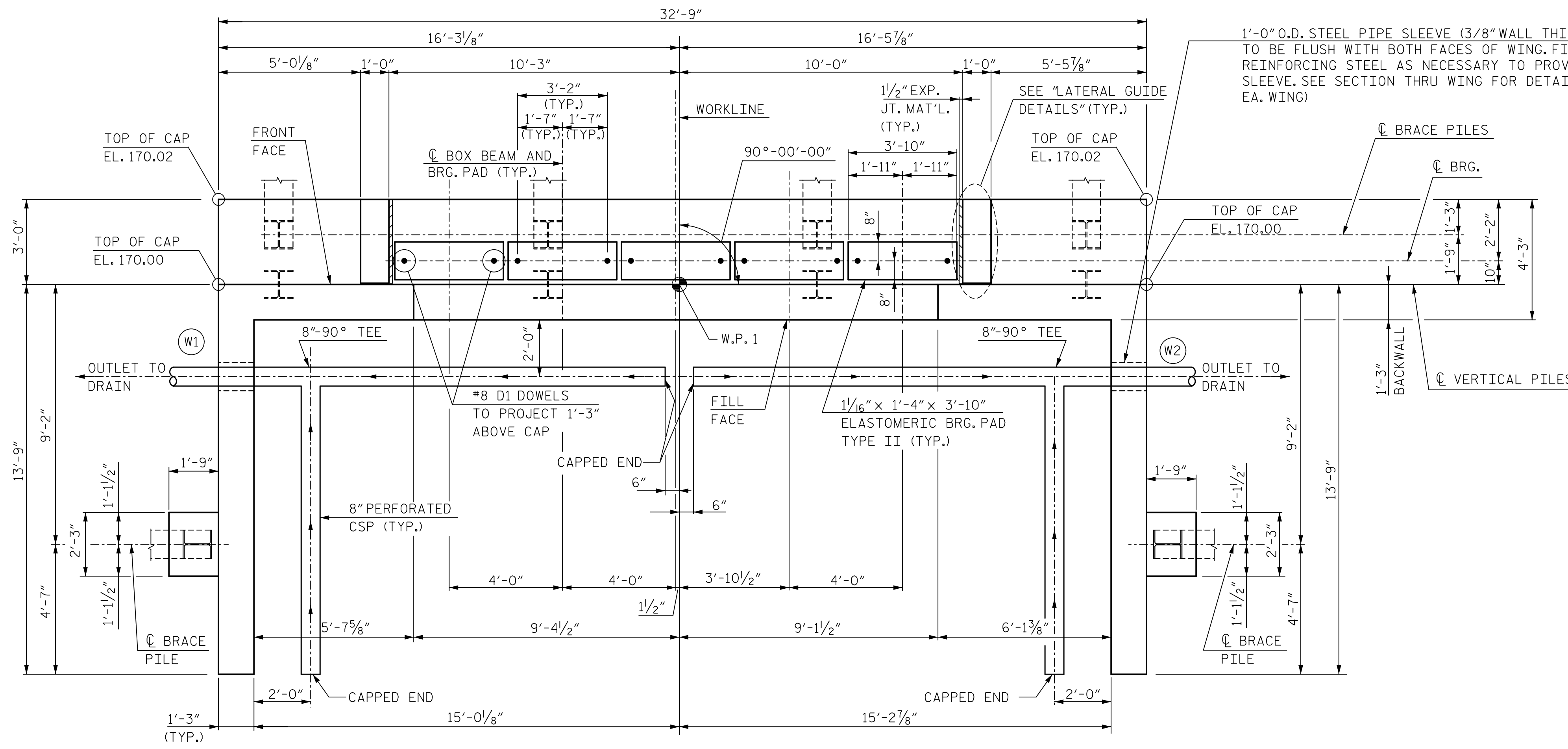
**RAIL EXPANSION JOINT DETAIL**

<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: M. WRIGHT	DATE: 8/14	DWG. NO. 9	
CHECKED BY: P. BARBER	DATE: 9/14		

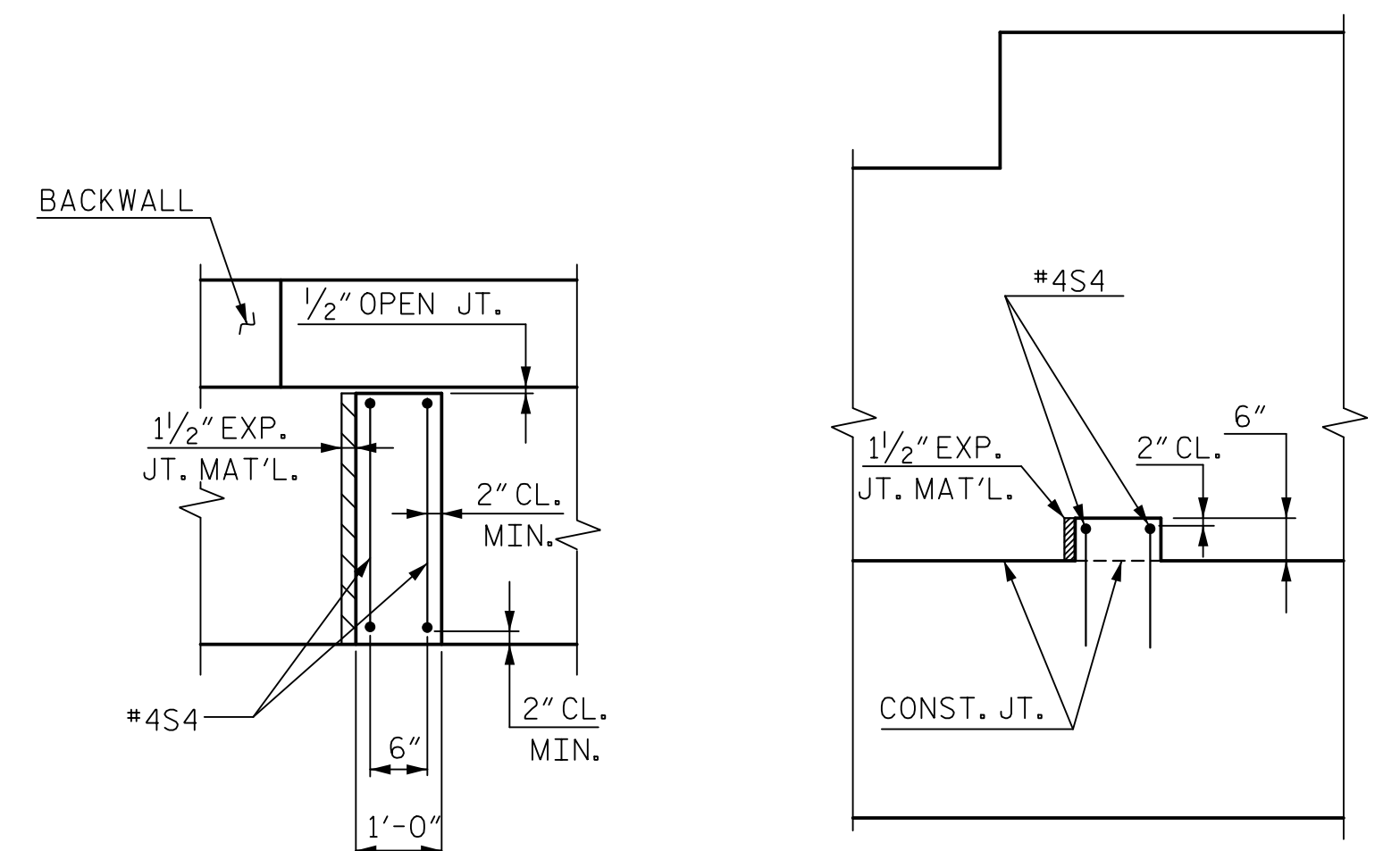
REVISIONS			
NO.	BY:	DATE:	DATE:
1			
2			

SHEET NO. <b>S-9</b>	
TOTAL SHEETS	<b>54</b>

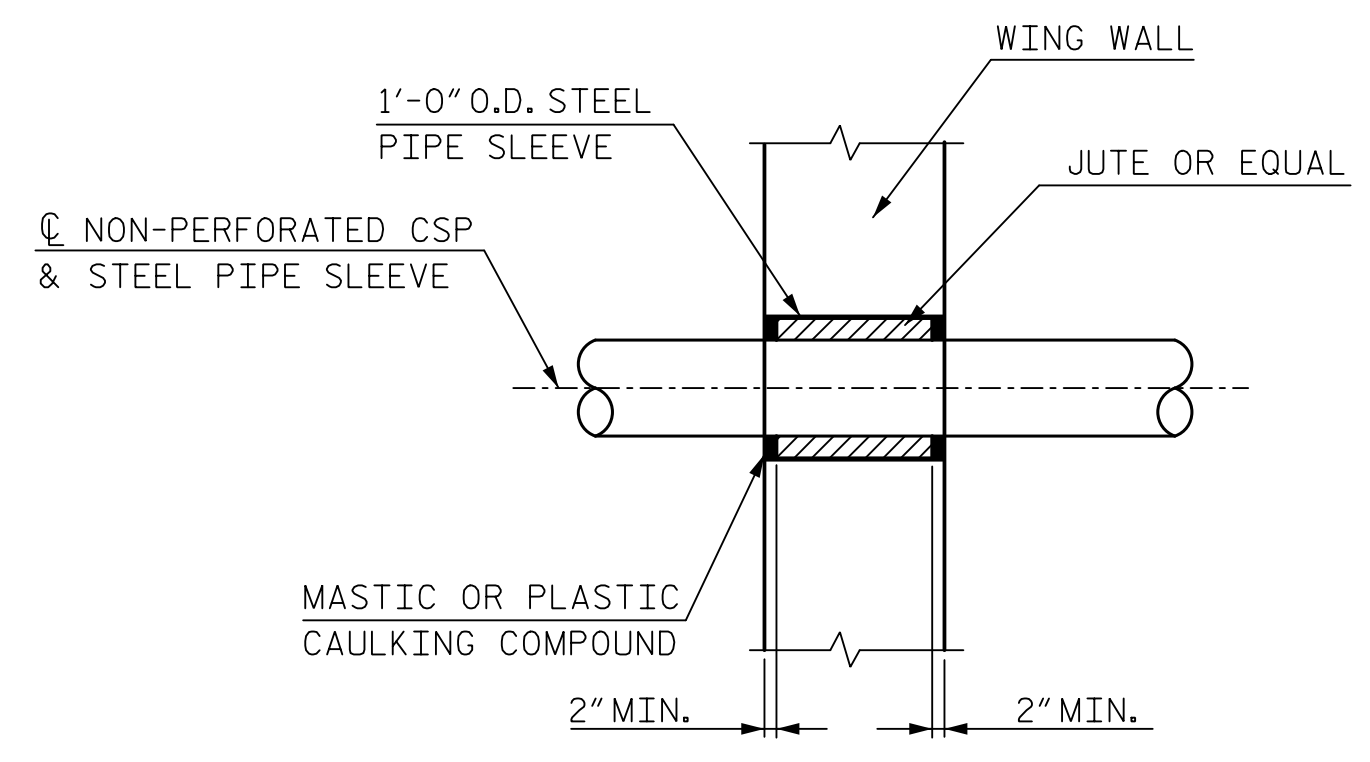
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUPERSTRUCTURE**  
**BOX BEAM SUMMARY**  
**AND HANDRAIL DETAILS**



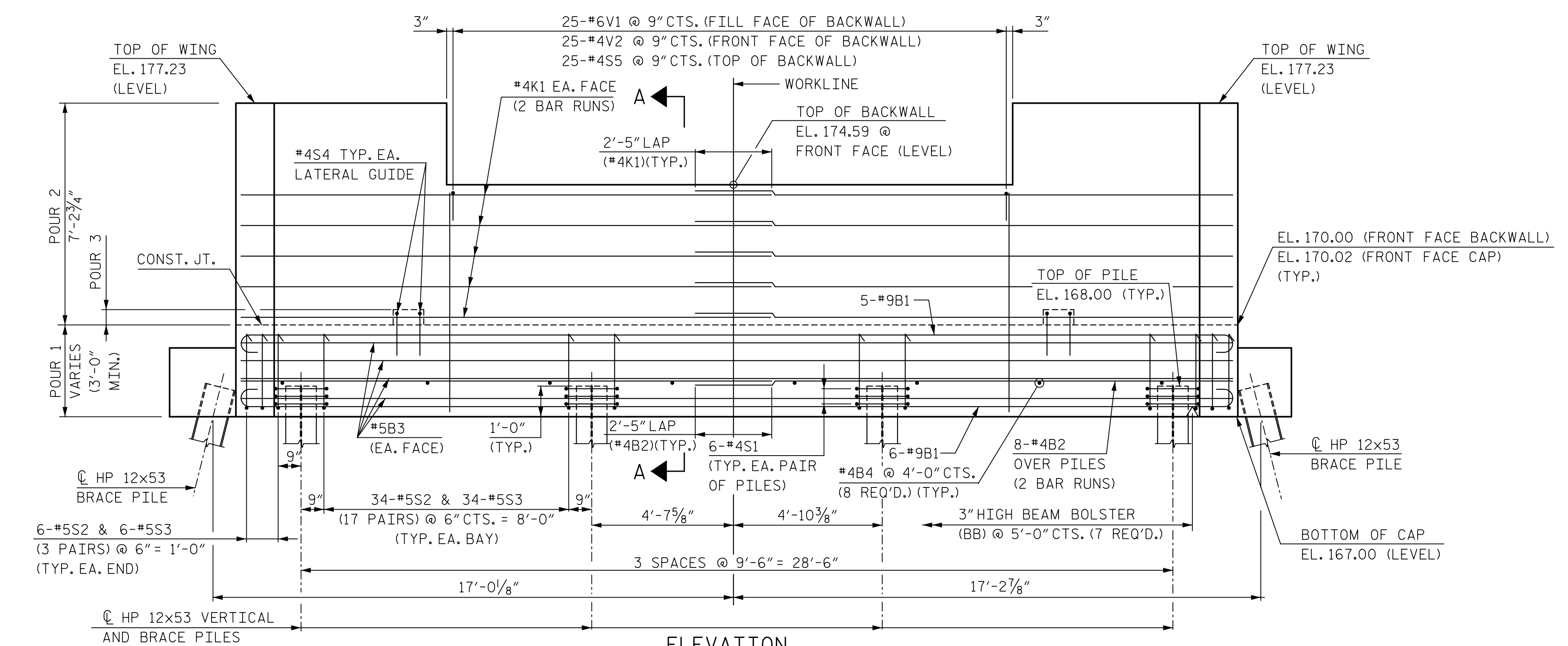
PLAN



LATERAL GUIDE DETAILS



SECTION THRU WING

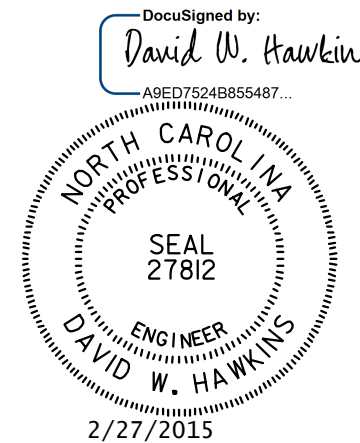
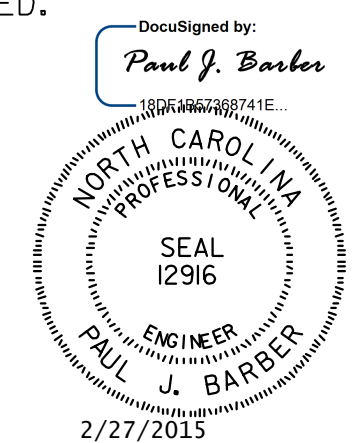


ELEVATION

NOTES:

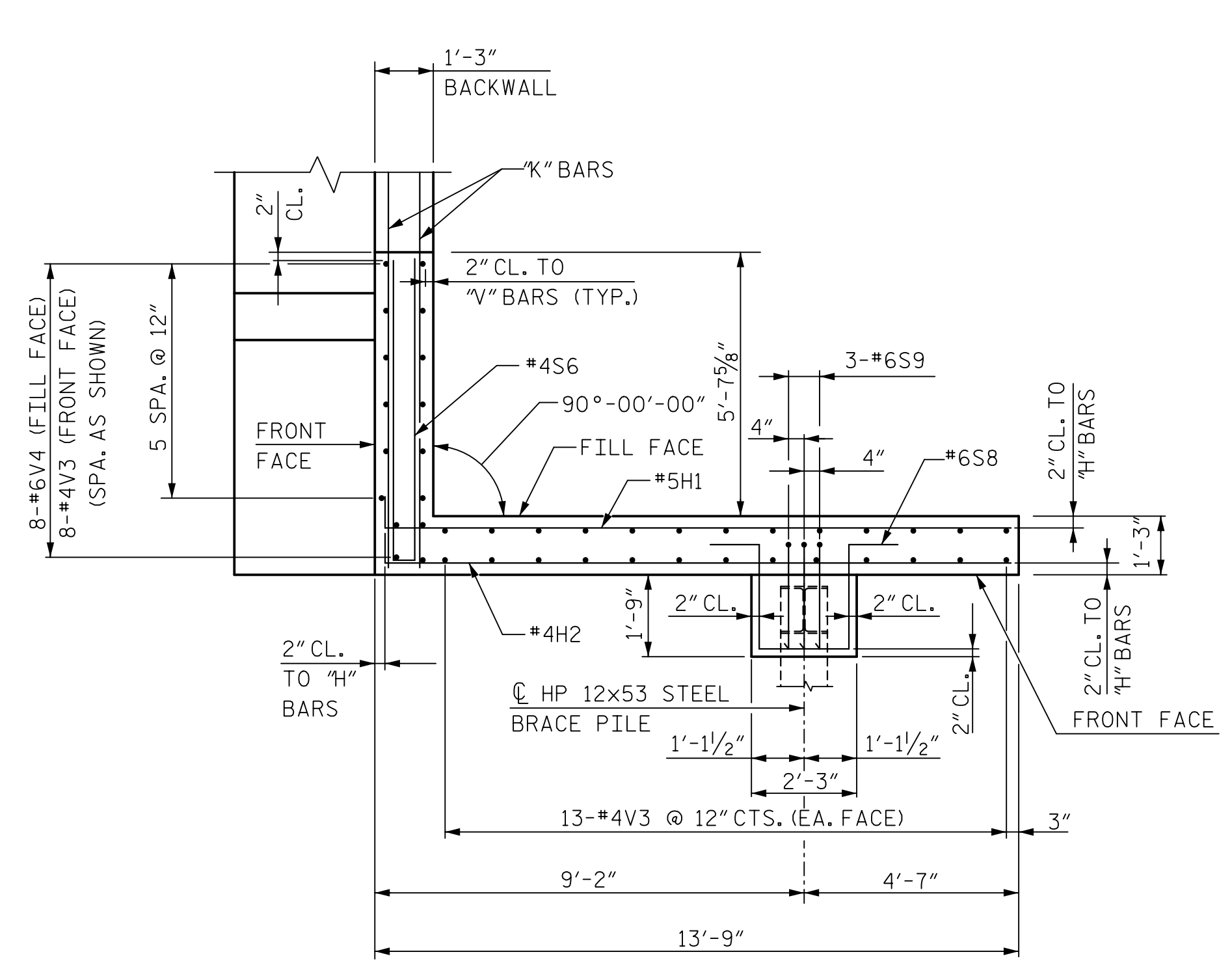
- FOR WINGWALL DETAILS, SEE SHEET 2 OF 3.
- FOR SECTION A-A, PILE SPLICE DETAILS, AND GENERAL NOTES, SEE SHEET 3 OF 3.
- [Symbol] INDICATES 3:12 PILE BATTER IN DIRECTION SHOWN.
- PAYMENT FOR PIPE SLEEVE INSERT SHALL BE CONSIDERED AS INCIDENTAL TO CONSTRUCTION OF END BENT.
- CORRUGATED STEEL PIPE LOCATED IN DRAINAGE AREA BETWEEN THE WINGWALLS SHALL BE PERFORATED. ALL OTHER CSP SHALL BE NON-PERFORATED.

PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POS 22+07.07 -L-  
 MILE POST: 0.23  
 SHEET 1 OF 3

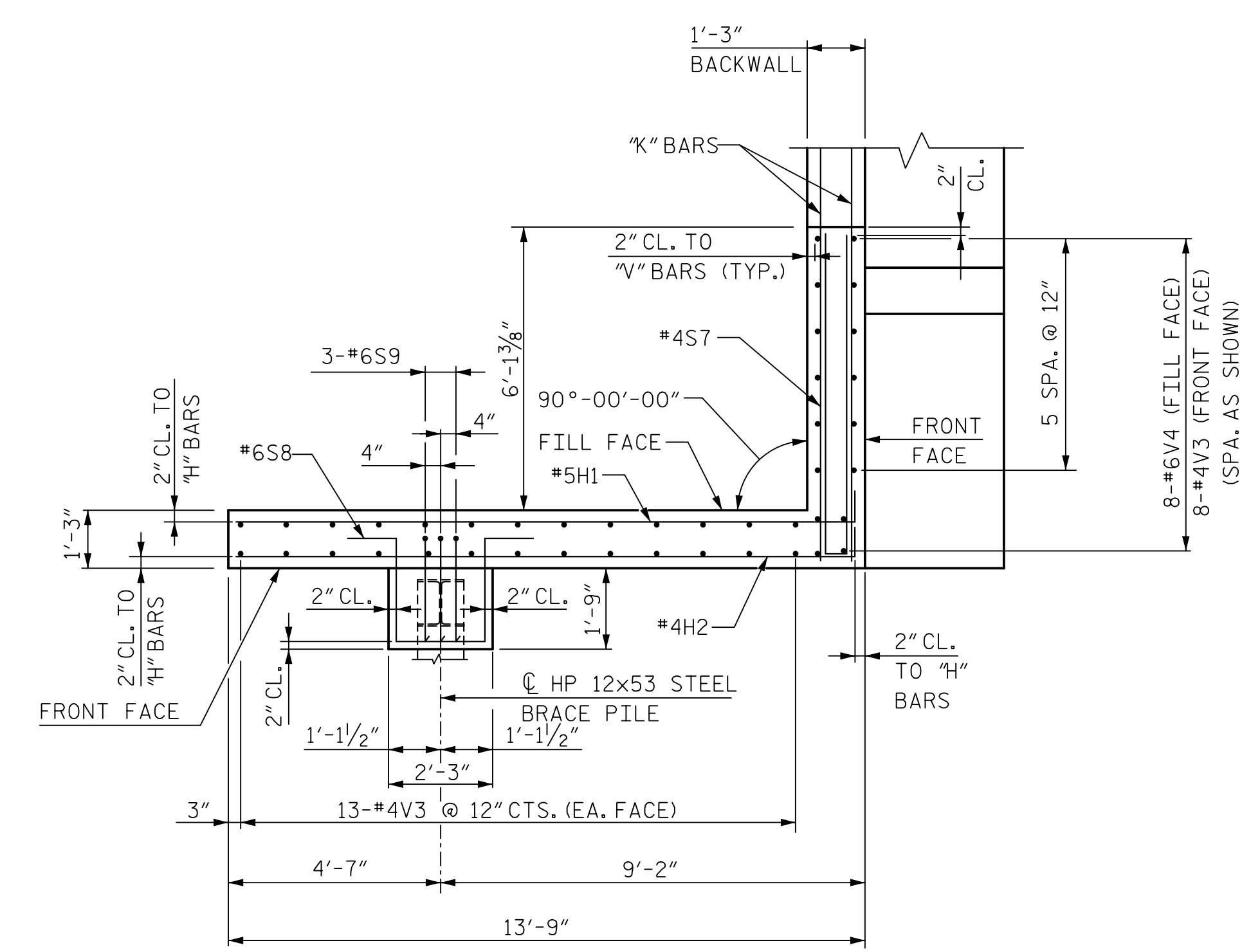


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 ABUTMENT 1

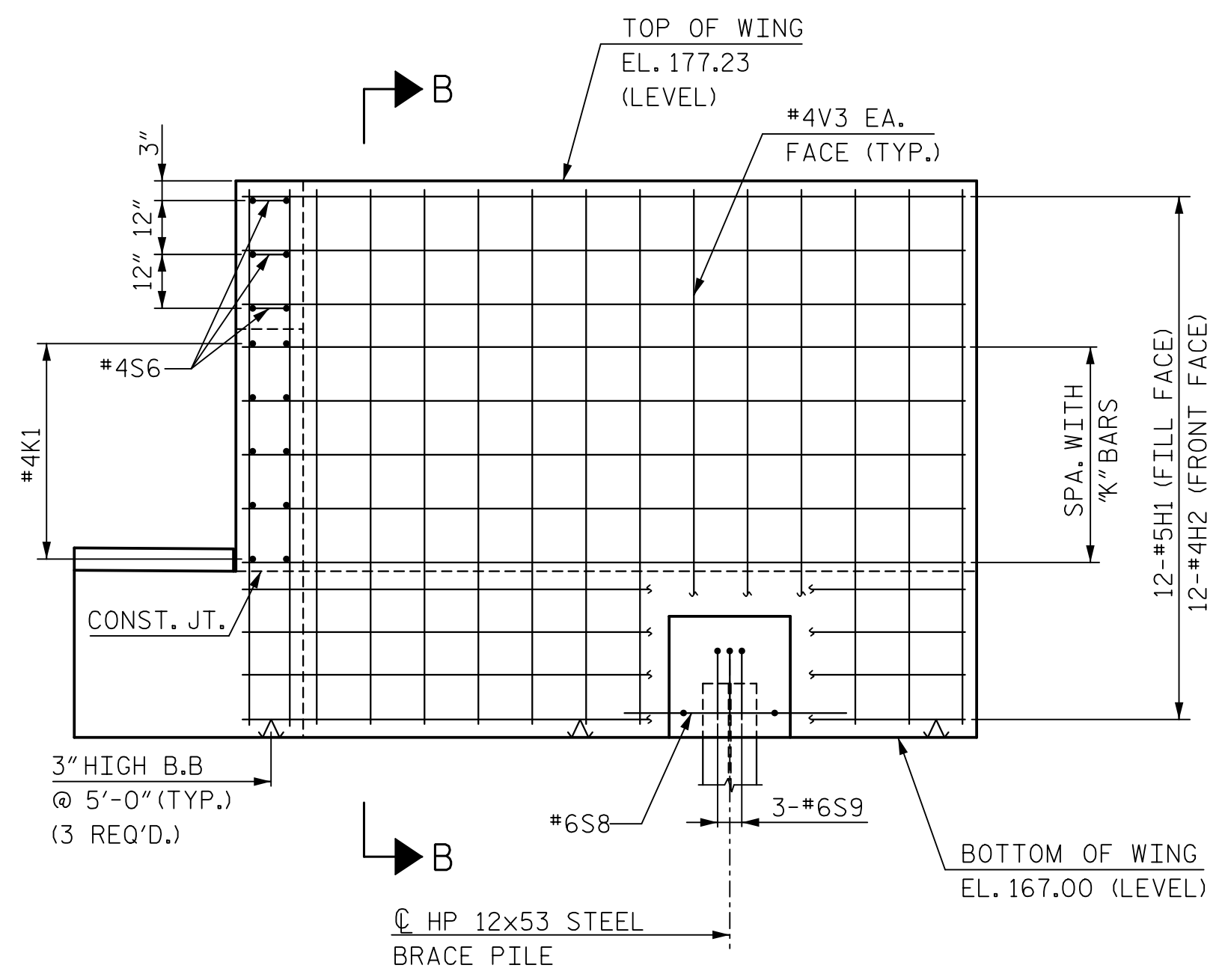
HNTB		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS			SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		
1	M. WRIGHT	9/14	3			TOTAL SHEETS	
2	D. RAGAN	10/14	4			54	



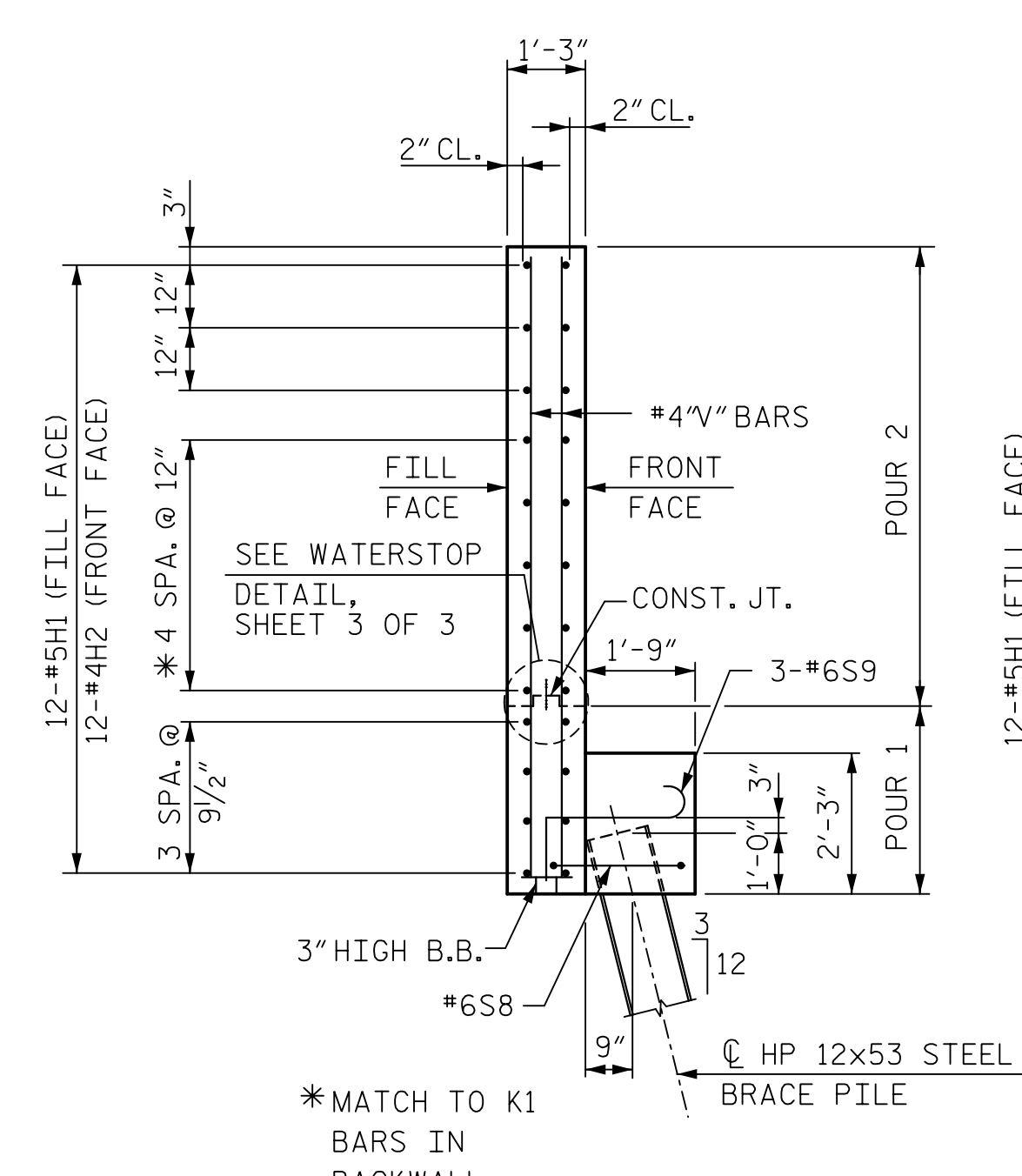
PLAN OF WING (W1)



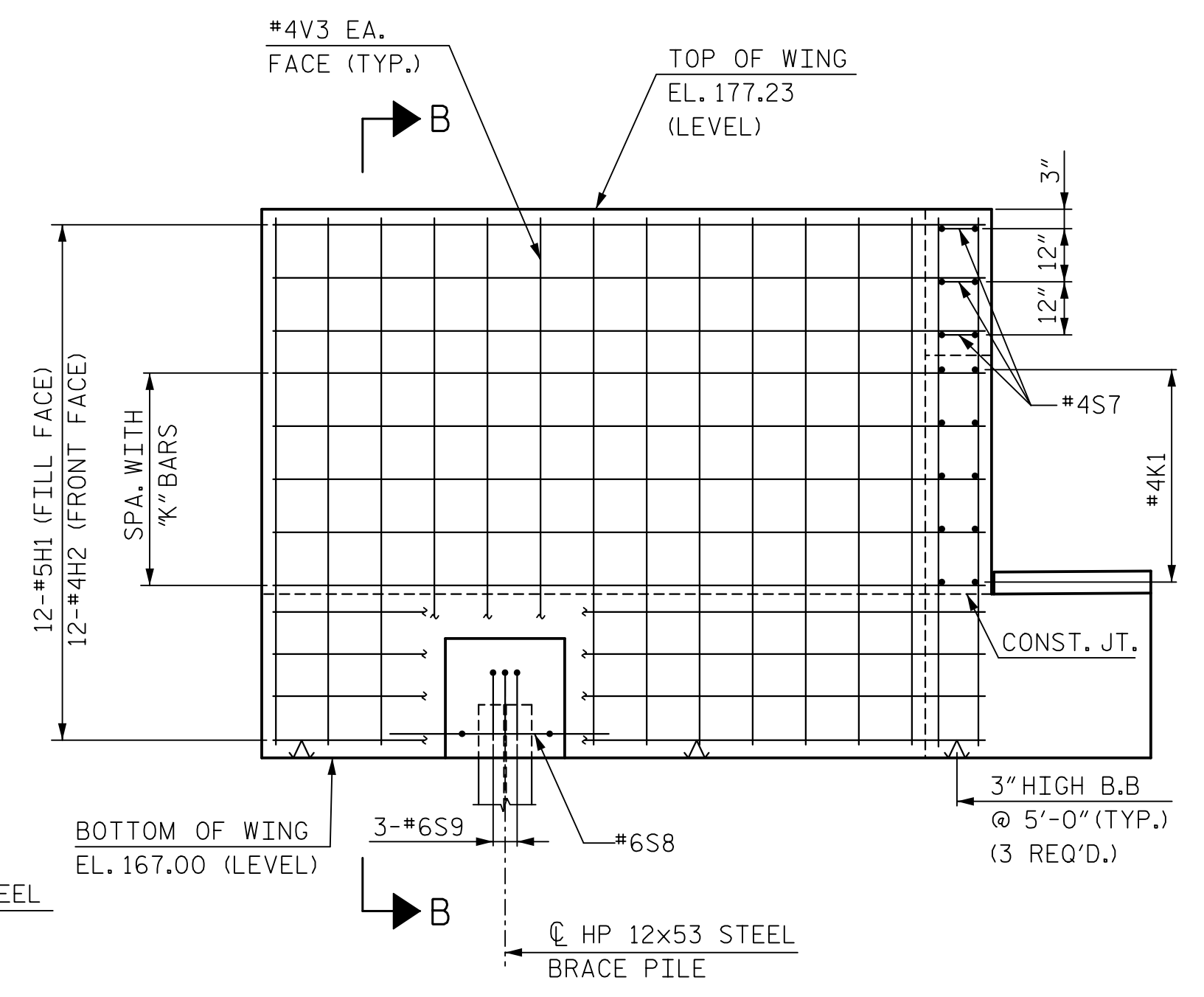
PLAN OF WING (W2)



ELEVATION OF WING (W1)

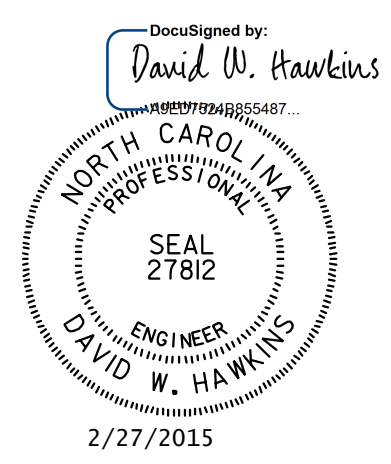
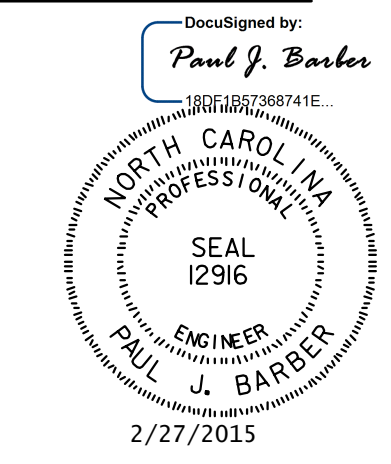


SECTION B-B



ELEVATION OF WING (W2)

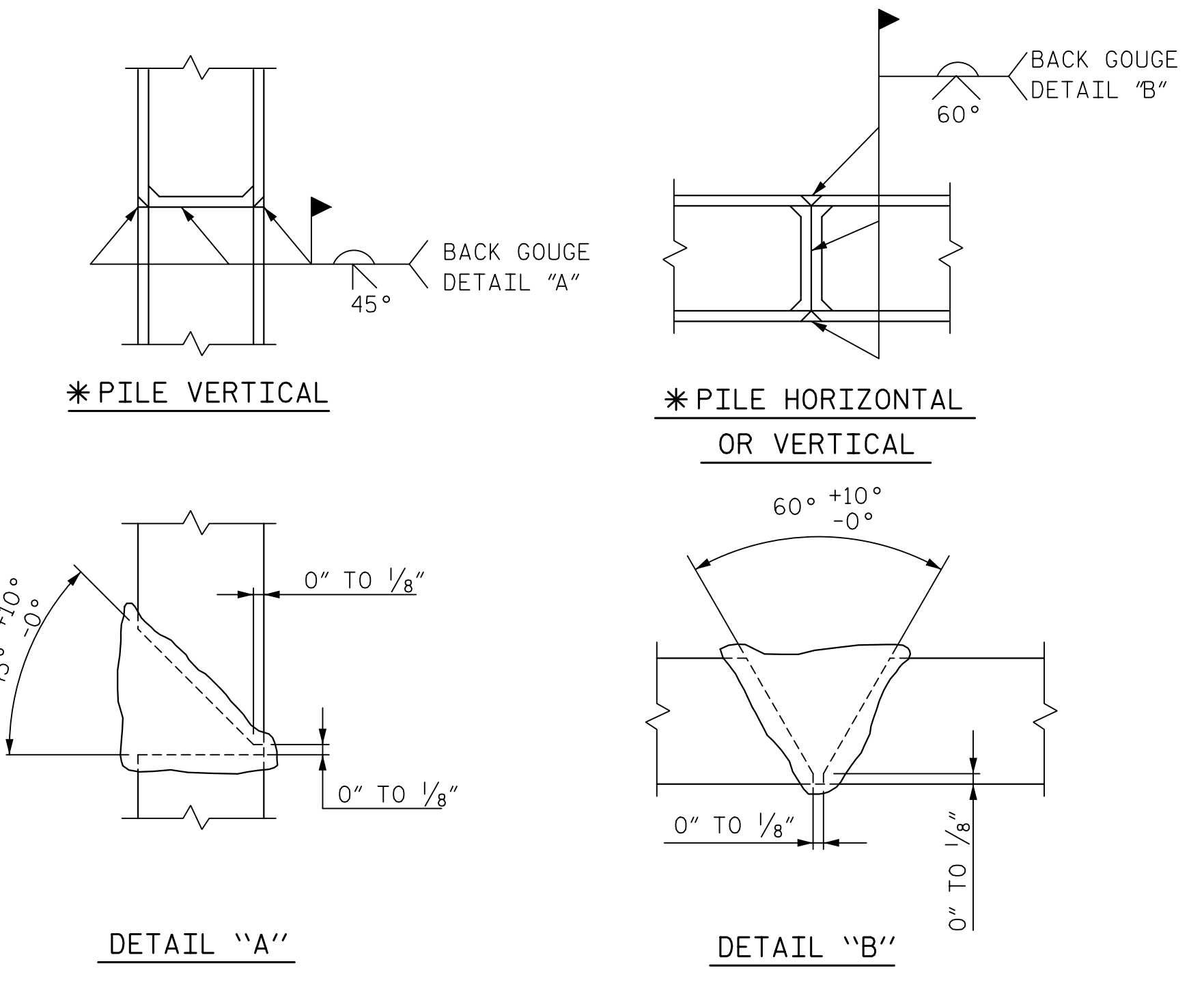
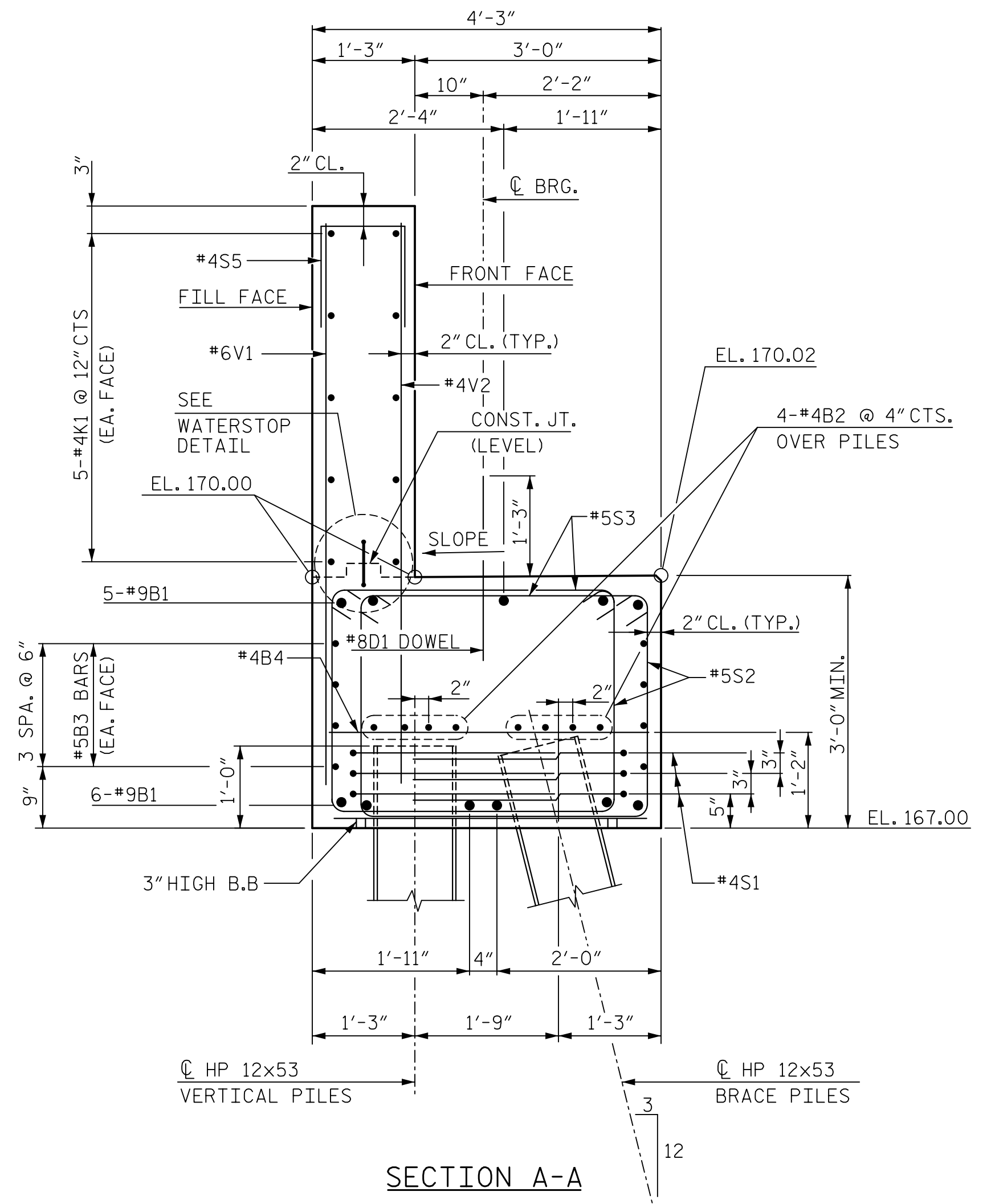
PROJECT NO. P-4900A  
 ROBESON COUNTY  
 STATION: POS 22+07.07 -L-  
 MILE POST: 0.23  
 SHEET 2 OF 3



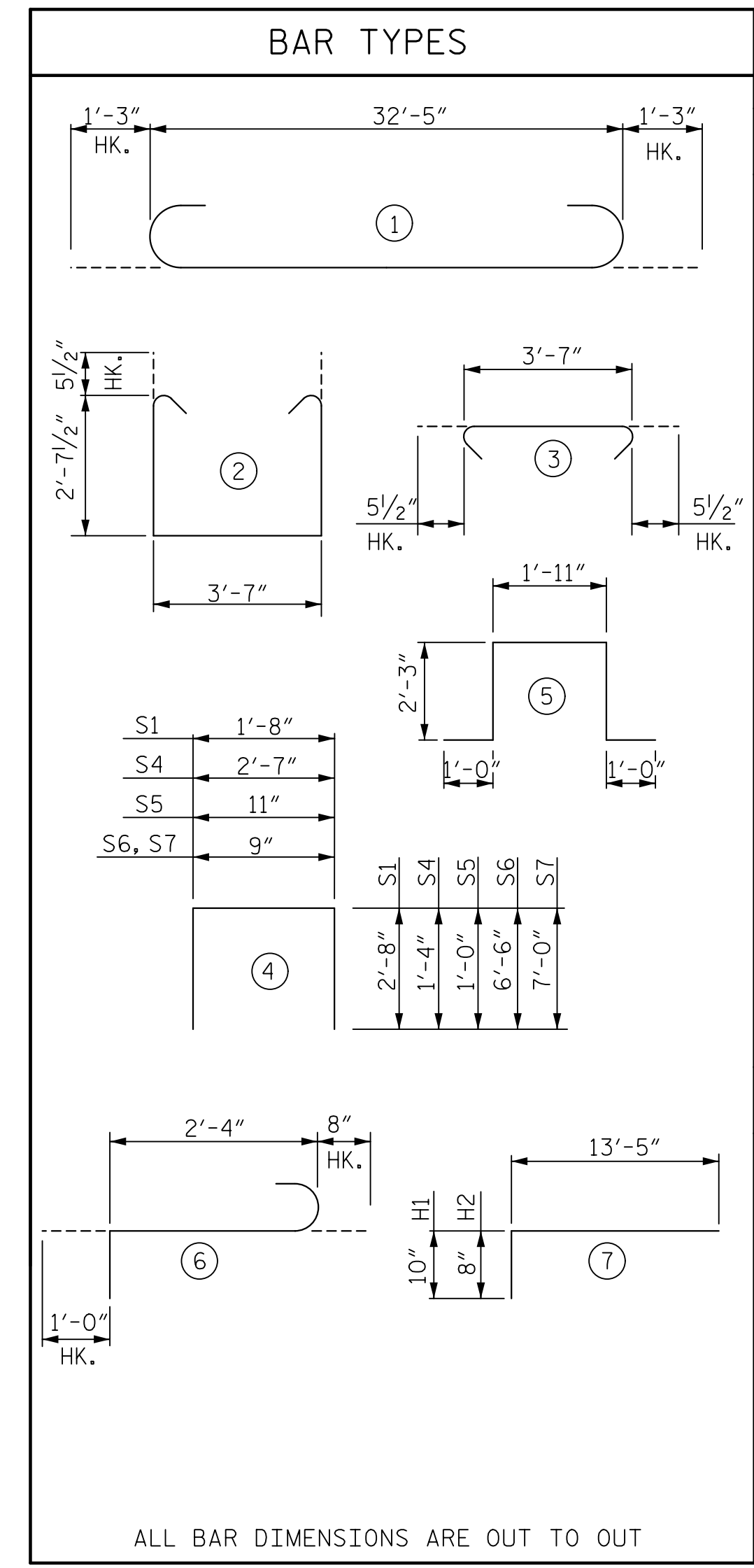
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 ABUTMENT 1

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11	
1	M. WRIGHT	9/14	3			TOTAL SHEETS	
2	D. RAGAN	10/14	4			54	

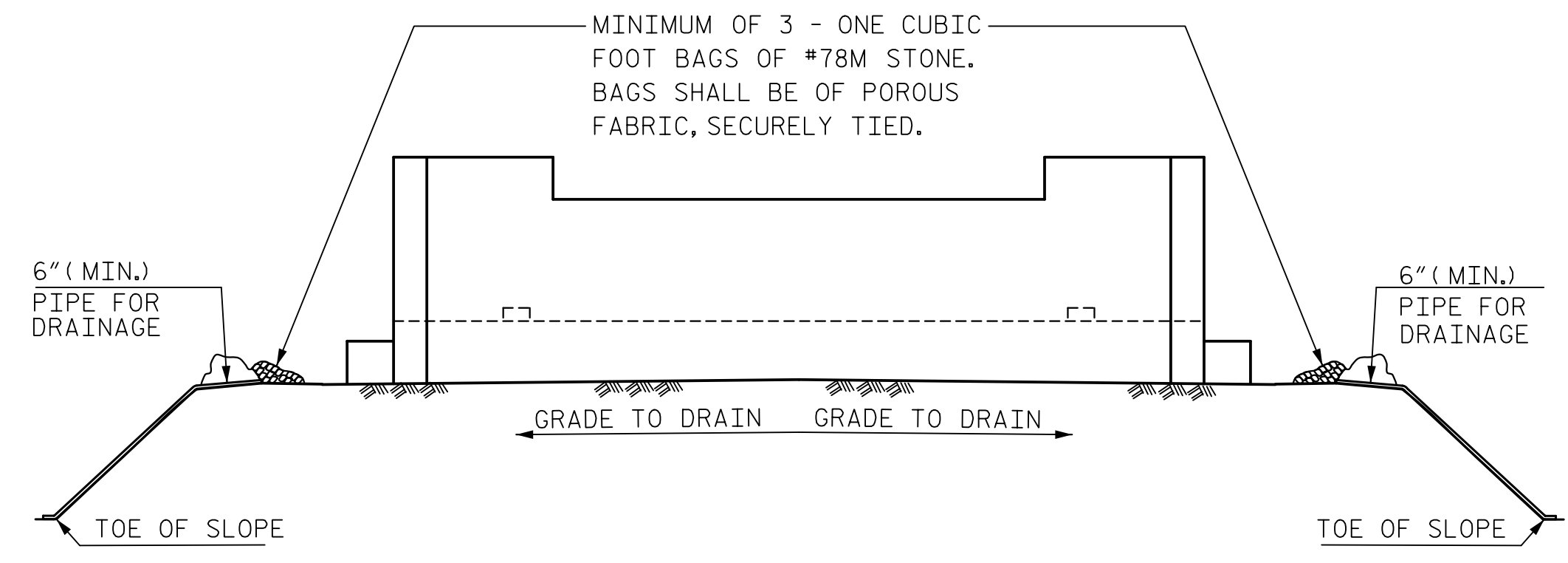
**HNTB** HNTB NORTH CAROLINA, P.C.  
 License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609  
 DRAWN BY: M. WRIGHT DATE: 9/14  
 CHECKED BY: D. RAGAN DATE: 10/14 DWG. NO. II



\* POSITION OF PILE DURING WELDING  
PILE SPLICE DETAILS



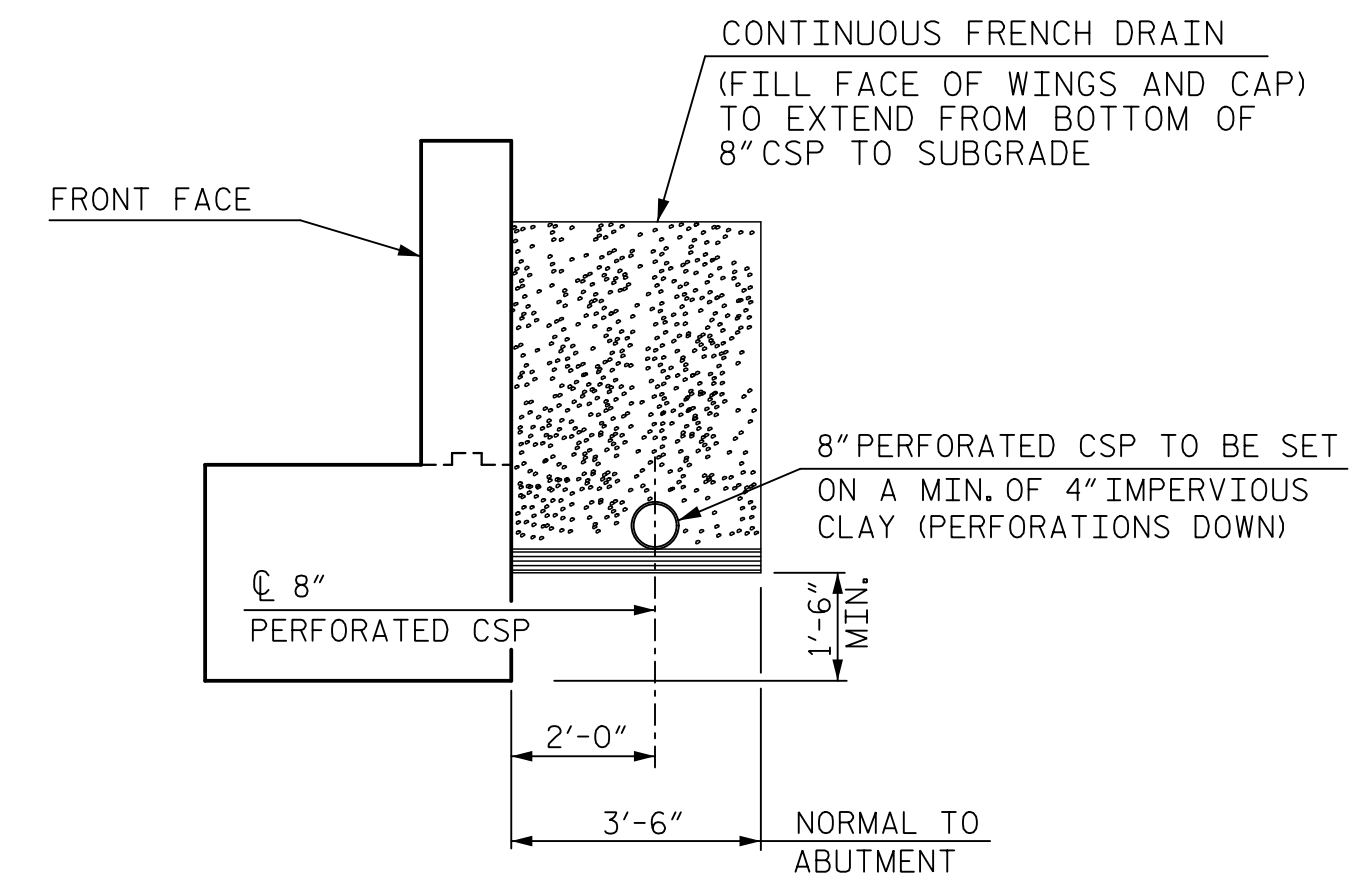
BILL OF REINFORCING					
ABUTMENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	11	9	1	34'-11"	1,306
B2	16	4	STR	17'-5"	186
B3	8	5	STR	32'-5"	270
B4	8	4	STR	3'-11"	21
D1	10	8	STR	2'-3"	60
H1	24	5	7	14'-3"	357
H2	24	4	7	14'-1"	226
K1	20	4	STR	17'-5"	233
S1	24	4	4	7'-0"	112
S2	114	5	2	9'-9"	1,159
S3	114	5	3	4'-6"	535
S4	4	4	4	5'-3"	14
S5	25	4	4	2'-11"	49
S6	3	4	4	13'-9"	28
S7	3	4	4	14'-9"	30
S8	2	6	5	8'-5"	25
S9	6	6	6	4'-0"	36
V1	25	6	STR	7'-2"	269
V2	25	4	STR	7'-2"	120
V3	68	4	STR	9'-9"	443
V4	16	6	STR	9'-9"	234
QUANTITIES					
REINFORCING STEEL				LBS.	5,713
CAST-IN-PLACE CONCRETE (4,000 PSI):					
POUR 1 - CAP & BOT. OF WINGS				CU. YDS.	19.8
POUR 2 - TOP OF WINGS & BACKWALL				CU. YDS.	16.9
POUR 3 - LATERAL GUIDES				CU. YDS.	0.1
TOTAL				CU. YDS.	36.8
HP 12x53 STEEL PILES				NO.	10
				L.F.	650
STEEL PILE POINTS				EACH	10



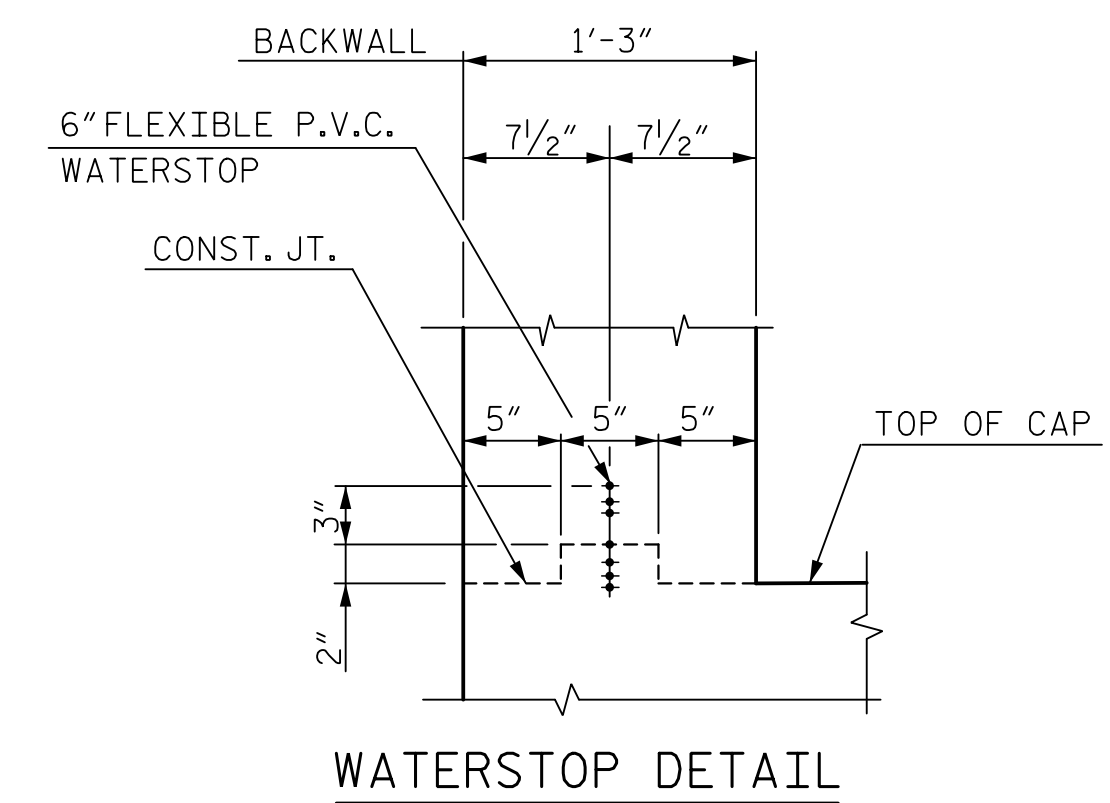
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF THE ABUTMENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

TEMPORARY DRAINAGE AT ABUTMENT



CONTINUOUS FRENCH DRAIN DETAIL



WATERSTOP DETAIL

NOTES:

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #8D1 DOWELS.

THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL BOX BEAMS ARE IN PLACE.

PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POS 22+07.07 -L-  
 MILE POST: 0.23  
 SHEET 3 OF 3

DocuSigned by:  
**Paul J. Barber**  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 12916  
 2/27/2015

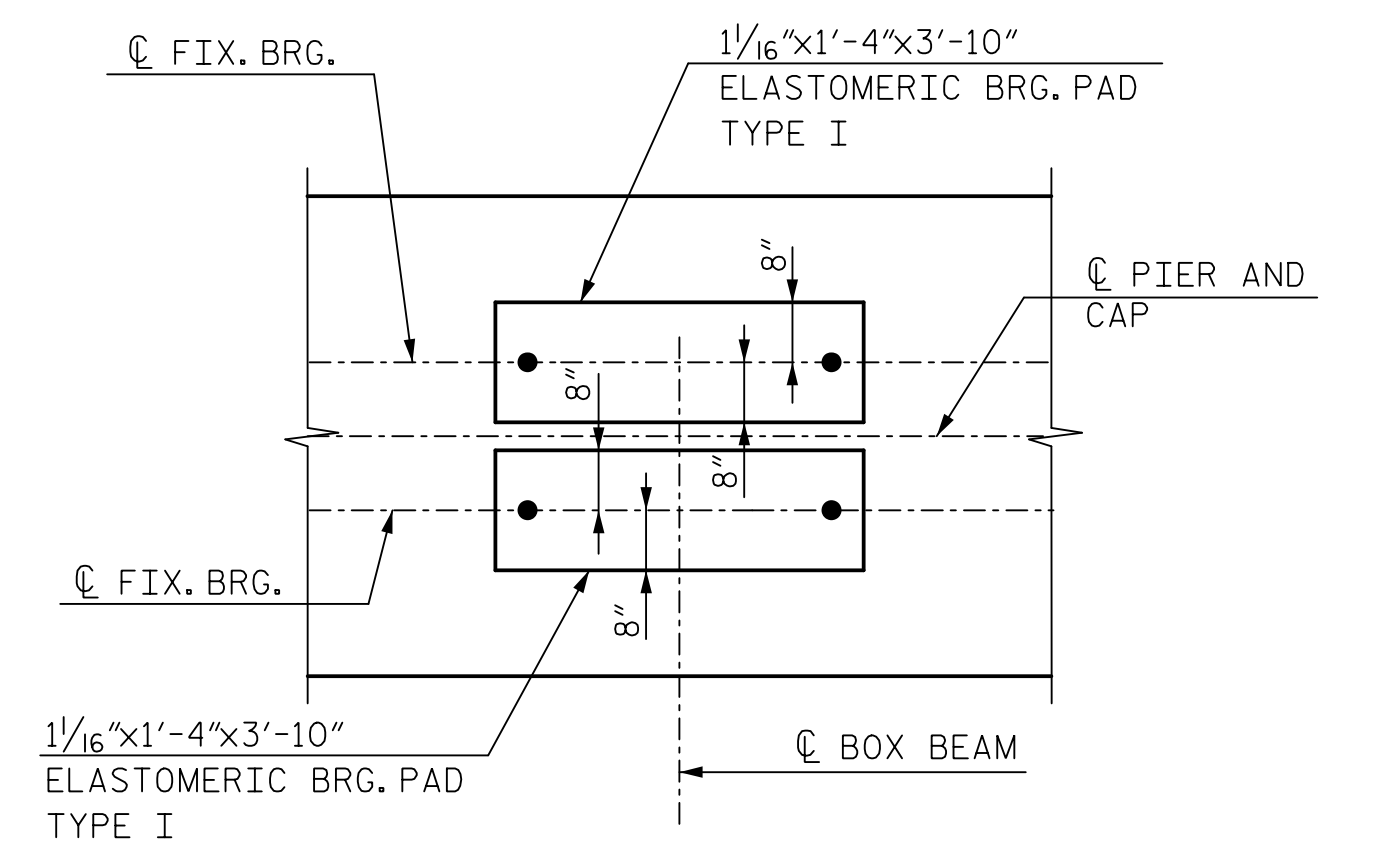
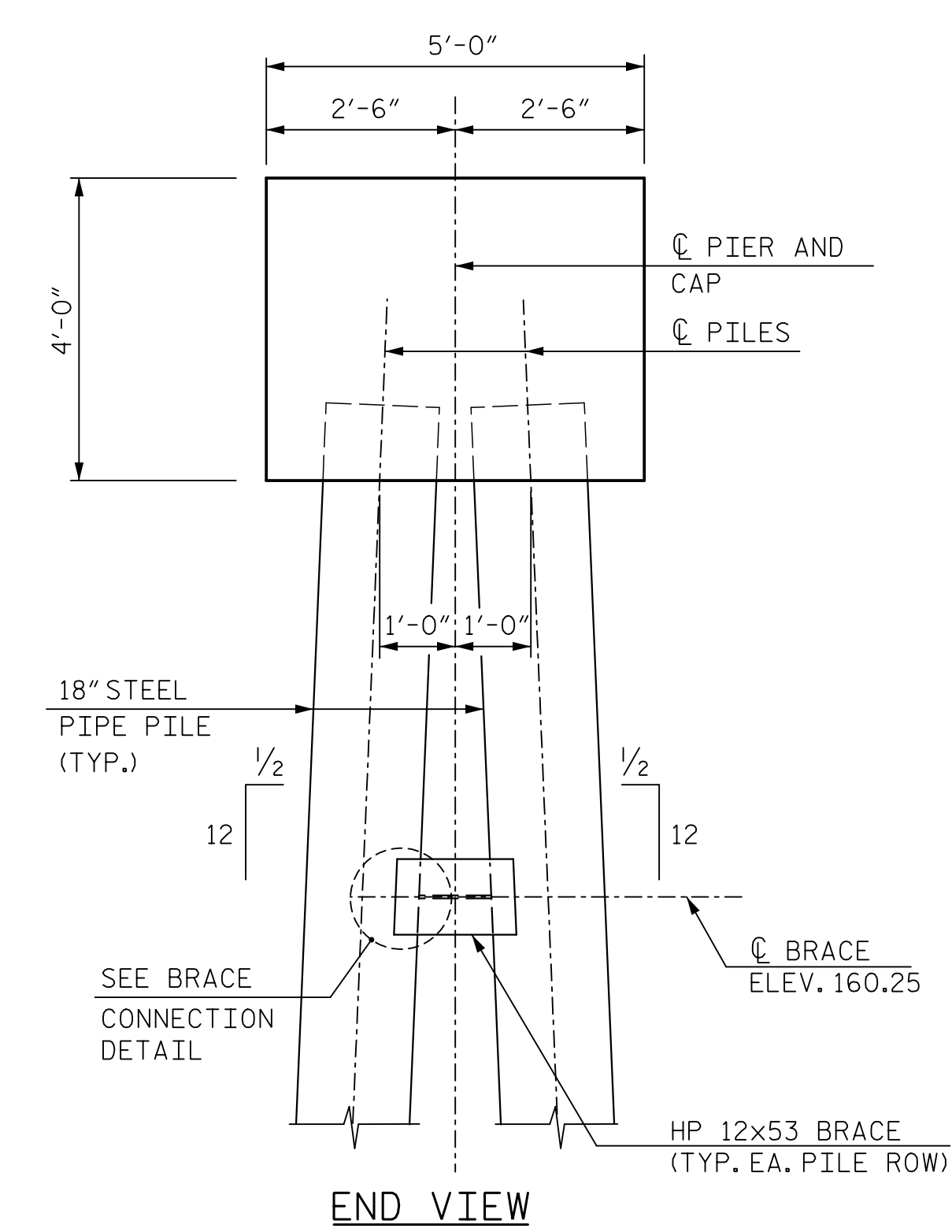
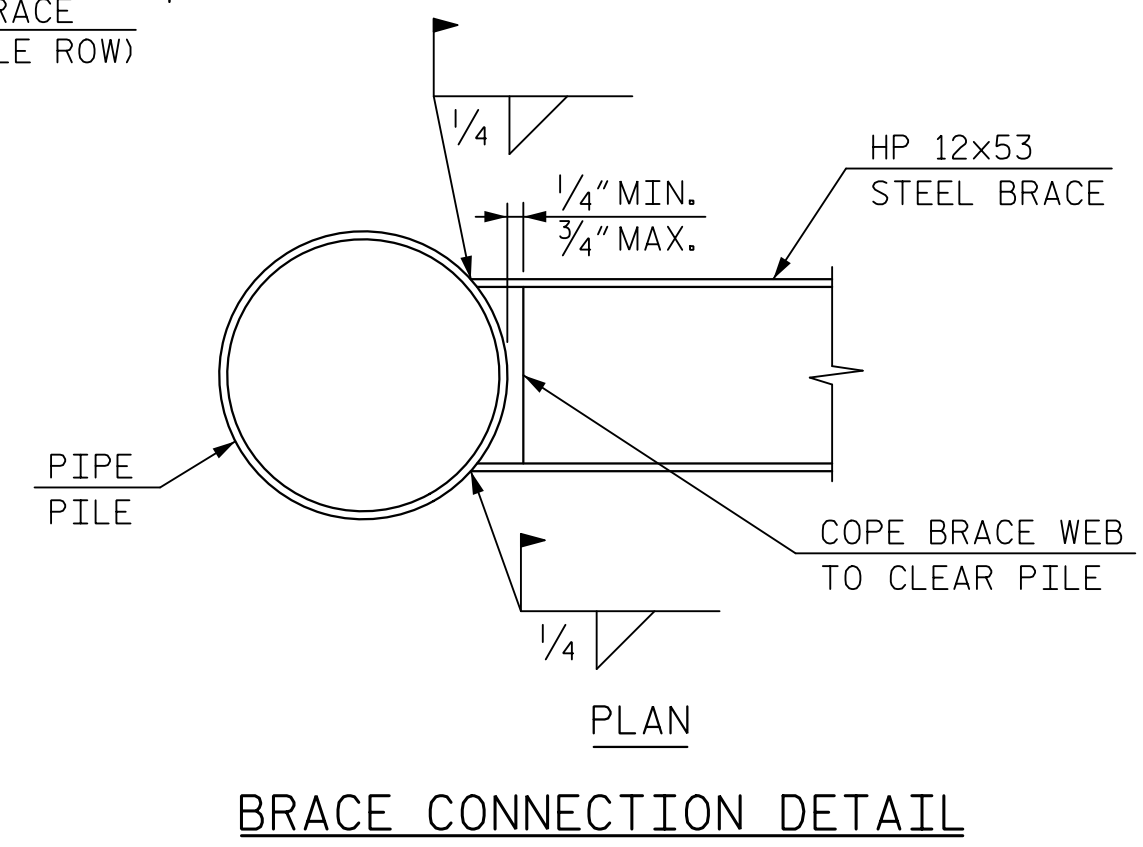
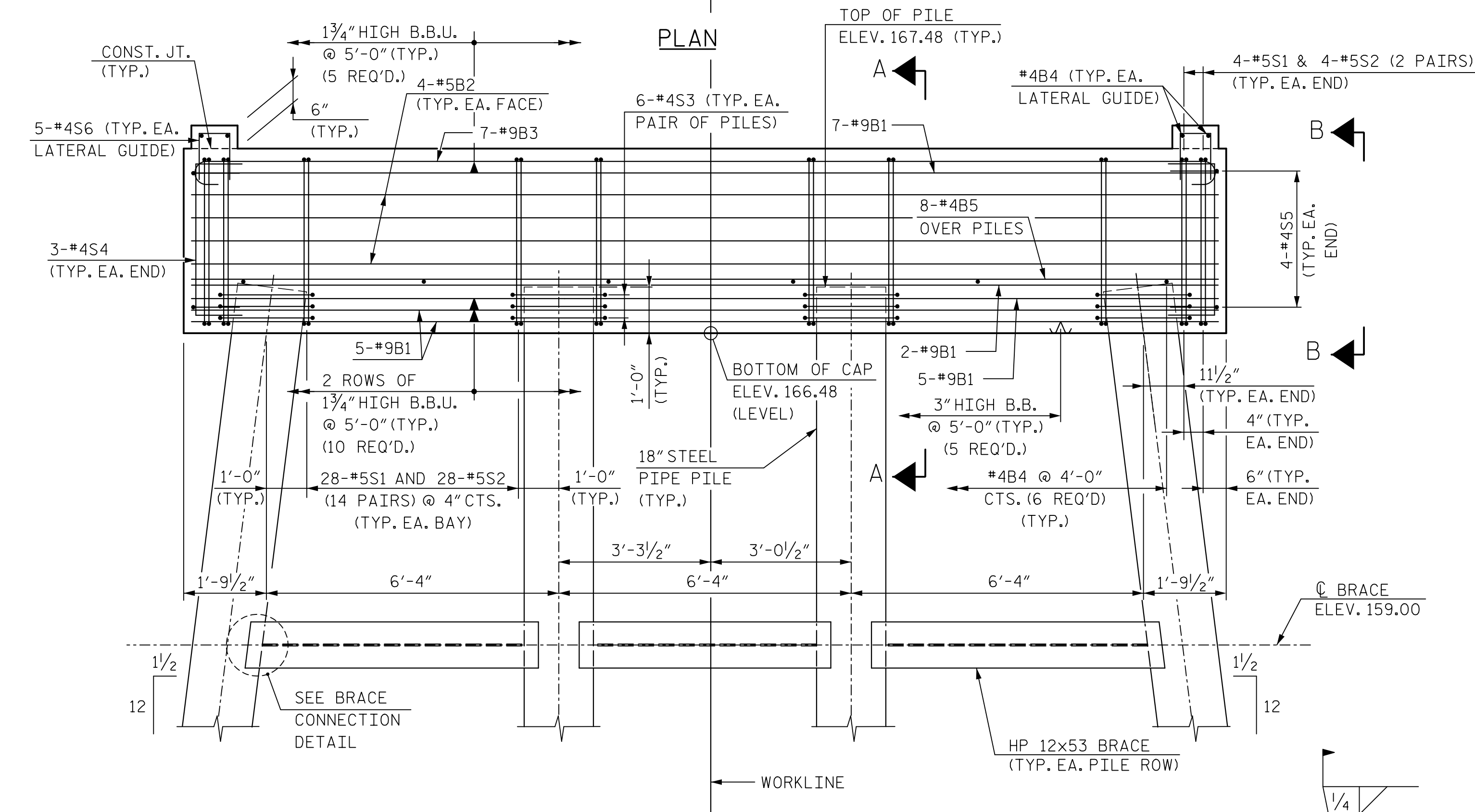
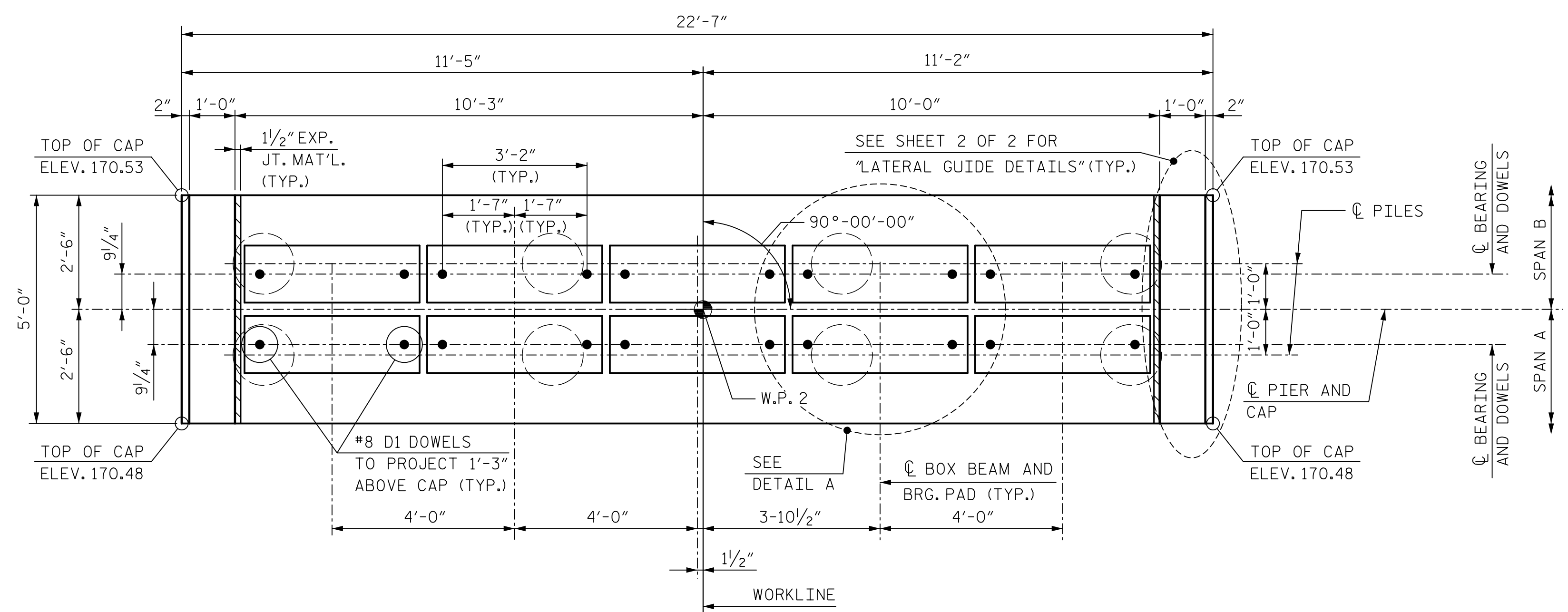
DocuSigned by:  
**David W. Hawkins**  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 27812  
 2/27/2015

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUBSTRUCTURE**  
 ABUTMENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			54

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 License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY M. WRIGHT DATE 9/14  
 CHECKED BY D. RAGAN DATE 10/14 DWG. NO. 12



**NOTES:**  
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #8D1 DOWELS.  
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.  
 LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE BOX BEAMS ARE IN PLACE.  
 FOR PIPE PILE DETAILS, SEE 18" STEEL PIPE PILES DETAIL SHEET.  
 HP 12x53 STEEL BRACE SHALL BE ASTM A36 STEEL GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.  
 HP 12x53 STEEL BRACE IS CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 18 x 0.50 GALVANIZED STEEL PILES.  
 WELDING SHALL BE IN ACCORDANCE WITH AWS D1.5, BRIDGE WELDING CODE, CURRENT EDITION.  
 REPAIR GALVANIZED SURFACES THAT ARE ABRADED OR DAMAGED DURING WELDING WITH 2 COATS OF ORGANIC ZINC REPAIR PAINT IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.  
 GALVANIZE THE TOP OF EACH INTERIOR PIER PILE A MINIMUM OF 45 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POS 22+07.07 -L-  
 MILE POST: 0.23  
 SHEET 1 OF 2

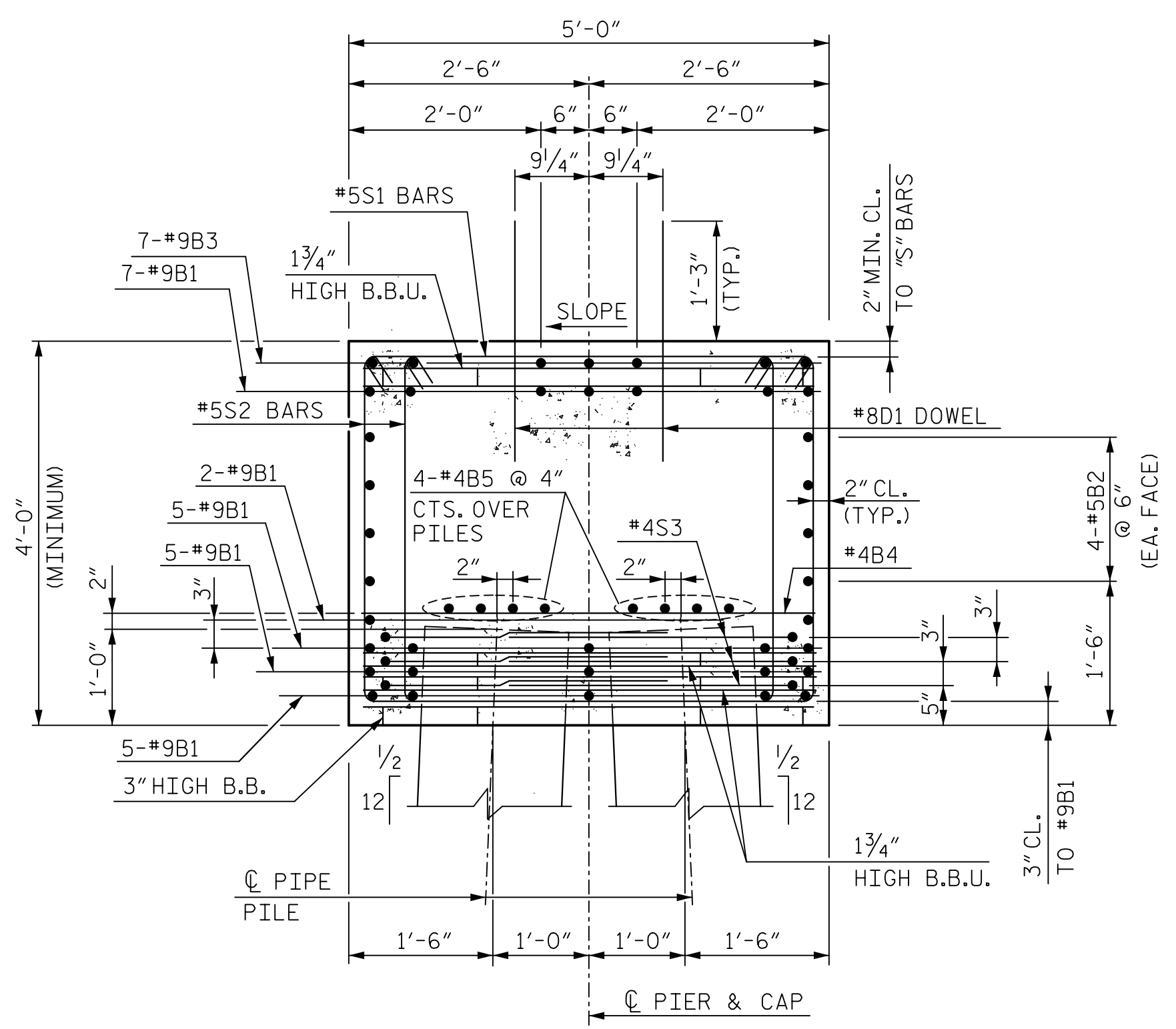
DocuSigned by:  
**Paul J. Barber**  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 12916  
 2/27/2015

DocuSigned by:  
**David W. Hawkins**  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 27812  
 2/27/2015

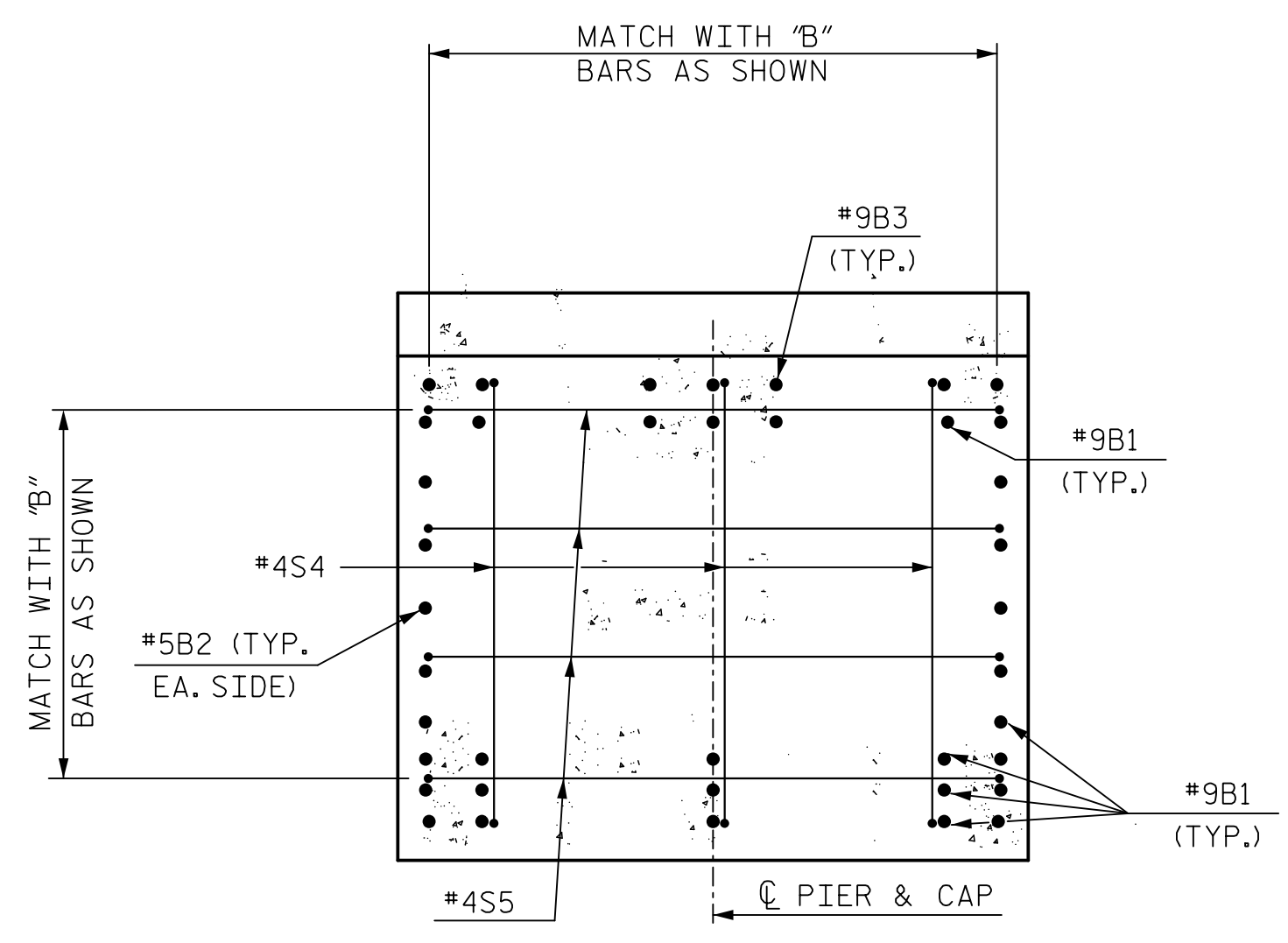
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUBSTRUCTURE**  
 PIER 1

<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DWG. NO. 13	
DRAWN BY: M. WRIGHT	DATE: 9/14	CHECKED BY: D. RAGAN	DATE: 10/14	REVISIONS	
				NO.	BY:
				1	3
				2	4
					SHEET NO. <b>S-13</b>
					TOTAL SHEETS <b>54</b>

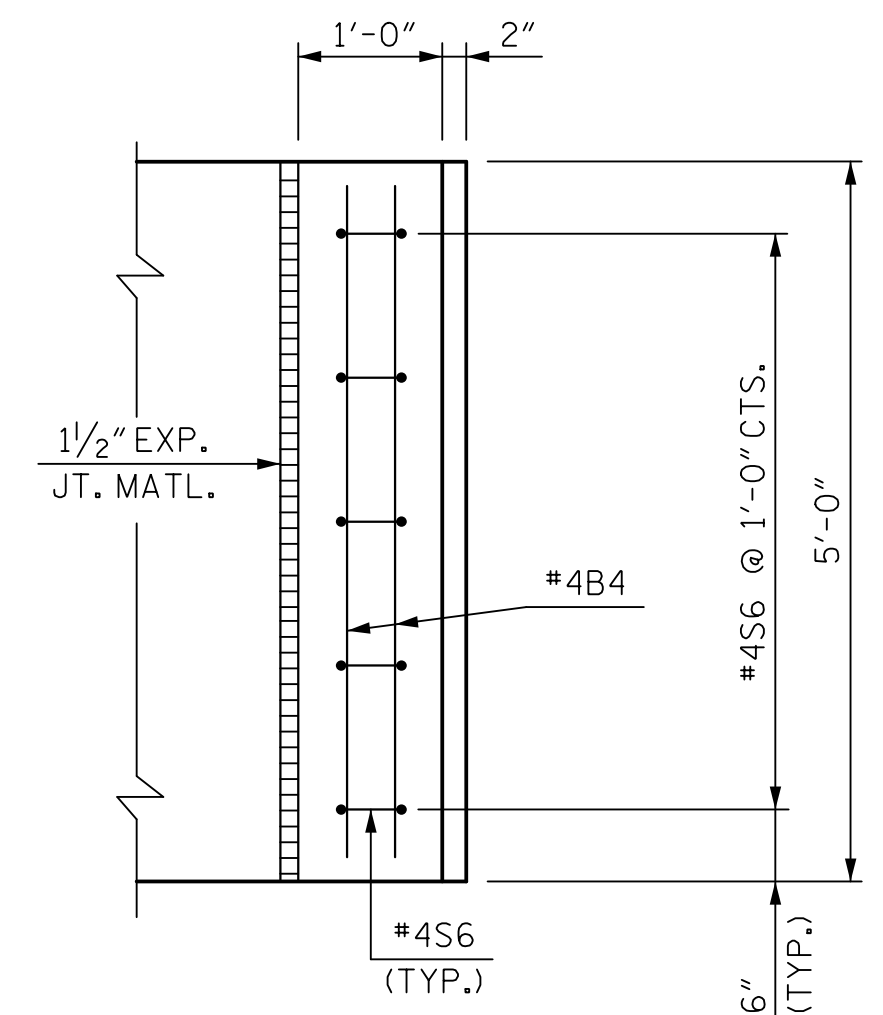




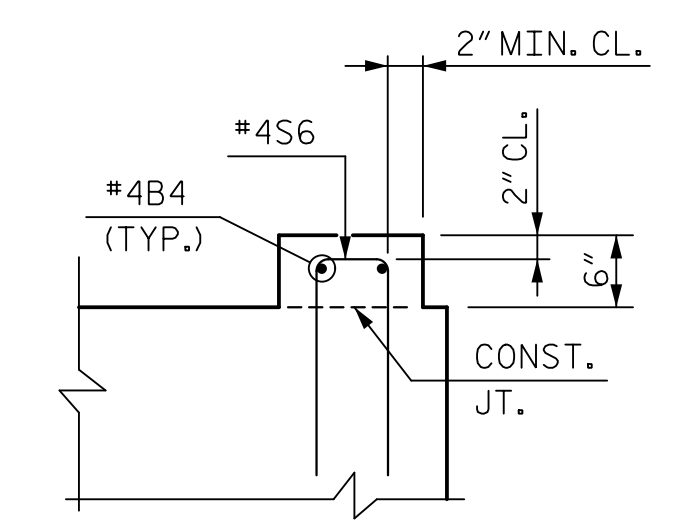
SECTION A-A



VIEW B-B

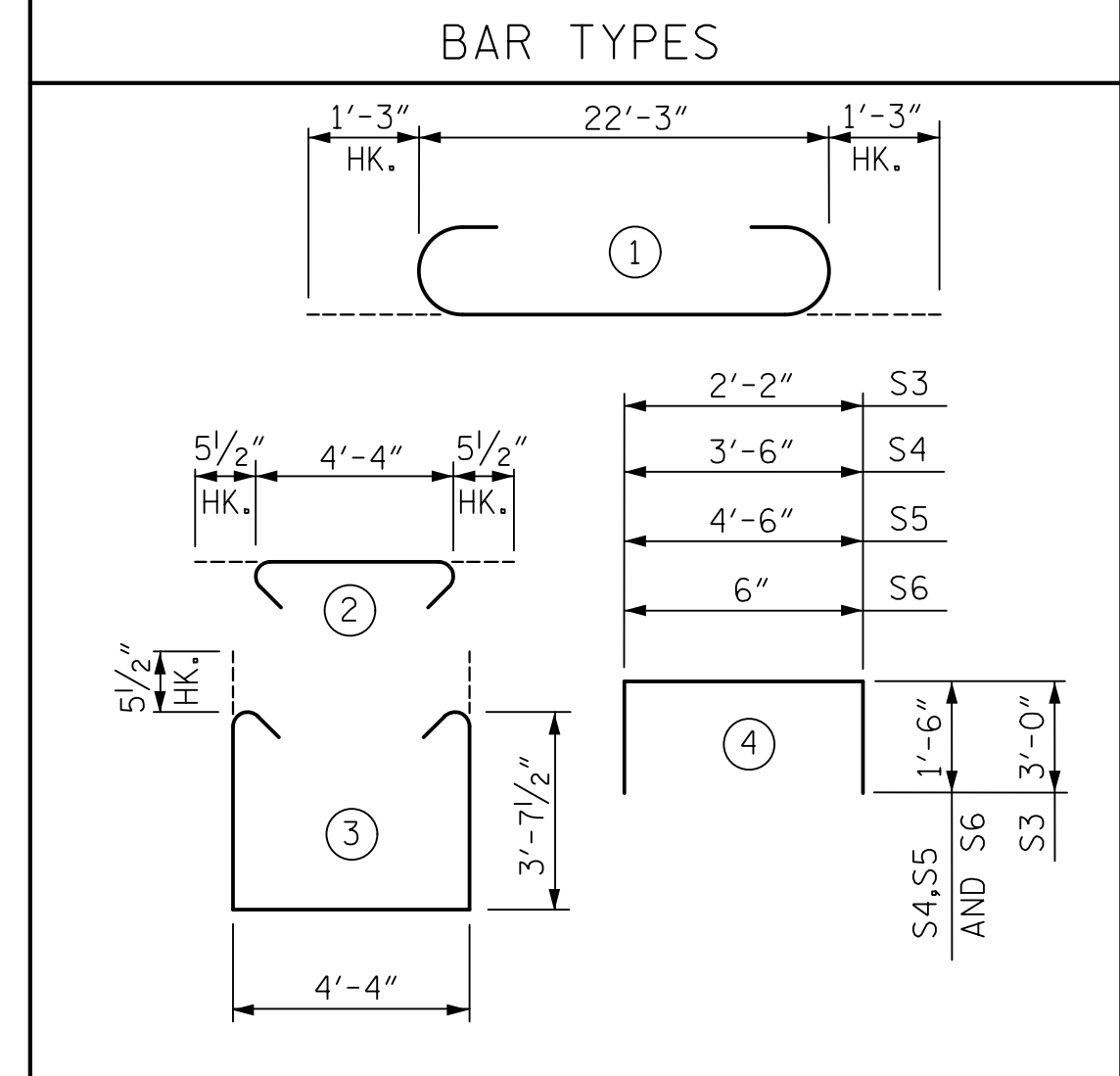


PLAN



ELEVATION

LATERAL GUIDE DETAILS  
(TYP. EACH LATERAL GUIDE)



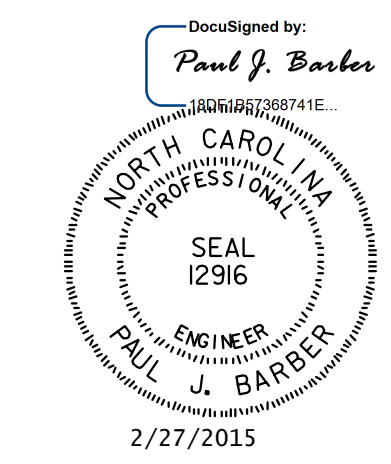
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	24	9	STR.	22'-3"	1,816
B2	8	5	STR.	22'-3"	186
B3	7	9	1	24'-9"	589
B4	10	4	STR.	4'-8"	31
B5	8	4	STR.	22'-3"	119
D1	20	8	STR.	2'-3"	120
S1	92	5	2	5'-3"	504
S2	92	5	3	12'-6"	1,199
S3	24	4	4	8'-2"	131
S4	6	4	4	6'-6"	26
S5	8	4	4	7'-6"	40
S6	10	4	4	3'-6"	23

QUANTITIES	
ITEM	TOTAL
REINFORCING STEEL	LBS. 4,784
CAST-IN-PLACE CONCRETE (4,000 PSI):	
POUR 1 - CAP	CU. YDS. 16.3
POUR 2 - LATERAL GUIDE	CU. YDS. 0.2
TOTAL	CU. YDS. 16.5
PP 18 x 0.50 GALVANIZED STEEL PILES	NO. 8
	L.F. 520
PIPE PILE PLATES	EACH 8

PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POS 22+07.07 -L-  
 MILE POST: 0.23  
 SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUBSTRUCTURE**  
 PIER 1

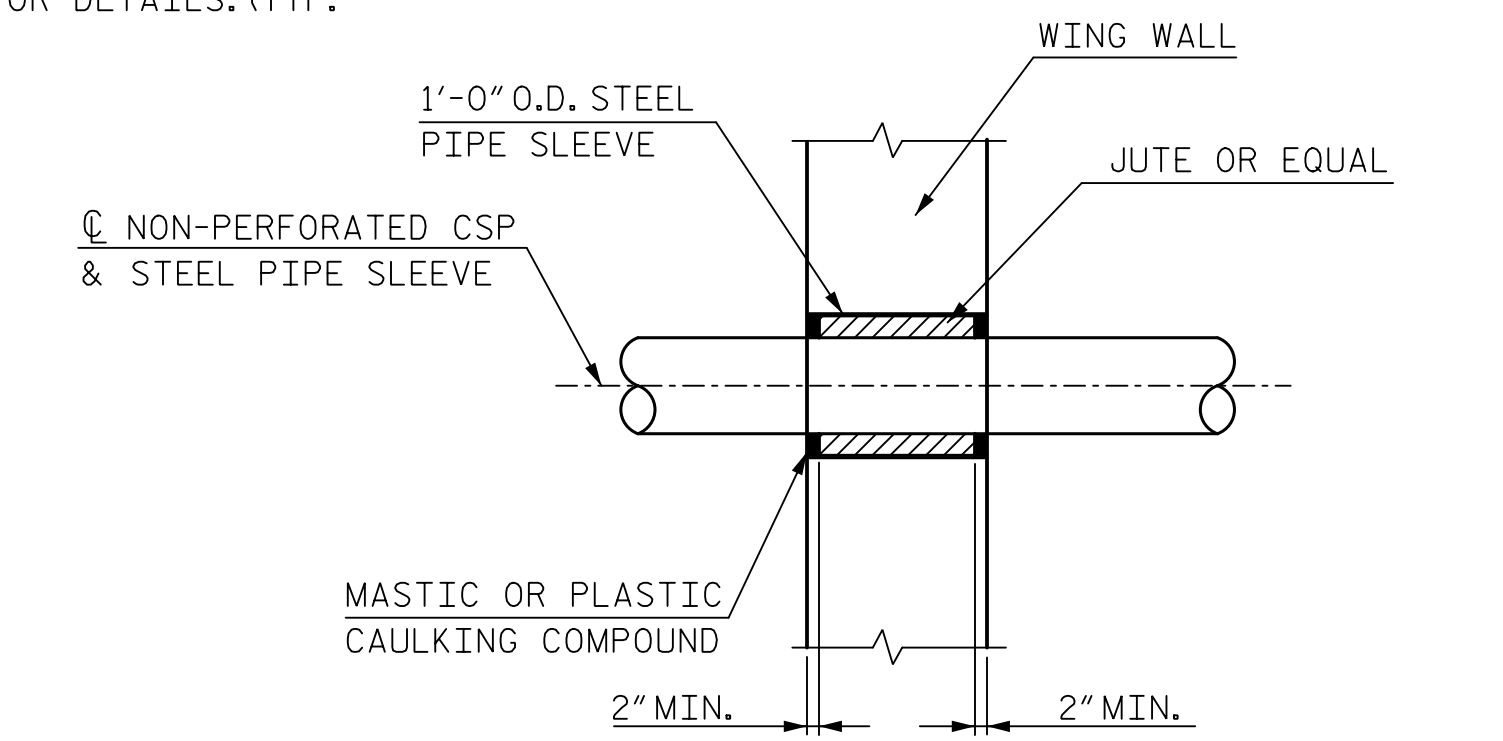
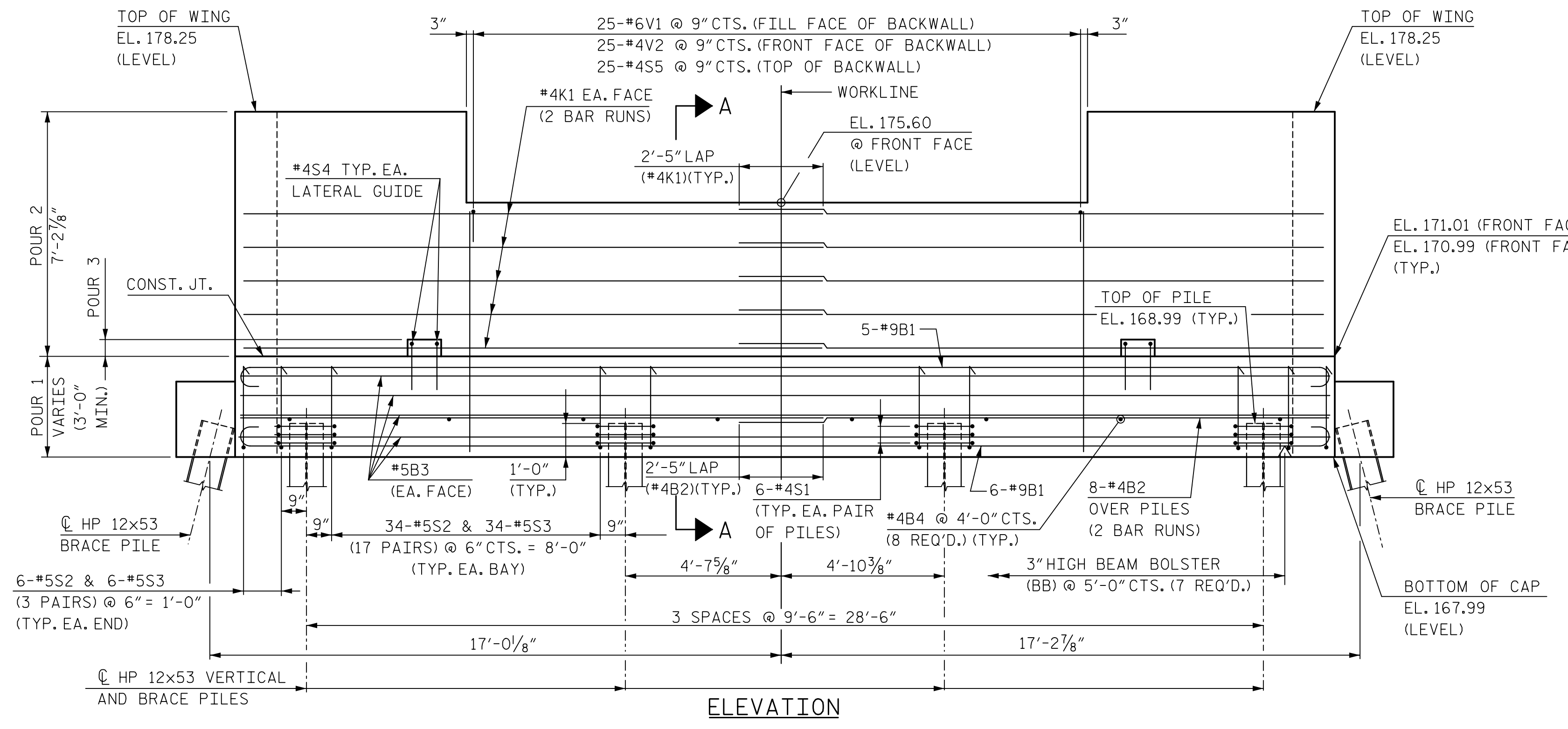
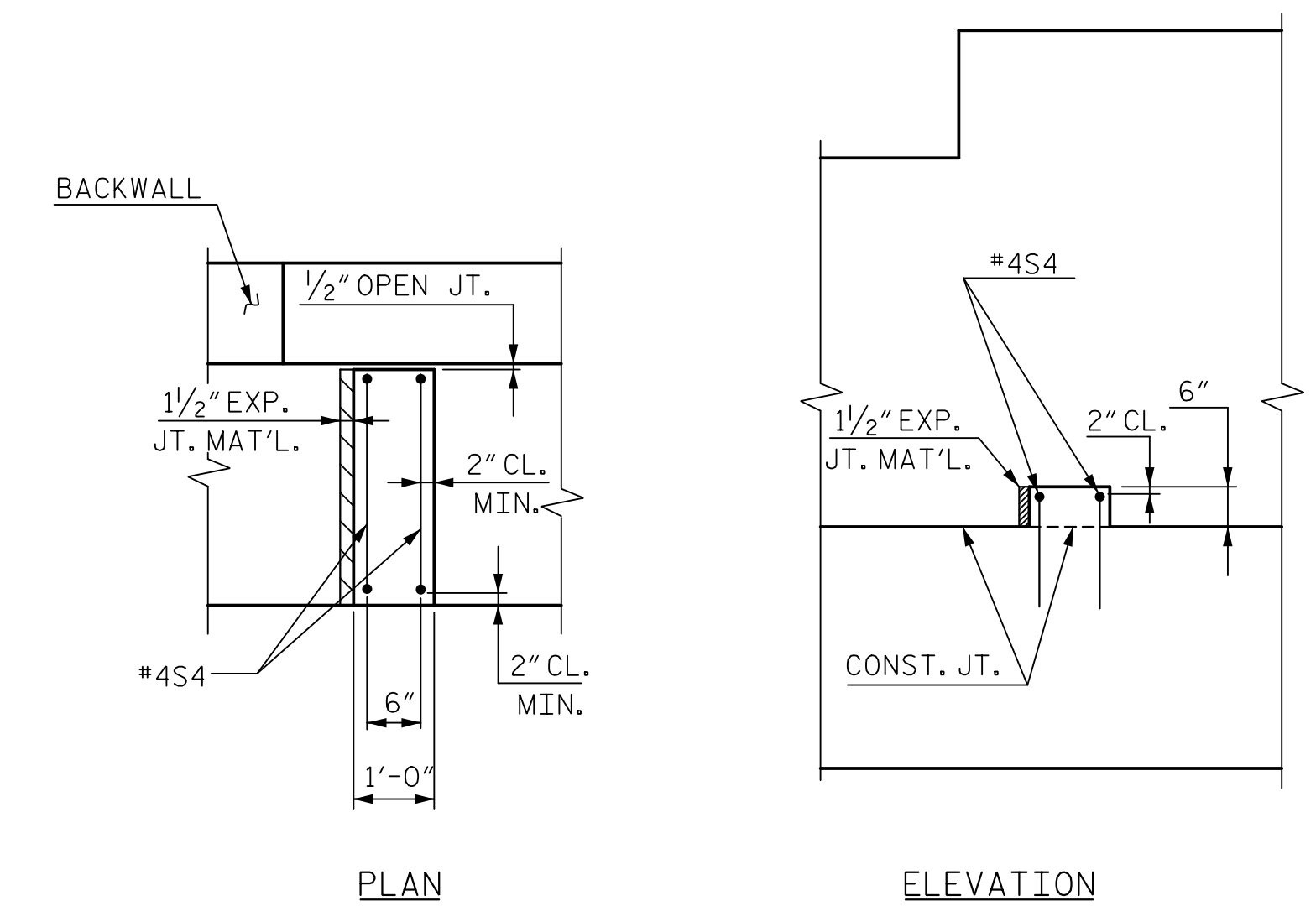
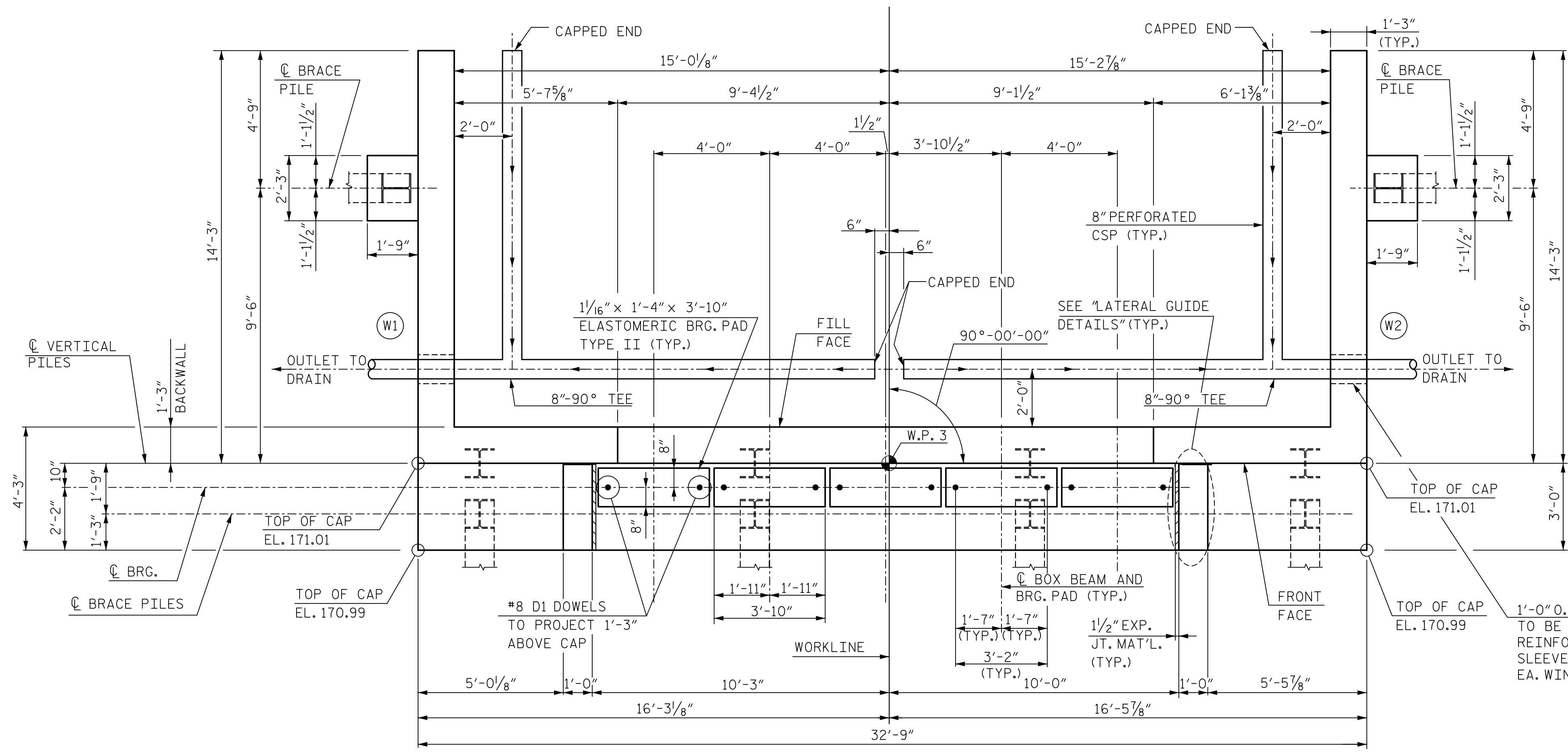


**HNTB** HNTB NORTH CAROLINA, P.C.  
 License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY M. WRIGHT DATE 9/14  
 CHECKED BY D. RAGAN DATE 10/14 DWG. NO. 14

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

SHEET NO.  
**S-14**  
 TOTAL SHEETS  
**54**



**NOTES:**

FOR WINGWALL DETAILS, SEE SHEET 2 OF 3.

FOR SECTION A-A, PILE SPLICE DETAILS, AND GENERAL NOTES, SEE SHEET 3 OF 3.

[Symbol] INDICATES 3:12 PILE BATTER IN DIRECTION SHOWN.

PAYMENT FOR PIPE SLEEVE INSERT SHALL BE CONSIDERED AS INCIDENTAL TO CONSTRUCTION OF END BENT.

CORRUGATED STEEL PIPE LOCATED IN DRAINAGE AREA BETWEEN THE WINGWALLS SHALL BE PERFORATED. ALL OTHER CSP SHALL BE NON-PERFORATED.

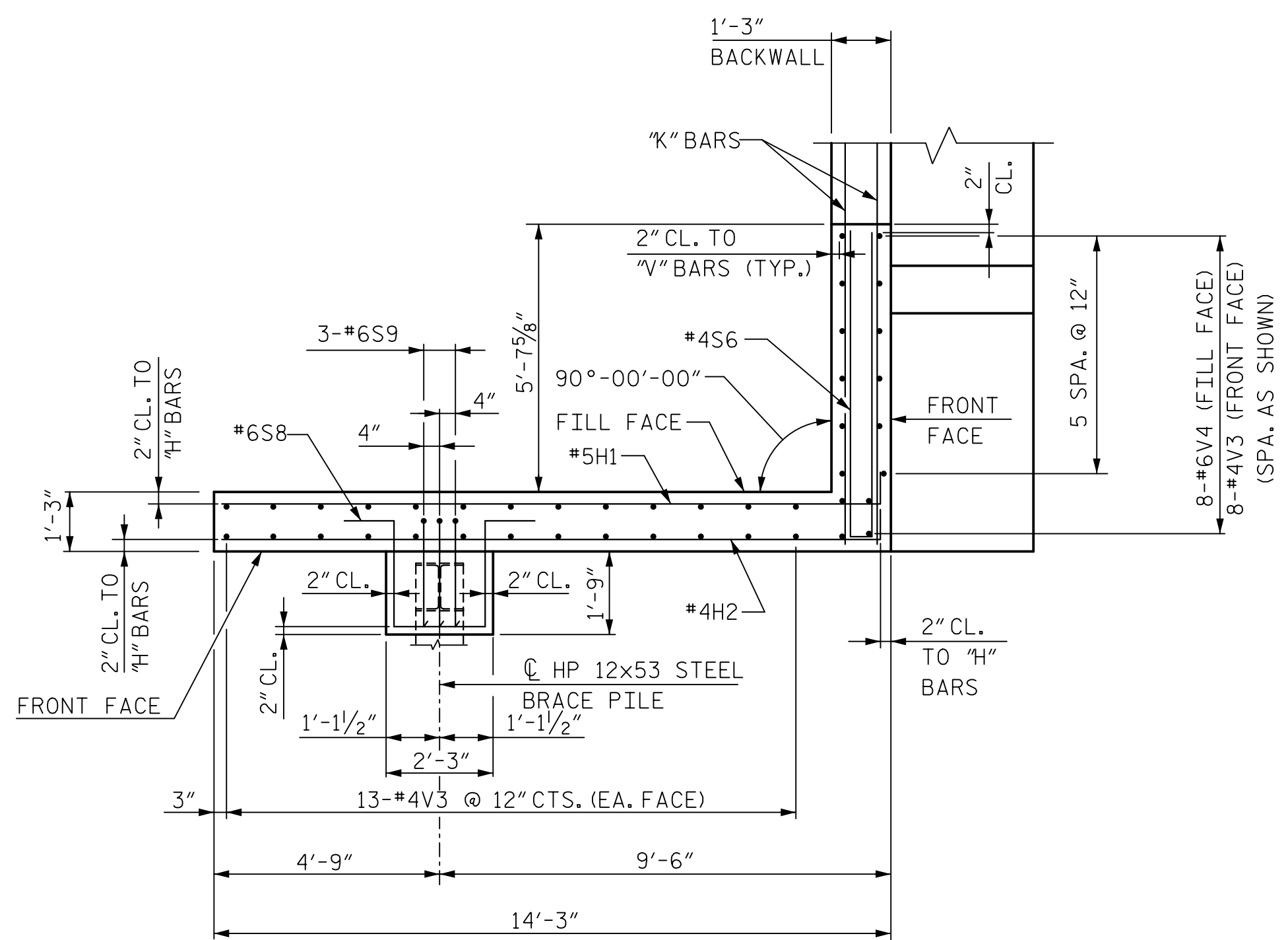
PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POS 22+07.07 -L-  
 MILE POST: 0.23  
 SHEET 1 OF 3

Designed by: *David W. Hawkins*  
 SEAL 27812  
 2/27/2015

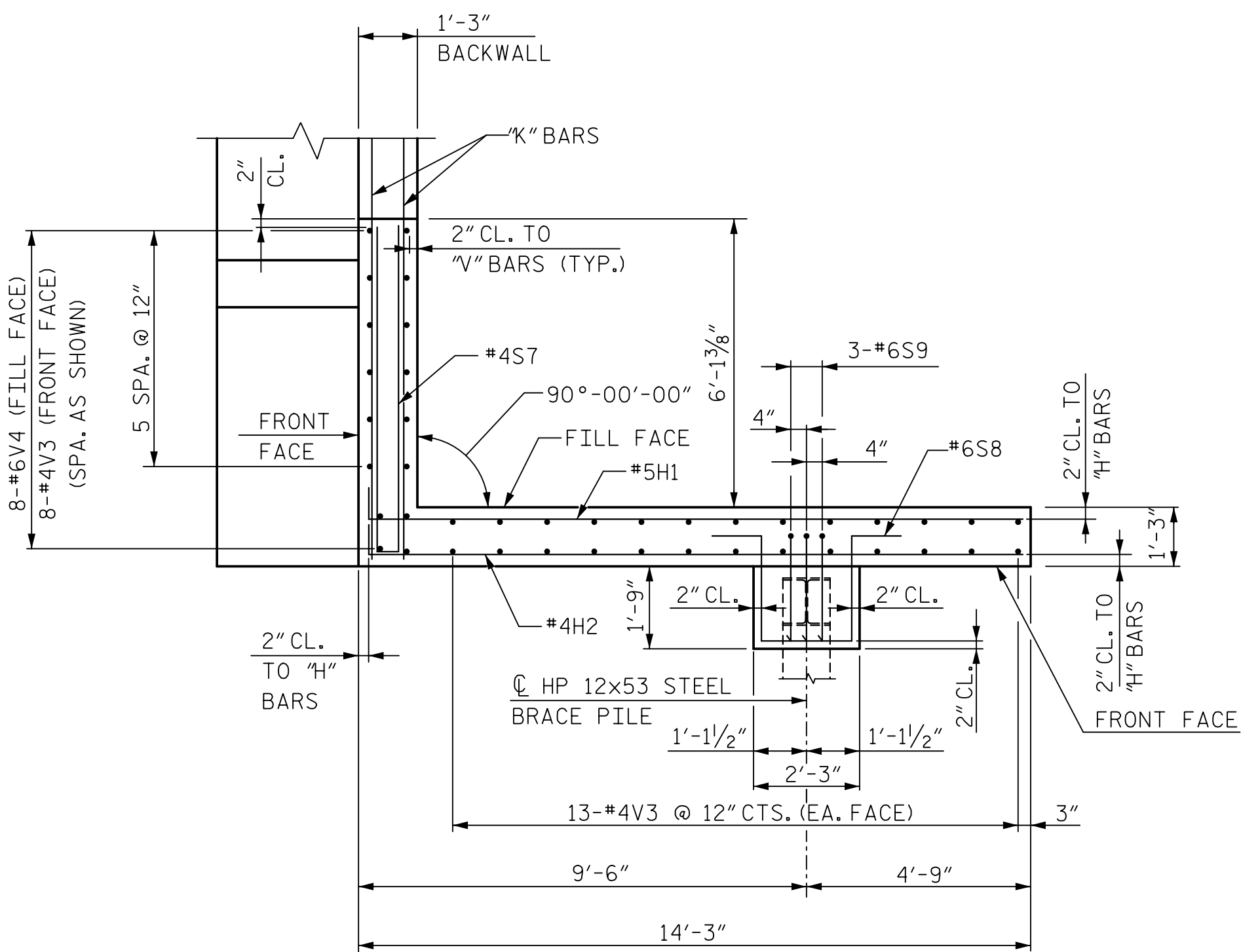
Checked by: *Paul J. Barber*  
 SEAL 12916  
 2/27/2015

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

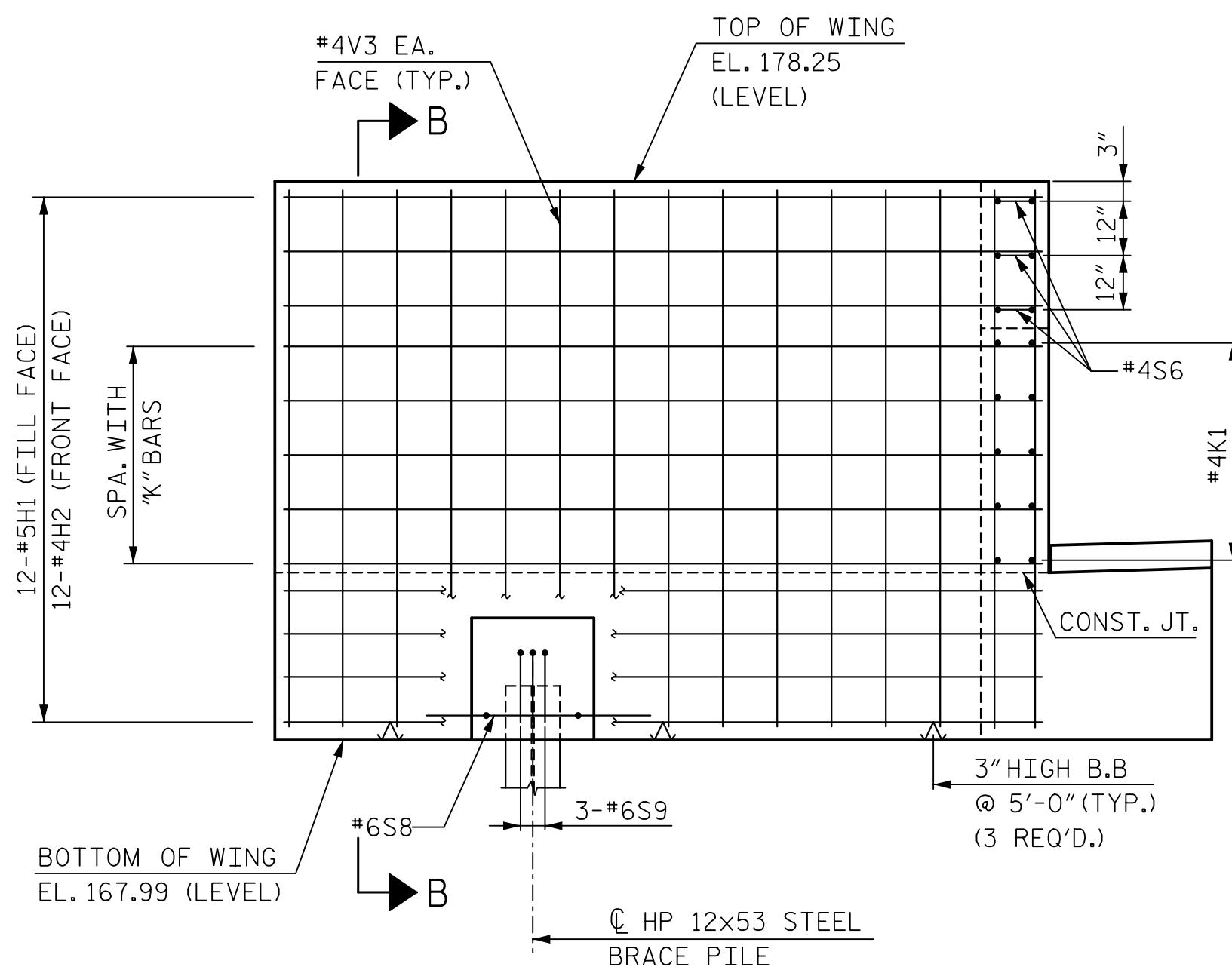
<b>HNTB</b> HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO. <b>S-15</b>
DRAWN BY: M. WRIGHT	DATE: 9/14	NO. 3	BY:	TOTAL SHEETS: 54
CHECKED BY: D. RAGAN	DATE: 10/14	NO. 4	DATE:	
DWG. NO. 15				



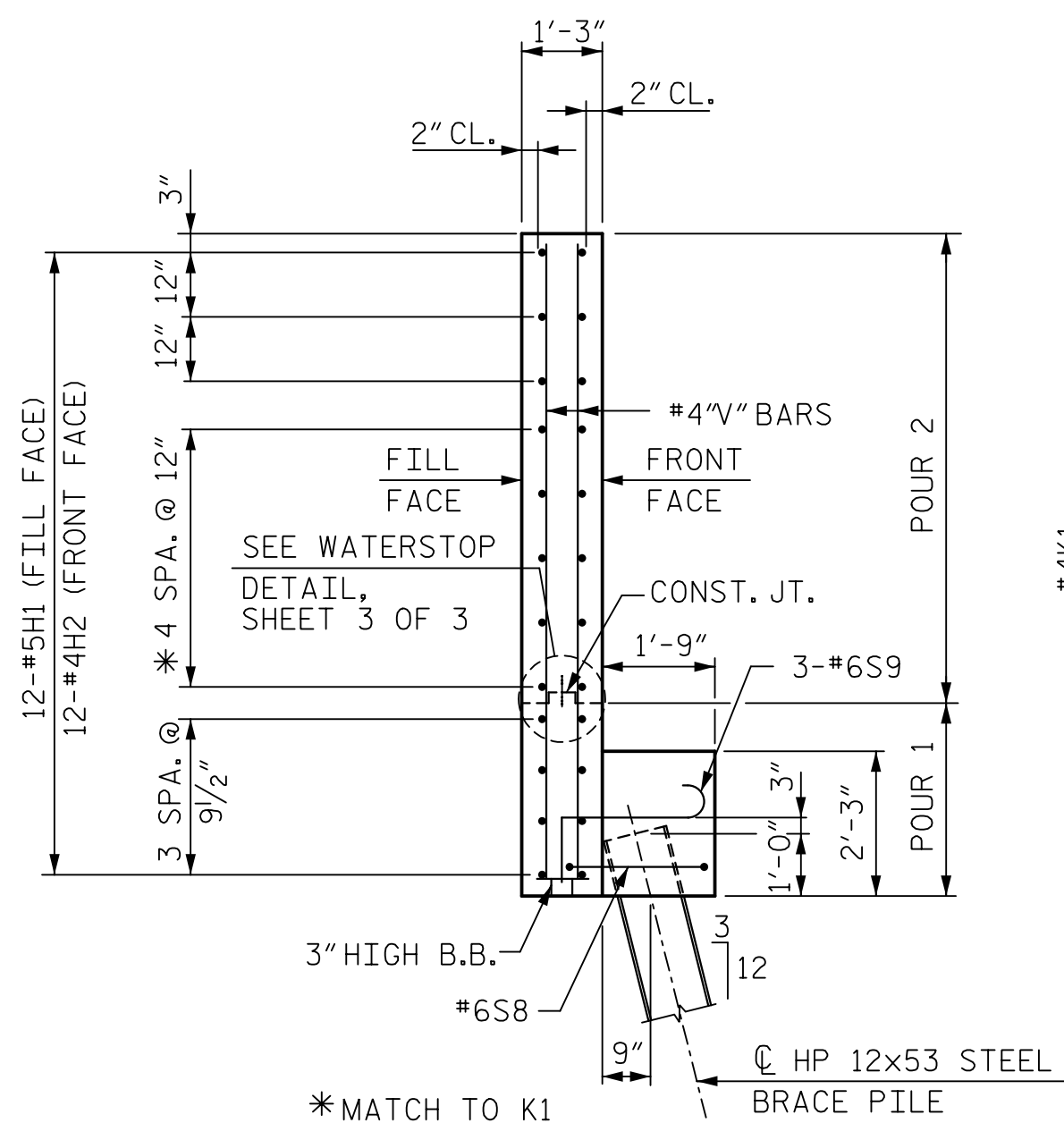
PLAN OF WING (W1)



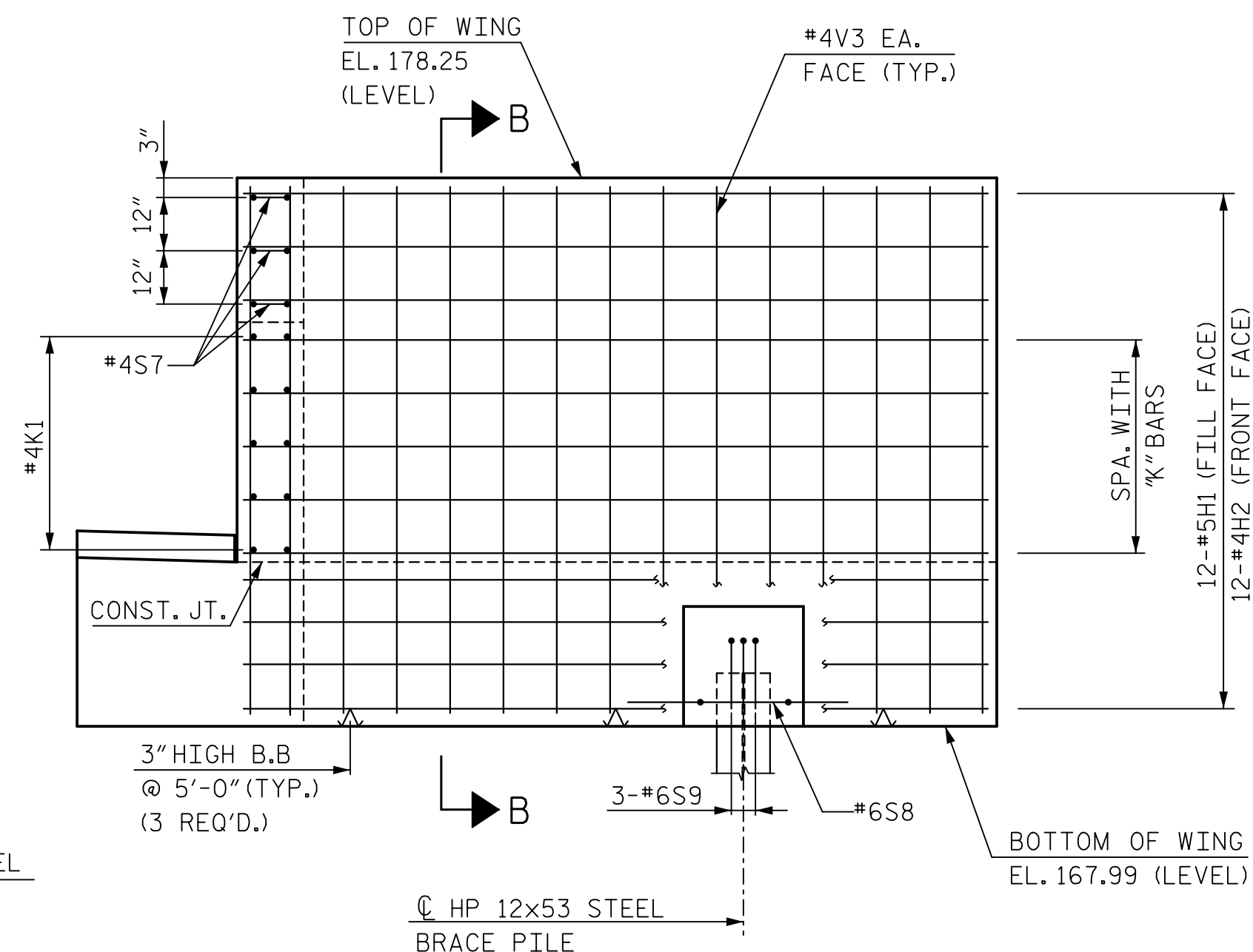
PLAN OF WING (W2)



ELEVATION OF WING (W1)



SECTION B-B



ELEVATION OF WING (W2)

PROJECT NO. P-4900A

ROBESON COUNTY

STATION: POS 22+07.07 -L-

MILE POST: 0.23

SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

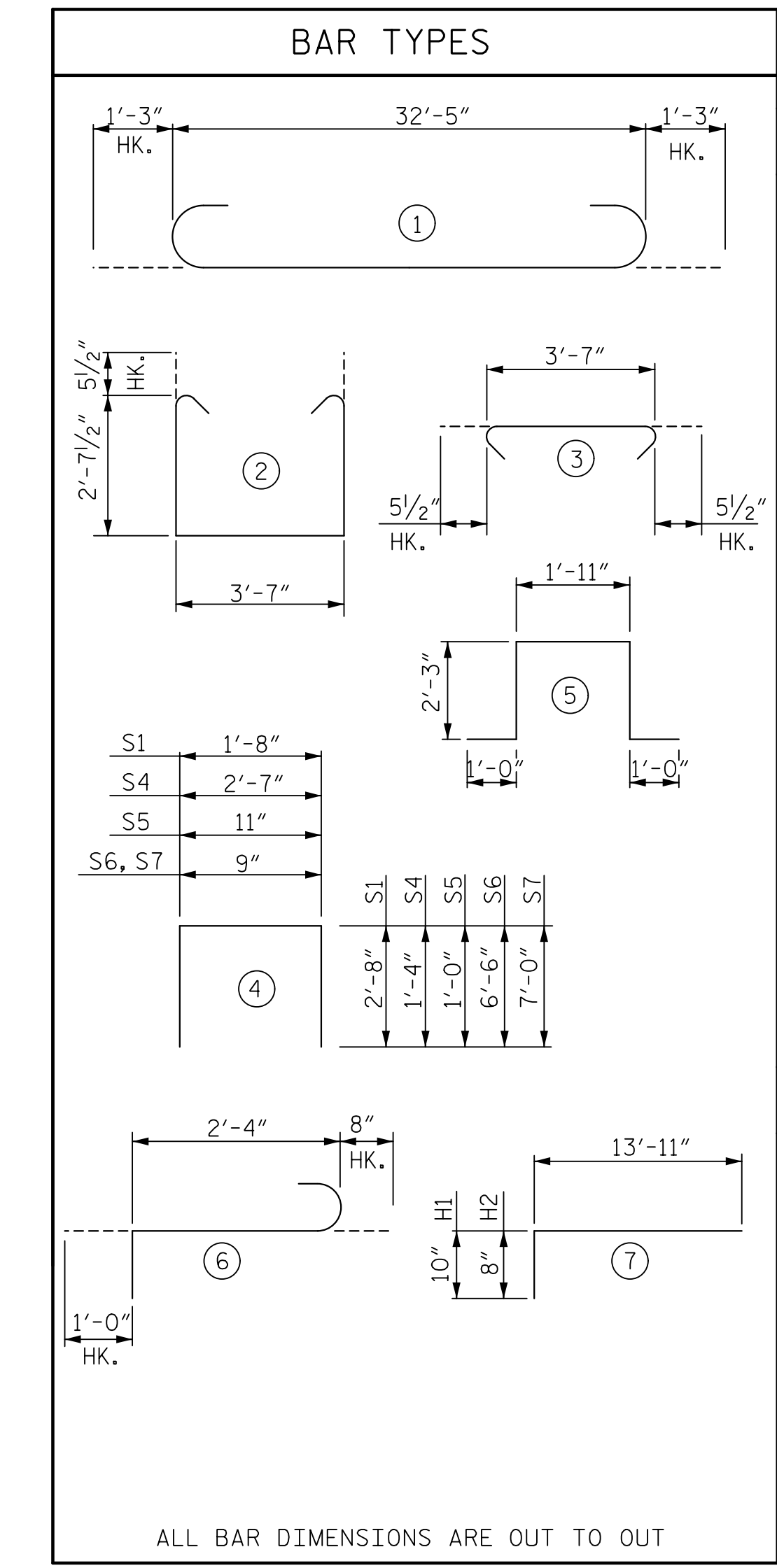
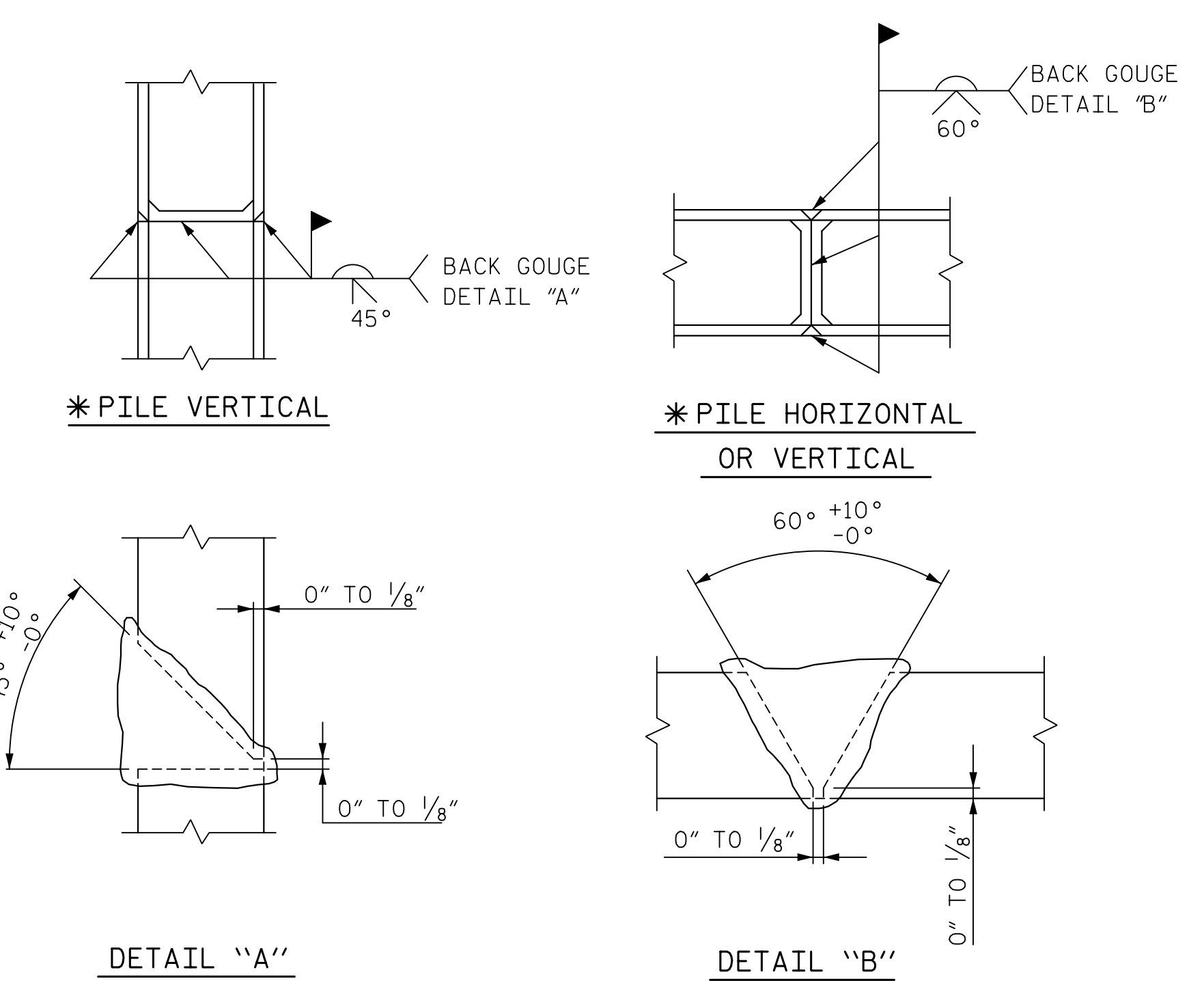
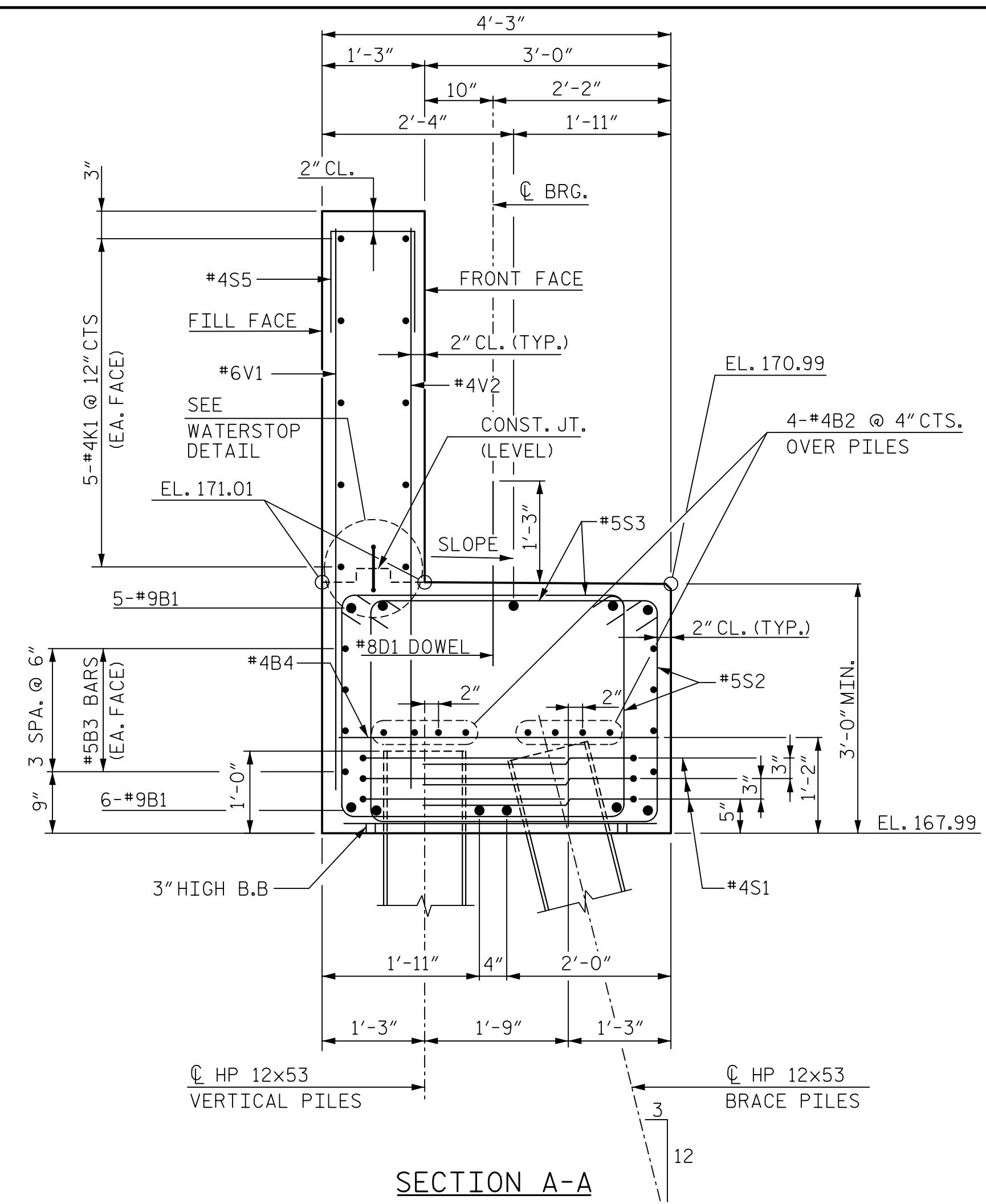
SUBSTRUCTURE

ABUTMENT 2

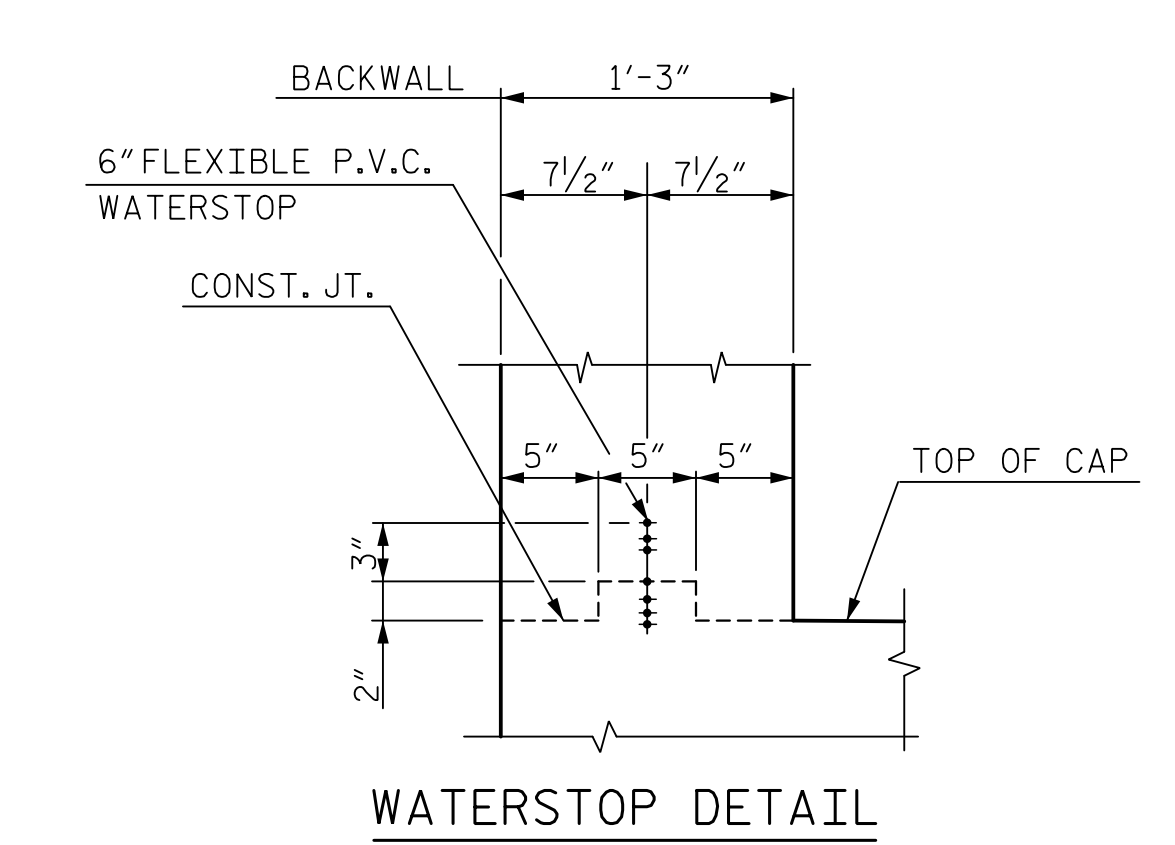
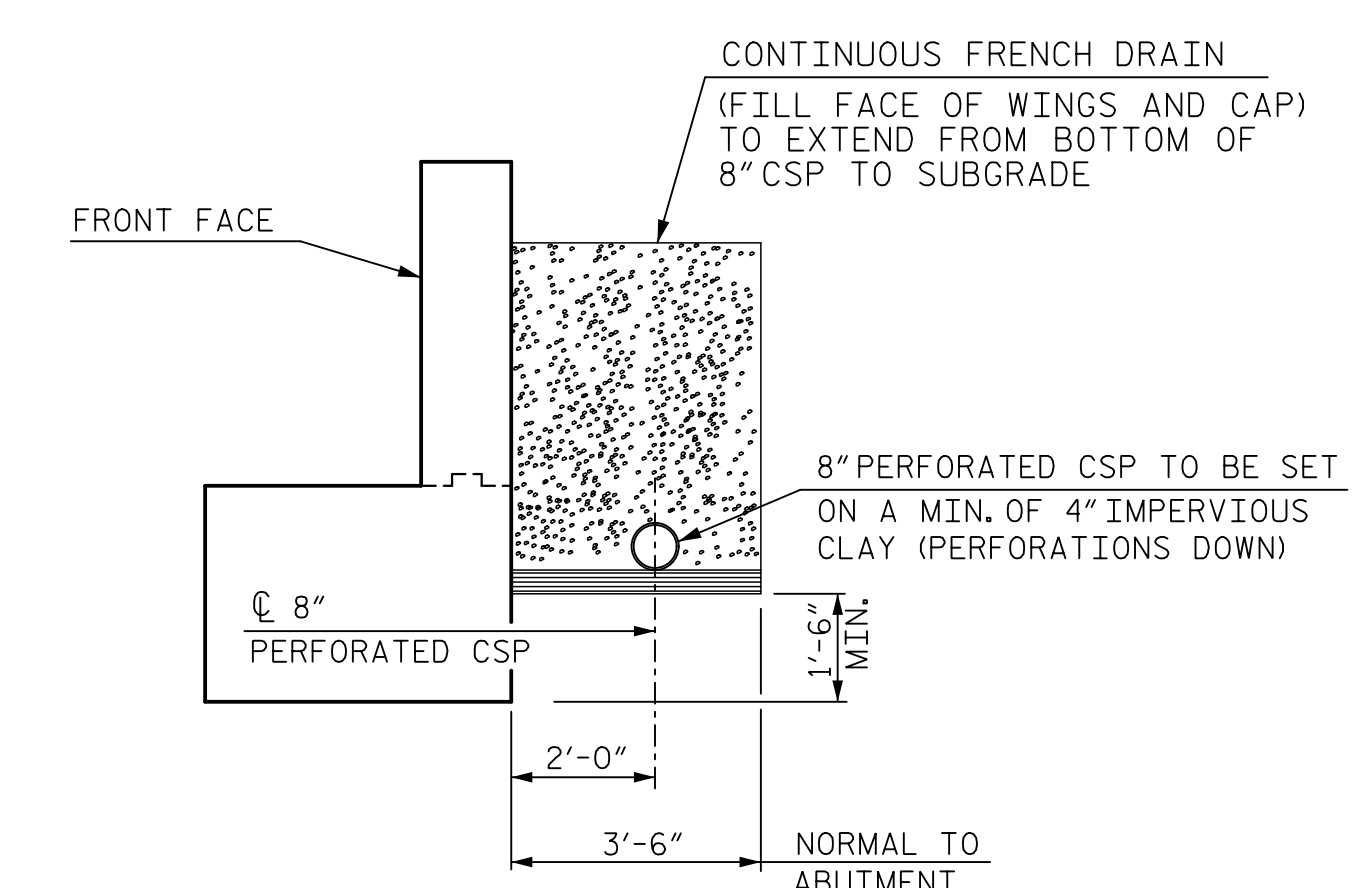
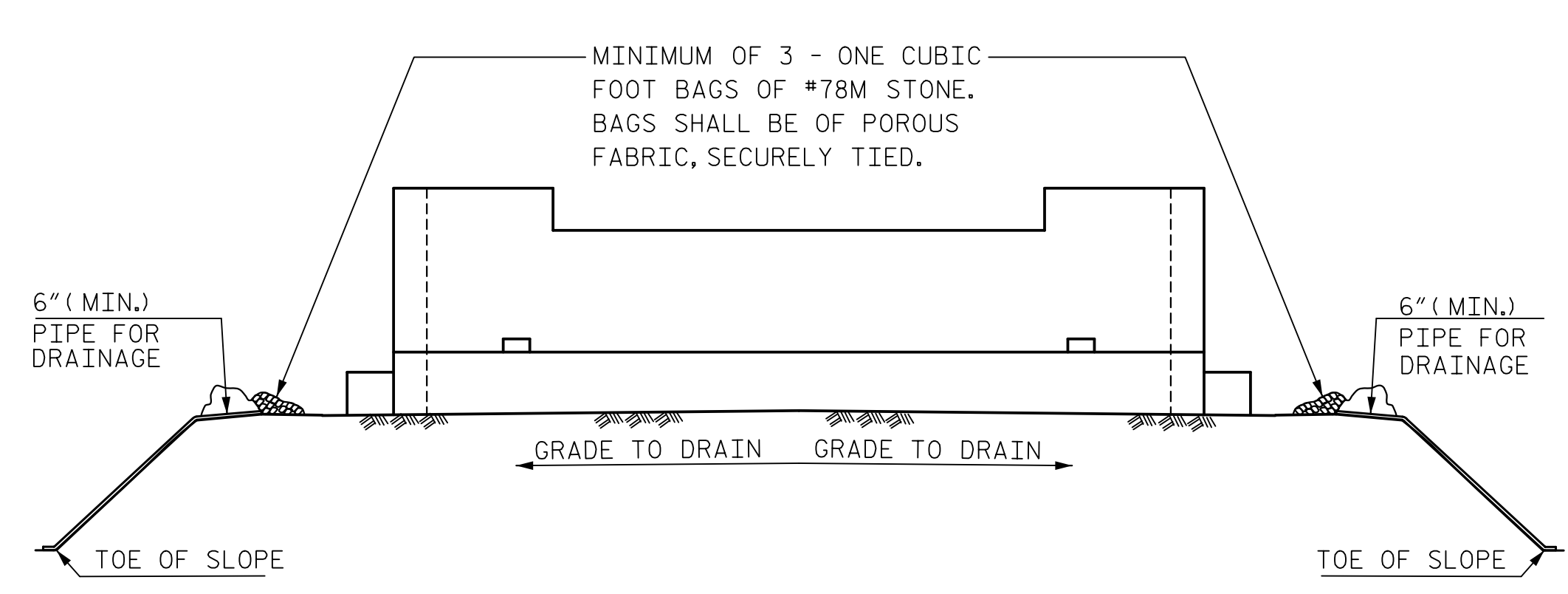
DocuSigned by:  
Paul J. Barber  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 12916  
ENGINEER PAUL J. BARBER  
2/27/2015

DocuSigned by:  
David W. Hawkins  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 27812  
ENGINEER DAVID W. HAWKINS  
2/27/2015

<b>HNTB</b> HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO. <b>S-16</b>
DRAWN BY M. WRIGHT	DATE 9/14	NO.	DATE	TOTAL SHEETS <b>54</b>
CHECKED BY D. RAGAN	DATE 10/14	1	4	



BILL OF REINFORCING						
ABUTMENT 2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	11	9	1	34'-11"	1,306	
B2	16	4	STR	17'-5"	186	
B3	8	5	STR	32'-5"	270	
B4	8	4	STR	3'-11"	21	
D1	10	8	STR	2'-3"	60	
H1	24	5	7	14'-9"	369	
H2	24	4	7	14'-7"	234	
K1	20	4	STR	17'-5"	233	
S1	24	4	4	7'-0"	112	
S2	114	5	2	9'-9"	1,159	
S3	114	5	3	4'-6"	535	
S4	4	4	4	5'-3"	14	
S5	25	4	4	2'-11"	49	
S6	3	4	4	13'-9"	28	
S7	3	4	4	14'-9"	30	
S8	2	6	5	8'-5"	25	
S9	6	6	6	4'-0"	36	
V1	25	6	STR	7'-2"	269	
V2	25	4	STR	7'-2"	120	
V3	68	4	STR	9'-10"	447	
V4	16	6	STR	9'-10"	236	
QUANTITIES						
REINFORCING STEEL					LBS.	5,739
CAST-IN-PLACE CONCRETE (4,000 PSI):						
POUR 1 - CAP & BOT. OF WINGS				CU. YDS.	20.0	
POUR 2 - TOP OF WINGS & BACKWALL				CU. YDS.	17.3	
POUR 3 - LATERAL GUIDES				CU. YDS.	0.1	
TOTAL				CU. YDS.	37.4	
HP 12x53 STEEL PILES					NO.	10
					L.F.	650
STEEL PILE POINTS					EACH	10



NOTES:  
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #8D1 DOWELS.  
 THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL BOX BEAMS ARE IN PLACE.

BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF THE ABUTMENT 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 FOR THE SEVERAL PAY ITEMS.

**TEMPORARY DRAINAGE AT ABUTMENT**

PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POS 22+07.07 -L-  
 MILE POST: 0.23  
 SHEET 3 OF 3

DocuSigned by:  
**Paul J. Barber**  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 12916  
 2/27/2015

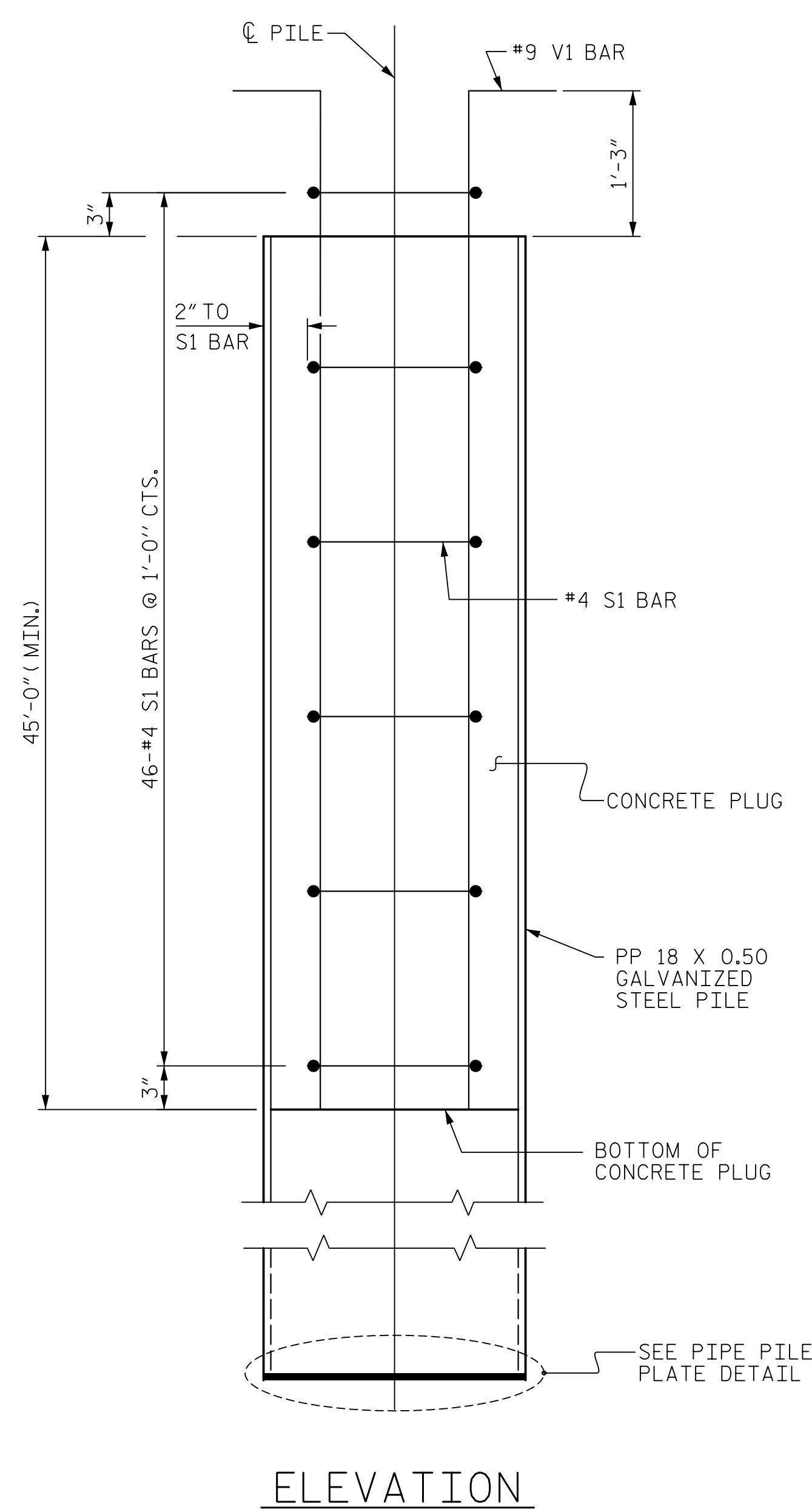
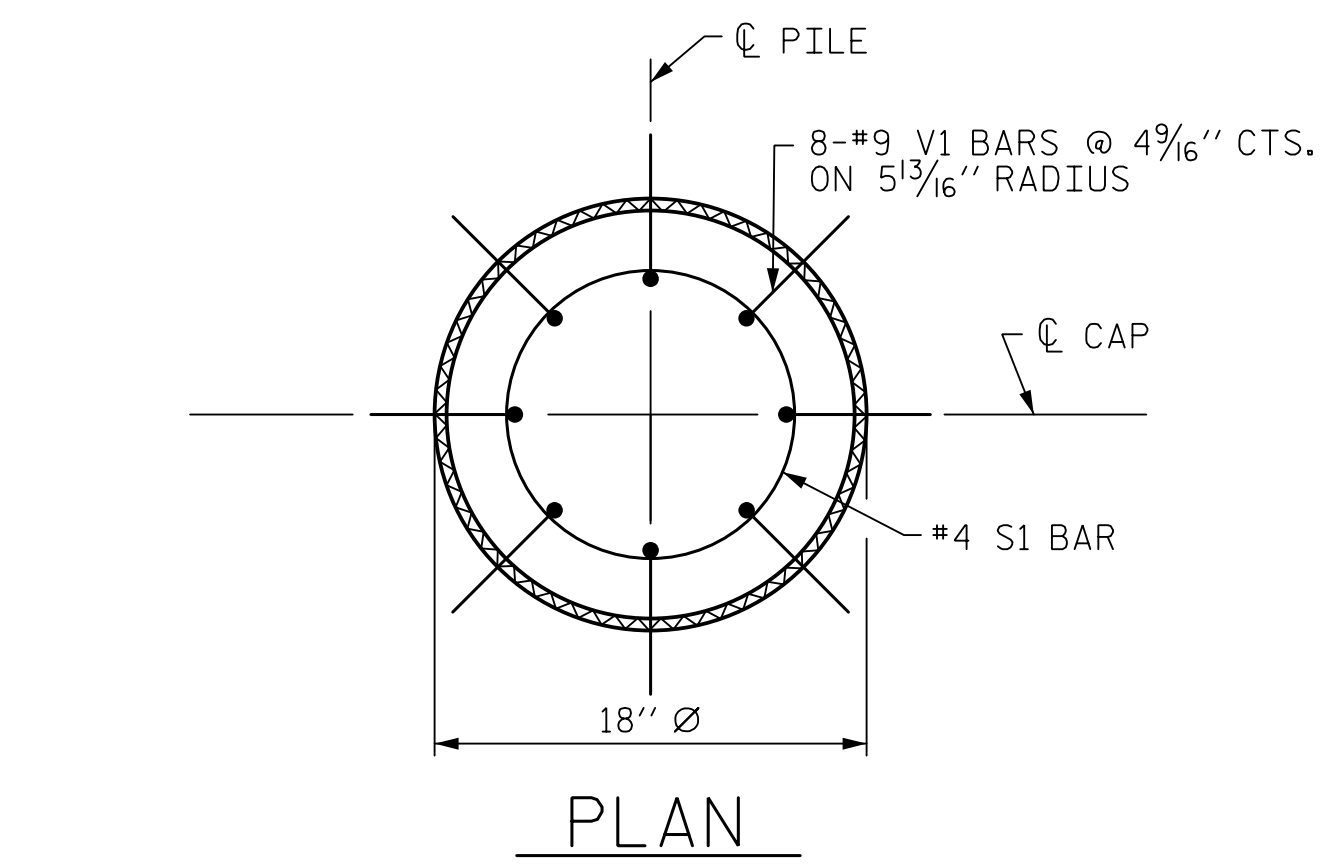
DocuSigned by:  
**David W. Hawkins**  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 27812  
 2/27/2015

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 License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

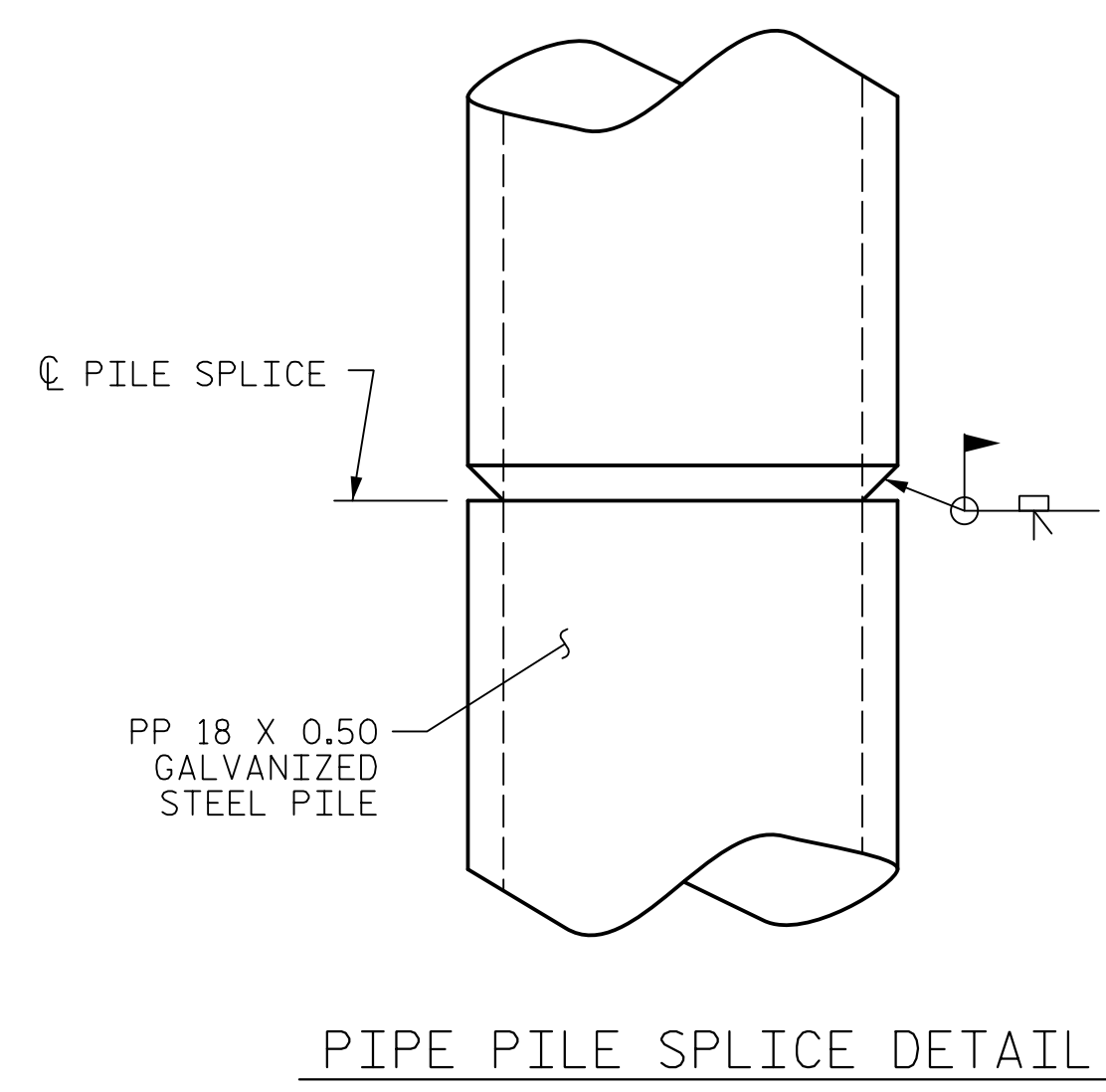
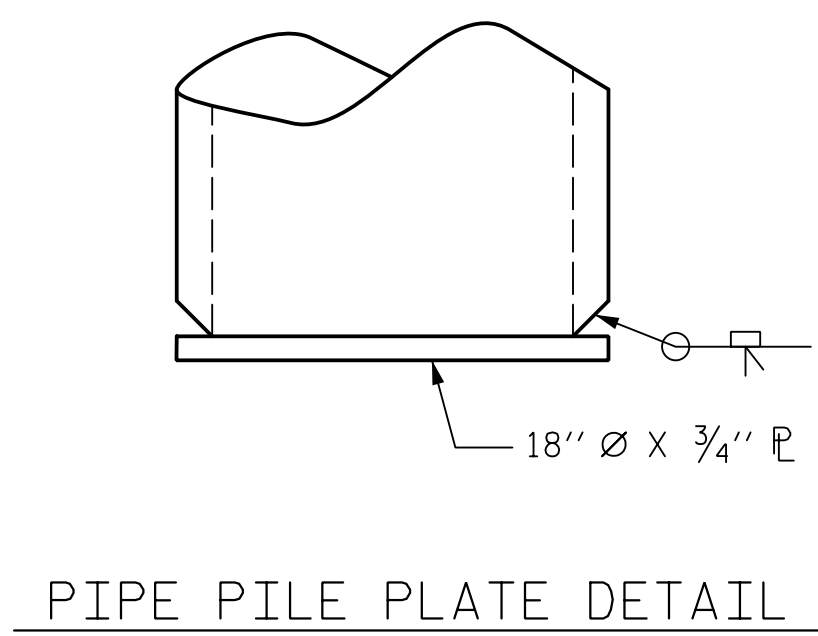
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DRAWN BY M. WRIGHT DATE 9/14  
 CHECKED BY D. RAGAN DATE 10/14 DWG. NO. 17

SHEET NO. **S-17**  
 TOTAL SHEETS **54**



PP 18 X 0.50 GALVANIZED STEEL PILE  
(CLOSED END)



NOTES

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

GALVANIZE STEEL PIPE PILES IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. GALVANIZING PIPE PILE PLATES IS NOT REQUIRED.

PIPE PILE PLATES, IF REQUIRED, SHALL BE IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

FOR CLOSED END PIPE PILES, REMOVE ALL SOIL AND WATER FROM INSIDE THE PILES JUST PRIOR TO PLACING REINFORCING STEEL AND CONCRETE FOR THE CONCRETE PLUG.

FORM THE CONCRETE PLUG SUCH THAT THE REINFORCING STEEL OR CONCRETE DOES NOT MOVE AND THE CLEARANCE FROM THE REINFORCING STEEL TO THE INSIDE OF THE PILE IS MAINTAINED AFTER CONCRETE PLACEMENT. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

THE REINFORCING STEEL, CONCRETE, AND GALVANIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 18 X 0.50 GALVANIZED STEEL PILES.

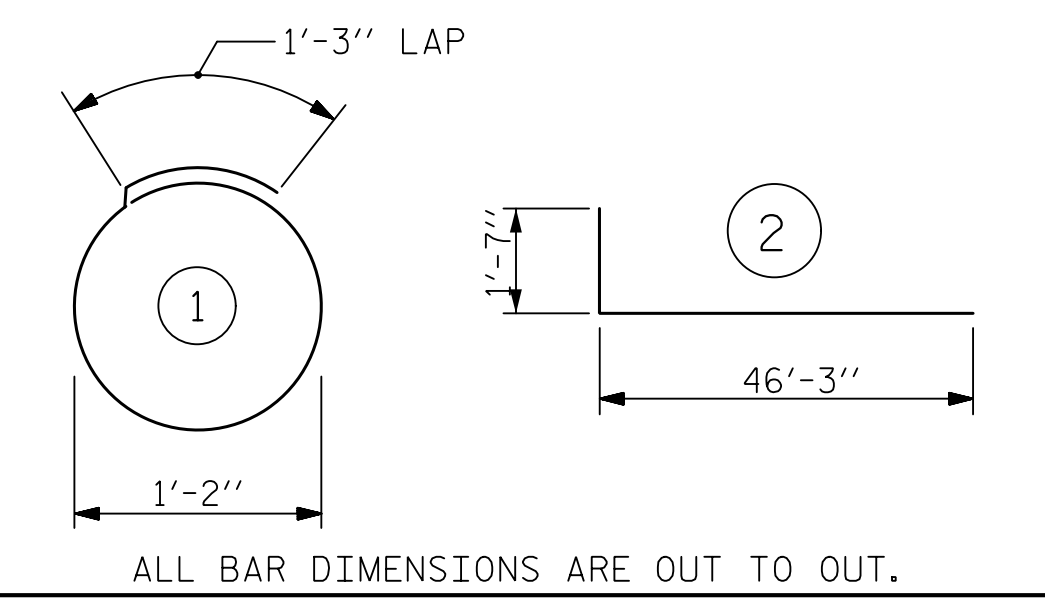
GALVANIZE THE TOP OF EACH INTERIOR PIER PILE A MINIMUM OF 45 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

PLACE CAST-IN-PLACE CONCRETE WITH  $f'_c = 2,500$  PSI IN THE PIPE PILE FROM THE PIPE PILE PLATE UP TO THE BOTTOM OF THE REINFORCED CONCRETE PLUG.

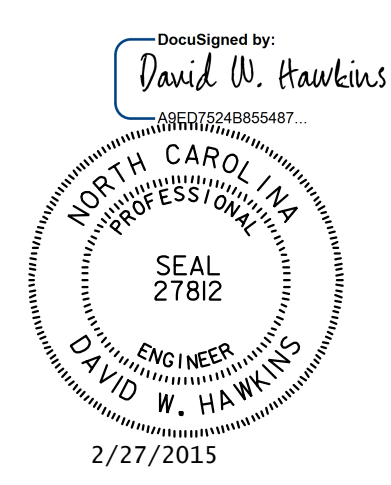
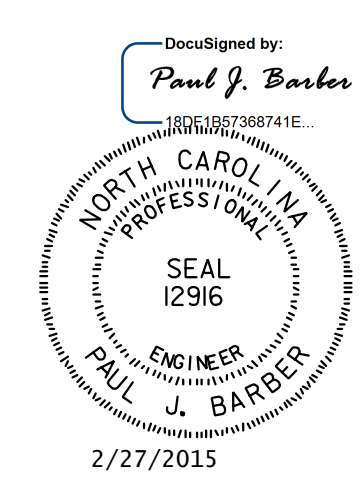
BILL OF MATERIAL FOR ONE  
PP 18 X 0.50 GALVANIZED STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
S1	46	4	1	4'-11"	151	
V1	8	9	2	47'-10"	1,301	
ITEM					TOTAL	
REINFORCING STEEL					LBS.	1,452
CAST-IN-PLACE CONCRETE (4,000 PSI):						
45'-0" MINIMUM PLUG				CU. YDS.	2.6	
CAST-IN-PLACE CONCRETE (2,500 PSI):						
				CU. YDS.	X.X	

BAR TYPES



PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POS 22+07.07 -L-  
 MILE POST: 0.23

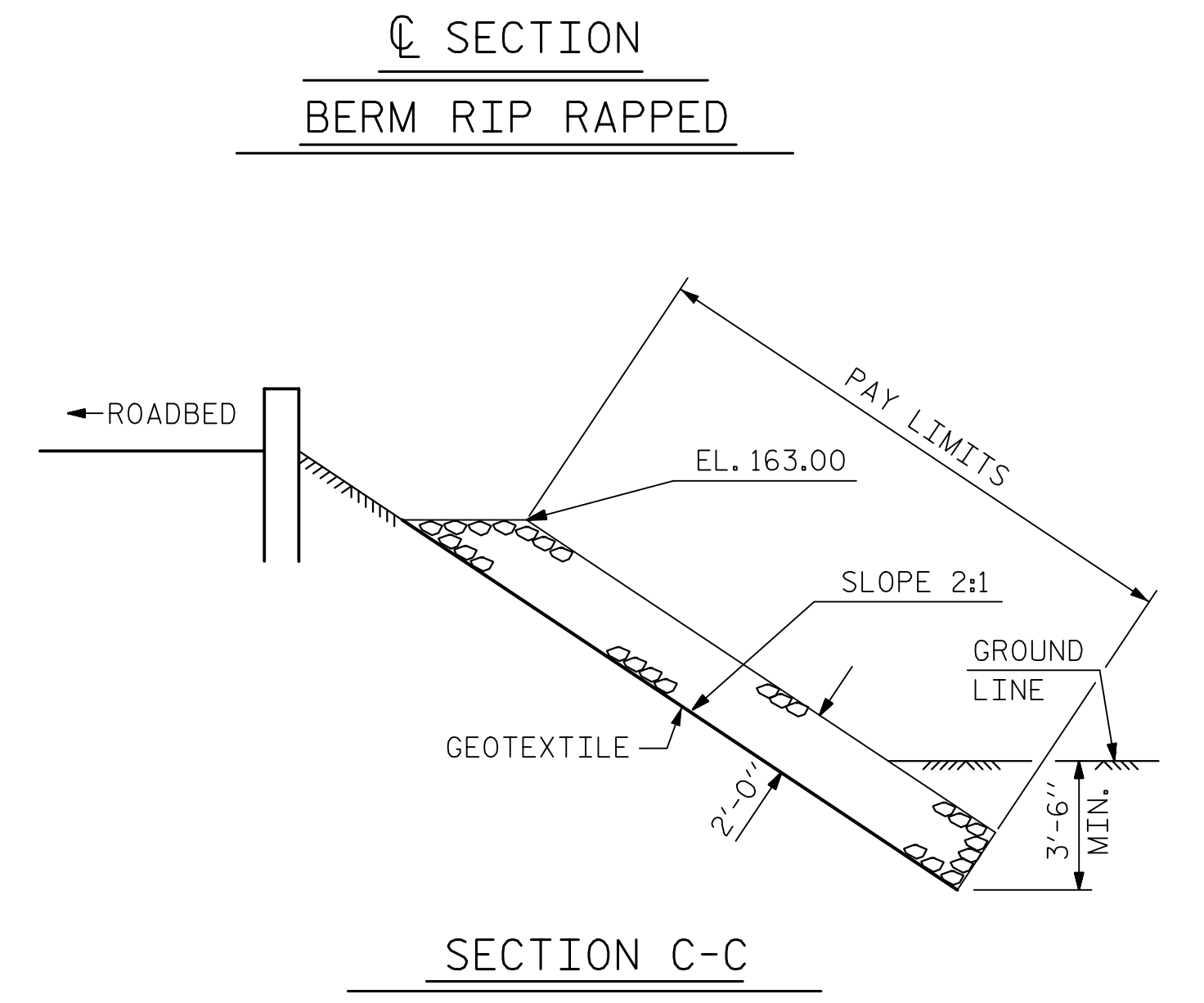
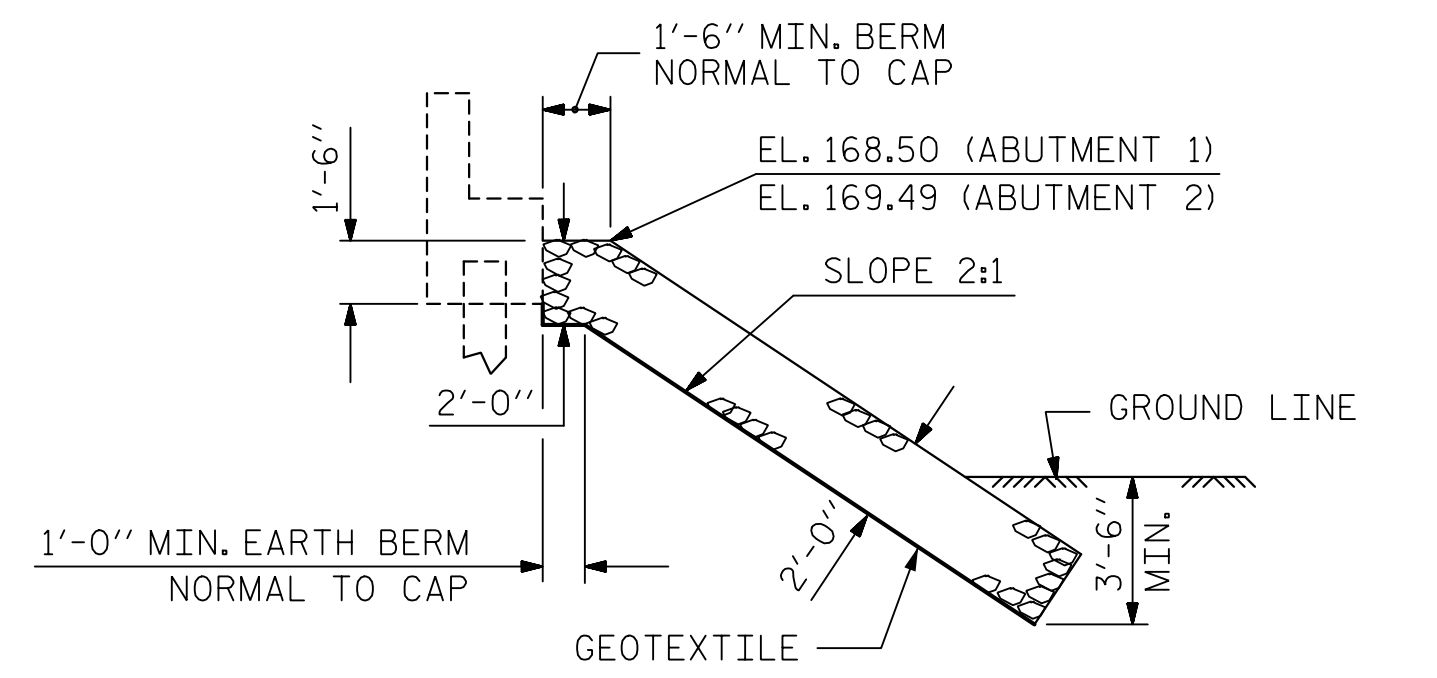
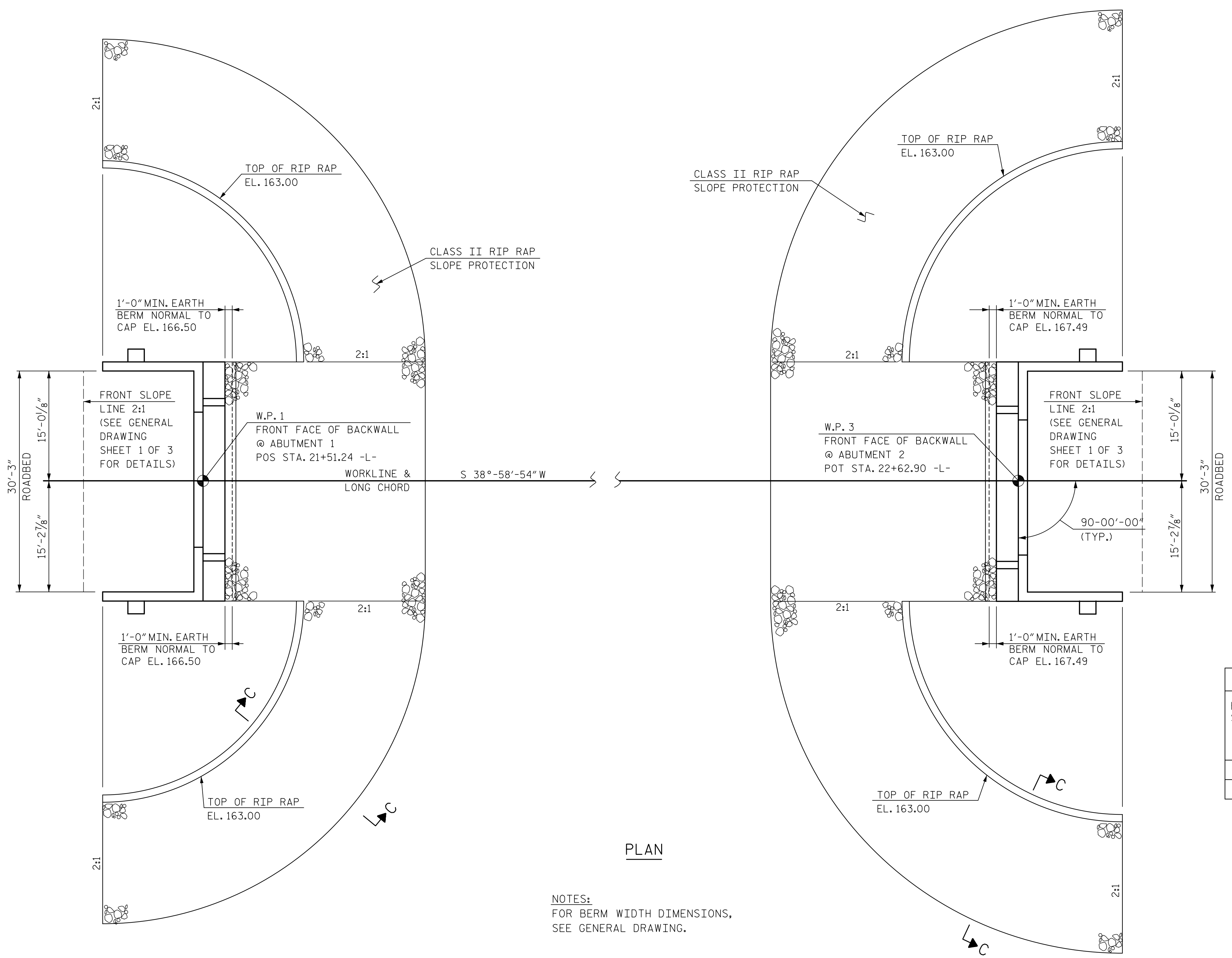


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 18" STEEL PIPE PILE

ASSEMBLED BY : M. WRIGHT	DATE : 10/14
CHECKED BY : D. RAGAN	DATE : 10/14
DRAWN BY : RWW 1/01	REV. 10/1/05 LBG/TLA
CHECKED BY : LES 1/01	REV. 5/1/06R MAA/KMM
	REV. 10/1/11 MAA/GM

<b>HNTB</b>		HNTB NORTH CAROLINA, P.C.	
License No. C-1554		343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY : M. WRIGHT	DATE : 10/14	DWG. NO. 18	
CHECKED BY : D. RAGAN	DATE : 10/14		

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
				TOTAL SHEETS	54



ESTIMATED QUANTITIES		
BRIDGE @ STA. 22+07.07 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
ABUTMENT 1	281	312
ABUTMENT 2	342	379

PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POS 22+07.07 -L-  
 MILE POST: 0.23

DocuSigned by:  
*Paul J. Barber*  
18DF1957368741E...

DocuSigned by:  
*David W. Hawkins*  
A5ED75248B55487...

NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 12916  
PAUL J. BARBER  
3/3/2015

NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 27812  
DAVID W. HAWKINS  
3/3/2015

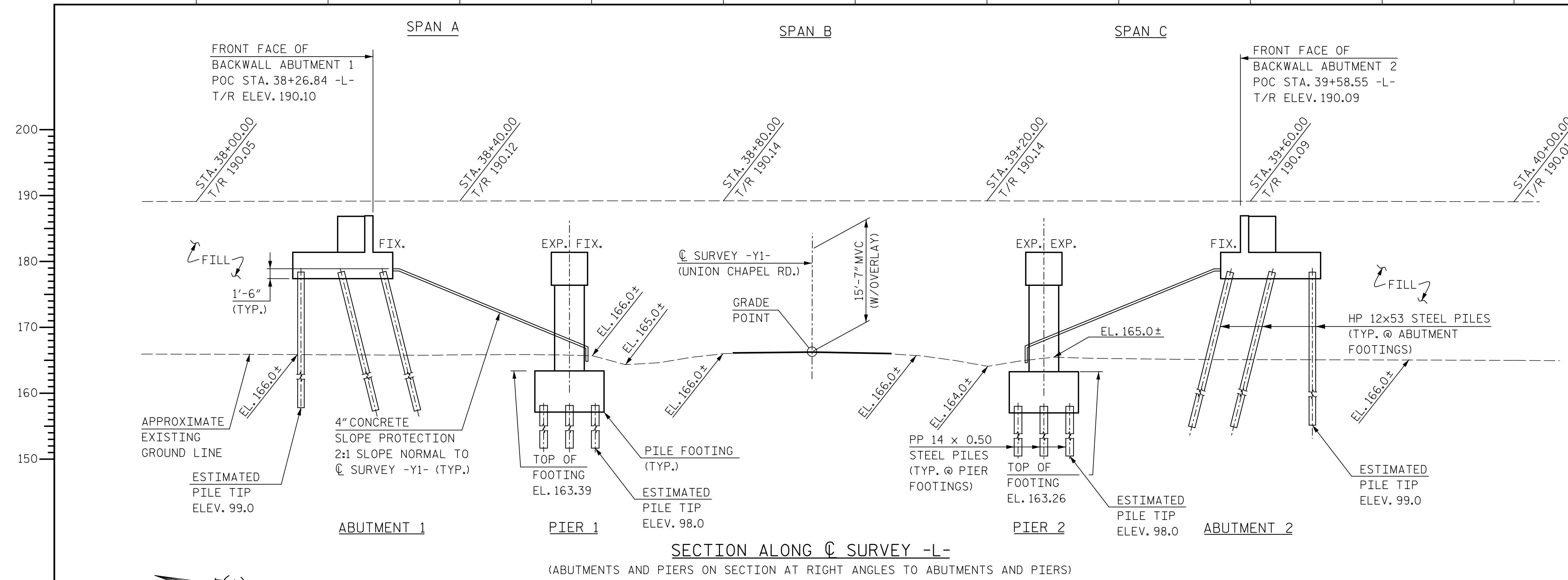
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 = RIP RAP DETAILS =

ASSEMBLED BY : W. WRIGHT	DATE : 9/14
CHECKED BY : D. RAGAN	DATE : 10/14
DRAWN BY : REK 1/84	REV. 5/1/06R TLA/GM
CHECKED BY : RDU 1/84	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM

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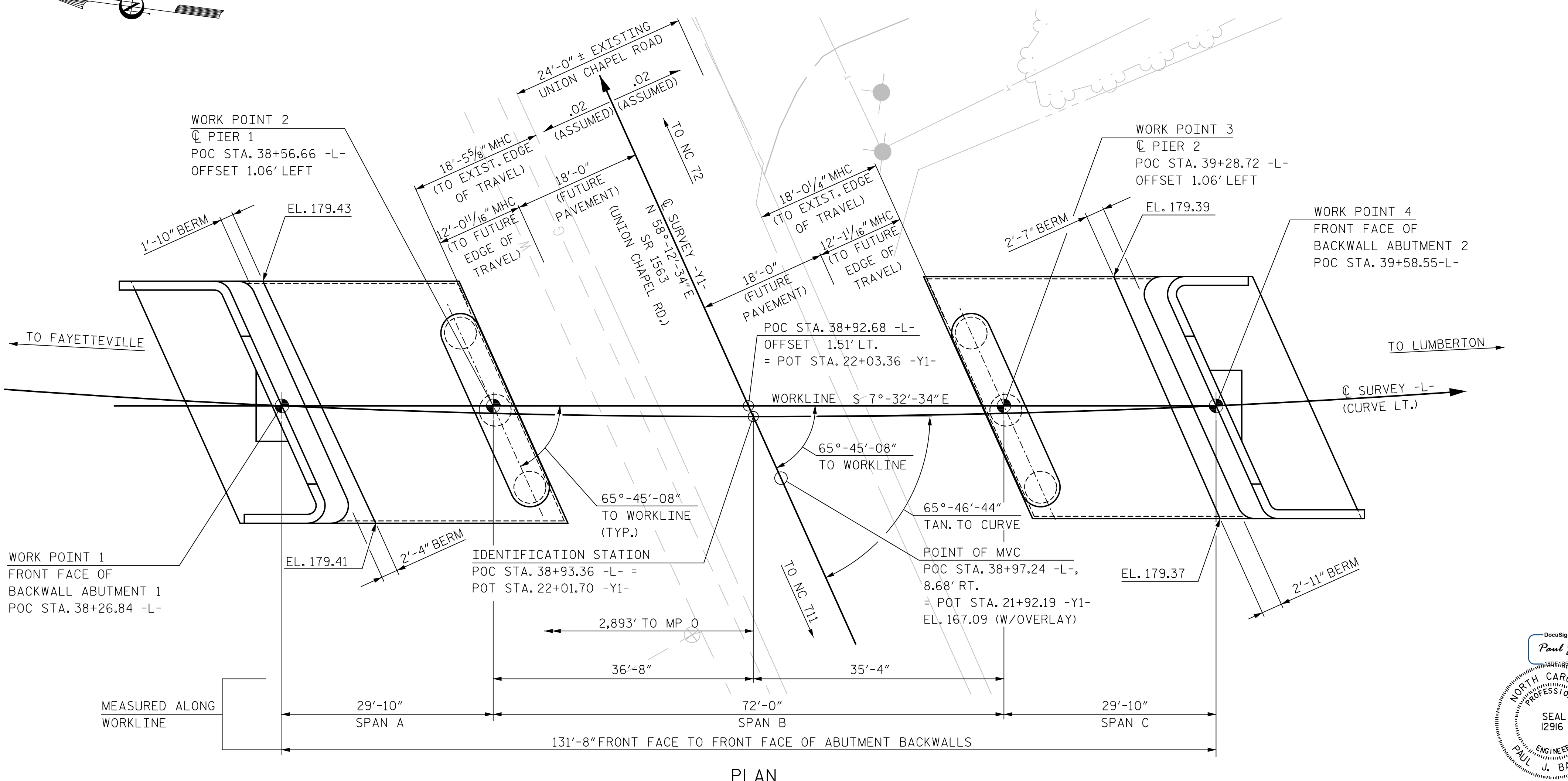
DRAWN BY M. WRIGHT DATE 9/14  
 CHECKED BY D. RAGAN DATE 10/14 DWG. NO. 19

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			54

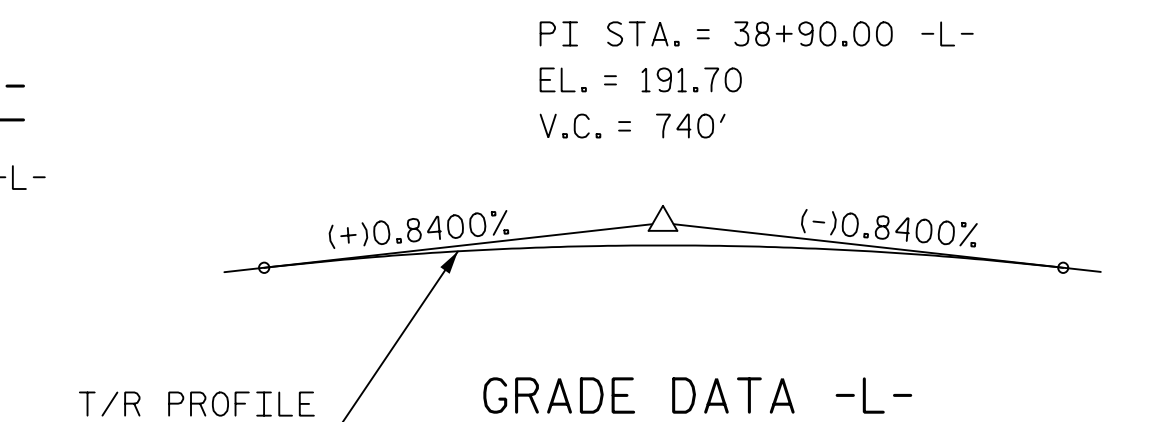


**NOTES:**  
 FOR GENERAL NOTES, SEE SHEET 4 OF 4.  
 MVC = MINIMUM VERTICAL CLEARANCE  
 MHC = MINIMUM HORIZONTAL CLEARANCE  
 MINIMUM VERTICAL CLEARANCE SHOWN ACCOUNTS FOR A 1.5" ASPHALT OVERLAY OF TOP OF PAVEMENT ELEVATIONS PROVIDED BELOW.

TOP OF PAVEMENT ELEVATIONS UNION CHAPEL RD. (EXISTING)	
STATION -Y1-	EL.
21+50.00	167.12
21+55.00	167.10
21+60.00	167.09
21+65.00	167.07
21+70.00	167.06
21+75.00	167.04
21+80.00	167.03
21+85.00	167.01
21+90.00	166.98
21+95.00	166.95
22+00.00	166.92
22+05.00	166.89
22+10.00	166.86
22+15.00	166.83
22+20.00	166.79
22+25.00	166.76
22+30.00	166.73
22+35.00	166.70
22+40.00	166.67
22+45.00	166.64
22+50.00	166.61
22+55.00	166.57
22+60.00	166.54



**CURVE DATA -L-**  
 PI STA. = 38+89.52 -L-  
 $\Delta = 71^\circ 34' 26.8''$  (LT)  
 $D = 4^\circ 00' 00.0''$   
 $L = 1,789.35'$   
 $T = 1,032.79'$   
 $R = 1,432.69'$   
 $SE = 4.25''$



**PLAN**  
 NOTE: PILES NOT SHOWN FOR CLARITY.  
 WORKLINE SHALL BE THE -L- LINE LONG CHORD BETWEEN ABUTMENT WORK POINTS.

PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POC 38+93.36 -L- =  
POT 22+01.70 -Y1-  
 MILE POST: 0.55  
 SHEET 1 OF 4 BRIDGE NO. \_\_\_\_\_

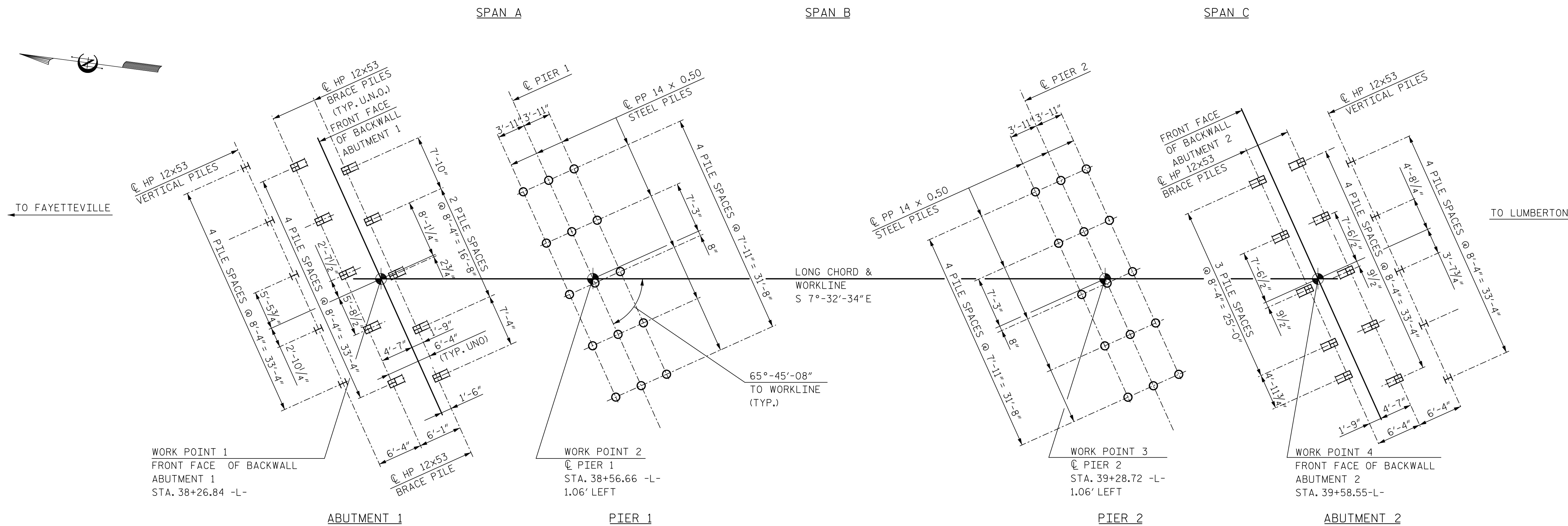
DocuSigned by:  
*Paul J. Barber*

PAUL J. BARBER  
ENGINEER  
2/27/2015

DocuSigned by:  
*David W. Hawkins*

DAVID W. HAWKINS  
ENGINEER  
2/27/2015

<b>HNTB</b> HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO. <b>S-20</b>
		NO.	BY:	
DRAWN BY J. BAYNE	DATE 9/14	CHECKED BY P. BARBER	DATE 9/14	DWG. NO. 1



**FOUNDATION NOTES**

FOR PILES, SEE SPECIAL PROVISIONS.

THE ALLOWABLE BEARING CAPACITY FOR PILES AT ABUTMENT NO.1 AND ABUTMENT NO.2 IS 75 TONS PER PILE.

DRIVE PILES AT ABUTMENT NO.1 AND ABUTMENT NO.2 TO A REQUIRED BEARING CAPACITY OF 150 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.

THE ALLOWABLE BEARING CAPACITY FOR PILES AT PIER NO.1 AND PIER NO.2 IS 100 TONS PER PILE.

DRIVE PILES AT PIER NO.1 AND PIER NO.2 TO A REQUIRED BEARING CAPACITY OF 200 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.

PIPE PILE PLATES ARE REQUIRED FOR PIPE PILES AT PIER NO.1 AND PIER NO.2. USE PIPE PILE PLATES WITH A DIAMETER EQUAL TO THE PIPE PILE DIAMETER.

TESTING THE FIRST PRODUCTION PILE AT ABUTMENT NO.1 AND ABUTMENT NO.2 WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED. FOR PDA TESTING, SEE SPECIAL PROVISIONS.

TESTING THE FIRST PRODUCTION PILE AT PIER NO.1 AND PIER NO.2 WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED. FOR PDA TESTING, SEE SPECIAL PROVISIONS.

GROUNDWATER WAS FOUND TO BE ABOVE THE BOTTOM OF FOOTING ELEVATIONS AT PIER NO. 1 AND PIER NO.2 AT THE TIME OF SUBSURFACE INVESTIGATION. THE CONTRACTOR SHALL USE A WELL POINT DEWATERING SYSTEM, APPROPRIATELY DESIGNED SHEET PILING COFFERDAM WITH GRAVEL BED AND SUMP PUMP, OR OTHER APPROPRIATE MEASURES AS NEEDED TO SAFELY CONSTRUCT THE FOOTING IN A DRY CONDITION. THE COSTS ASSOCIATED WITH THE ABOVE MENTIONED OPTIONS SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE FOUNDATION EXCAVATION.

DO NOT DRIVE PILES AT ABUTMENT NO.1 OR PIER NO.1 UNTIL AFTER OBSERVING A 3 MONTH WAITING PERIOD BEGINNING WHEN FILL AND SURCHARGE HAVE BEEN PLACED AS SHOWN IN RAIL PLANS FOR A MINIMUM DISTANCE OF 250 FT FROM ABUTMENT 1. SEE RAIL PLANS AND SURCHARGE SPECIAL PROVISION FOR SURCHARGE DETAILS.

DO NOT DRIVE PILES AT ABUTMENT NO.2 OR PIER NO.2 UNTIL AFTER OBSERVING A 3 MONTH WAITING PERIOD BEGINNING WHEN FILL AND SURCHARGE HAVE BEEN PLACED AS SHOWN IN RAIL PLANS FOR A MINIMUM DISTANCE OF 250 FT FROM ABUTMENT 2. SEE RAIL PLANS AND SURCHARGE SPECIAL PROVISION FOR SURCHARGE DETAILS.

**FOUNDATION LAYOUT**

**NOTES:**

ALL DIMENSIONS ARE PARALLEL OR NORMAL TO PIER CENTERS AND FRONT FACES OF BACKWALL.

INDICATES HP 12x53 PILE TO BE BATTERED 3:12 IN DIRECTION SHOWN.

ALL PILE DIMENSIONS ARE TO CENTERS OF PILES AT BOTTOM OF ABUTMENTS OR PIER FOOTINGS.

FOR FOUNDATION ELEVATIONS AND DETAILS, SEE PIER AND ABUTMENT DETAILS.

U.N.O. = UNLESS NOTED OTHERWISE.

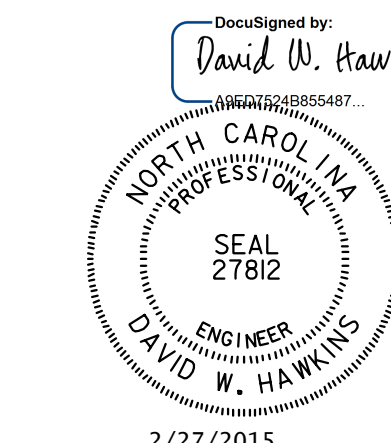
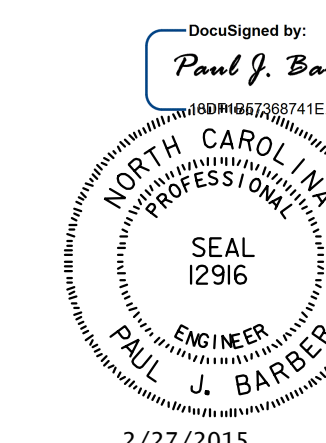
PROJECT NO. P-4900A

ROBESON COUNTY

STATION: POC 38+93.36 -L-

MILE POST: 0.55

SHEET 2 OF 4



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**GENERAL DRAWING**  
FOUNDATION LAYOUT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1	J. BAYNE	10/14	3			TOTAL SHEETS
2	D. RAGAN	10/14	4			54

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DWG. NO. 2

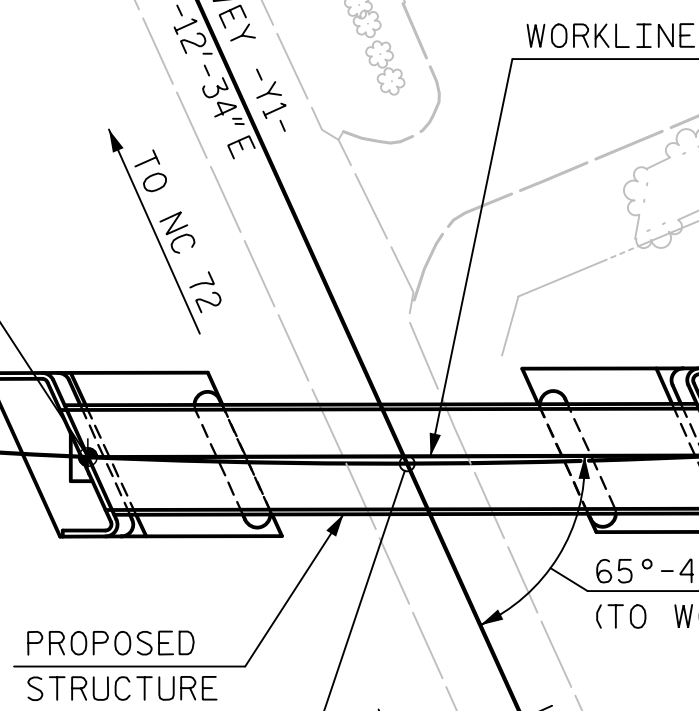


BM - P4900 BY2-12 : -Y1- STA. 19+99.26, 26.34' RT.  
N 341486.6412 E 1945040.0808 EL. 165.99



BEGIN BRIDGE  
FRONT FACE OF  
BACKWALL ABUTMENT 1  
POC STA. 38+26.84 -L-

IDENTIFICATION STATION  
POC STA. 38+93.36 -L- =  
POT STA. 22+01.70 -Y1-



END BRIDGE  
FRONT FACE OF BACKWALL  
ABUTMENT 2  
POC STA. 39+58.55 -L-

LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

INDEX OF DRAWINGS

- 1 GENERAL DRAWING: GENERAL PLAN AND ELEVATION (SHEET 1 OF 4)
- 2 GENERAL DRAWING: FOUNDATION LAYOUT (SHEET 2 OF 4)
- 3 GENERAL DRAWING: LOCATION SKETCH AND TOTAL BILL OF MATERIAL (SHEET 3 OF 4)
- 4 GENERAL DRAWING: GENERAL NOTES (SHEET 4 OF 4)
- 5 SUPERSTRUCTURE: TYPICAL SECTION
- 6 SUPERSTRUCTURE: DECK DETAILS
- 7 SUPERSTRUCTURE: PLAN OF DECK - SPAN A
- 8 SUPERSTRUCTURE: PLAN OF DECK - SPAN B
- 9 SUPERSTRUCTURE: PLAN OF DECK - SPAN C
- 10 SUPERSTRUCTURE: FRAMING PLAN AND GIRDER DETAILS - SPANS A & C
- 11 SUPERSTRUCTURE: FRAMING PLAN AND GIRDER DETAILS - SPAN B
- 12 SUPERSTRUCTURE: STRUCTURAL STEEL DETAILS
- 13 SUPERSTRUCTURE: BEARING DETAILS SPANS A & C
- 14 SUPERSTRUCTURE: BEARING DETAILS SPAN B
- 15 SUPERSTRUCTURE: EXPANSION PLATE DETAILS
- 16 SUPERSTRUCTURE: PARAPET ELEVATION
- 17 SUPERSTRUCTURE: PARAPET PANEL DETAILS
- 18 SUPERSTRUCTURE: PARAPET PANEL FORM LINER FINISH DETAILS
- 19 SUPERSTRUCTURE: BILL OF MATERIAL
- 20 SUBSTRUCTURE: ABUTMENT 1 (SHEET 1 OF 3)
- 21 SUBSTRUCTURE: ABUTMENT 1 (SHEET 2 OF 3)
- 22 SUBSTRUCTURE: ABUTMENT 1 (SHEET 3 OF 3)
- 23 SUBSTRUCTURE: PIER 1 (SHEET 1 OF 2)
- 24 SUBSTRUCTURE: PIER 1 (SHEET 2 OF 2)
- 25 SUBSTRUCTURE: PIER 2 (SHEET 1 OF 2)
- 26 SUBSTRUCTURE: PIER 2 (SHEET 2 OF 2)
- 27 SUBSTRUCTURE: ABUTMENT 2 (SHEET 1 OF 3)
- 28 SUBSTRUCTURE: ABUTMENT 2 (SHEET 2 OF 3)
- 29 SUBSTRUCTURE: ABUTMENT 2 (SHEET 3 OF 3)
- 30 STRUCTURE DRAINAGE DETAILS (SHEET 1 OF 4)
- 31 STRUCTURE DRAINAGE DETAILS (SHEET 2 OF 4)
- 32 STRUCTURE DRAINAGE DETAILS (SHEET 3 OF 4)
- 33 STRUCTURE DRAINAGE DETAILS (SHEET 4 OF 4)
- 34 SLOPE PROTECTION DETAILS (SHEET 1 OF 2)
- 35 SLOPE PROTECTION DETAILS (SHEET 2 OF 2)

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION FOR PIER NO. 1 AT STA. 38+93.36 -L-	FOUNDATION EXCAVATION FOR PIER NO. 2 AT STA. 38+93.36 -L-	PDA TESTING	CAST-IN-PLACE CONCRETE (5,000 PSI)	CAST-IN-PLACE CONCRETE (4,000 PSI)	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL	APPROX. 329,519 LBS. STRUCTURAL STEEL	PAINTING OF STRUCTURAL STEEL	HP 12 x 53 STEEL PILES		PP 14 x 0.50 STEEL PILES		PIPE PILE PLATES	PILE REDRIVES	WATERPROOFING	DAMPPROOFING	CONCRETE PARAPET	4" SLOPE PROTECTION
										NO.	L.F.	NO.	L.F.						
SUPERSTRUCTURE	---	---	---	94.8	---	---	12,688	LUMP SUM	LUMP SUM	---	---	---	---	---	---	322.5	---	260.8	---
ABUTMENT 1	---	---	---	---	123.7	9,884	---	---	---	15	1,200	---	---	---	8	13.2	80.1	---	134.3
PIER 1	LUMP SUM	---	---	---	136.8	21,536	---	---	---	---	---	15	900	15	8	9.4	58.2	---	---
PIER 2	---	LUMP SUM	---	---	136.8	21,536	---	---	---	---	---	15	900	15	8	9.4	59.4	---	---
ABUTMENT 2	---	---	---	---	123.0	9,823	---	---	---	15	1,200	---	---	---	8	13.2	79.2	---	134.7
TOTAL	LUMP SUM	LUMP SUM	4	94.8	520.3	62,779	12,688	LUMP SUM	LUMP SUM	30	2,400	30	1,800	30	32	367.7	276.9	260.8	269.0

TOTAL BILL OF MATERIAL

	SELF-LUBRICATING EXPANSION BEARING ASSEMBLIES	STRUCTURE DRAINAGE SYSTEM AT STA. 38+93.36 -L-	APPLICATION OF BRIDGE COATING
	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM	LUMP SUM	LUMP SUM
ABUTMENT 1	---	---	LUMP SUM
PIER 1	---	---	LUMP SUM
PIER 2	---	---	LUMP SUM
ABUTMENT 2	---	---	LUMP SUM
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM

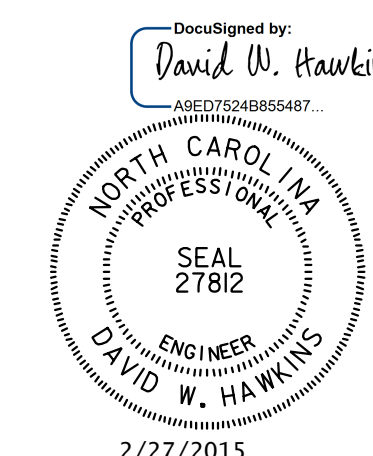
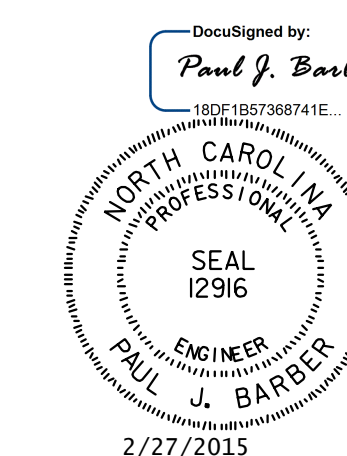
PROJECT NO. P-4900A

ROBESON COUNTY

STATION: POC 38+93.36 -L-

MILE POST: 0.55

SHEET 3 OF 4



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

GENERAL DRAWING  
LOCATION SKETCH  
AND  
TOTAL BILL OF MATERIAL

HNTB						HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609						REVISIONS			SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:										
1	J. BAYNE	9/14	3									S-22			
2	D. RAGAN	10/14	4										TOTAL SHEETS 54		

DRAWN BY: J. BAYNE DATE: 9/14  
CHECKED BY: D. RAGAN DATE: 10/14 DWG. NO. 3

**GENERAL NOTES**

ASSUMED LIVE LOAD = AREMA E80 WITH FULL DIESEL IMPACT OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT EDITION OF AREMA'S MANUAL FOR RAILWAY ENGINEERING, "VOL. 2, STRUCTURES" AND CSX TRANSPORTATION'S "UNDERGRADE BRIDGE CRITERIA INCLUDING BALLAST DECK" AND THE STRUCTURE SPECIAL PROVISIONS.

WELDING SHALL BE IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY (AWS) BRIDGE WELDING CODE D1.5 AS AMENDED AND COMPLEMENTED BY THE AREMA MANUAL.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

REINFORCING STEEL SHALL BE DEFORMED BILLET STEEL CONFORMING TO ASTM DESIGNATION A615, GRADE 60. ALL DIMENSIONS RELATING TO BAR SPACING ARE TO BAR CENTERS UNLESS NOTED. ALL REINFORCING IN THE CONCRETE DECK SLAB AND PARAPETS SHALL BE EPOXY COATED. COMPATIBLE EPOXY COATED STEEL TIE WIRES SHALL BE USED WITH THE EPOXY COATED BARS.

EXPANSION JOINT MATERIAL SHALL BE EITHER RUBBER OR CORK CONFORMING WITH AASHTO SPECIFICATIONS M-153-84 EXCEPT AS SHOWN ON THE PLANS OR IN THE SPECIAL PROVISIONS. CELLULAR AND BULB TYPE WATERSTOPS AND RUBBER JOINT COMPOUNDS SHALL BE AS SHOWN ON THE PLANS AND IN THE SPECIAL PROVISIONS.

METAL DRAINS BEHIND ABUTMENTS AND IN BALLAST TROUGH OF BRIDGE, INCLUDING DUCTILE IRON PIPE COLLECTOR SYSTEM, SHALL BE AS SHOWN ON THE PLANS AND OUTLINED IN THE SPECIAL PROVISIONS. DETAILS OF THE DRAINAGE SYSTEM SHALL BE SUBMITTED FOR REVIEW.

WATERPROOFING: BRIDGE DECK, ALL CONSTRUCTION JOINTS AND ANY VISIBLE SHRINKAGE CRACKS WHICH WILL BE COVERED BY FILL SHALL BE WATERPROOFED WITH A COLD LIQUID - APPLIED ELASTOMERIC MEMBRANE. FOR WATERPROOFING, SEE SPECIAL PROVISIONS.

- WATERPROOFING IS REQUIRED AT THE FOLLOWING LOCATIONS:
1. OVER ENTIRE TOP SURFACE OF REINFORCED CONCRETE DECK SLAB AND INSIDE FACES OF CONCRETE PARAPETS TO PROPOSED BALLAST ELEVATION.
  2. ALONG FULL LENGTH OF HORIZONTAL CONSTRUCTION JOINT AT TOP OF CAP/FOOTING WITH BACKWALL AT EACH ABUTMENT (FILL FACE OF BACKWALL AND WINGWALLS ONLY).
  3. ALONG FULL CIRCUMFERENCE OF EACH BOTTOM OF COLUMN TO TOP OF FOOTING INTERFACE.
  4. AT ANY CONCRETE SHRINKAGE CRACKS WHICH WILL BE COVERED BY FILL.

WATERPROOFING FOR LOCATIONS 2, 3 AND 4 ABOVE SHALL BE 24" WIDE AND SHALL BE CENTERED OVER JOINTS OR CRACKS.

DAMPPOOFING SHALL BE APPLIED TO THE FOLLOWING SURFACES REGARDLESS OF WHETHER OR NOT THE PLAN DETAILS SO INDICATE:

1. ON FILL SIDE TOP OF FOOTING AND FILL FACE OF BACKWALL AT EACH ABUTMENT.
2. ON FILL FACE OF ABUTMENT WINGWALLS FROM BOTTOM OF WINGWALL TO TOP OF BACKWALL ELEVATION AT EACH ABUTMENT.
3. TOP OF PIER FOOTINGS AND PIER COLUMNS UP TO PROPOSED GROUND LINE.

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.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES", JANUARY 2012, NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (HEREIN CALLED STANDARD SPECIFICATIONS), EXCEPT AS NOTED HEREIN, ELSEWHERE ON PLANS, OR IN THE SPECIAL PROVISIONS.

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

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

THE ELEVATION(S) AND CLEARANCE(S) SHOWN ON THE PLANS AT THE POINT(S) OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION(S) ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

ALL CONSTRUCTION JOINTS SHOWN ON THESE PLANS SHALL BE REQUIRED UNLESS SHOWN AS OPTIONAL. CONSTRUCTION JOINTS SHALL NOT BE PERMITTED EXCEPT AS SHOWN ON THE PLANS, OR WHERE WRITTEN APPROVAL HAS BEEN OBTAINED.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH SEISMIC PERFORMANCE CATEGORY A REQUIREMENTS OF THE AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES", AND CHAPTER NINE "SEISMIC DESIGN FOR RAILWAY STRUCTURES" OF THE CURRENT EDITION OF AREMA'S MANUAL FOR RAILWAY ENGINEERING, "VOL. 2 STRUCTURES".

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR SELF-LUBRICATING EXPANSION BEARING ASSEMBLIES, SEE SPECIAL PROVISIONS.

SEE "STRUCTURAL STEEL DETAILS" SHEET FOR STRUCTURAL STEEL NOTES.

FOR BACKFILL BEHIND ABUTMENTS AND OTHER BACKFILL AROUND THE STRUCTURE, SEE SPECIAL PROVISION "BACKFILLING AROUND STRUCTURES".

FOR PAINTING STEEL STRUCTURES, SEE SPECIAL PROVISIONS.

FOR WATERSTOPS, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC FLASHING, SEE SPECIAL PROVISIONS.

FOR RUBBER JOINT COMPOUNDS, SEE SPECIAL PROVISIONS.

FOR STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

FOR RAILROAD TRACKWORK, SEE RAILROAD TRACKWORK PLANS.

FOR ARCHITECTURAL TREATMENT, SEE SPECIAL PROVISIONS.

FOR WATERPROOFING, SEE SPECIAL PROVISIONS.

FOR REINFORCING, CONCRETE, AND DAMPPROOFING, SEE "CAST-IN-PLACE CONCRETE", SPECIAL PROVISION.

ONLY ITEMS IN THE PROPOSAL AS PAY ITEMS WILL BE PAID FOR. COMPENSATION FOR ALL LABORS, MATERIALS, TOOLS, EQUIPMENT AND INCIDENTALS FOR THE ENTIRE CONTRACT SHALL BE INCLUDED IN THE PRICE BID FOR PAY ITEMS.

FOR FOUNDATION NOTES, SEE "FOUNDATION LAYOUT" SHEET.

FOR APPLICATION OF BRIDGE COATING, SEE SPECIAL PROVISION.

FOR CONCRETE PARAPET, SEE SPECIAL PROVISION.

FOR MASS CONCRETE AT PIER 1 AND PIER 2, SEE SPECIAL PROVISIONS.

PROJECT NO. P-4900A

ROBESON COUNTY

STATION: POC 38+93.36 -L-

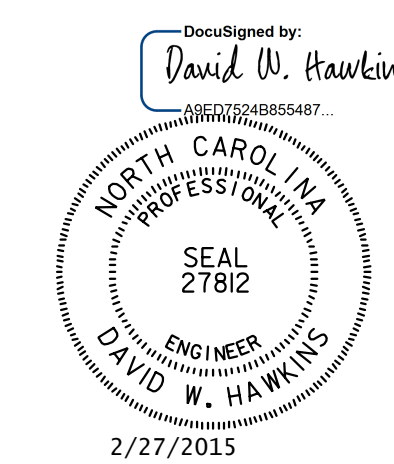
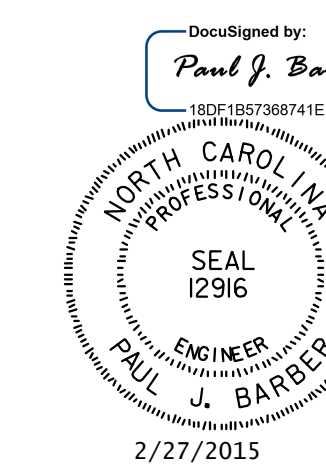
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SHEET 4 OF 4

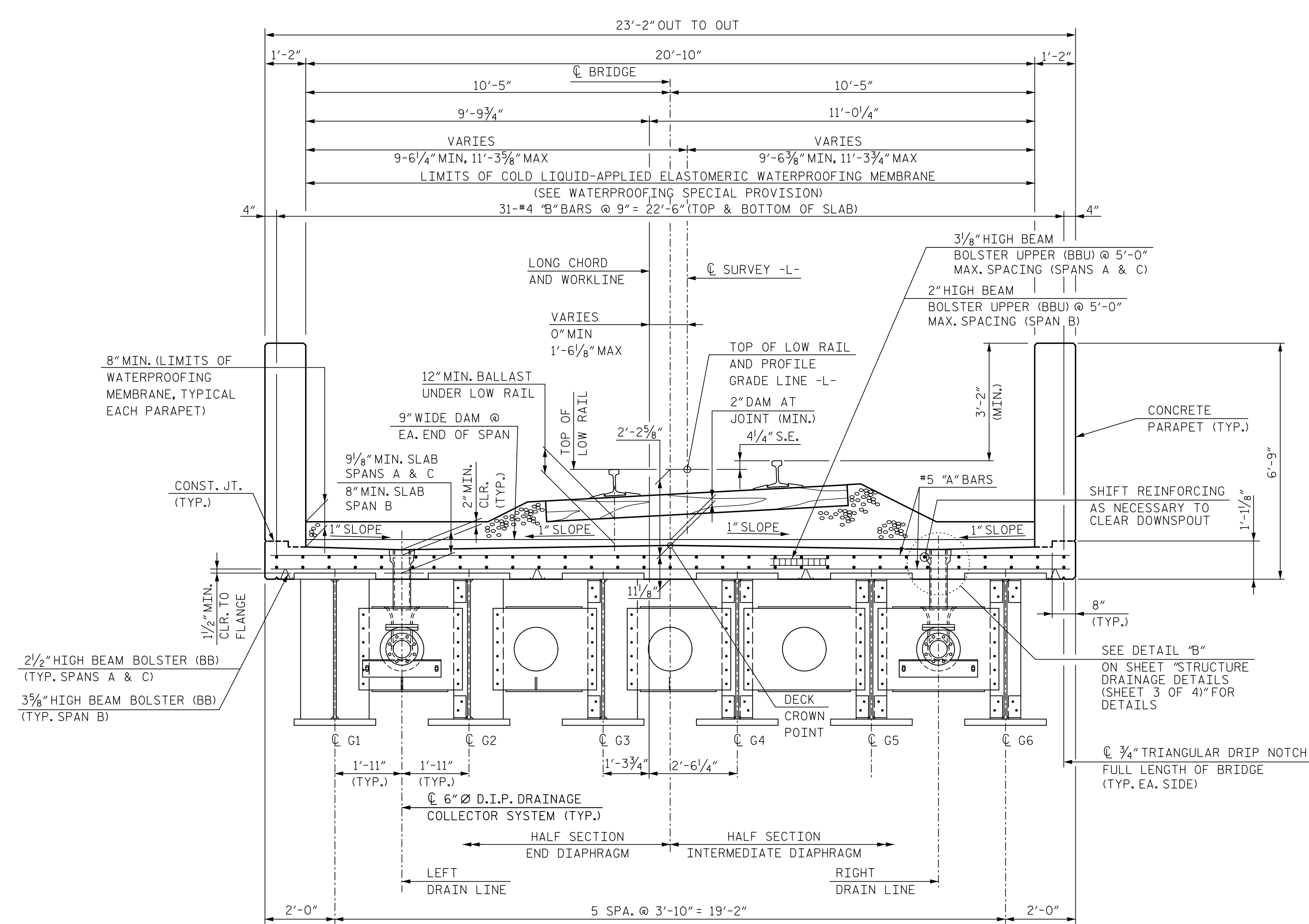
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

GENERAL DRAWING

GENERAL NOTES



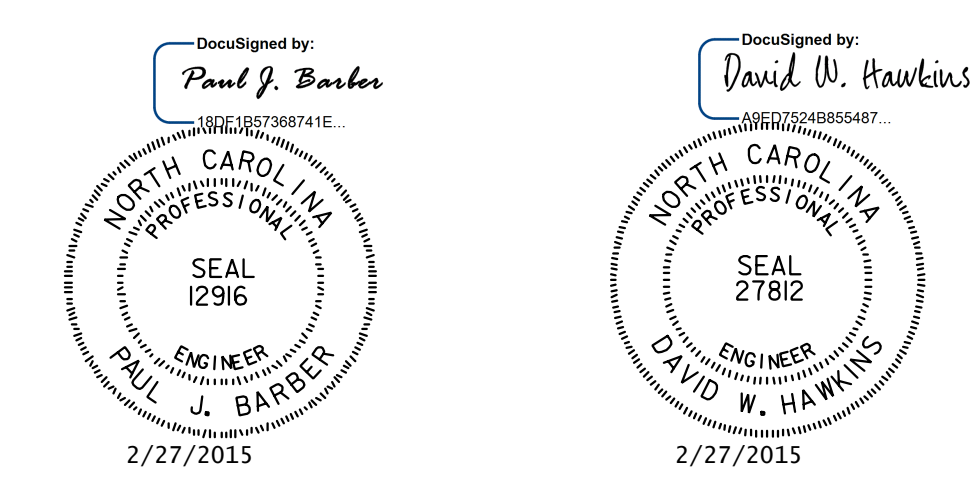
<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS			SHEET NO. <b>S-23</b>
DRAWN BY	M. WRIGHT	DATE	8/14	NO.	BY:	DATE:	TOTAL SHEETS
CHECKED BY	P. BARBER	DATE	9/14	1			54
			DWG. NO. 4	2			
				3			
				4			



**TYPICAL SECTION**  
(ALL SPANS SIMILAR)

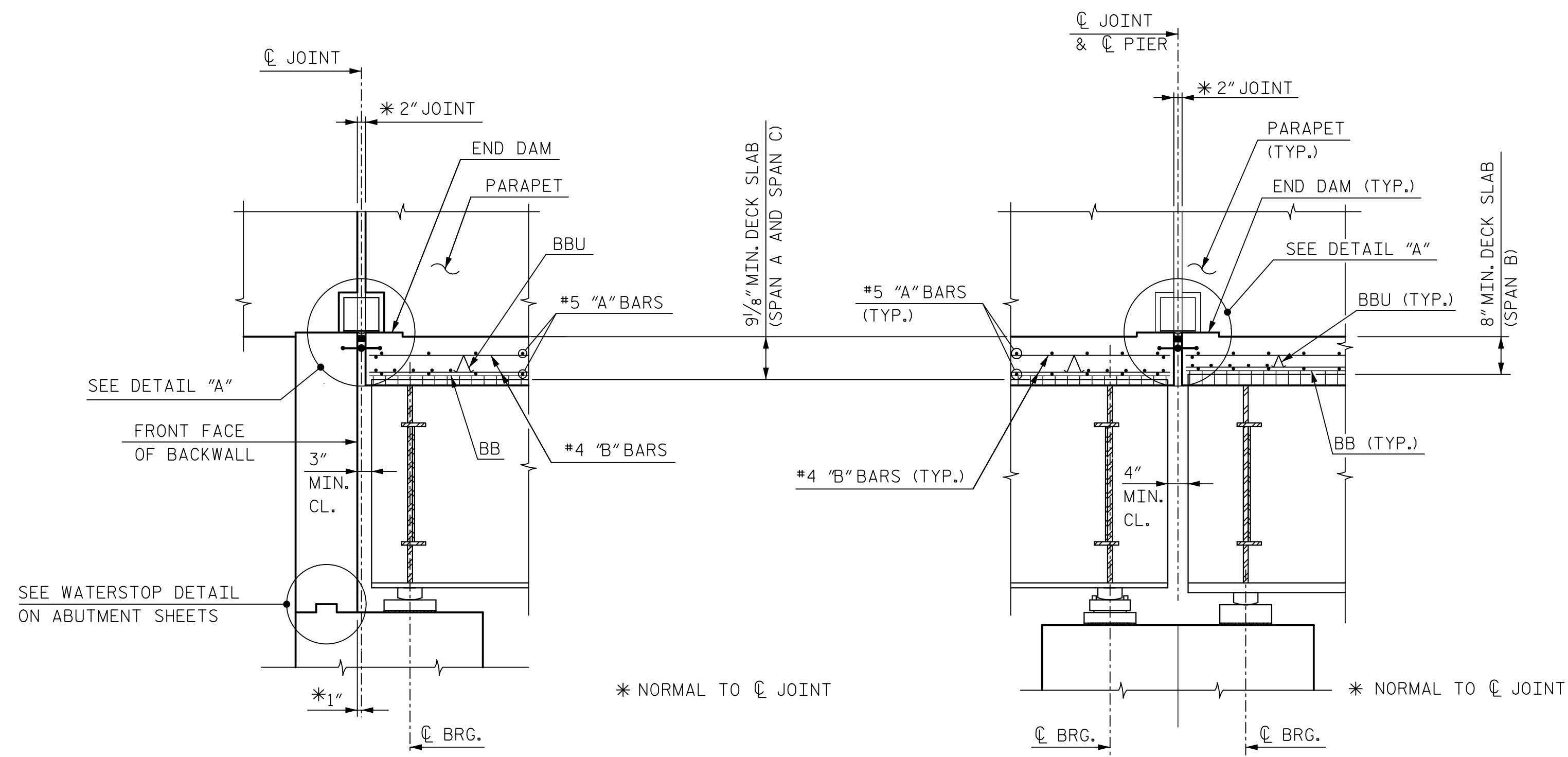
**NOTES:**  
 ALL REINFORCING STEEL IN THE DECK AND PARAPETS SHALL BE EPOXY COATED. CLEAR COVER TO ALL REINFORCING IS 2" MINIMUM UNLESS NOTED OTHERWISE.  
 FOR CONCRETE PARAPET DETAILS, SEE "CONCRETE PARAPET DETAILS" SHEET.  
 FOR ARCHITECTURAL TREATMENTS, SEE "PARAPET ARCHITECTURAL DETAILS" SHEET.  
 DESIGN INCLUDES WEIGHT OF 6" ADDITIONAL BALLAST TO ACCOUNT FOR FUTURE RESURFACING OF TRACK.  
 THE DECK SLAB SHALL BE CONSTRUCTED USING REMOVABLE FORMS.

PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POC 38+93.36 -L-  
 MILE POST: 0.55



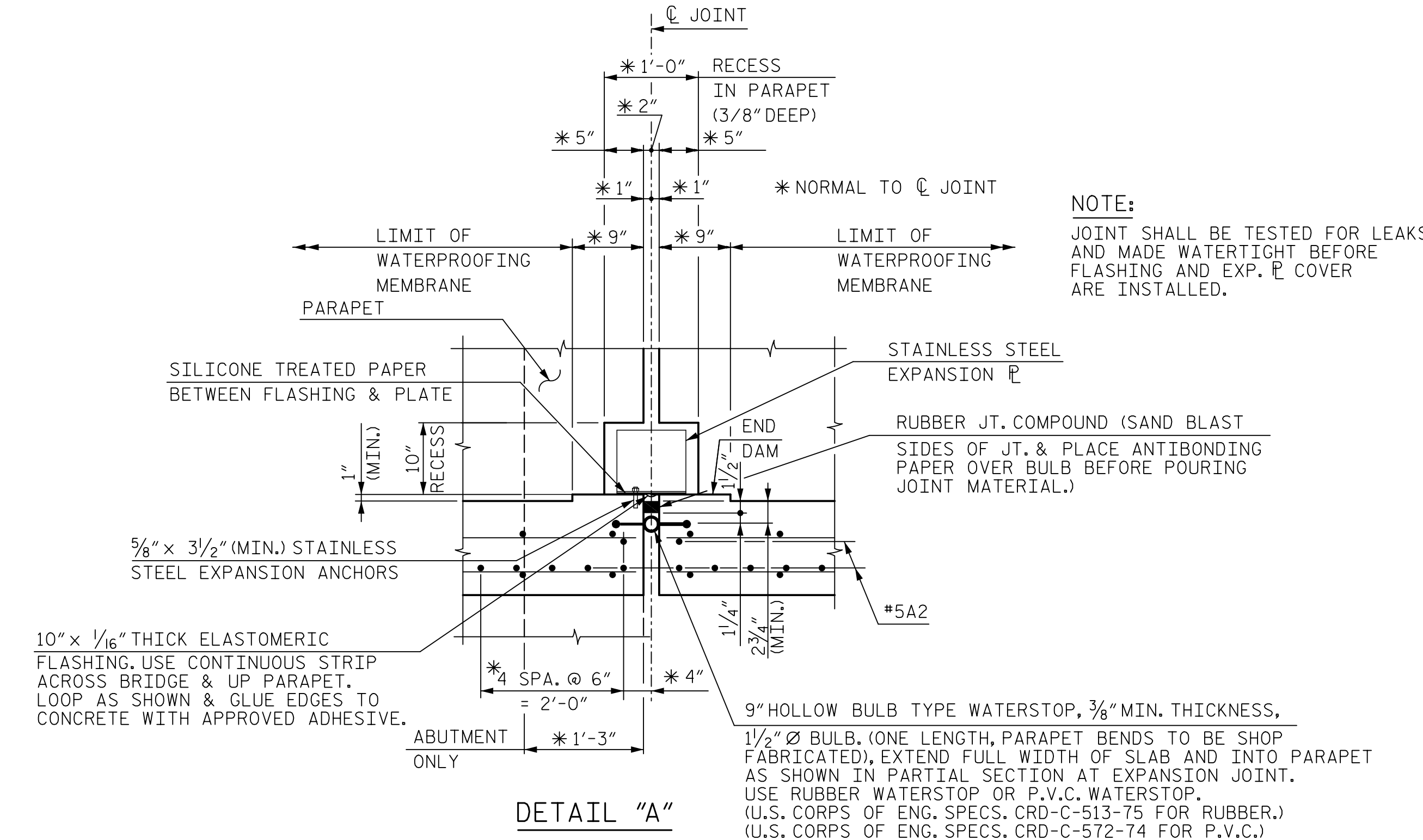
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUPERSTRUCTURE**  
 TYPICAL SECTION

<b>HNTB</b> HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609						REVISIONS			SHEET NO.	
DRAWN BY	M. WRIGHT	DATE	7/14	NO.	BY:	DATE:	NO.	BY:	DATE:	<b>S-24</b>
CHECKED BY	P. BARBER	DATE	7/14	1			3			TOTAL SHEETS
				2			4			<b>54</b>



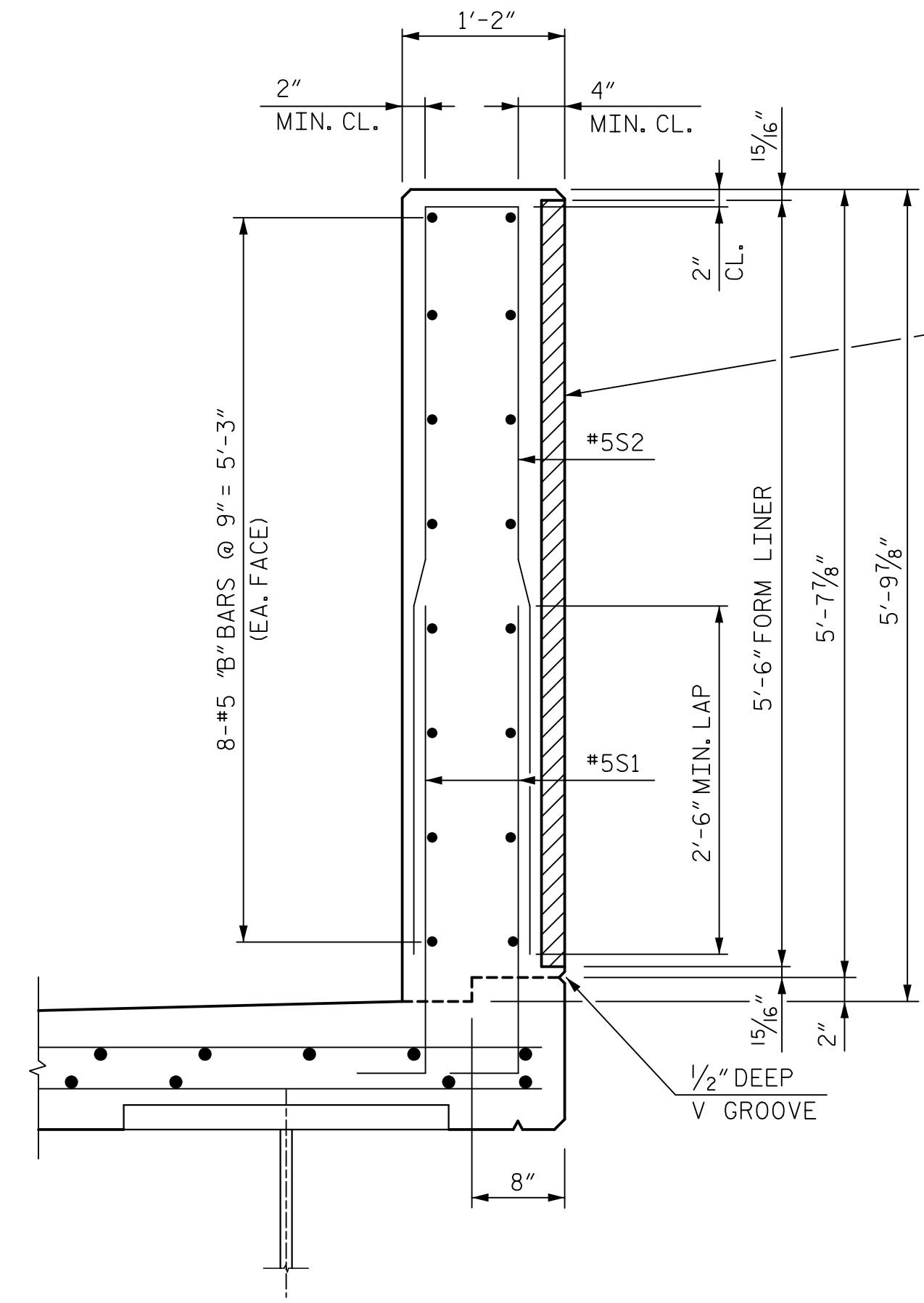
**SECTION A-A**  
(ABUT. 1 & 2)

**SECTION B-B**  
(PIERS 1 & 2)  
(PIER 1 SHOWN, PIER 2 SIMILAR)



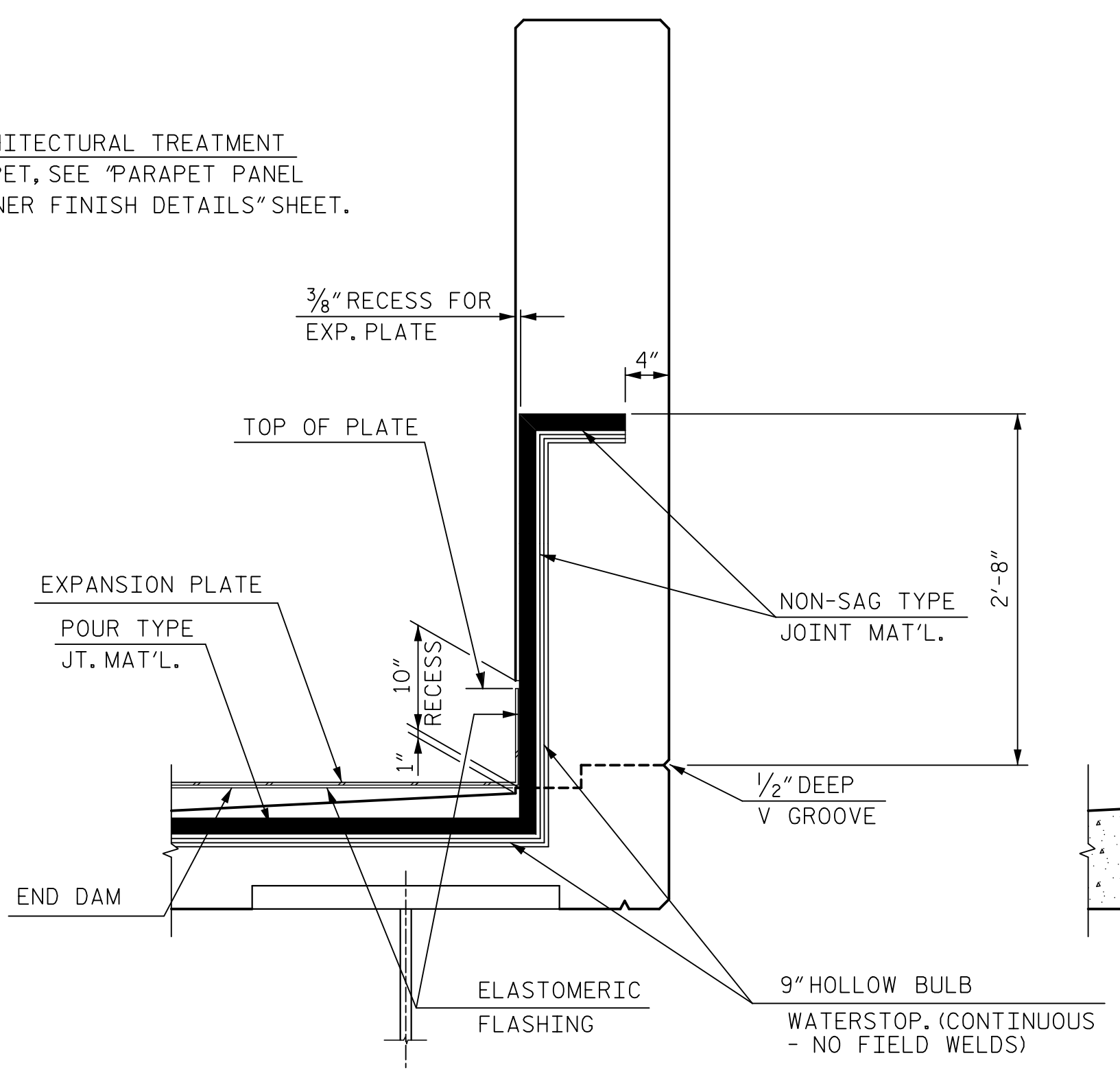
**DETAIL "A"**

**NOTE:**  
JOINT SHALL BE TESTED FOR LEAKS AND MADE WATERTIGHT BEFORE FLASHING AND EXP. P. COVER ARE INSTALLED.

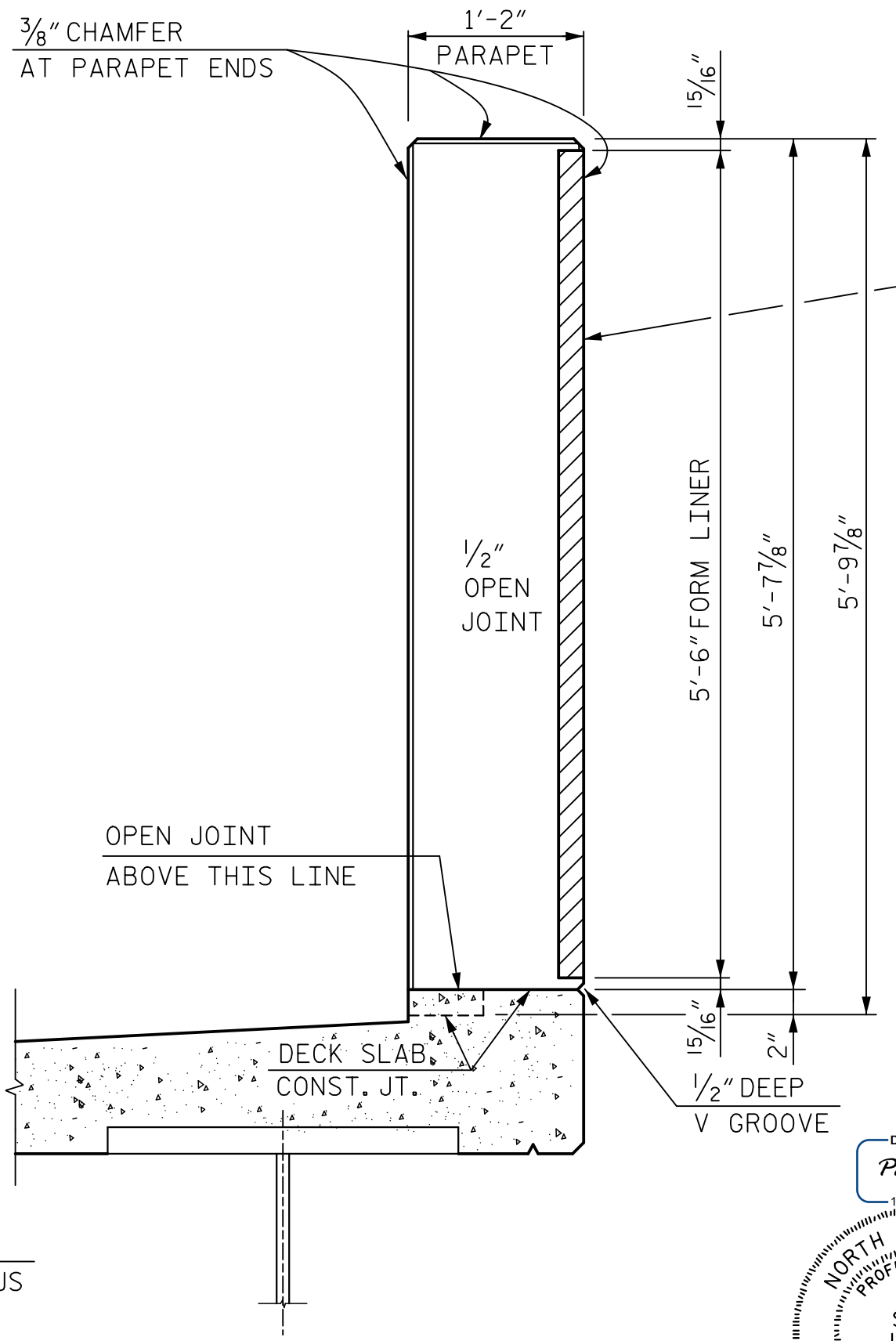


**SECTION THRU PARAPET**

FOR ARCHITECTURAL TREATMENT OF PARAPET, SEE "PARAPET PANEL FORM LINER FINISH DETAILS" SHEET.



**PART SECTION AT EXPANSION JOINT**



**SECTION THRU OPEN JOINT IN PARAPET**

FOR ARCHITECTURAL TREATMENT OF PARAPET, SEE "PARAPET PANEL FORM LINER FINISH DETAILS" SHEET.

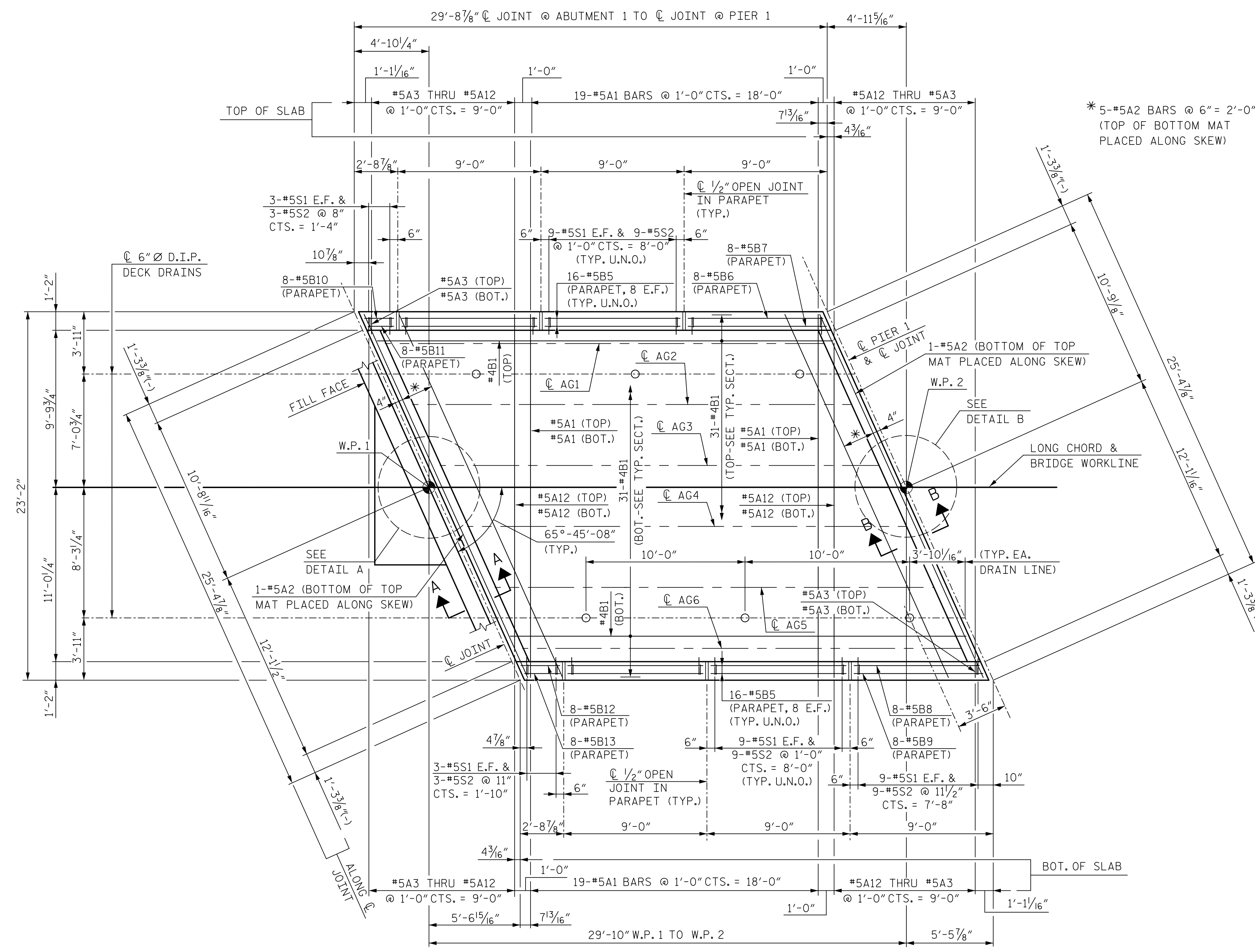
DocuSigned by:  
**Paul J. Barber**  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 12916  
2/27/2015

DocuSigned by:  
**David W. Hawkins**  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 27812  
2/27/2015

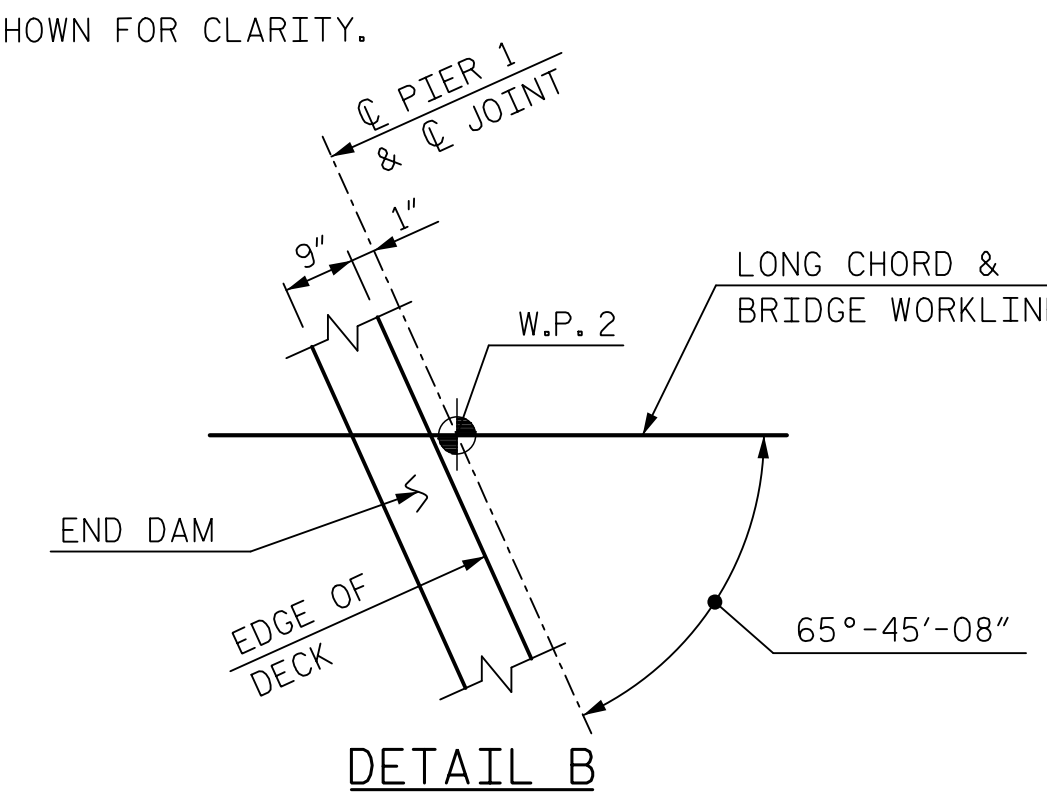
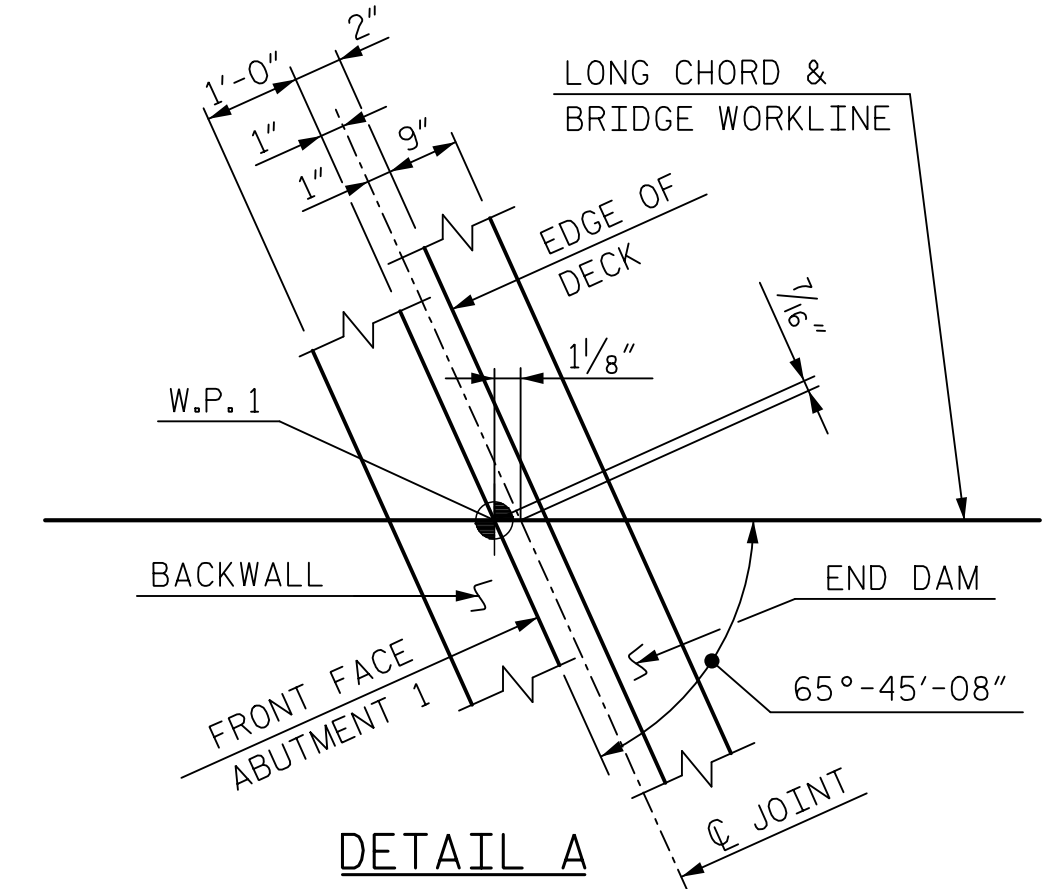
PROJECT NO. P-4900A  
ROBESON COUNTY  
STATION: POC 38+93.36 -L-  
MILE POST: 0.55

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**SUPERSTRUCTURE**  
DECK DETAILS

<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO. <b>S-25</b>	
DRAWN BY	M. WRIGHT	DATE	7/14	NO.	3	BY:	
CHECKED BY	P. BARBER	DATE	7/14	NO.	4	DATE:	
DWG. NO. 6				TOTAL SHEETS		<b>54</b>	

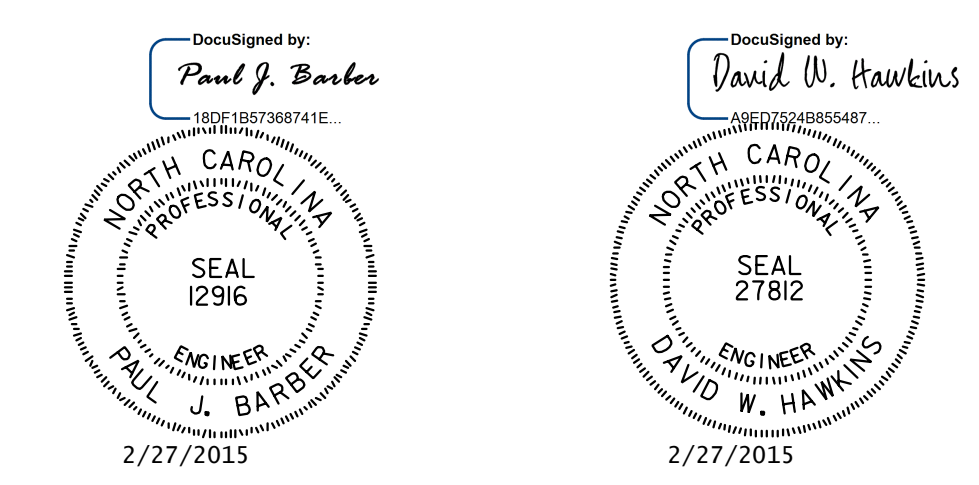


PLAN - SPAN A  
 @ SURVEY -L- NOT SHOWN FOR CLARITY.



**NOTES:**  
 ALL REINFORCING SHALL BE EPOXY COATED.  
 FOR SECTION A-A & B-B SEE "DECK DETAILS" SHEET.  
 FOR DECK DRAIN DETAILS SEE DETAIL "B" ON "DRAINAGE DETAILS SHEET 3 OF 4" SHEET.  
 FOR CONCRETE PARAPET DETAILS, SEE "DECK DETAILS" SHEETS.  
 FOR ARCHITECTURAL TREATMENT OF PARAPET, SEE "PARAPET ARCHITECTURAL DETAILS" SHEET.  
 SLAB BARS MAY BE SHIFTED TO AVOID DECK DRAIN LOCATIONS.  
 U.N.O. = UNLESS NOTED OTHERWISE  
 E.F. = EACH FACE

PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POC 38+93.36 -L-  
 MILE POST: 0.55

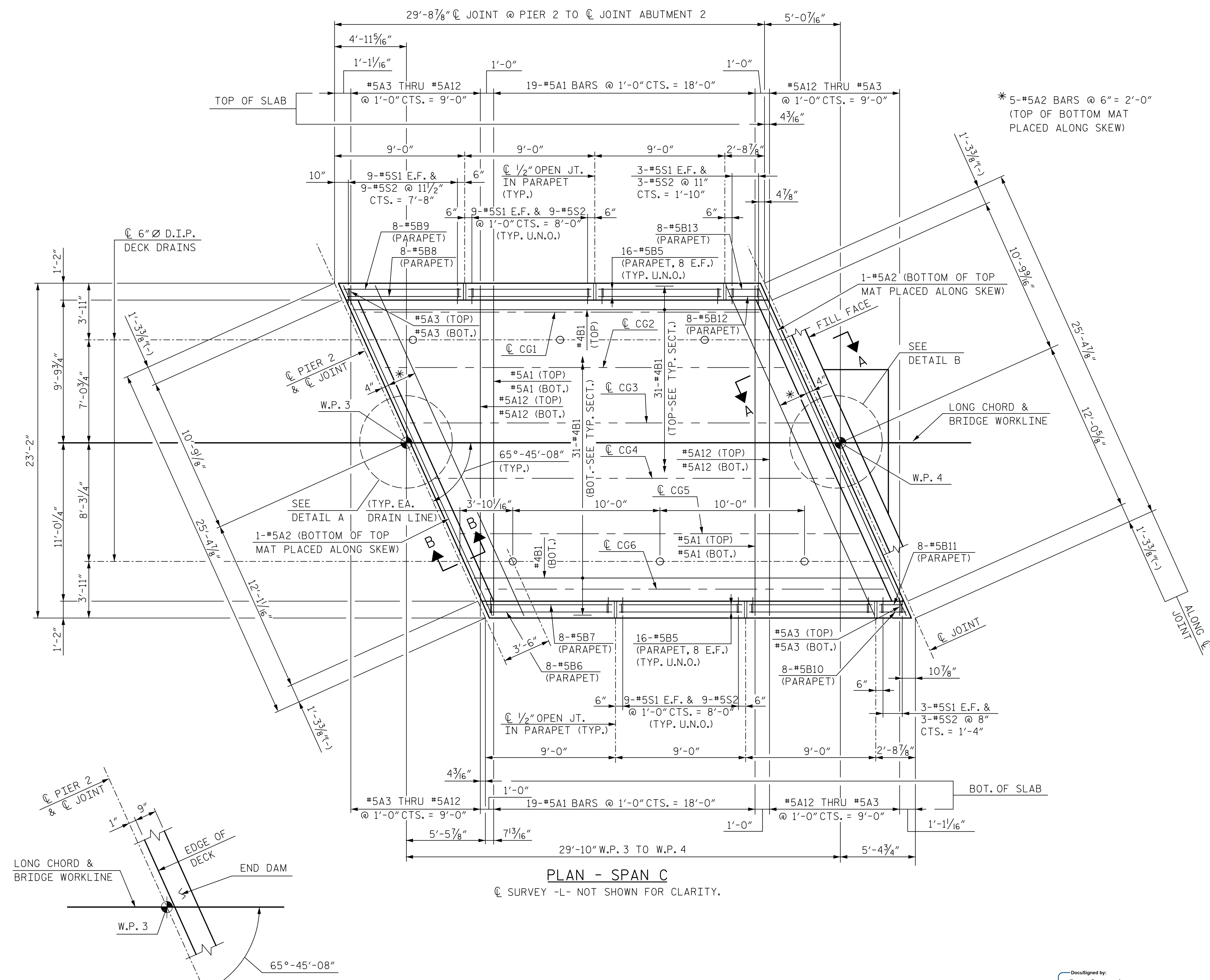


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUPERSTRUCTURE**  
 PLAN OF DECK - SPAN A

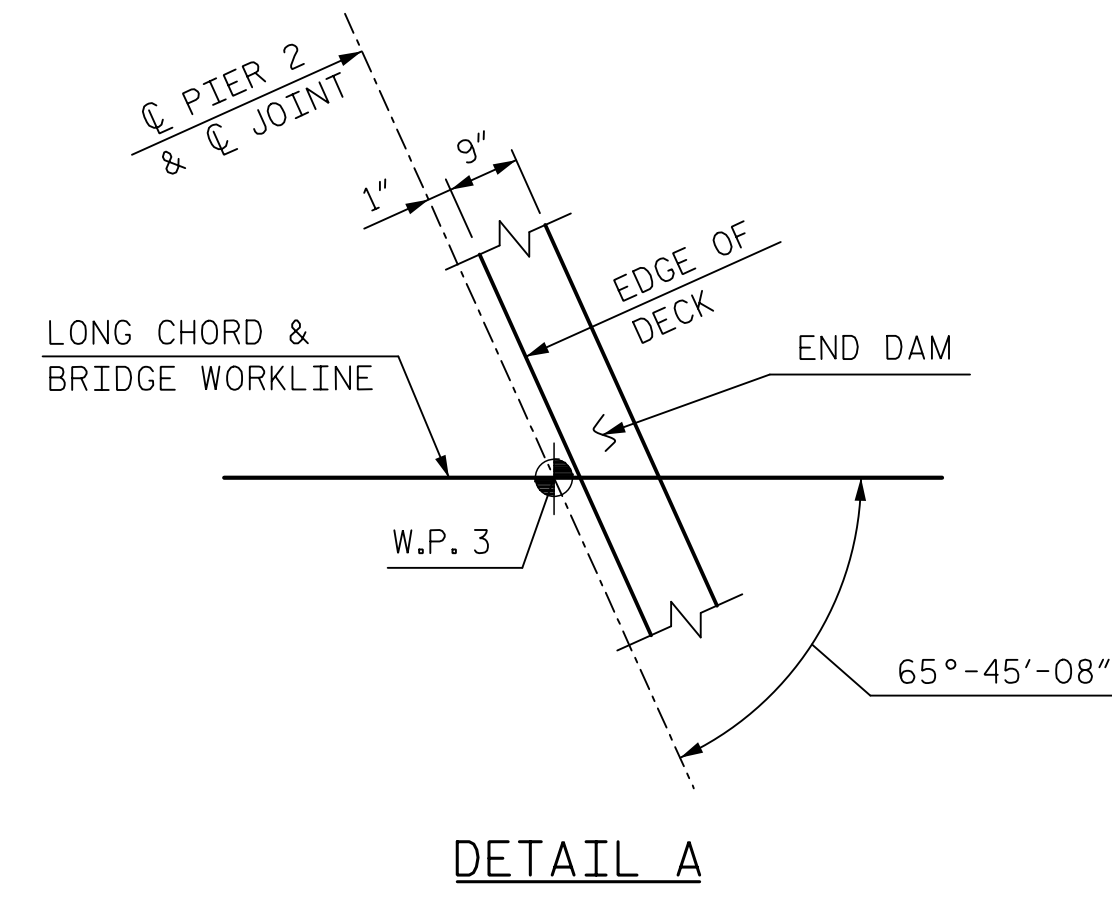
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			54

HNTB HNTB NORTH CAROLINA, P.C.  
 License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609  
 DRAWN BY: M. WRIGHT DATE: 6/14  
 CHECKED BY: P. BARBER DATE: 7/14 DWG. NO. 7

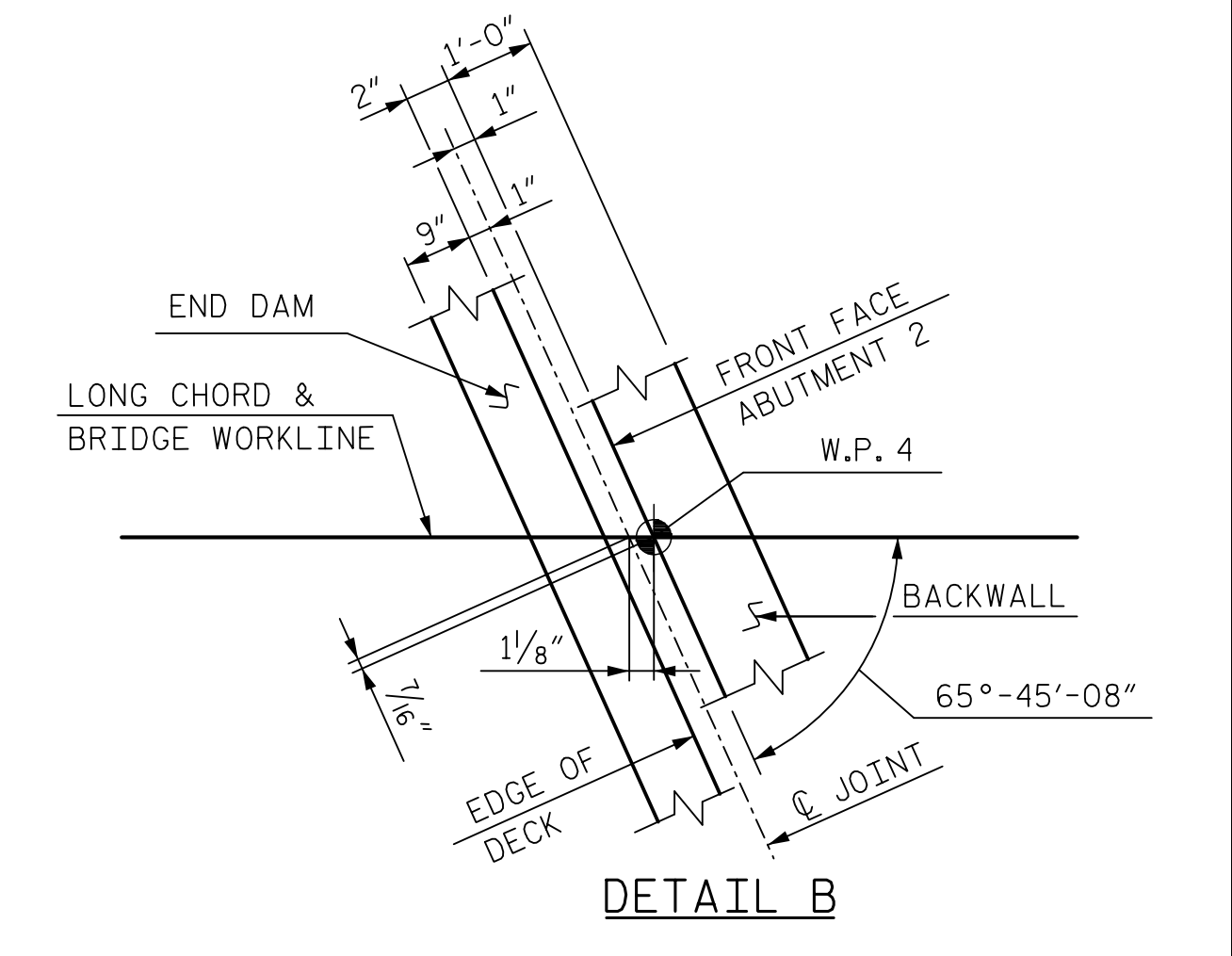




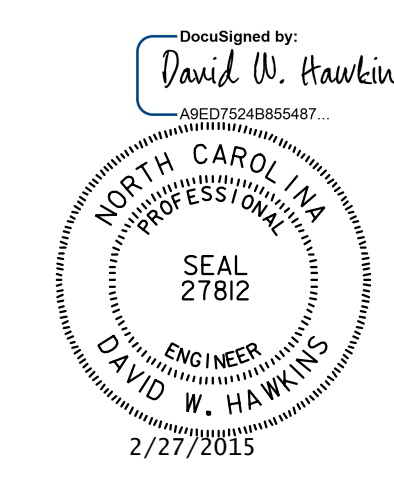
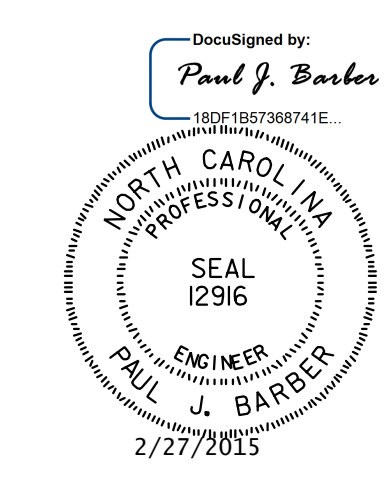
PLAN - SPAN C  
 @ SURVEY -L- NOT SHOWN FOR CLARITY.



**NOTES:**  
 ALL REINFORCING SHALL BE EPOXY COATED.  
 FOR SECTION A-A & B-B SEE "DECK DETAILS" SHEET.  
 FOR DECK DRAIN DETAILS SEE DETAIL "B" ON "DRAINAGE DETAILS SHEET 3 OF 4" SHEET.  
 FOR CONCRETE PARAPET DETAILS, SEE "DECK DETAILS" SHEETS.  
 FOR ARCHITECTURAL TREATMENT OF PARAPET, SEE "PARAPET ARCHITECTURAL DETAILS" SHEET.  
 SLAB BARS MAY BE SHIFTED TO AVOID DECK DRAIN LOCATIONS.  
 U.N.O. = UNLESS NOTED OTHERWISE  
 E.F. = EACH FACE

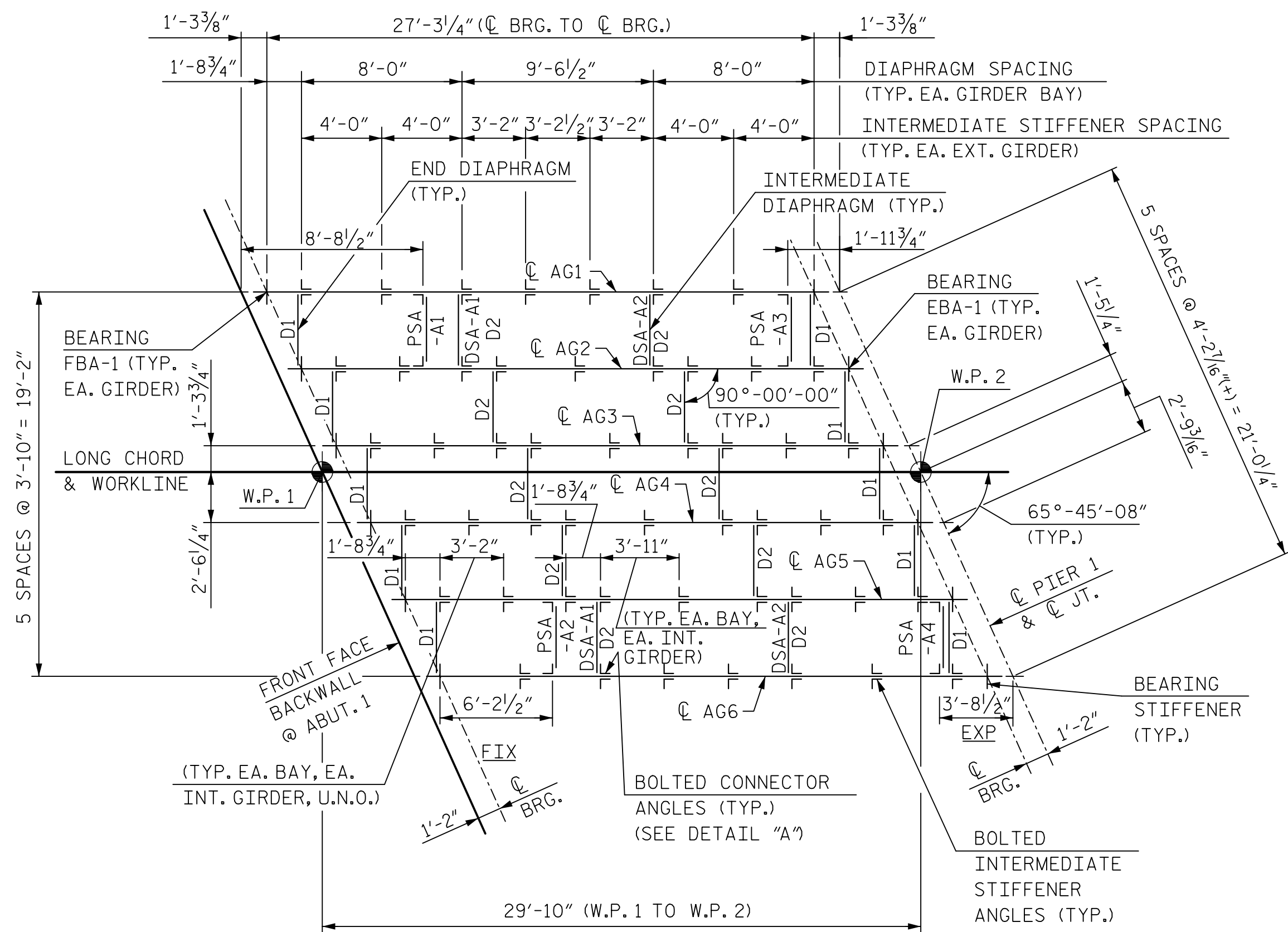


PROJECT NO. P-4900A  
 ROBESON COUNTY  
 STATION: POC 38+93.36 -L-  
 MILE POST: 0.55

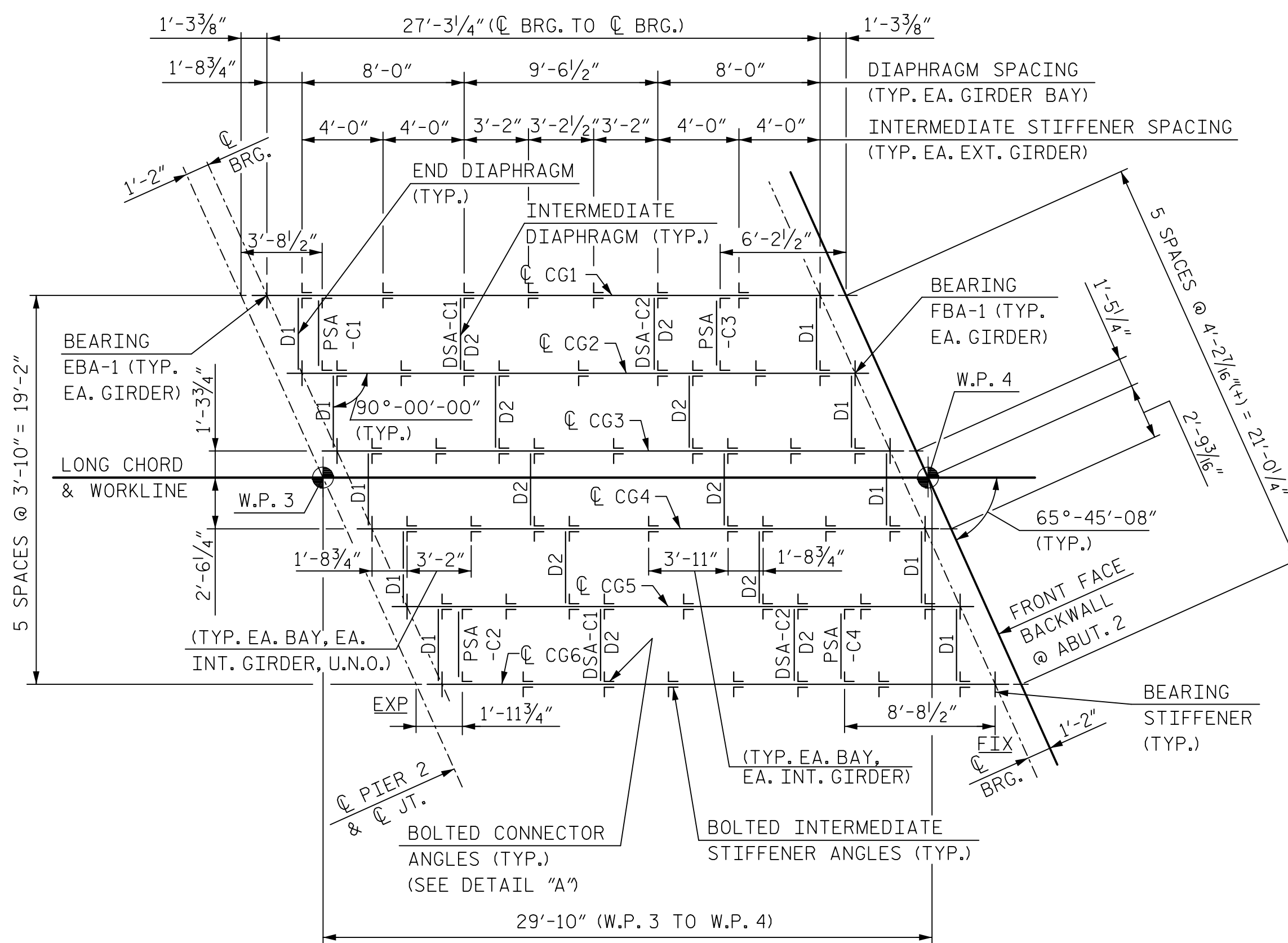


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF DECK - SPAN C

<b>HNTB</b> HNTB NORTH CAROLINA, P.C.		REVISIONS		SHEET NO.
DRAWN BY: M. WRIGHT	DATE: 6/14	NO. 3	BY: [ ]	S-28
CHECKED BY: P. BARBER	DATE: 7/14	NO. 4	DATE: [ ]	
DWG. NO. 9			TOTAL SHEETS: 54	



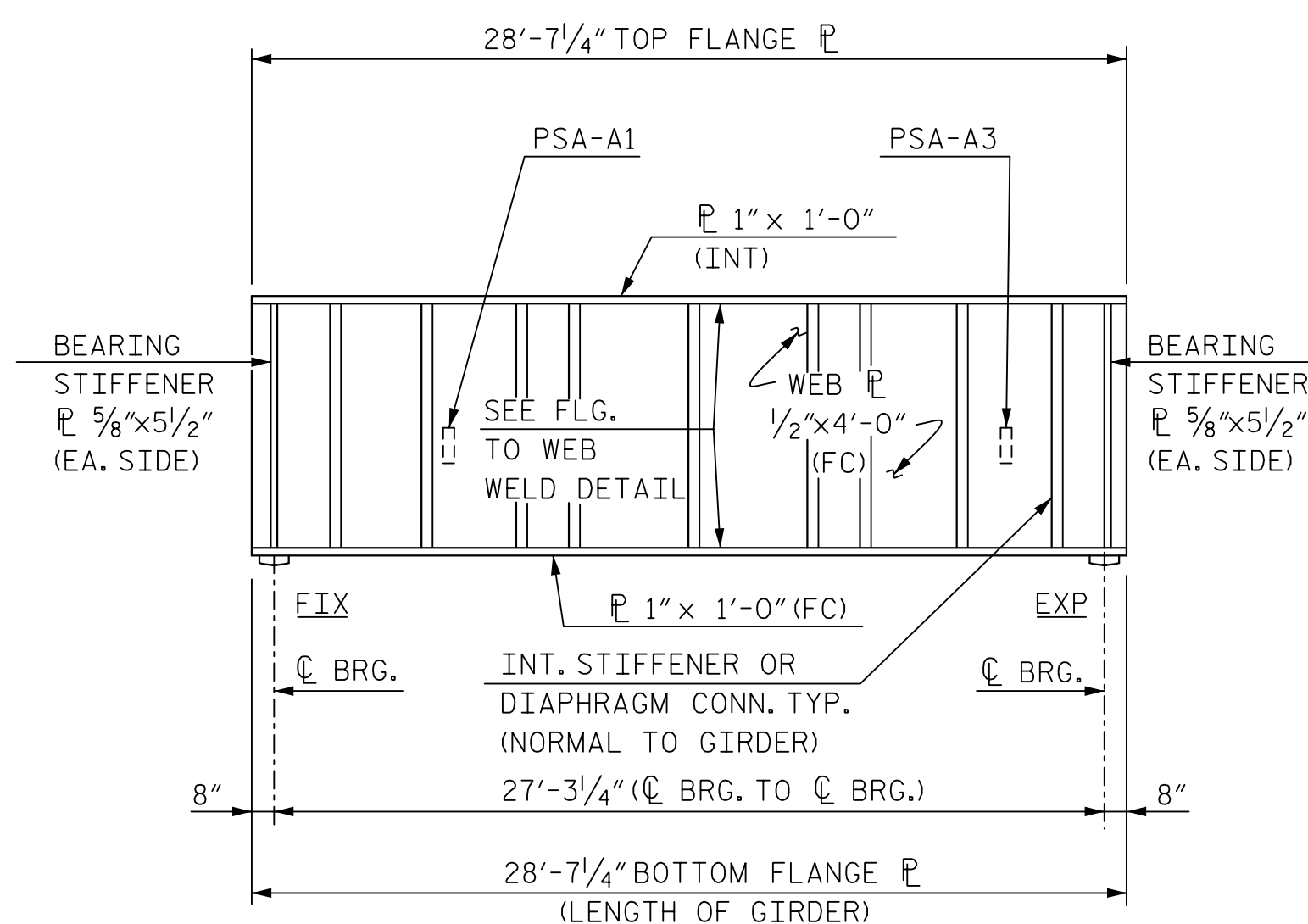
FRAMING PLAN - SPAN A



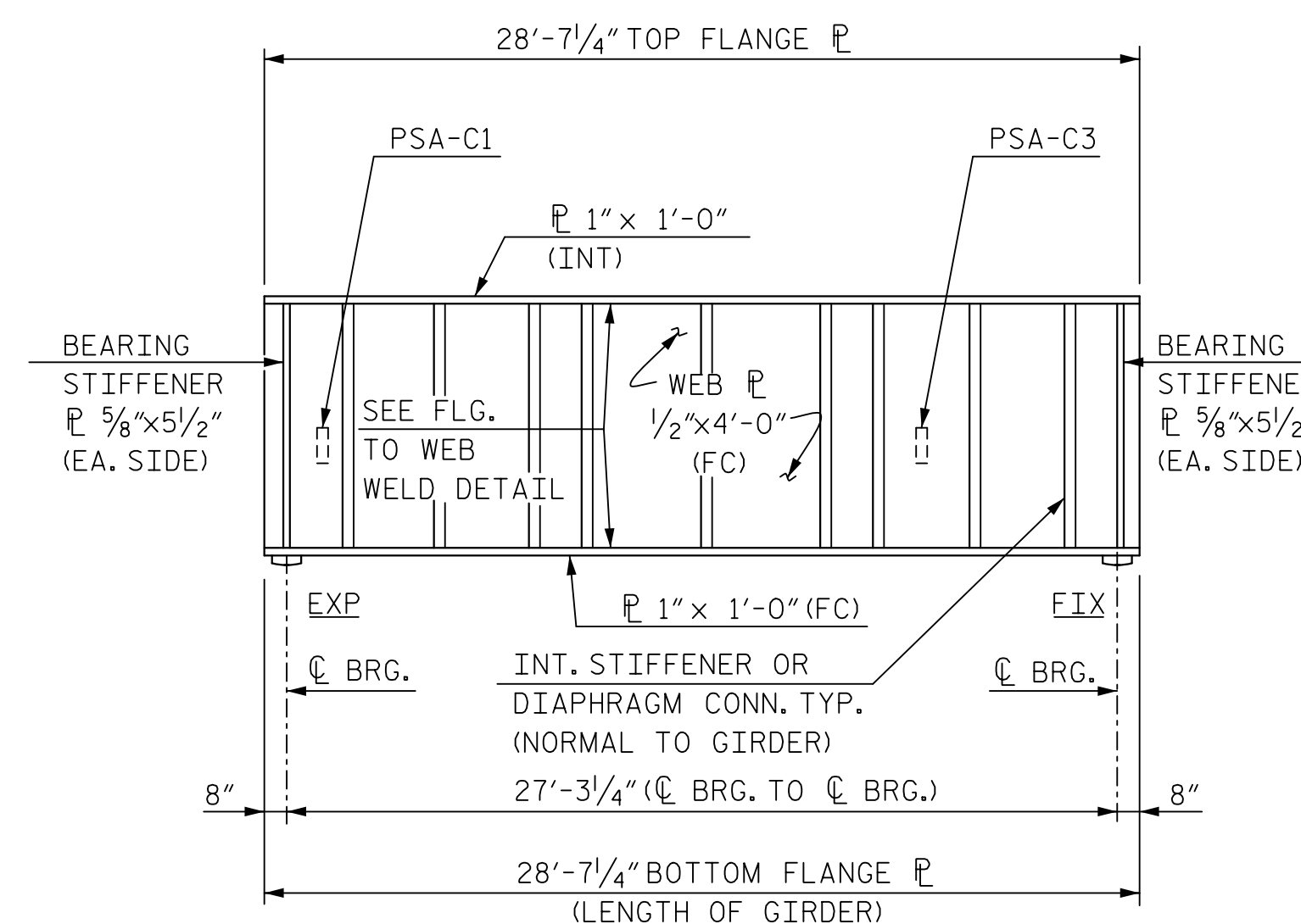
FRAMING PLAN - SPAN C

NOTE: U.N.O. = UNLESS NOTED OTHERWISE

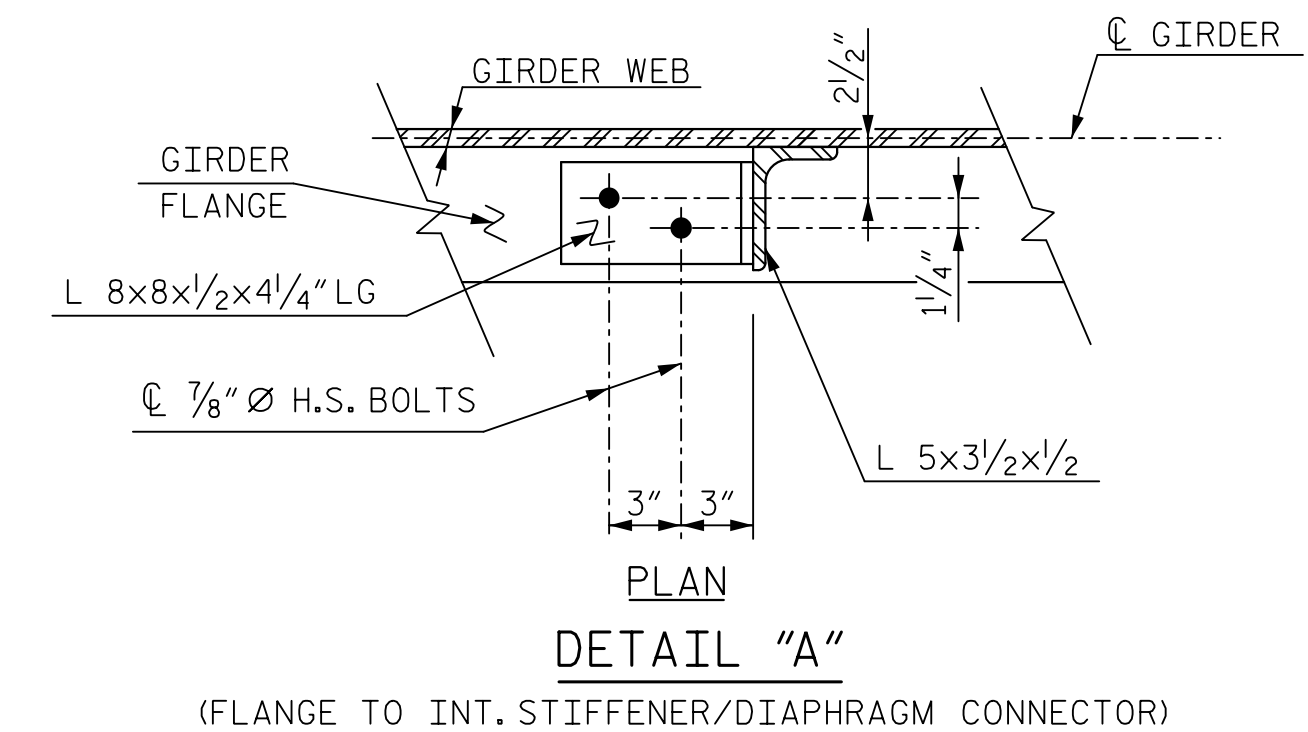
**NOTES:**  
 ALL DIMENSIONS ON THIS DRAWING ARE HORIZONTAL  
 ALL C PIER AND C BEARINGS ARE PARALLEL.  
 NO WEB CAMBER REQUIRED FOR SPAN A & C GIRDERS.  
 REFER TO "STRUCTURAL STEEL DETAILS" SHEET FOR:  
 DIAPHRAGM DETAILS  
 STIFFENER AND CONNECTOR DETAILS  
 FLANGE TO WEB WELD DETAIL  
 STRUCTURAL STEEL NOTES  
 FOR BEARINGS, SEE "BEARING DETAILS, SPANS A & C" SHEET.  
 FOR DRAIN PIPE SUPPORT ANGLE DETAILS (DSA & PSA), SEE "DRAINAGE DETAILS (SHEET 3 OF 4)" SHEET.  
 FLANGE SPLICES AND WEB SPLICES SHALL BE MADE WITH FULL PENETRATION GROOVE WELDS, SEE DETAILS ON "STRUCTURAL STEEL DETAILS" SHEET. FABRICATOR SHALL SHOW WELD CONFIGURATION AND JOINT PREPARATION ON SHOP DRAWINGS FOR APPROVAL.  
 FLANGE SPLICES AND WEB SPLICES SHALL BE STAGGERED LONGITUDINALLY A MINIMUM OF 2'-0" - SEE "STRUCTURAL STEEL DETAILS" SHEET FOR DETAIL.  
 GIRDERS HAVE BEEN DESIGNED NON-COMPOSITE.  
 \*INT\* DENOTES NON-FRACTURE CRITICAL MEMBER OR COMPONENT REQUIRING IMPROVED NOTCH TOUGHNESS, T2.  
 \*FC\* DENOTES FRACTURE CRITICAL MEMBER OR COMPONENT REQUIRING IMPROVED NOTCH TOUGHNESS, F2.



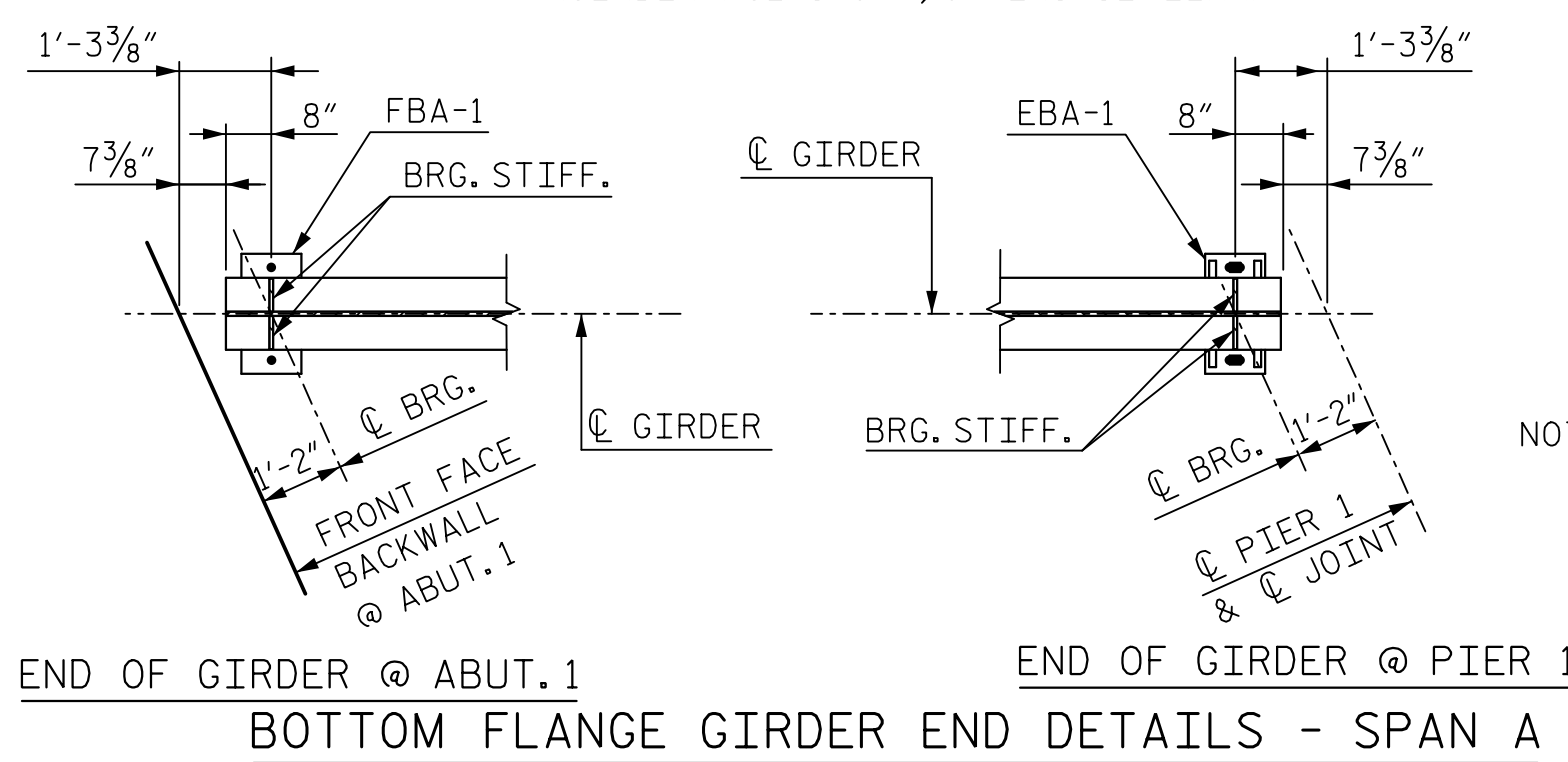
GIRDER ELEVATION - SPAN A  
 (GIRDER AG2 SHOWN, OTHERS SIMILAR)



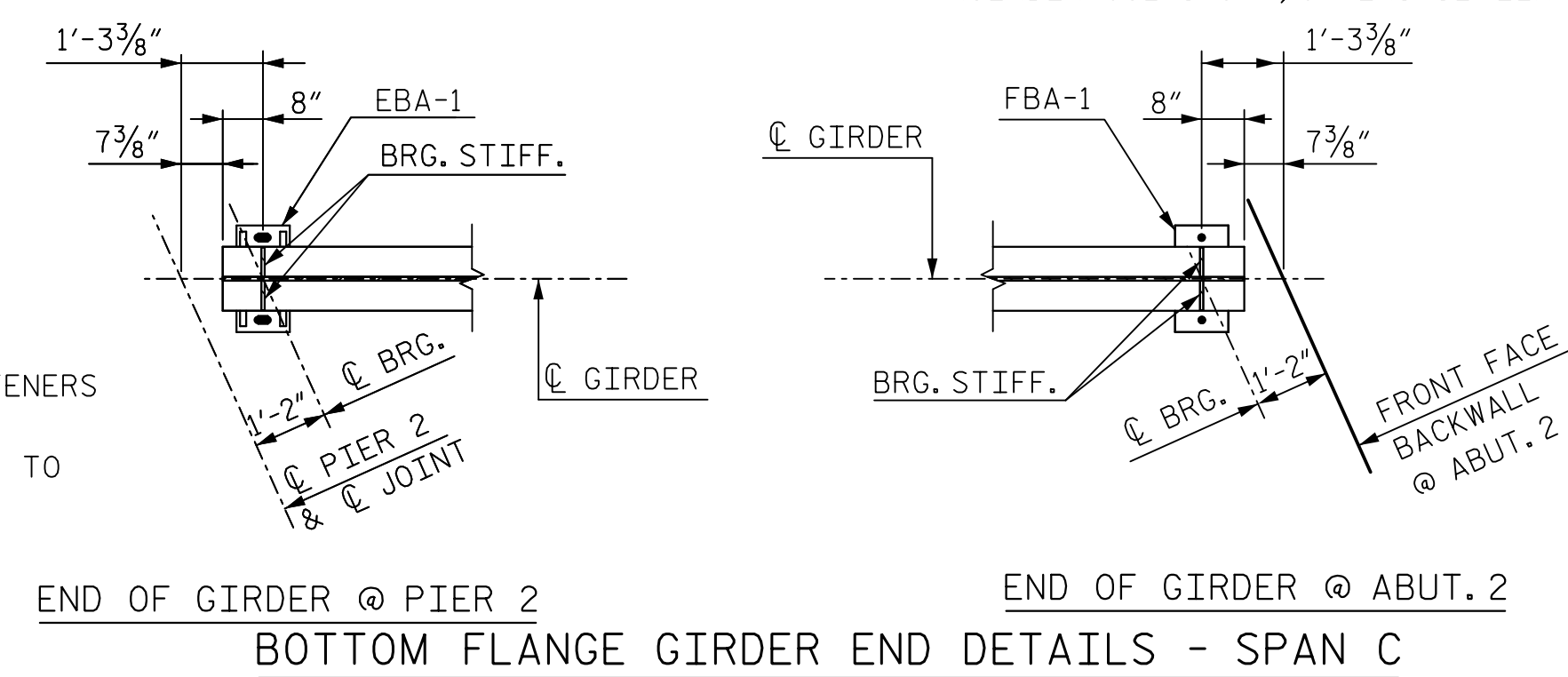
GIRDER ELEVATION - SPAN C  
 (GIRDER CG2 SHOWN, OTHERS SIMILAR)



DETAIL "A"  
 (FLANGE TO INT. STIFFENER/DIAPHRAGM CONNECTOR)

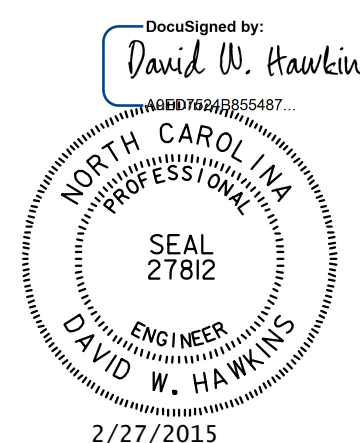
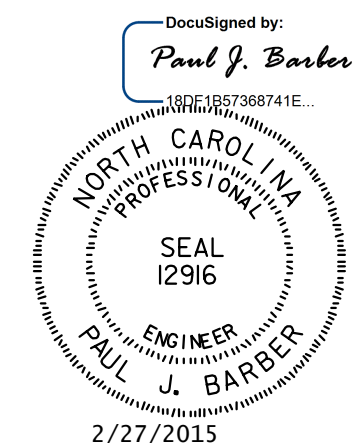


BOTTOM FLANGE GIRDER END DETAILS - SPAN A



BOTTOM FLANGE GIRDER END DETAILS - SPAN C

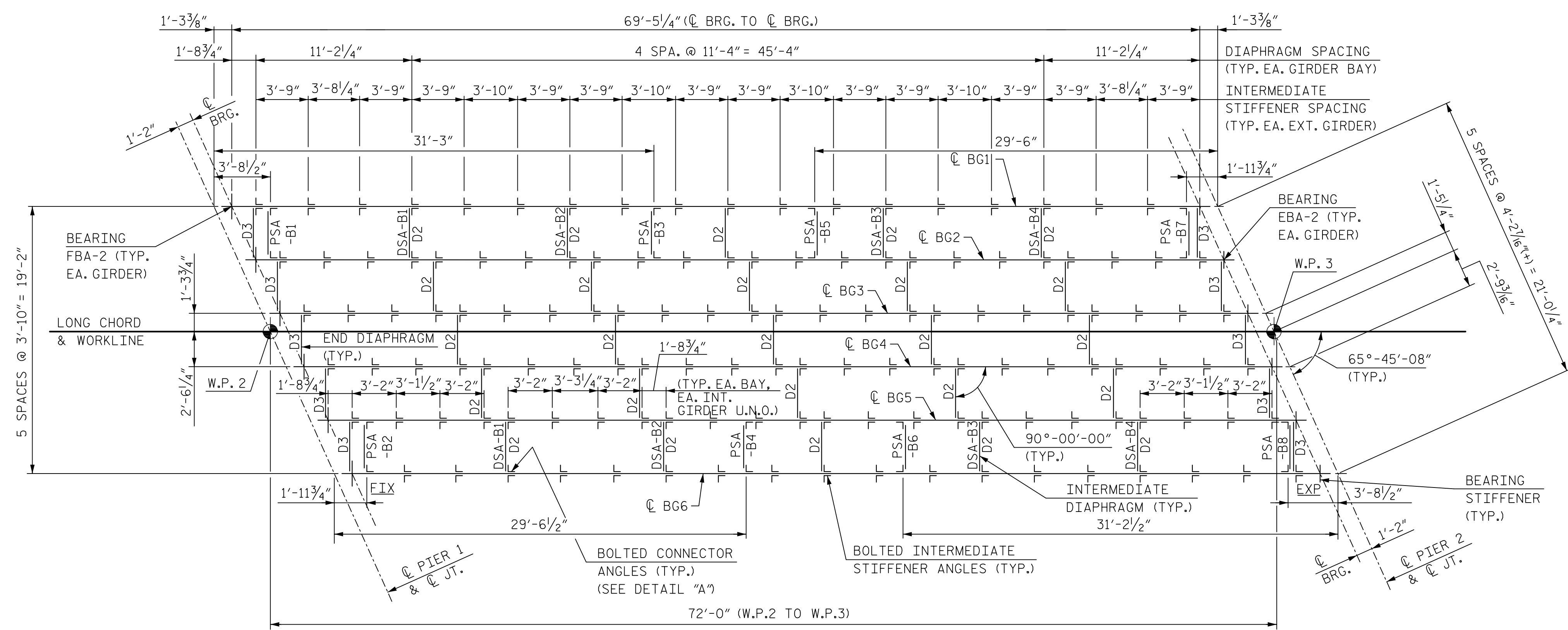
NOTE: BEARING STIFFENERS ARE ORIENTED PERPENDICULAR TO THE WEB.



PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POC 38+93.36 -L-  
 MILE POST: 0.55

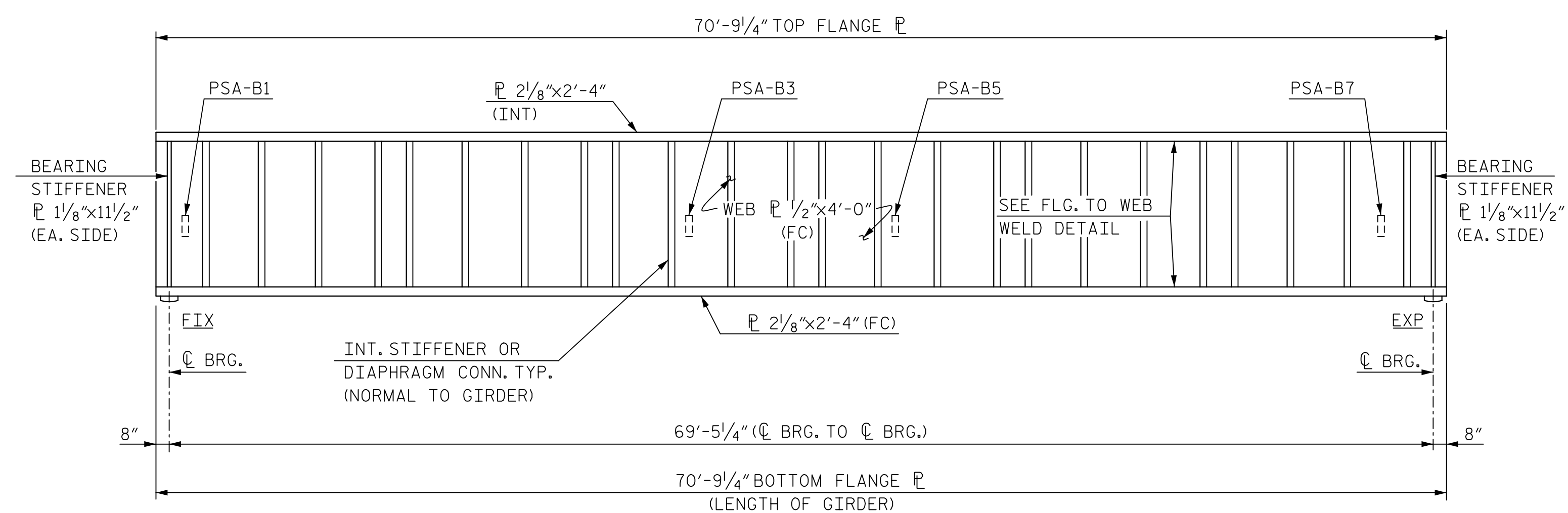
<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO.	
DRAWN BY	M. WRIGHT	DATE	7/14	NO.	BY:	DATE:	S-29
CHECKED BY	P. BARBER	DATE	9/14	1			
				DWG. NO. 10		TOTAL SHEETS	
						54	





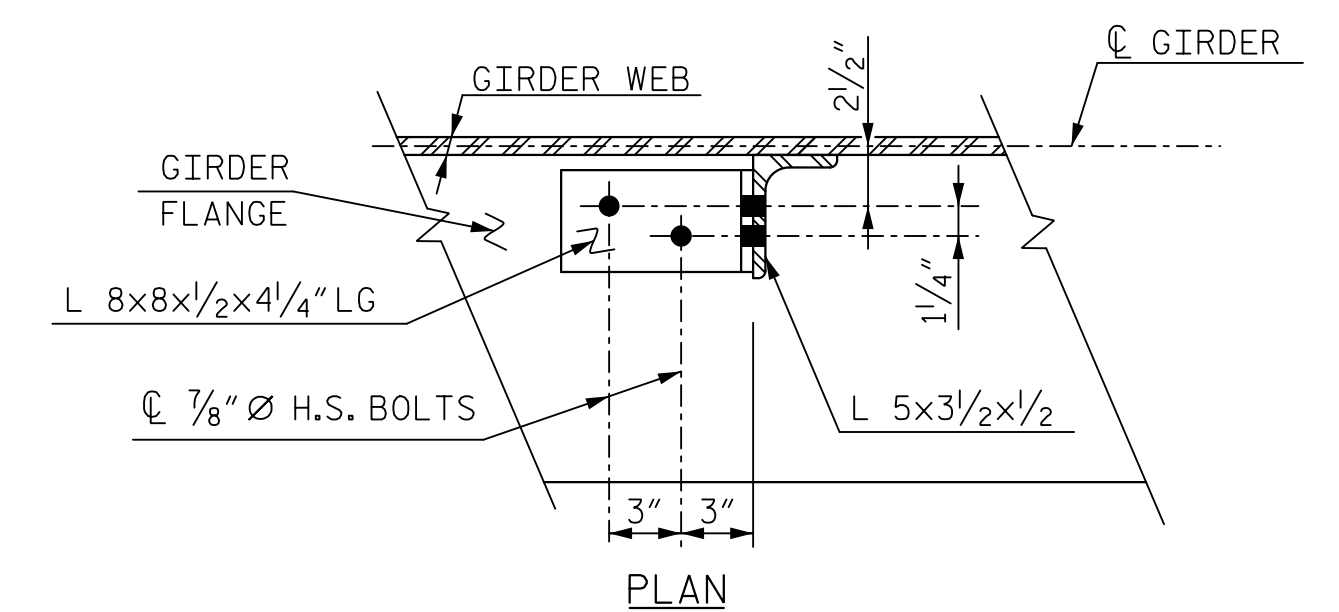
FRAMING PLAN - SPAN B

NOTE: U.N.O. = UNLESS NOTED OTHERWISE



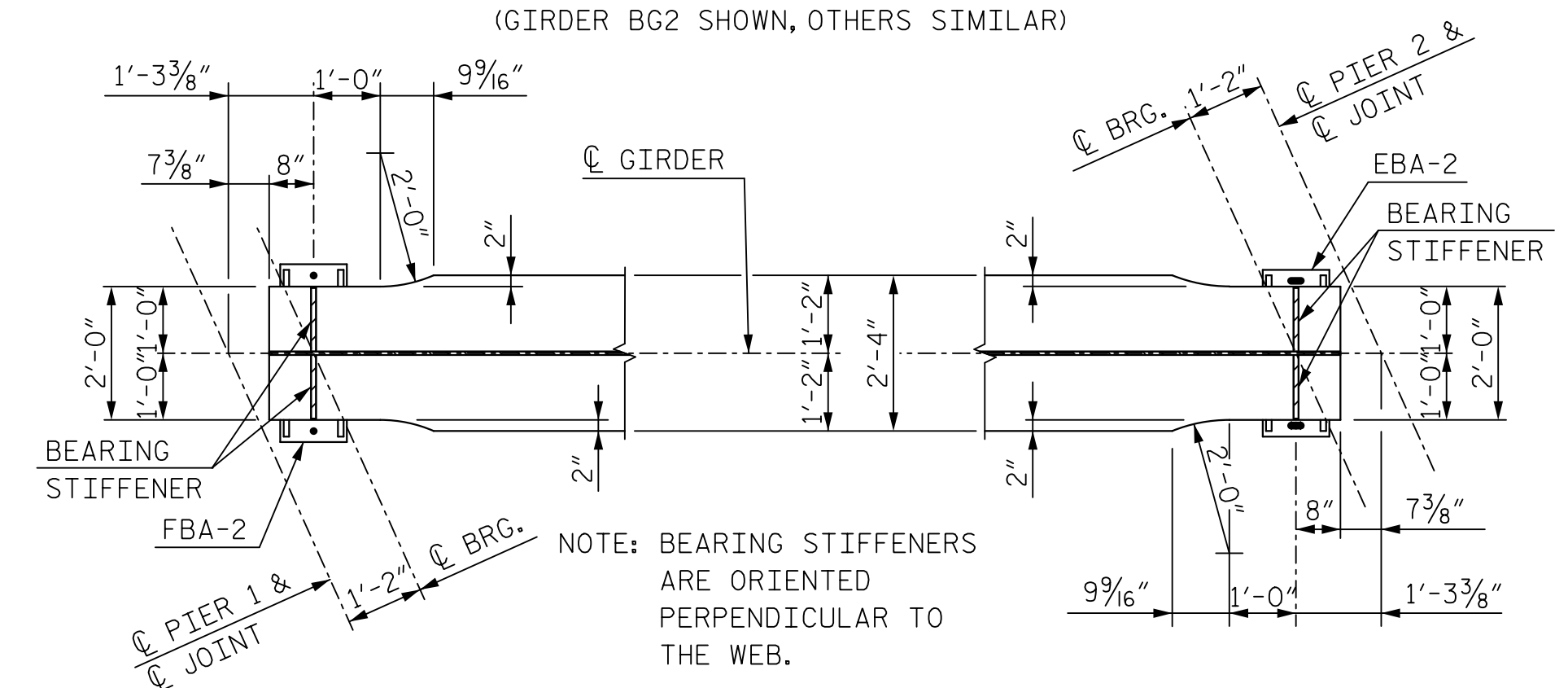
GIRDER ELEVATION - SPAN B

(GIRDER BG2 SHOWN, OTHERS SIMILAR)



DETAIL "A"

(FLANGE TO INT. STIFFENER/DIAPHRAGM CONNECTOR)



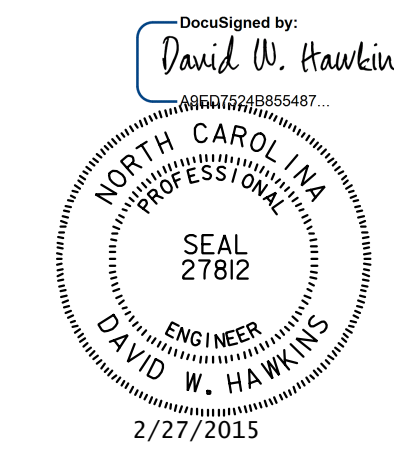
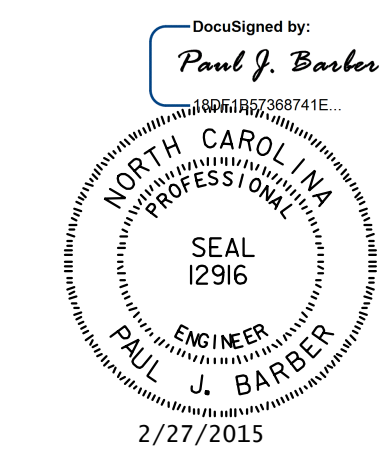
BOTTOM FLANGE GIRDER END DETAILS @ PIER 1

BOTTOM FLANGE GIRDER END DETAILS @ PIER 2

BOTTOM FLANGE GIRDER END DETAILS

**NOTES:**  
 ALL DIMENSIONS ON THIS DRAWING ARE HORIZONTAL  
 ALL  $\text{C}$  PIERS AND  $\text{C}$  BEARINGS ARE PARALLEL.  
 NO WEB CAMBER REQUIRED FOR SPAN B GIRDERS.  
 REFER TO "STRUCTURAL STEEL DETAILS" SHEET FOR:  
 DIAPHRAGM DETAILS  
 STIFFENER AND CONNECTOR DETAILS  
 FLANGE TO WEB WELD DETAIL  
 STRUCTURAL STEEL NOTES  
 FOR BEARINGS, SEE "BEARING DETAILS, SPAN B" SHEET.  
 FOR DRAIN PIPE SUPPORT ANGLE DETAILS (DSA & PSA), SEE "DRAINAGE DETAILS (SHEET 3 OF 4)" SHEET.  
 FLANGE SPLICES AND WEB SPLICES SHALL BE MADE WITH FULL PENETRATION GROOVE WELDS, SEE DETAILS ON "STRUCTURAL STEEL DETAILS" SHEET. FABRICATOR SHALL SHOW WELD CONFIGURATION AND JOINT PREPARATION ON SHOP DRAWINGS FOR APPROVAL.  
 FLANGE SPLICES AND WEB SPLICES SHALL BE STAGGERED LONGITUDINALLY A MINIMUM OF 2'-0" - SEE "STRUCTURAL STEEL DETAILS" SHEET FOR DETAIL.  
 GIRDERS HAVE BEEN DESIGNED NON-COMPOSITE.  
 "INT" DENOTES NON-FRACTURE CRITICAL MEMBER OR COMPONENT REQUIRING IMPROVED NOTCH TOUGHNESS, T2.  
 "FC" DENOTES FRACTURE CRITICAL MEMBER OR COMPONENT REQUIRING IMPROVED NOTCH TOUGHNESS, F2.

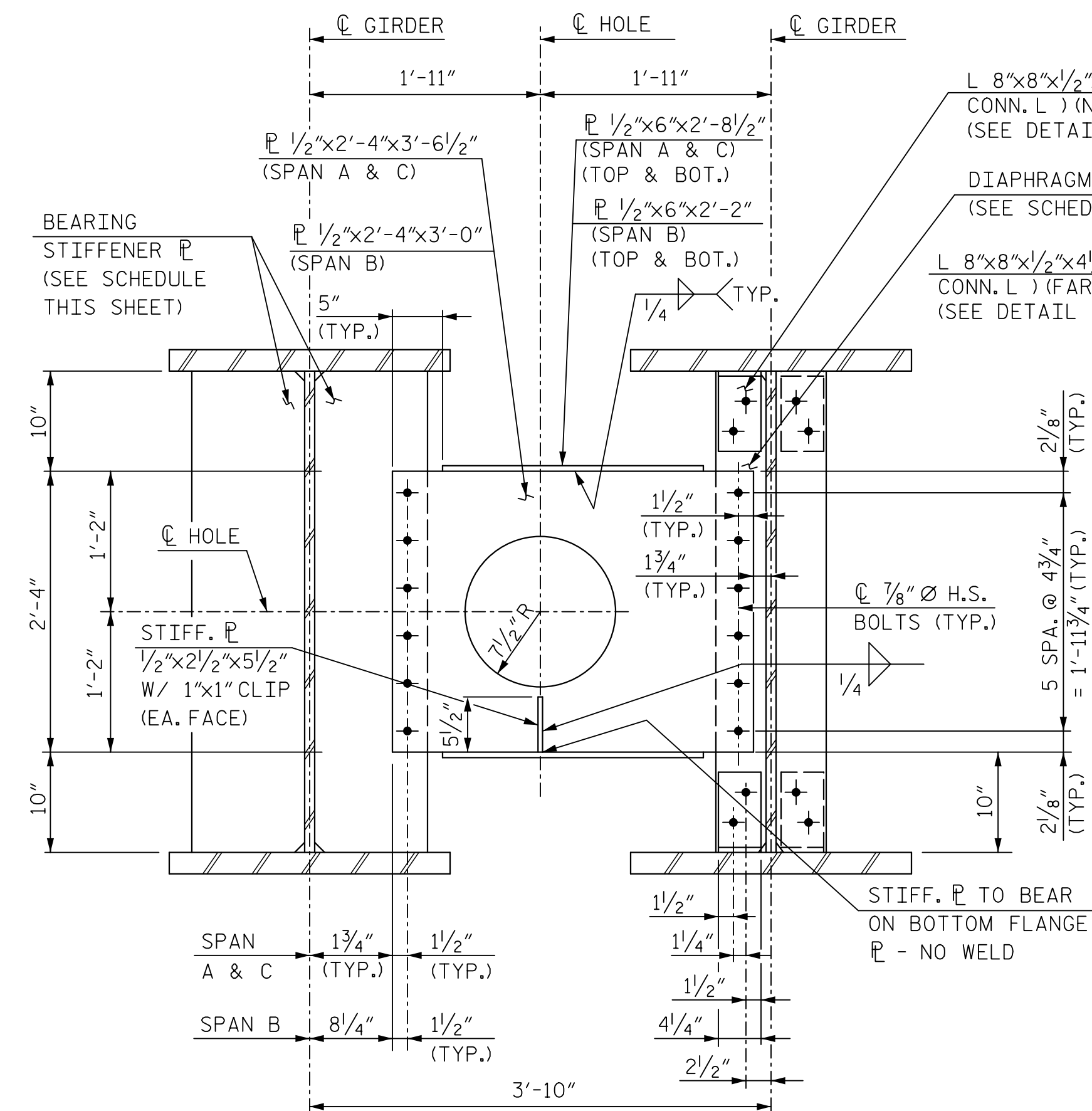
PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POC 38+93.36 -L-  
 MILE POST: 0.55



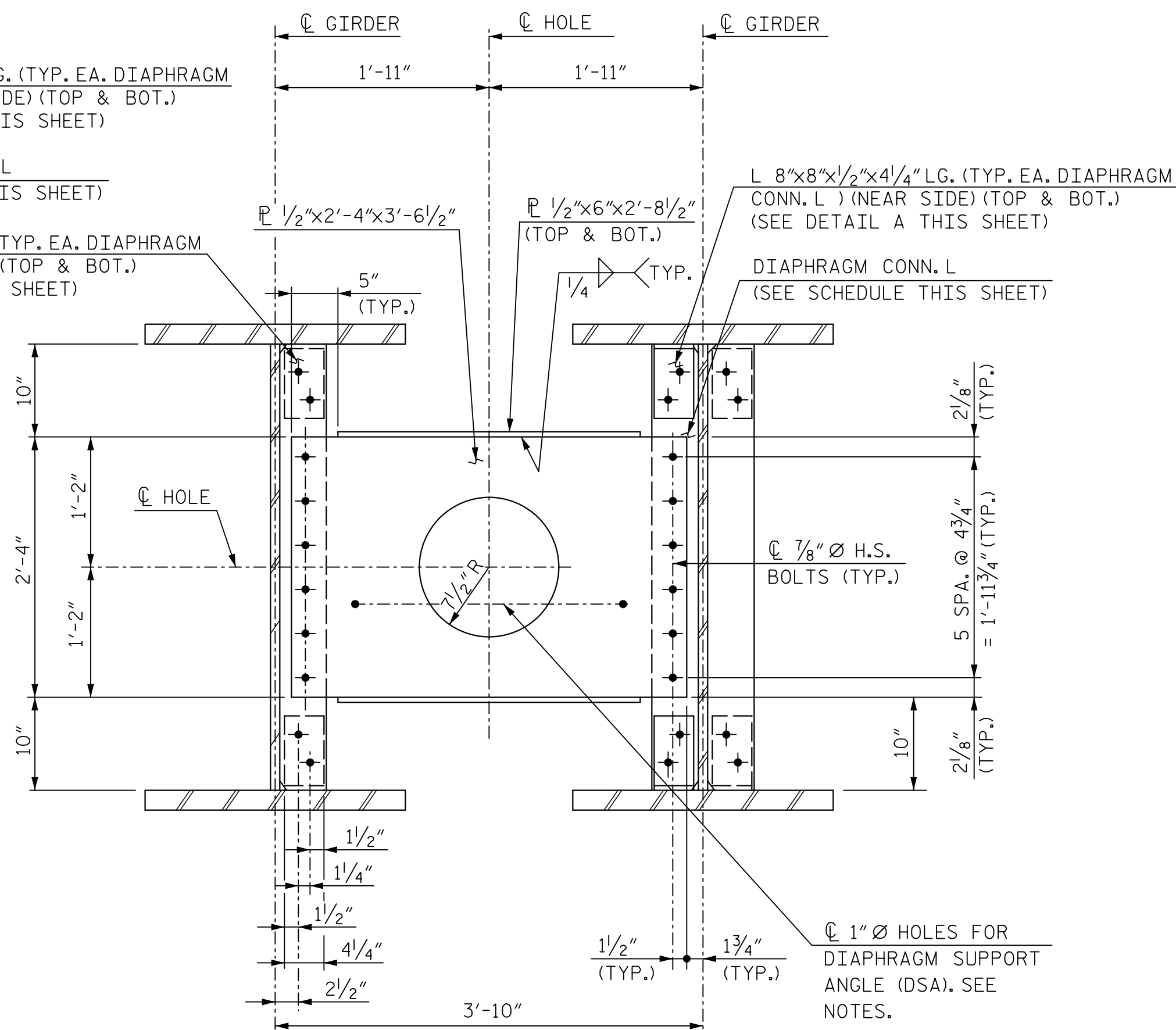
**HNTB** HNTB NORTH CAROLINA, P.C.  
 License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: M. WRIGHT DATE: 7/14  
 CHECKED BY: P. BARBER DATE: 9/14 DWG. NO. II

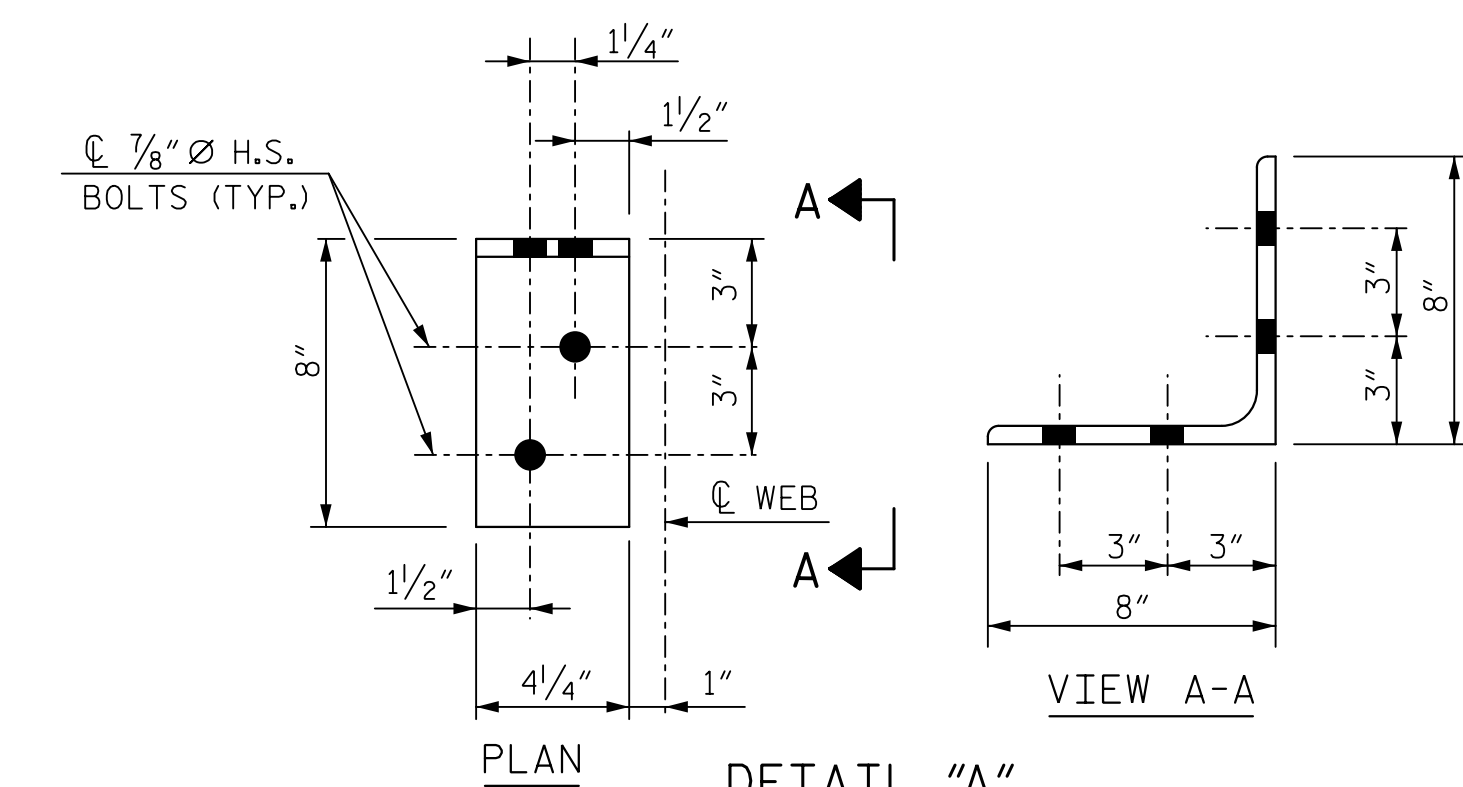
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE FRAMING PLAN AND GIRDER DETAILS SPAN B					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. <b>S-30</b> TOTAL SHEETS <b>54</b>



SECTION AT END DIAPHRAGM (D1 - SPAN A & C)  
(D3 - SPAN B)



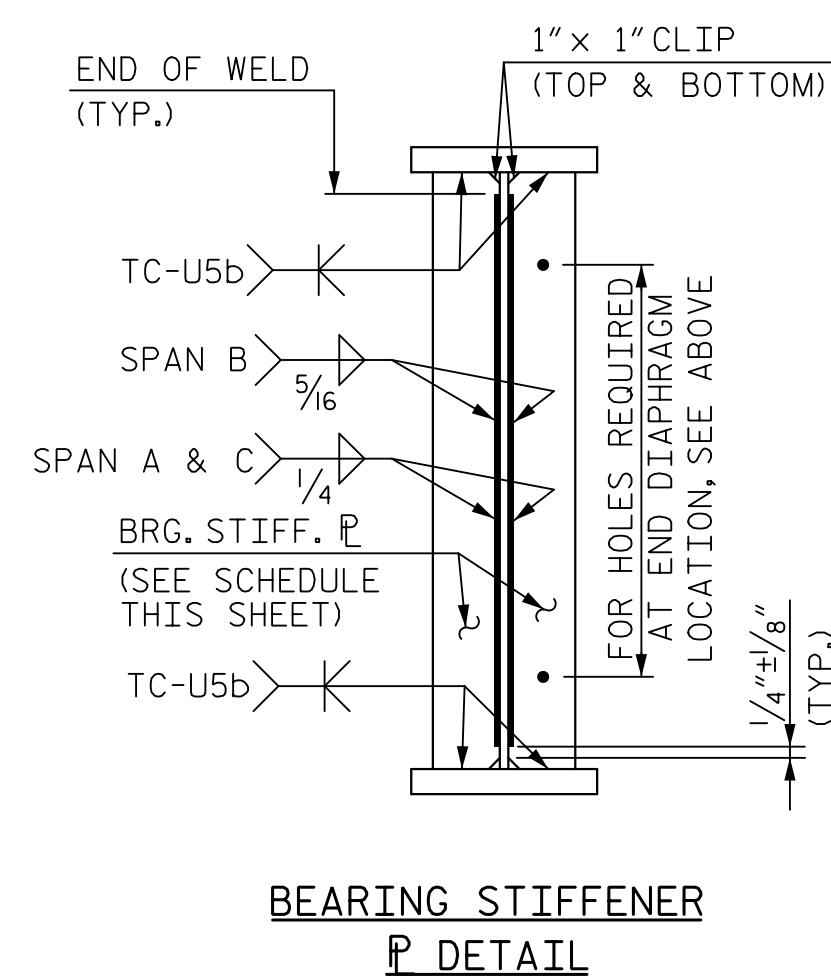
SECTION AT INTERMEDIATE DIAPHRAGM (D2)



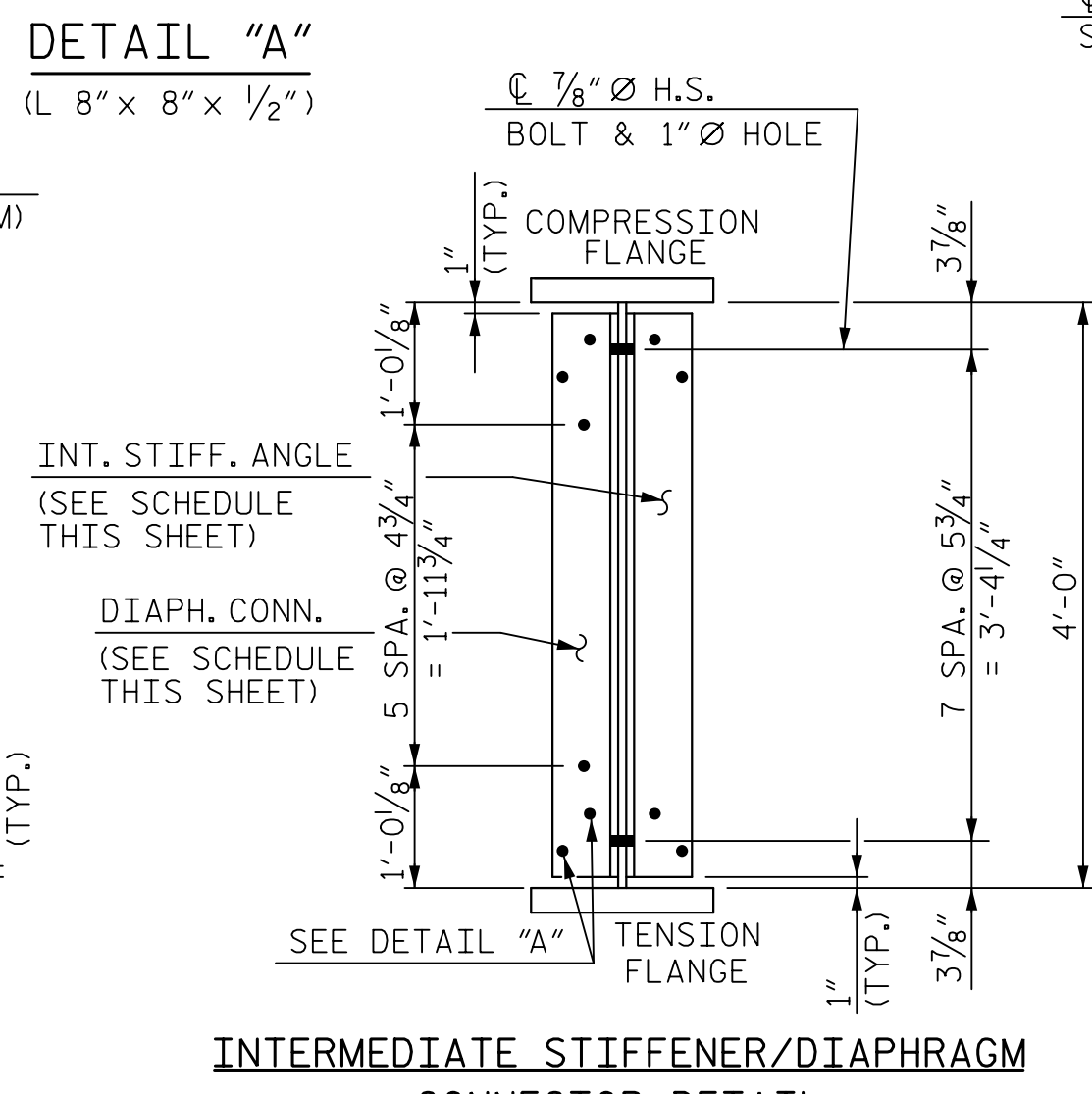
DETAIL "A"  
(L 8x8x1/2x4/4)

STIFF./CONN. SCHEDULE		
TYPE	SPAN A & C	SPAN B
BRG. STIFF.	P 5/8x5 1/2"	P 1 1/8x11 1/2"
DIAPH. CONN.	L 5x3 1/2x1/2	L 5x3 1/2x1/2
INT. STIFF.	L 5x3 1/2x1/2	L 5x3 1/2x1/2

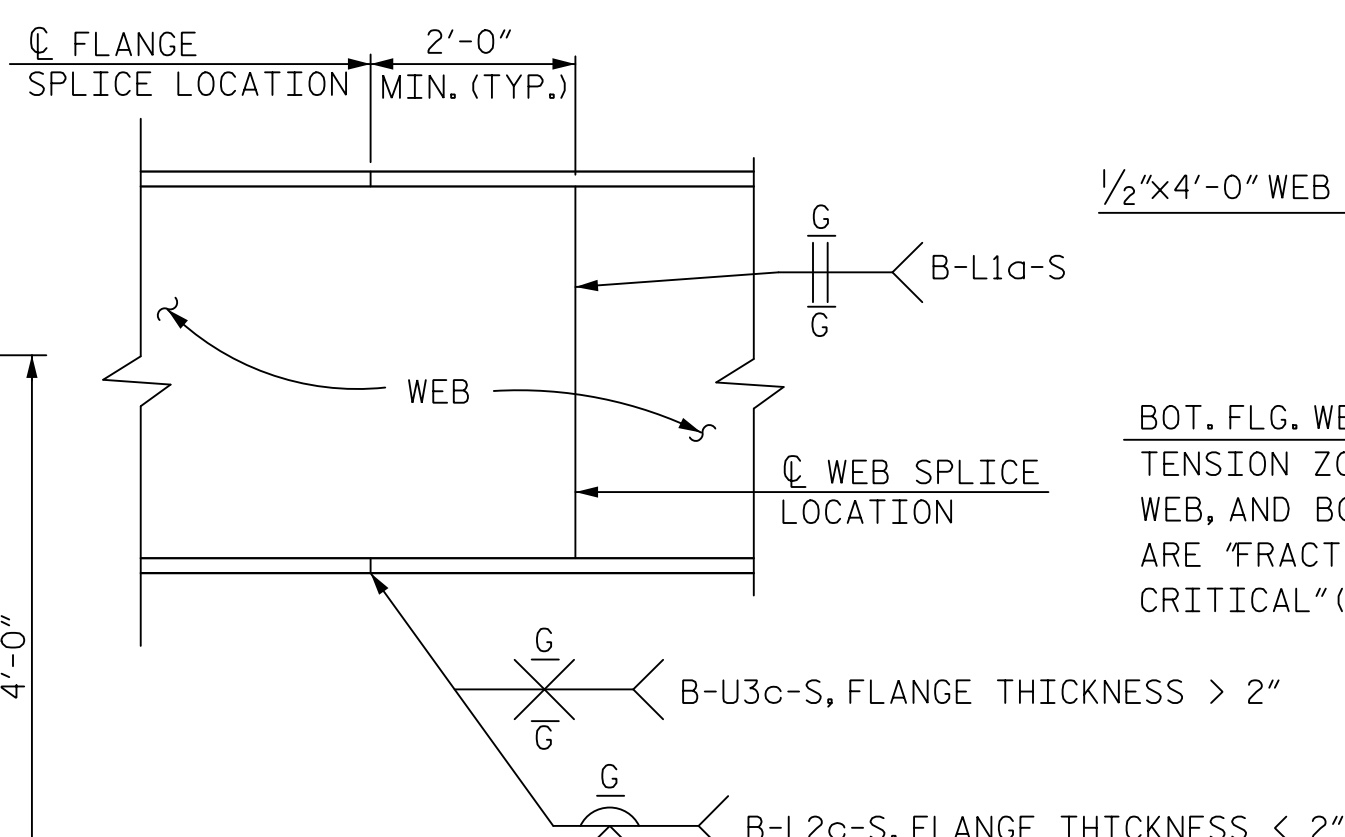
NOTE: SEE FRAMING PLANS FOR STIFFENER/CONN. LOCATIONS.



BEARING STIFFENER  
P DETAIL



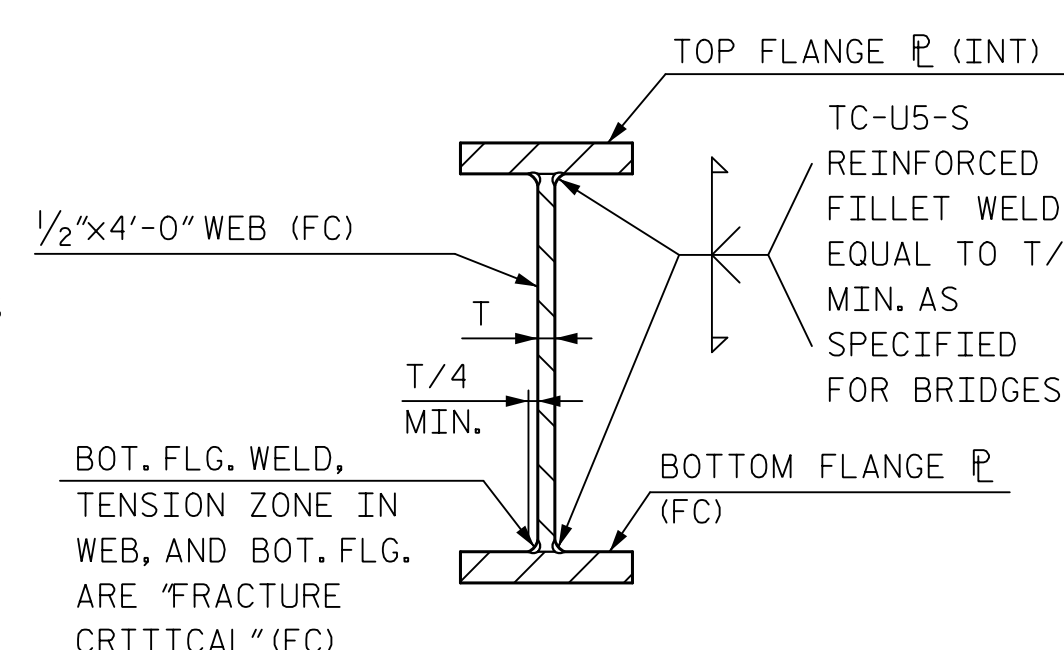
INTERMEDIATE STIFFENER/DIAPHRAGM  
CONNECTOR DETAIL



NOTES:

ELECTROSLAG WELDING IS NOT PERMITTED.  
ULTRASONIC OR RADIOGRAPHIC INSPECTION IS REQUIRED FOR ALL FLANGE AND WEB SPLICE WELDS. SEE SPECIAL PROVISIONS.  
GRIND WELDS IN DIRECTION OF STRESS ONLY (I.E. PARALLEL TO C GIRDER).

SHOP SPLICE DETAIL



FLANGE TO WEB  
WELD DETAIL  
(NO SCALE)

STRUCTURAL STEEL NOTES

DESIGN DATA:

STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM SPECIFICATIONS:

- GIRDER FLANGES AND WEB: A709, GRADE 50.
- MISCELLANEOUS MATERIAL: A709, GRADE 50.
- ANCHOR BOLTS FOR BEARING DEVICES SHALL CONFORM TO ASTM A449. ANCHOR BOLTS, NUTS, AND PLATE WASHERS SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH AASHTO M232.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED. ALL DIMENSIONS ARE SHOWN AT 60°F.

CSX TRANSPORTATION SHALL BE FURNISHED COPIES OF MILL TEST REPORTS FOR ALL MATERIALS EXCEPT MISCELLANEOUS PLATES AND SHAPES. REPORTS SHALL INDICATE COMPLIANCE WITH ALL SPECIFIED REQUIREMENTS.

SHOP INSPECTION SHALL BE BY CSX TRANSPORTATION OR ITS AUTHORIZED AGENT. SEE STRUCTURAL STEEL SPECIAL PROVISION FOR ADDITIONAL WELDING INSPECTION OF FLANGE PLATE TO WEB PLATE WELDS.

FOR PAINTING STEEL STRUCTURES, SEE SPECIAL PROVISIONS.

BOLTED CONNECTIONS SHALL BE MADE WITH 7/8" Ø ASTM A325, TYPE 1 HIGH STRENGTH BOLTS WITH HEAVY HEX HEAD, HEAVY HEX NUT AND HARDENED WASHERS IN ACCORDANCE WITH A.R.E.M.A. SPECIFICATIONS USING THE TURN OF THE NUT METHOD. DIRECT TENSION INDICATORS SHALL NOT BE USED.

SHOP DRAWINGS SHALL BE APPROVED BY THE CHIEF ENGINEER-BRIDGES, CSX TRANSPORTATION, JACKSONVILLE, FL.

BOLT HOLES IN STRUCTURAL STEEL MEMBERS SHALL BE STANDARD SIZE UNLESS OTHERWISE INDICATED ON THE PLANS.

HIGH STRENGTH BOLTS, NUTS & WASHERS SHALL BE MECHANICALLY GALVANIZED IN ACCORDANCE WITH ASTM B695.

ANCHOR BOLTS SHALL BE 1 1/4" Ø IN ACCORDANCE WITH A.R.E.M.A. SPECIFICATIONS AND SHALL BE GROUTED IN FORMED HOLES AFTER GIRDERS ARE ERECTED.

BEARING PADS SHALL BE USED WHENEVER STEEL MASONRY PLATE, OR OTHER STEEL BEARING PLATE, BEARS ON CONCRETE. PADS SHALL BE PREFORMED FABRIC BEARING PADS, 1/2" THICK. FOR PAD REQUIREMENTS, SEE STRUCTURAL STEEL SPECIAL PROVISIONS.

WEB SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED WEB PIECE LENGTHS TO 45'-0". PERMITTED WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15'-0" OF MAXIMUM DEAD LOAD DEFLECTION AND SHALL BE LOCATED 6" MIN. FROM CONNECTOR OR INTERMEDIATE STIFFENER CONNECTIONS. FLANGE AND WEB SHOP SPLICES SHALL CONFORM TO SHOP SPLICE DETAILS SHOWN ON THE PLANS.

STRUCTURAL STEEL ELEMENTS DENOTED AS "FC" ARE FRACTURE CRITICAL AND SHALL MEET IMPACT TEST REQUIREMENTS SET FORTH IN THE FRACTURE CONTROL PLAN OF THE AREMA MANUAL, CHAPTER 15, SECTION 1.14. NOTCH TOUGHNESS REQUIREMENTS AND TESTING SHALL BE BASED ON ZONE 2 REQUIREMENTS.

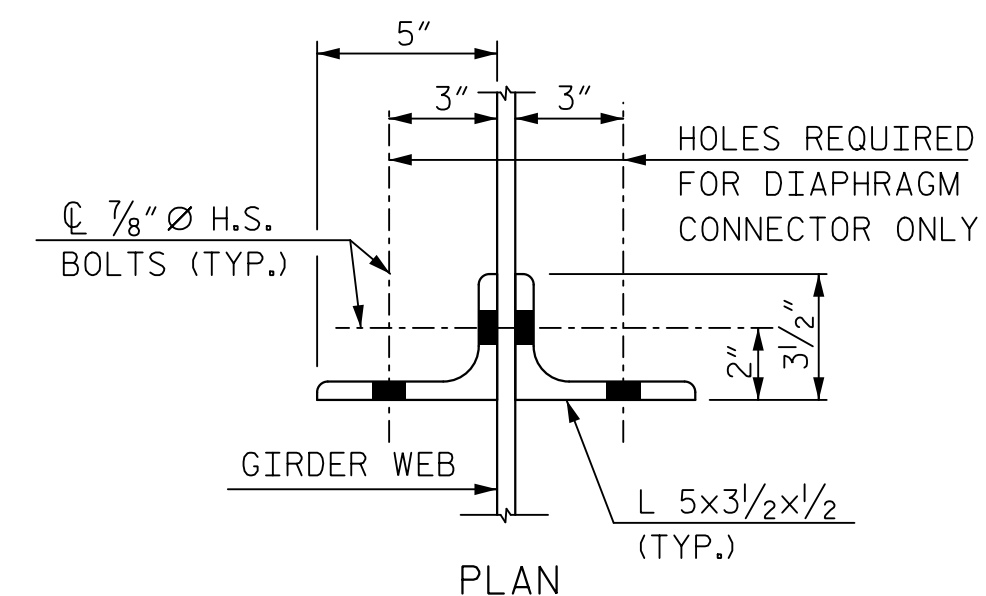
STRUCTURAL STEEL ELEMENTS DENOTED AS "INT" SHALL MEET IMPACT TEST REQUIREMENTS SET FORTH IN THE FRACTURE CONTROL PLAN OF THE AREMA MANUAL, CHAPTER 15, SECTION 1.2. TESTING SHALL BE BASED ON ZONE 2 REQUIREMENTS.

ALL WELDING CONNECTIONS SHALL BE MADE WITH SERIES E70 WELDING ELECTRODES.

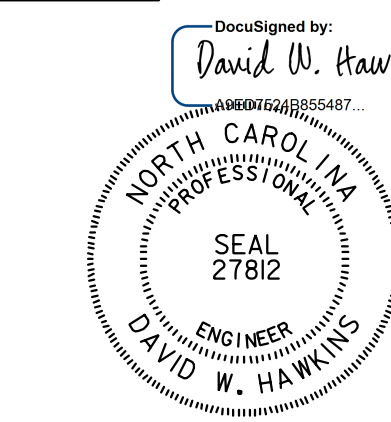
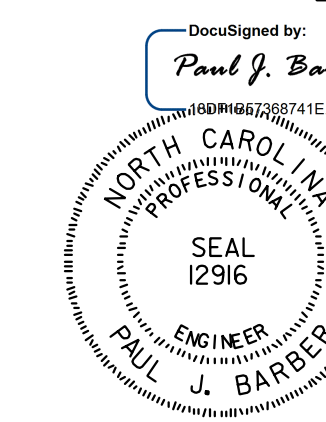
FOR DRAINAGE PIPE SUPPORT ANGLE DETAIL, SEE "DRAINAGE DETAILS (SHEET 3 OF 4)".

"INT" DENOTES NON-FRACTURE CRITICAL MEMBER OR COMPONENT REQUIRING IMPROVED NOTCH TOUGHNESS, T2.

"FC" DENOTES FRACTURE CRITICAL MEMBER OR COMPONENT REQUIRING IMPROVED NOTCH TOUGHNESS, F2.



CONNECTER/STIFFENER  
ANGLE DETAIL

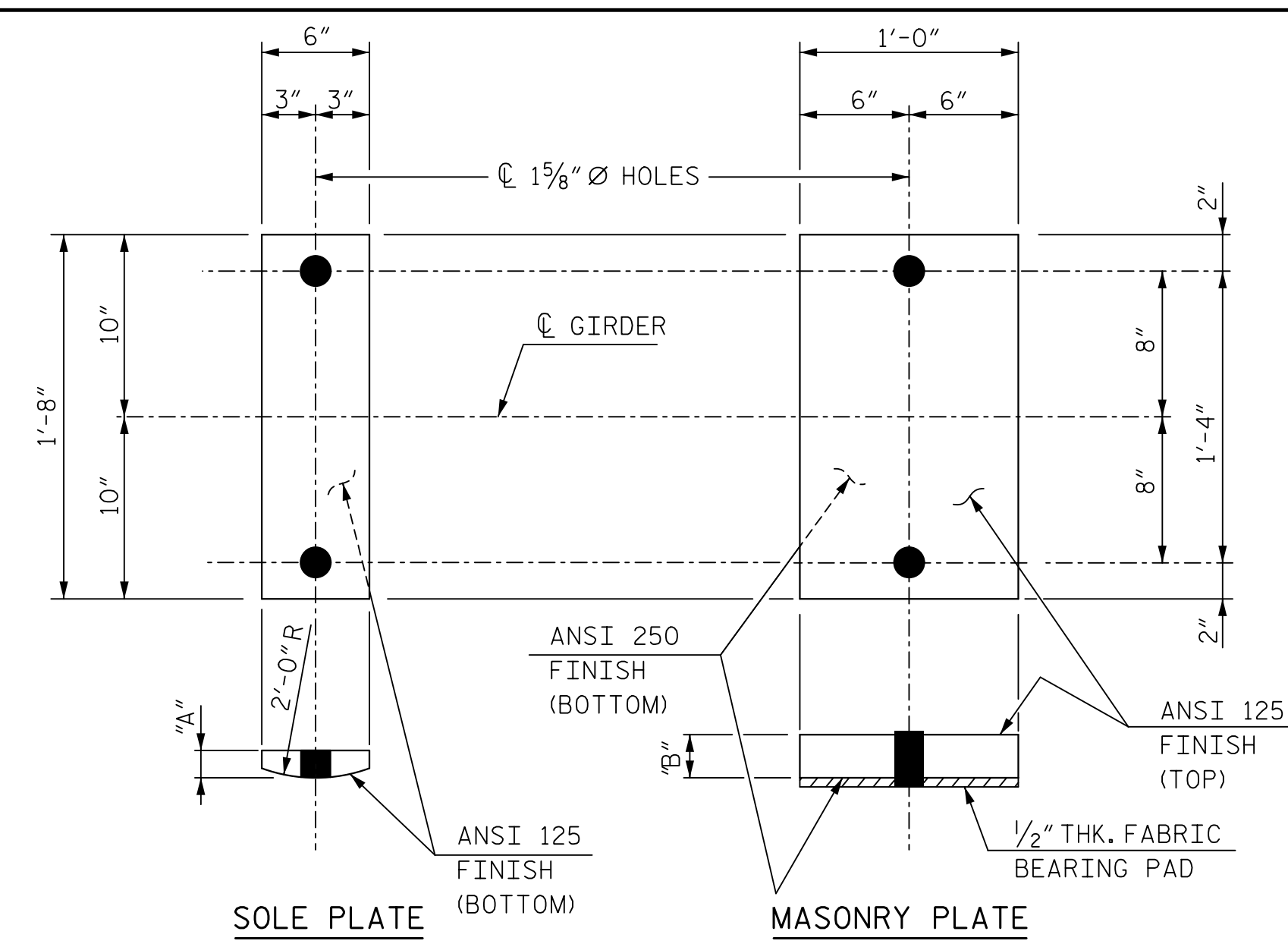


PROJECT NO. P-4900A  
ROBESON COUNTY  
STATION: POC 38+93.36 -L-  
MILE POST: 0.55

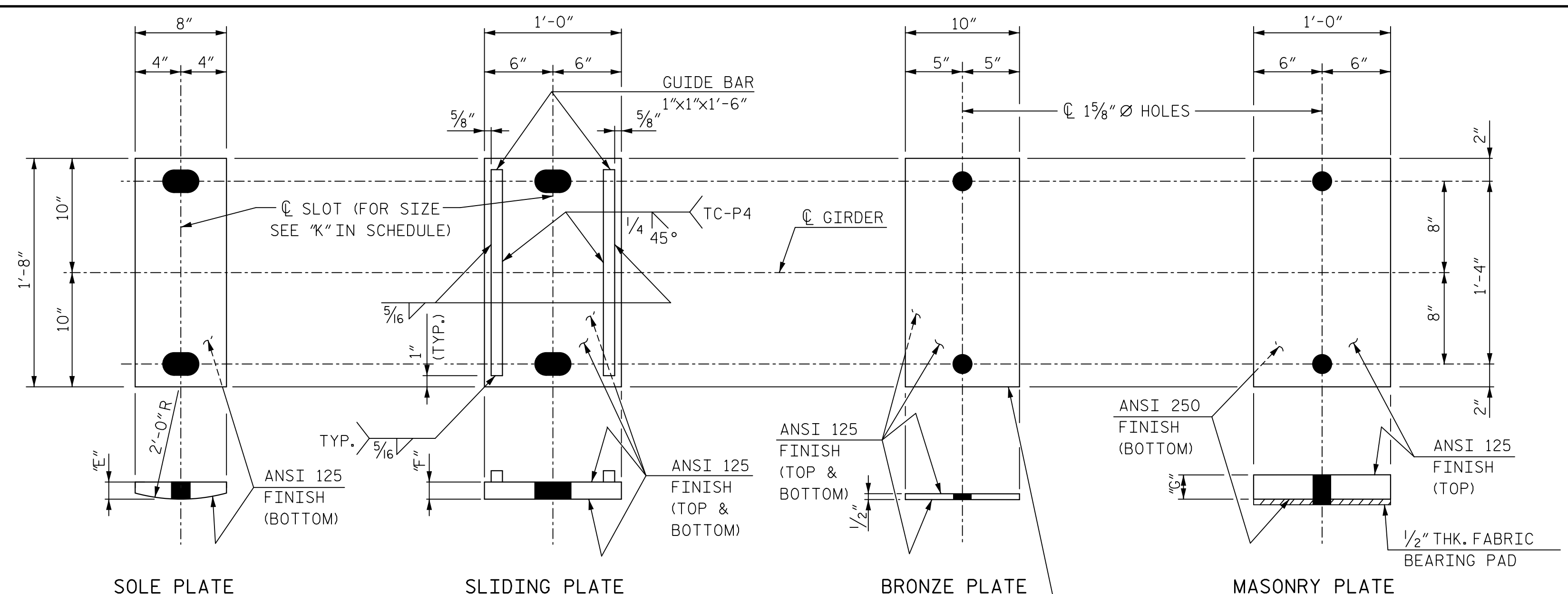
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1	M. WRIGHT	7/14	3			TOTAL SHEETS
2	P. BARBER	9/14	4			54

**HNTB** HNTB NORTH CAROLINA, P.C.  
License No. C-1554  
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609  
DRAWN BY M. WRIGHT DATE 7/14  
CHECKED BY P. BARBER DATE 9/14 DWG. NO. 12

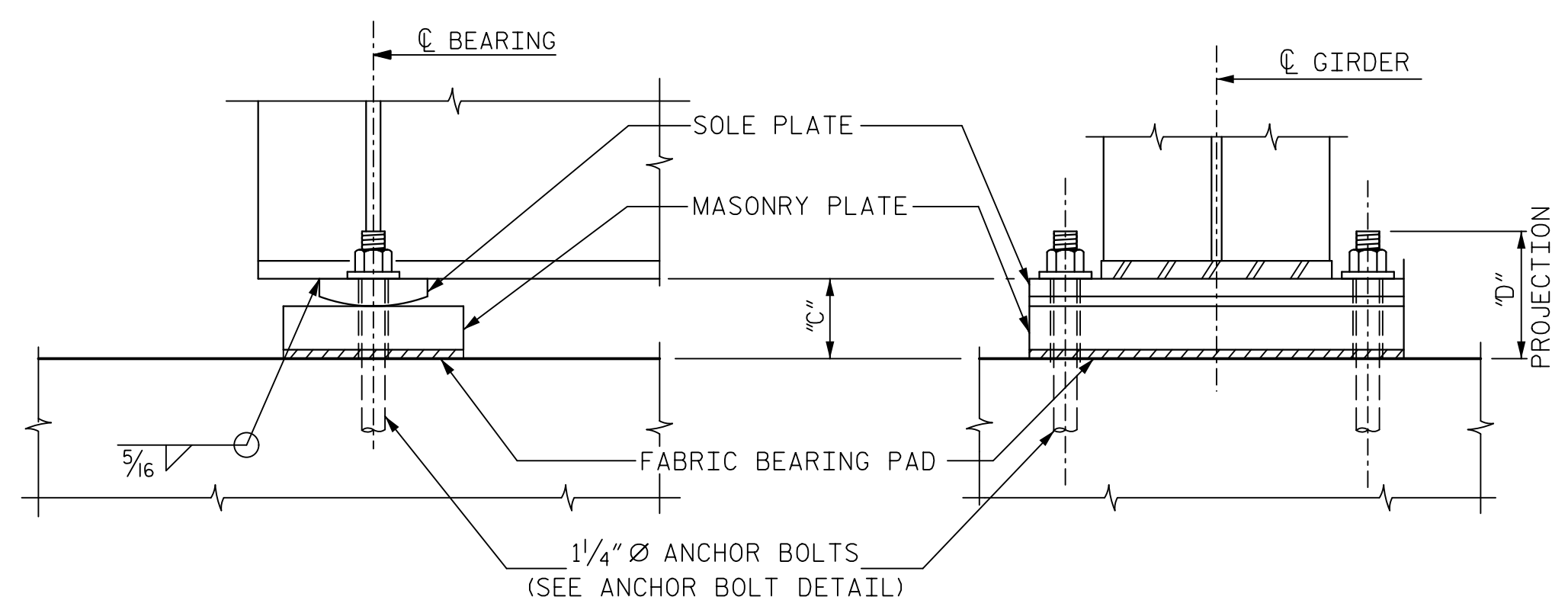


**FIXED BEARINGS**



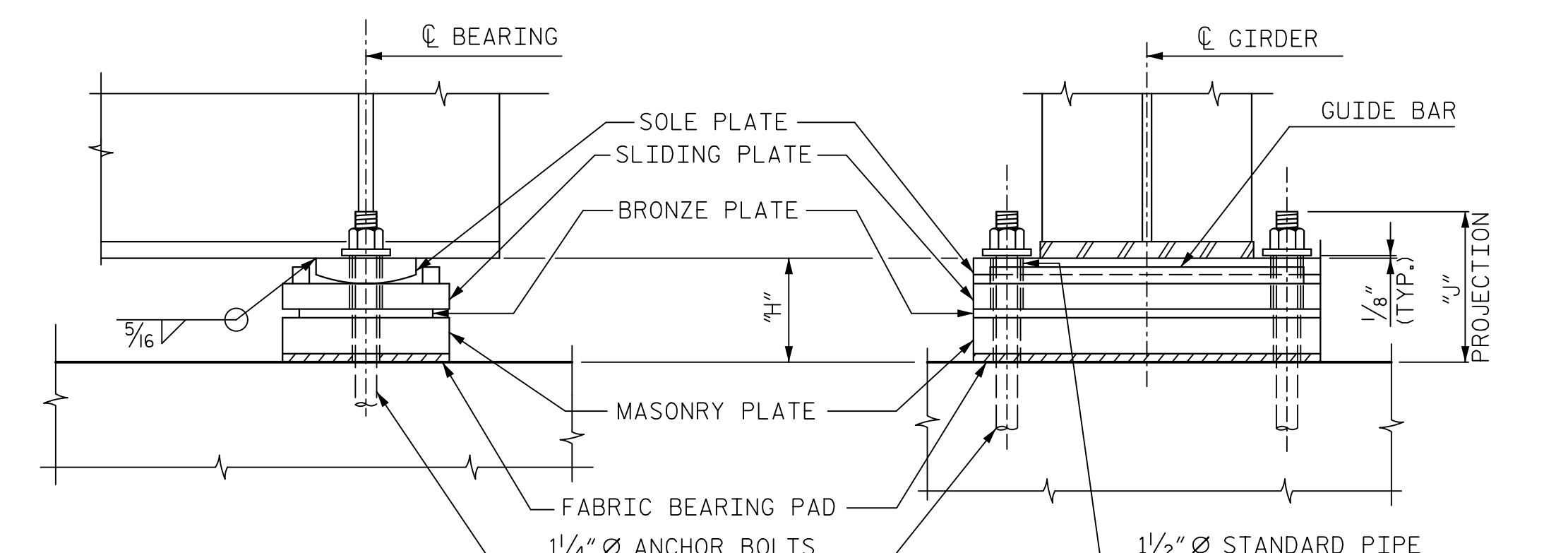
**EXPANSION BEARINGS**

BRONZE PLATE TO BE ASTM B22 - COPPER ALLOY 911 OR ASTM B100 - COPPER ALLOY 510. TOP SURFACE TO BE SELF LUBRICATING.



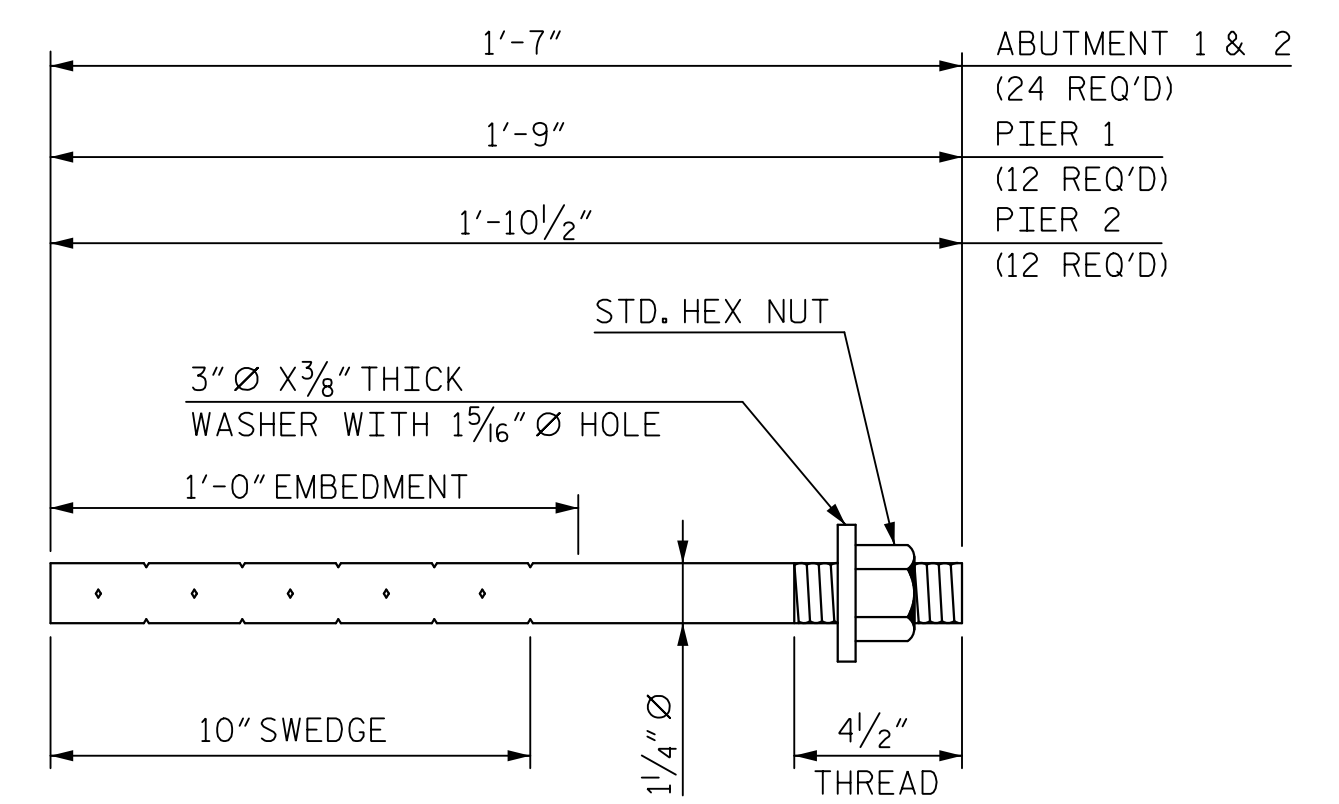
**FIXED BEARING ASSEMBLY (FBA-1)**

(12 REQ'D)



**EXPANSION BEARING ASSEMBLY (EBA-1)**

(12 REQ'D)



**ANCHOR BOLT DETAIL**

ABUTMENT 1 & 2 (24 REQ'D)  
PIER 1 (12 REQ'D)  
PIER 2 (12 REQ'D)

GIRDER	BEARING PLATE SCHEDULE									
	DIMENSIONS									
	FIXED BEARING (FBA-1)					EXPANSION BEARING (EBA-1)				
	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"	"K"
AG1	1 1/2"	2 3/8"	4 3/8"	7"	1 1/2"	1 1/2"	2 1/8"	6 1/8"	9"	2"x3"
AG2	1 1/2"	2 3/8"	4 3/8"	7"	1 1/2"	1 1/2"	2 1/8"	6 1/8"	9"	2"x3"
AG3	1 1/2"	2 3/8"	4 3/8"	7"	1 1/2"	1 1/2"	2 1/8"	6 1/8"	9"	2"x3"
AG4	1 1/2"	2 3/8"	4 3/8"	7"	1 1/2"	1 1/2"	2 1/8"	6 1/8"	9"	2"x3"
AG5	1 1/2"	2 1/2"	4 1/2"	7"	1 1/2"	1 1/2"	2 1/8"	6 1/8"	9"	2"x3"
AG6	1 1/2"	2 1/2"	4 1/2"	7"	1 1/2"	1 1/2"	2 1/8"	6 1/8"	9"	2"x3"
CG1	1 1/2"	2 1/2"	4 1/2"	7"	1 1/2"	1 1/2"	3 5/8"	7 5/8"	10 1/2"	2"x3"
CG2	1 1/2"	2 3/8"	4 3/8"	7"	1 1/2"	1 1/2"	3 5/8"	7 5/8"	10 1/2"	2"x3"
CG3	1 1/2"	2 3/8"	4 3/8"	7"	1 1/2"	1 1/2"	3 5/8"	7 5/8"	10 1/2"	2"x3"
CG4	1 1/2"	2 3/8"	4 3/8"	7"	1 1/2"	1 1/2"	3 5/8"	7 5/8"	10 1/2"	2"x3"
CG5	1 1/2"	2 3/8"	4 3/8"	7"	1 1/2"	1 1/2"	3 1/2"	7 1/2"	10 1/2"	2"x3"
CG6	1 1/2"	2 3/8"	4 3/8"	7"	1 1/2"	1 1/2"	3 1/2"	7 1/2"	10 1/2"	2"x3"

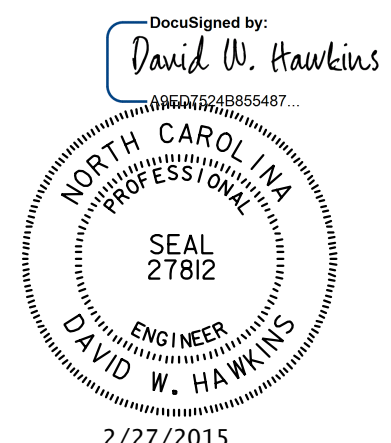
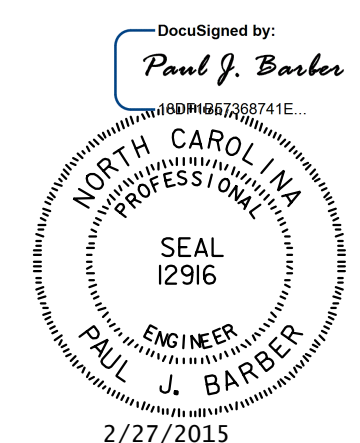
**NOTES:**  
ANCHOR BOLTS, SLIDING PLATE (EXPANSION BEARING) AND MASONRY PLATE (FIXED AND EXPANSION BEARINGS) SHALL BE HOT DIPPED GALVANIZED.

ALL PLATE SURFACES SHALL BE PAINTED WITH A 3 COAT PAINT SYSTEM EXCEPT AS SPECIFIED BELOW.

- (A) THE SLIDING PLATE (EXPANSION BEARING) SHALL NOT BE PAINTED BUT SHALL RECEIVE A COAT OF LUBRICATION.
- (B) THE MASONRY PLATE (FIXED AND EXPANSION BEARINGS) SHALL NOT BE PAINTED.
- (C) THE BOTTOM SURFACE OF THE SOLE PLATE SHALL NOT BE PAINTED BUT SHALL RECEIVE A SINGLE COAT OF PRIMER APPLIED IN THE SHOP.
- (D) THE TOP SURFACE OF THE SOLE PLATE SHALL NOT BE PAINTED IN THE VICINITY OF THE WELD BETWEEN THE SOLE PLATE AND THE BOTTOM FLANGE.

FOR PAINTING STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

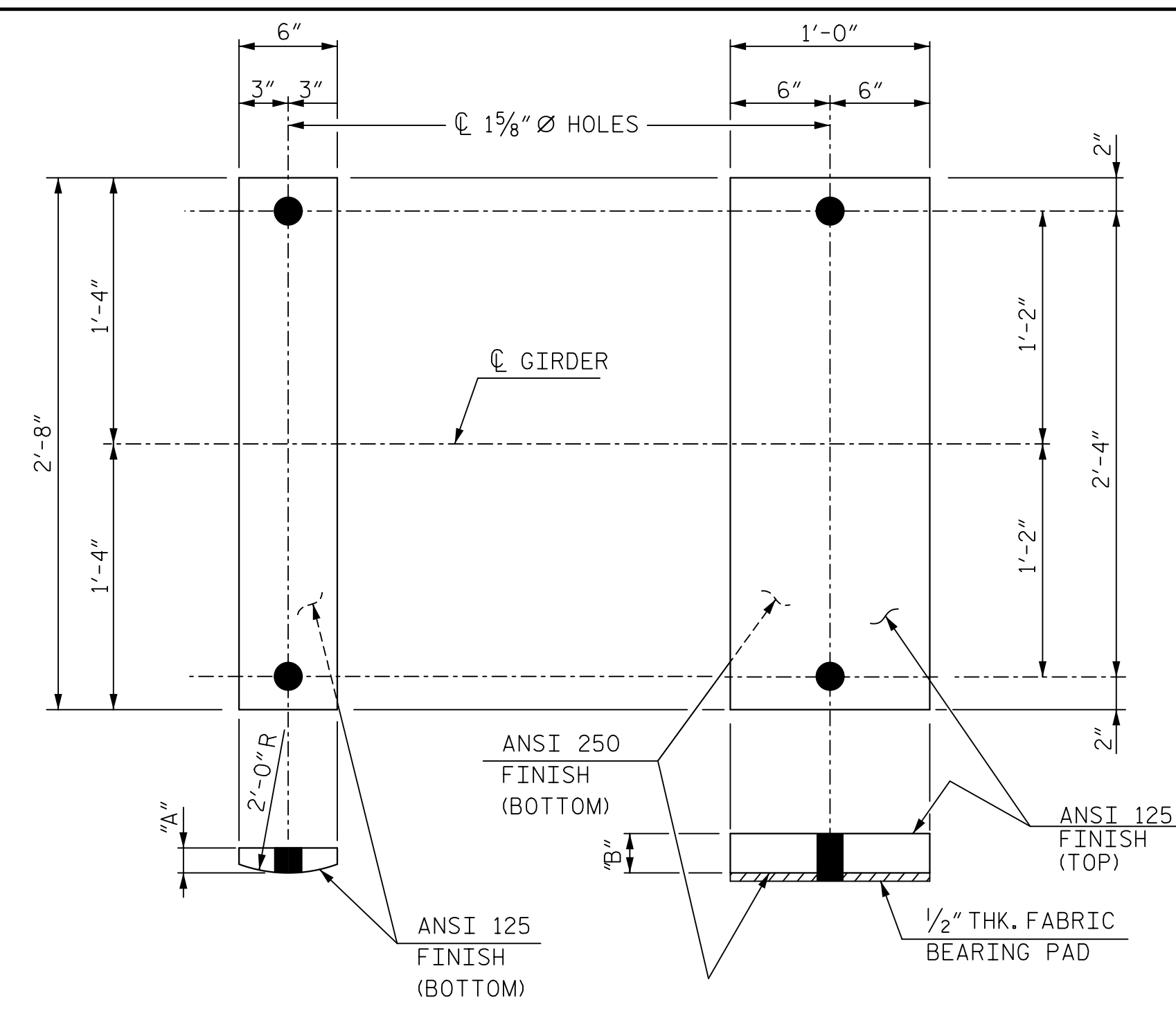
FOR SELF-LUBRICATING EXPANSION BEARING ASSEMBLIES, SEE SPECIAL PROVISIONS.



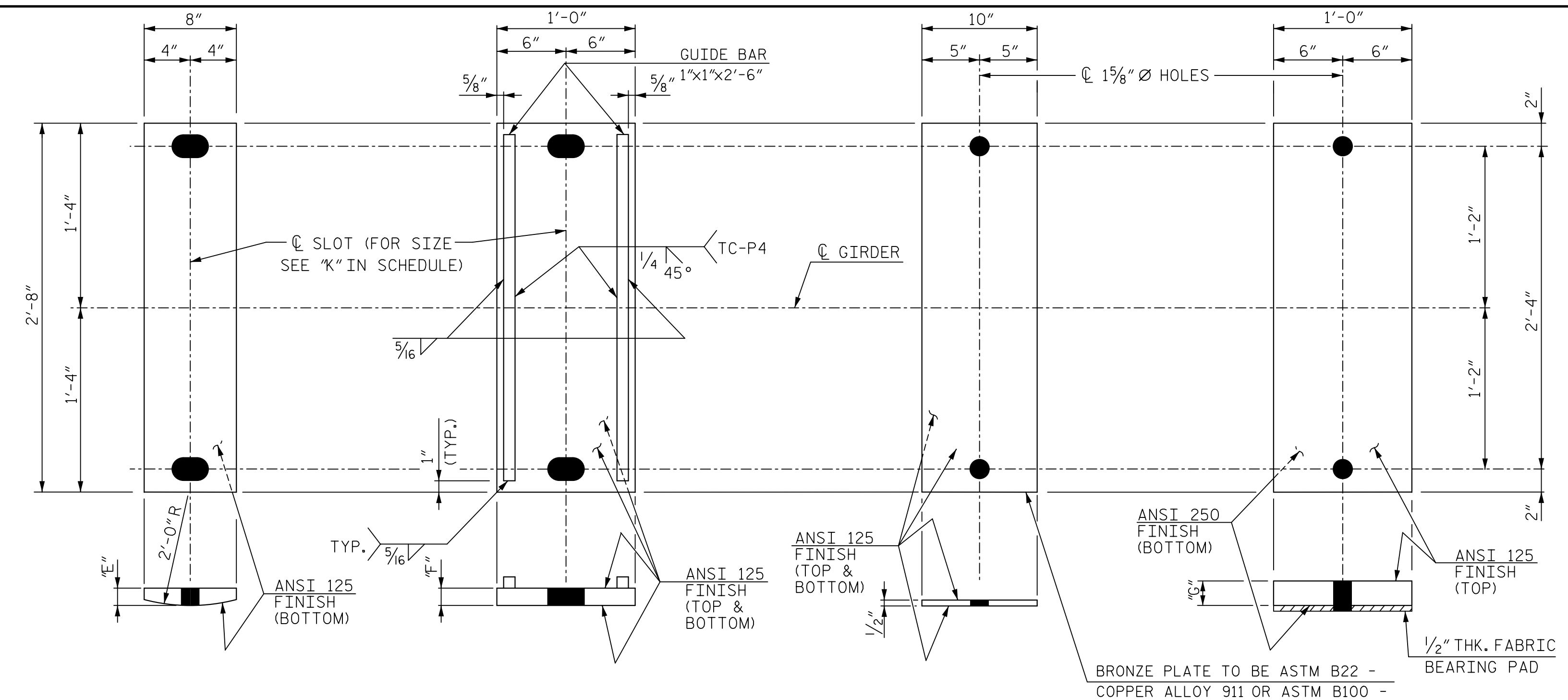
PROJECT NO. P-4900A  
ROBESON COUNTY  
STATION: POC 38+93.36 -L-  
MILE POST: 0.55

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**SUPERSTRUCTURE**  
BEARING DETAILS  
SPANS A & C

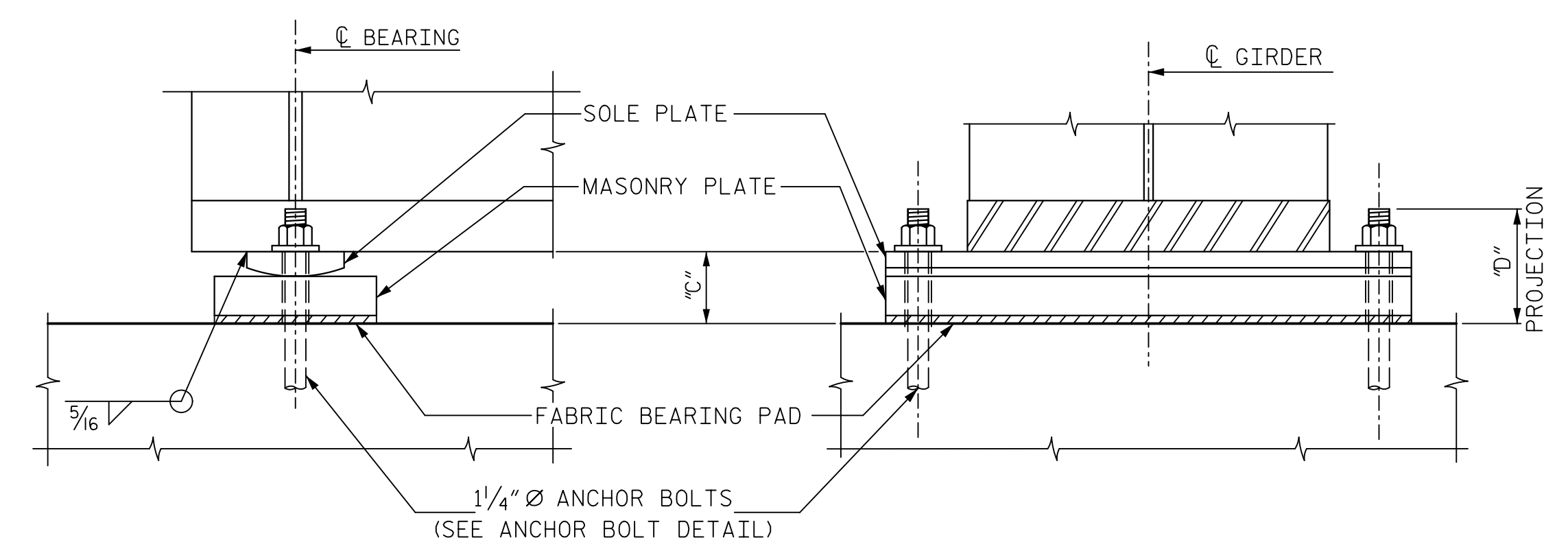
HNTB						HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609									
DRAWN BY		DATE		DATE		DWG. NO.		NO.		BY:		DATE:		SHEET NO.	
J. BAYNE		7/14		8/14		13		1		3				S-32	
D. RAGAN								2		4				TOTAL SHEETS 54	



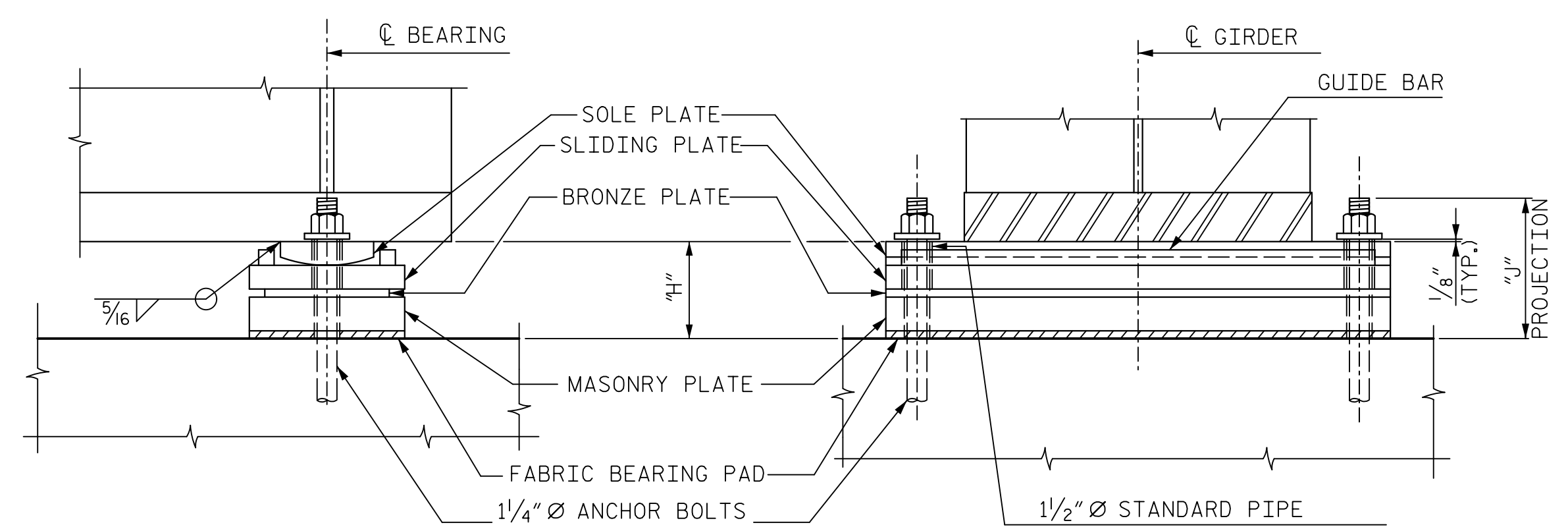
**SOLE PLATE**      **MASONRY PLATE**  
**FIXED BEARINGS**



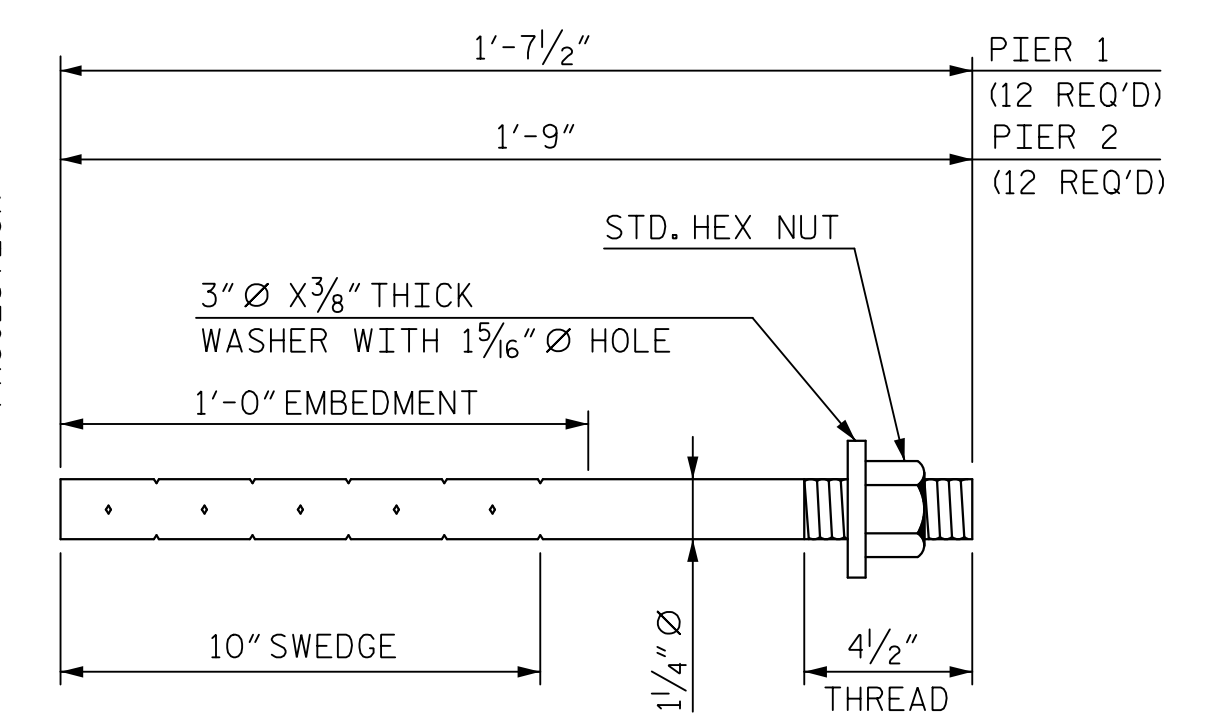
**SOLE PLATE**      **SLIDING PLATE**      **BRONZE PLATE**      **MASONRY PLATE**  
**EXPANSION BEARINGS**



**FIXED BEARING ASSEMBLY (FBA-2)**  
(6 REQ'D)



**EXPANSION BEARING ASSEMBLY (EBA-2)**  
(6 REQ'D)



**ANCHOR BOLT DETAIL**

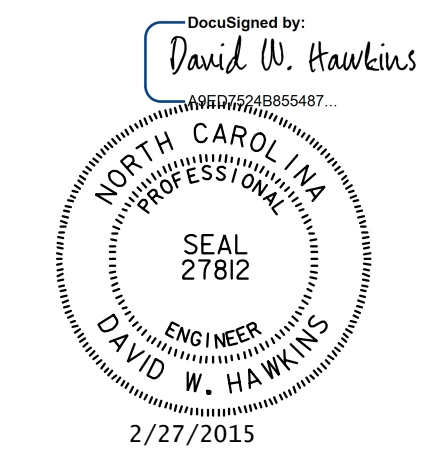
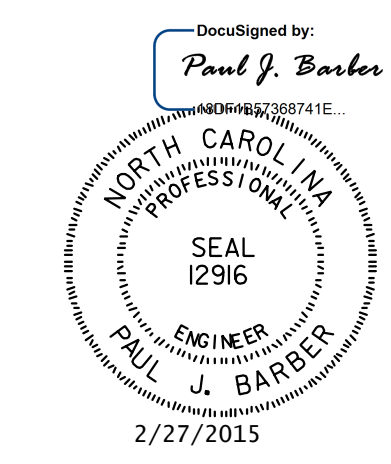
GIRDER	BEARING PLATE SCHEDULE									
	DIMENSIONS									
	FIXED BEARING (FBA-2)					EXPANSION BEARING (EBA-2)				
	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"	"K"
BG1	1 1/2"	3"	5"	7 1/2"	1 1/2"	1 1/2"	2 1/2"	6 1/2"	9"	2"x4"
BG2	1 1/2"	3"	5"	7 1/2"	1 1/2"	1 1/2"	2 1/2"	6 1/2"	9"	2"x4"
BG3	1 1/2"	3"	5"	7 1/2"	1 1/2"	1 1/2"	2 1/2"	6 1/2"	9"	2"x4"
BG4	1 1/2"	3"	5"	7 1/2"	1 1/2"	1 1/2"	2 1/2"	6 1/2"	9"	2"x4"
BG5	1 1/2"	3"	5"	7 1/2"	1 1/2"	1 1/2"	2 1/2"	6 1/2"	9"	2"x4"
BG6	1 1/2"	3"	5"	7 1/2"	1 1/2"	1 1/2"	2 1/2"	6 1/2"	9"	2"x4"

**NOTES:**

- ANCHOR BOLTS, SLIDING PLATE (EXPANSION BEARING) AND MASONRY PLATE (FIXED AND EXPANSION BEARINGS) SHALL BE HOT DIPPED GALVANIZED.
- ALL PLATE SURFACES SHALL BE PAINTED WITH A 3 COAT PAINT SYSTEM EXCEPT AS SPECIFIED BELOW.
- (A) THE SLIDING PLATE (EXPANSION BEARING) SHALL NOT BE PAINTED BUT SHALL RECEIVE A COAT OF LUBRICATION.
- (B) THE MASONRY PLATE (FIXED AND EXPANSION BEARINGS) SHALL NOT BE PAINTED.
- (C) THE BOTTOM SURFACE OF THE SOLE PLATE SHALL NOT BE PAINTED BUT SHALL RECEIVE A SINGLE COAT OF PRIMER APPLIED IN THE SHOP.
- (D) THE TOP SURFACE OF THE SOLE PLATE SHALL NOT BE PAINTED IN THE VICINITY OF THE WELD BETWEEN THE SOLE PLATE AND THE BOTTOM FLANGE.

FOR PAINTING STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

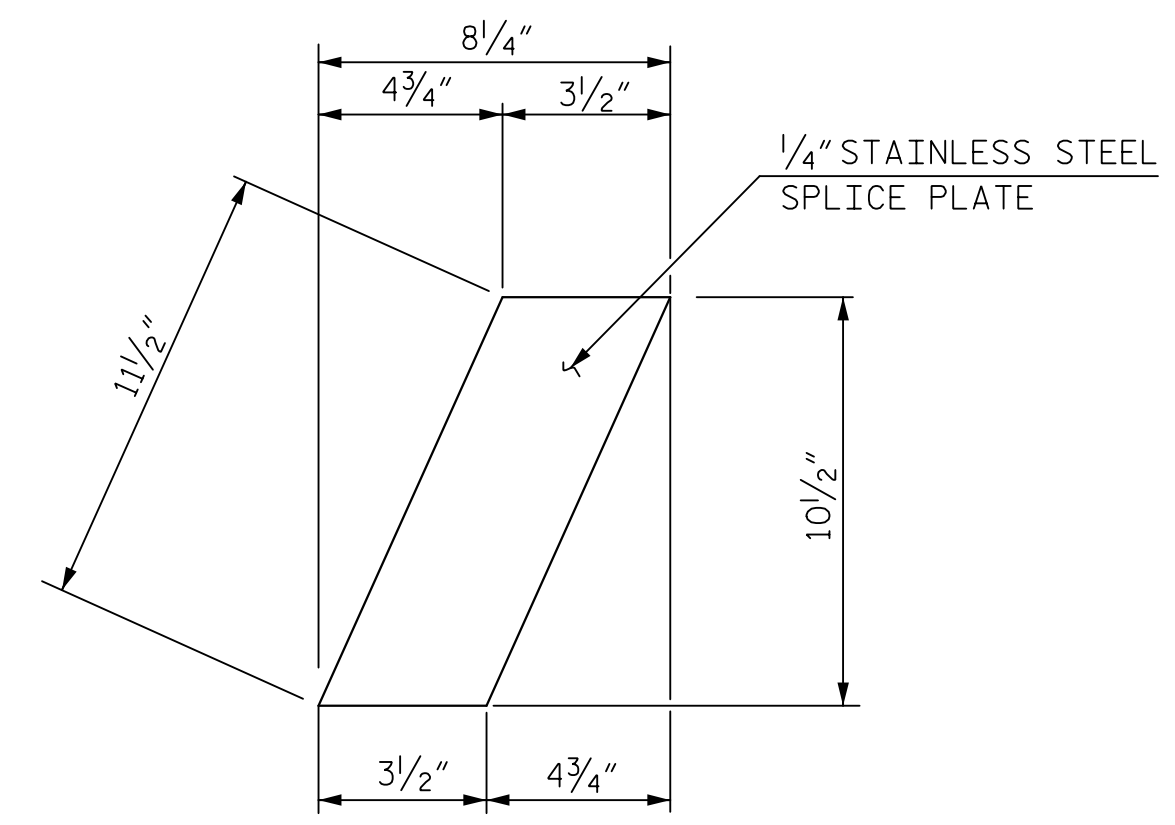
FOR SELF-LUBRICATING EXPANSION BEARING ASSEMBLIES, SEE SPECIAL PROVISIONS.



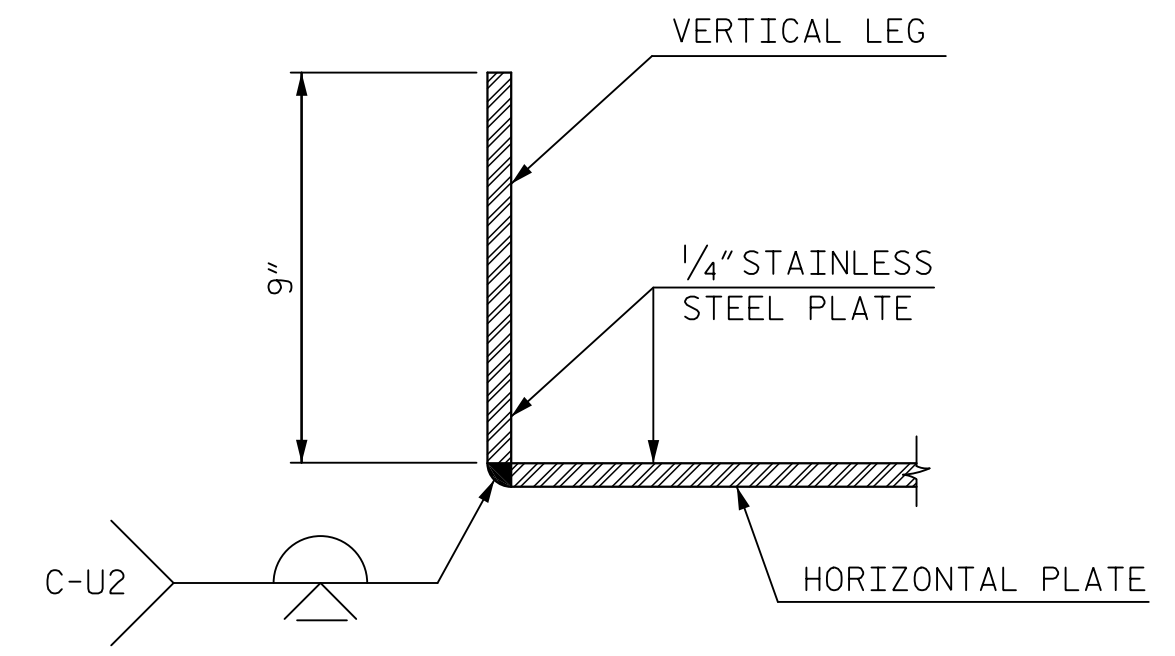
PROJECT NO. P-4900A  
ROBESON COUNTY  
STATION: POC 38+93.36 -L-  
MILE POST: 0.55

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**SUPERSTRUCTURE**  
BEARING DETAILS  
SPAN B

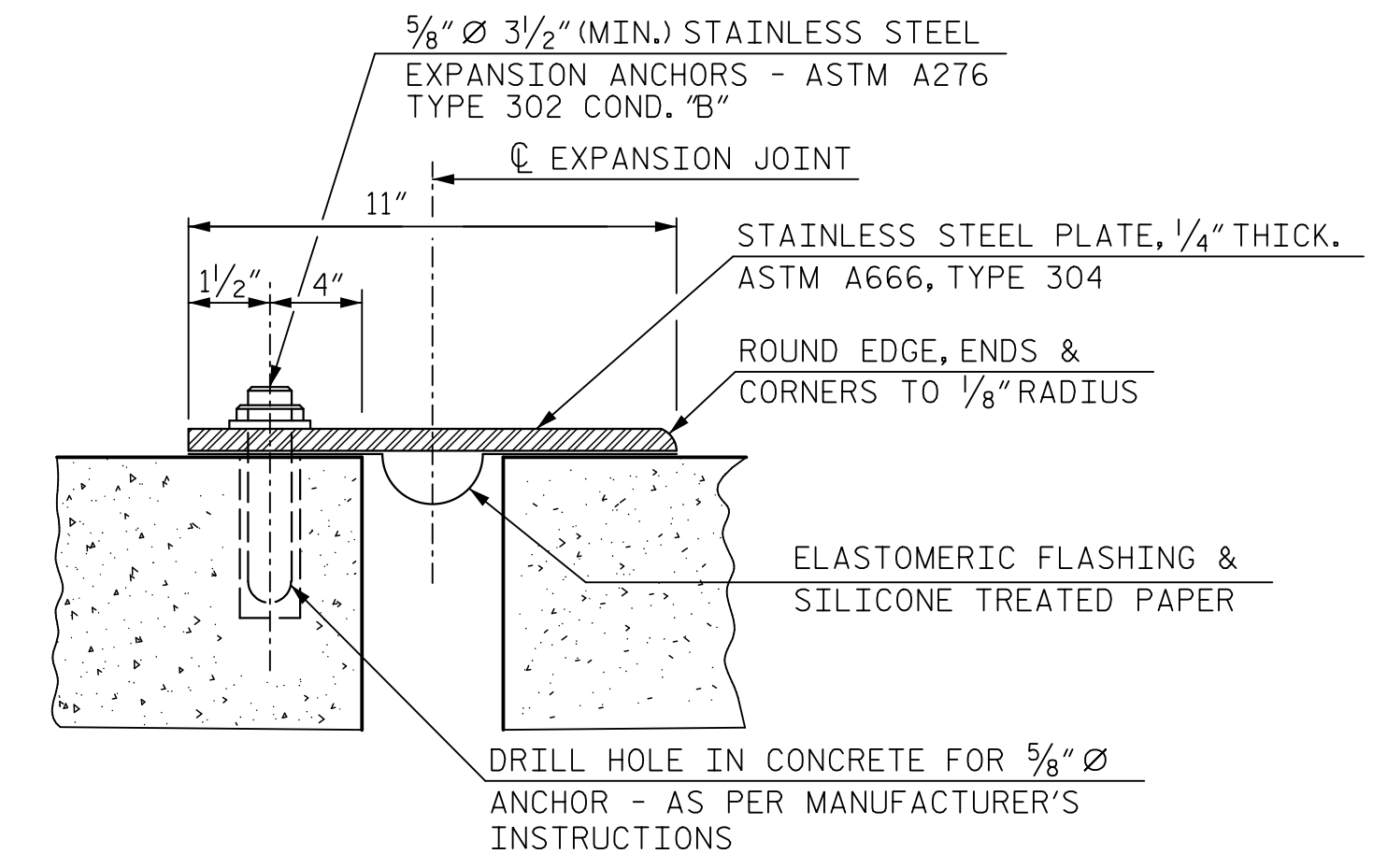
<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DWG. NO. 14	
DRAWN BY: J. BAYNE	DATE: 7/14	CHECKED BY: D. RAGAN	DATE: 8/14	REVISIONS	
				NO.	DATE
				1	
				2	
				3	
				4	
				SHEET NO. <b>S-33</b>	
				TOTAL SHEETS <b>54</b>	



DETAIL A

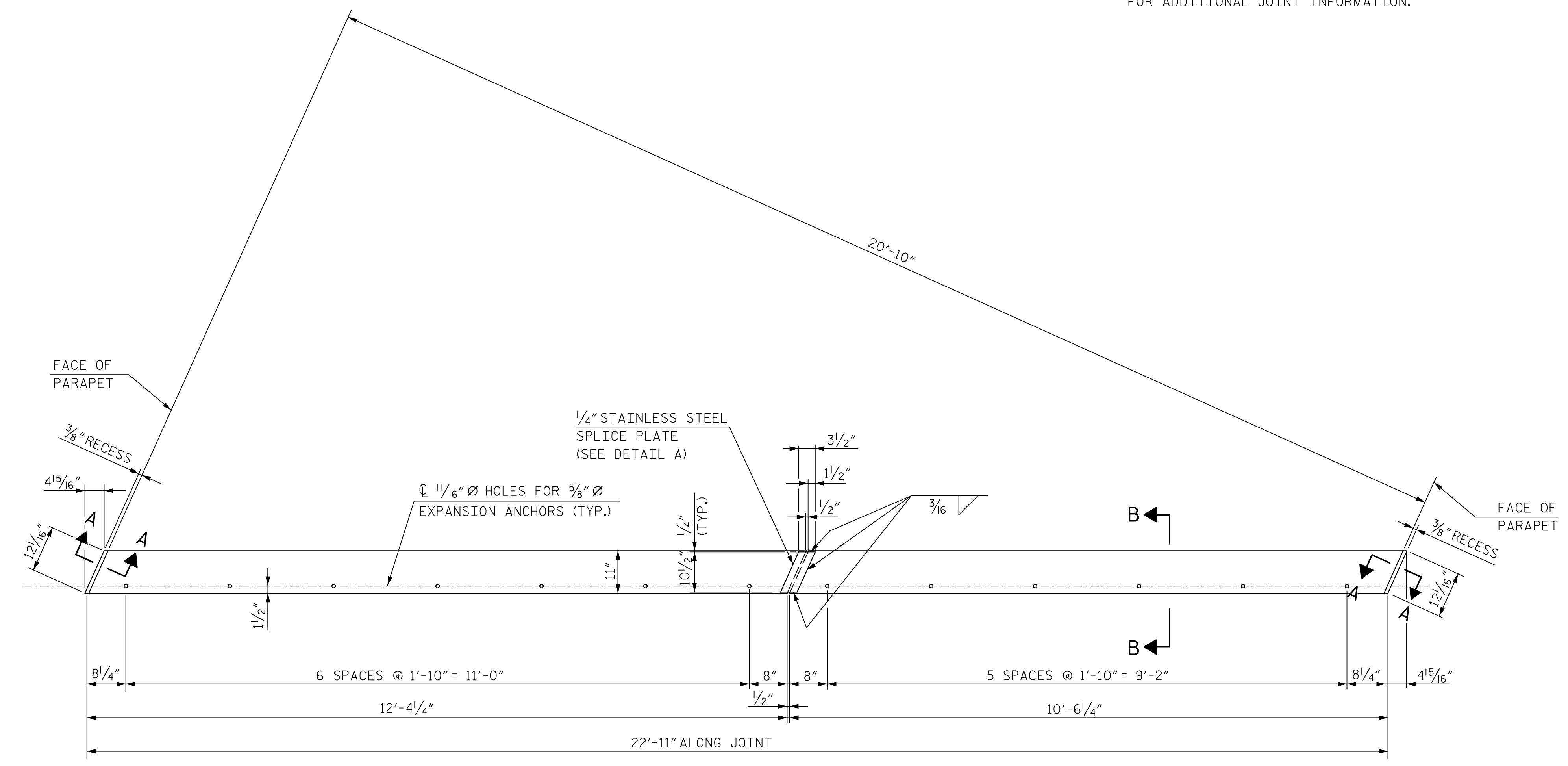


SECTION A-A



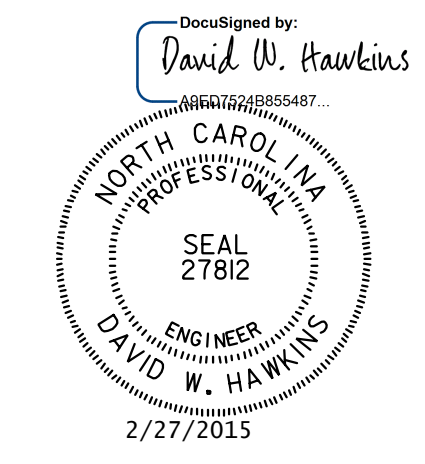
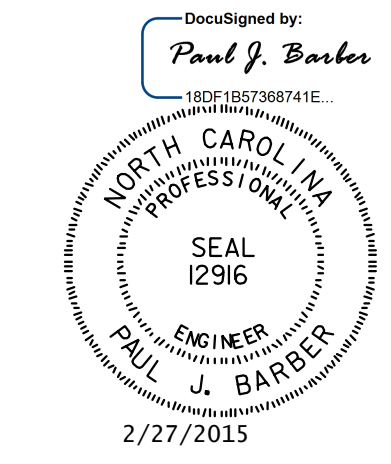
SECTION B-B

DETAIL OF EXPANSION ANCHOR AND PLATE  
SEE DETAIL A ON "DECK DETAILS" SHEET FOR ADDITIONAL JOINT INFORMATION.



PLAN - EXPANSION PLATE  
(4 REQUIRED)

NOTE: PAYMENT FOR THE EXPANSION PLATE AND EXPANSION ANCHORS IS INCLUDED IN THE COST FOR STRUCTURAL STEEL.  
PLATE SHALL BE ANCHORED AT BACKWALL OF ABUTMENT 1 & 2, SPAN B SIDE OF PIER 1 AND SPAN B SIDE OF PIER 2.



PROJECT NO. P-4900A  
ROBESON COUNTY  
STATION: POC 38+93.36 -L-  
MILE POST: 0.55

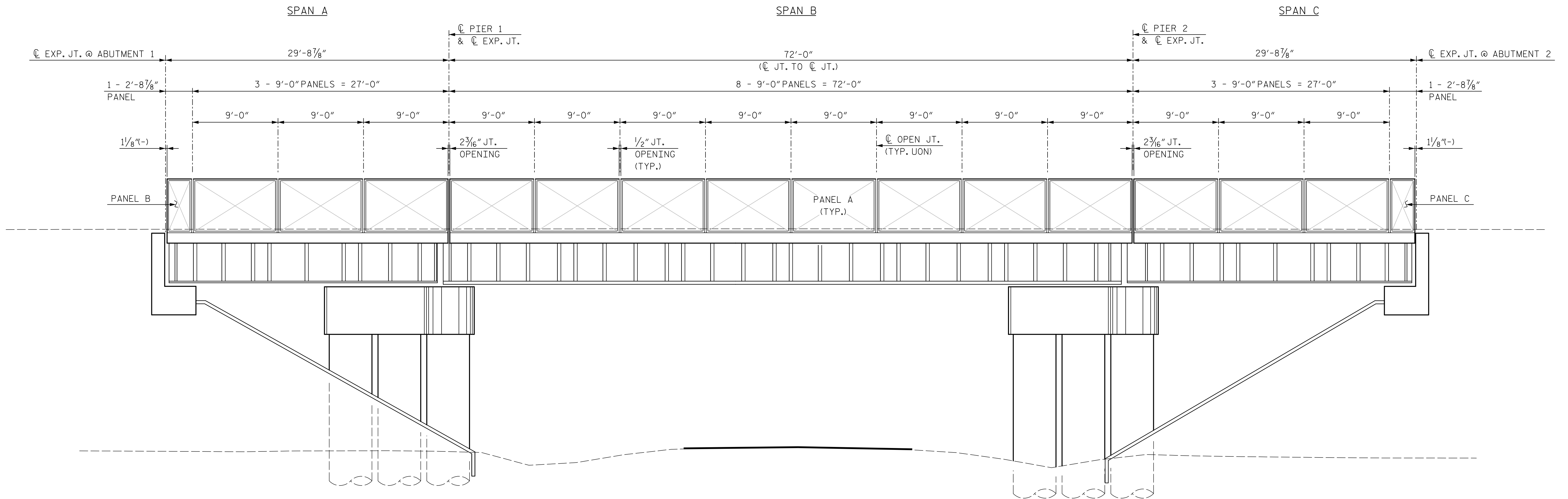
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
EXPANSION PLATE DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			54

HNTB HNTB NORTH CAROLINA, P.C.  
License No. C-1554  
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: M. WRIGHT DATE: 7/14  
CHECKED BY: P. BARBER DATE: 9/14 DWG. NO. 15



**ELEVATION**  
 LOOKING EAST  
 (ELEVATION LOOKING WEST SIMILAR)

PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POC 38+93.36 -L-  
 MILE POST: 0.55  
 SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE**  
**PARAPET ELEVATION**

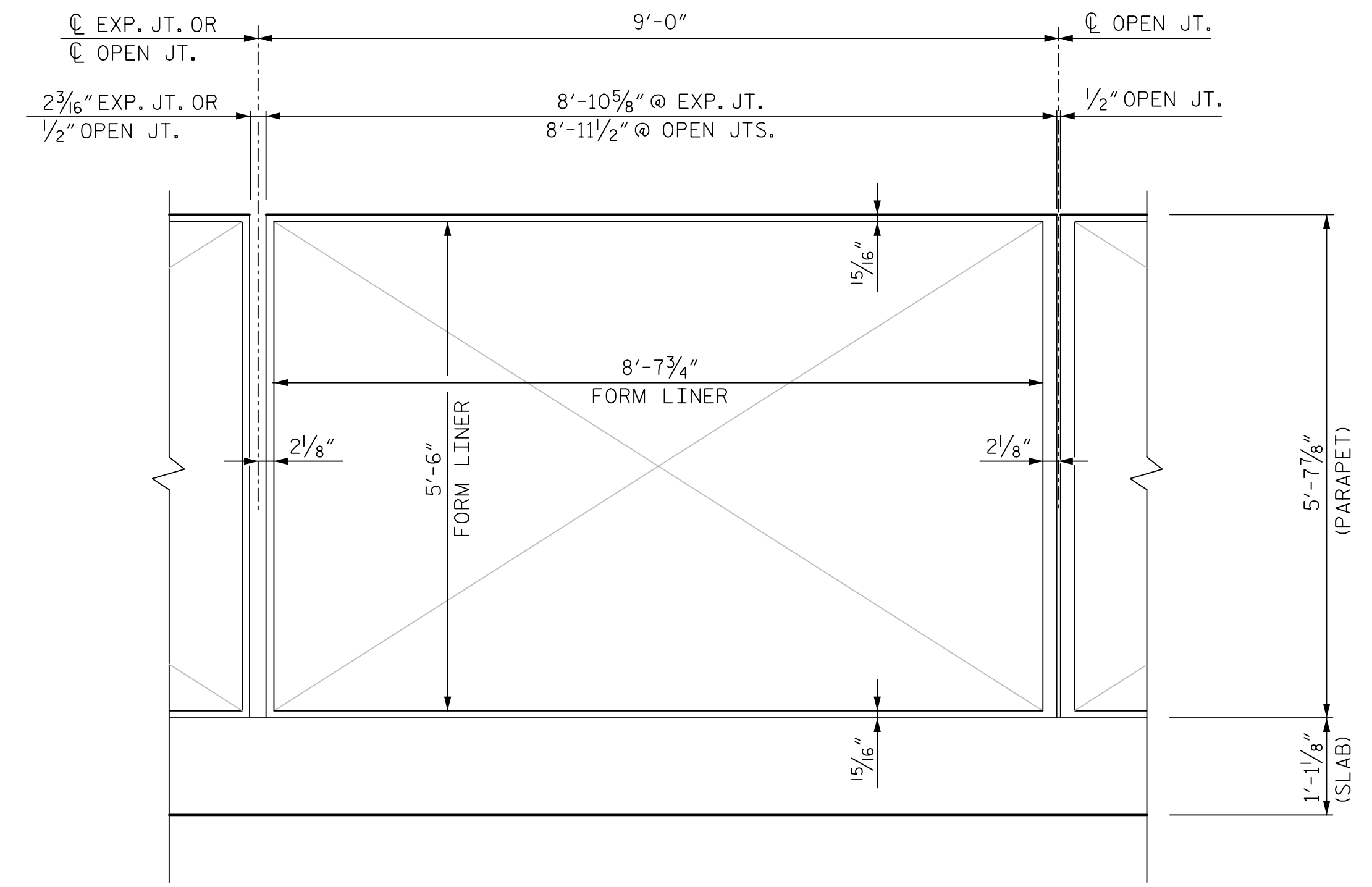
DocuSigned by:  
*Paul J. Barber*  
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DocuSigned by:  
*David W. Hawkins*  
 46E7C4B855A87...

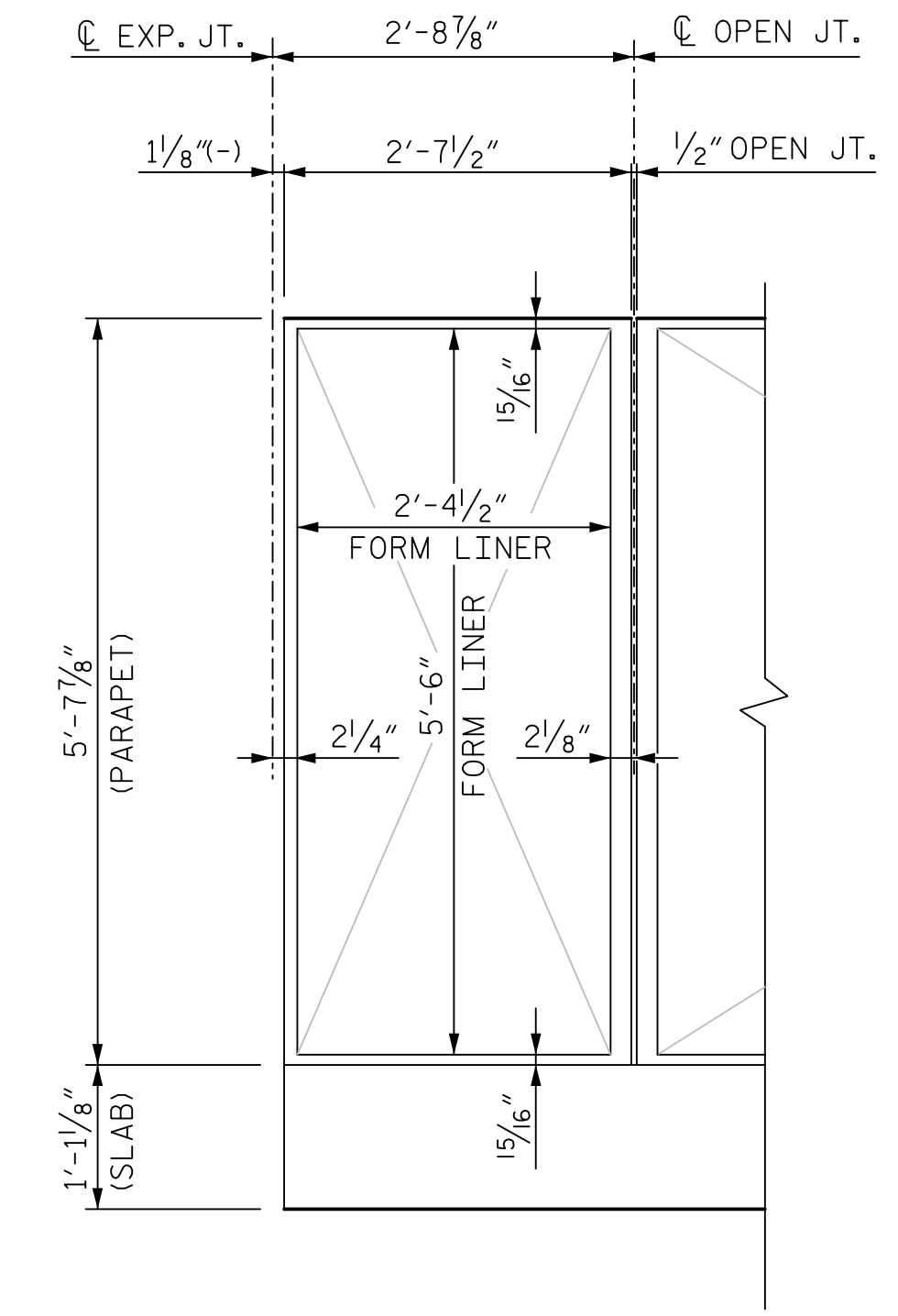
**SEAL 12916**  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 PAUL J. BARBER  
 2/27/2015

**SEAL 27812**  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 DAVID W. HAWKINS  
 2/27/2015

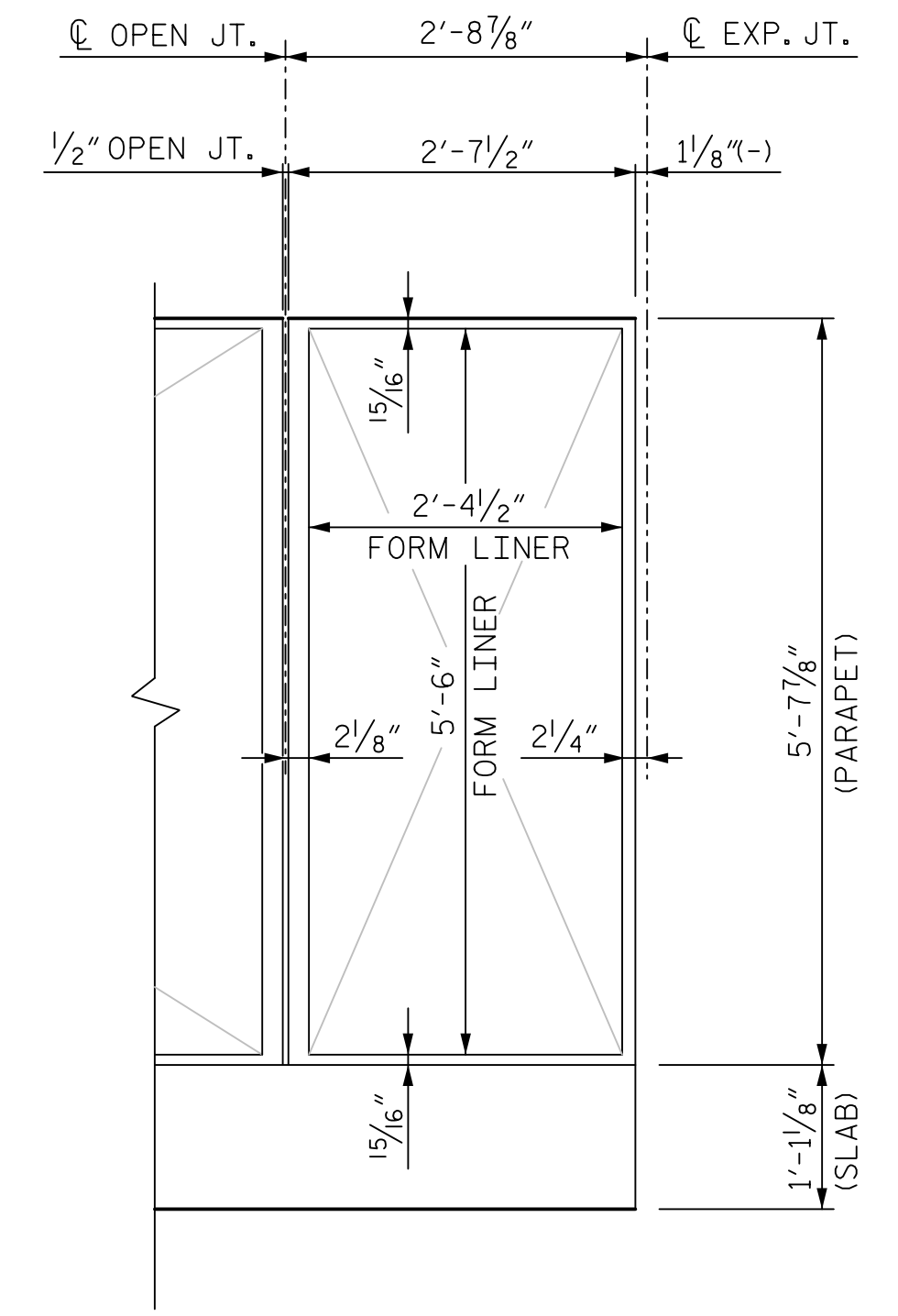
<b>HNTB</b> HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO.
DRAWN BY: M. WRIGHT	DATE: 7/14	NO. 3	BY:	S-35
CHECKED BY: P. BARBER	DATE: 9/14	NO. 4	DATE:	
DWG. NO. 16		TOTAL SHEETS		54



**PANEL A**  
(28 REQ'D)

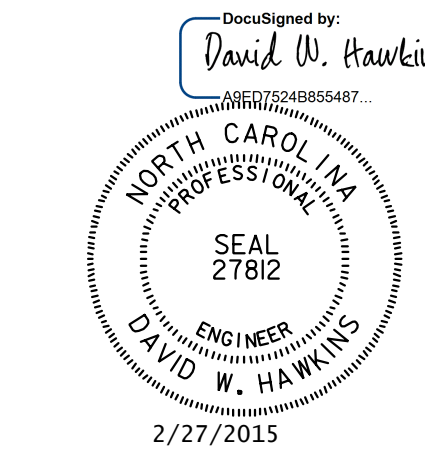
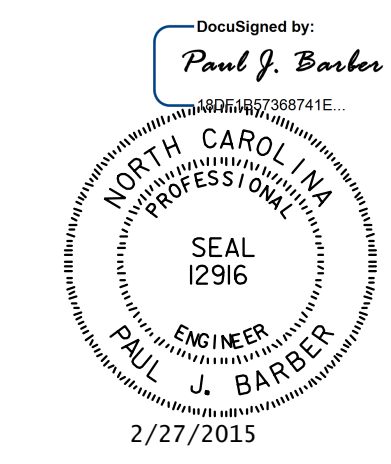


**PANEL B**  
(2 REQ'D)



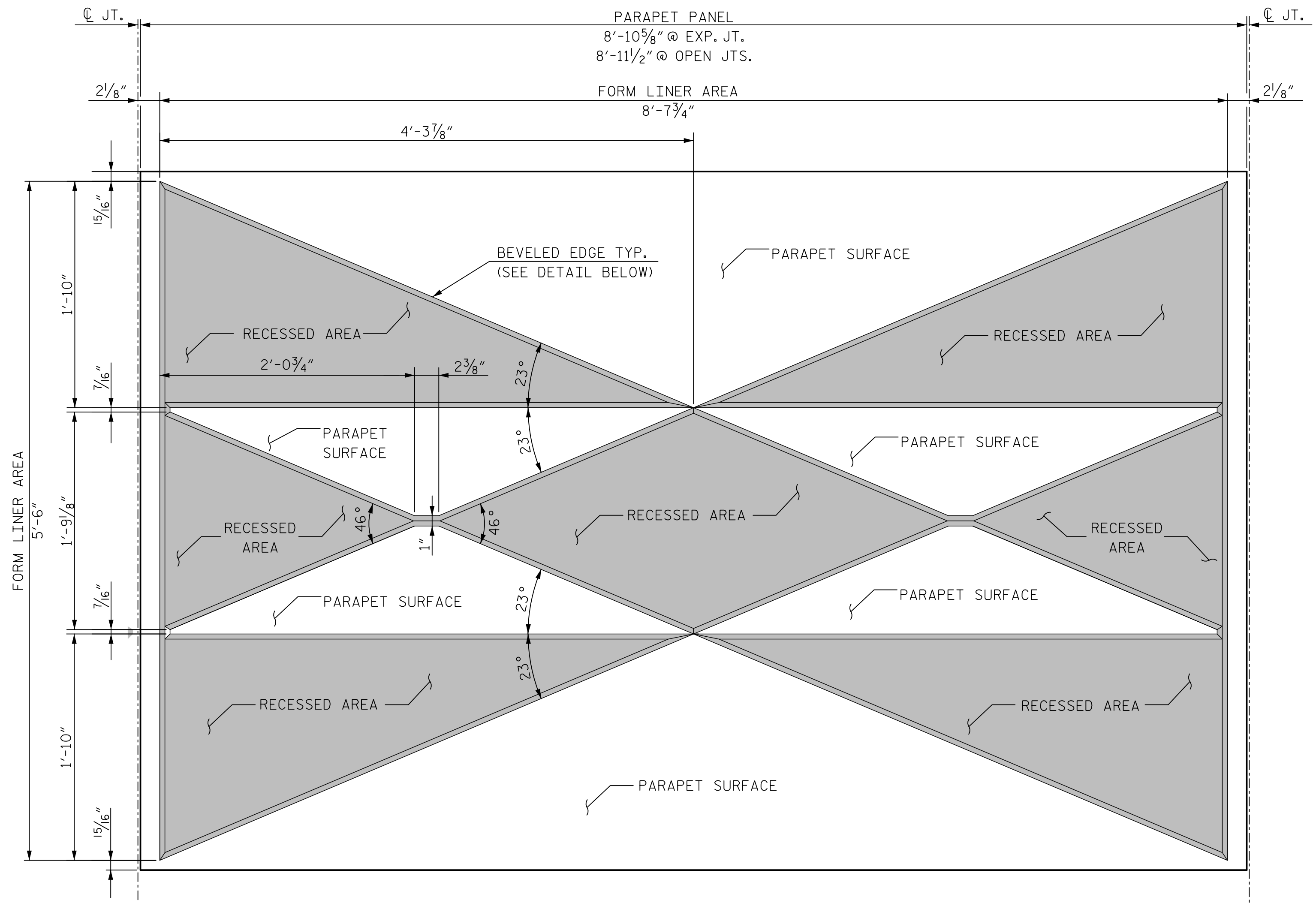
**PANEL C**  
(2 REQ'D)

PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POC 38+93.36 -L-  
 MILE POST: 0.55  
 SHEET 2 OF 4

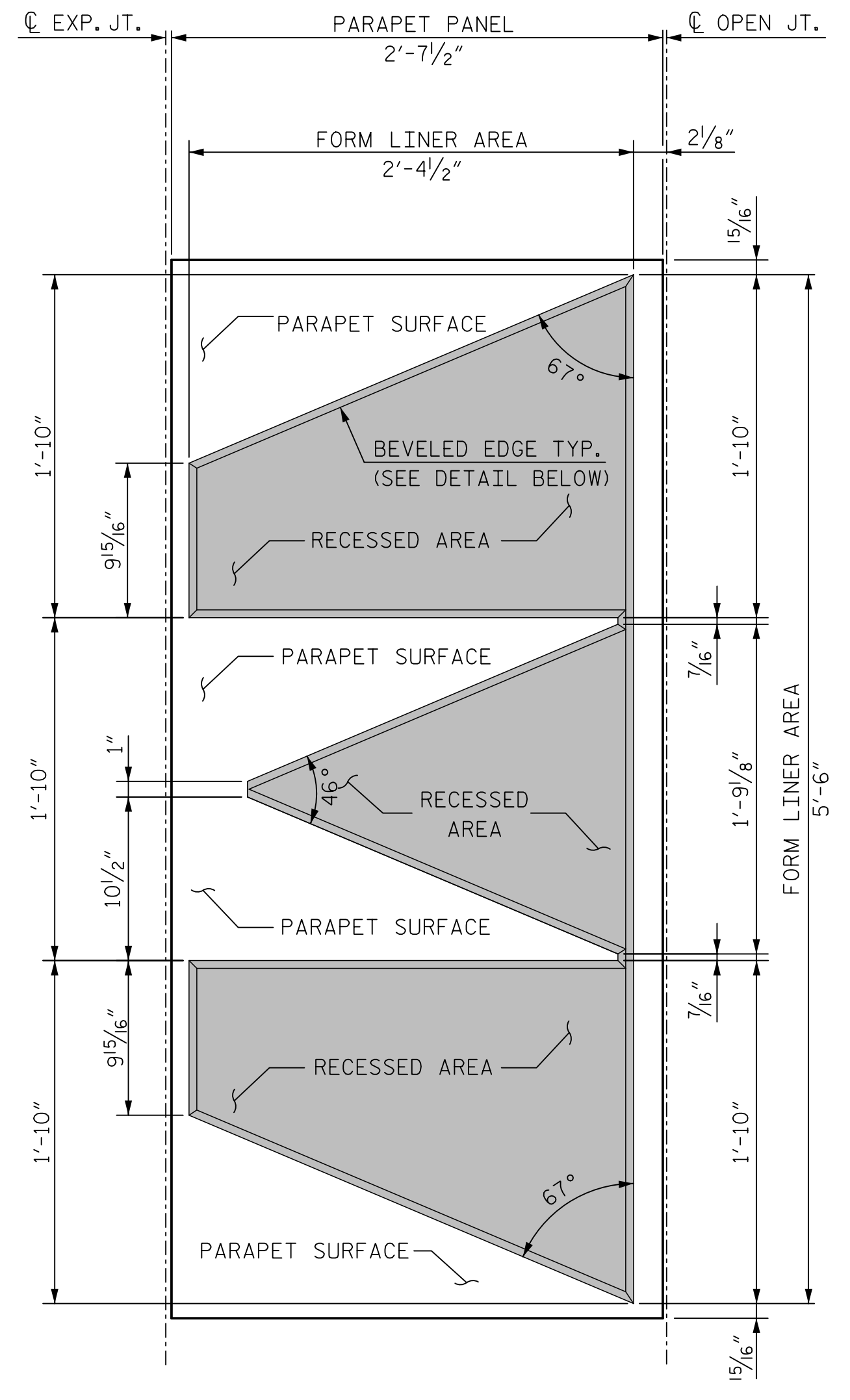
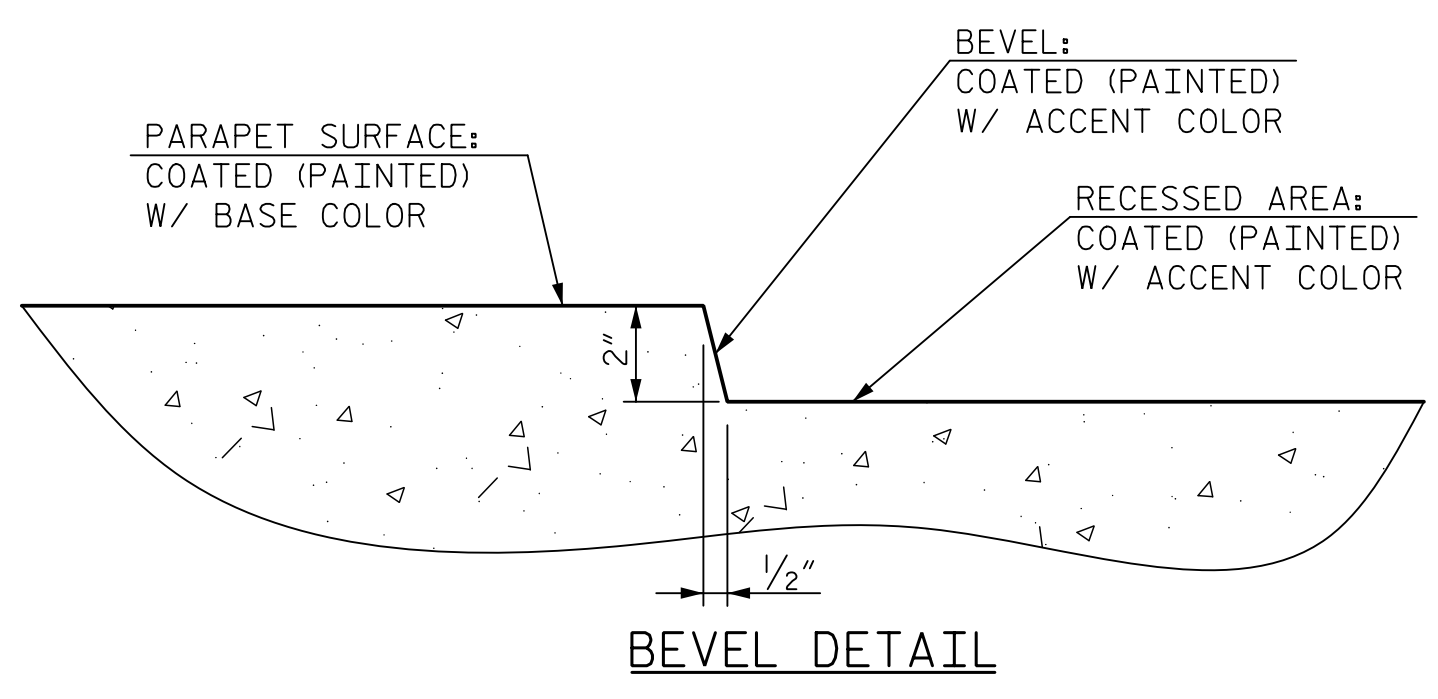


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUPERSTRUCTURE**  
 PARAPET PANEL  
 DETAILS

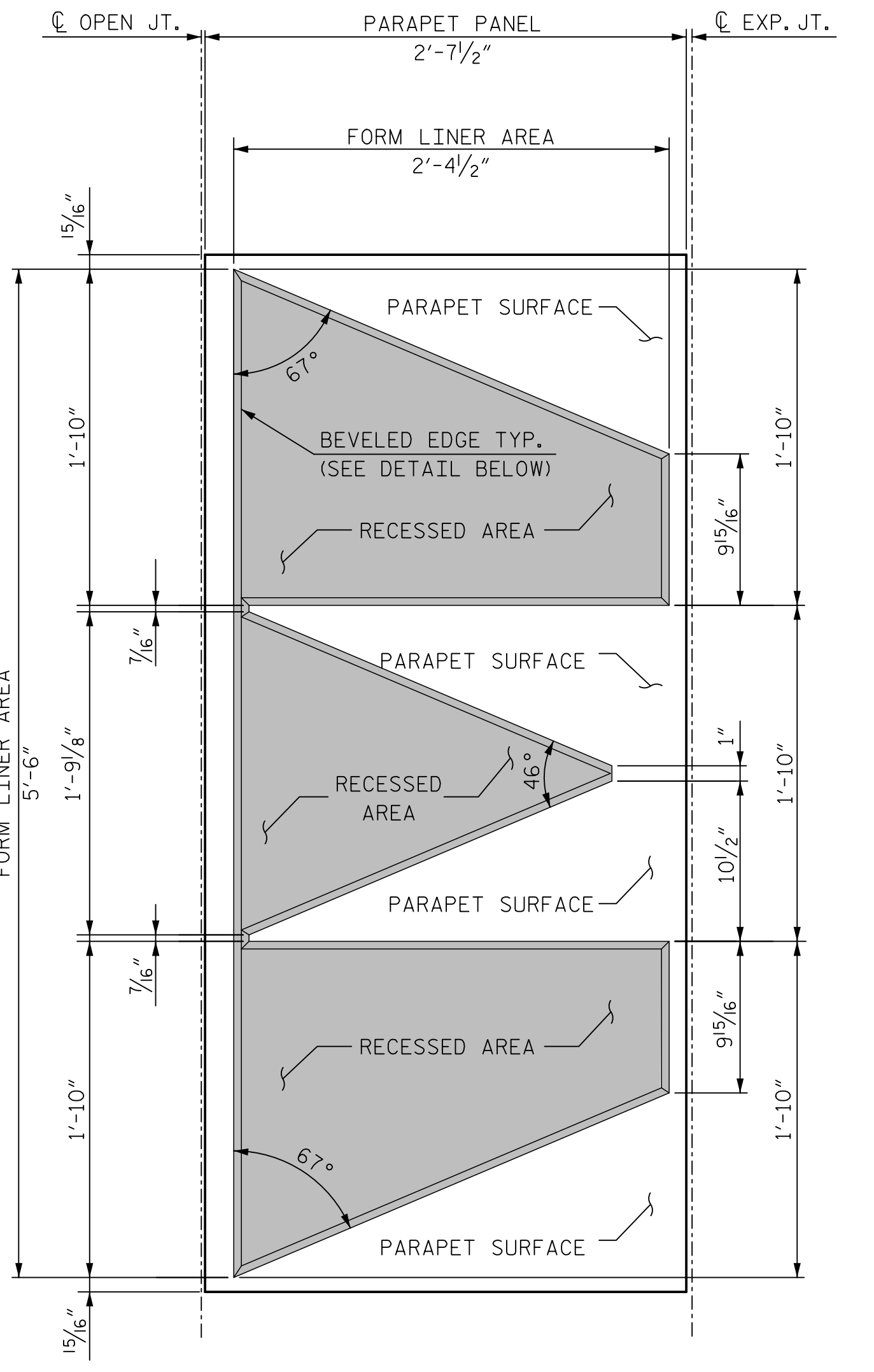
<b>HNTB</b> HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO.
DRAWN BY: M. WRIGHT	DATE: 8/14	NO. 1	BY: [ ]	S-36
CHECKED BY: P. BARBER	DATE: 9/14	NO. 2	BY: [ ]	
DWG. NO. 17			TOTAL SHEETS	54



PANEL A FORM LINER FINISH



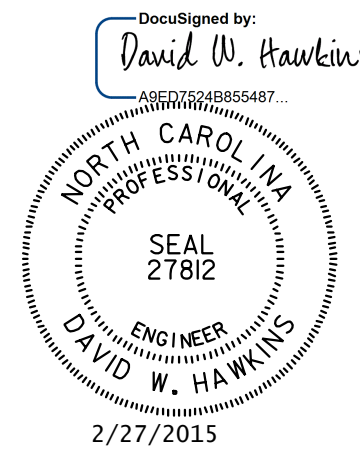
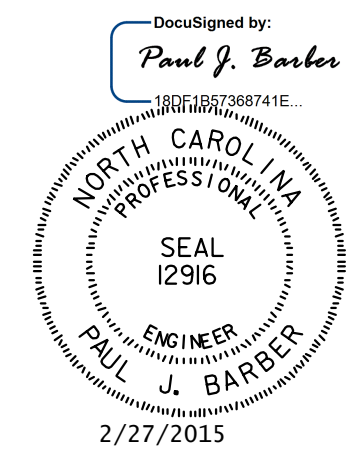
PANEL B FORM LINER FINISH



PANEL C FORM LINER FINISH

GENERAL NOTES:

1. FOR CONCRETE FINISH REQUIREMENTS ON ALL PARAPET SURFACES, BEVEL SURFACES AND RECESSED SURFACES, SEE SPECIAL PROVISION.
2. BEVEL ALL EDGES OF RECESSED AREAS ACCORDING TO THE BEVEL DETAIL.
3. ALL VISIBLY EXPOSED CONCRETE SURFACES INCLUDING THE PARAPET, OUTER SLAB EDGE AND OVERHANG, ABUTMENT, AND PIERS SHALL BE COATED (PAINTED) THE BASE COLOR.
4. THE RECESSED AREAS AND BEVELED EDGE SHALL BE PAINTED RED, AN ACCENT COLOR FROM THE PARAPET.
5. THE COATING COLOR PALETTE FOR THE BASE AND ACCENT COLOR SHALL BE A MATTE COLOR FINISH AND SHALL BE SUBMITTED TO THE ENGINEER FOR FINAL COLOR SELECTION.



PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POC 38+93.36 -L-  
 MILE POST: 0.55

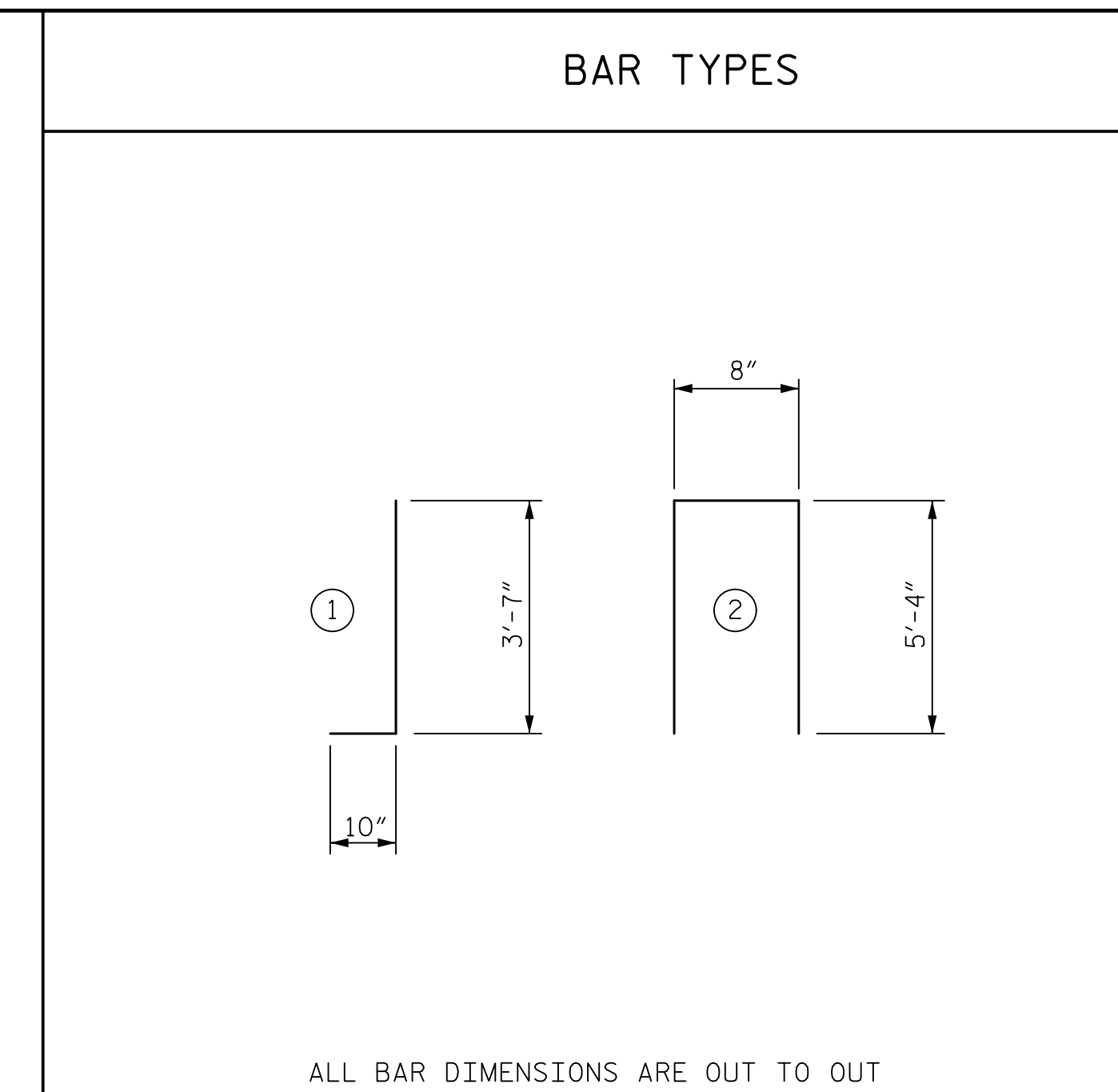
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUPERSTRUCTURE**  
**PARAPET PANEL**  
**FORM LINER**  
**FINISH DETAILS**

<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO.	
DRAWN BY	R. BRICKER	DATE	9/14	NO.	3	BY:	
CHECKED BY	P. BARBER	DATE	9/14	NO.	4	BY:	
DWG. NO. 18						S-37	
						TOTAL SHEETS 54	



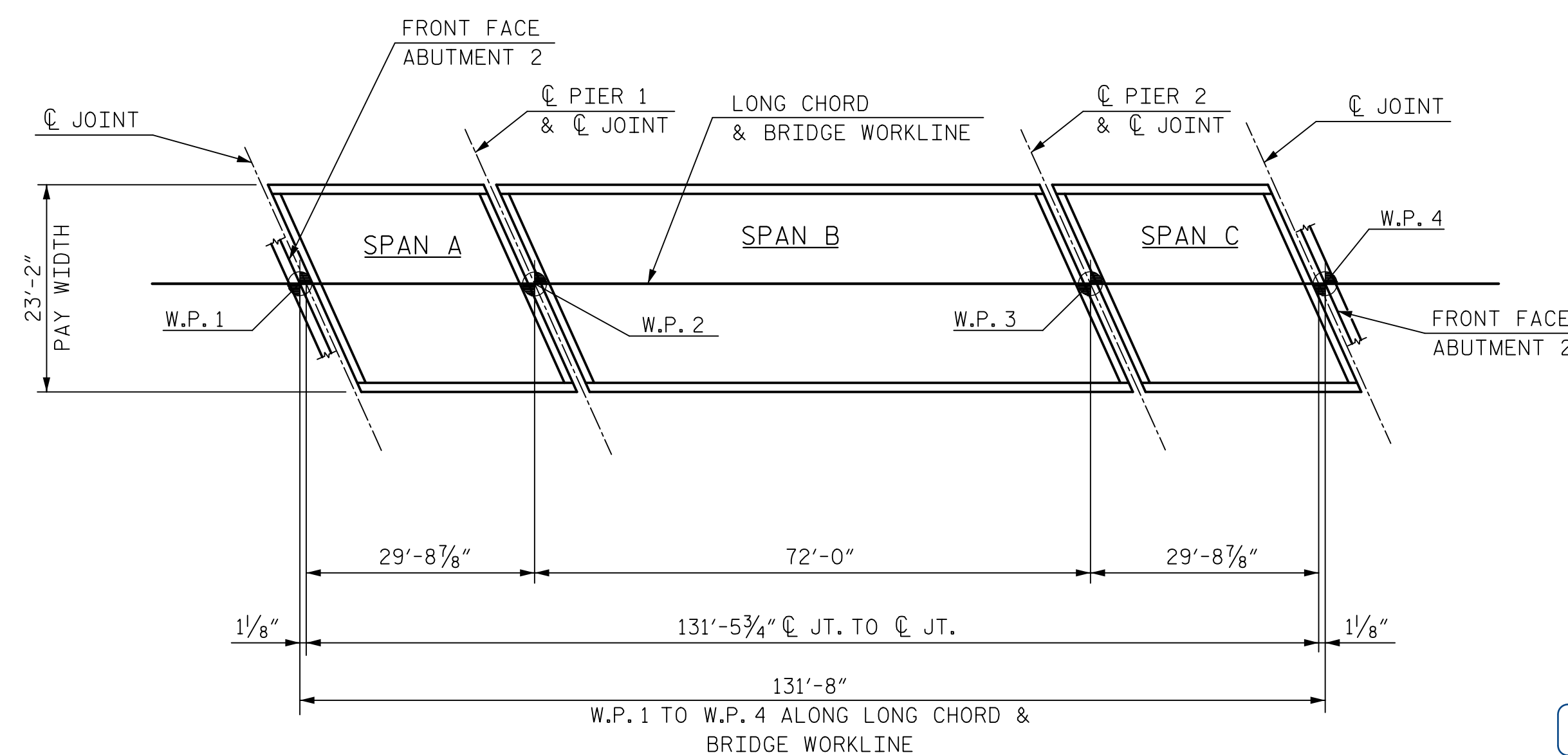
EPOXY-COATED REINFORCING STEEL																	
SPAN A						SPAN B						SPAN C					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	38	5	STR.	22'-10"	905	A1	124	5	STR.	22'-10"	2,953	A1	38	5	STR.	22'-10"	905
A2	12	5	STR.	25'-0"	313	A2	12	5	STR.	25'-0"	313	A2	12	5	STR.	25'-0"	313
A3	4	5	STR.	1'-6"	6	A3	4	5	STR.	1'-6"	6	A3	4	5	STR.	1'-6"	6
A4	4	5	STR.	3'-9"	16	A4	4	5	STR.	3'-9"	16	A4	4	5	STR.	3'-9"	16
A5	4	5	STR.	6'-0"	25	A5	4	5	STR.	6'-0"	25	A5	4	5	STR.	6'-0"	25
A6	4	5	STR.	8'-2"	34	A6	4	5	STR.	8'-2"	34	A6	4	5	STR.	8'-2"	34
A7	4	5	STR.	10'-5"	43	A7	4	5	STR.	10'-5"	43	A7	4	5	STR.	10'-5"	43
A8	4	5	STR.	12'-8"	53	A8	4	5	STR.	12'-8"	53	A8	4	5	STR.	12'-8"	53
A9	4	5	STR.	14'-10"	62	A9	4	5	STR.	14'-10"	62	A9	4	5	STR.	14'-10"	62
A10	4	5	STR.	17'-1"	71	A10	4	5	STR.	17'-1"	71	A10	4	5	STR.	17'-1"	71
A11	4	5	STR.	19'-4"	81	A11	4	5	STR.	19'-4"	81	A11	4	5	STR.	19'-4"	81
A12	4	5	STR.	21'-6"	90	A12	4	5	STR.	21'-6"	90	A12	4	5	STR.	21'-6"	90
B1	62	4	STR.	29'-2"	1,208	B2	124	4	STR.	30'-0"	2,485	B1	62	4	STR.	29'-2"	1,208
*B5	64	5	STR.	8'-7"	573	B3	62	4	STR.	15'-6"	642	*B5	64	5	STR.	8'-7"	573
*B6	8	5	STR.	8'-8"	72	*B5	192	5	STR.	8'-7"	1,719	*B6	8	5	STR.	8'-8"	72
*B7	8	5	STR.	8'-11"	74	*B6	16	5	STR.	8'-8"	145	*B7	8	5	STR.	8'-11"	74
*B8	8	5	STR.	8'-1"	67	*B7	16	5	STR.	8'-11"	149	*B8	8	5	STR.	8'-1"	67
*B9	8	5	STR.	8'-4"	70	*B8	16	5	STR.	8'-1"	135	*B9	8	5	STR.	8'-4"	70
*B10	8	5	STR.	2'-0"	17	*B9	16	5	STR.	8'-4"	139	*B10	8	5	STR.	2'-0"	17
*B11	8	5	STR.	1'-10"	15							*B11	8	5	STR.	1'-10"	15
*B12	8	5	STR.	2'-8"	22	*S1	288	5	1	4'-5"	1,327	*B12	8	5	STR.	2'-8"	22
*B13	8	5	STR.	2'-5"	20	*S2	144	5	2	11'-4"	1,702	*B13	8	5	STR.	2'-5"	20
*S1	120	5	1	4'-5"	553							*S1	120	5	1	4'-5"	553
*S2	60	5	2	11'-4"	709							*S2	60	5	2	11'-4"	709
				TOTAL	5,099					TOTAL	12,190					TOTAL	5,099

\* REINFORCING INCLUDED IN PARAPET TOTAL

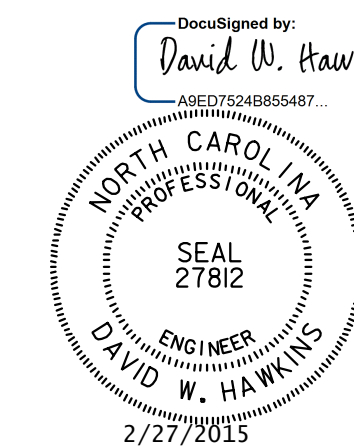
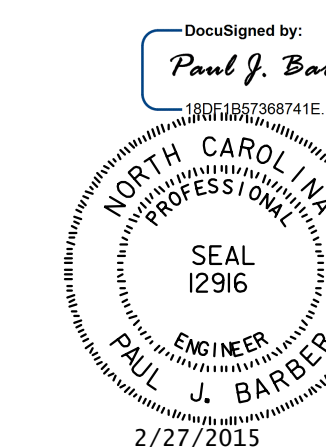


	EPOXY COATED REINFORCING STEEL (LBS.)	CAST-IN-PLACE CONCRETE (5,000 PSI) (CU. YDS.)	
		DECK SLAB	PARAPETS
SPAN "A"	5,099	22.7	13.6
SPAN "B"	12,190	49.4	33.1
SPAN "C"	5,099	22.7	13.6
TOTALS	22,388	94.8	60.3

	TOTAL SUPERSTRUCTURE QUANTITIES	
	EPOXY COATED REINFORCING STEEL (LBS.)	CAST-IN-PLACE CONCRETE (5,000 PSI) (CU. YDS.)
DECK SLAB	12,688	94.8
PARAPET	9,700	60.3
TOTALS	22,388	155.1



LAYOUT FOR COMPUTING AREA  
OF REINFORCED CONCRETE DECK SLAB  
(SQ. FEET = 3,045.9)



PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POC 38+93.36 -L-  
 MILE POST: 0.55

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 BILL OF MATERIAL

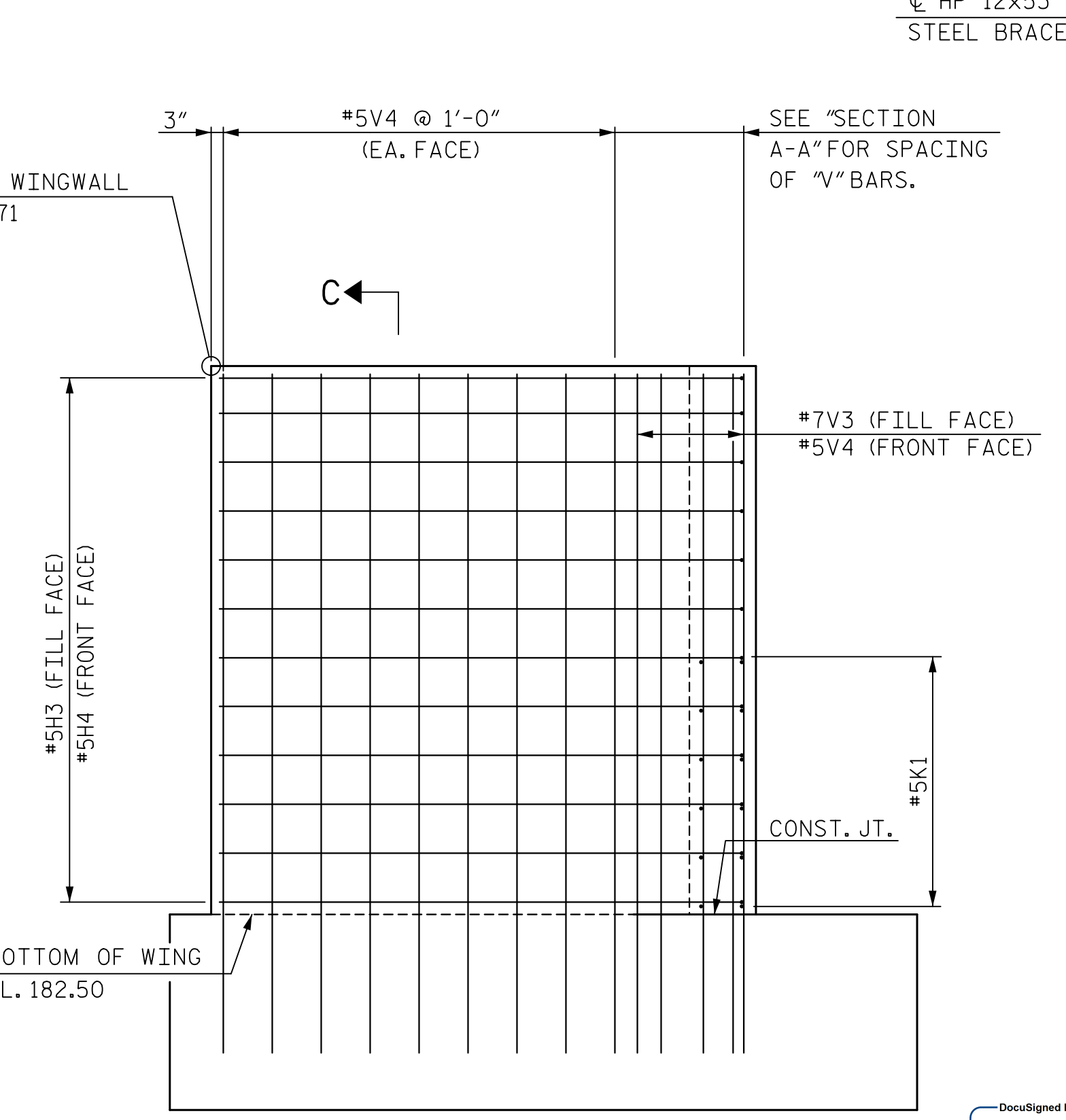
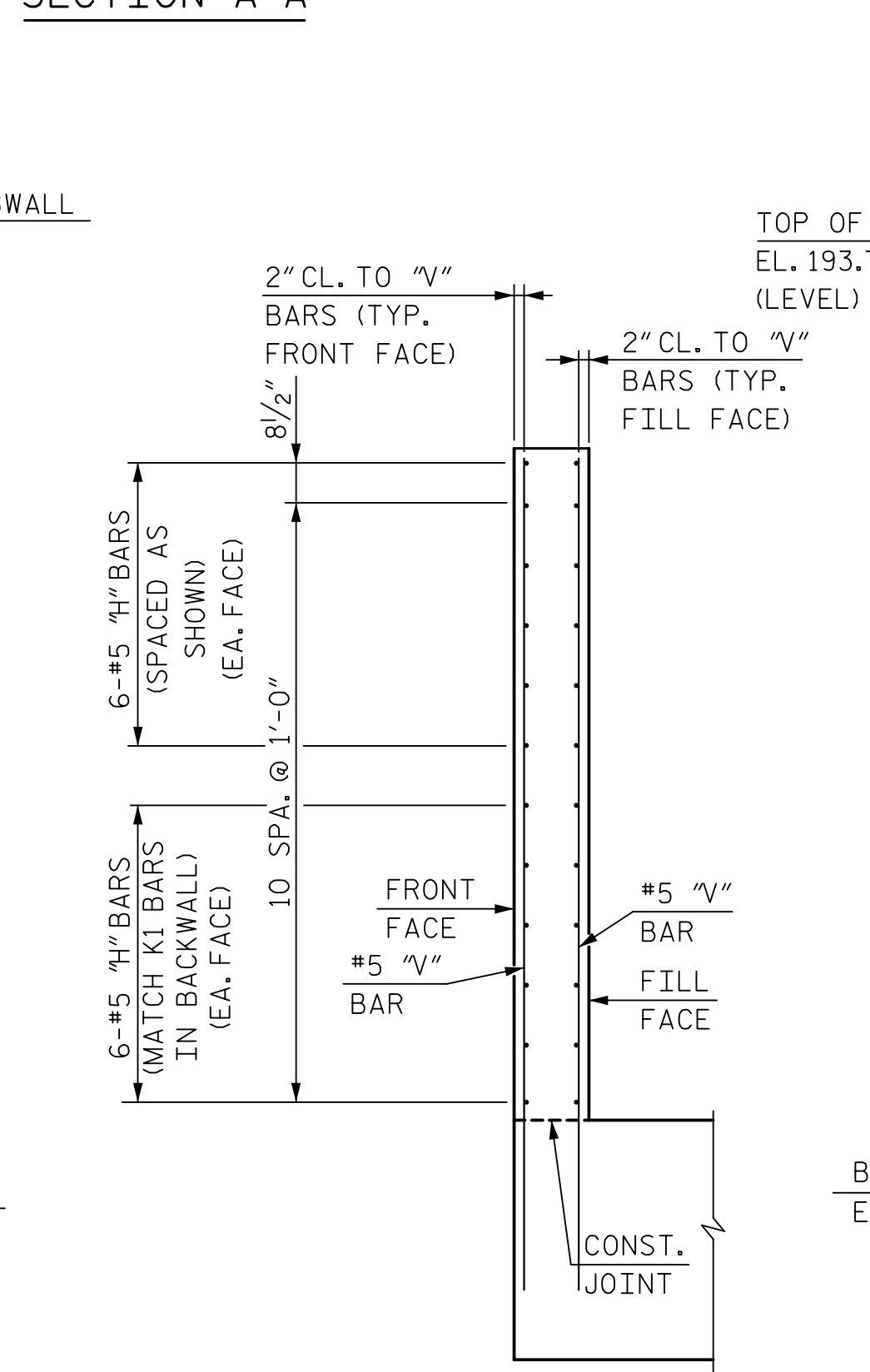
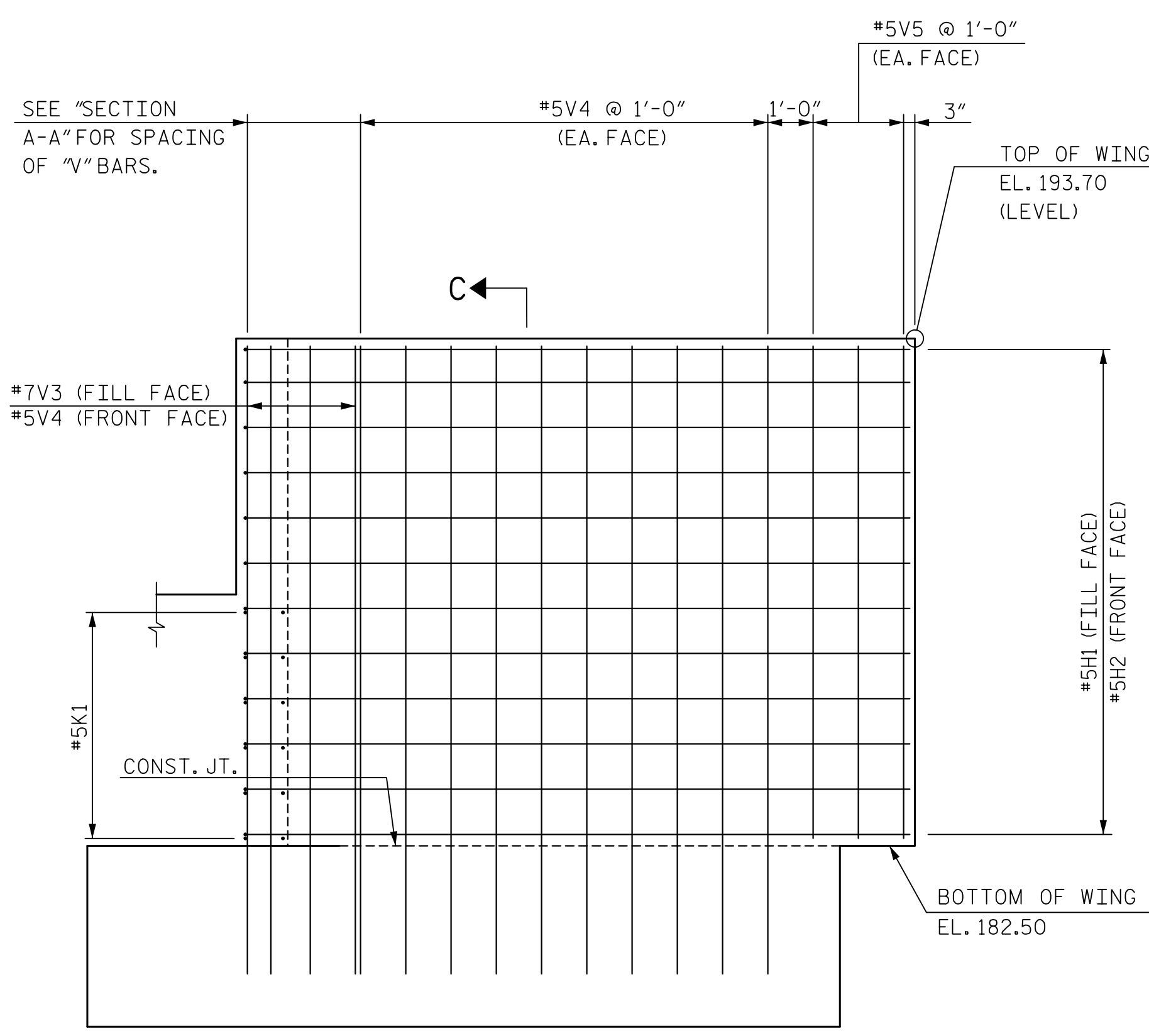
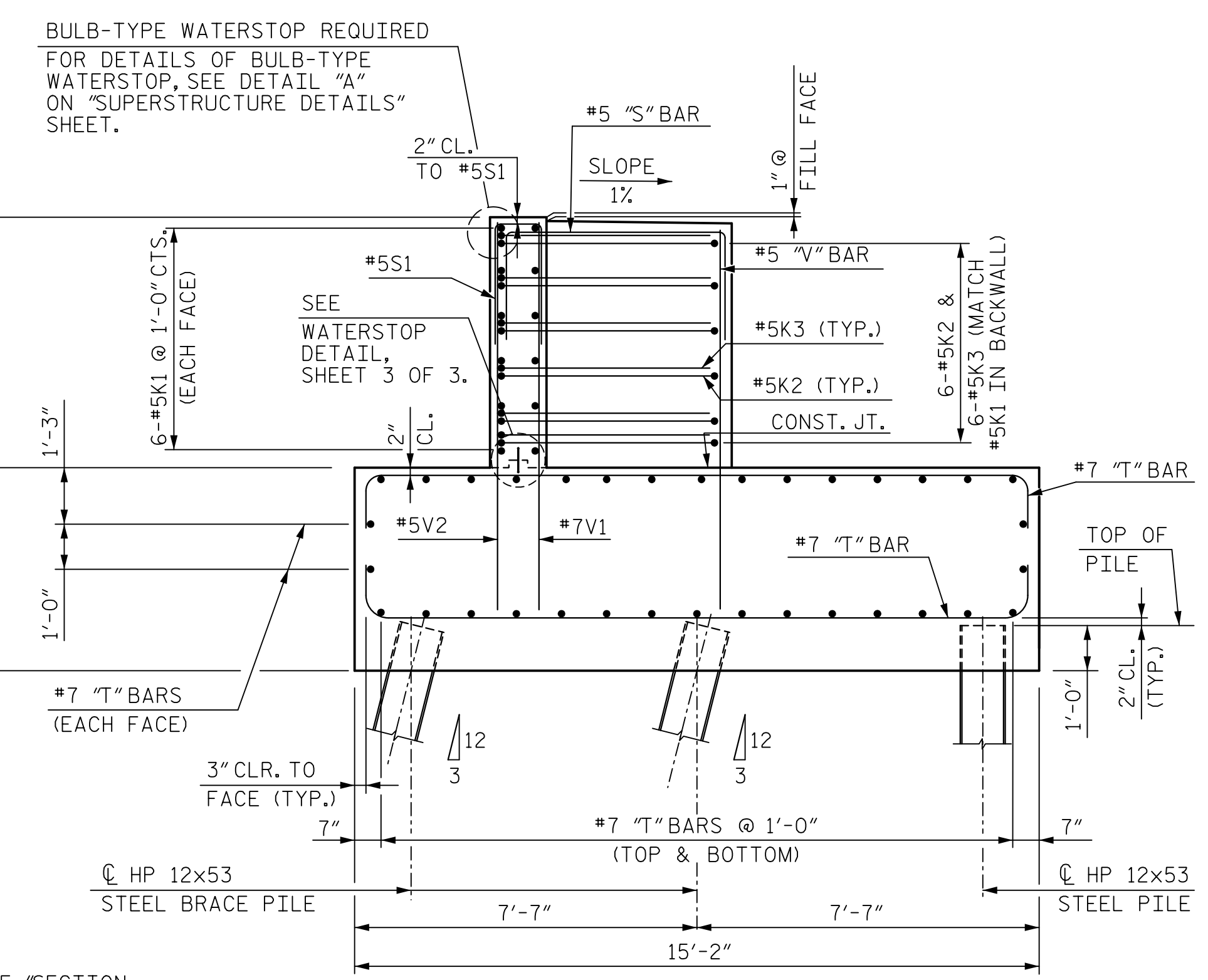
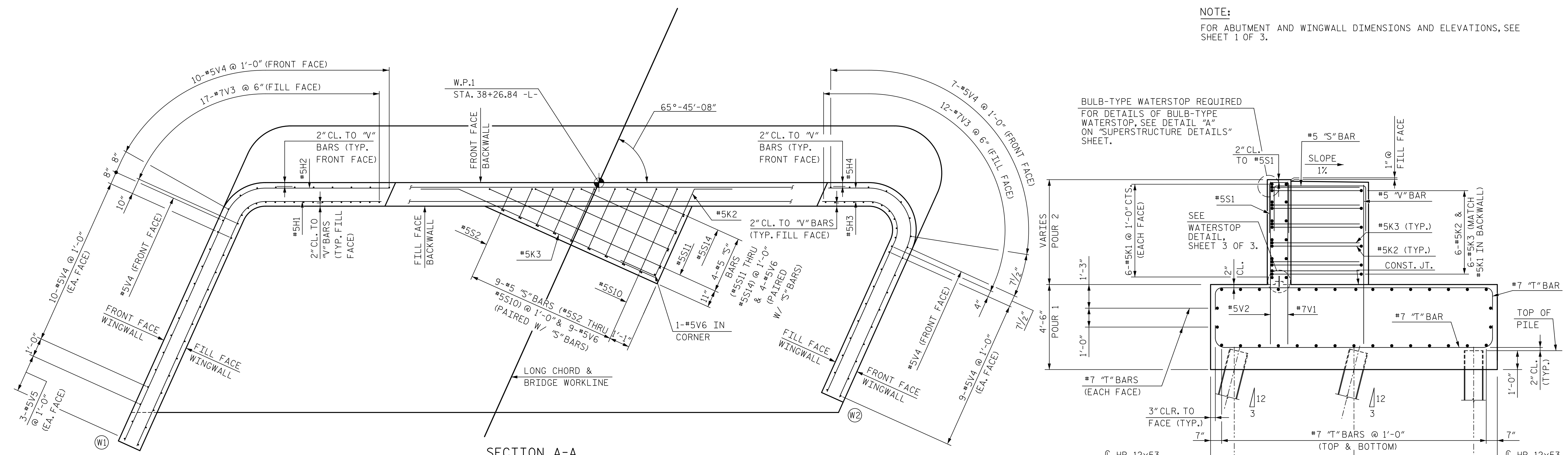
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38 TOTAL SHEETS 54
1			3			
2			4			

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 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: M. WRIGHT DATE: 6/14  
 CHECKED BY: P. BARBER DATE: 7/14 DWG. NO. 19



NOTE:  
FOR ABUTMENT AND WINGWALL DIMENSIONS AND ELEVATIONS, SEE SHEET 1 OF 3.



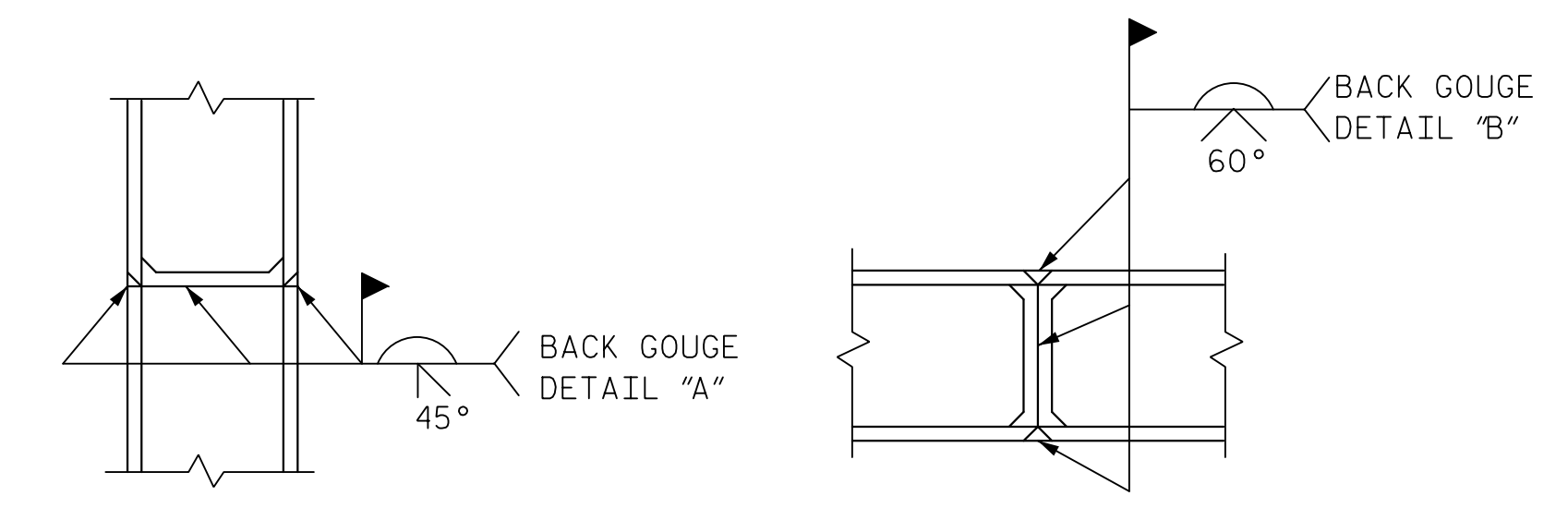
PROJECT NO. P-4900A  
ROBESON COUNTY  
STATION: POC 38+93.36 -L-  
MILE POST: 0.55  
SHEET 2 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
ABUTMENT 1

DocuSigned by:  
**Paul J. Barber**  
180F18B738B741E...  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 12916  
PAUL J. BARBER  
2/27/2015

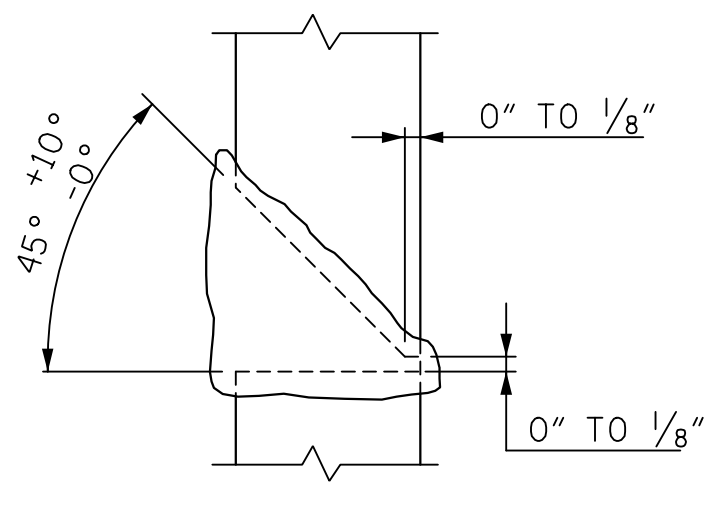
DocuSigned by:  
**David W. Hawkins**  
180F18B738B741E...  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 27812  
DAVID W. HAWKINS  
2/27/2015

<b>HNTB</b> HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO. <b>S-40</b>
DRAWN BY M. WRIGHT	DATE 7/14	NO. 3	BY:	TOTAL SHEETS 54
CHECKED BY D. RAGAN	DATE 9/14	NO. 4	DATE:	
DWG. NO. 21				

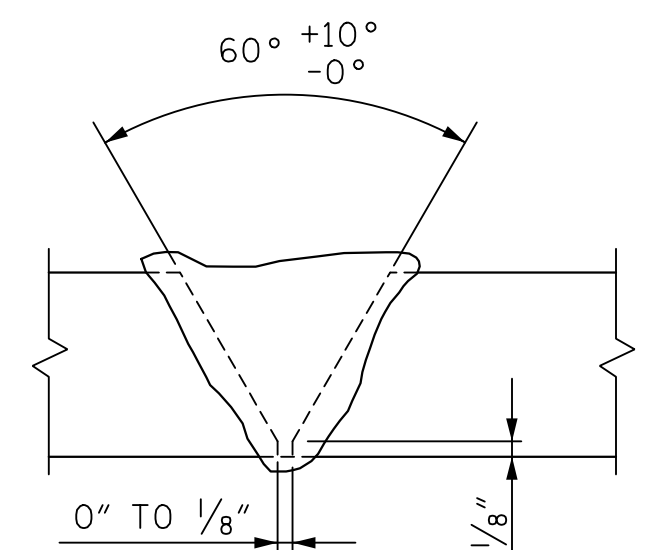


\* PILE VERTICAL

\* PILE HORIZONTAL OR VERTICAL

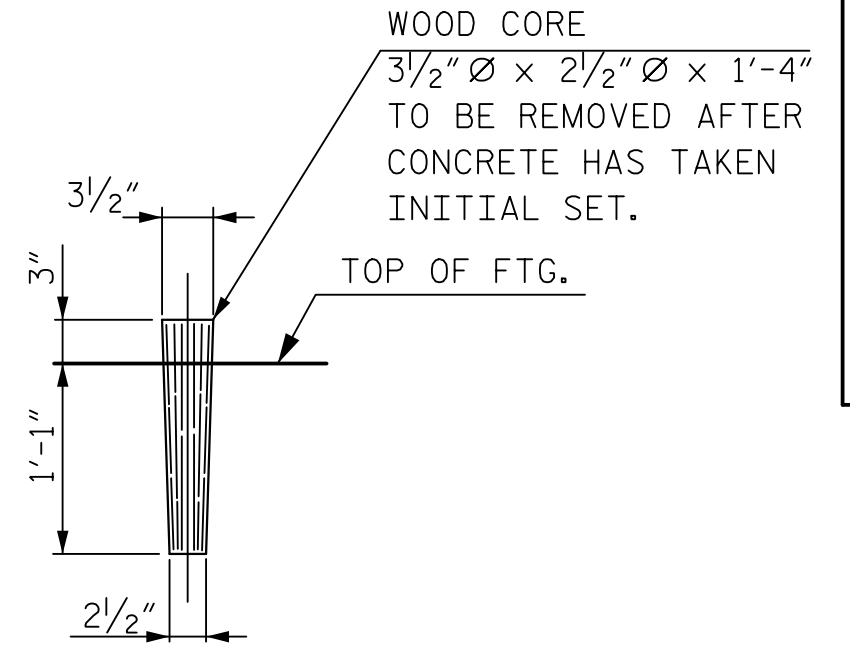


DETAIL "A"



DETAIL "B"

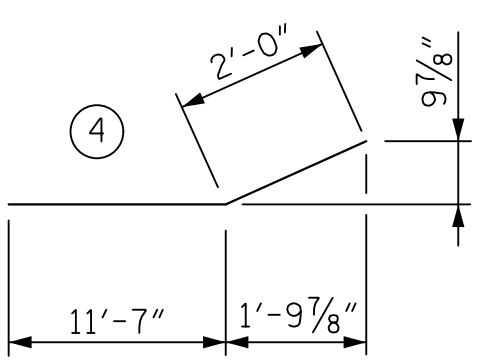
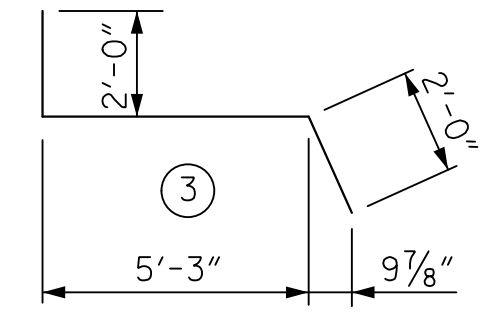
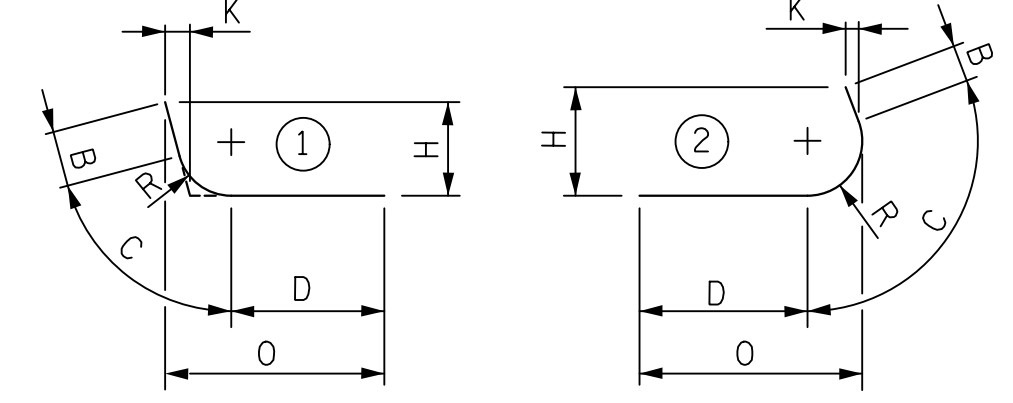
\* POSITION OF PILE DURING WELDING  
PILE SPLICE DETAILS



DETAIL OF WOOD CORE FOR ANCHOR BOLT HOLES

BAR TYPES							
MARK	B	C	D	H	K	O	R
H1	6'-3"	1'-9/16"	13'-1 1/2"	6'-7 3/16"	2'-11 3/4"	17'-1 1/2"	1'-6 3/8"
H2	6'-7"	2'-6 5/16"	13'-2 1/16"	7'-3 5/16"	3'-3 1/16"	17'-11 1/16"	2'-3"
H3	2'-5"	3'-0 9/16"	8'-8 7/16"	4'-4 3/16"	1'-1 1/2"	10'-2 3/16"	1'-6 3/8"
H4	2'-1"	4'-5 3/4"	8'-8 1/4"	5'-0 3/16"	1'-0 5/8"	10'-11 1/4"	2'-3"

NOTE: "D" IS PARALLEL TO WINGWALL.



T1	1'-2"	14'-8"	1'-2"
T2	1'-2"	14'-5"	1'-2"
T3	1'-2"	13'-8"	1'-2"
T4	1'-2"	11'-5"	1'-2"
T5	1'-2"	9'-3"	1'-2"
T6	1'-2"	7'-0"	1'-2"
T7	1'-2"	4'-4"	1'-2"
T8	1'-2"	4'-11"	1'-2"
T9	1'-2"	2'-9"	1'-2"
T10	1'-2"	36'-10"	1'-2"
T11	1'-2"	36'-8"	1'-2"
T12	1'-2"	36'-0"	1'-2"
T13	1'-2"	34'-1"	1'-2"
S1	11"		
S2	1'-3"		
S3	1'-9"		
S4	2'-2"		
S5	2'-7"		
S6	3'-1"		
S7	3'-6"		
S8	4'-0"		
S9	4'-5"		
S10	4'-10"		
S11	10'-1"		
S12	7'-10"		
S13	5'-7"		
S14	3'-5"		

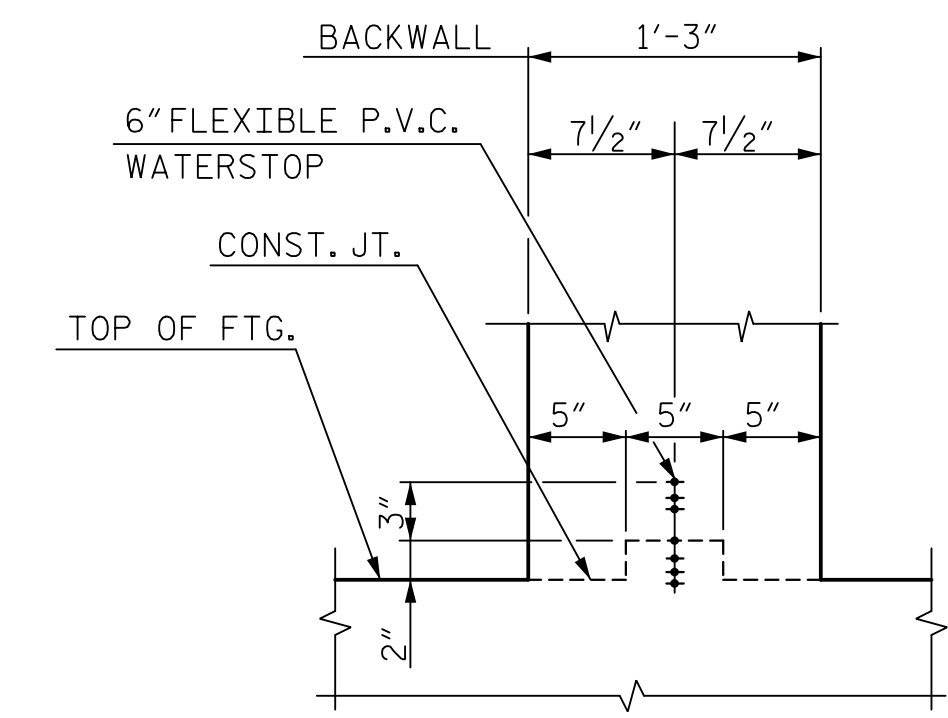
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING

ABUTMENT 1											
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	12	5	1	21'-2"	265	T1	58	7	6	17'-0"	2,015
H2	12	5	1	22'-4"	280	T2	2	7	6	16'-9"	68
H3	12	5	2	14'-2"	177	T3	4	7	6	16'-0"	131
H4	12	5	2	15'-3"	191	T4	4	7	6	13'-9"	112
						T5	4	7	6	11'-7"	95
K1	12	5	STR.	31'-11"	399	T6	4	7	6	9'-4"	76
K2	6	5	3	9'-3"	58	T7	2	7	6	6'-8"	27
K3	6	5	4	13'-7"	85	T8	2	7	6	7'-3"	30
						T9	2	7	6	5'-1"	21
S1	23	5	5	3'-11"	94	T10	24	7	6	39'-2"	1,921
S2	1	5	5	4'-3"	4	T11	2	7	6	39'-0"	159
S3	1	5	5	4'-9"	5	T12	2	7	6	38'-4"	157
S4	1	5	5	5'-2"	5	T13	2	7	6	36'-5"	149
S5	1	5	5	5'-7"	6	T14	2	7	STR.	33'-1"	135
S6	1	5	5	6'-1"	6	T15	2	7	STR.	36'-10"	151
S7	1	5	5	6'-6"	7	T16	2	7	STR.	15'-2"	62
S8	1	5	5	7'-0"	7	T17	2	7	STR.	13'-3"	54
S9	1	5	5	7'-5"	8	V1	46	7	STR.	8'-6"	799
S10	1	5	5	7'-10"	8	V2	23	5	STR.	8'-6"	204
S11	1	5	5	13'-1"	14	V3	29	7	STR.	14'-2"	840
S12	1	5	5	10'-10"	11	V4	57	5	STR.	14'-2"	842
S13	1	5	5	8'-7"	9	V5	6	5	STR.	10'-10"	68
S14	1	5	5	6'-5"	7	V6	14	5	STR.	8'-4"	122

QUANTITIES

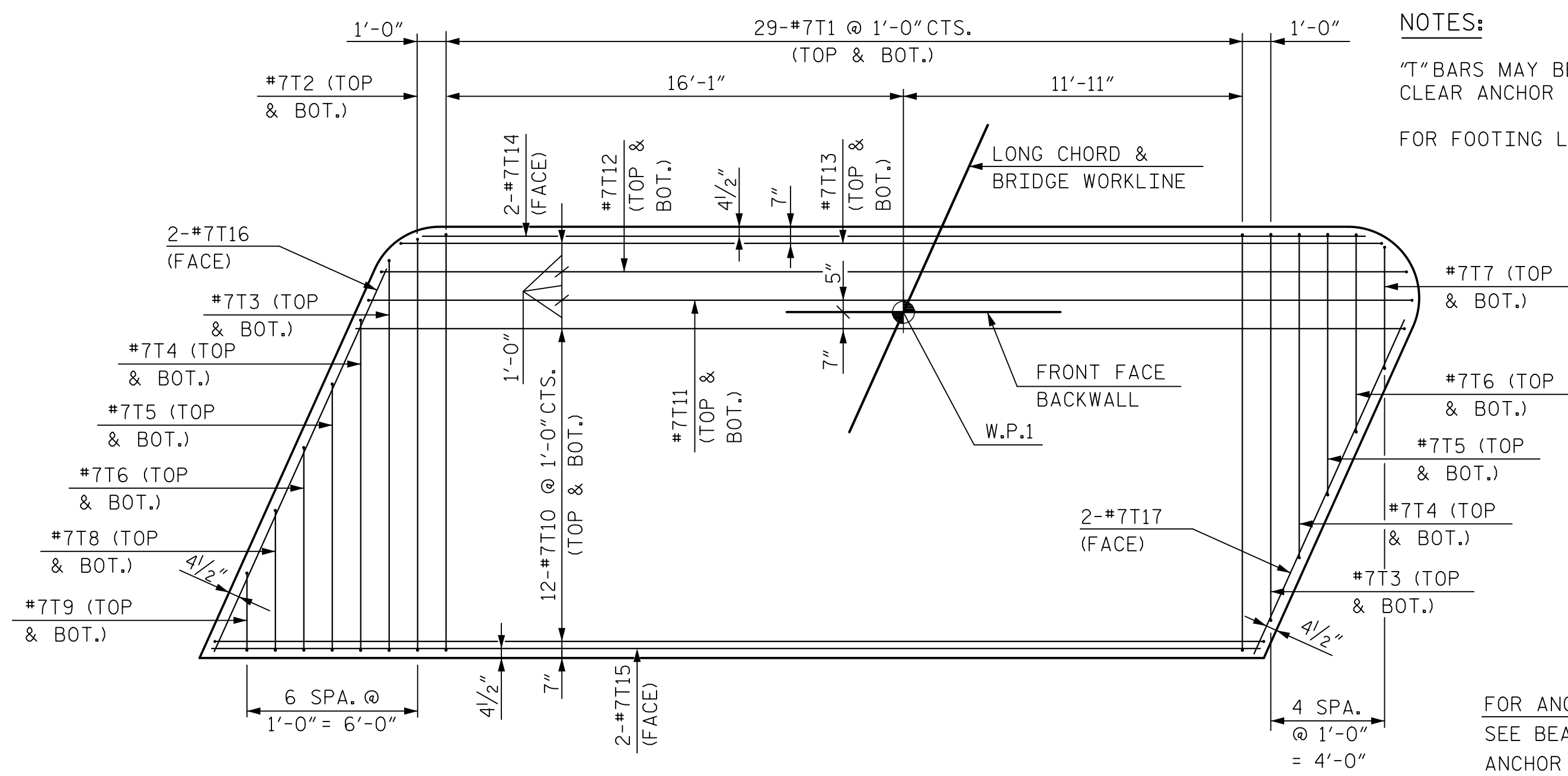
ITEM	TOTAL
REINFORCING STEEL	LBS. 9,884
CAST-IN-PLACE CONCRETE (4,000 PSI):	
POUR 1 - FOOTING	CU. YDS. 94.0
POUR 2 - BACKWALL & WINGS	CU. YDS. 29.7
TOTAL	CU. YDS. 123.7
HP 12 X 53 STEEL PILES	NO. 15
	L.F. 1,200



WATERSTOP DETAIL

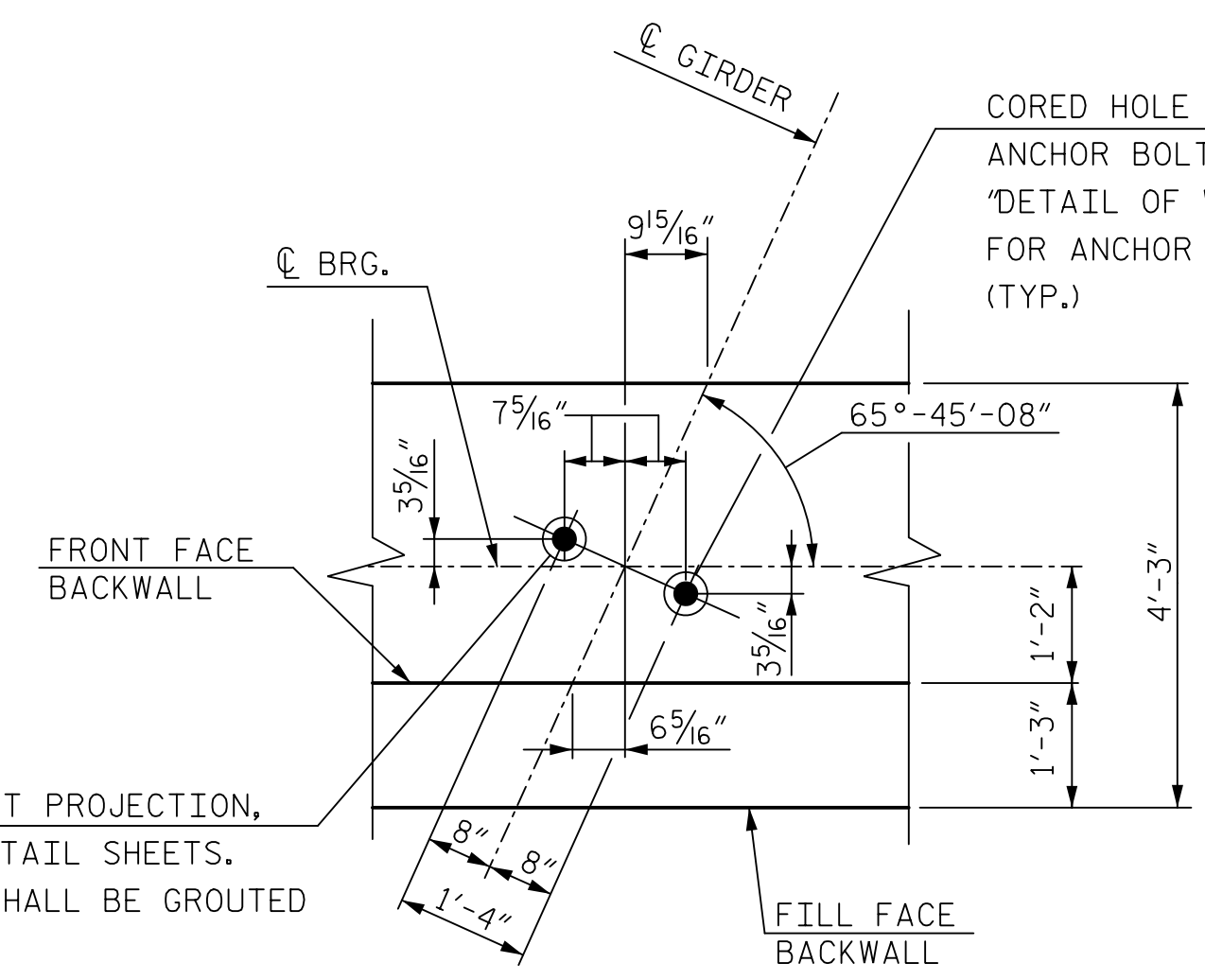
NOTES:

"T" BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR ANCHOR BOLTS.  
FOR FOOTING LAYOUT AND DIMENSIONS, SEE SHEET 1 OF 3.

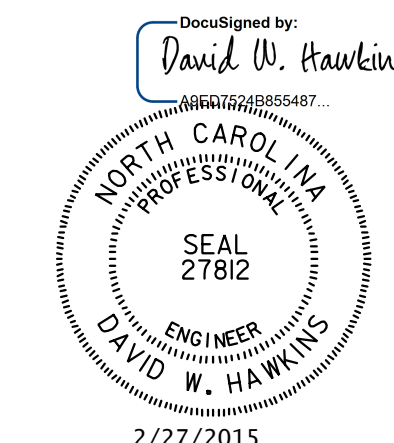
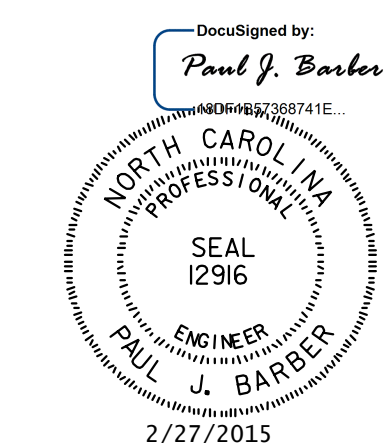


FOOTING REINFORCING PLAN

FOR ANCHOR BOLT PROJECTION, SEE BEARING DETAIL SHEETS. ANCHOR BOLTS SHALL BE GROUTED IN PLACE.



ANCHOR BOLT LAYOUT DETAIL



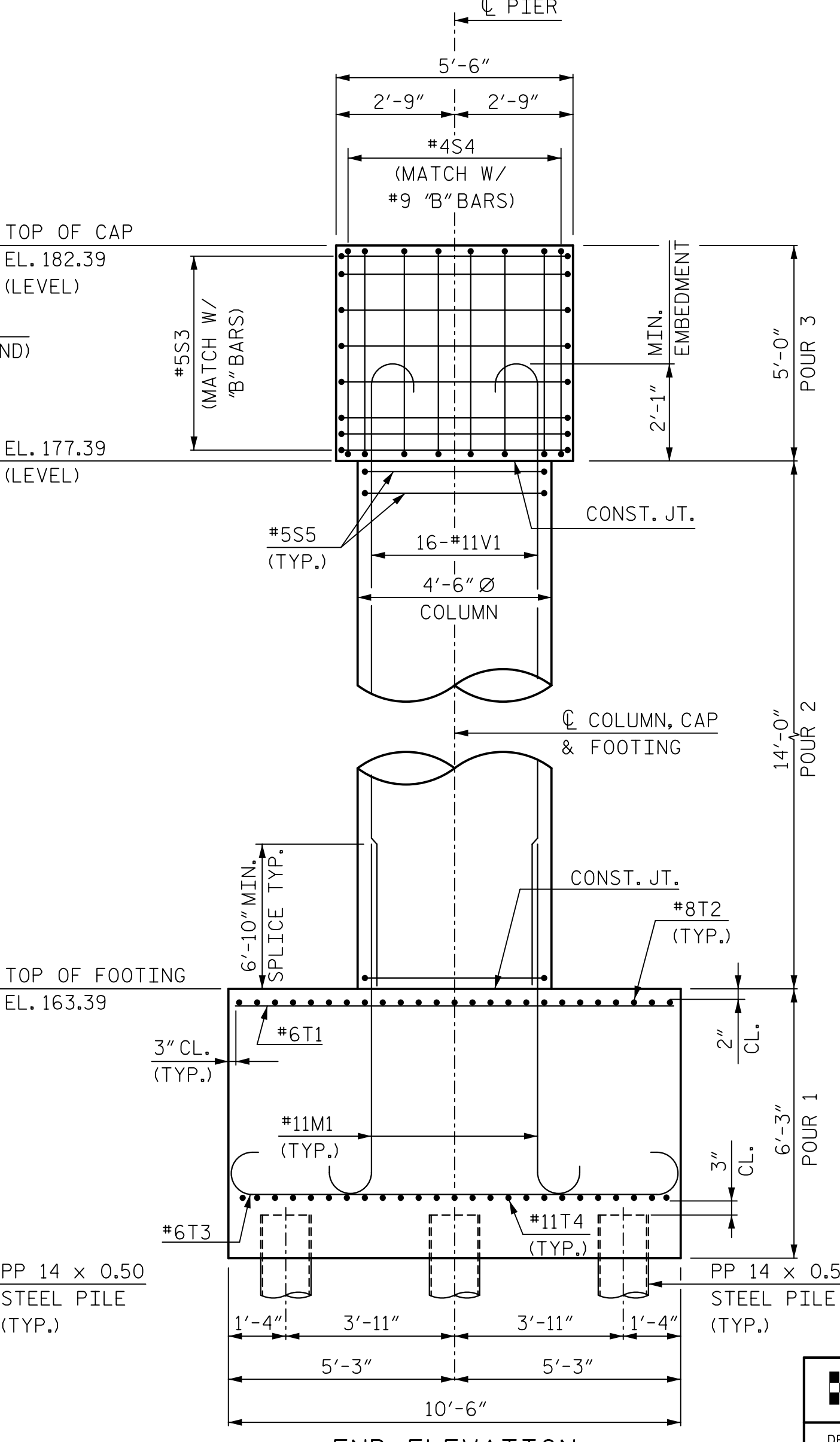
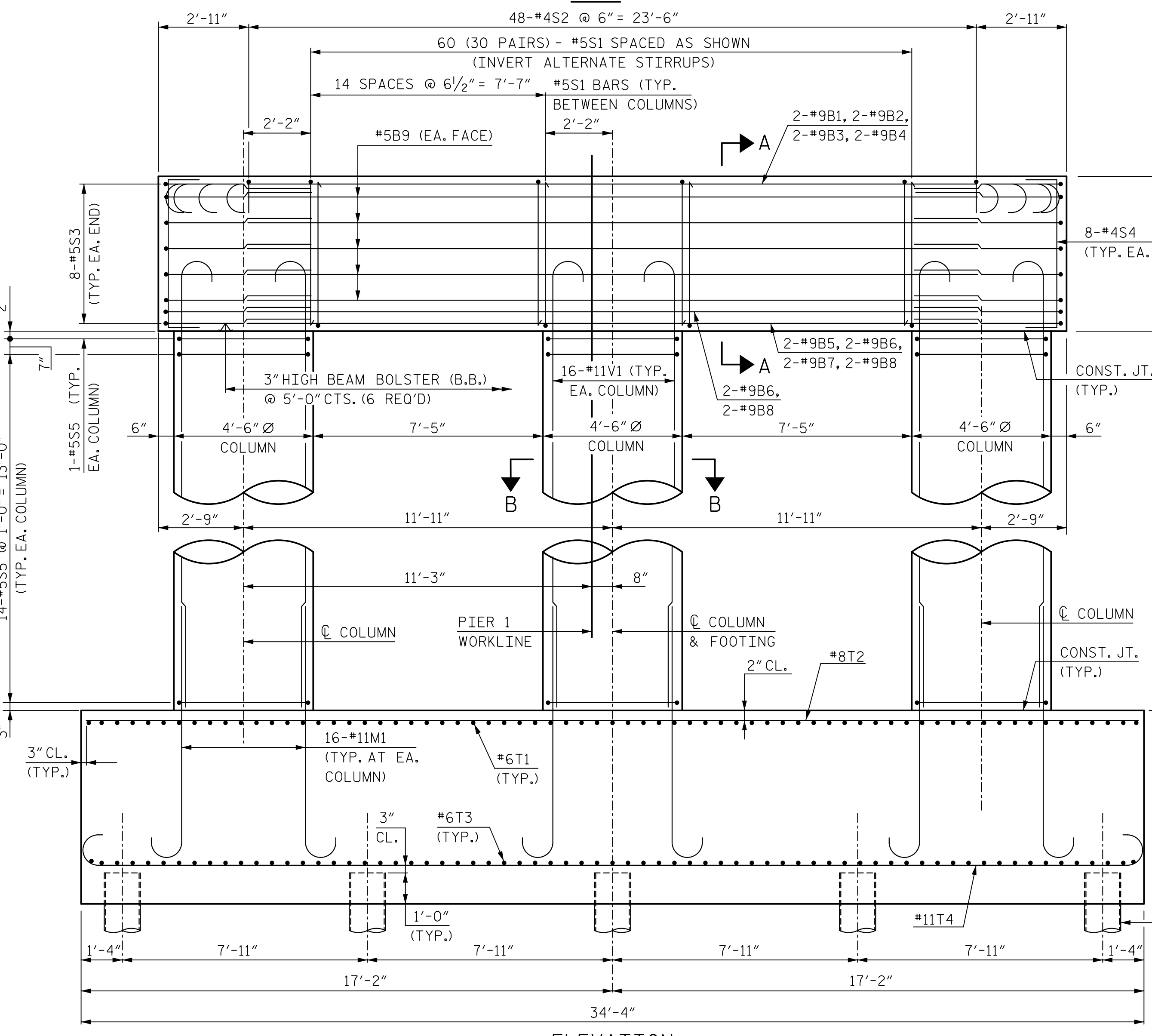
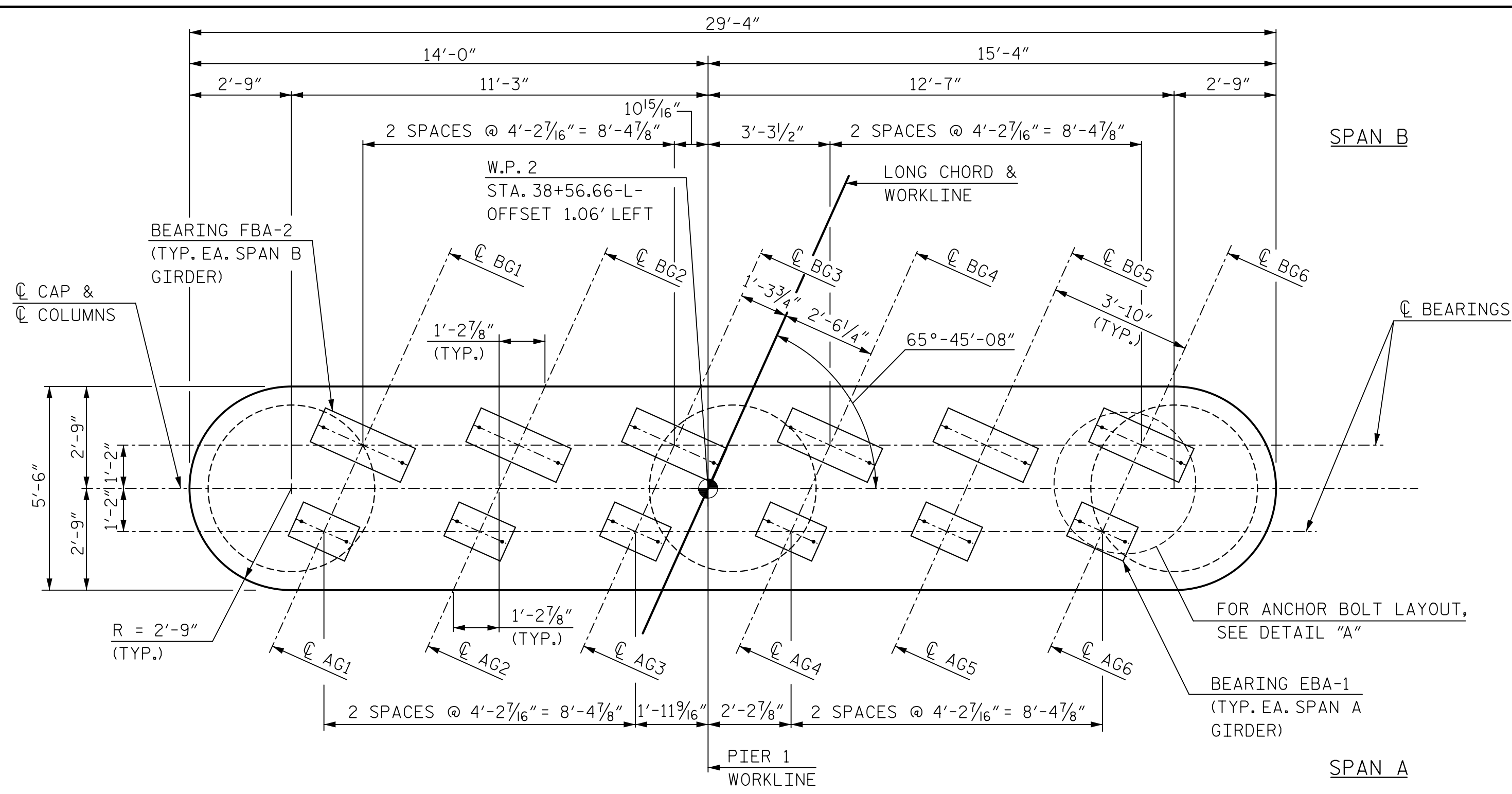
PROJECT NO. P-4900A  
ROBESON COUNTY  
STATION: POC 38+93.36 -L-  
MILE POST: 0.55  
SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
ABUTMENT 1

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41	
1			3			TOTAL SHEETS	
2			4			54	

**HNTB** HNTB NORTH CAROLINA, P.C.  
License No. C-1554  
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY M. WRIGHT DATE 7/14  
CHECKED BY D. RAGAN DATE 9/14 DWG. NO. 22



**NOTES:**

ALL DIMENSIONS SHOWN ARE PARALLEL OR NORMAL TO PIER UNLESS NOTED.

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

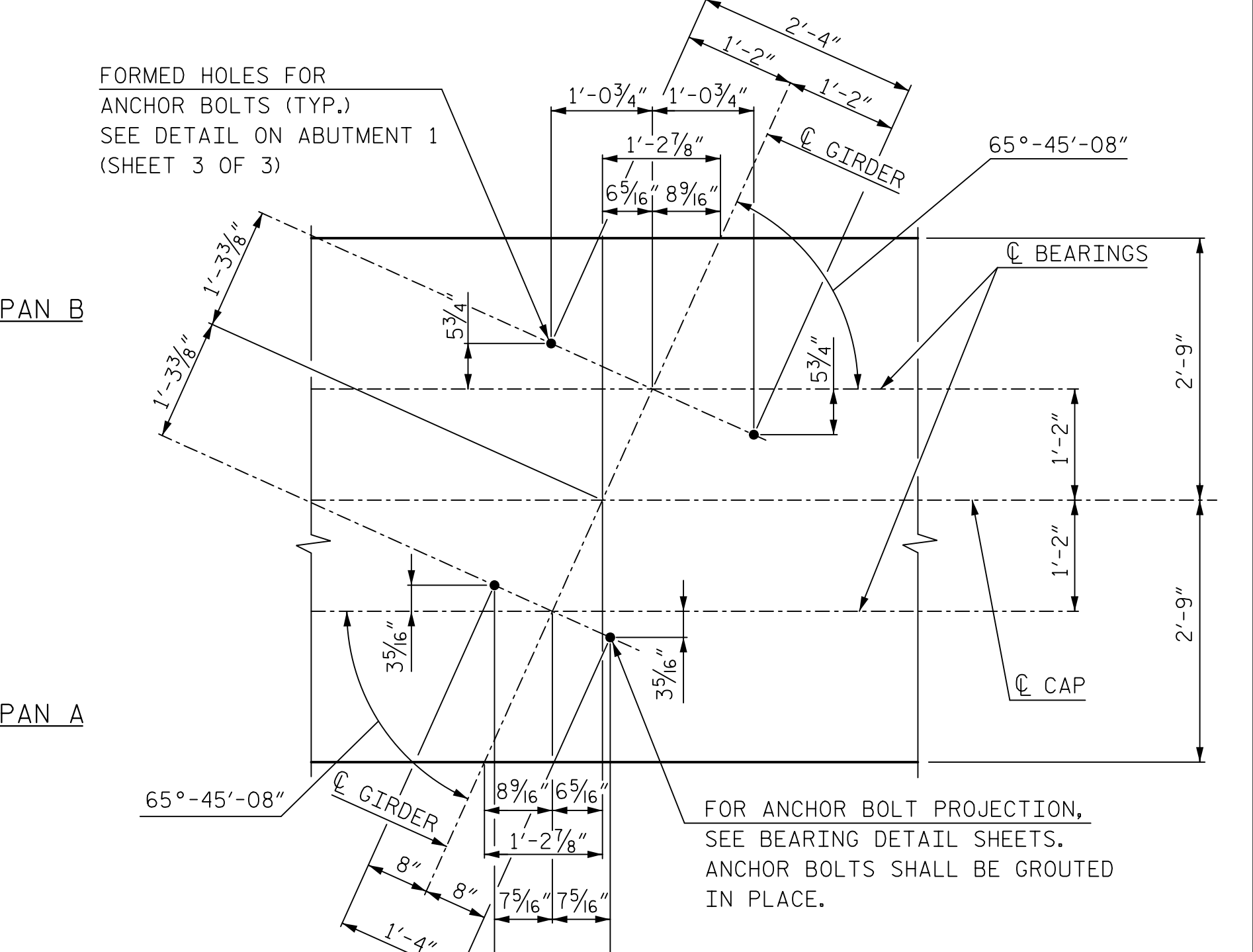
ALL SURFACES OF THE PIER EXCEPT FOR TOP OF CAP AND COLUMN/FOOTING SURFACES BELOW GRADE SHALL HAVE A RUBBED FINISH SUITABLE FOR PAINTING.

ALL EXPOSED SURFACES OF PIER CAP AND COLUMNS, EXCEPT TOP OF CAP, SHALL BE PAINTED. FOR APPLICATION OF BRIDGE COATING, SEE SPECIAL PROVISIONS.

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.



DocuSigned by: David W. Hawkins

DocuSigned by: Paul J. Barber

SEAL 12916

SEAL 27812

2/27/2015

2/27/2015

PROJECT NO. P-4900A

ROBESON COUNTY

STATION: POC 38+93.36 -L-

MILE POST: 0.55

SHEET 1 OF 2

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

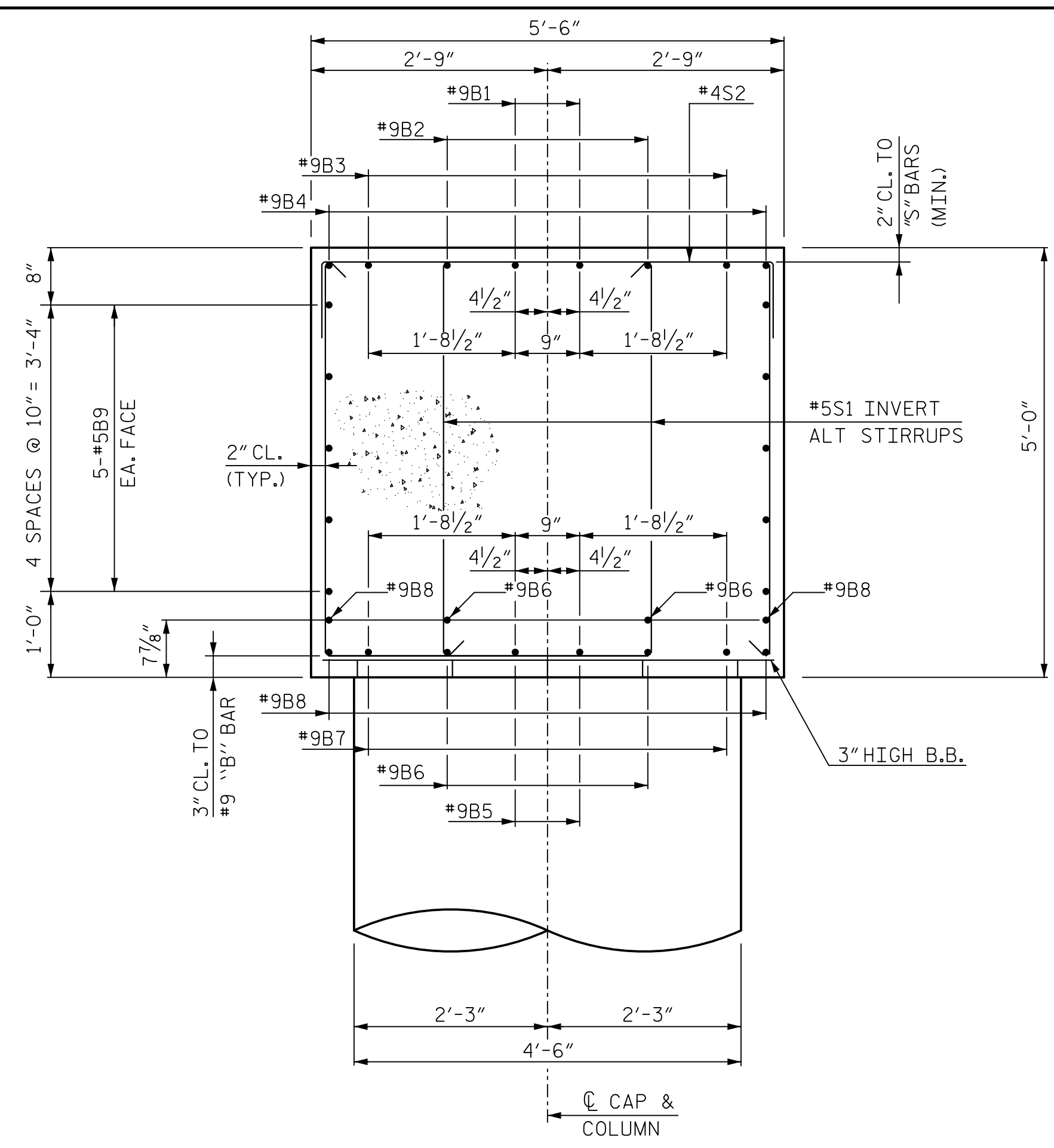
SUBSTRUCTURE

PIER 1

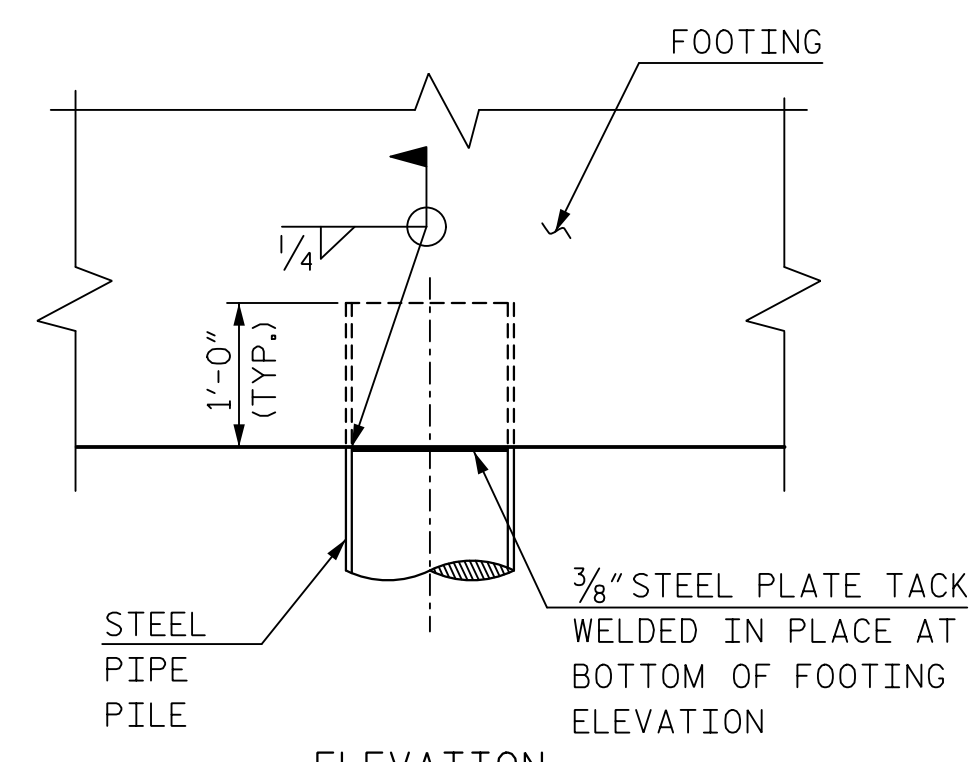
REVISIONS						SHEET NO. S-42
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	J. BAYNE	9/14	3			TOTAL SHEETS 54
2	P. BARBER	9/14	4			

HNTB HNTB NORTH CAROLINA, P.C.  
License No. C-1554  
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: J. BAYNE DATE: 9/14 DWG. NO. 23  
CHECKED BY: P. BARBER DATE: 9/14



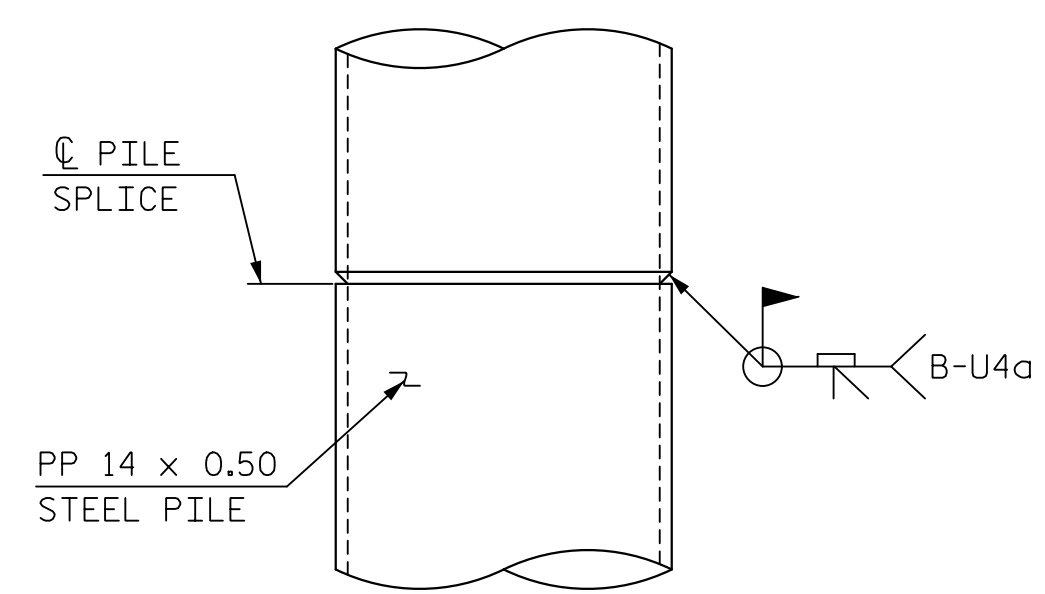
SECTION A-A



ELEVATION

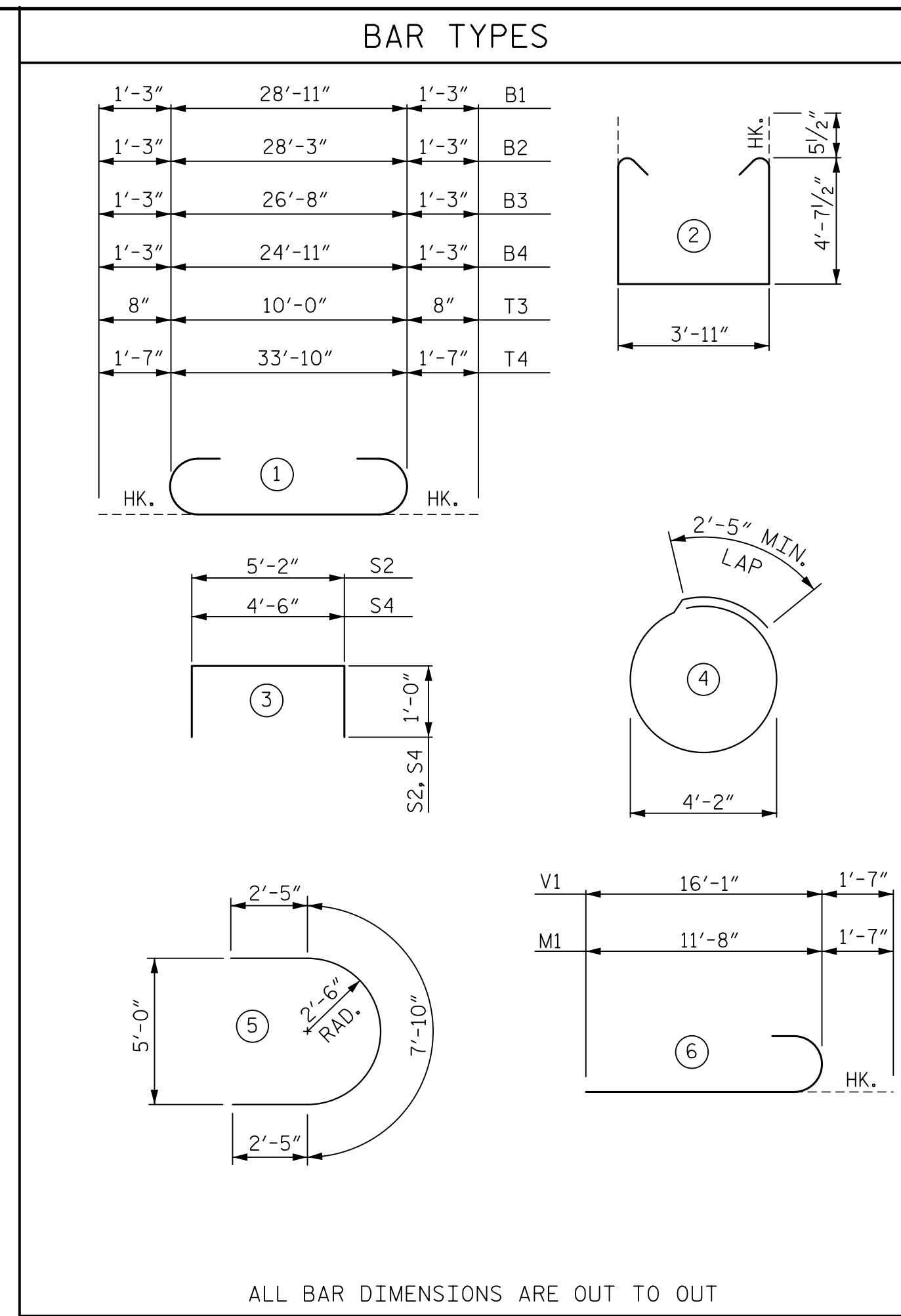
NOTE: THE CONTRACTOR MAY PROPOSE AN ALTERNATE METHOD FOR PLUGGING THE STEEL PILE, SUBJECT TO APPROVAL BY THE ENGINEER.

PIPE PILE IN FOOTING DETAIL



PIPE PILE SPLICE DETAIL

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

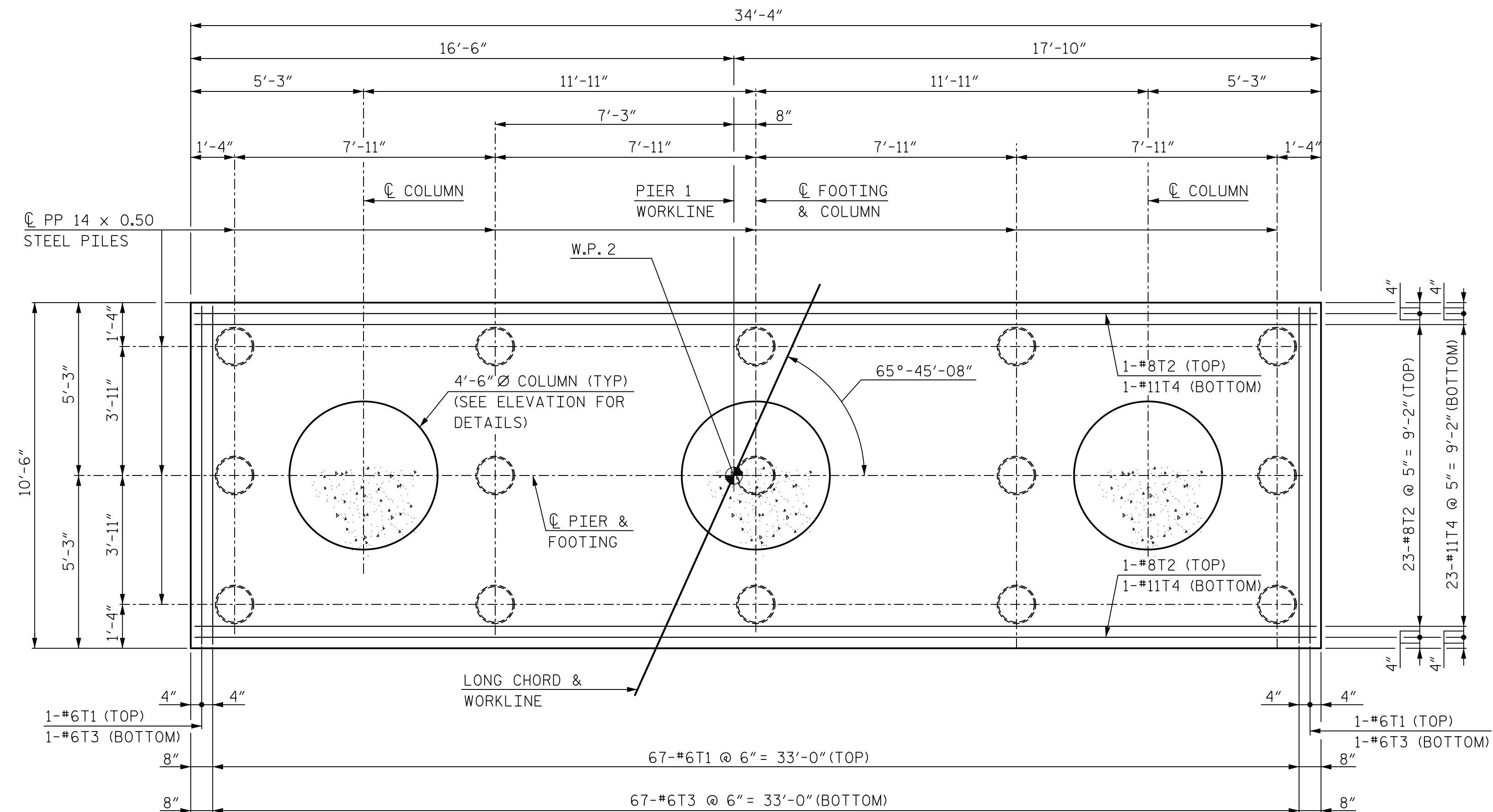


BAR TYPES

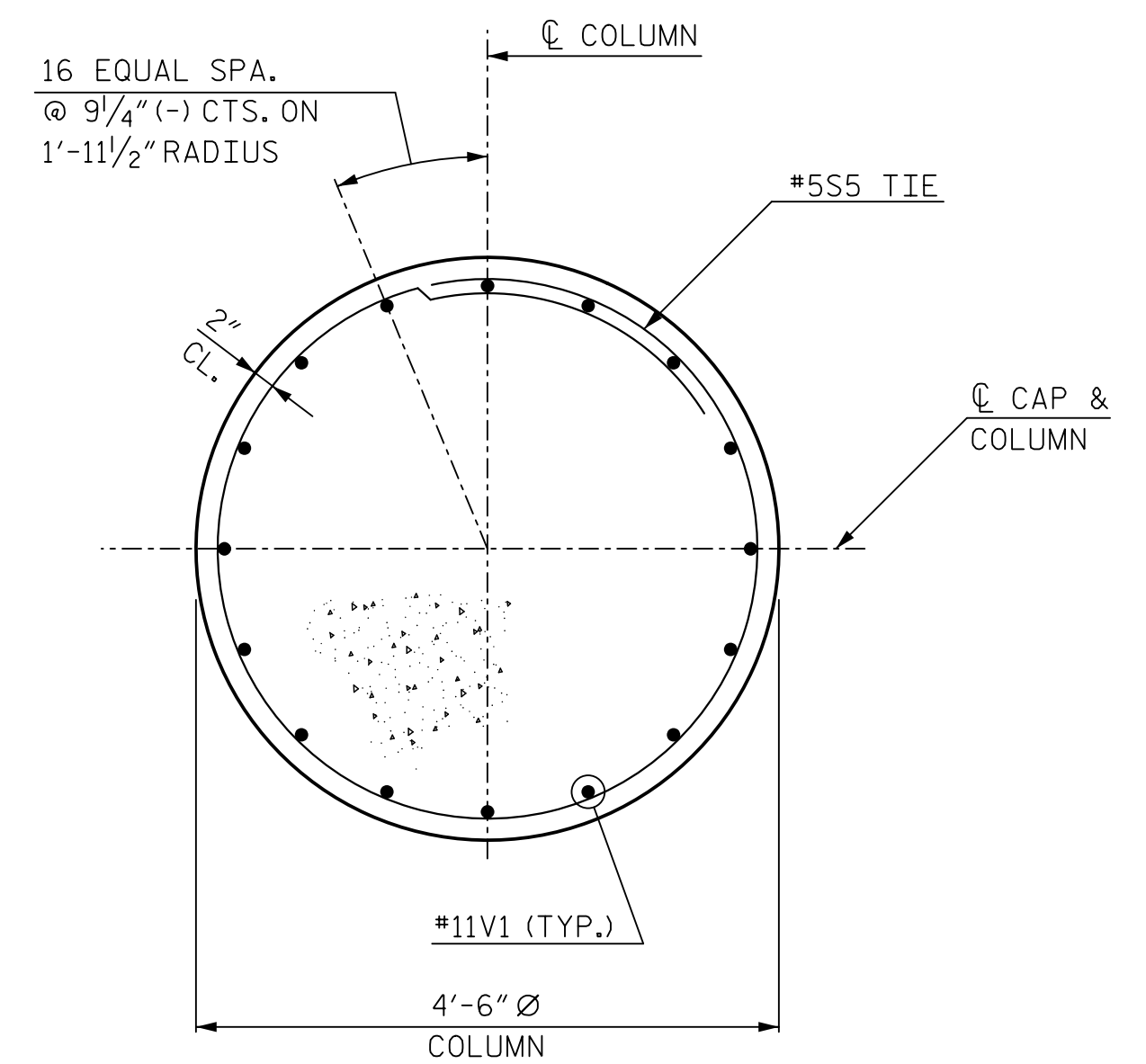
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING					
PIER 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	2	9	1	31'-5"	214
B2	2	9	1	30'-9"	209
B3	2	9	1	29'-2"	198
B4	2	9	1	27'-5"	186
B5	2	9	STR.	28'-11"	197
B6	4	9	STR.	28'-3"	384
B7	2	9	STR.	26'-8"	181
B8	4	9	STR.	24'-11"	339
B9	10	5	STR.	23'-10"	249
S1	60	5	2	14'-1"	881
S2	48	4	3	7'-2"	230
S3	16	5	5	12'-8"	211
S4	16	4	3	6'-6"	69
S5	45	5	4	15'-4"	720
M1	48	11	6	13'-3"	3,379
T1	69	6	STR.	10'-0"	1,036
T2	25	8	STR.	33'-10"	2,258
T3	69	6	1	11'-4"	1,175
T4	25	11	1	37'-0"	4,915
V1	48	11	6	17'-8"	4,505

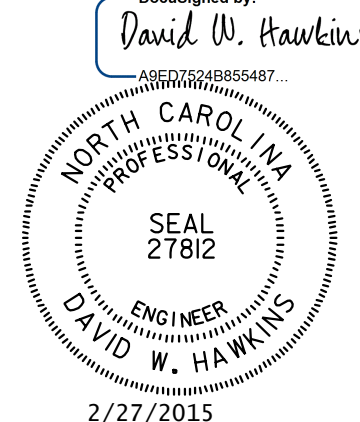
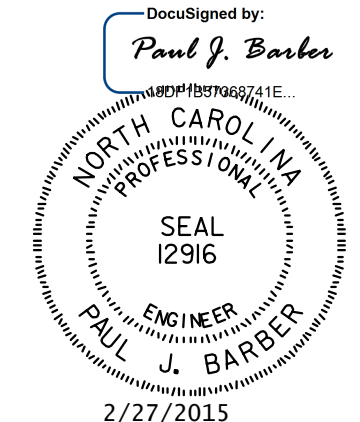
QUANTITIES			
ITEM	TOTAL		
REINFORCING STEEL	LBS	21,536	
CAST-IN-PLACE CONCRETE (4,000 PSI):			
POUR 1	CU. YDS.	83.4	
POUR 2	CU. YDS.	24.7	
POUR 3	CU. YDS.	28.7	
TOTAL	CU. YDS.	136.8	
PP 14 x 0.50 STEEL PILES	NO.	15	
	L.F.	900	
PIPE PILE PLATES	EACH	15	



FOOTING PLAN



SECTION B-B



PROJECT NO. P-4900A  
 ROBESON COUNTY  
 STATION: POC 38+93.36 -L-  
 MILE POST: 0.55  
 SHEET 2 OF 2

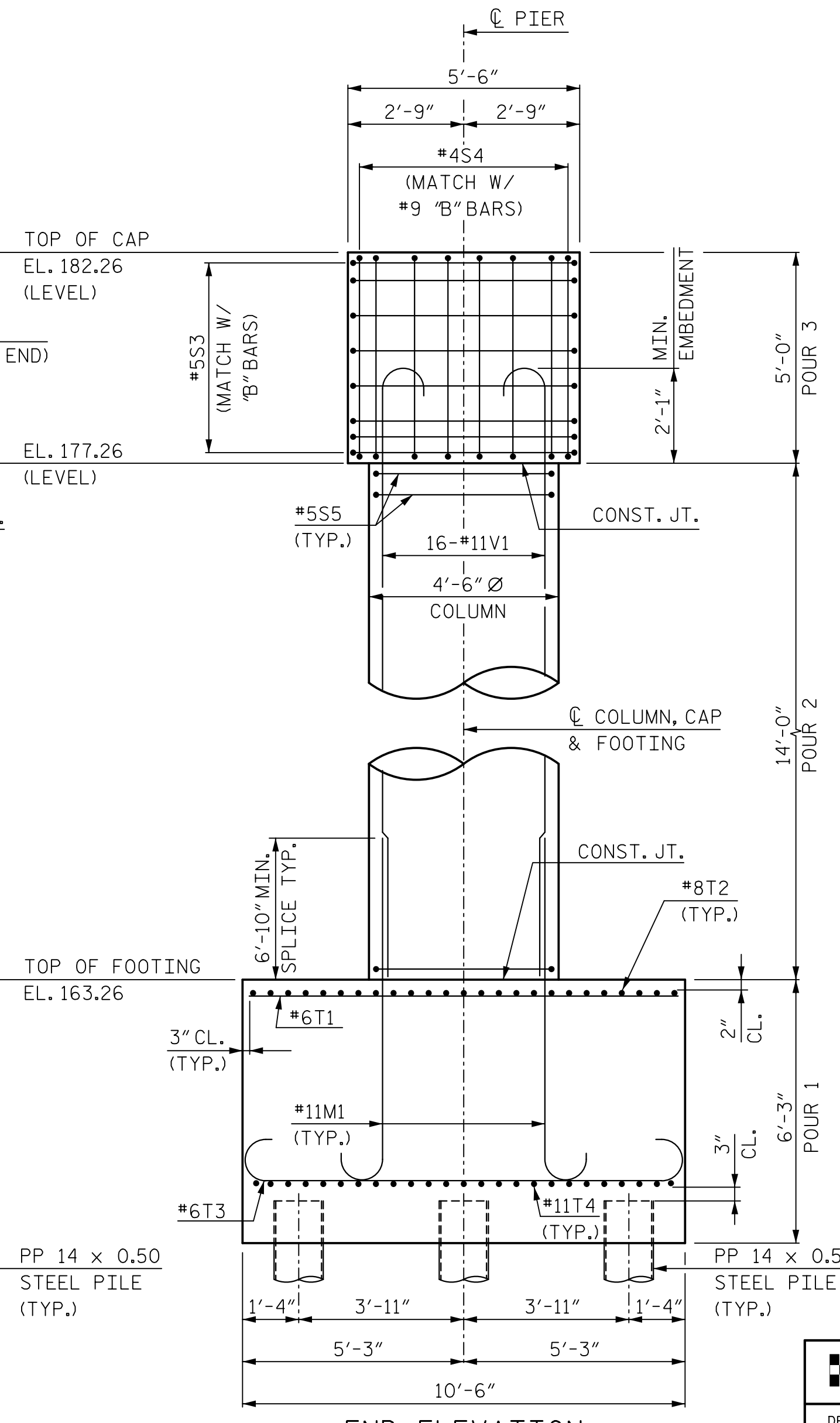
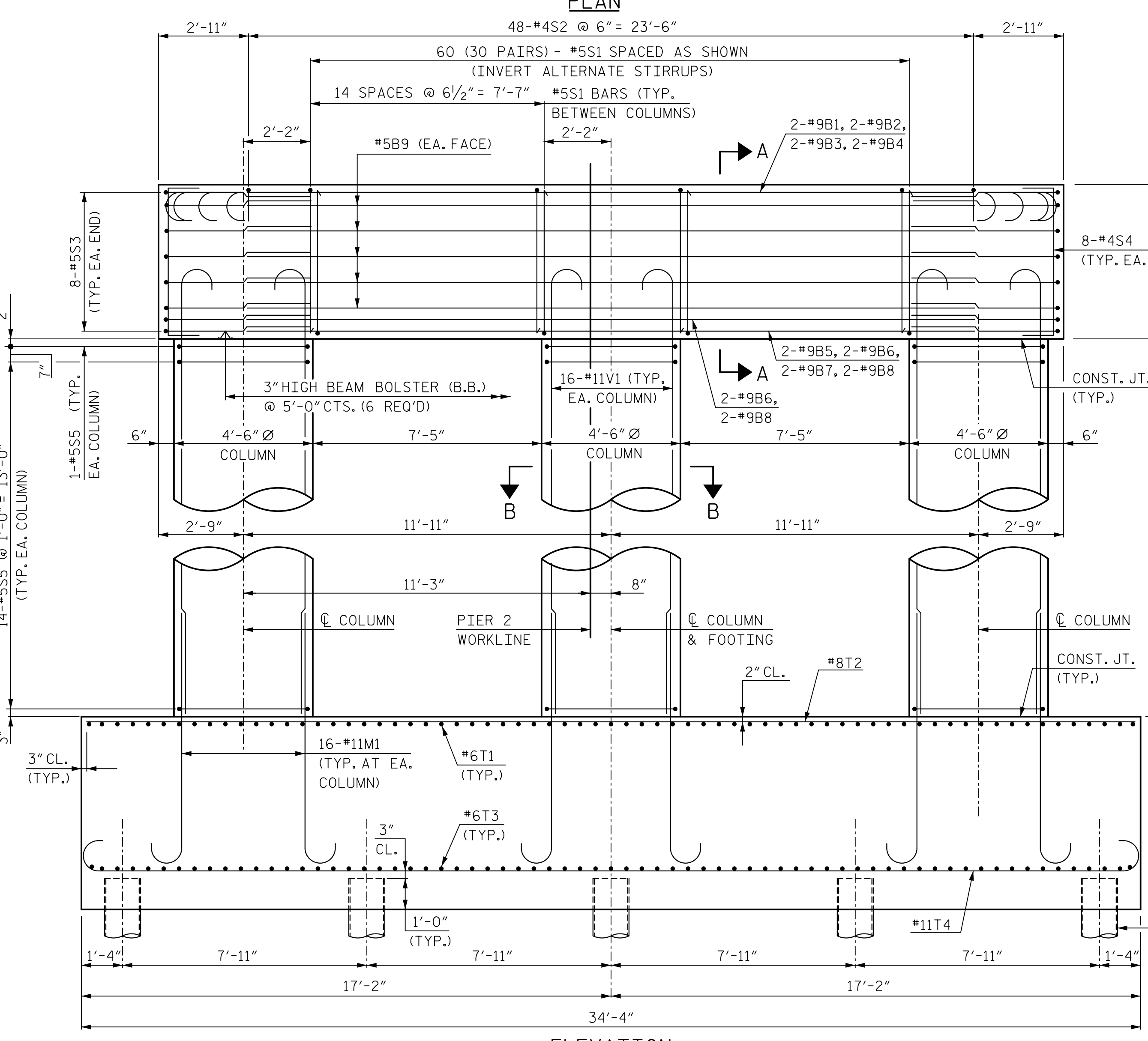
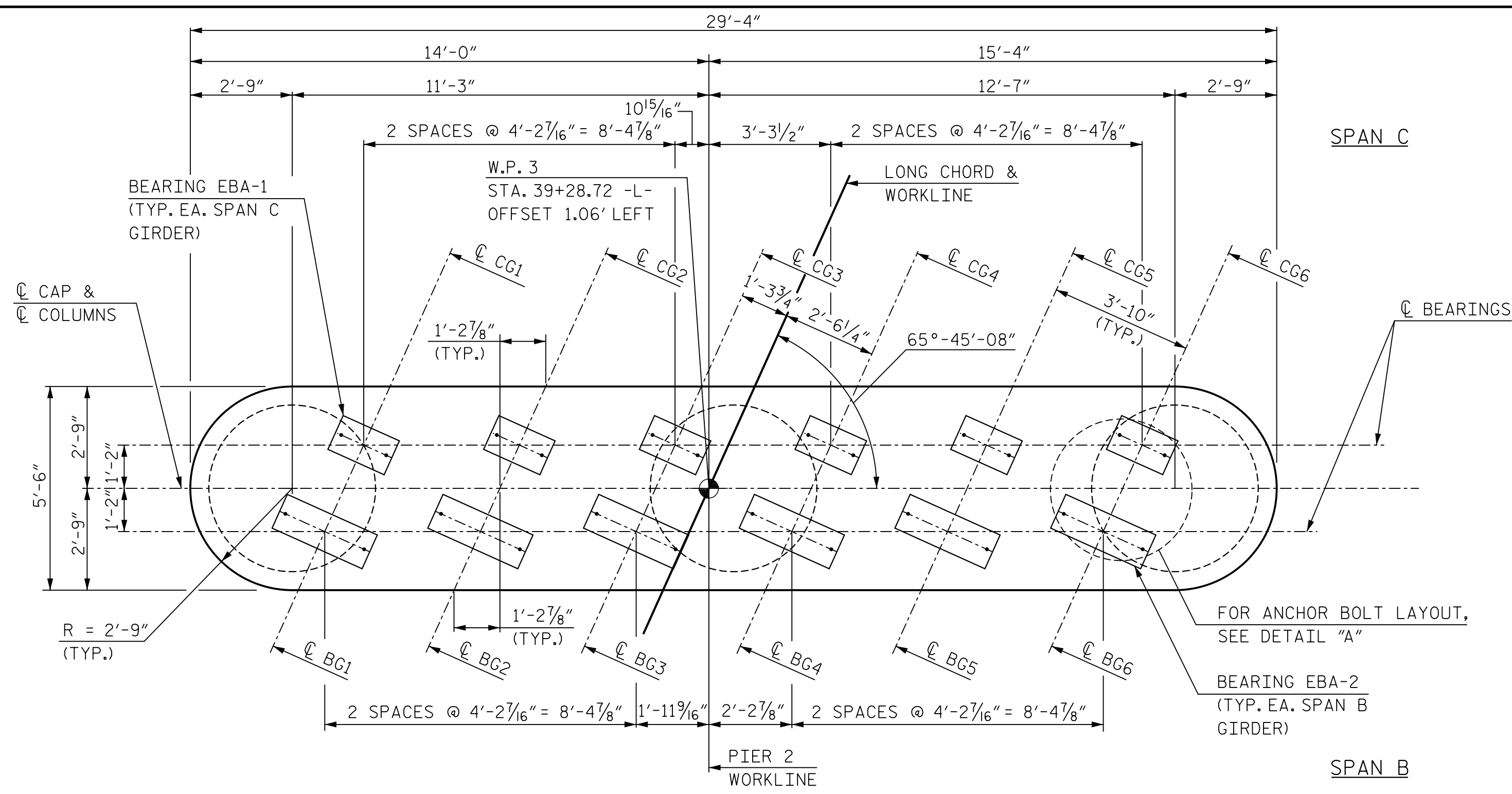
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

**HNTB** HNTB NORTH CAROLINA, P.C.  
 License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: J. BAYNE DATE: 9/14  
 CHECKED BY: P. BARBER DATE: 9/14

DWG. NO. 24

SHEET NO. S-43  
 TOTAL SHEETS 54



**NOTES:**

ALL DIMENSIONS SHOWN ARE PARALLEL OR NORMAL TO PIER UNLESS NOTED.

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

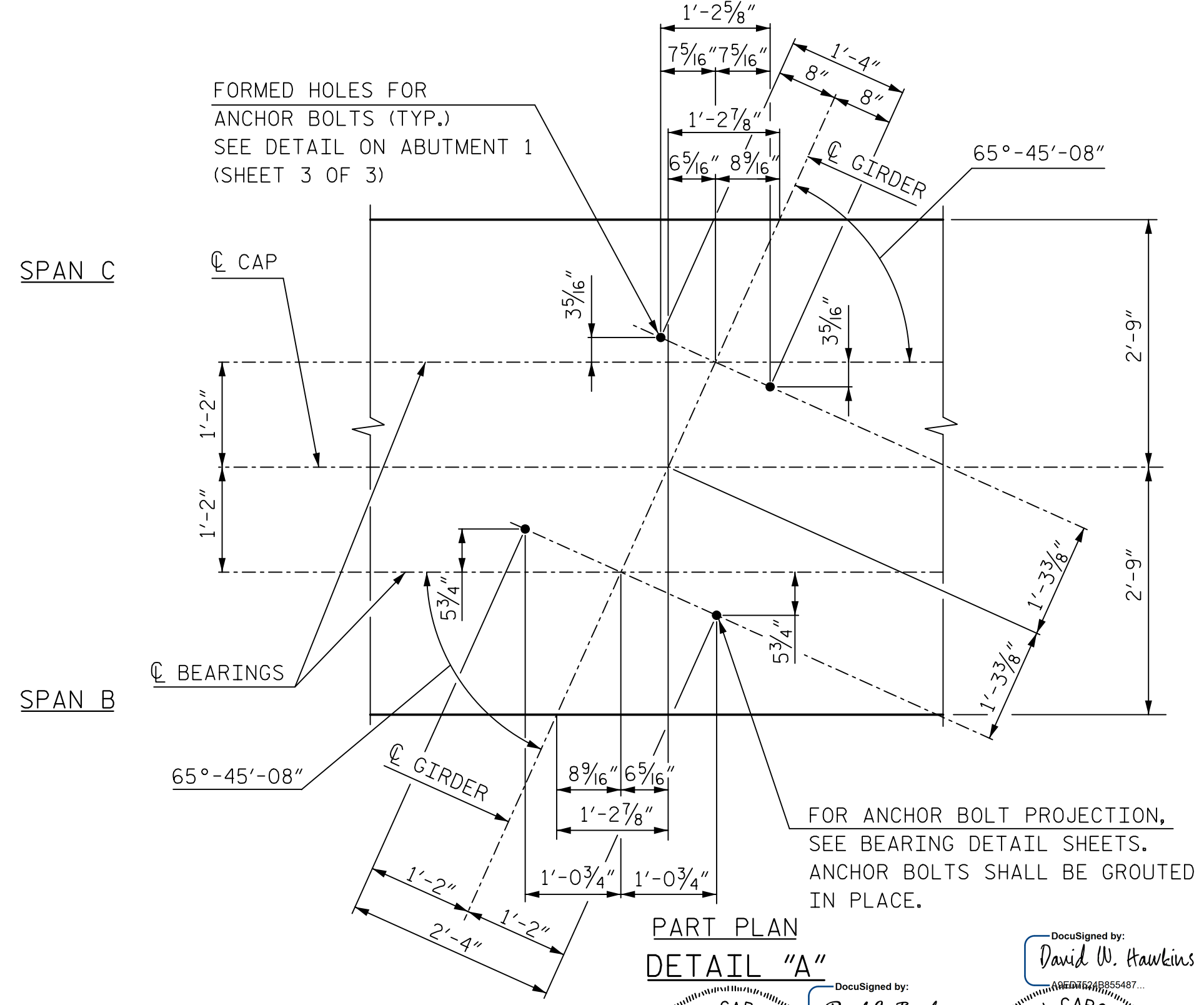
ALL SURFACES OF THE PIER EXCEPT FOR TOP OF CAP AND COLUMN/FOOTING SURFACES BELOW GRADE SHALL HAVE A RUBBED FINISH SUITABLE FOR PAINTING.

ALL EXPOSED SURFACES OF PIER CAP AND COLUMNS, EXCEPT TOP OF CAP, SHALL BE PAINTED. FOR APPLICATION OF BRIDGE COATING, SEE SPECIAL PROVISIONS.

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.



DocuSigned by:  
David W. Hawkins  
180F1807368741E

DocuSigned by:  
Paul J. Barber  
180F1807368741E

SEAL 12916  
ENGINEER  
PAUL J. BARBER  
2/27/2015

SEAL 27812  
ENGINEER  
DAVID W. HAWKINS  
2/27/2015

PROJECT NO. P-4900A

ROBESON COUNTY

STATION: POC 38+93.36 -L-

MILE POST: 0.55

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

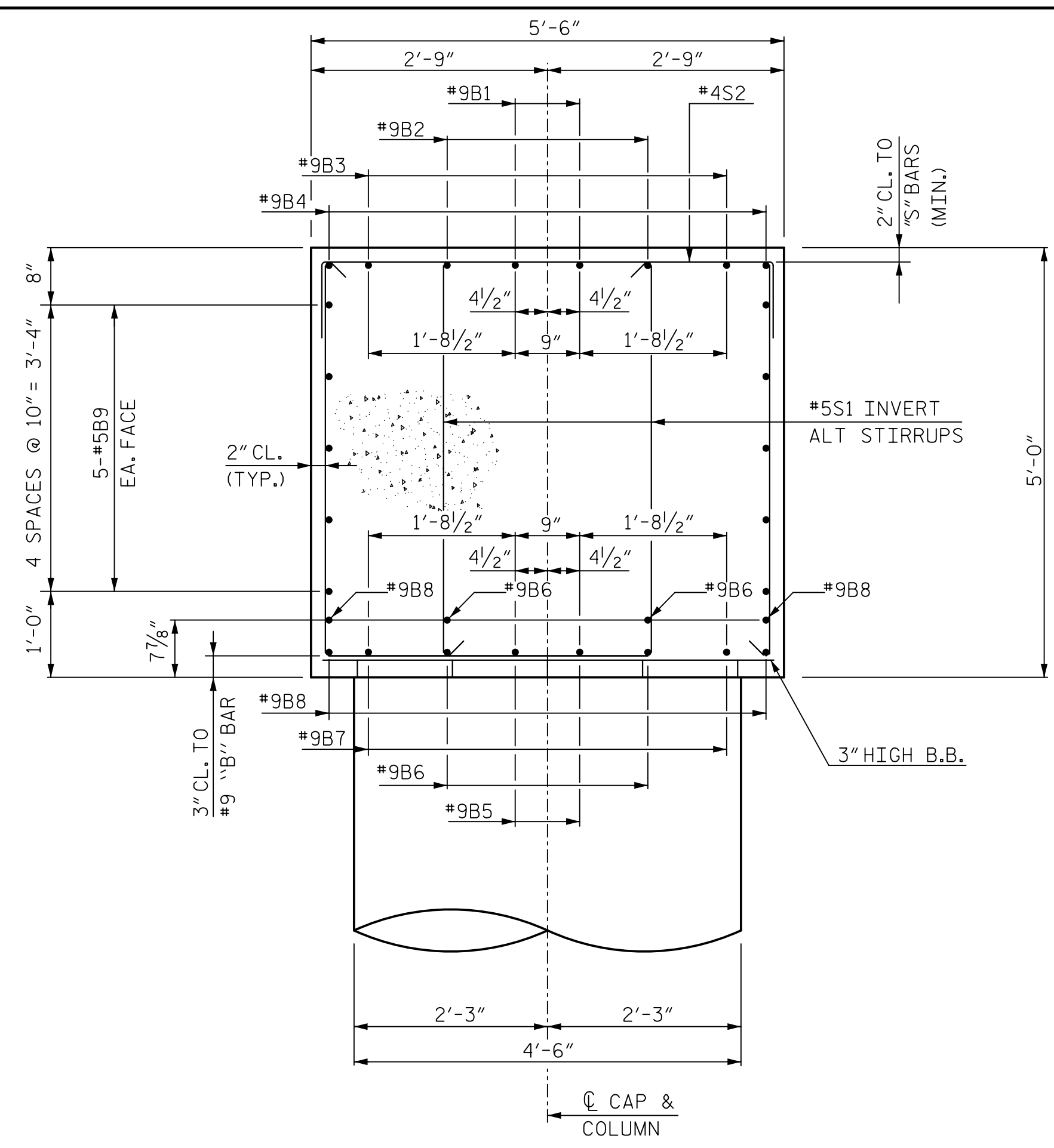
**SUBSTRUCTURE**

PIER 2

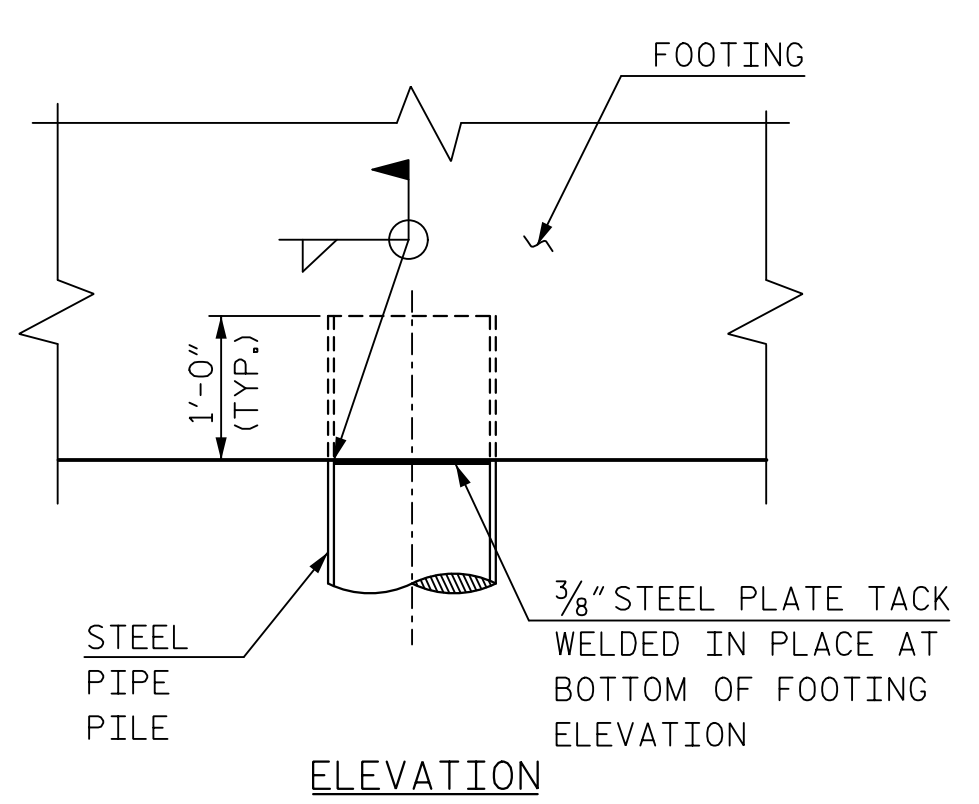
<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DWG. NO. 25	
DRAWN BY J. BAYNE	DATE 9/14	CHECKED BY P. BARBER	DATE 9/14	NO.	DATE
1		3		NO.	DATE
2		4		NO.	DATE

SHEET NO. S-44

TOTAL SHEETS 54

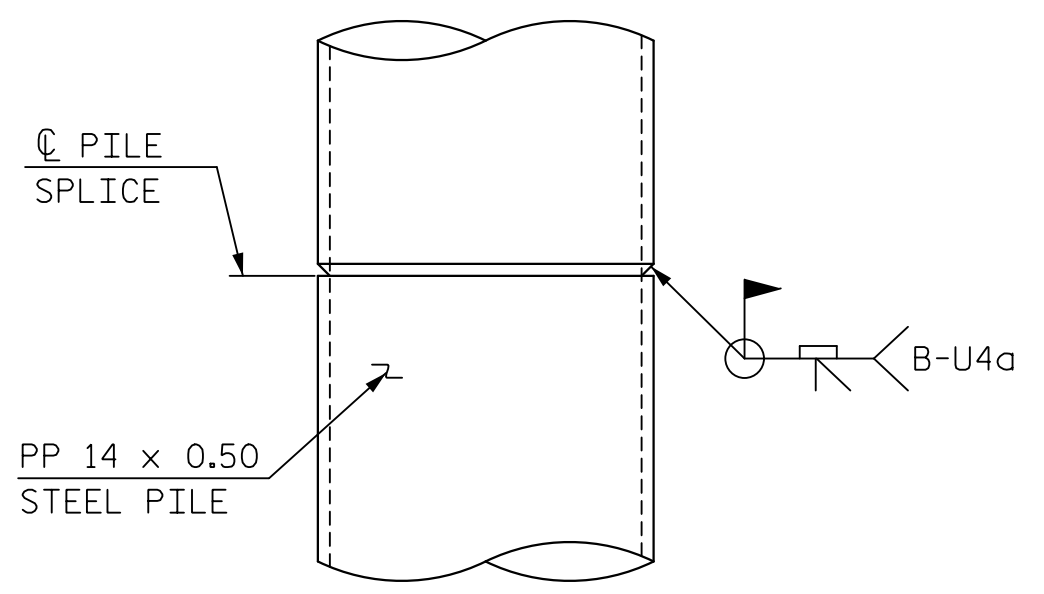


SECTION A-A

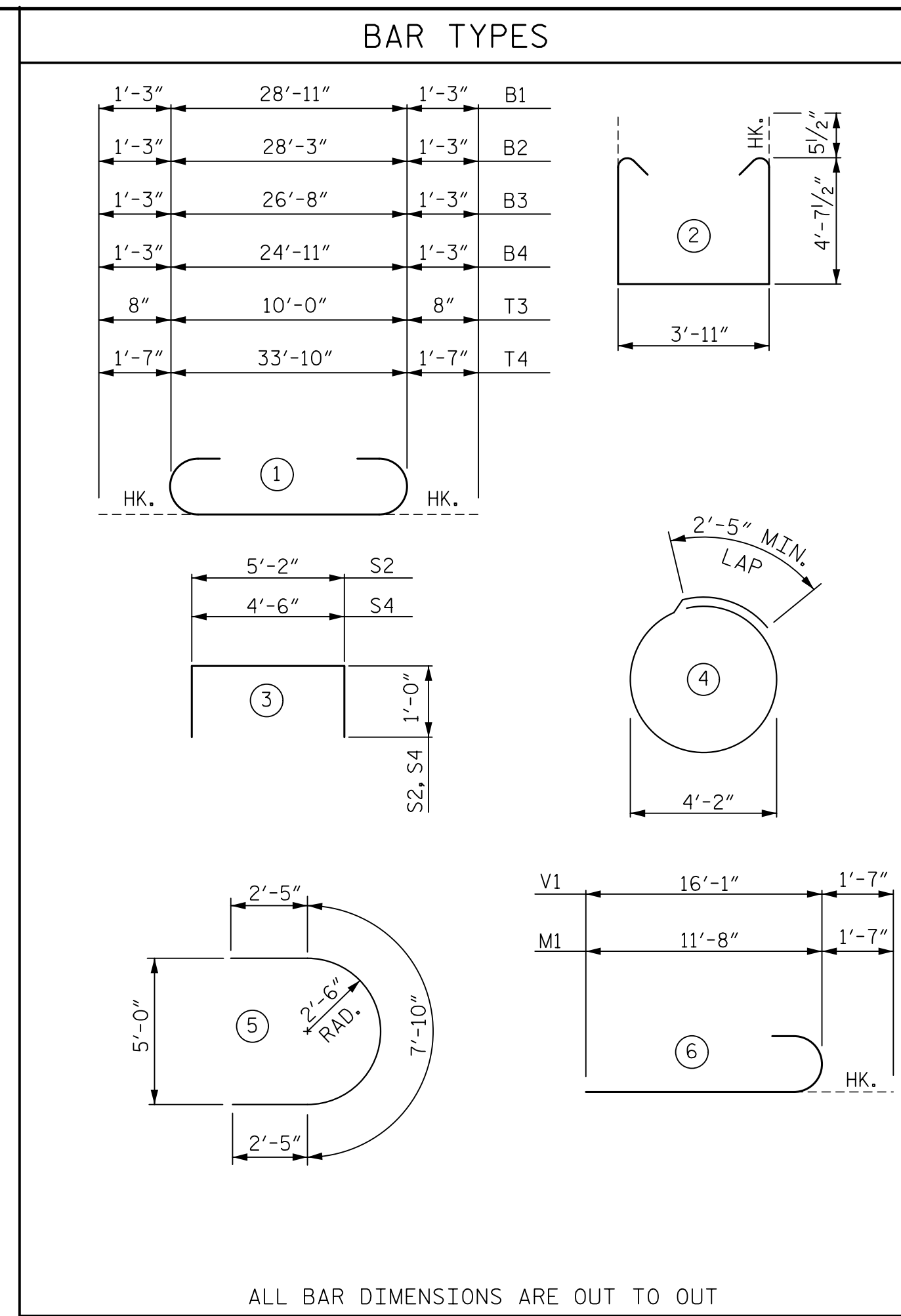


NOTE: THE CONTRACTOR MAY PROPOSE AN ALTERNATE METHOD FOR PLUGGING THE STEEL PIPE PILE, SUBJECT TO APPROVAL BY THE ENGINEER.

PIPE PILE IN FOOTING DETAIL



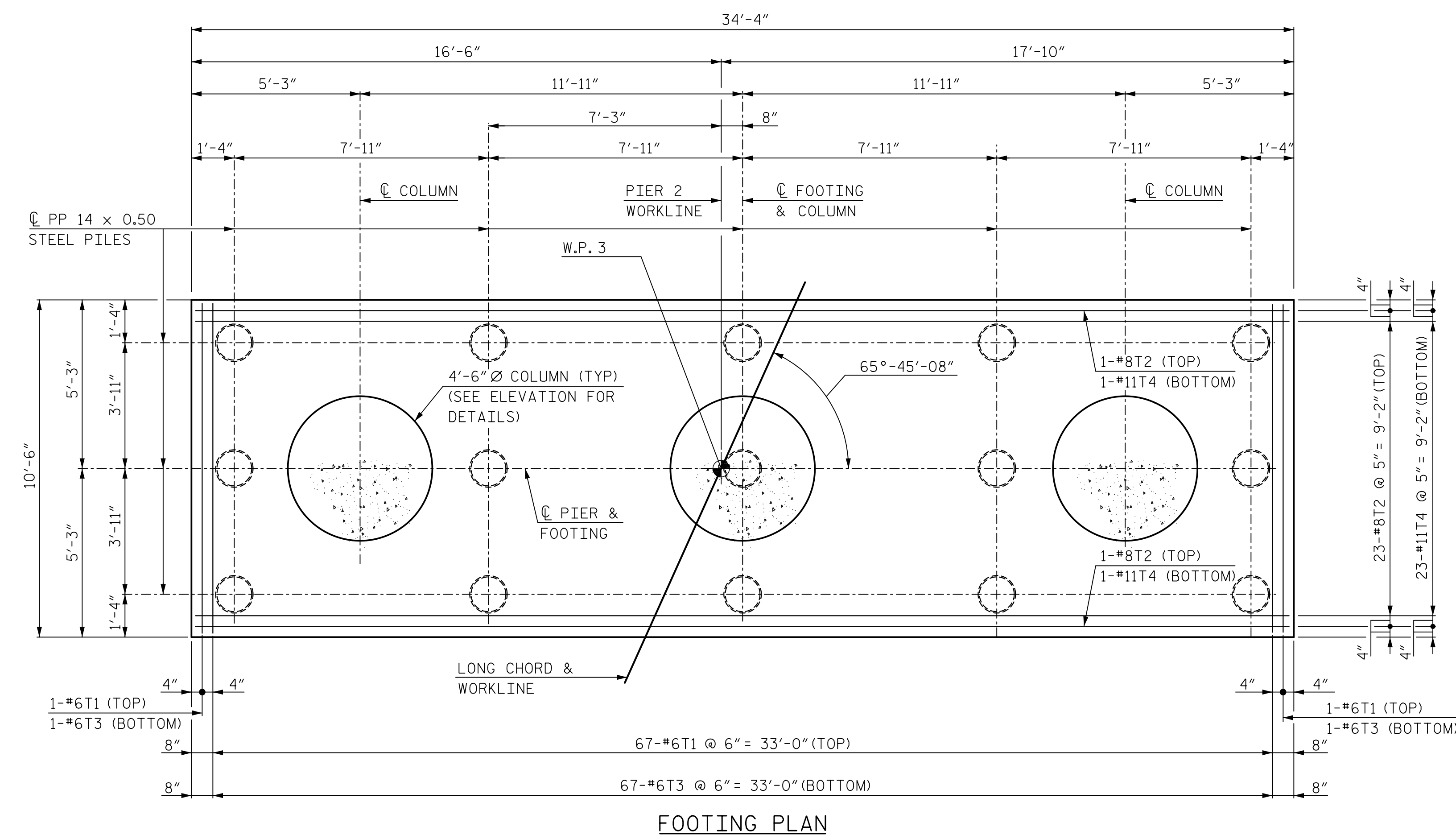
PIPE PILE SPLICE DETAIL  
PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.



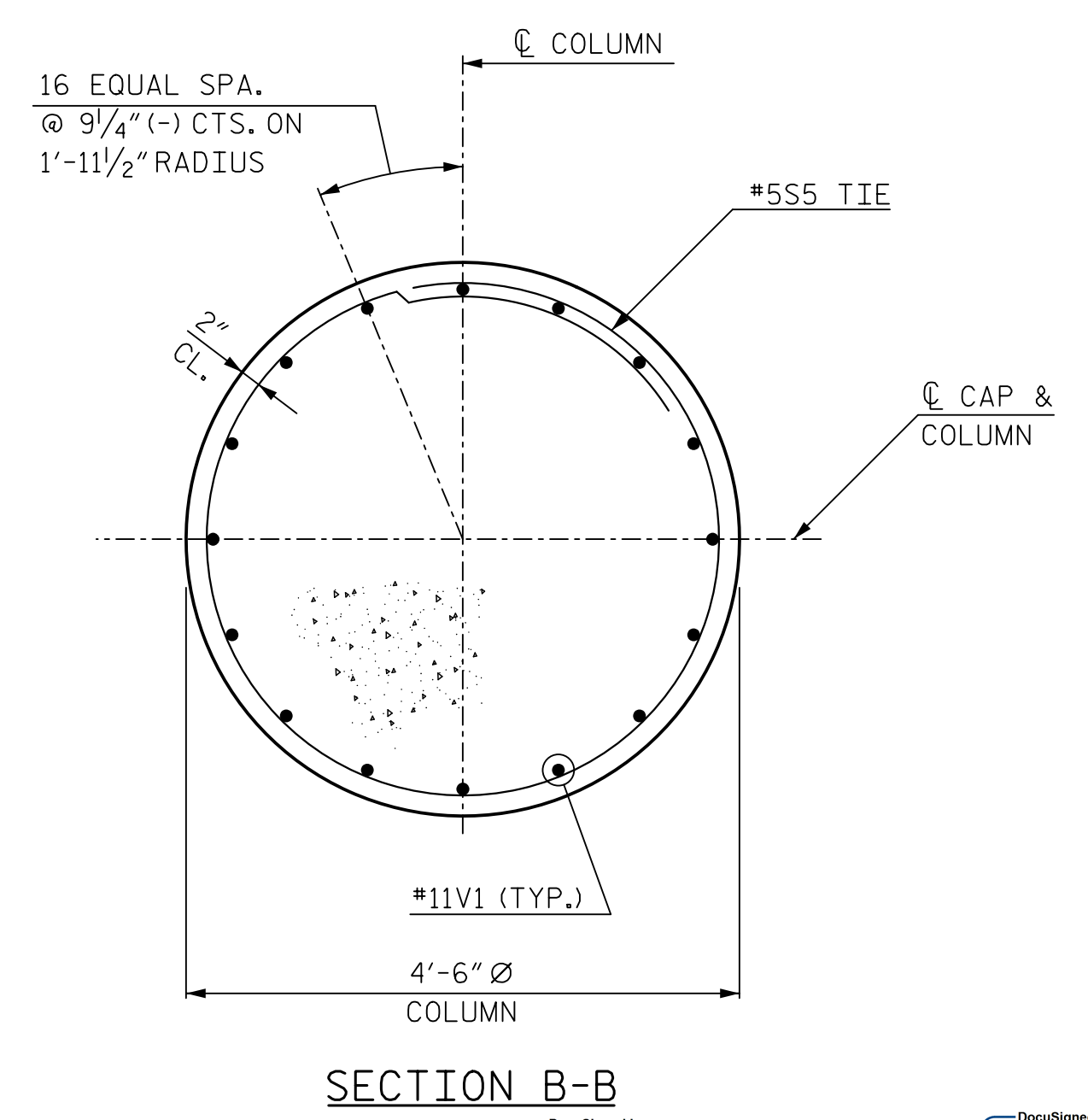
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING					
PIER 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	2	9	1	31'-5"	214
B2	2	9	1	30'-9"	209
B3	2	9	1	29'-2"	198
B4	2	9	1	27'-5"	186
B5	2	9	STR.	28'-11"	197
B6	4	9	STR.	28'-3"	384
B7	2	9	STR.	26'-8"	181
B8	4	9	STR.	24'-11"	339
B9	10	5	STR.	23'-10"	249
S1	60	5	2	14'-1"	881
S2	48	4	3	7'-2"	230
S3	16	5	5	12'-8"	211
S4	16	4	3	6'-6"	69
S5	45	5	4	15'-4"	720
M1	48	11	6	13'-3"	3,379
T1	69	6	STR.	10'-0"	1,036
T2	25	8	STR.	33'-10"	2,258
T3	69	6	1	11'-4"	1,175
T4	25	11	1	37'-0"	4,915
V1	48	11	6	17'-8"	4,505

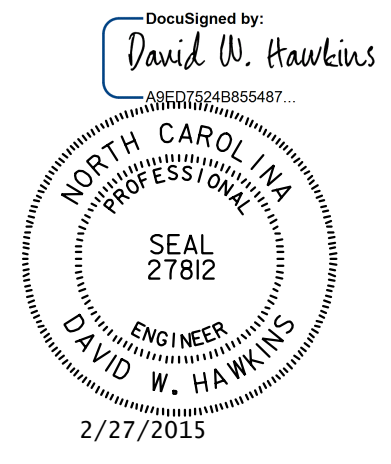
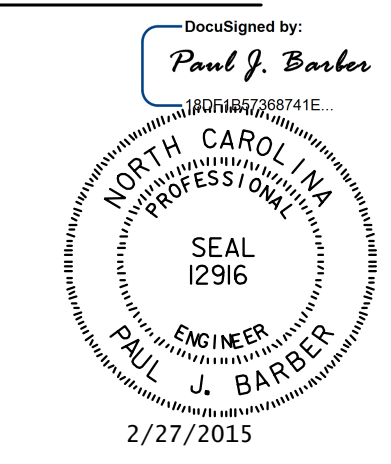
QUANTITIES			
ITEM			TOTAL
REINFORCING STEEL		LBS	21,536
CAST-IN-PLACE CONCRETE (4,000 PSI):			
POUR 1		CU. YDS.	83.4
POUR 2		CU. YDS.	24.7
POUR 3		CU. YDS.	28.7
TOTAL		CU. YDS.	136.8
PP 14 x 0.50 STEEL PILES		NO.	15
		L.F.	900
PIPE PILE PLATES		EACH	15



FOOTING PLAN



SECTION B-B



PROJECT NO. P-4900A  
ROBESON COUNTY  
STATION: POC 38+93.36 -L-  
MILE POST: 0.55  
SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
PIER 2

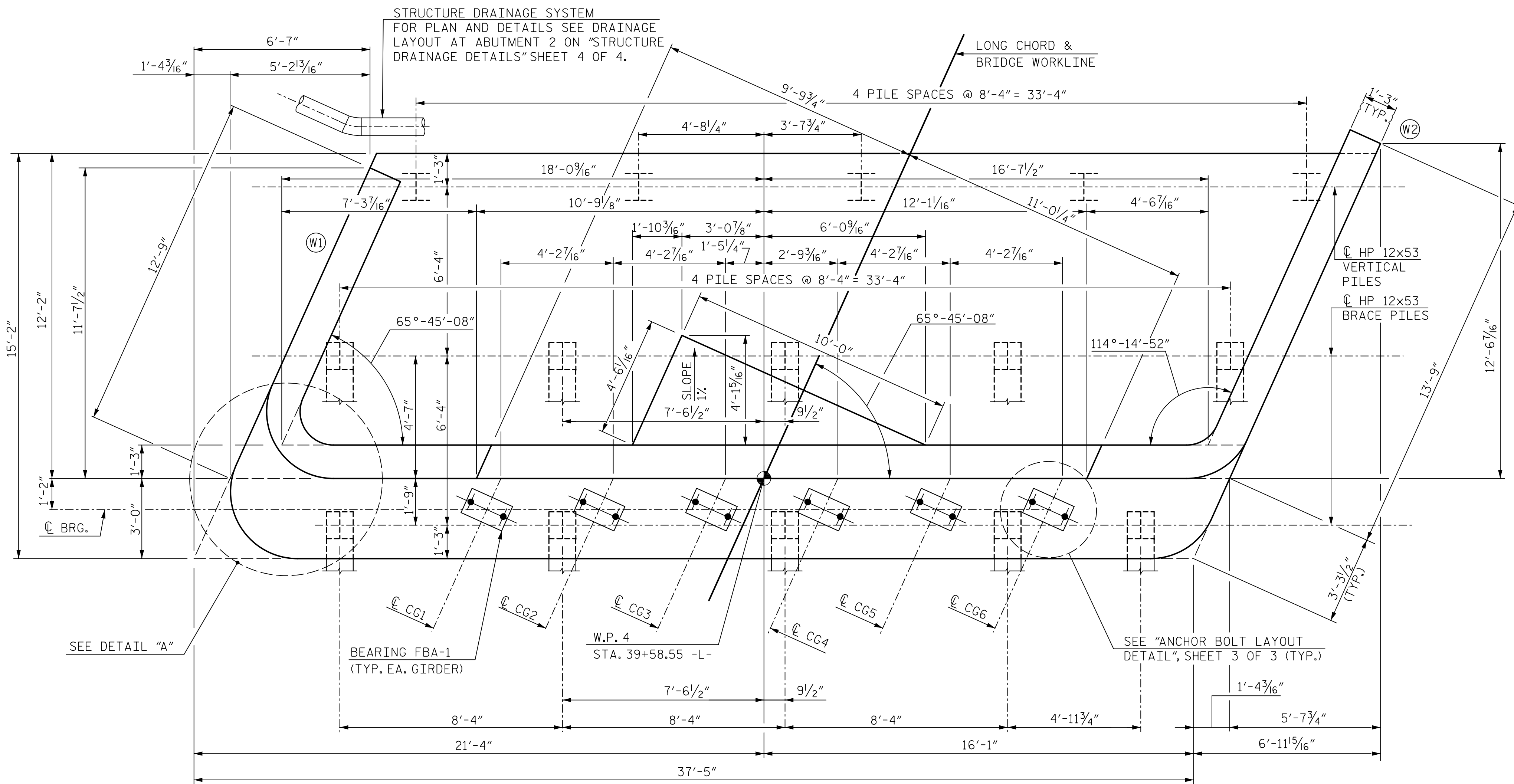
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			54

**HNTB** HNTB NORTH CAROLINA, P.C.  
License No. C-1554  
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: J. BAYNE DATE: 9/14  
CHECKED BY: P. BARBER DATE: 9/14

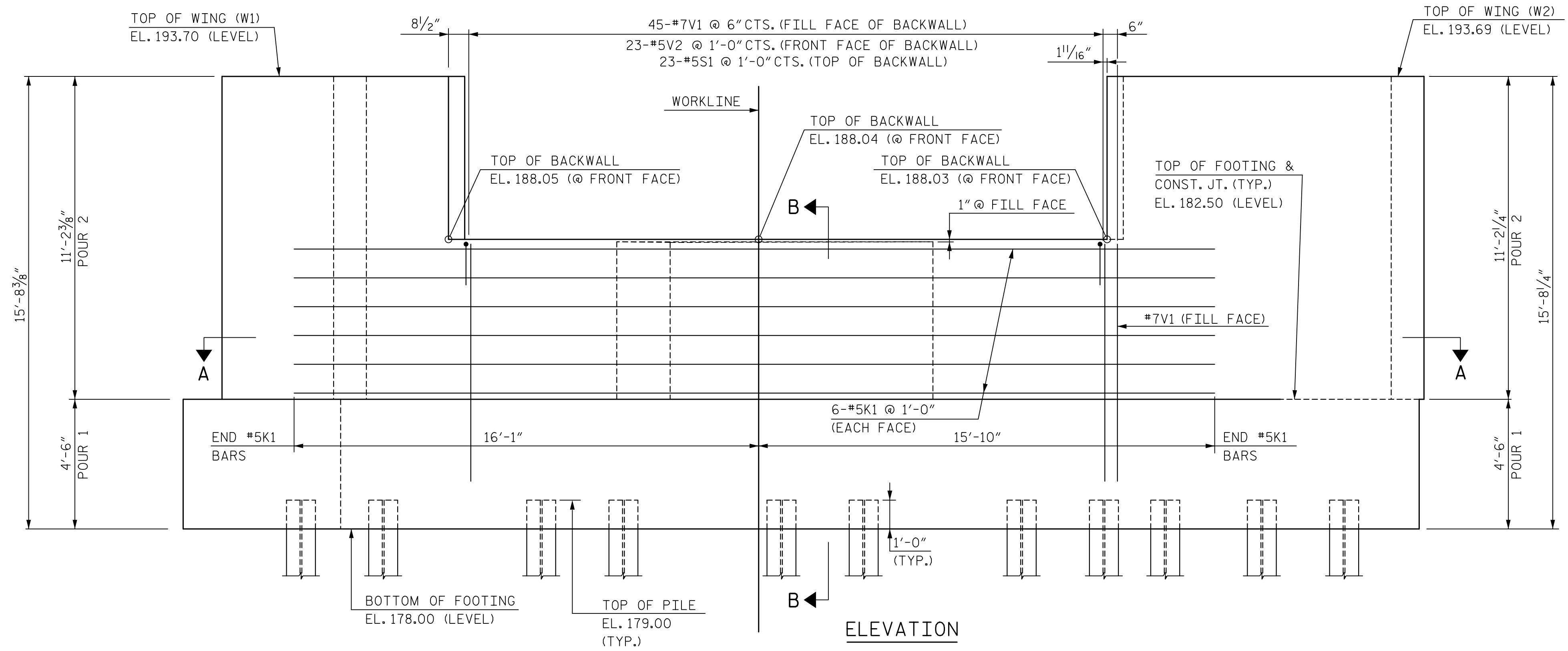
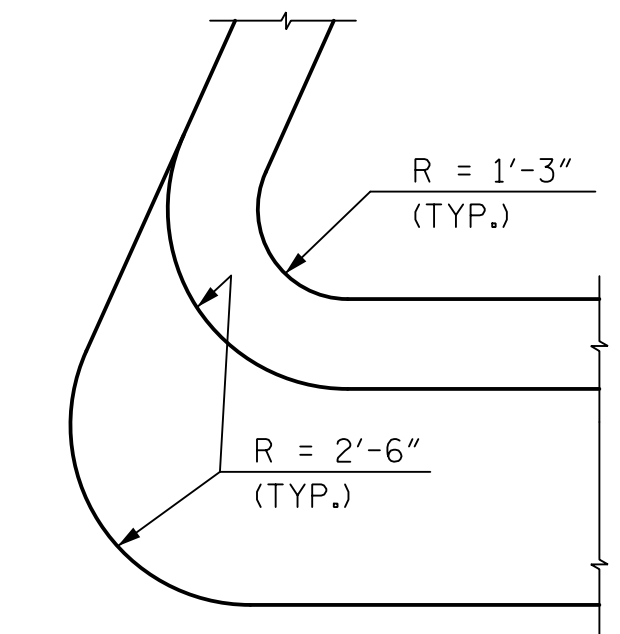
DWG. NO. 26



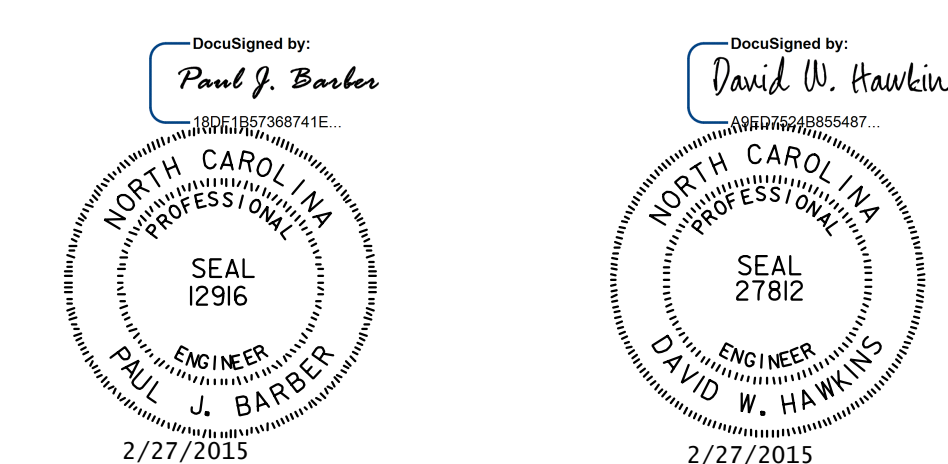


**NOTES:**

- FOR SECTION A-A, SECTION B-B AND WINGWALL DETAILS, SEE SHEET 2 OF 3.
- FOR LAYOUT AND DETAILS OF CONTINUOUS FRENCH DRAIN SYSTEM BETWEEN ABUTMENT WINGWALLS, SEE "STRUCTURE DRAINAGE DETAILS" SHEET 4 OF 4.
- INDICATES 3:1 PILE BATTER IN DIRECTION SHOWN.
- FOR FOOTING REINFORCING, SEE SECTION B-B SHEET 2 OF 3 AND FOOTING REINFORCING PLAN SHEET 3 OF 3.
- ALL SURFACES OF ABUTMENT EXCEPT FOR TOP OF CAP AND SURFACES BELOW GRADE SHALL HAVE A RUBBED FINISH SUITABLE FOR PAINTING.
- ALL EXPOSED SURFACES OF ABUTMENT CAP, BACKWALL AND WINGWALLS, EXCEPT FOR TOP OF CAP, SHALL BE PAINTED. FOR APPLICATION OF BRIDGE COATING, SEE SPECIAL PROVISIONS.



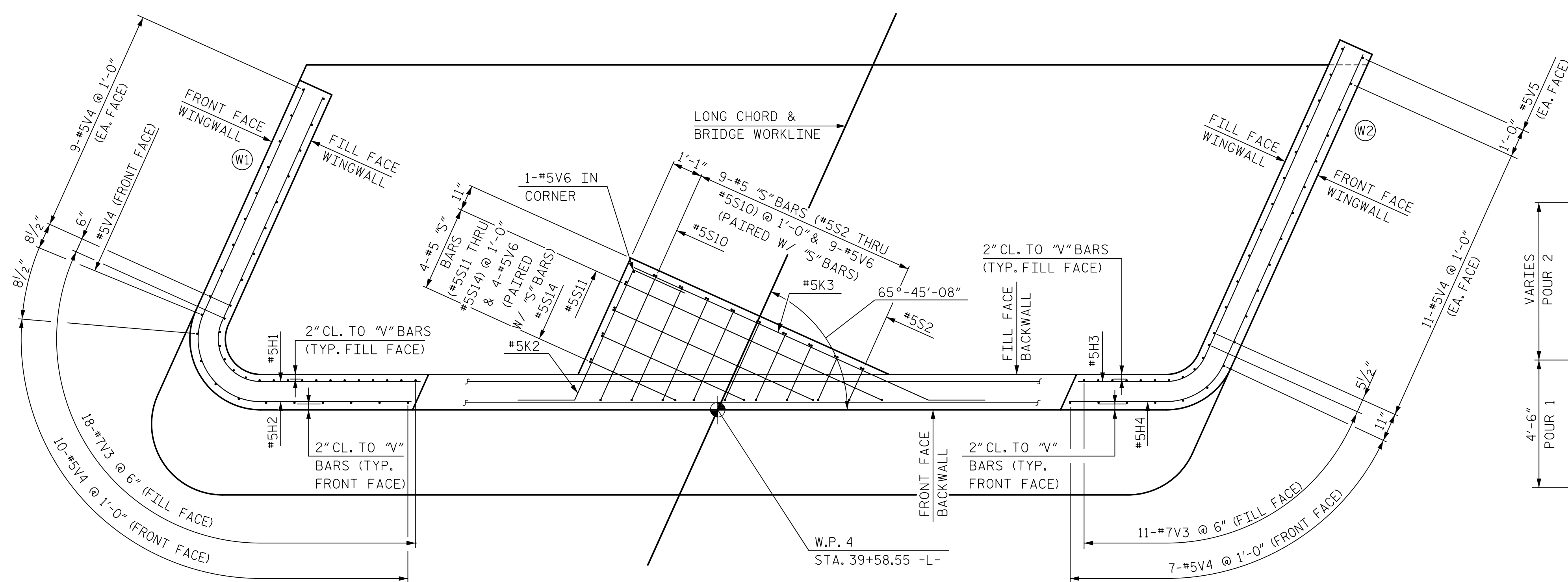
PROJECT NO. P-4900A  
ROBESON COUNTY  
STATION: POC 38+93.36 -L-  
MILE POST: 0.55  
SHEET 1 OF 3



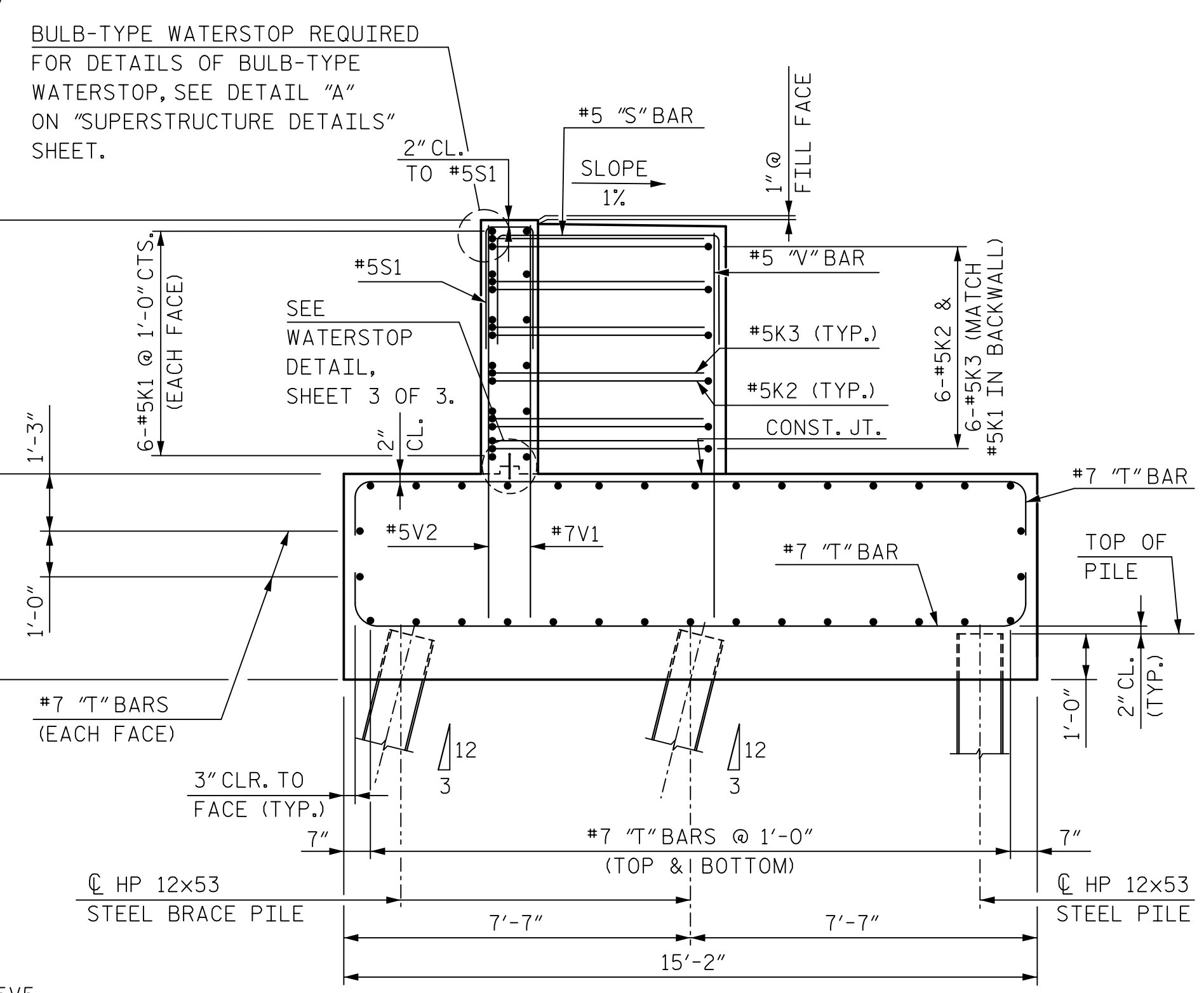
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
ABUTMENT 2

<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: M. WRIGHT	DATE: 7/14	CHECKED BY: D. RAGAN	DATE: 9/14
DWG. NO. 27		REVISIONS	
NO. 1	BY:	DATE:	NO. 3
2			4
SHEET NO. S-46			TOTAL SHEETS 54

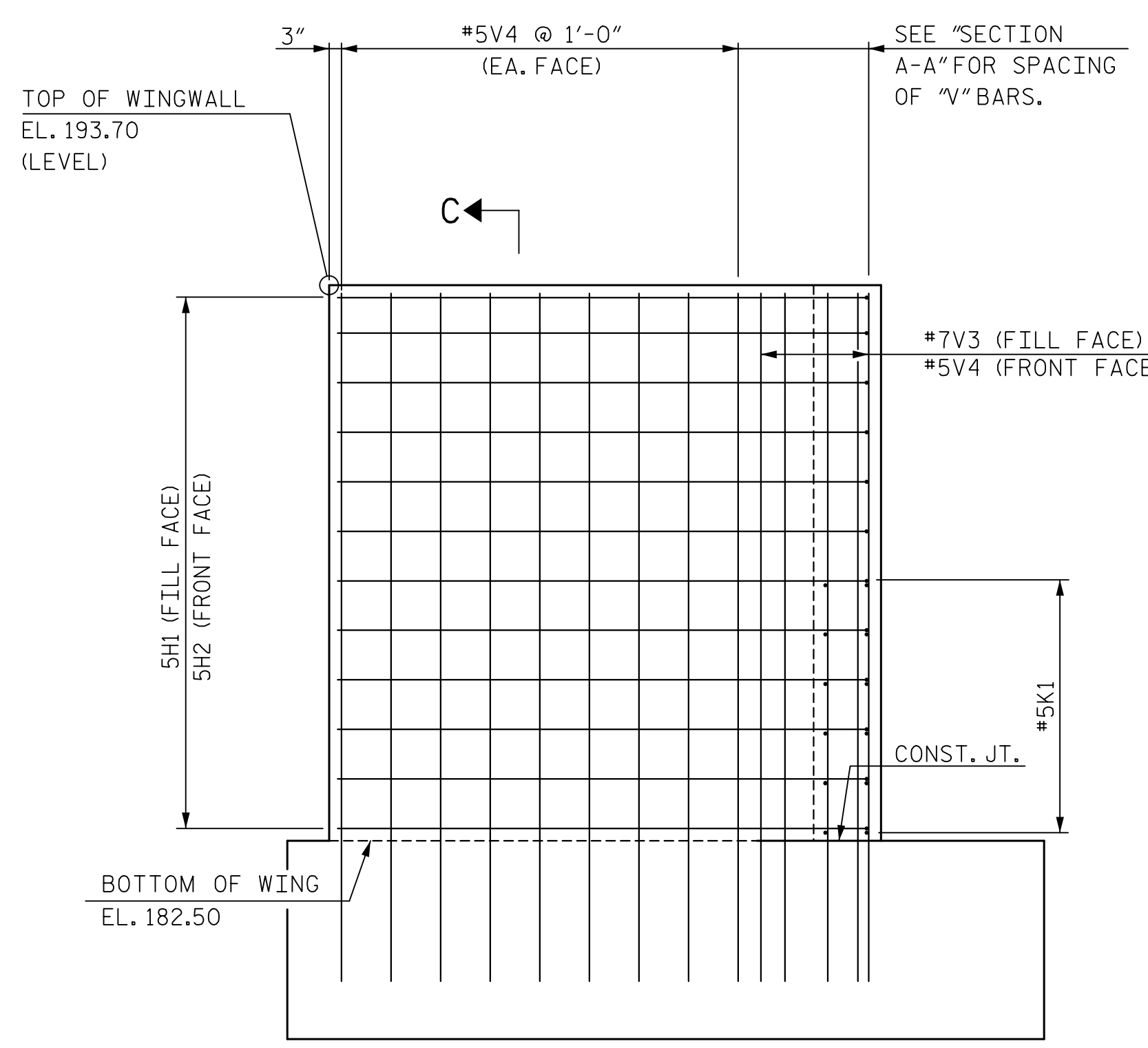
NOTE:  
FOR ABUTMENT AND WINGWALL DIMENSIONS AND ELEVATIONS, SEE SHEET 1 OF 3.



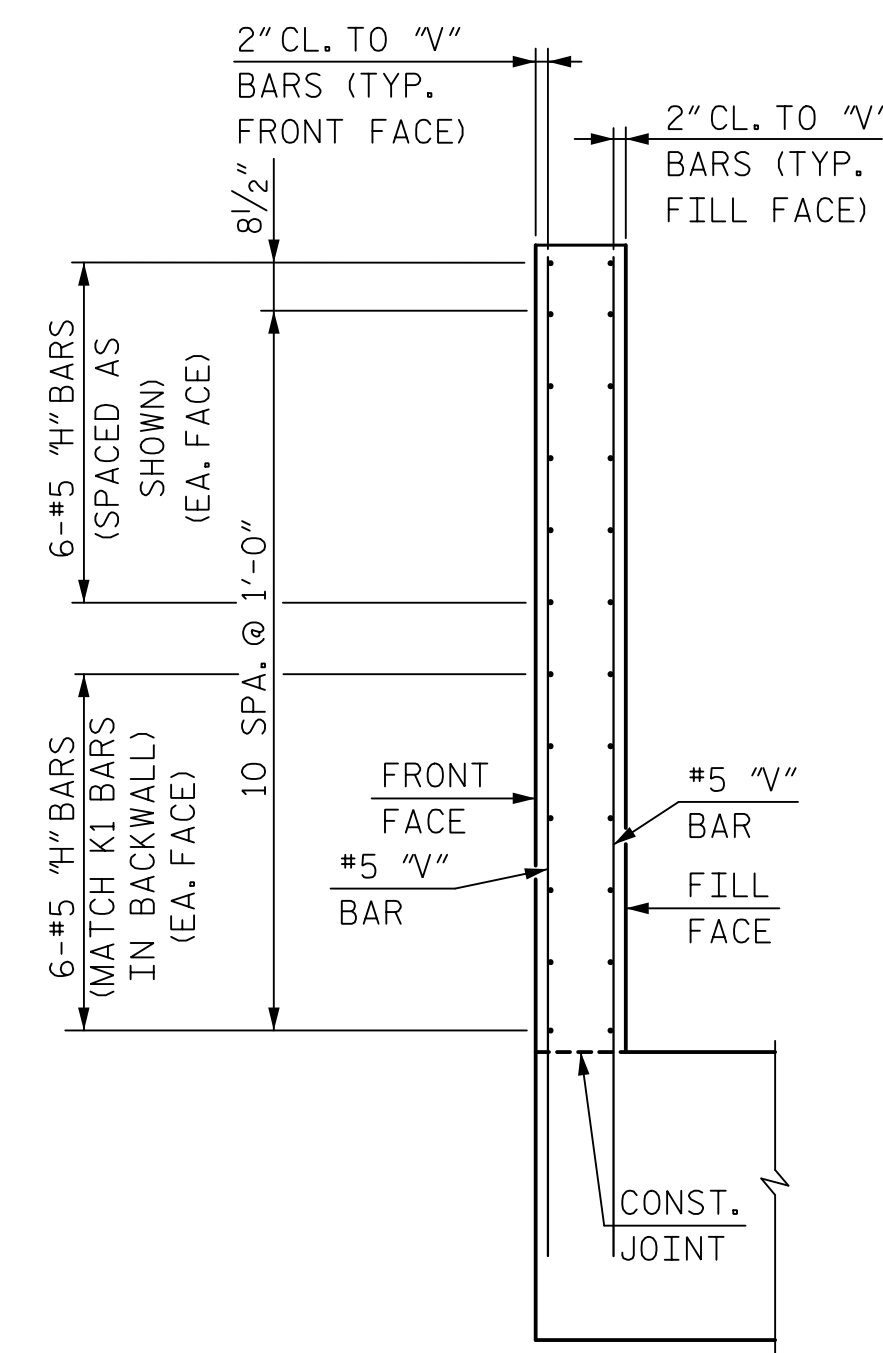
SECTION A-A



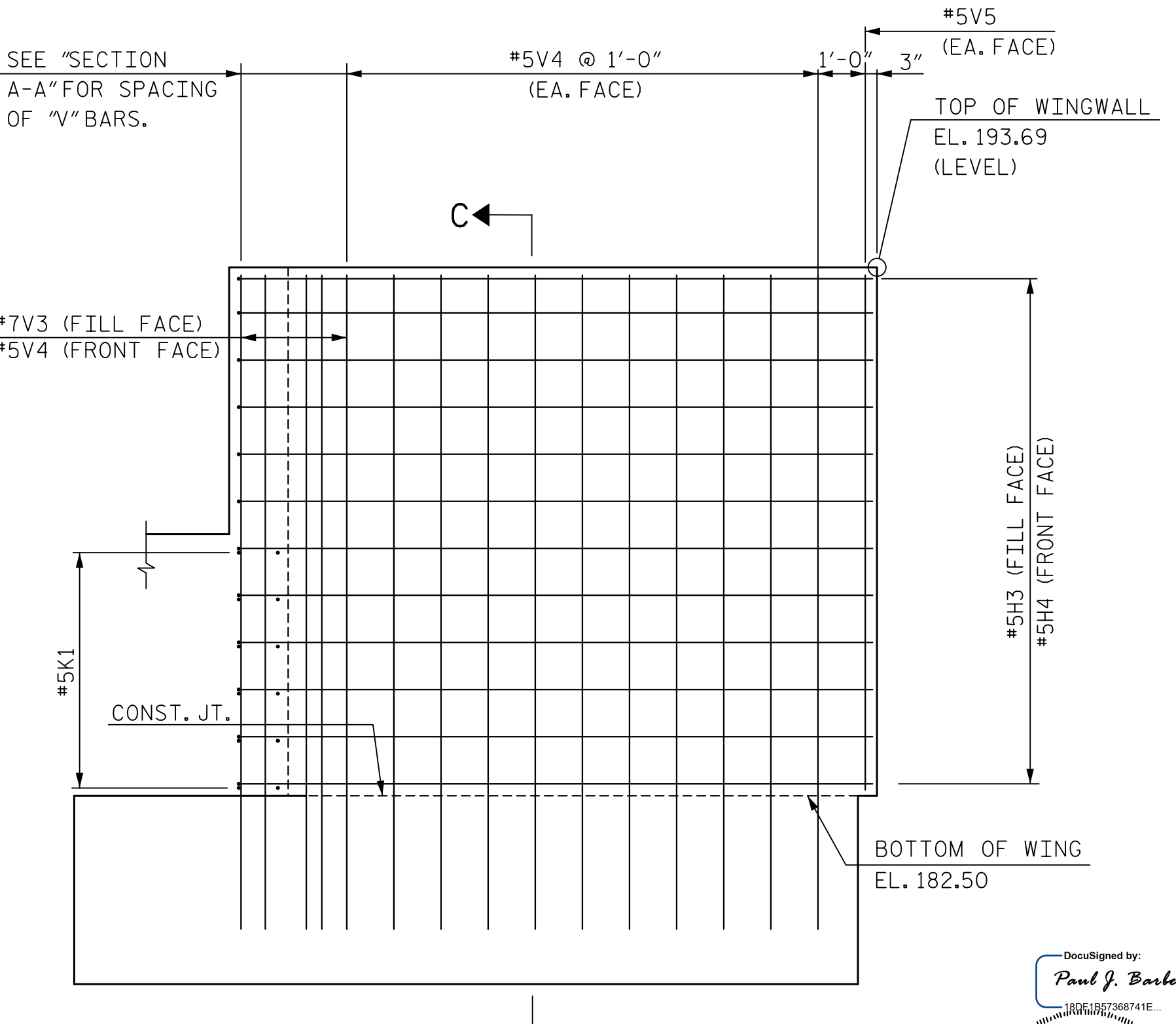
SECTION B-B



ELEVATION OF WING (W1)

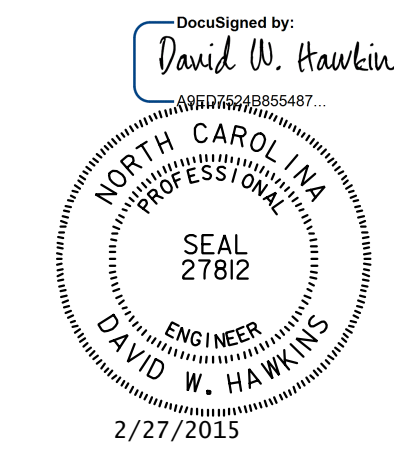
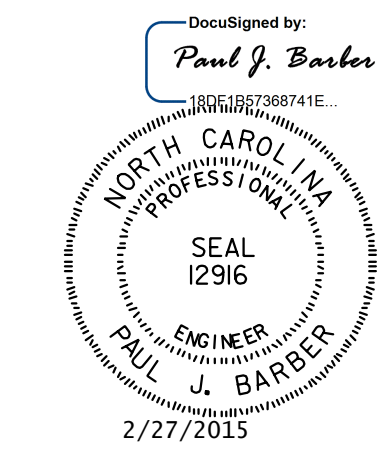


SECTION C-C



ELEVATION OF WING (W2)

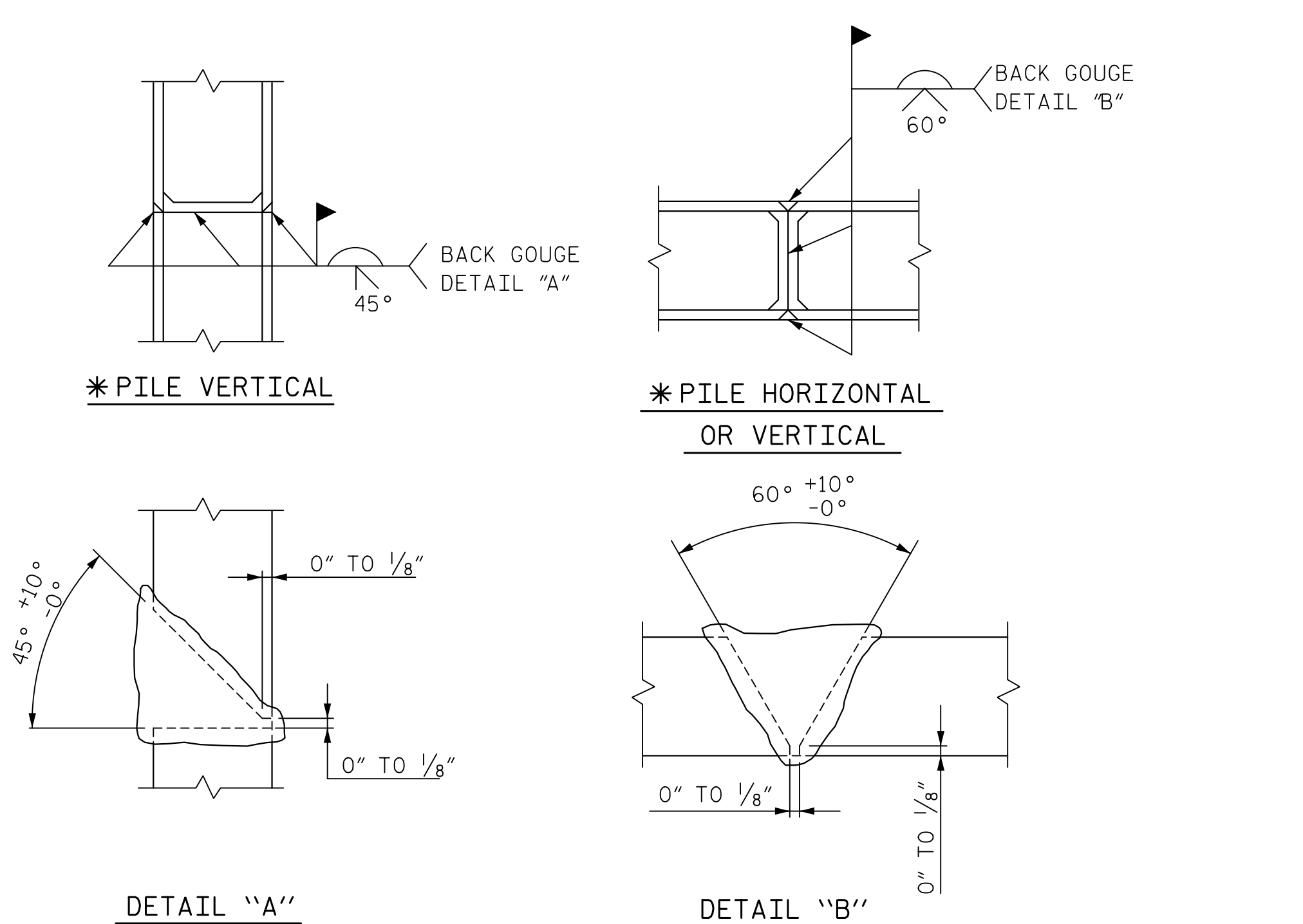
PROJECT NO. P-4900A  
ROBESON COUNTY  
STATION: POC 38+93.36 -L-  
MILE POST: 0.55  
SHEET 2 OF 3



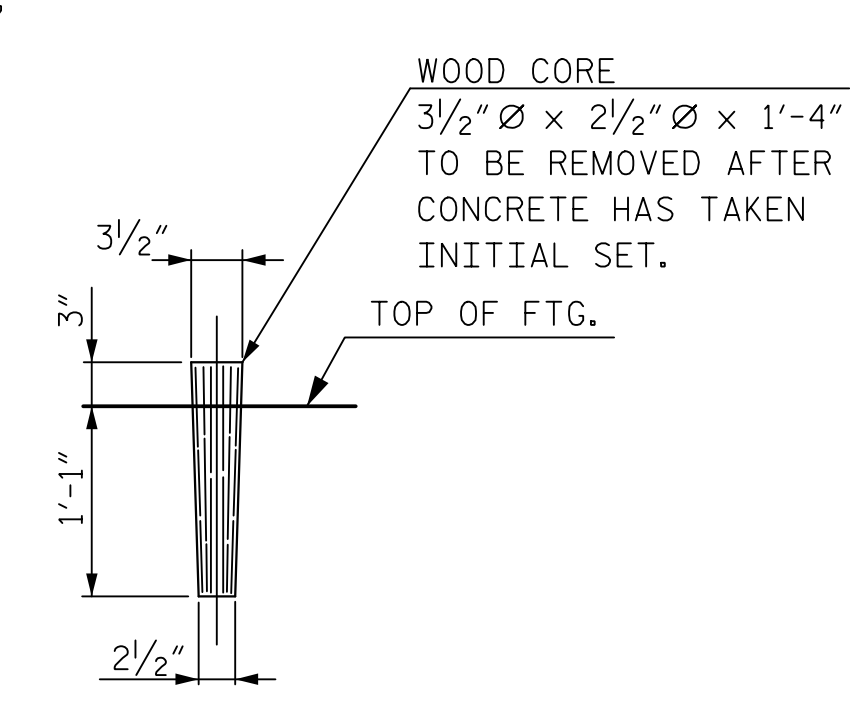
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
ABUTMENT 2

REVISIONS						SHEET NO. <b>S-47</b>
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	M. WRIGHT	8/14	3			TOTAL SHEETS <b>54</b>
2	D. RAGAN	9/14	4			

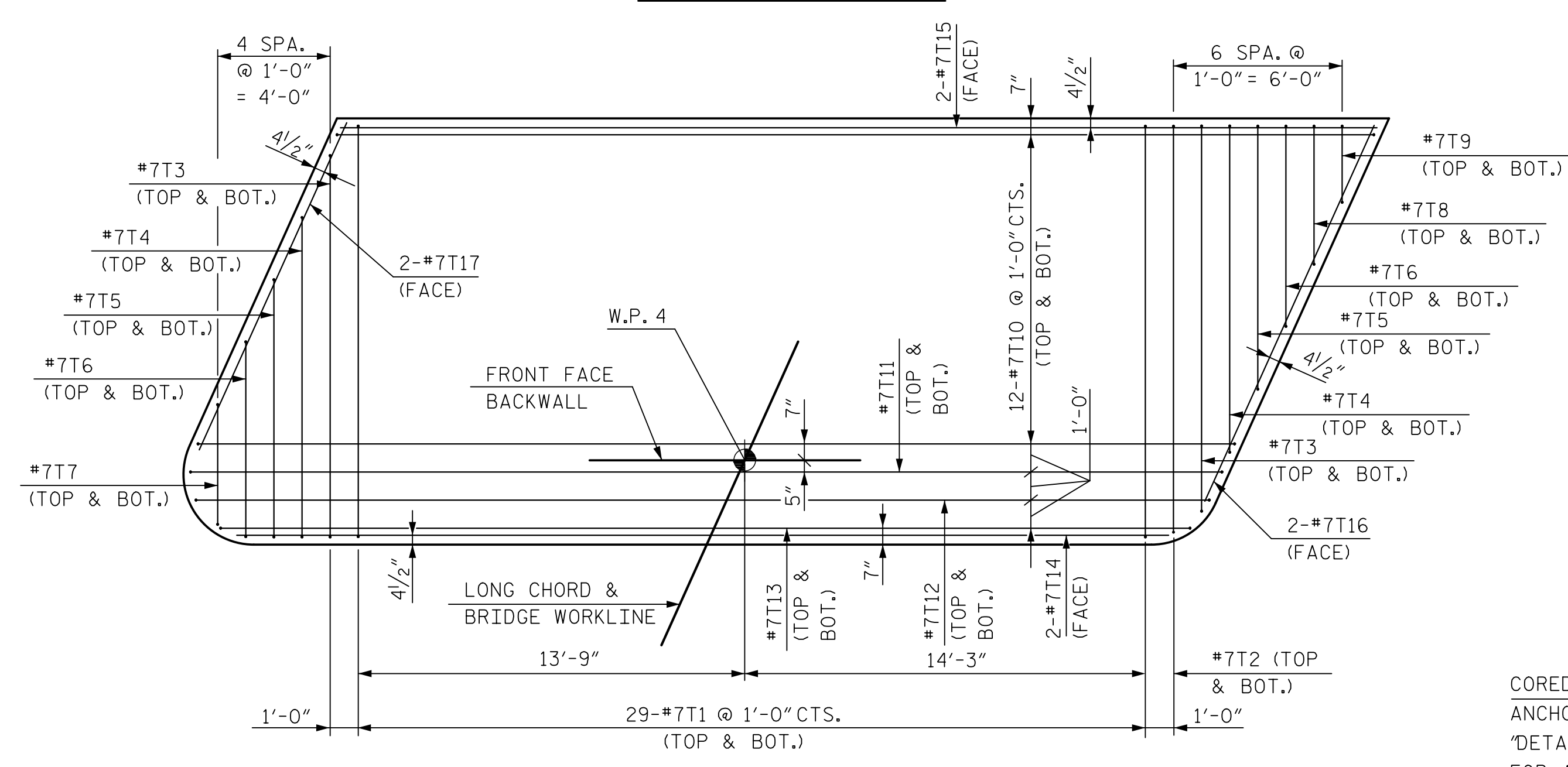
**HNTB** HNTB NORTH CAROLINA, P.C.  
License No. C-1554  
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609  
DRAWN BY: M. WRIGHT DATE: 8/14  
CHECKED BY: D. RAGAN DATE: 9/14 DWG. NO. 28



\* POSITION OF PILE DURING WELDING  
PILE SPLICE DETAILS



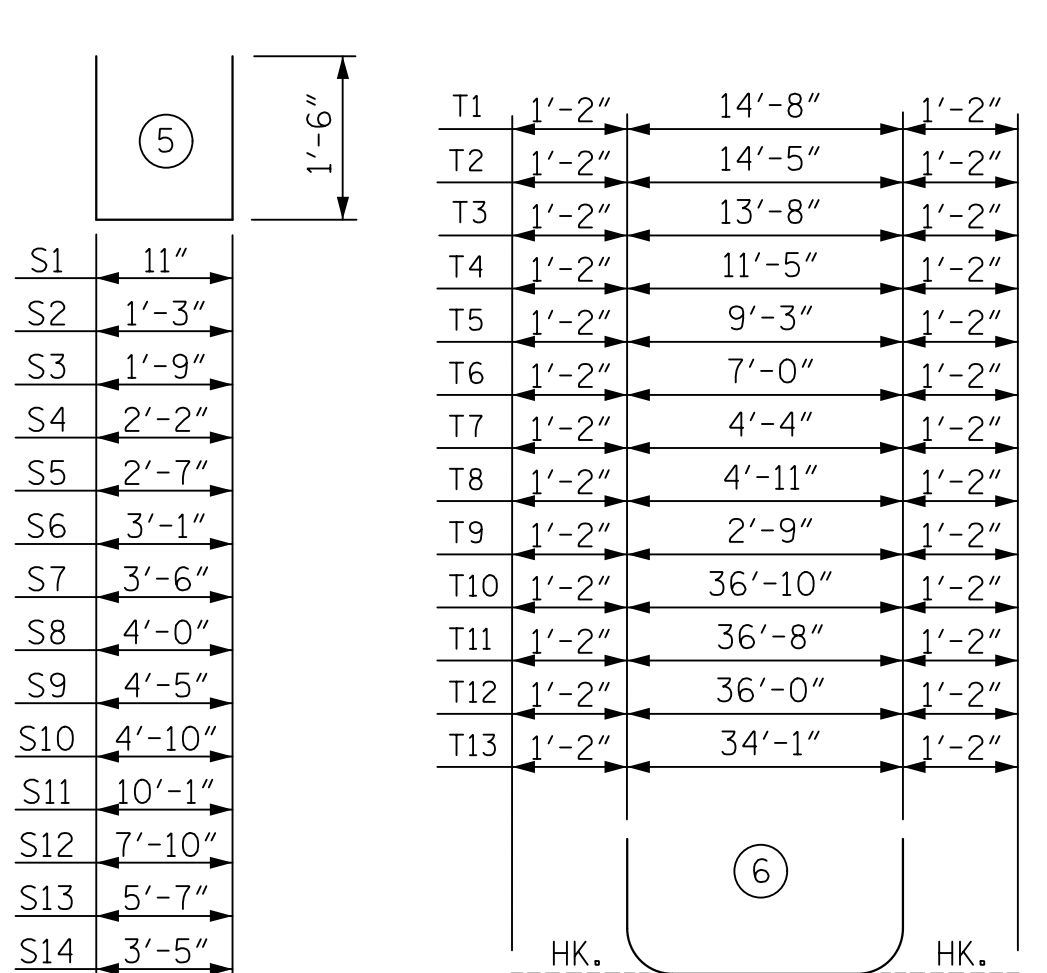
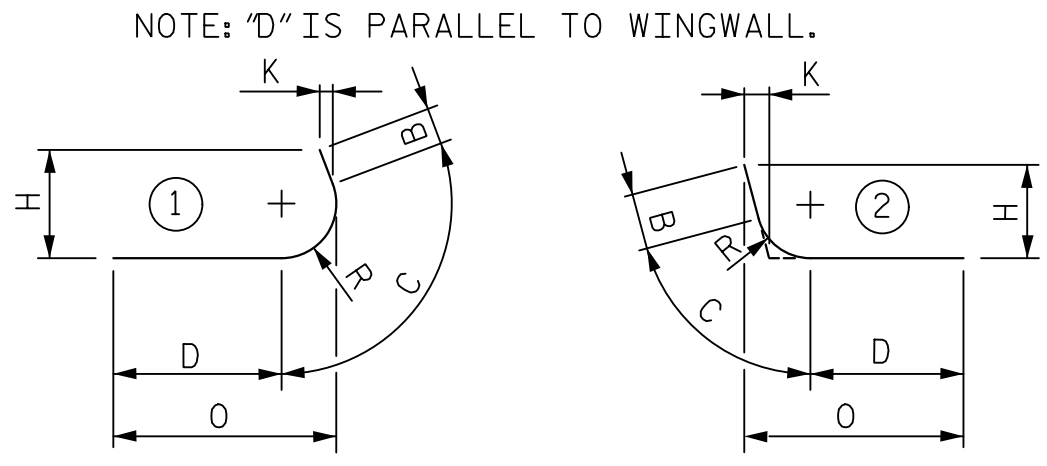
DETAIL OF WOOD CORE FOR ANCHOR BOLT HOLES



FOOTING REINFORCING PLAN

**BAR TYPES**

MARK	B	C	D	H	K	O	R
H1	5'-7"	3'-0 3/16"	8'-8 7/16"	7'-2 15/16"	2'-5 1/8"	10'-2 3/16"	1'-6 3/8"
H2	5'-3"	4'-5 3/4"	8'-8 1/4"	7'-11 1/2"	2'-4 1/4"	10'-11 1/4"	2'-3"
H3	3'-1"	1'-9 1/16"	11'-10 15/16"	3'-8 3/16"	1'-8 1/16"	14'-6 7/8"	1'-6 3/8"
H4	3'-5"	2'-6 15/16"	11'-11 1/16"	4'-5 1/4"	2'-0"	15'-4 1/2"	2'-3"



ALL BAR DIMENSIONS ARE OUT TO OUT

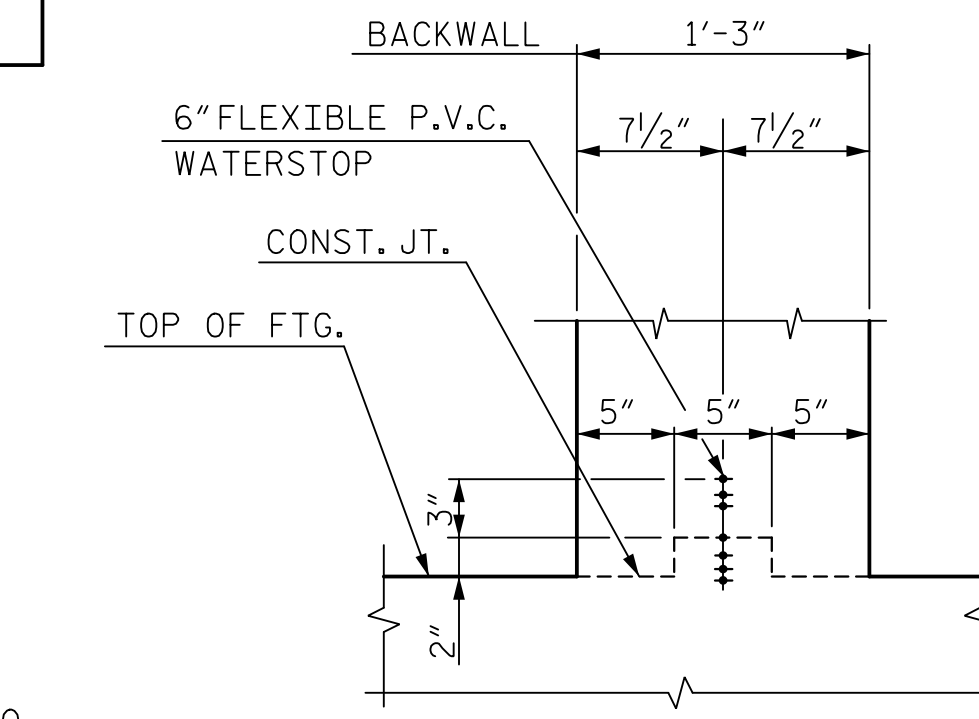
**BILL OF REINFORCING**

**ABUTMENT 2**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	12	5	1	17'-4"	217
H2	12	5	1	18'-5"	231
H3	12	5	2	16'-9"	210
H4	12	5	2	17'-11"	224
K1	12	5	STR.	31'-11"	399
K2	6	5	3	9'-3"	58
K3	6	5	4	13'-7"	85
S1	23	5	5	3'-11"	94
S2	1	5	5	4'-3"	4
S3	1	5	5	4'-9"	5
S4	1	5	5	5'-2"	5
S5	1	5	5	5'-7"	6
S6	1	5	5	6'-1"	6
S7	1	5	5	6'-6"	7
S8	1	5	5	7'-0"	7
S9	1	5	5	7'-5"	8
S10	1	5	5	7'-10"	8
S11	1	5	5	13'-1"	14
S12	1	5	5	10'-10"	11
S13	1	5	5	8'-7"	9
S14	1	5	5	6'-5"	7
T1	58	7	6	17'-0"	2,015
T2	2	7	6	16'-9"	68
T3	4	7	6	16'-0"	131
T4	4	7	6	13'-9"	112
T5	4	7	6	11'-7"	95
T6	4	7	6	9'-4"	76
T7	2	7	6	6'-8"	27
T8	2	7	6	7'-3"	30
T9	2	7	6	5'-1"	21
T10	24	7	6	39'-2"	1,921
T11	2	7	6	39'-0"	159
T12	2	7	6	38'-4"	157
T13	2	7	6	36'-5"	149
T14	2	7	STR.	33'-1"	135
T15	2	7	STR.	36'-10"	151
T16	2	7	STR.	15'-2"	62
T17	2	7	STR.	13'-3"	54
V1	46	7	STR.	8'-6"	799
V2	23	5	STR.	8'-6"	204
V3	29	7	STR.	14'-2"	840
V4	58	5	STR.	14'-2"	857
V5	2	5	STR.	10'-10"	23
V6	14	5	STR.	8'-4"	122

**QUANTITIES**

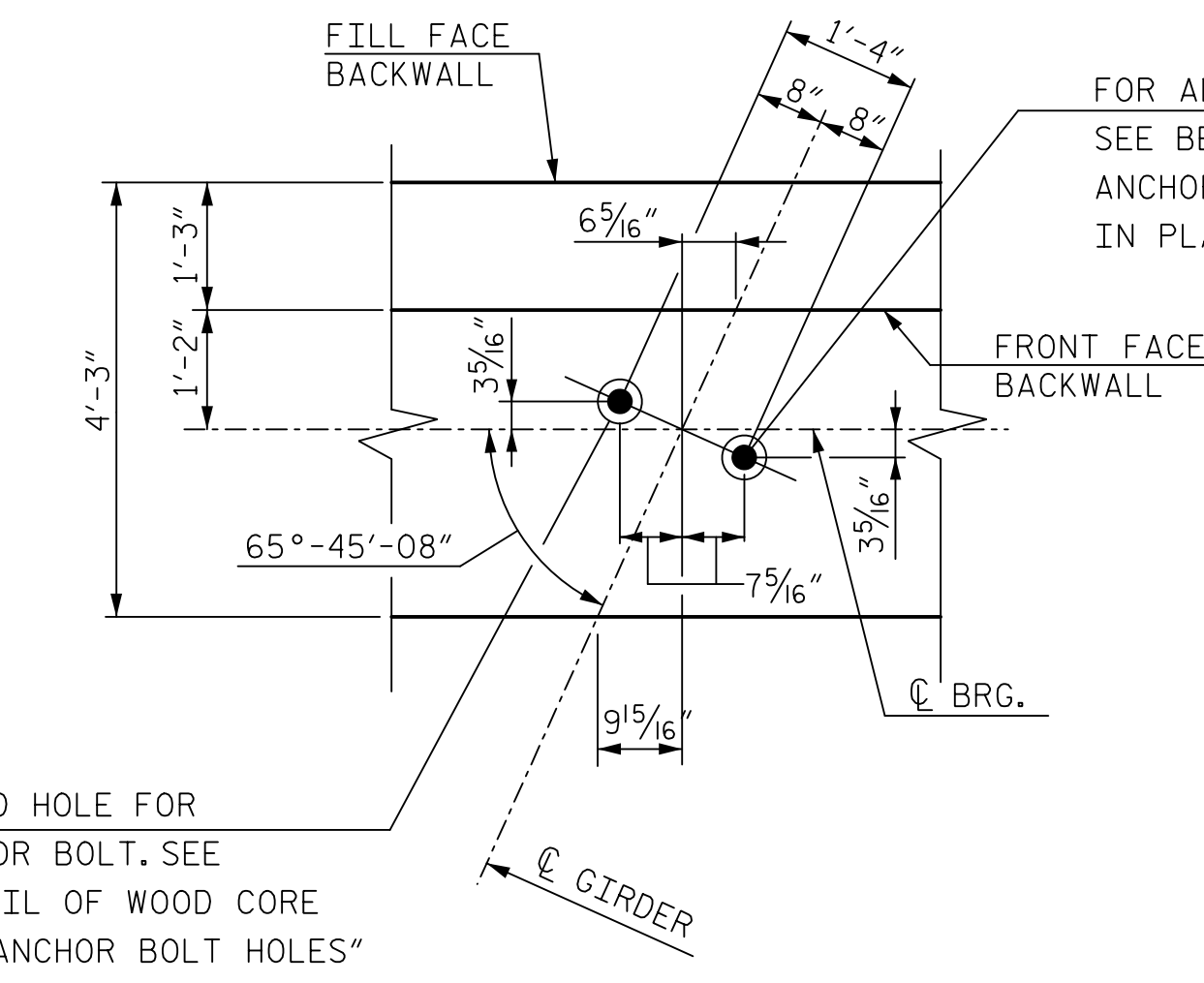
ITEM	TOTAL
REINFORCING STEEL	LBS. 9,823
CAST-IN-PLACE CONCRETE (4,000 PSI):	
POUR 1 - FOOTING	CU. YDS. 94.0
POUR 2 - BACKWALL & WINGS	CU. YDS. 29.0
TOTAL	CU. YDS. 123.0
HP 12 X 53 STEEL PILES	NO. 15
	L.F. 1,200



WATERSTOP DETAIL

**NOTES:**

"T" BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR ANCHOR BOLTS.  
FOR FOOTING LAYOUT AND DIMENSIONS, SEE SHEET 1 OF 3.



CORED HOLE FOR ANCHOR BOLT. SEE "DETAIL OF WOOD CORE FOR ANCHOR BOLT HOLES" (TYP.)

ANCHOR BOLT LAYOUT DETAIL

DocuSigned by: **Paul J. Barber** (Professional Engineer Seal 12916, 2/27/2015)

DocuSigned by: **David W. Hawkins** (Professional Engineer Seal 27812, 2/27/2015)

PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POC 38+93.36 -L-  
 MILE POST: 0.55  
 SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

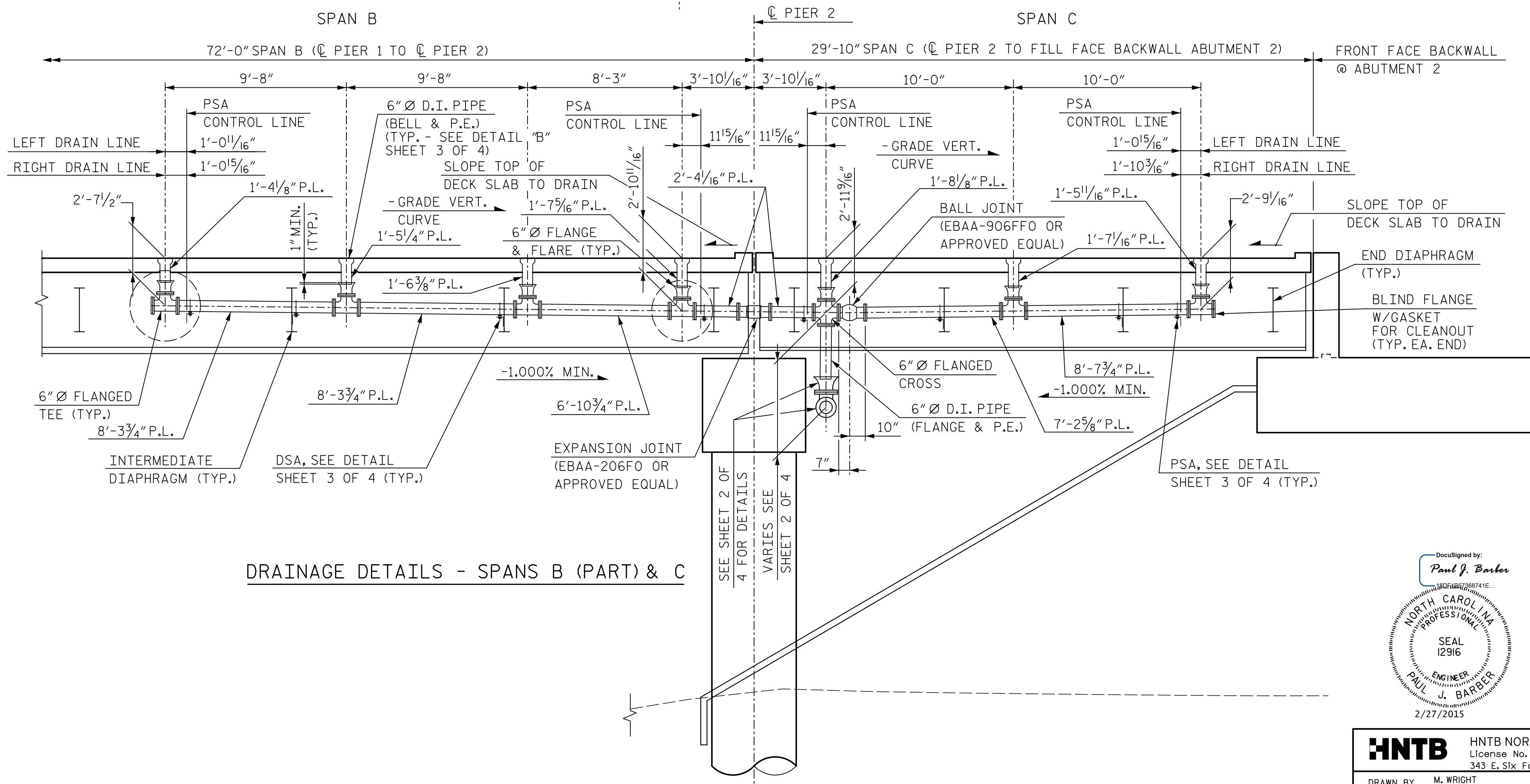
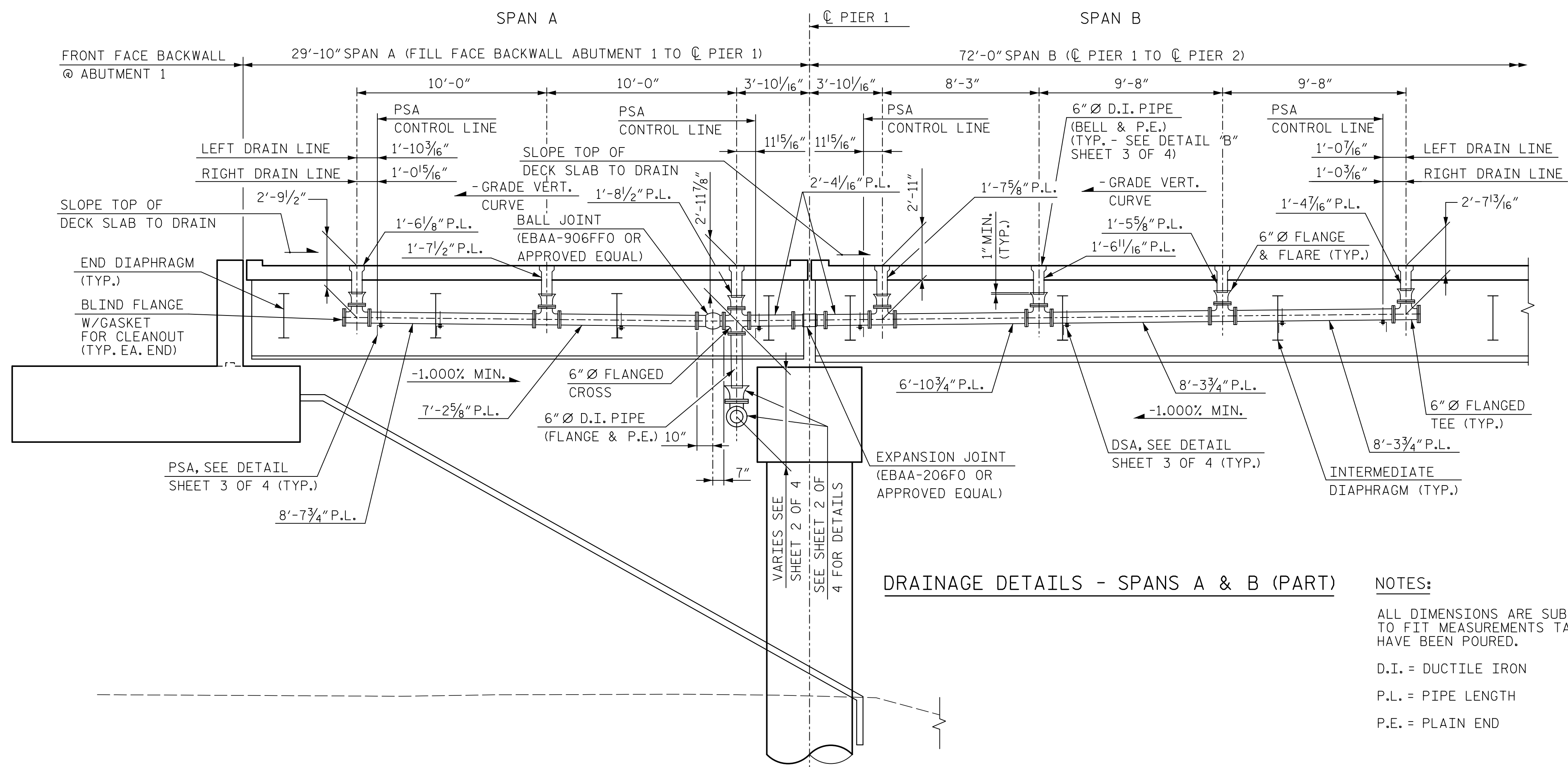
**SUBSTRUCTURE**

**ABUTMENT 2**

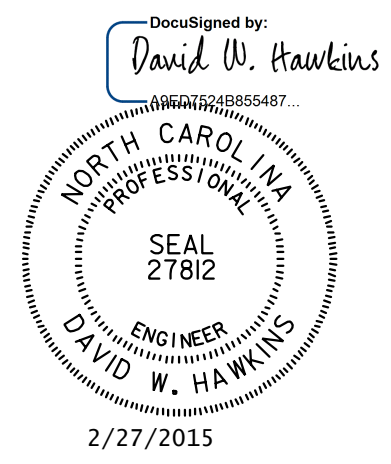
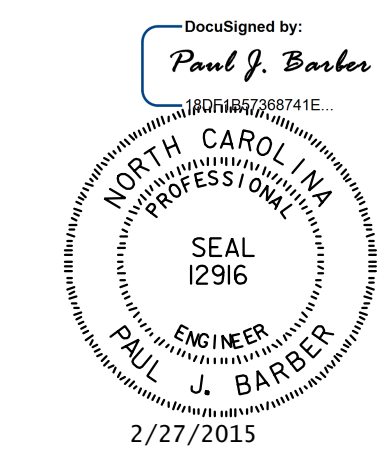
**HNTB** HNTB NORTH CAROLINA, P.C.  
 License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48	
1	M. WRIGHT	8/14	3			TOTAL SHEETS 54	
2	D. RAGAN	9/14	4				

DRAWN BY: M. WRIGHT DATE: 8/14 DWG. NO. 29  
 CHECKED BY: D. RAGAN DATE: 9/14

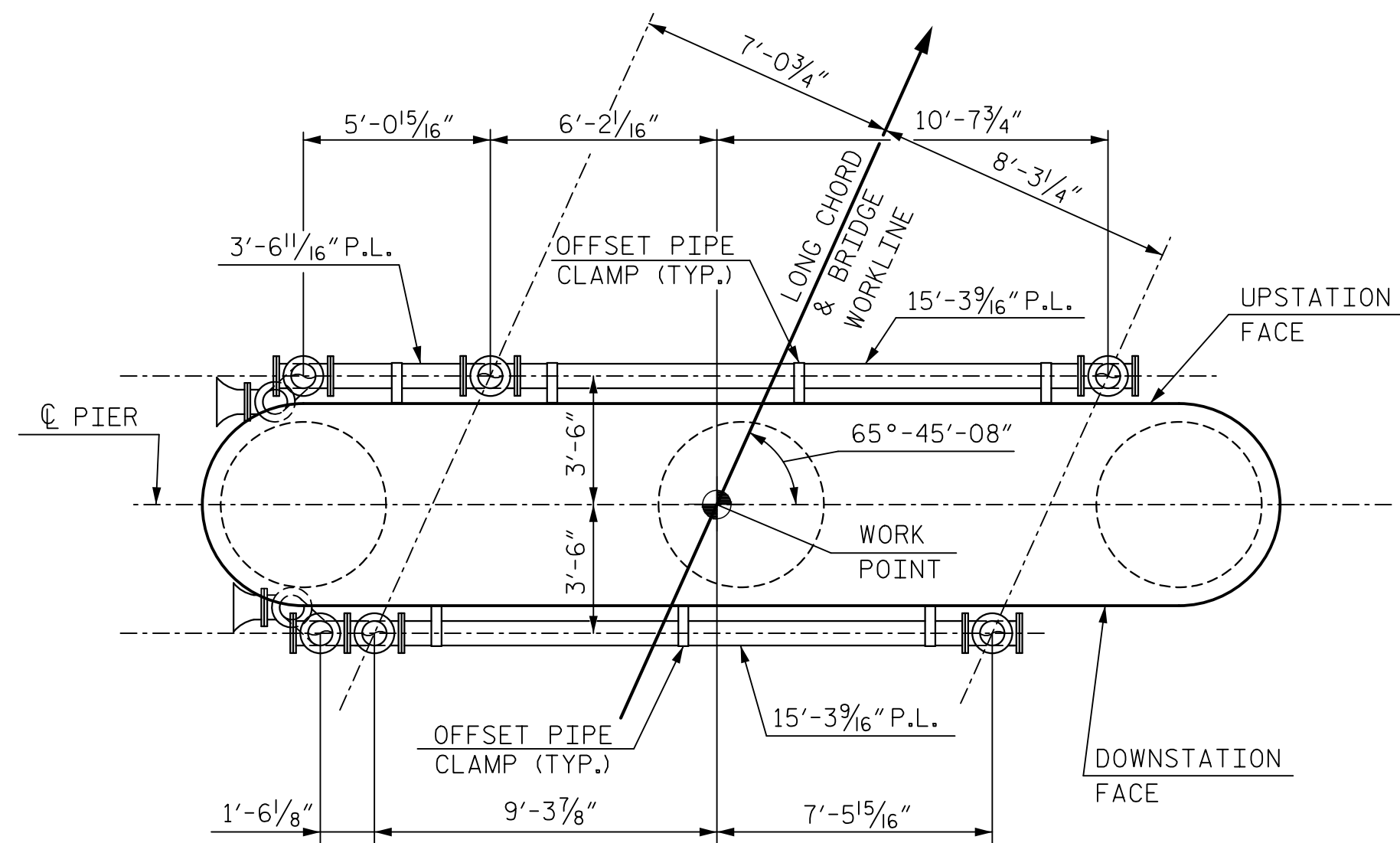


PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POC 38+93.36 -L-  
 MILE POST: 0.55  
 SHEET 1 OF 4

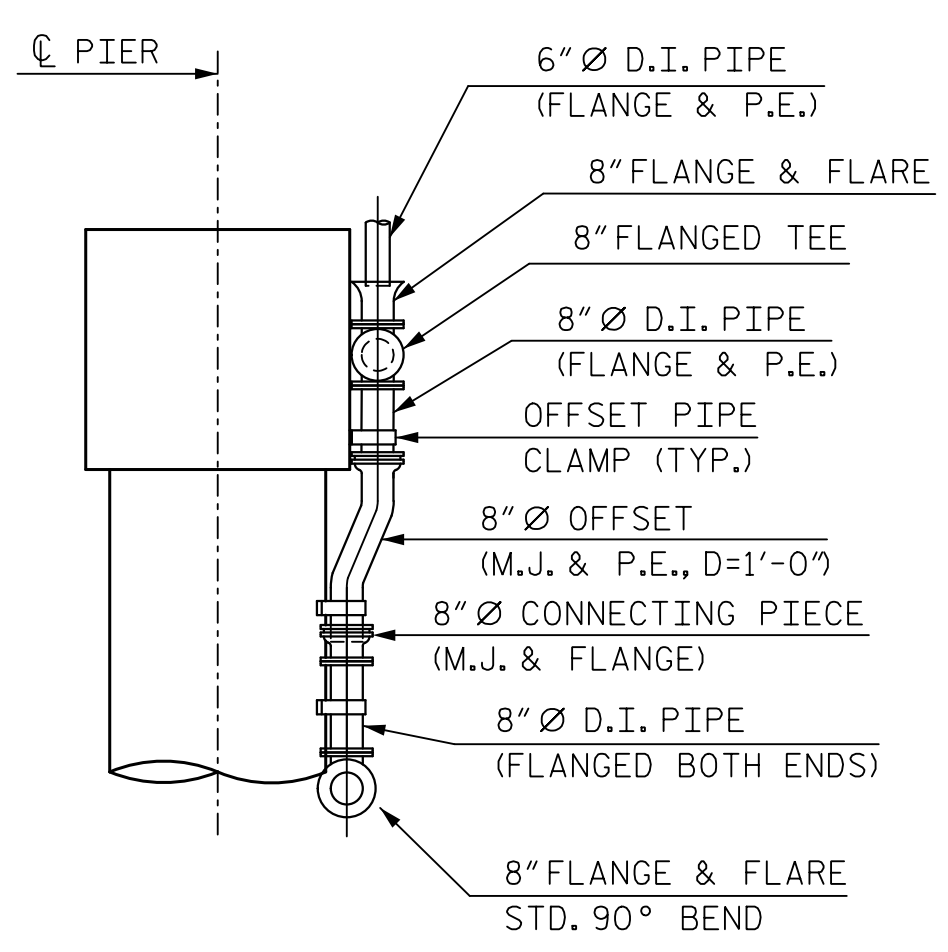


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**STRUCTURE  
 DRAINAGE  
 DETAILS**

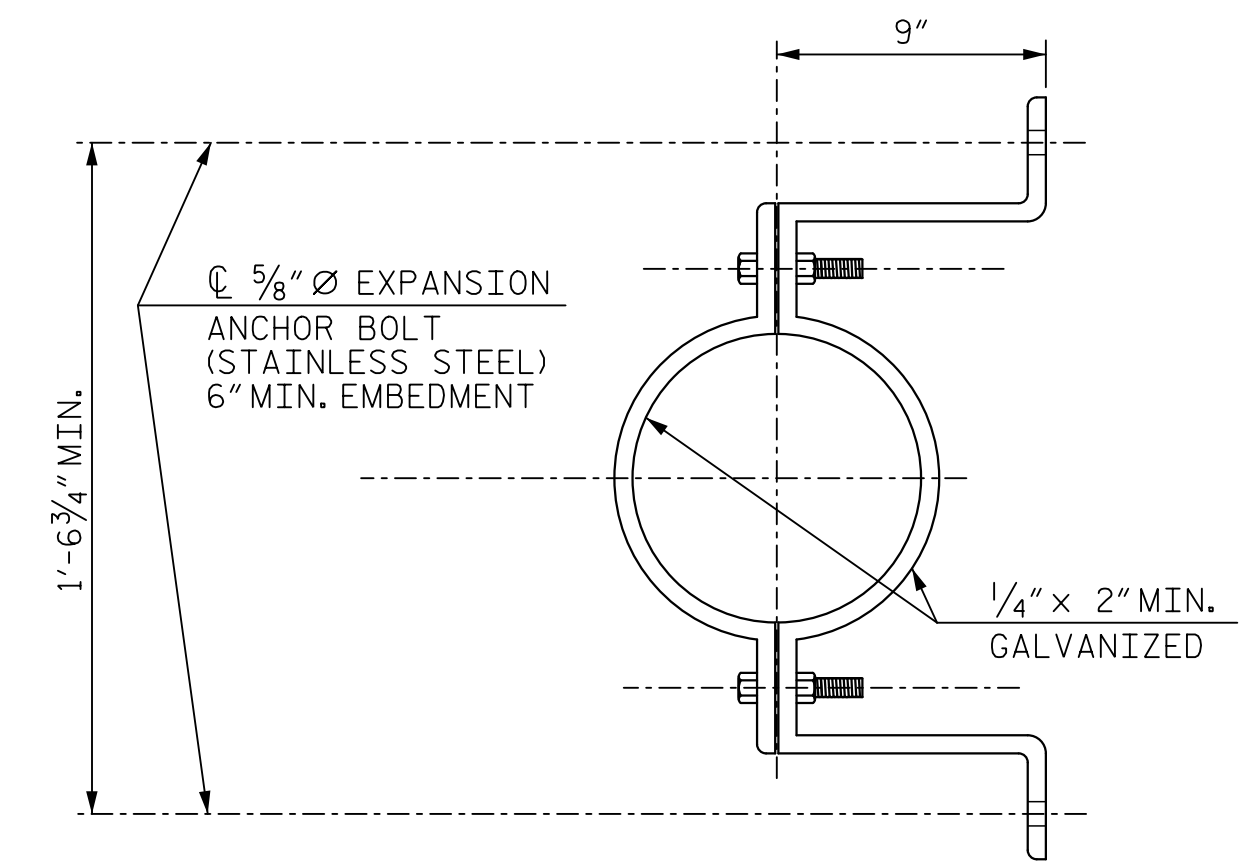
<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DWG. NO. 30	
DRAWN BY: M. WRIGHT	DATE: 7/14	CHECKED BY: D. HAWKINS	DATE: 9/14		
REVISIONS				SHEET NO. <b>S-49</b>	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
				TOTAL SHEETS <b>54</b>	



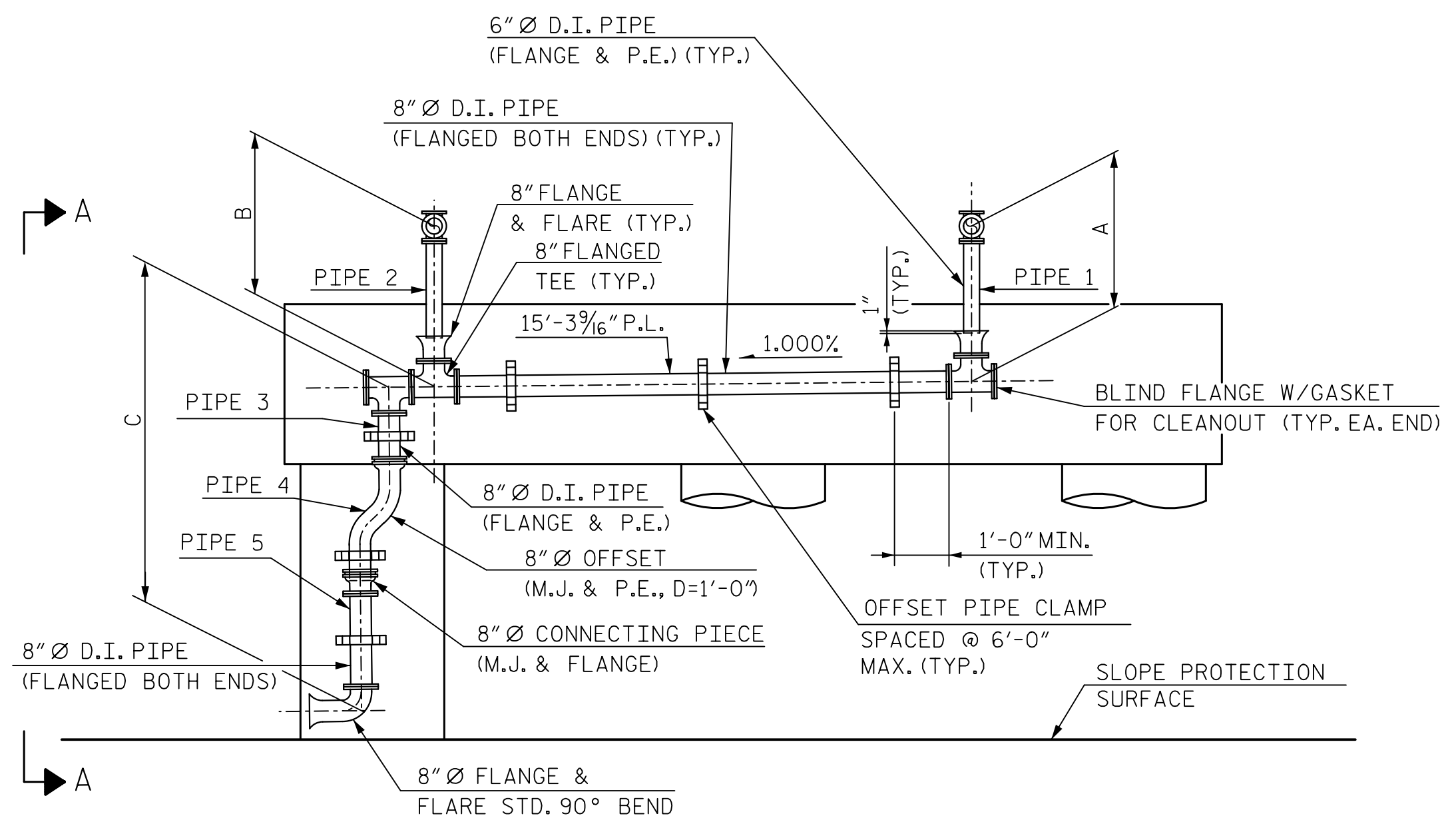
**TYPICAL DRAINAGE LAYOUT DETAILS AT PIERS**  
(DOWNSTATION FACE PIER 1 ONLY; UPSTATION FACE PIER 2 ONLY)



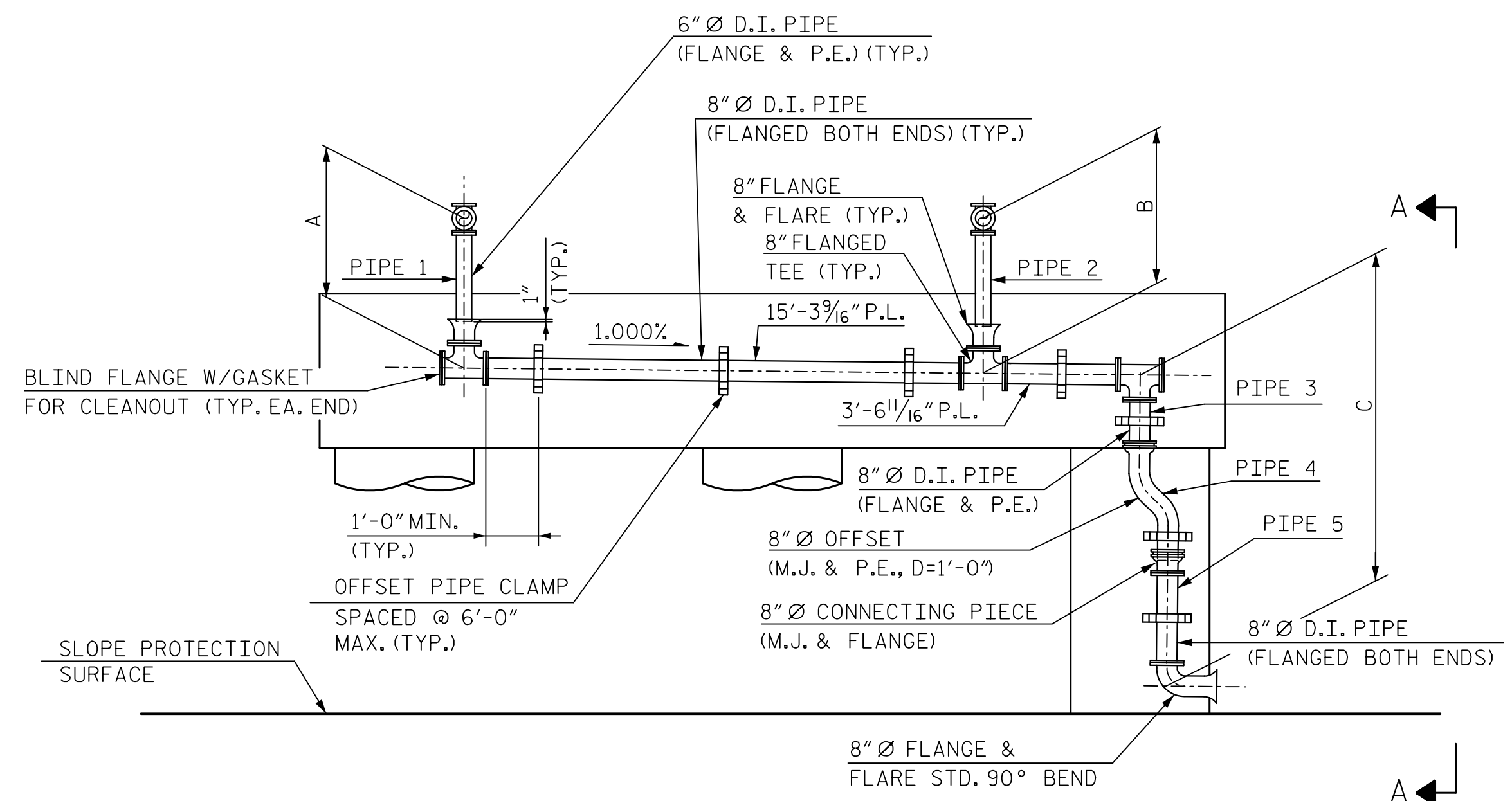
**VIEW A-A**  
(PIER 1 SHOWN, PIER 2 OPPOSITE HAND)



**OFFSET PIPE CLAMP DETAIL**



**ELEVATION - PIER 1**



**ELEVATION - PIER 2**

**NOTES:**

ALL DIMENSIONS ARE SUBJECT TO ADJUSTMENTS TO FIT MEASUREMENTS TAKEN AFTER DECKS HAVE BEEN POURED.

D.I. = DUCTILE IRON

P.L. = PIPE LENGTH

P.E. = PLAIN END

M.J. = MECHANICAL JOINT

DIMENSIONS			
LOCATION	A	B	C
PIER 1, SPAN A	4'-11 3/8"	5'-1 1/2"	8'-11 1/2"
PIER 2, SPAN C	5'-1 1/8"	5'-3 3/4"	8'-7 1/2"

PIPE LENGTHS					
LOCATION	1	2	3	4	5
PIER 1, SPAN A	2'-9 7/8"	2'-11 1/4"	1'-6"	3'-0"	2'-3 1/8"
PIER 2, SPAN C	2'-10 7/8"	3'-1"	1'-6"	3'-0"	1'-11 1/8"

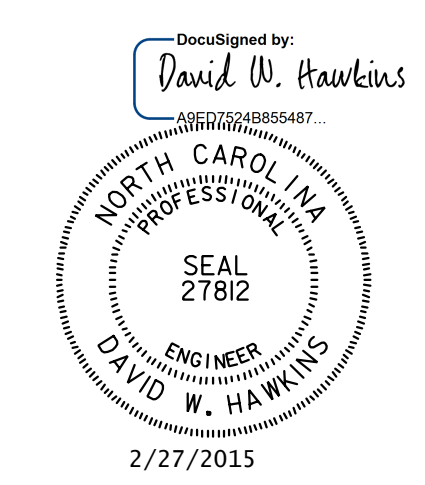
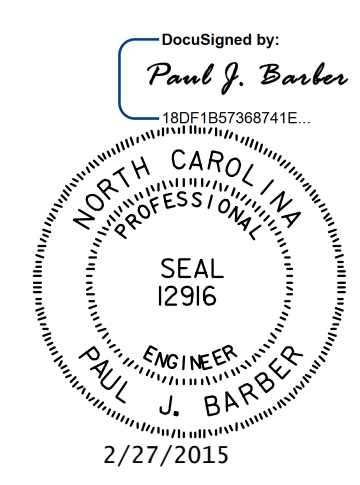
PROJECT NO. P-4900A

ROBESON COUNTY

STATION: POC 38+93.36 -L-

MILE POST: 0.55

SHEET 2 OF 4



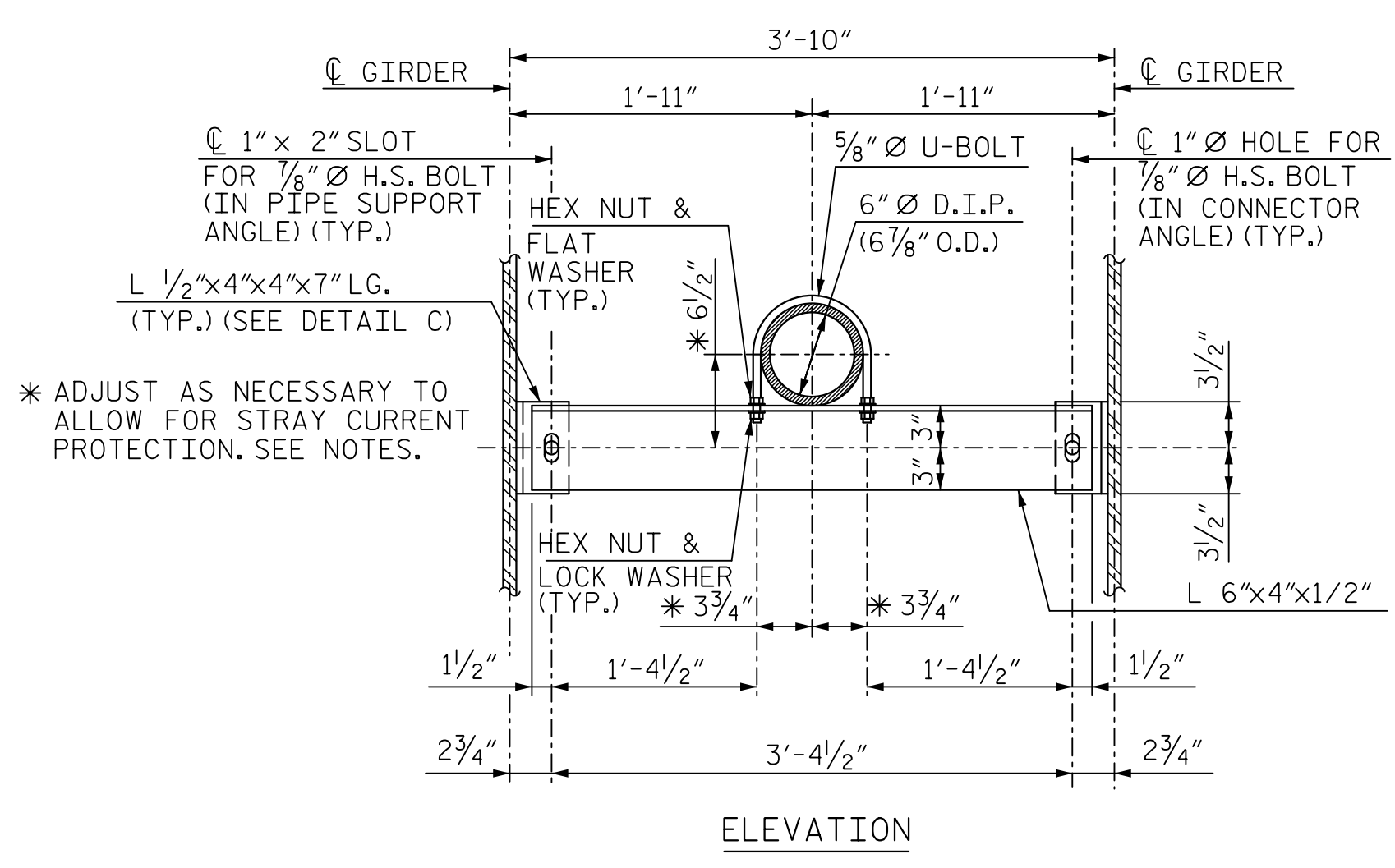
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**STRUCTURE**  
**DRAINAGE**  
**DETAILS**

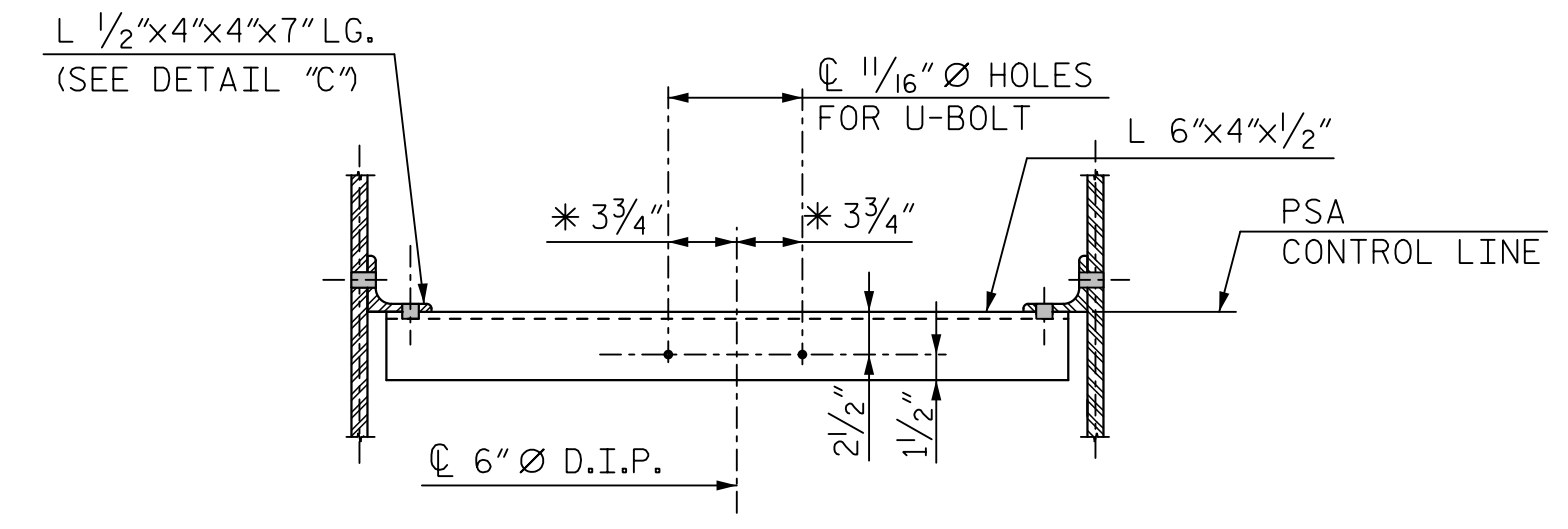
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-50
1			3			TOTAL SHEETS
2			4			54

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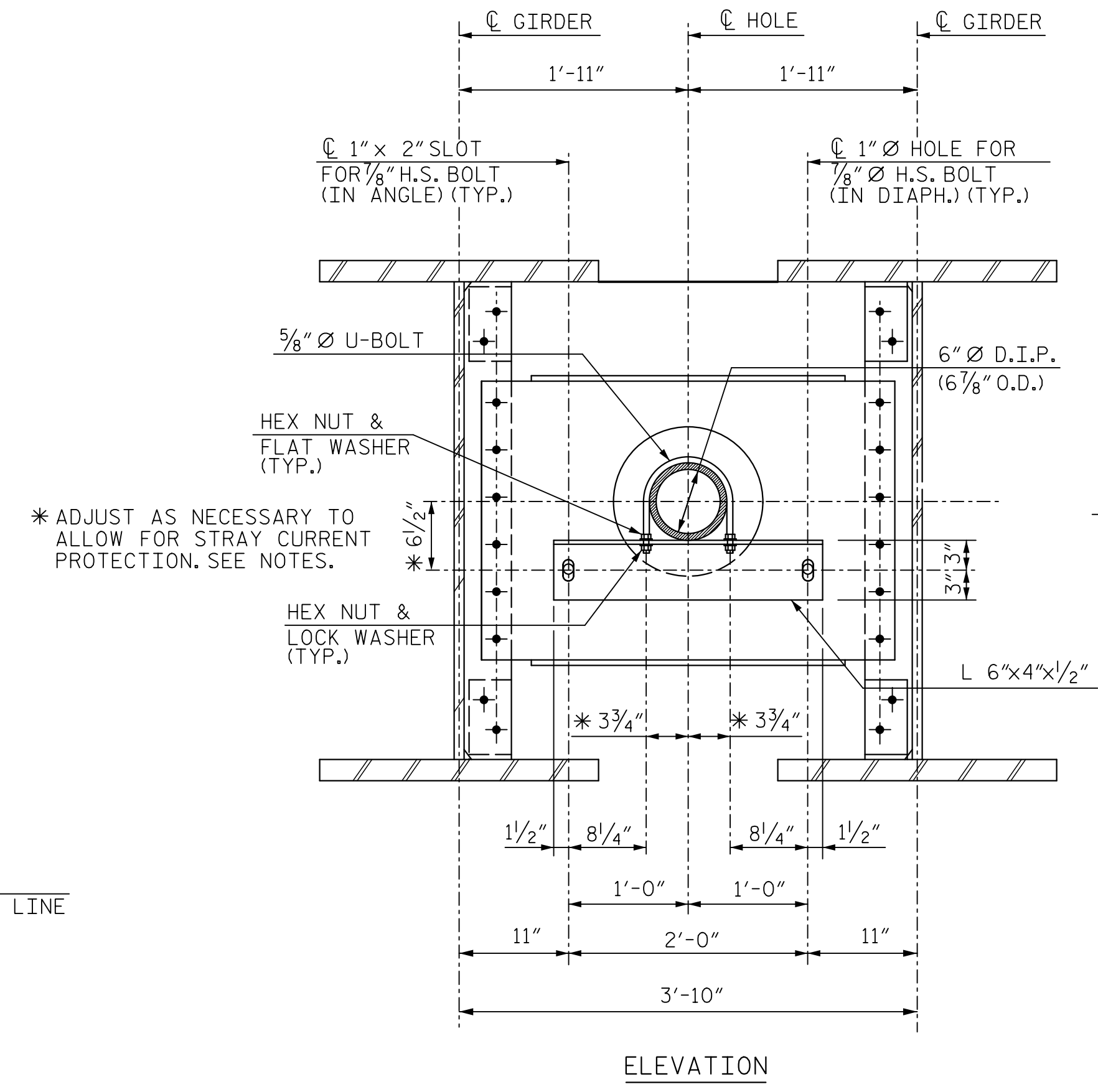
DRAWN BY: M. WRIGHT DATE: 7/14  
CHECKED BY: D. HAWKINS DATE: 9/14 DWG. NO. 31



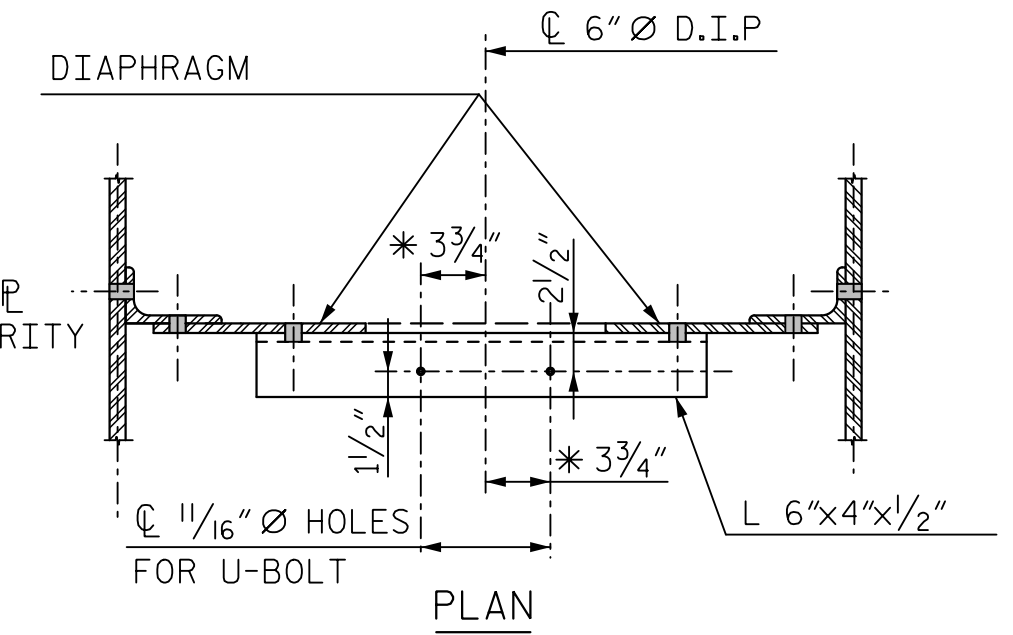
\* ADJUST AS NECESSARY TO ALLOW FOR STRAY CURRENT PROTECTION. SEE NOTES.



**PIPE SUPPORT ANGLE (PSA)**  
 (8 REQ'D., SEE FRAMING PLAN AND DRAINAGE DETAILS SHEET 1 OF 4 FOR LOCATION AND ORIENTATION)

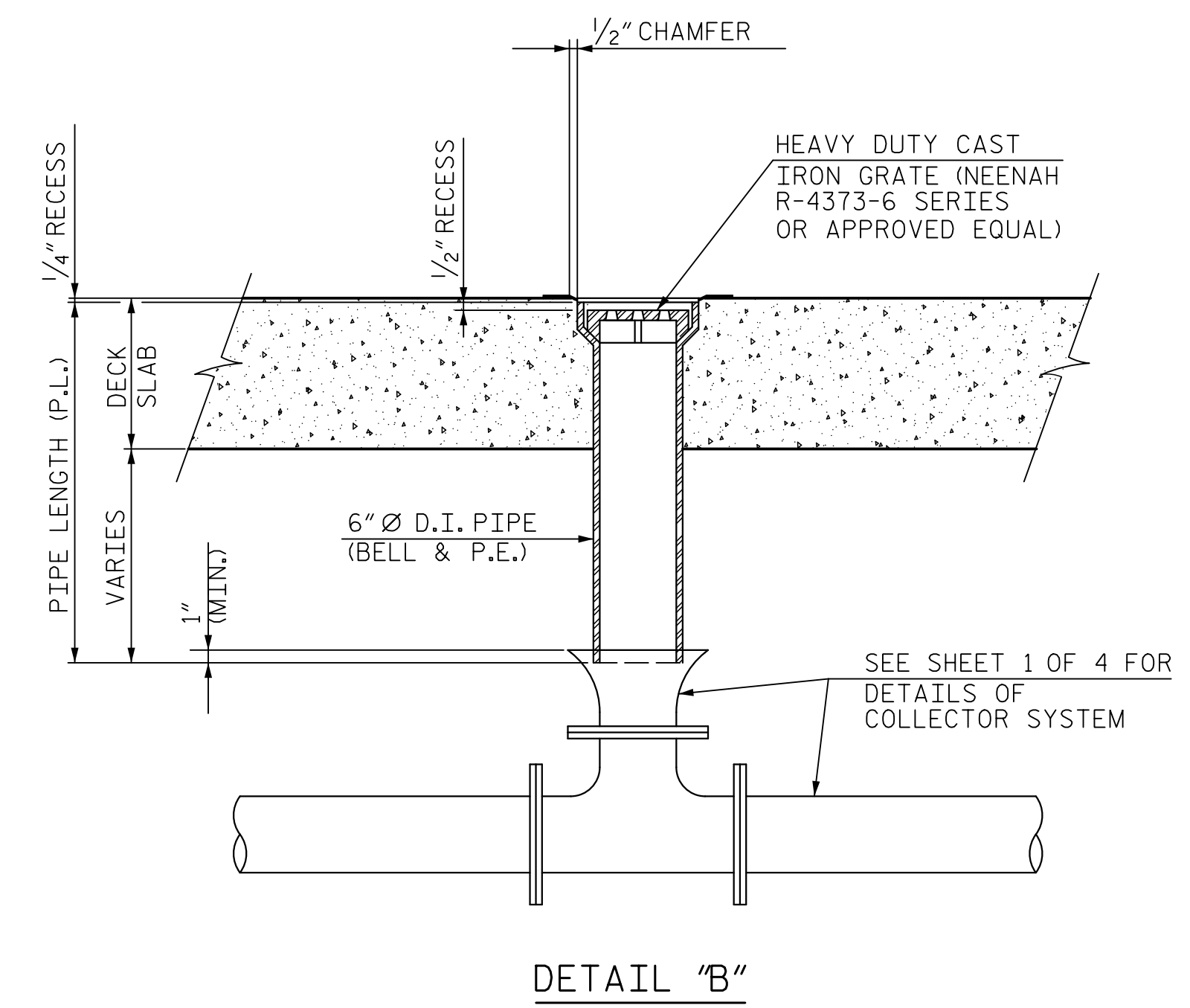


\* ADJUST AS NECESSARY TO ALLOW FOR STRAY CURRENT PROTECTION. SEE NOTES.



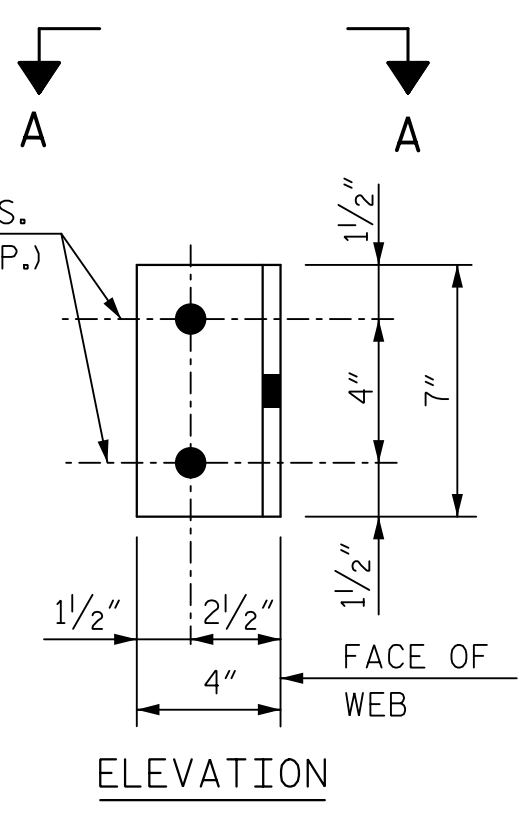
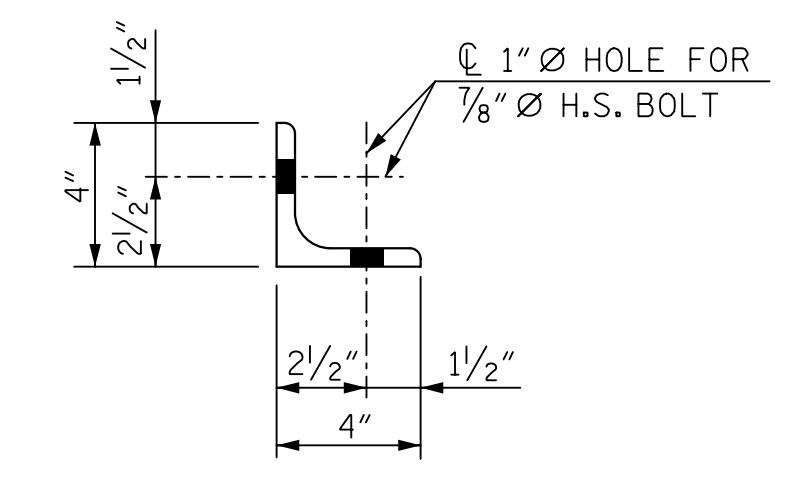
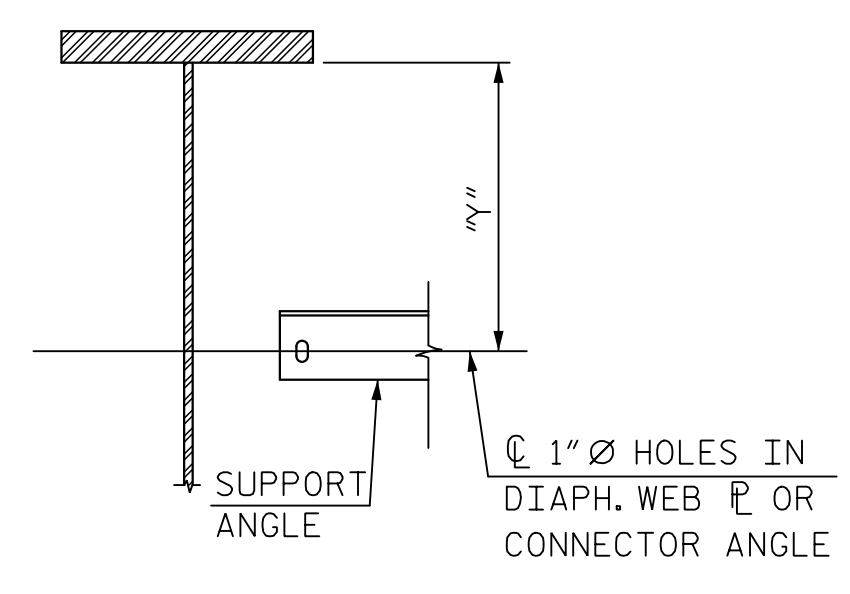
NOTE: DIAPHRAGM FLANGE NOT SHOWN FOR CLARITY

**DIAPHRAGM SUPPORT ANGLE (DSA)**  
 (24 REQ'D.)



DSA	"γ"	DSA	"γ"	DSA	"γ"
A1	2'-6 7/16"	B1	2'-6 5/16"	C1	2'-7 5/16"
A2	2'-7 11/16"	B2	2'-5"	C2	2'-6"
		B3	2'-4 11/16"		
		B4	2'-6"		

PSA	"γ"	PSA	"γ"	PSA	"γ"
A1	2'-6 7/8"	B1	2'-7 1/2"	C1	2'-7 13/16"
A2	2'-6"	B2	2'-7 7/16"	C2	2'-7 5/8"
A3	2'-8 1/8"	B3	2'-4 5/16"	C3	2'-5 9/16"
A4	2'-8 1/8"	B4	2'-4 1/4"	C4	2'-5 5/8"
		B5	2'-4"		
		B6	2'-4"		
		B7	2'-7 1/8"		
		B8	2'-7 3/16"		



**DETAIL "C"**  
 (L 4" x 4" x 1/2")

**NOTES:**

ALL PIPES, FLANGES AND FITTINGS SHALL BE CLASS 53 DUCTILE IRON.  
 ALL BENDS TO BE SHORT RADIUS, INCLUDING FLANGE & FLARE BENDS, UNLESS OTHERWISE NOTED.

FOR LOCATIONS AND DESIGNATIONS OF DSA & PSA, SEE FRAMING PLAN.  
 PIPE LENGTHS SHOWN ALLOW FOR 1/8" THICK GASKETS TO BE USED AT ALL BOLTED FLANGE CONNECTIONS.

MAKE FINAL PIPE ALIGNMENT AND TIGHTEN U-BOLTS AFTER RAILROAD TRACK HAS BEEN LAID ACROSS THE BRIDGE.

PAYMENT FOR ALL MATERIALS, FABRICATION, INSTALLATION AND ADJUSTMENTS RELATED TO STRUCTURE DRAINAGE SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE BID FOR "STRUCTURE DRAINAGE SYSTEM". NO SEPARATE MEASUREMENT OR PAYMENT SHALL BE MADE FOR ANY COMPONENT OF THE STRUCTURE DRAINAGE SYSTEM INCLUDING, BUT NOT LIMITED TO:

- DUCTILE IRON PIPE AND FITTINGS AND CAST IRON GRATES
- GASKETS AND PVC OR NEOPRENE COATED STRIPS
- STEEL SUPPORT ANGLES
- U-BOLTS AND H.S. BOLTS, WASHERS AND NUTS
- OFFSET PIPE CLAMPS AND EXPANSION ANCHOR BOLTS
- EXPANSION JOINT
- BALL JOINT

PROVIDE PVC OR NEOPRENE-COATED STRIPS, EPOXY-CEMENTED TO THE U-BOLT OR PIPE FOR STRAY CURRENT PROTECTION.

THE OUTSIDE COATING FOR D.I. PIPE SHALL BE PAINTED WITH A SHOP PRIME COAT OF INORGANIC ZINC PRIMER AND A FINISH (FIELD) COATING OF ACRYLIC PAINT AS SPECIFIED FOR THE STRUCTURAL STEEL.

FOR STRUCTURE DRAINAGE SYSTEM, SEE SPECIAL PROVISIONS.

STRUCTURE DRAINAGE SYSTEM ESTIMATED QUANTITIES		
ITEM	UNIT	TOTAL
8" I.D. DUCTILE IRON PIPE, CLASS 53 (FLANGED BOTH ENDS)	FEET	38'-4 1/16"
8" I.D. DUCTILE IRON PIPE, CLASS 53 (FLANGE & P.E.)	FEET	3'-0"
8" I.D. DUCTILE IRON PIPE OFFSET, 250 psi P.R. (M.J. & P.E.)	LBS	390
8" I.D. DUCTILE IRON PIPE CONNECTING PIECE, 250 psi P.R. (M.J. & FLANGE)	LBS	170
8" I.D. DUCTILE IRON PIPE FLANGED FITTINGS, 250 psi P.R.	LBS	1,430
8" I.D. DUCTILE IRON BLIND FLANGES	LBS	168
8" I.D. OFFSET PIPE CLAMPS	EA.	13
6" I.D. DUCTILE IRON PIPE, CLASS 53 (FLANGED BOTH ENDS)	FEET	176'-3"
6" I.D. DUCTILE IRON PIPE, CLASS 53 (FLANGE & P.E.)	FEET	11'-8 1/4"
6" I.D. DUCTILE IRON PIPE, CLASS 53 (BELL & P.E.)	FEET	43'-0 7/8"
6" I.D. DUCTILE IRON PIPE FLANGED FITTINGS, 250 psi P.R.	LBS	3,880
6" I.D. DUCTILE IRON BLIND FLANGES	LBS	200
BALL JOINT	EA.	4
EXPANSION JOINT	EA.	4
HEAVY DUTY CAST IRON GRATES	EA.	28
PIPE SUPPORT ANGLES (PSA) *	EA.	16
DIAPHRAGM SUPPORT ANGLES (DSA) *	EA.	16

\* INCLUDES U-BOLTS, ANGLES, NUTS, BOLTS, AND WASHERS.

PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POC 38+93.36 -L-  
 MILE POST: 0.55  
 SHEET 3 OF 4

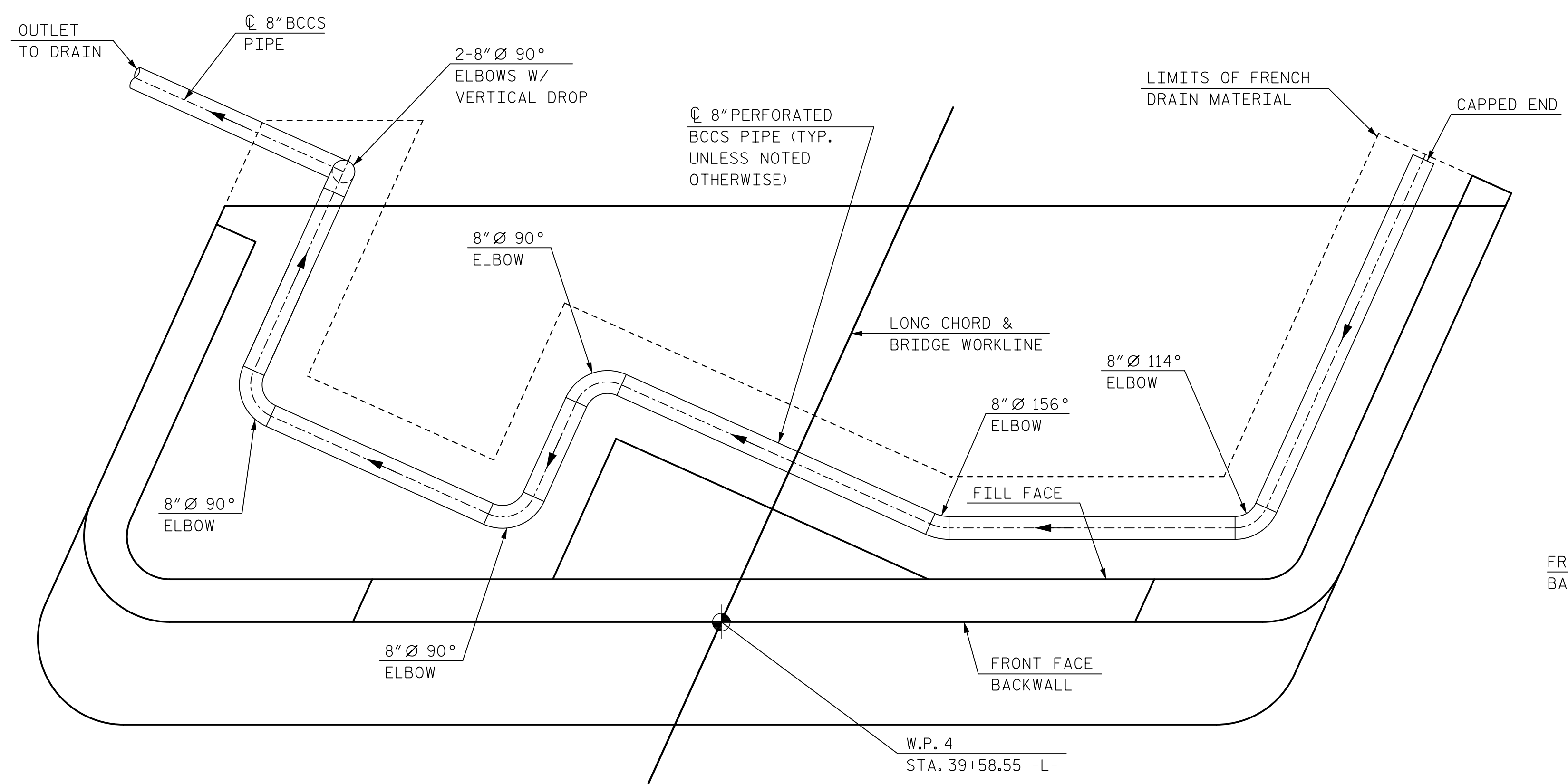
Designed by: **Paul J. Barber**  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 12916  
 2/27/2015

Designed by: **David W. Hawkins**  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 27812  
 2/27/2015

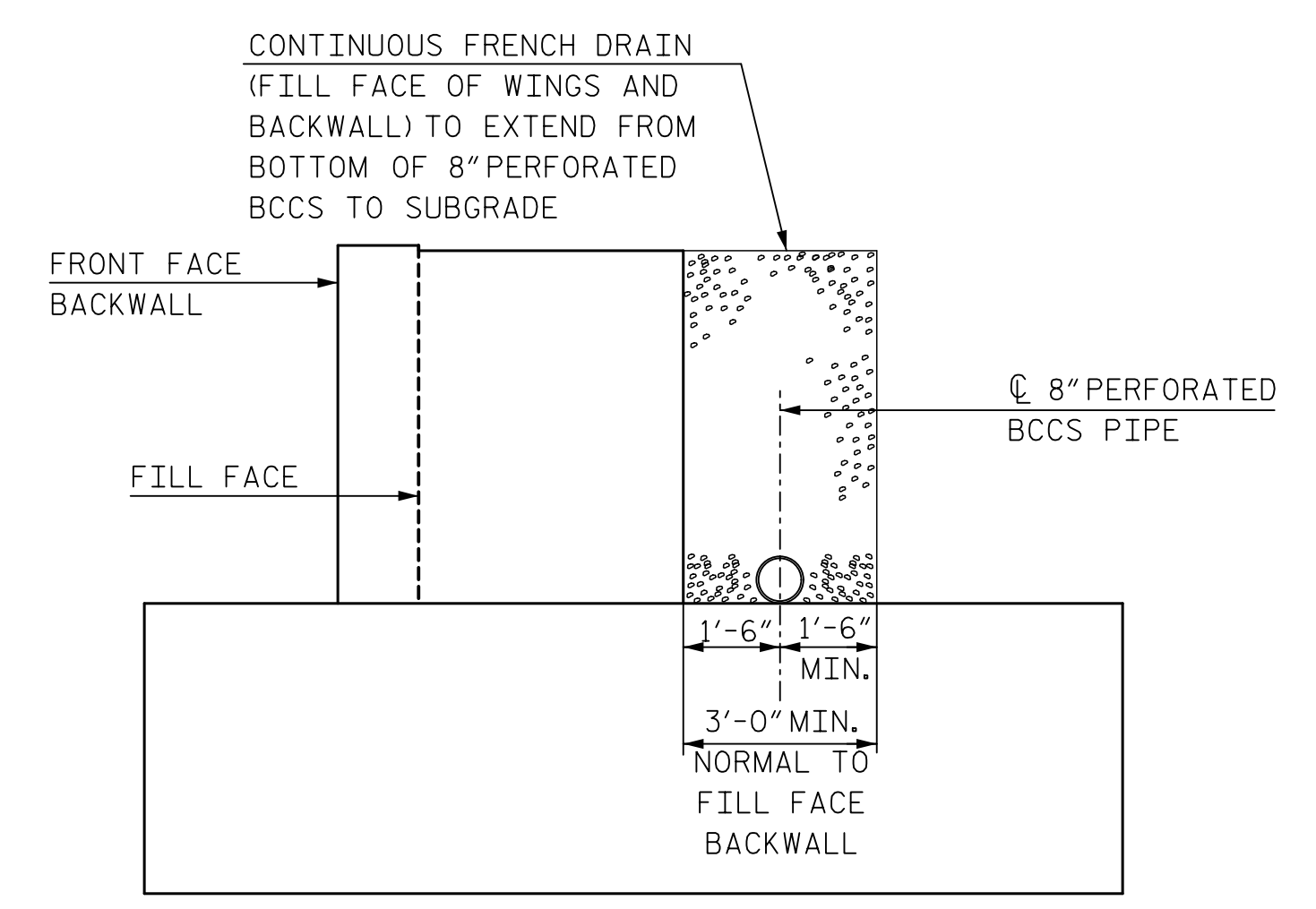
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**STRUCTURE DRAINAGE DETAILS**

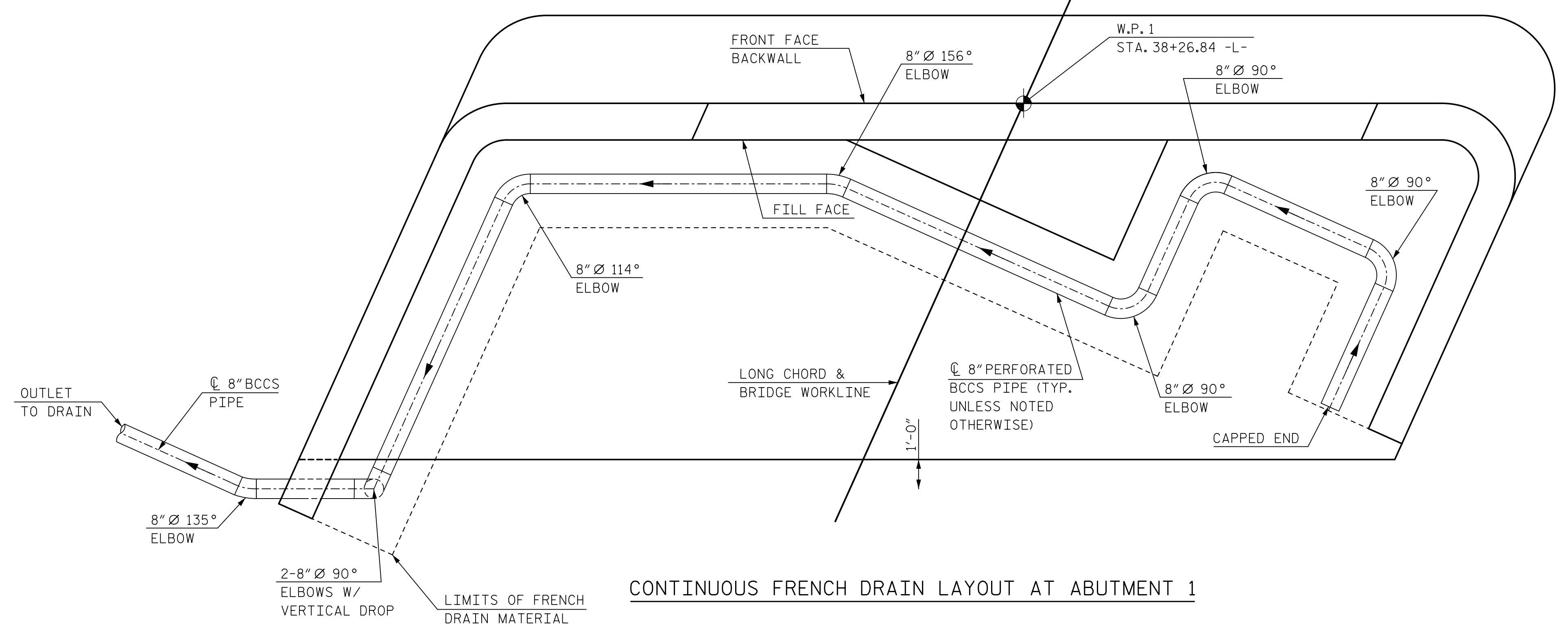
<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO. <b>S-51</b>	
DRAWN BY	M. WRIGHT	DATE	7/14	NO.	3	DATE	
CHECKED BY	P. BARBER	DATE	9/14	NO.	4	DATE	
DWG. NO. 32				TOTAL SHEETS		54	



CONTINUOUS FRENCH DRAIN LAYOUT AT ABUTMENT 2

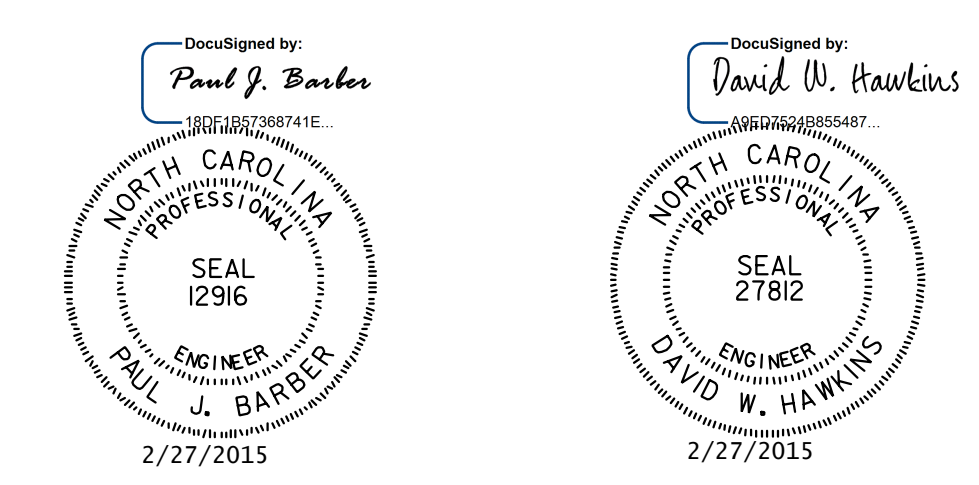


CONTINUOUS FRENCH DRAIN DETAIL



CONTINUOUS FRENCH DRAIN LAYOUT AT ABUTMENT 1

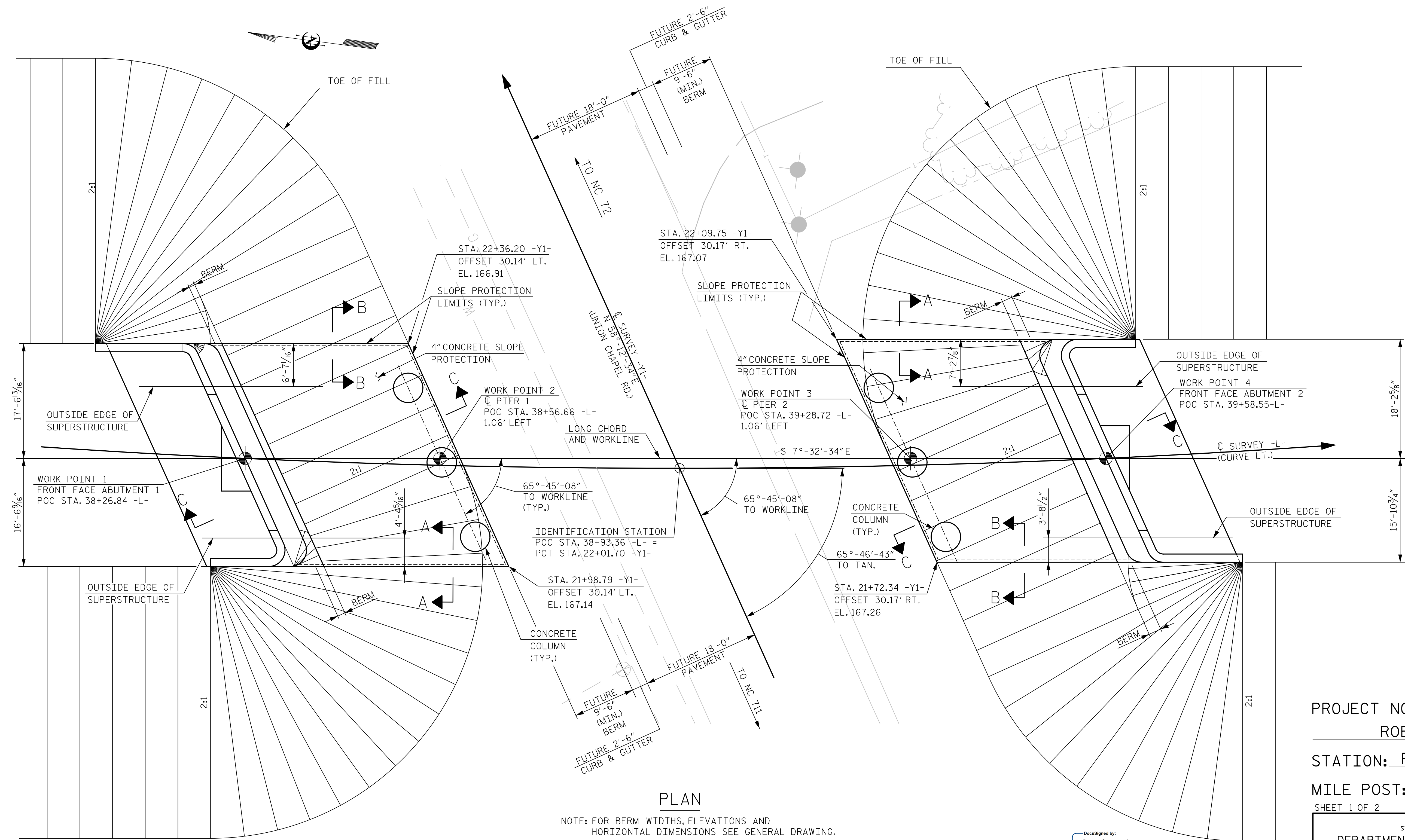
PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POC 38+93.36 -L-  
 MILE POST: 0.55  
 SHEET 4 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**STRUCTURE  
 DRAINAGE  
 DETAILS**

<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO.
DRAWN BY	M. WRIGHT	DATE	7/14	NO.	BY:	DATE:
CHECKED BY	D. HAWKINS	DATE	9/14	1		
DWG. NO. 33				2		
						TOTAL SHEETS
						54



**PLAN**

NOTE: FOR BERM WIDTHS, ELEVATIONS AND HORIZONTAL DIMENSIONS SEE GENERAL DRAWING.  
FOR SECTIONS A-A, B-B, & C-C SEE SHEET 2 OF 2.

PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POC 38+93.36 -L-  
 MILE POST: 0.55  
 SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SLOPE PROTECTION  
 DETAILS**

DocuSigned by:  
**Paul J. Barber**  
 License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DocuSigned by:  
**David W. Hawkins**  
 License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

SEAL 12916  
 ENGINEER  
 PAUL J. BARBER  
 2/27/2015

SEAL 27812  
 ENGINEER  
 DAVID W. HAWKINS  
 2/27/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-53
1			3			TOTAL SHEETS
2			4			54

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 License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY M. WRIGHT DATE 8/14  
 CHECKED BY P. BARBER DATE 9/14 DWG. NO. 34



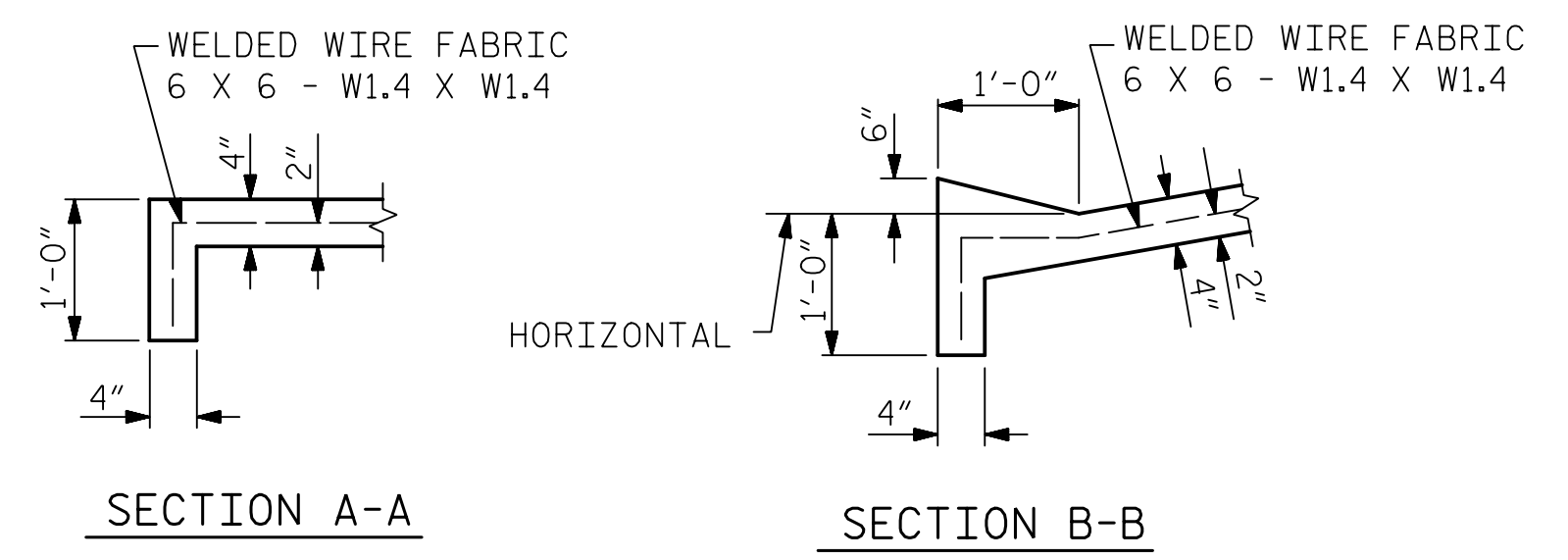
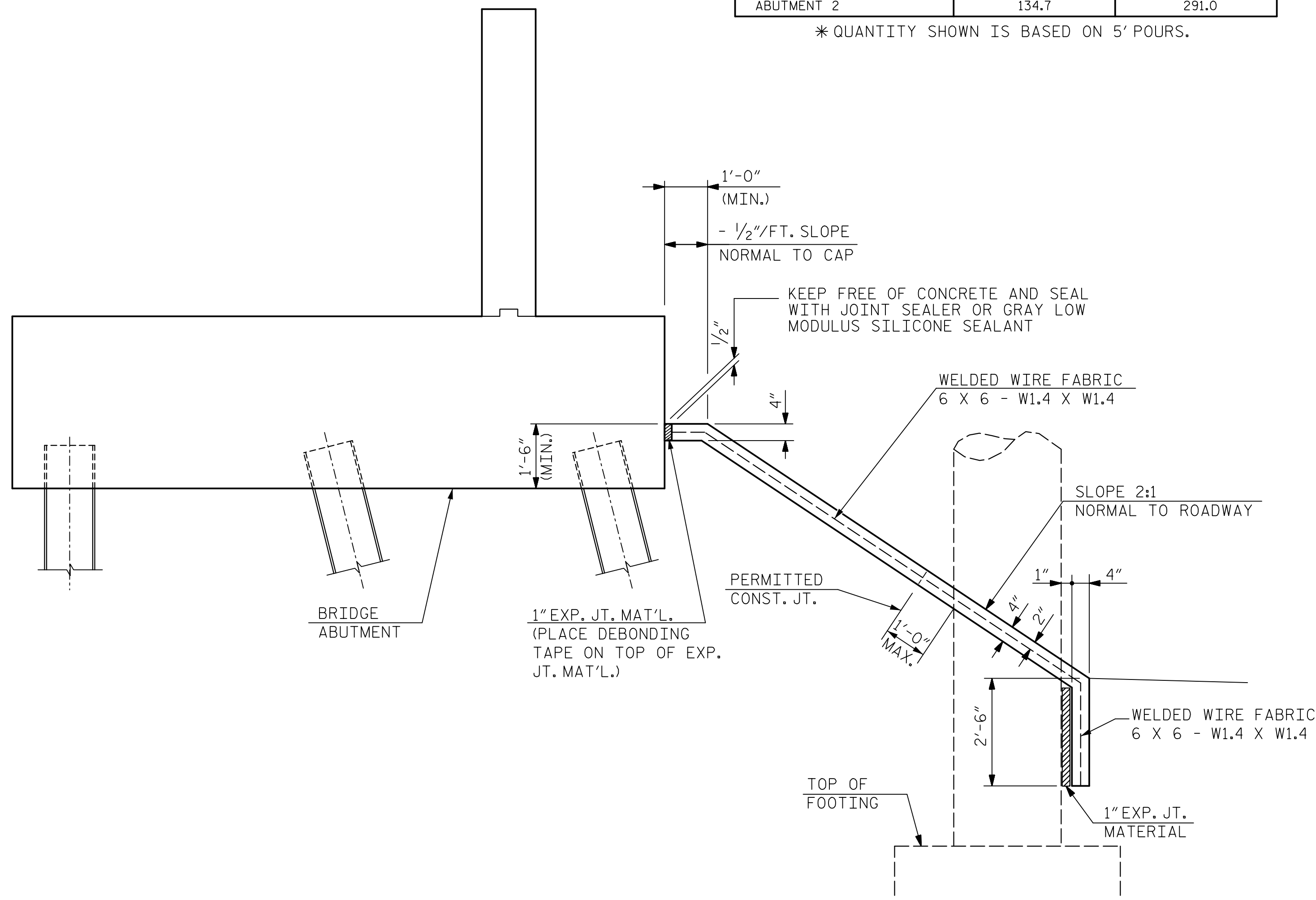
BRIDGE @ POC STA. 38+93.36 -L-	4" SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
ABUTMENT 1	134.3	290.1
ABUTMENT 2	134.7	291.0

\* QUANTITY SHOWN IS BASED ON 5' POURS.

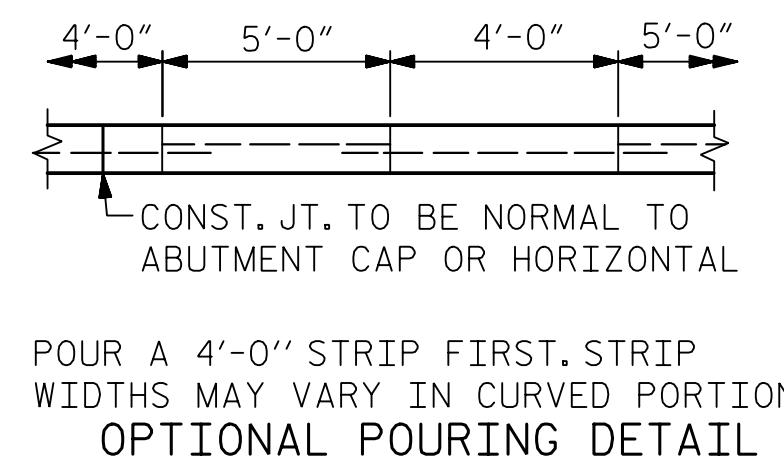
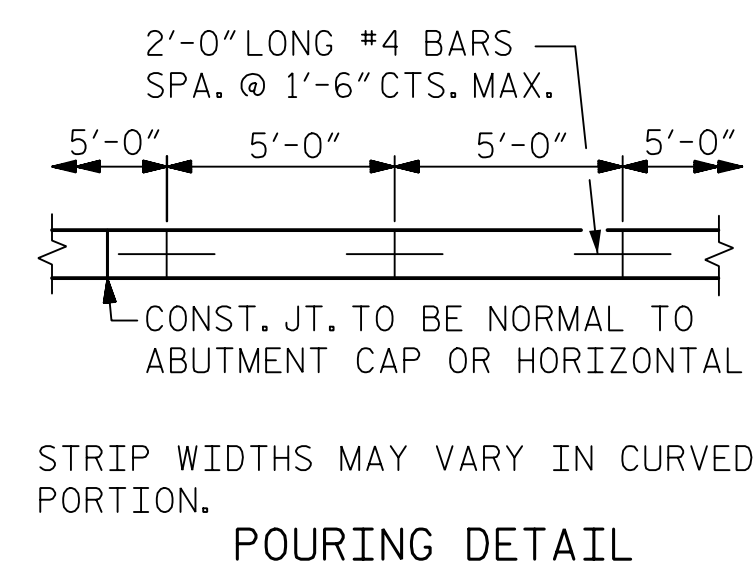
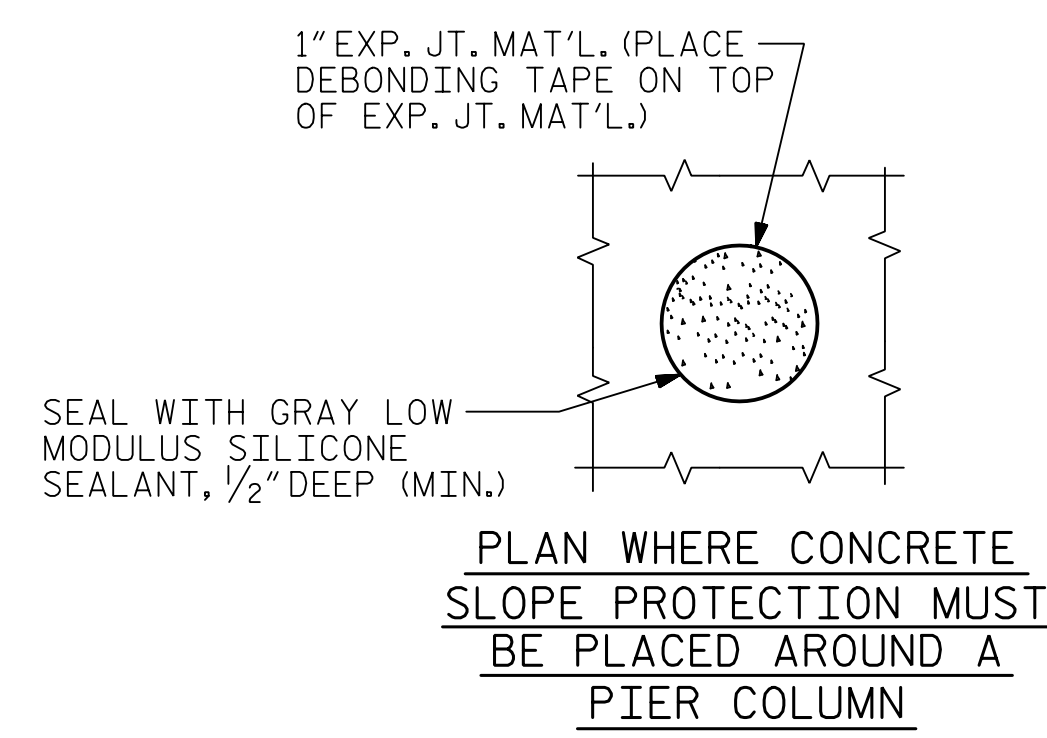
**GENERAL NOTES**

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.



**SECTION C-C**



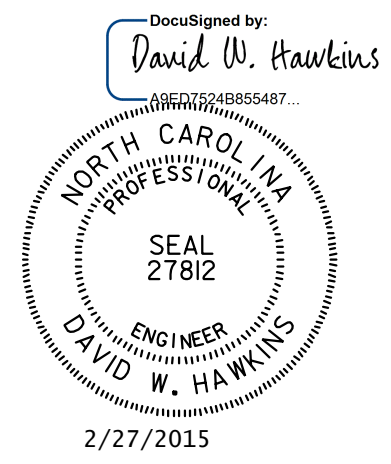
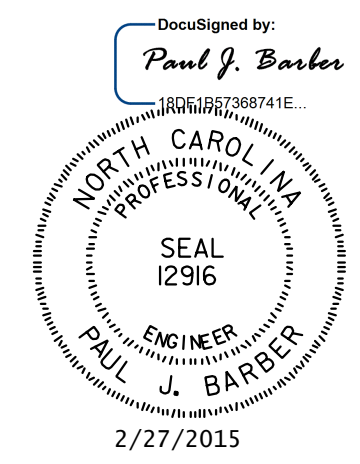
PROJECT NO. P-4900A  
ROBESON COUNTY  
 STATION: POC 38+93.36 -L-  
 MILE POST: 0.55

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**STANDARD**

**SLOPE PROTECTION**  
**DETAILS**



ASSEMBLED BY : MEW	DATE : 7/14
CHECKED BY : PJB	DATE : 9/14
DRAWN BY : ELR 5/92	REV. 5/1/06 TLA/GM
CHECKED BY : GRP 6/92	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM

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DRAWN BY: M. WRIGHT DATE: 7/14  
 CHECKED BY: P. BARBER DATE: 9/14

DWG. NO. 35

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			54